

APPENDIX H1

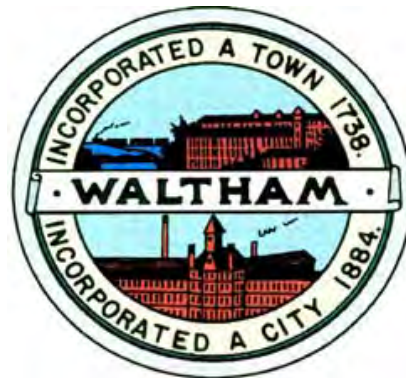
FERNALD CENTER REHABILITATION WETLAND STUDY REPORT

APRIL 2016



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APRIL 2016

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APRIL 2016

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1. EXECUTIVE SUMMARY

The City of Waltham has taken the ownership of the Fernald Center in December 2014 and plans to redevelop and reuse the campus. The Campus has been sub-divided into two parcels; Parcel 1 (139.70 acres) has been purchased with Community Preservation Act (CPA) funds. The Community Preservation Committee's (CPC's) plan is to reuse Parcel 1 of the campus strictly for Open Space (including recreation) and Historic Preservation purposes. Parcel 2 (49.79 acres) has been purchased using the City's General Funds and there is a potential for repurposing existing buildings and proposing new residential, commercial, and institutional development. See Figure ES-1.

This wetland study has been funded by the CPC to complete a Hydrologic and Hydraulic (H/H) Study of the surface water through a portion of the Fernald Center and evaluate the feasibility of restoring pond and stream with associated wetlands that existing prior to year 1947.

Objective

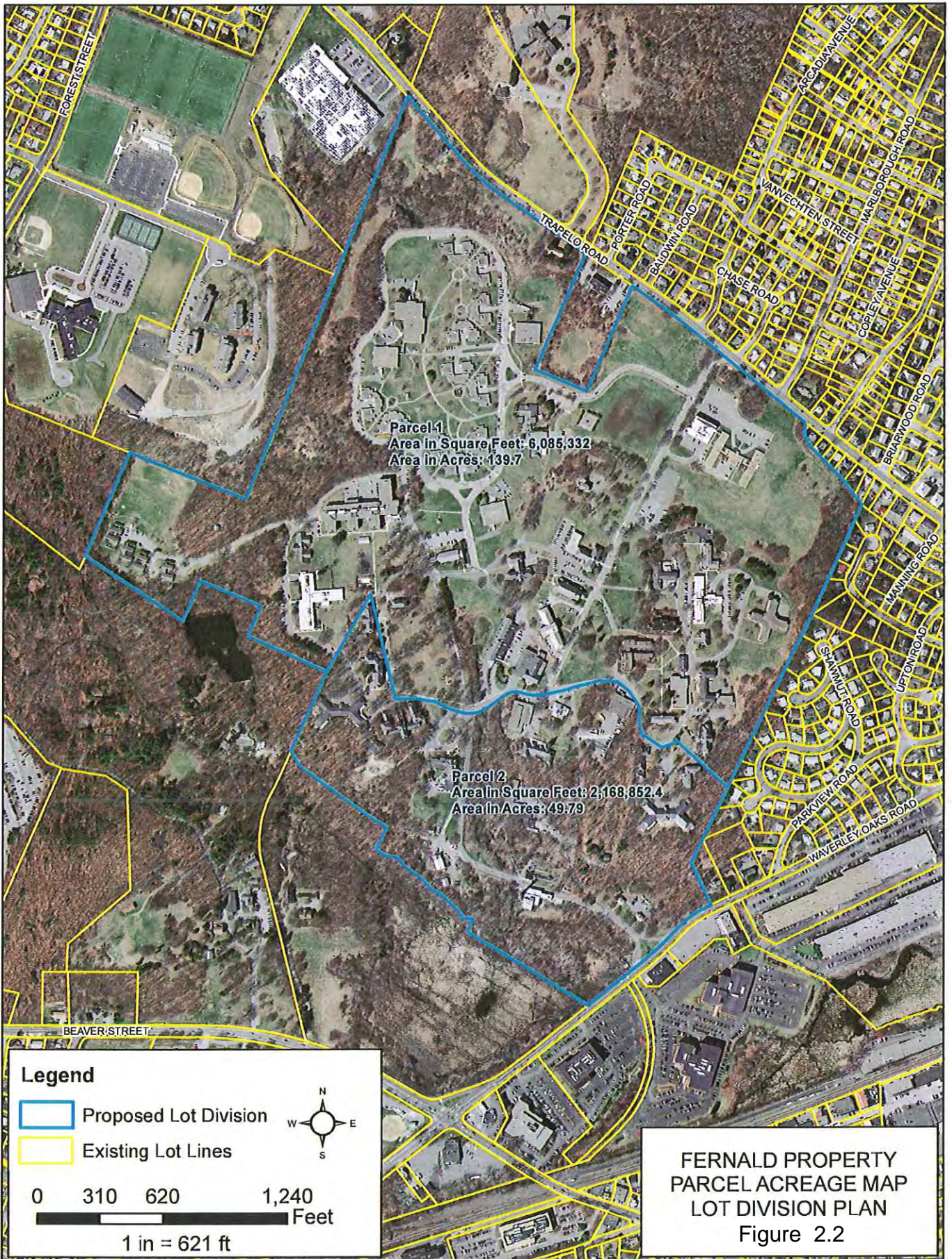
One of the major objectives of the study was to evaluate the magnitude of beneficial flooding mitigation for the downstream areas along Beaver Brook as a result of pond/wetland restoration within the Fernald Center Campus. This will be accomplished by completing an Hydrologic and Hydraulic (H/H) Modeling under three timelines:

1. Current year 2015 conditions
2. Prior to year 1946 conditions
3. An assumed full build-out conditions - year 2025 and beyond

Study Process

The process of this study involved a thorough review of the existing information as it relates to mapping, relevant reports and documents, recollections of activities and development within the campus by various residents and City public officials. Several meetings were held with the chair and other member of the CPC to develop clear goals and metrics for evaluation of benefits to alleviate flooding by way of completing the H/H Study.

Detailed site visits were conducted in January 2015 to locate major drainage infrastructure, existing wetlands, open channel stream sections and conditions, identify ridgeline for determining the runoff flow paths to various analysis points for the H/H modeling.



Existing Conditions

An unnamed stream runs in a southerly direction from near Trapelo Road to the wetland system associated with Clematis Brook at Waverly Oaks Road and Beaver Street area. See Figure ES-2. The majority of the Fernald Center Campus drains to this unnamed stream which discharges to the Beaver Brook that has chronic flooding problems. The area near the Shriver Center Building and parking lot near the northeast corner of the campus drains generally towards the Shirley Road area resulting in flooding.

Historical aerial photographs and USGS topographic maps were compiled from year 1903 through 2015. The land use and cover that existed during the three timelines of the H/H were estimated based on this information and input into the H/H Models that were developed. HydroCAD Modeling software was used to develop the H/H Models for the study.

For the buildout condition year 2025 and beyond it was estimated that the Cottages within the Cottage Street Campus along with the paved roadway will be removed. Also, it was assumed that the net effective impervious area within the sub-catchments will approximately remain the same. The City could easily update the H/H Models with any planned development as time progresses.

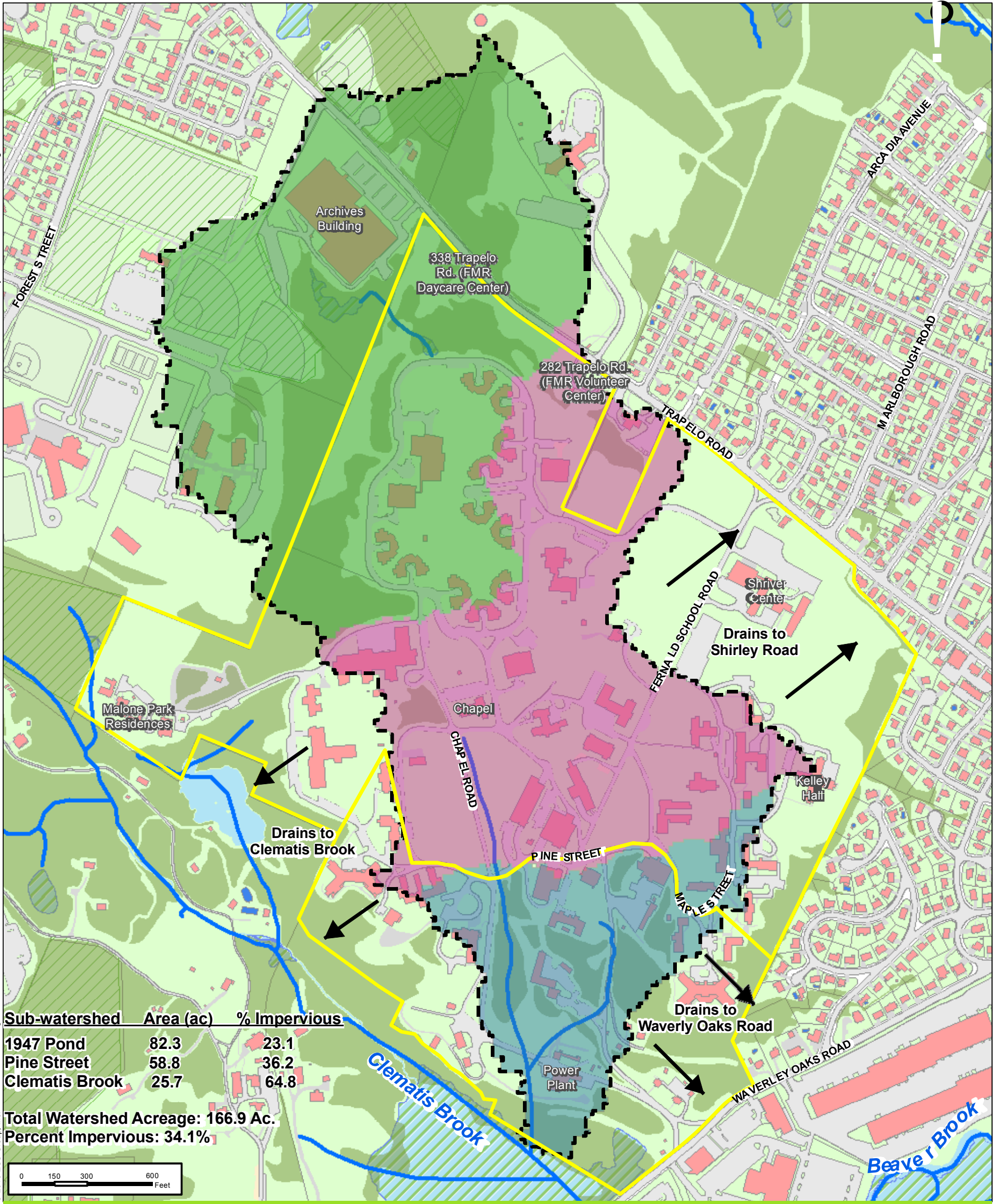
Results of H/H Modeling

The Point of Analysis (POA) for the H/H Modeling for the unnamed stream through the Fernald Center is the discharge point just south of the power plant and into the Clematis Brook and associated wetlands. The results and H/H modeling input and output data report has been compiled.

Table ES-1 Estimated Reductions in Peak Flows Over Current Conditions

H/H Model Description	Percent Reductions in Peak Flows Over Current Conditions (%)			
	2-year	10-year	25-year	100-year
Year 2025 and Beyond				
Scenario #1 1 Storage Pond	33.9	20.0	12.2	2.3
Scenario #2 2 Storage Ponds	44.2	28.9	21.1	11.2
Scenario #3 3 Storage Ponds	47.5	31.7	23.5	13.1

Based on the results from Table ES-1 nearly 50% reductions in peak flows during smaller and more frequent storms (2-year event) could be expected. Also, nearly 25% reductions in peak flows during large storm events (25 year event) can be expected.



Fernald School Wetland Study
Waltham, Massachusetts

1 inch = 600 feet

Source: 1) City of Waltham - Base Layer Data, 2011
2) Watersheds, ESS Group, 2015

Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed Area to Existing Discharge Location
- Existing Stream
- Sub-Watershed to 1947 Pond Sub-
- Watershed to Pine Street Sub-
- Watershed to Clematis Brook

Figure ES-2
Current Conditions
Year 2015

Recommendations

One of the major recommendations of the study is as follows:

Phase I Restore Pond/Wetland System and Daylight Buried Culvert - Cottage Street Campus (CPC)

The Pond/Wetland system and the stream that existing prior to the year 1947 can be restored within the Cottage Street Campus. The CPC could engage the services of an Engineering/Landscape Architectural firm to conduct detailed site investigation and site suitability analysis and produce construction bid documents for this work.

A preliminary project rendering is shown on Figures ES-3 and ES-4 to help visualize the day-lighted stream and pond. Also shown on the rendering are some of the potential passive recreational features that the CPC could consider implementing.

In addition to flood mitigation to Beaver Brook restoring the pond and day lighting the stream will result in: improved water quality, establishment of wildlife corridor connectivity and encourage passive recreational activities such as walking, biking, community gardens, school educational activities to name a few.

Planning level costs for implementing this phase may be in the range of **\$1.2 to \$1.5 million** and higher depending on specific site conditions. Major factors that could significantly impact these costs include:

- any contamination discovered in the existing soils and groundwater
- type of crossing near the entrance to the Chapel and roadway redesign

The planning level costs include the following:

- Engineering assessment, design, permitting related to wetlands/surface water resources
- Construction, construction administration and resident inspection
- Post construction monitoring, repair and maintenance (2-years following construction)
- Follow up monitoring (up to 3-years following the 2-years post construction monitoring)



Fernald Center Wetland Study

Cottage Street Campus Existing Condition

Greenspace, Aquatic Habitat and Flood Storage Restoration Project

FIGURE ES-3
Recommendations - Phase I



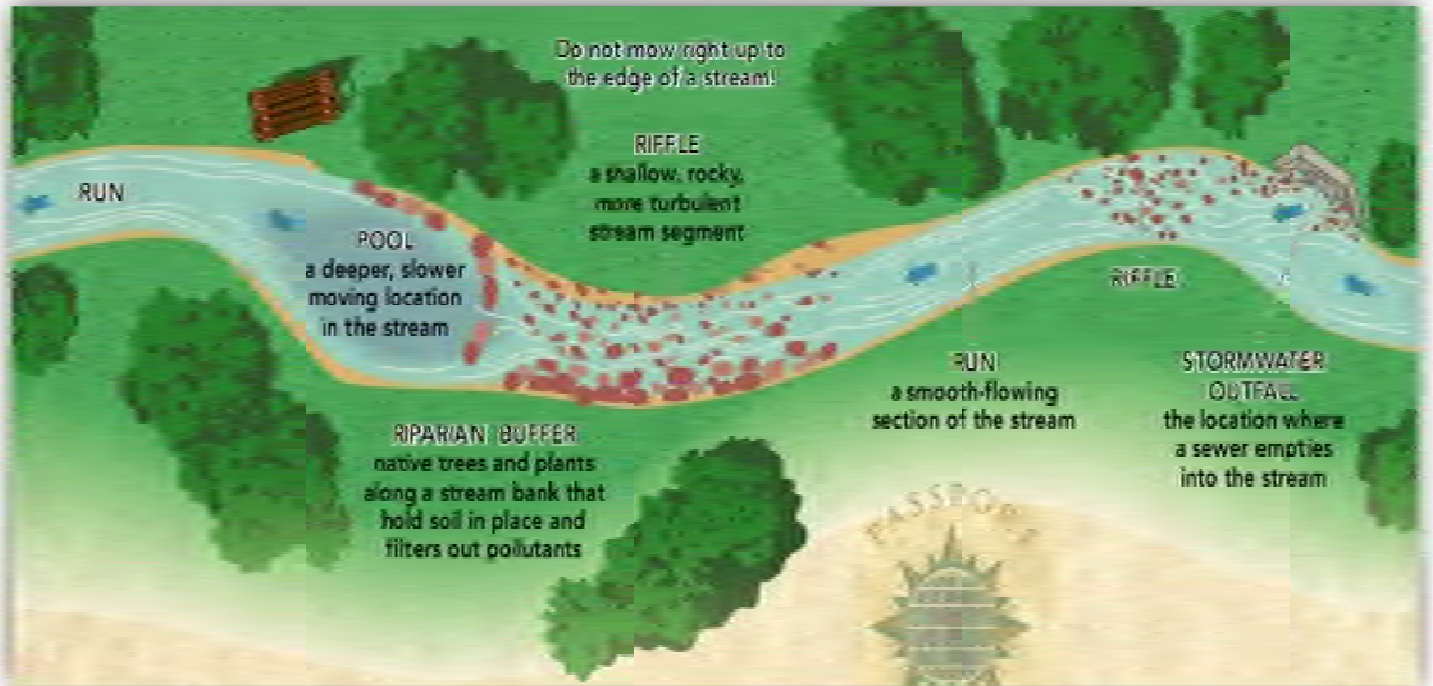


Fernald Center Wetland Study

Cottage Street Campus Conceptual Rendering
 Greenspace, Aquatic Habitat and Flood Storage Restoration Project

FIGURE ES-4
 Recommendations - Phase I





Creating Sinuosity of Daylighted Stream with Riparian Zones

2. INTRODUCTION

Walter E. Fernald Development Center (Fernald Center) is located in the northeast quadrant of the City of Waltham, Middlesex County, MA, near the neighboring towns of Watertown, Belmont and Lexington, with a street address of 200 Trapelo Road. The site abuts Federal, State, City, and institutional properties to the northwest, west, south and residential properties to north and east as shown on Figure 2.1. Access to the campus is via a main entrance on Trapelo Road and a secondary entrance on Waverley Oaks Road (Route 60).

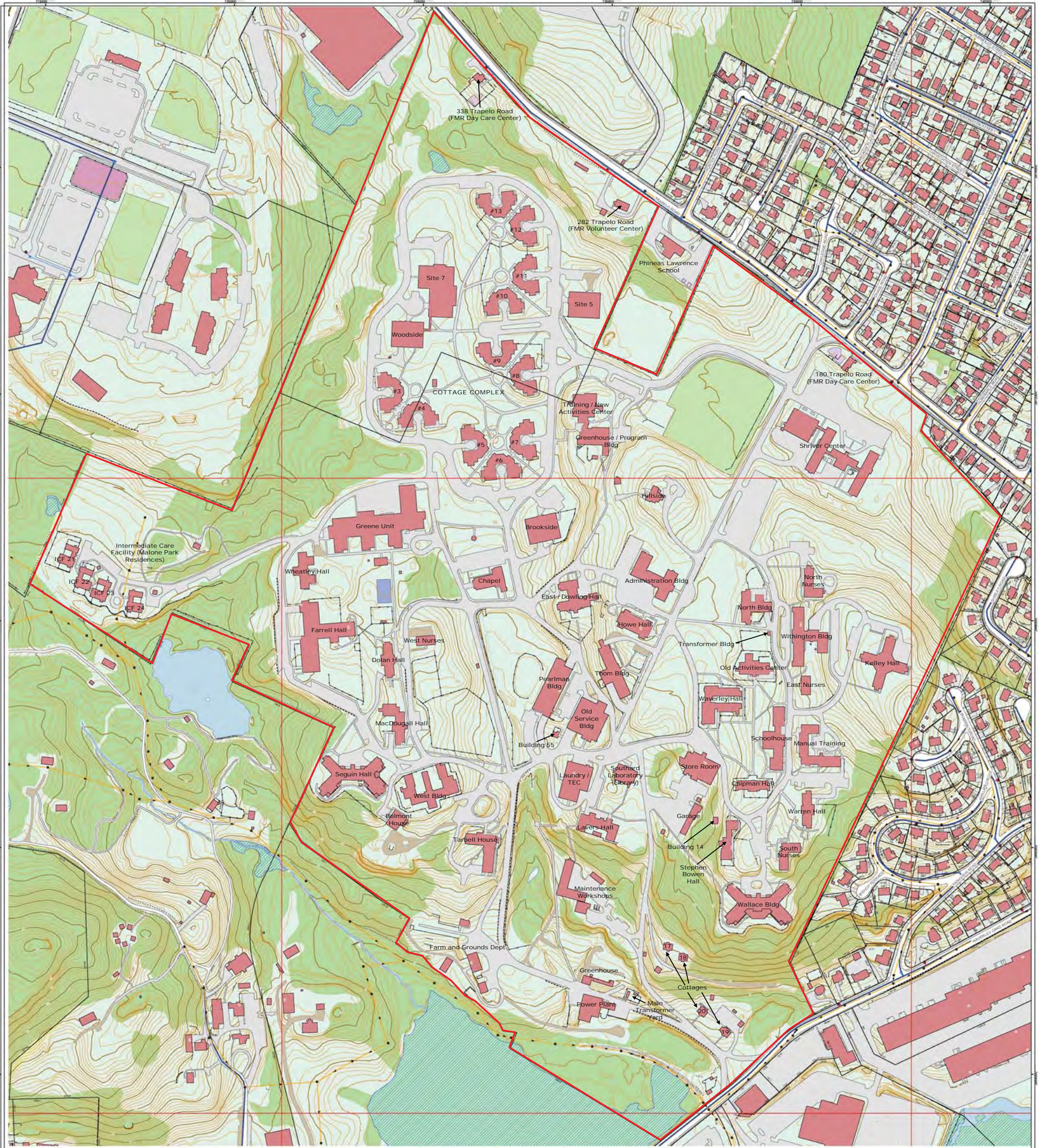
The City of Waltham has taken over the ownership of the Fernald Center in December 2014 and plans to redevelop and reuse the campus. The Campus has been sub-divided into two parcels as shown on Figure 2.2. Parcel 1 (139.70 acres) has been purchased with Community Preservation Act (CPA) funds. The CPA acquired parcel (Parcel) of the campus is strictly for Open Space (including recreation) and Historic Preservation purposes. Parcel 2 (49.79) acres has been purchased using the City's General Funds and there is a potential for repurposing existing buildings and proposing new residential, commercial, and institutional development.

This wetland study has been funded by the CPC to complete a Hydrologic and Hydraulic (H/H) Study of the surface water through the Fernald Center and evaluate the feasibility of restoring pond and stream with associated wetlands that existing prior to year 1947.

2.1 SCOPE OF SERVICES

The planned scope of services for the study included the following:

1. Attend, as required, meetings with the Community Preservation Committee, (CPC); the Waltham Conservation Commission, the Engineering Department and other city interest groups as the CPC invites.
2. Make as few as three presentations to the city, stakeholder groups and other interested parties.
3. Create a HydroCAD storm water runoff model of the existing conditions compared to the historic conditions of the Fernald drainage system identifying the major water courses both current and historic.
Create a minimum of three HydroCAD model runs indicating different options for restoring the drainage system or improving the existing drainage system. Provide output results indicating the order of magnitude advantages or disadvantages of the different options.

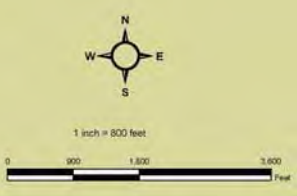


Legend

Flow Eq Chamber	Gate Valve	Force Main	Index Contours	Water Bodies
Pump Station	Hydrant	Gravity Main	Index Depression Contours	Upland
Regulator	Increaser	Service	Intermediate Contours	Wetland Area
Sewer Manhole	Pipe-End, Plug	Abandoned Water Line	Rail Lines	Stream
Wet Well	Pump Station	Fire	Parcel Lines	Paved Roads
Gate Valve - Hydrant	Reducer	Water Force Main	Building Footprints	Unpaved Roads
		Water Main		Basketball Court
		Service		Athletic Field
		Stand Pipe		Playground
		Unknown		Tennis Court
		Easement Lines		Vegetated Area

DISCLAIMER:
 This map is for reference and planning purposes only. It is prepared for the inventory of real property within the City of Waltham and is created from the most recorded deeds and plans. Users of this map are hereby notified that the information and data presented herein should be verified for the information contained on this map. The City of Waltham and its engineering consultants assume no legal responsibility for the information contained herein.

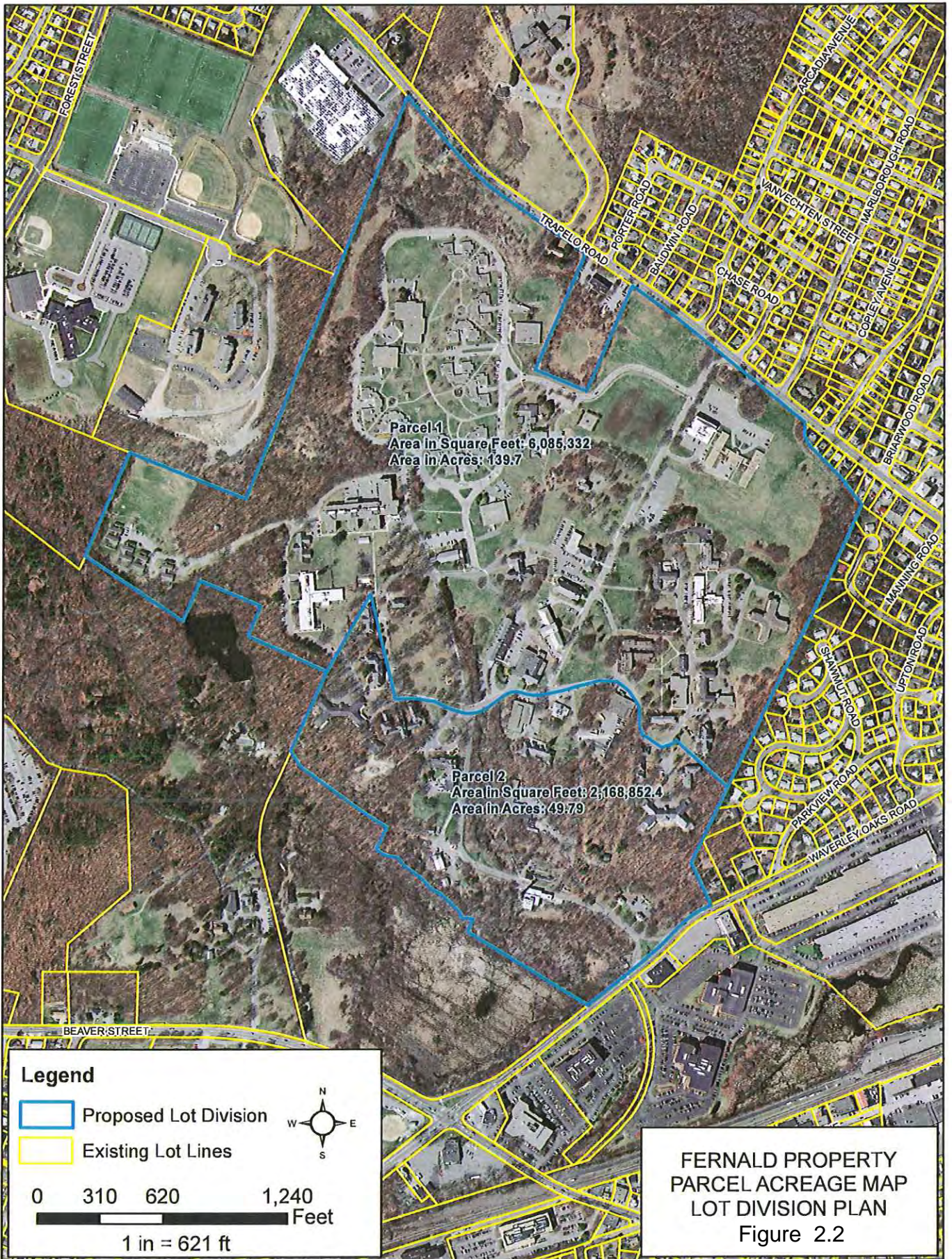
DATA SOURCE:
 The digital planimetric base map data was developed by Clear Technology, Inc. and is based on a spring 2011 1"=40' scale color orthophotograph.



FERNALD SCHOOL
 AND SURROUNDING AREA



FIGURE 2.1
 Site Plan



4. The deliverable of the study will include the following:
- A written report explaining the process of the study
 - A complete topographical watershed map of the branch of the Beaver Brook that the Fernald Property sits within.
 - An existing conditions topographical map of the property and at least 1,500-foot offset, indicating generally the drainage infrastructure and the existing topography; it is expected that GIS information supplemented with record information would be sufficient.
 - An historic conditions topographical map, (generally based on the 1946 USGS topographic maps and/or the city Raytheon maps) of the property and at least 1,500-foot offset, indicating generally the drainage infrastructure and the existing topography.
 - Drainage calculations indicating the effect of both the existing conditions and the historic conditions.
 - A HydroCAD model of the system for use by the City Engineering Department.

2.2 MAJOR OBJECTIVES

The major objectives of the study area as follows:

1. Assist the City to identify areas within the Fernald Center for restoring wetlands that existed prior to the development activities.
2. Evaluate the magnitude of beneficial flooding mitigation for the downstream areas along Beaver Brook as a result of pond/wetland restoration. This will be completed under three timelines:
 1. Current year 2015 conditions
 2. Prior to year 1946 conditions
 3. An assumed full build-out conditions - 2025 and beyond

3.0 PROCESS OF THE STUDY

There are numerous existing reports, studies, articles that describe the history, development activities that resulted in altering the surface water features within and near vicinity of the Fernald Center. The information from these sources was reviewed and compiled. Also, a firsthand knowledge of the physical features and alterations over a time period exists with prominent City officials that reside near the Center and serve on various City Commissions and Committees. This information was obtained through the Chair of the CPC and has been incorporated into this report.

3.1 REVIEW OF EXISTING INFORMATION

Following were the major sources of existing information that was reviewed and compiled as detailed in the following sections and listed below:

- The City of Waltham GIS information and MassGIS for mapping
- DCAM information on existing storm drain and other utility infrastructure
- DCAM current infrastructure projects (sanitary sewer project-Judith Nitsch Engineering)
- various topographical historic USGS maps and relevant information
- DCAM Project No. DCP9923 HDI - DMR Fernald Development Center Site Study
- Draft Phase I Environmental Site Assessment - TechLaw Inc., 2009
- History of the Walter E. Fernald Development Center, Marie E. Daly

3.2 MEETINGS WITH CPC and OTHER INTEREST GROUPS

The Chair of the CPC and the chair of the Conservation Commission acted as a liaison between the City public officials and departments and other interest groups to acquire information that was requested. Numerous meetings were held to develop a clear understanding and definition of the goals of this study and identify the need for information needed and the required coordination.

A presentation was made to the CPC during the meeting that was held on March 10, 2015. The CPC was briefed on the objectives of the study and the initial findings of the Hydrologic/Hydraulic Modeling that had been completed and recommended stream day lighting and establishing/restoring a pond/wetland system. A copy of the presentation is included in Appendix H. The findings of the draft wetlands study report were presented at the Fernald Reuse Committee meeting on December 14, 2015. Input received from the Committee members has been incorporated into the report.

3.3 SITE RECONNAISSANCE

Detailed site visits of the Fernald Center were conducted in January 2015 to locate surface water conveyance infrastructure, document existing wetlands, open channel stream sections and conditions, identify ridgeline for determining the runoff flow paths to various analysis points for the H/H modeling. A log of the photos that were taken during this site visit have been compiled and included in Appendix A - Site Photos.

Supplemental site visit to document flooding conditions at Cottage Street was conducted during a rain event on March 27, 2015. A photo log of this site visit is

also included in Appendix A - Site Photos.



Wetland/Pond Overflow Cottage Street North of Cottage Street - March 27, 2015

A site visit was also conducted on September 24, 2015 to confirm that there was flow in the brook south of the Chapel in spite of a relatively dry spell during late summer. This confirmed that the stream is perennial and that could likely support the restored wetland and day-lighted stream.

4.0 SUMMARY OF FINDINGS

Prior to developing a Hydrologic and Hydraulic Model information relevant data was compiled for the three timelines of the study:

1. Current year 2015 conditions
2. Prior to year 1946 conditions
3. Projected build-out conditions - year 2025 and beyond

4.1 SUMMARY OF HISTORICAL USE INFORMATION

The following relevant information has been referenced from the report, " Draft Phase I Environmental Site Assessment", prepared by TechLaw Inc. and dated October 22, 2009.

The Property was used for agricultural and residential uses prior to its development as a school for developmentally delayed patients. Below is a summary of the information on past uses and development of the Fernald Center and surrounding parcels.

4.1.1 Aerial Photographs

Information from the available aerial photographs dated 1938, 1955, 1960, 1978, 1980, 1987, 1995, and 2006 is summarized below. A copy of the aerial photographs is included in Appendix C - Aerial Photo Decade Package.

Date: December 1938

Description: The 1938 aerial photograph shows the Property with numerous buildings to the south and primarily agricultural fields along Trapelo Road to the north (except for the residences (the Cardinal, Baldwin and Trapelo Cottages) present on the south side of Trapelo Road). Areas to the north of Trapelo Road include agricultural fields and residential neighborhoods. The area to the west, south, and east of the Property is mostly wooded terrain. Waverley Oaks Road is present on the southeastern corner of the photograph and the Pierce Brothers greenhouse complex is visible east of Waverley Oaks Road.

Date: December 1955

Description: The 1955 aerial photograph shows the Property with few notable changes since the 1938 photograph except for the addition of the Greene Unit on the western portion of the Property. Significant changes in surrounding properties include the oval-shaped Murphy Army Hospital complex (northwest of the Property); a building of the Massachusetts Metropolitan State Hospital (north of the Property), further development of residential neighborhoods (north and east of the Property); tank farms with large above ground storage tanks (ASTs)

(southeast of the Property beyond Waverley Oaks Road). The photograph shows containers (possibly ASTs) and a lagoon at the rear portion of the Pierce Brothers greenhouse complex located southeast of Waverley Oaks Road. This complex is shown immediately north of a winding stream and north of railroad tracks.

Date: May 1960

Description: The 1960 aerial photograph shows the Fernald Center in much the same configuration as in 1955. The resolution of the photograph is poor, making it difficult to observe any changes since 1955.

Date: April 1978

Description: The 1978 aerial photograph shows changes on the Property including the addition of a portion of the Cottage Complex (on the northwest side of the Fernald Center) and the Shriver Center (located near the Trapelo Road entrance to the Property). Off-site changes include the development of the residential neighborhoods between the east side of the Property and Waverley Oaks Road; replacement of the Pierce Brothers greenhouse complex with an office building, and construction of the Federal Records Center Archives building adjacent to the northwest Property boundary (formerly a baseball field on the Murphy Army Hospital grounds in a prior photograph).

Date: October 1980

Description: The 1980 aerial photograph shows the Property in the same configuration as in 1978. The only significant change noted on nearby parcels is the addition of a second office building to the former Pierce Brothers greenhouse property (by that time owned by Duffy Brothers Construction).

Date: April 1987

Description: The 1987 aerial photograph shows the Property as previously shown. Although the photographic resolution is poor, it is possible to see that Malone Park has, at least in part, been developed or been cleared for construction of the four residential buildings. No other significant changes are noted to the Property or nearby properties.

Date: March 1995

Description: The 1995 aerial photograph shows the Property as it currently exists. The only significant changes noted to surrounding properties since 1987 includes the redevelopment of the tank farm on the southeast side of Waverley Oaks Road (the tanks having been removed and only the tank footprints visible) and additional office buildings across from the Waverley Oaks entrance.

Date: 2006

Description: The 2006 aerial photograph shows the majority of the Property except for the Malone Park Drive residences on the southwestern portion of the Property. No significant changes are noted on the Property, and the former Murphy Army Hospital area (partially visible) has begun to be redeveloped with athletic fields.

4.1.2 Historical USGS Topographic Maps

Copies of the historical topographic maps are included in Appendix D and summarized below:

Date: 1903

Description: Some development is suggested on the southern portion of the Property between Cedar Hill and Owl Hill. A stream and wetland area is located on the western portion of the Property.

Date: 1947

Description: Buildings and roadways are present on the Property (which is shown as the Fernald State School), on the west side of Owl Hill. Clematis Brook is shown flowing beyond the southern portion of the Property, and an unnamed stream and pond on the Property discharge into Clematis Brook. Beaver Brook flows along the northern side of the Boston and Maine Railroad line southeast of the Property. The Metropolitan State Hospital complex is located north of the Property a considerable distance beyond Trapelo Road. Other than residential development in the immediate vicinity of the Property, no other changes have been observed since the 1903 topographic map. The Pierce Brothers greenhouse complex appears southeast of Waverley Oaks Road.

Date: 1950

Description: One substantial change noted since the 1947 topographic map is the development of the Murphy General Hospital Complex west of the Property.

Date: 1956

Description: Changes to the Property since the 1950 topographic map includes the addition of the Greene Unit on the western portion of the Property. The railroad siding which enters the Property from the southeast is visible on the topographic map. The initial development of the Shell Oil Distribution facility is noted by the two tanks (black circles) on the map south of Waverley Oaks Road. The water tower that serves the Property is located on the hilltop north of Trapelo Road, and a building of the Metropolitan State Hospital is located along the road to the water tower.

Date: 1971

Description: By 1971, the topographic map includes the Murphy Federal Archives building northwest of the Property, and additional large ASTs on the Shell Products Distribution center south of the Property and Waverley Oaks Road.

Date: 1985

Description: Changes to the Property include construction of a portion of the Cottage Complex on the northwest side of the Property and the construction of Malone Park Road. The only significant change to nearby properties is the construction of a long office building south of Waverley Oaks Road where the Pierce Brothers greenhouses were previously located.

4.2 CURRENT YEAR 2015 CONDITIONS

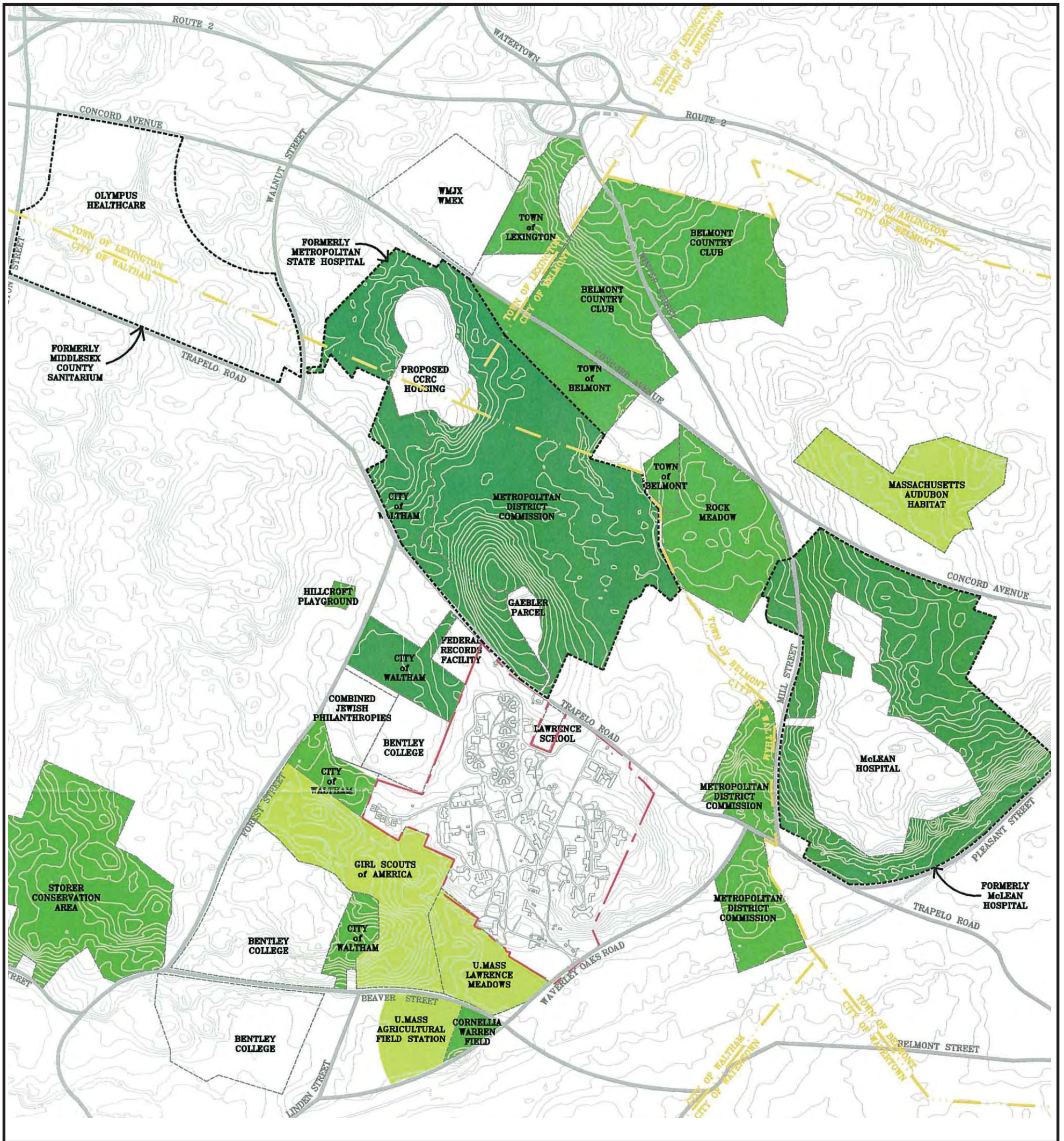
The following relevant information has been referenced from the published report, " Draft Phase I Environmental Site Assessment", prepared by TechLaw Inc. and dated October 22, 2009 and supplemented with information from other sources listed above and observations during site visits.

4.2.1 Surrounding Area Land use

The Fernald Center is surrounded by a public school and a parcel (formerly occupied as a state hospital) to the north; residential neighborhoods to the northeast and southeast; a commercial area occupied by commercial buildings to the south-southeast; a Girl Scout Camp and agricultural land (including a wetland) occupied by the University of Massachusetts Agricultural School (UMASS) to the southwest; and Bentley college buildings, a city park, and the Regional Archives of the Federal Records Center to the northwest. Please refer to Figure 4.1.

4.2.2 Topography

Most of the campus lies on rolling terrain between elevations of 150 and 220 feet above sea level saddled between low hills to the east and west. The high point on the site is the summit of Owl Hill (el. 236 ft.), a glacial drumlin on the east site boundary, which is not much higher than the plateau-like summit (el. 216 ft.) of the former Army Corps site west of the site, but the ground tends to fall slightly to the west. There are two knolls, local high points that offer views, one at the center of the campus (area of Administration Building, el. 206) with westerly views over the lower and newer campus; the other in the west-central campus, near MacDougall. The major landform in the view shed is Mackerel Hill (el. 300 ft.), the drumlin with the standpipe to the north across Trapelo Road on the former State Hospital site. See Figure 4.2.



Key:







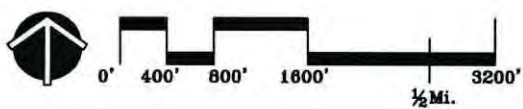
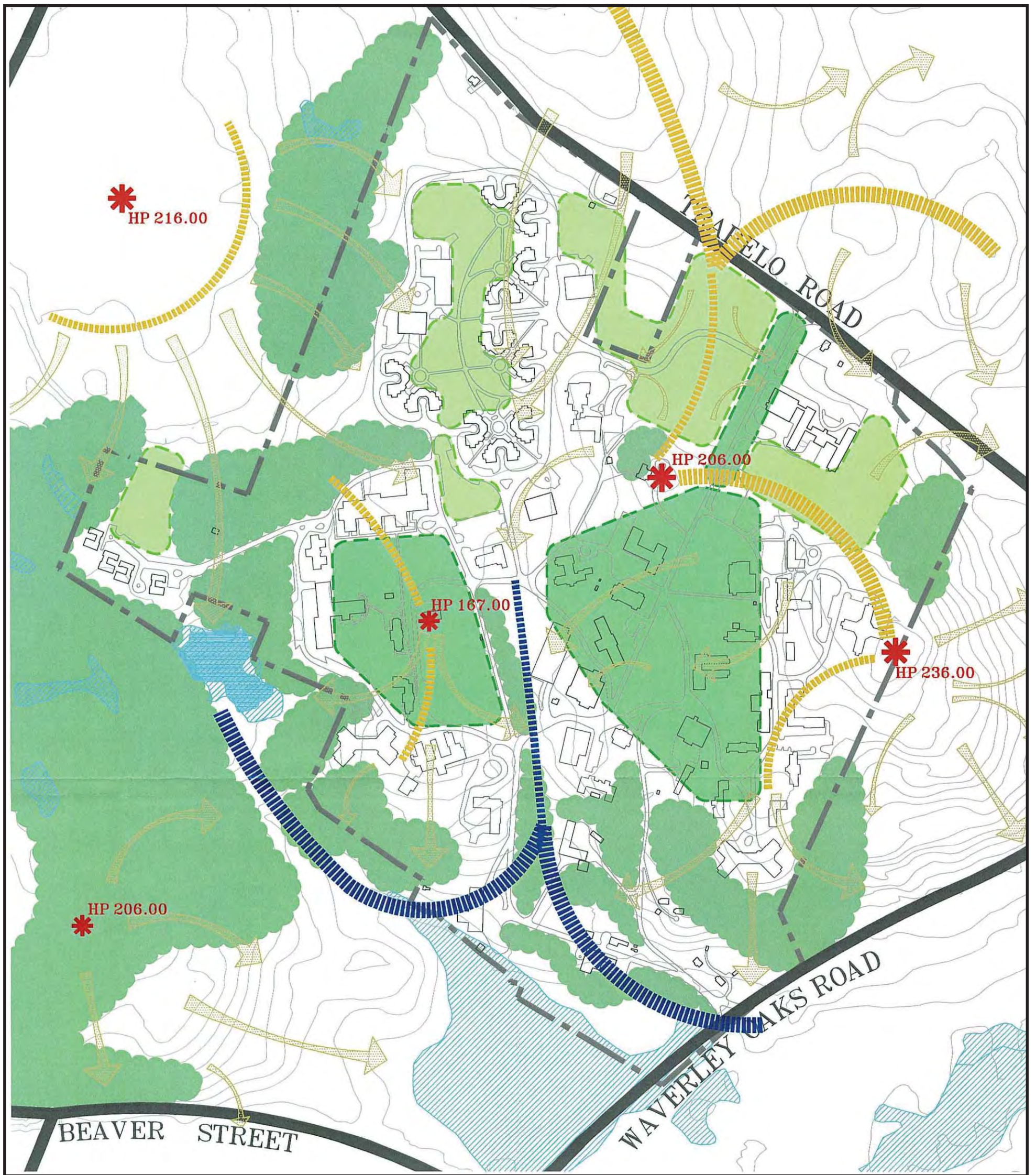
- | | | | |
|---|---|---|--------------------------|
|  | Semi-Public Open Space |  | Former Contiguous Parcel |
|  | Public Open Space |  | Municipal Boundary |
|  | Newly Designated Open Space | | |
|  | Private Land Potential Open Space Linkage | | |

FIGURE 4.1
Neighboring Large Parcels



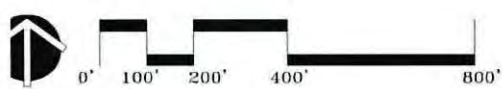
Source:
 The Saratoga Associates, December 21, 2001
 Massachusetts Division of Capital Asset Management



Key:

- | | | | | | |
|--|-----------------|--|-------------------|--|----------------|
| | Wetland | | Node / High Point | | Forested Areas |
| | Lake | | Primary Ridge | | Grove Areas |
| | Primary Swale | | Secondary Ridge | | Turf Areas |
| | Secondary Swale | | Down Slope | | |

FIGURE 4.2
General
Topographical
Features



Source:
 The Saratoga Associates, December 21, 2001
 Massachusetts Division of Capital Asset Management

4.2.3 Soils/Geology

From a geological standpoint Fernald Center occupies elevated bedrock on the edge of the Boston Basin Fault line, as does McLean Hospital to the east and Bentley College to the west. Numerous bedrock outcrops could be seen across the Center during the site inspections. According to the MassGIS Surficial Geology map nearly all of the Center consists of till or bedrock with a minor component of sand and gravel deposits in the vicinity of the wetland on the southern corner.

A detailed soils report from the USDA Natural Resources Conservation Service's Web Soil Survey is included in Appendix B - Soils Report.

4.2.4 Hydrology

Site Hydrographic Features are presented on Figure 4.3. Groundwater in the vicinity of the Property flows in a generally southerly direction toward the Charles River which is located approximately 1.5 miles to the south. However, actual groundwater flow direction within the Fernald Center will vary based on land topography, and could flow in directions other than to the south, depending on localized features.

The depth of groundwater on the property varies based on elevation, local topographic gradients, and proximity to water bodies. A wetland area occupies the southern corner associated with Clematis Brook which follows the southwestern property line beyond the property and discharges into Beaver Brook, a tributary of the Charles River.

Beaver Brook flows generally from north to south beyond the eastern perimeter of the Property beyond Waverley Oaks Road.

An unnamed perennial stream runs generally in a north to south direction bisecting the Fernald Center Property. Most of the northern portion of the stream (approximately 2,000 feet) runs within the Cottage Street Campus inside a 18-24 inches diameter concrete pipe that day lights just south of the Chapel.

Based on field observations there are existing isolated wetlands as shown on Figure 4.3.

4.2.5 Flood Zone Information

A review of the MassGIS FEMA Flood Zone map indicates that the yellow area surrounding the wetland on the southern corner of the is mapped as flood zone X500 (500-year flood zone). The on-site wetland is within Flood Zone AE, the area of a 100-year flood zone. See Figure 4.4.



Legend

- Fernald Development Center
- Surface Water
- Wetlands
- Certified Vernal Pools

Outstanding Resource Waters

ORW Type

- ACEC
- Cape Cod National Seashore
- Protected Shoreline
- Public Water Supply Watershed
- Retired Public Water Supply
- Scenic/Protected River
- Wildlife Refuge








Figure 4.3
Hydrographic Features

Source: TerraServer
TechLaw



Legend

- | | |
|---|---|
|  A |  VE |
|  AE |  ANI |
|  AH |  X500 |
|  AO |  D |
|  V |  UNDES |



0 0.1 0.2 0.4 0.6 0.8



**Figure 4.4
FEMA Flood Map**

Source: TerraServer
TechLaw

4.2.6 Existing Utilities

The information summarized below has been referenced from the report, "DCAM Project No. DCP9923 HDI - DMR Fernald Development Center Site Study" and supplemented with other sources listed above and observations made during site visits. See Figure 4.5 for gas and steam systems and Figure 4.6 for storm drainage system.

Gas Thermal System

A 2-inch gas supply off a 6-inch intermediate main in Trapelo Road (there is also a 12-inch low pressure main there) that served 3 buildings: Shriver (125), Hillside (043), and Perlman (400).

Steam and Condensate Thermal System

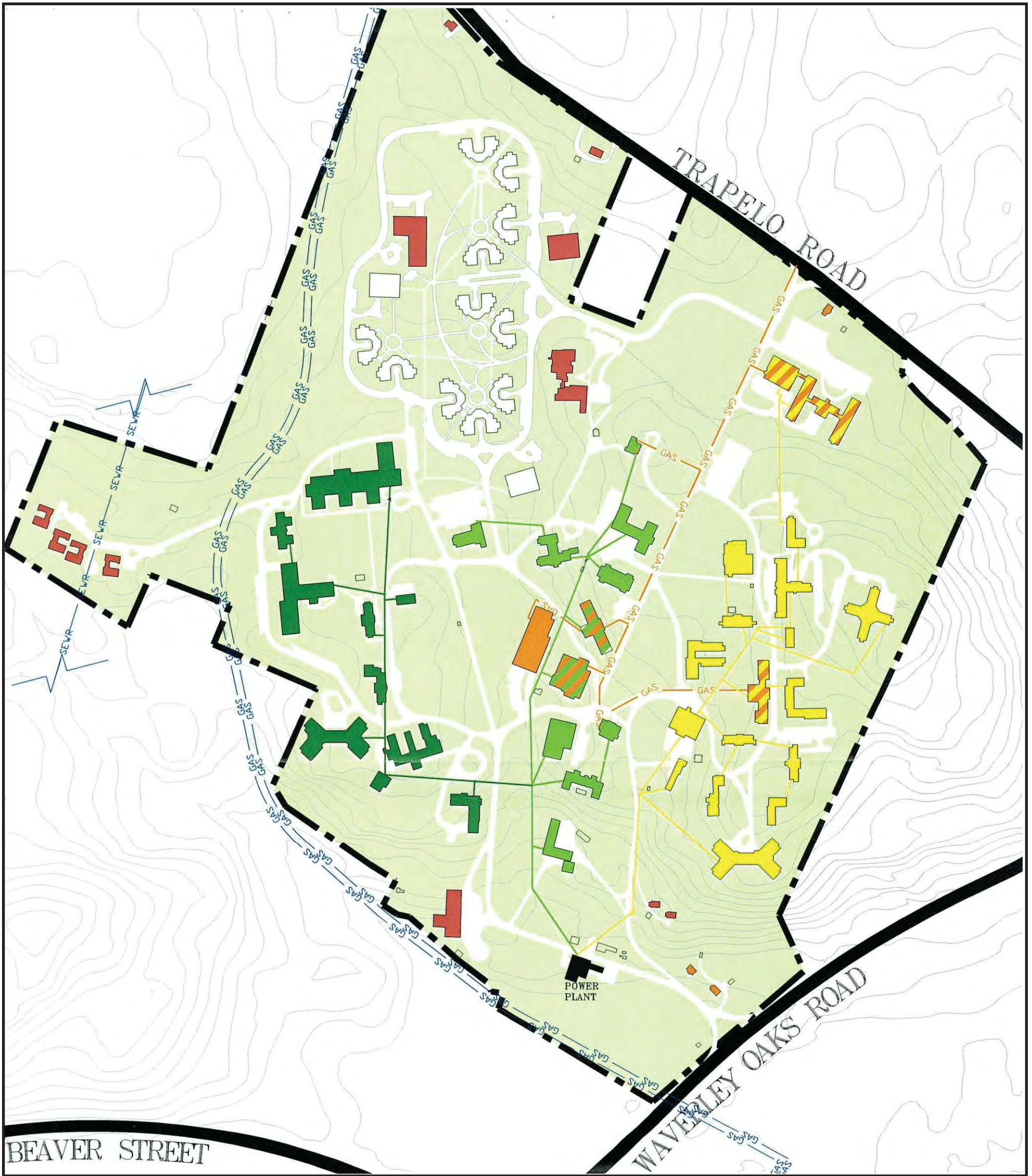
The majority of buildings—fifty—were heated by a centralized high-pressure steam-pipe system fueled by the oil-fired Power Plant (026). The steam pipe system consisted of asbestos-insulated iron piping in reinforced concrete utility maintenance tunnels from which direct burial piping lead to individual buildings, with the exception of lines running through the basement of one building to the next building on the East Branch. The two-branch system directly served 38 buildings as follows: the East Branch served 18 buildings, and the West Branch served 20 buildings plus a hydronic loop in the northwest quadrant of the site. Linked at Greene (050) to the high-pressure steam system, the hydronic loop served 13 buildings, including the Cottage Complex of 11 cottages constructed in 1976 (105-115) plus Brookside (116) and Woodside (117). A majority of the buildings had steam-to-hot-water converters.

Water and Sewer System

Except for Baldwin (045), Trapelo (051), and Cardinal (052 cottages all buildings at Fernald were supplied by a water system shared with the Shriver Center. The water system was supplied by a 12-inch branch main connecting the MWRA-MDC main in Waverley Oaks Road to the Power Plant, from which water was pumped at night via a 12-inch main to the water tower located on Mackerel Hill on the Metropolitan State Hospital property. In daytime, pipe flow reversed direction, from the water tower back to Fernald. A 6-inch main from Waltham was in place for emergency backup.

Sewage from FDC buildings flows by gravity through the existing sewer mains down to the MWRA sewer connection near the Farm and Grounds Department.

DCAM and MWRA are currently updating the water distribution system and the sewer mains through the Fernald Center. A copy of the design drawings for the on-going DCAM Sewer Main Replacement Project is included in Appendix E.



Key:






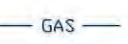






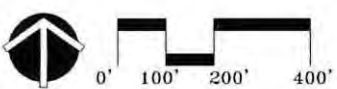
- | | | | | | |
|---|---|---|--------------------------------------|--|---------------------|
|  | Building Served By Steam: East Branch |  | Building Served By Oil (tank stored) |  | Gas Supply Line |
|  | Building Served By Steam: West Branch 'a' |  | Steam Line: East Branch |  | Gas Line Easement |
|  | Building Served By Steam: West Branch 'b' |  | Steam Line: West Branch 'a' |  | Sewer Line Easement |
|  | Building Served By Natural Gas |  | Steam Line: West Branch 'b' | | |
|  | Fernald Property | | | | |

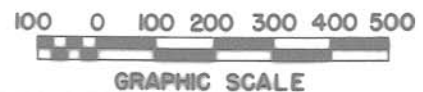
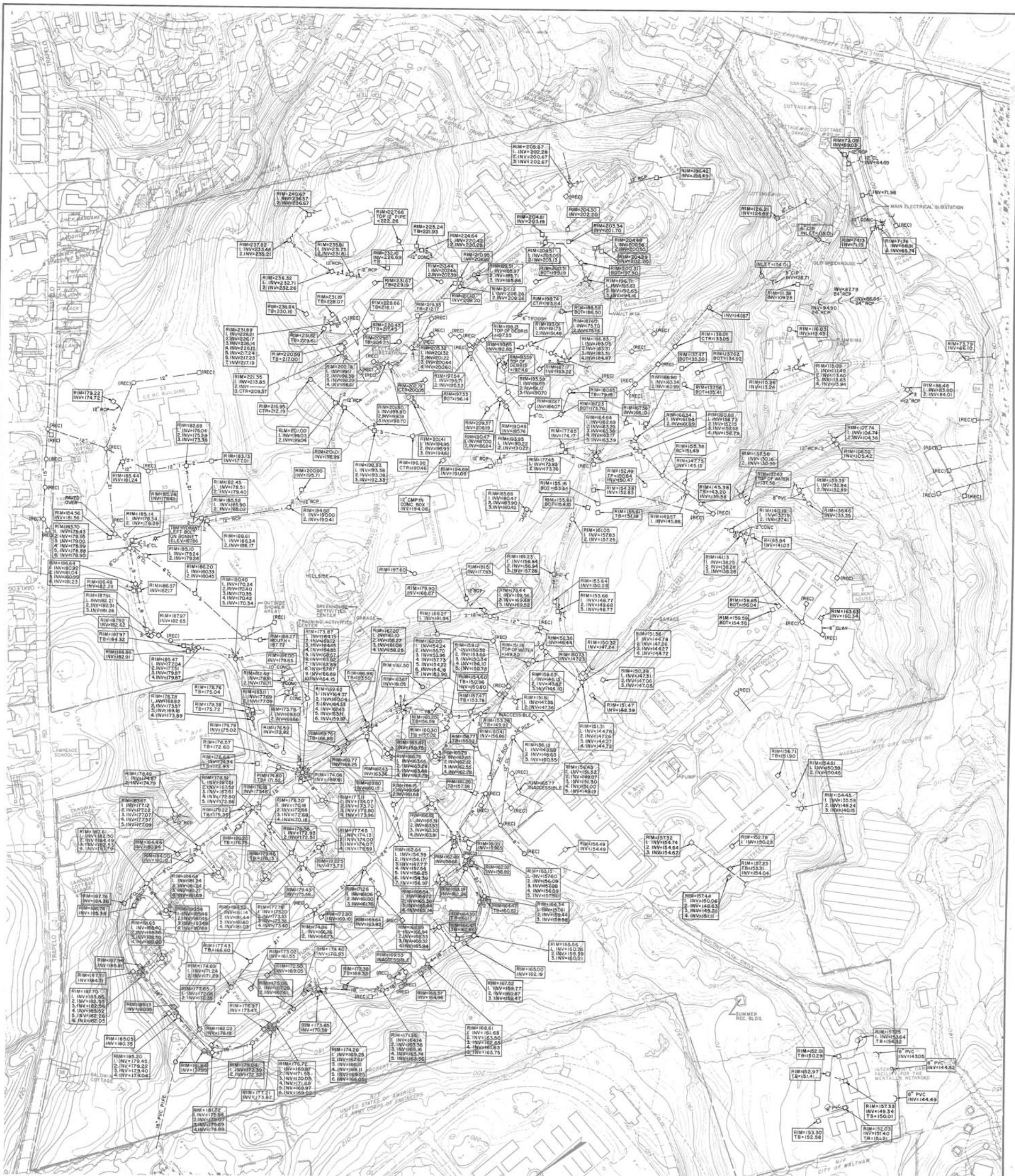
FIGURE 4.5
Major Utilities

Note: All underground utility and easement locations are approximate. Information should be field varrified prior to any site work.

Source:

The Saratoga Associates, December 21, 2001
Massachusetts Division of Capital Asset Management





**FERNALD STATE SCHOOL
WALTHAM, MASSACHUSETTS
MASS. STATE PROJECT
NO. MR88-5 STU
UTILITIES MASTER PLAN**

Source: **GANTEAUME AND McMULLEN
ARCHITECTS · ENGINEERS
BOSTON, MASSACHUSETTS**

**EXISTING
STORM SEWER SYSTEM**

EXISTING CONDITIONS BY BRYANT ASSOCIATES, INC.

FIGURE 4.6

Storm Drainage System

Storm water flows directly into swales or is collected by catch basins in paved areas and diverted to drainage swales and ultimately flows into wetlands, nearby ponds, detention basins, or streams. A small unnamed stream once flowed from the northwest portion of the Fernald Center to the southeast portion that has been buried and flows through a culvert pipe. The day lighted segment of this stream remains west of the Power Plant. Based on field observations it is likely that the catch basins were not equipped with oil/water separators. See Figure 4.6 that shows the existing storm drainage system. Based on observations in the field, this drainage system map is not an accurate representation of the existing system.

Figure 4.7 presents an overall depiction of the current 2015 conditions.

4.3 PRIOR TO YEAR 1947 CONDITIONS

The 1938 aerial photograph shows numerous buildings to the south and primarily agricultural fields along Trapelo Road to the north (except for the residences present on the south side of Trapelo Road). Areas to the north of Trapelo Road include agricultural fields and residential neighborhoods. The area to the west, south, and east of the Property is mostly wooded terrain.

The 1947 USGS Topographic Map shows a stream and wetland area is located on the western portion of the Fernald Center. Clematis Brook is shown flowing beyond the southern portion of the Property, and an unnamed stream and pond on the Property discharge into Clematis Brook. Beaver Brook flows along the northern side of the Boston and Maine Railroad line southeast of the Property.

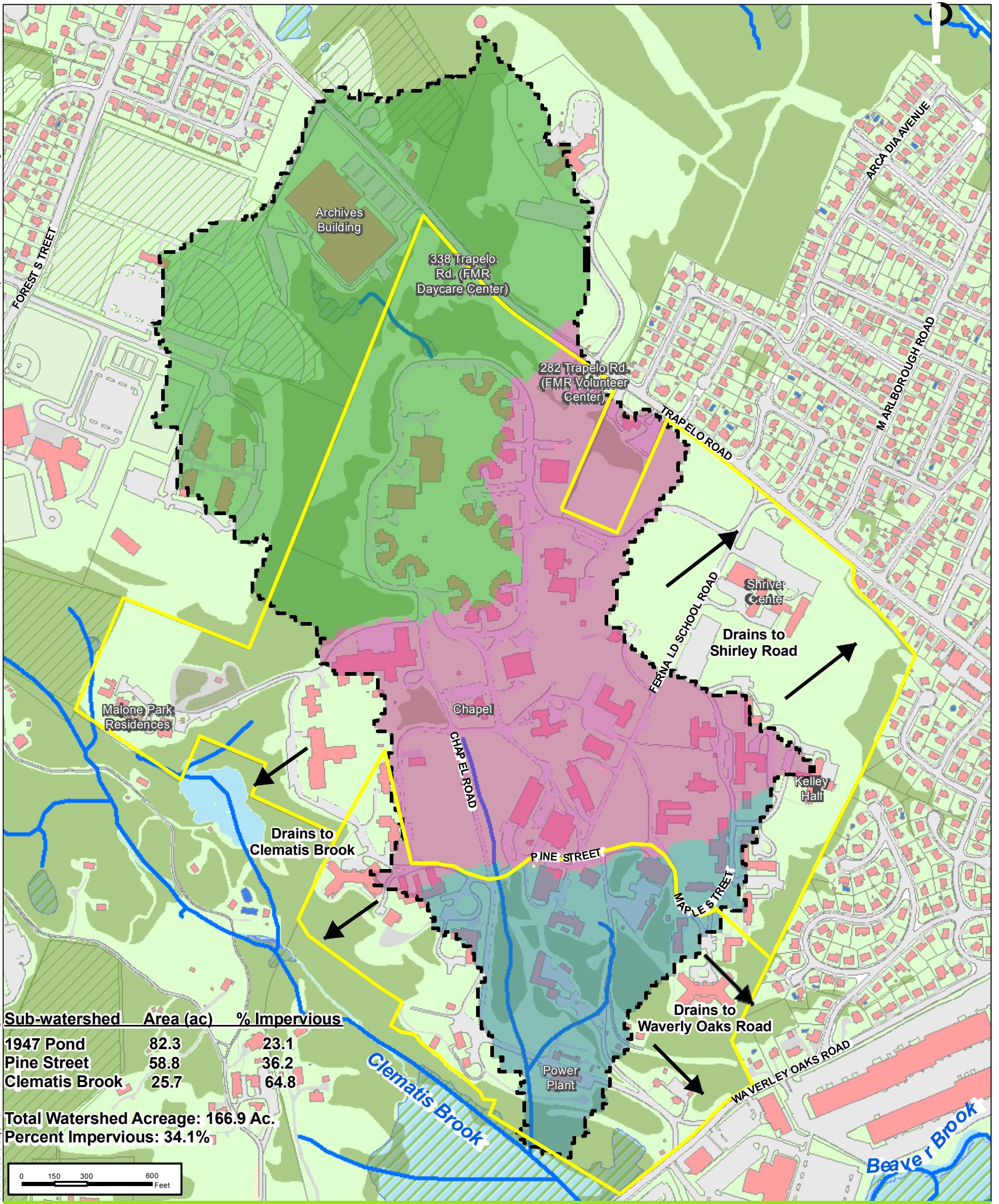
Figure 4.8 presents an overall depiction of the conditions that existed prior to 1947.

4.4 PROJECTED BUILD-OUT CONDITIONS - YEAR 2015 AND BEYOND

Based on input from the Mayor's Office and other public City officials the CPC anticipates that the following alterations will most likely be executed in the near future within Parcel 1:

- Demolition of the Cottages within the Cottage Street Campus including removal of the paved surface of Cottage Street.
- Demolition of the Shriver Building and paved parking
- Demolition of Kelley Hall and paved parking
- Demolition of Malone Park Residences

It is also anticipated that the buried/culvert portion of the unnamed perennial stream will be restored and Storage Pond 1 as shown on Figure 4.9 will be restored along with associated wetlands.



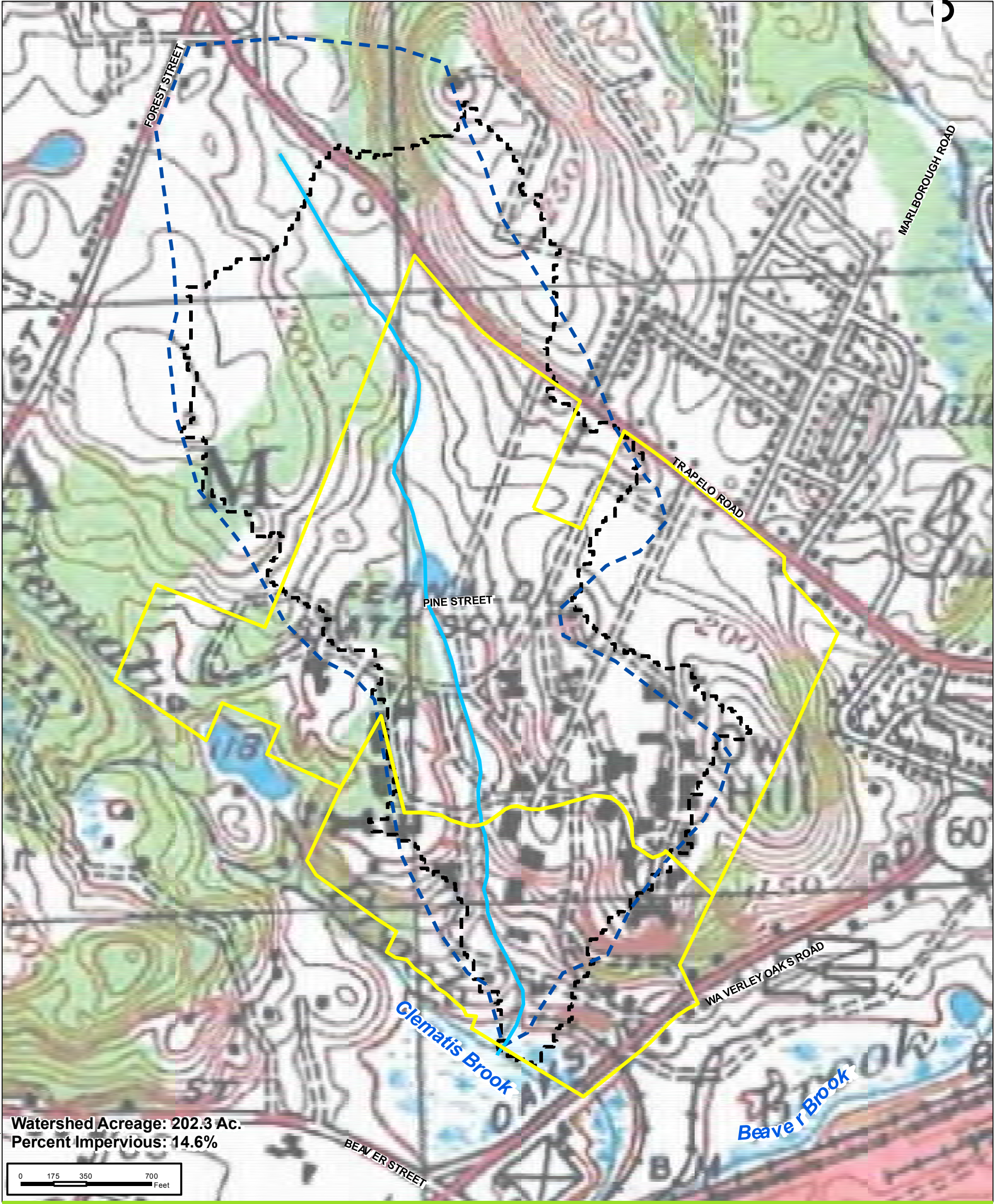
Fernald School Wetland Study
Waltham, Massachusetts

1 inch = 600 feet

Source: 1) City of Waltham - Base Layer Data, 2011
2) Watersheds, ESS Group, 2015

- Legend**
- Parcel Boundary Delineation (140/50 ac)
 - Watershed Area to Existing Discharge Location
 - Existing Stream
 - Sub-Watershed to 1947 Pond Sub-
 - Watershed to Pine Street Sub-
 - Watershed to Clematis Brook

Figure 4.7
Current Conditions
Year 2015



Fernald School Wetland Study
Waltham, Massachusetts

1 inch = 700 feet

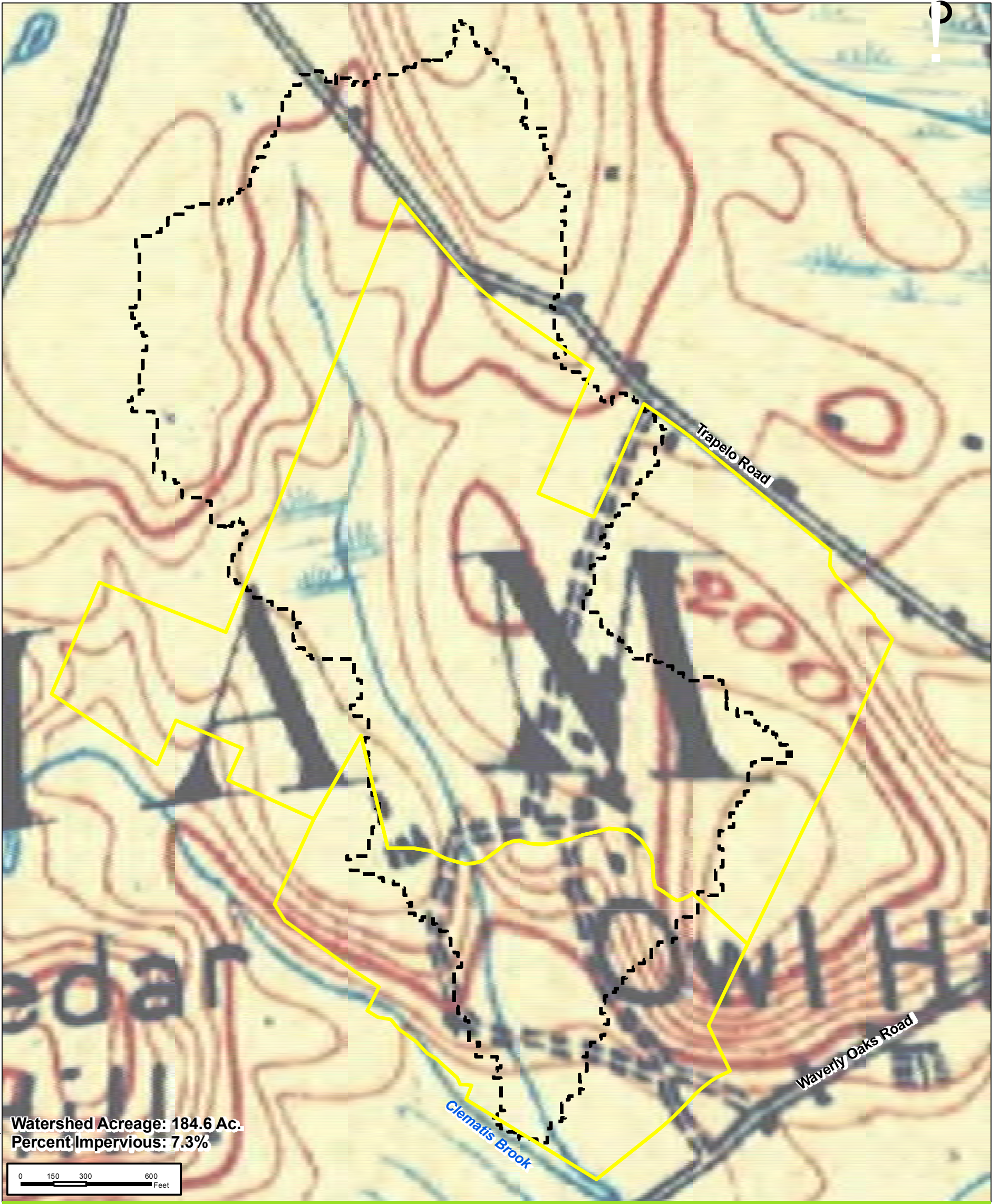
- Source: 1) City of Waltham - MassGIS, Tax Parcels Data, 2011
2) USGS, Historic Topographic Maps, 1947
3) Existing Watershed, ESS Group, 2014

*Based on 1947 Topography

Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed to Clematis Brook*
- Watershed Area to Existing Discharge Location

Figure 4.8
Historic Topography
Year 1947



Fernald School Wetland Study Waltham, Massachusetts

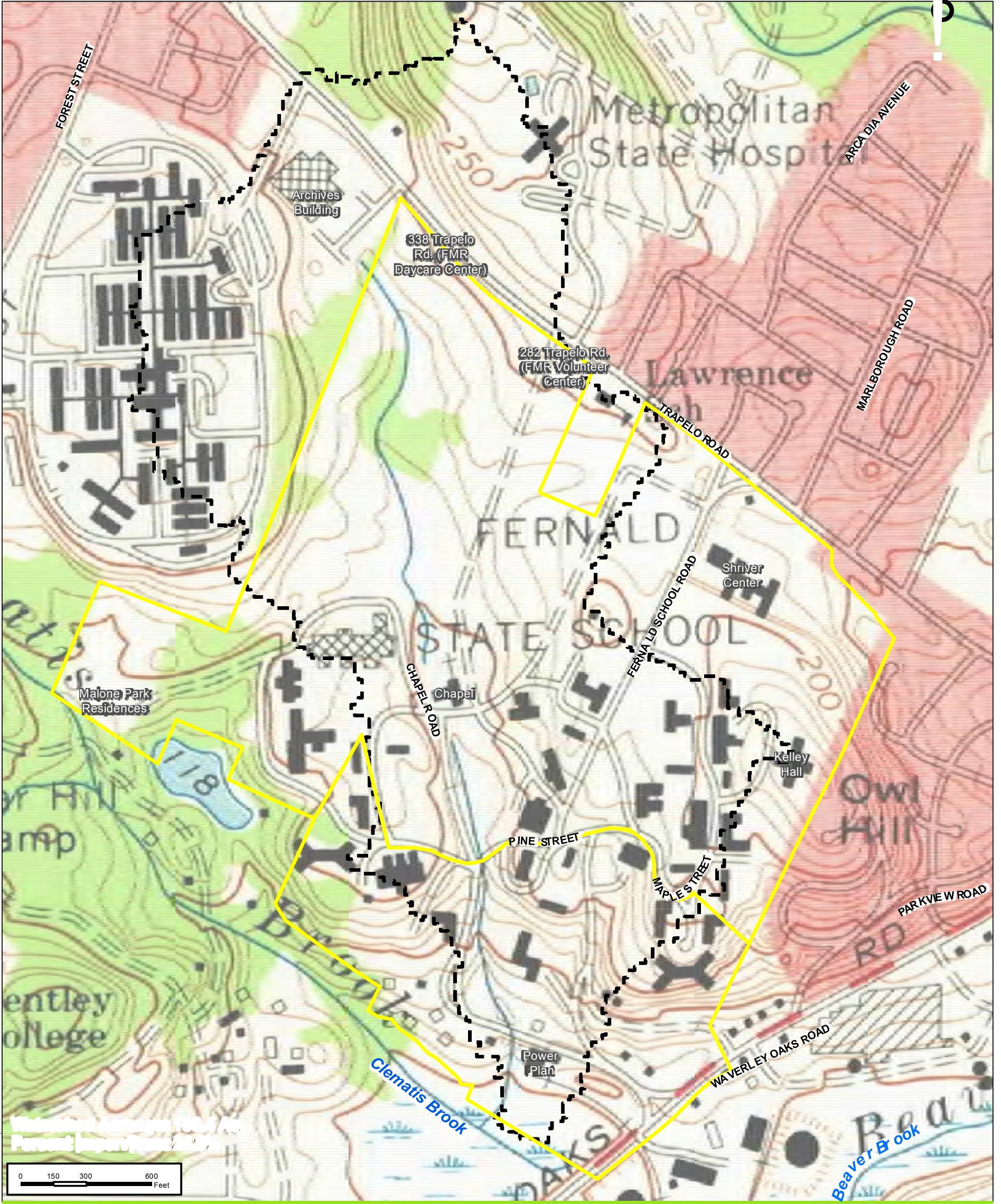
1 inch = 600 feet

- Source: 1) City of Waltham - MassGIS, Tax Parcels Data, 2011
2) USGS, Historic Topographic Maps, 1903
3) Existing Watershed, ESS Group, 2014

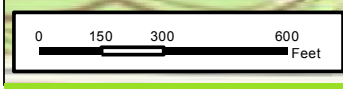
Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed Area to Existing Discharge Location

Figure 4.8A
Historic Topography
Year 1903



Watershed Area: 140/50 ac
Parcel Boundary Delineation



Fernald School Wetland Study
Waltham, Massachusetts

1 inch = 600 feet

- Source: 1) City of Waltham - MassGIS, Tax Parcels Data, 2011
2) USGS, Historic Topographic Maps, 1971
3) Existing Watershed, ESS Group, 2014

*Based on 1947 Topography

Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed Area to Existing Discharge Location

Figure 4.8 B
Topography
Year 1971

Path: \\dc2\jobs\S461-000 Fernald Wetland Study\Technical\GIS\MXD\S461-000 Figure 5 - Buildout Conditions - Preliminary.mxd

Drawing Date: 2015/02/10

© 2015 ESS Group, Inc.



Fernald School Wetland Study
 Waltham, Massachusetts

1 inch = 600 feet

Source: 1) City of Waltham - Base Layer Data, 2011
 2) USGS, Historic Topographic Maps, 1903-1947
 3) Existing Watershed, ESS Group, 2014

- Legend**
- Parcel Boundary Delineation (140/50 ac)
 - Watershed Area to Existing Discharge Location
 - Existing Stream
 - Restored Stream
 - Future Segment of Western Greenway

Figure 4.9
Buildout Conditions
Year 2025

5.0 HYDROLOGIC AND HYDRAULIC (H/H) MODELING

5.1 METHODOLOGY

The 'Hydro-CAD Storm Water Modeling System' computer program (Version 10) that is based on Natural Resources Conservation Service (NRCS) Technical Release TR-20 methodology was used to develop Hydrologic and Hydraulics (H/H) Models for the conditions during the three timelines:

1. Current year 2015
2. Prior to year 1946
3. Projected build-out - year 2025 and beyond

The rainfall-runoff response of the site in terms of the peak flow rates, velocities and volume of flow were evaluated for the three conditions during rainfall recurrence intervals of 2-, 10-, 25-, and 100-years.

Typically, rainfall volumes used for the analysis would be based on the NRCS Type III, 24-hour rainfall event for Middlesex County and are 3.1, 4.6, 5.5, and 6.6 inches for the 2-, 10-, 25-, and 100-years recurrence rainfall events respectively.

However; to take into account the change in rainfall intensities in the recent decades, rainfall totals published in the "Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada", published by the Northeast Regional Climate Center (NRCC), Cornell University, dated September 1993 was used in the H/H Models.

The updated rainfall volumes used were 3.20, 4.84, 6.14 and 8.80 for the 2-, 10-, 25-, and 100-years recurrence rainfall events respectively.

5.2 ASSUMPTIONS/MODELING DESIGN CRITERIA

- ◆ Watersheds and sub-catchments have been delineated using available data including aerial topographic survey, GIS data and field verification.
- ◆ Time-of-Concentration calculations were based on sheet flow lengths that do not exceed 50 feet.
- ◆ Time-of-Concentration calculations were based on combined sheet flow and shallow concentrated flow that do not exceed 1,000 feet.
- ◆ Time-of-Concentration calculations included the 2-year storm event calibration for channel flow.
- ◆ Manning's roughness coefficients (n) for existing conditions have been assumed based on field visits conducted
- ◆ Existing wetlands have been modeled as saturated and have no storage capacity so as to simulate conservative scenario producing maximum runoff.

5.3 SOILS

The soil types were identified using the Soil Survey published by the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey online data. A detailed soil report is included in Appendix B. Soil types were analyzed based on hydrologic grouping for the purpose of curve number calculations. The Natural Resources Conservation Service (NRCS) soil map indicates the project area includes soils classified as Montauk fine sandy loam, with the majority of the project area being classified as urban lands. The Montauk fine sandy loams are hydrologic group C with moderate permeability in the surface layer and subsoil and permeability being slow or very slow in the substratum.

5.4 HYDROLOGIC DATA

H/H Model for Year 2015

For the existing conditions hydrologic analysis, the area tributary to the unnamed stream through the Fernald Center has been divided into 14 sub-catchment areas numbered E1 through E14.

The hydrologic information for each of the sub-catchment area is summarized in Table 5.1.

It should be noted that accurate field measurements were not obtained utilizing a detailed topographical field survey. This was due to the fact that the intent of the project was to do conduct a planning level study. The elevation data that was input into the H/H Models was mainly based on a the 2-foot contour interval topographic map/data from the City of Waltham's GIS System. This mapping data was also used to estimate the surface areas of features such as wetlands, roof areas, road surfaces and other physical features. However; limited data was collected during field investigation efforts to complete relatively accurate H/H analysis. Assumptions such as a uniform geometry for the open stream channel with a constant flow area and depth were made to simplify the H/H Modeling efforts. As additional topographical data becomes available the City could update the H/H Models to further refinement.

In general, the surface areas utilized in the H/H Models are more accurate than the assumed/estimated elevations and depths.

Table 5.1 Hydrologic Data - Current year 2015

Drainage Area	Total Area (SF)	Impervious Area (SF)	Wetlands Area (SF)	Pervious Area (SF)	Percent Impervious	Hydraulic Length (LF)	Upstream Elevation	Downstream Elevation	Approximate Slope (FT/FT)
E1	1,084,076	204,428	-	879,648	18.9	2460	298	192	0.0431
E2	385,532	44,884	18,424	322,224	16.4	777	214	180	0.0438
E3	340,060	208,936	-	131,124	61.4	1072	190	178	0.0112
E4	243,628	2,744	4,900	235,984	3.1	602	218	176	0.0698
E5	1,033,704	150,528	25,676	857,500	17.0	1813	222	152	0.0386
E6	426,692	152,096	-	274,596	35.6	830	175	165	0.0120
E7	856,912	223,440	-	633,472	26.1	1389	184	154	0.0216
E8	289,296	80,752	-	208,544	27.9	1086	206	140	0.0608
E9	314,972	71,932	-	243,040	22.8	711	164	135	0.0408
E10	530,768	228,928	14,896	286,944	45.9	1487	206	132	0.0498
E11	519,596	174,636	-	344,960	33.6	1243	208	164	0.0354
E12	386,316	111,720	980	273,616	29.2	1362	158	60	0.0719
E13	568,596	182,868	-	385,728	32.2	1656	204	72	0.0797
E14	365,344	63,700	-	301,644	17.4	1106	204	70	0.1212
Total Area	168.6 acres	43.7 acres	1.5 acres	123.5 acres					

H/H Model for Conditions Prior to Year 1947

For the conditions prior to Year 1947 hydrologic analysis, the area tributary to the unnamed stream through the Fernald Center has been divided into 14 sub-catchment areas numbered H1 through H14.

The hydrologic information for each of the sub-catchment area is summarized in Table 5.2. The topographic data for the current conditions was also assumed for the conditions prior to year 1947. The mapping available has very crude information and would require significant effort to interpret and interpolate data to be used as input for the H/H Model that may ultimately be very approximate. Therefore; an assumption was made that the drainage boundary and sub-catchments delineations and slopes are approximately the same as the current conditions. However, the landuse type and land cover information was obtained using the historic photographs.

H/H Model for Build Out Conditions Year 2025 and Beyond

For the projected build out conditions Year 2025 and beyond hydrologic analysis, the area tributary to the unnamed stream through the Fernald Center has been divided into 14 sub-catchment areas numbered F1 through F14.

The hydrologic information for each of the sub-catchment area is summarized in Table 5.3.

Three H/H Model simulations were completed as described below:

Scenario #1: Stream day-lighting through the Cottage Complex to connect to the open stream south of Chapel. Storage Pond #1 constructed at the Cottage Complex with the cottages demolished and the pavement removed.

Scenario #2: Storage Pond #2 constructed just north of Pine Street in addition to Scenario #1 features.

Scenario #3: Storage Pond #3 constructed east of the power plant in addition to Scenario#2 features.

Scenario #2 and #3 were completed to quantify the benefit of additional flood mitigation that the City could recognize and make it integral to implement with any proposed development in Parcel #2.

Table 5.2 Hydrologic Data - Conditions Prior to Year 1947

Drainage Area	Total Area (SF)	Impervious Area (SF)	Wetlands Area (SF)	Pervious Area (SF)	Percent Impervious	Hydraulic Length (LF)	Upstream Elevation	Downstream Elevation	Approximate Slope (FT/FT)
H1	1,084,076	-	-	1,084,076	0.0	2460	298	192	0.0431
H2	385,532	-	-	385,532	0.0	777	214	180	0.0438
H3	340,060	208,936	-	131,124	61.4	1072	190	178	0.0112
H4	243,628	-	-	243,628	0.0	602	218	176	0.0698
H5	1,033,704	-	25,676	1,008,028	2.5	1813	222	152	0.0386
H6	426,692	-	45,000	381,692	10.5	830	175	165	0.0120
H7	856,912	-	47,670	809,242	5.6	1389	184	154	0.0216
H8	289,296	-	-	289,296	0.0	1086	206	140	0.0608
H9	314,972	71,932	-	243,040	22.8	711	164	135	0.0408
H10	530,768	114,464	-	416,304	21.6	1487	206	132	0.0498
H11	519,596	174,636	-	344,960	33.6	1243	208	164	0.0354
H12	386,316	111,720	-	274,596	28.9	1362	158	60	0.0719
H13	568,596	182,868	-	385,728	32.2	1656	204	72	0.0797
H14	365,344	63,700	-	301,644	17.4	1106	204	70	0.1212
Total Area	168.6 acres	21.3 acres	2.7 acres	144.6 acres					

Table 5.3 Hydrologic Data - Build Out Conditions - Year 2025 and Beyond

Drainage Area	Total Area (SF)	Impervious Area (SF)	Wetlands Area (SF)	Pervious Area (SF)	Percent Impervious	Hydraulic Length (LF)	Upstream Elevation	Downstream Elevation	Approximate Slope (FT/FT)
F1	1,084,076	204,428	-	879,648	18.9	2460	298	192	0.0431
EF2	385,532	44,884	18,424	322,224	16.4	777	214	180	0.0438
F3	340,060	208,936	-	131,124	61.4	1072	190	178	0.0112
F4	243,628	2,744	4,900	235,984	3.1	602	218	176	0.0698
F5	1,033,704	150,528	25,676	857,500	17.0	1813	222	152	0.0386
F6	426,692	-	45,000	381,692	10.5	830	175	165	0.0120
F7	856,912	53,312	47,670	755,930	11.8	1389	184	154	0.0216
F8	289,296	73,892	-	215,404	25.5	1086	206	140	0.0608
F9	314,972	71,932	-	243,040	22.8	711	164	135	0.0408
F10	530,768	228,928	14,896	286,944	45.9	1487	206	132	0.0498
F11	519,596	174,636	-	344,960	33.6	1243	208	164	0.0354
F12	386,316	111,720	980	273,616	29.2	1362	158	60	0.0719
F13	568,596	182,868	-	385,728	32.2	1656	204	72	0.0797
F14	365,344	63,700	-	301,644	17.4	1106	204	70	0.1212
Total Area	168.6 acres	36.1 acres	3.6 acres	128.9 acres					

5.5 RESULTS - H/H MODEL SIMULATIONS

The Point of Analysis (POA) for the H/H Modeling for the unnamed stream through the Fernald Center is the discharge point just south of the power plant and into the Clematis Brook and associated wetlands. The results and H/H modeling input and output data report has been compiled and included in Appendix G. Table 5.4 below summarizes the peak flow rates simulated during the design rain events at the POA.

Table 5.4 Summary of Simulated Peak Flows

H/H Model Description	Peak Flows at POA (cfs)			
	2-year	10-year	25-year	100-year
Prior to year 1947	166.51	326.32	460.38	742.74
Current year 2015	250.68	427.74	566.98	853.87
Year 2025 and Beyond				
Scenario #1 1 Storage Pond	165.07	342.18	497.68	833.48
Scenario #2 2 Storage Ponds	139.89	304.00	447.33	758.55
Scenario #3 3 Storage Ponds	131.52	292.07	433.46	742.14

Table 5.5 Estimated Reductions in Peak Flows Over Current Conditions

H/H Model Description	Percent Reductions in Peak Flows Over Current Conditions (%)			
	2-year	10-year	25-year	100-year
Year 2025 and Beyond				
Scenario #1 1 Storage Pond	33.9	20.0	12.2	2.3
Scenario #2 2 Storage Ponds	44.2	28.9	21.1	11.2
Scenario #3 3 Storage Ponds	47.5	31.7	23.5	13.1

Based on the results from Table 5.5 nearly 50% reductions in peak flows during smaller and more frequent storms (2-year event) could be expected. Also, nearly 25% reductions in peak flows during large storm events (25 year event) can be expected.

6.0 RECOMMENDATIONS

Phase I Restore Pond/Wetland System and Daylight Buried Culvert - Cottage Street

Campus The Pond/Wetland system and the stream that existing prior to the year 1947 can be restored within the Cottage Street Campus. The City could engage the services of an Engineering/Landscape Architectural firm to conduct detailed site investigation and site suitability analysis and produce construction bid documents for this work.

A preliminary project rendering is shown on Figures 6.1 and 6.2 to help visualize the day-lighted stream and pond. Also shown on the rendering are some of the potential passive recreational features that the City could consider implementing.

The major benefits of day lighting the buried culvert and recreating the pond/wetland system are:

- increase hydraulic capacity by recreating a *floodplain* resulting in flood mitigation downstream to the Beaver Brook watershed.
- reduce runoff velocities—thus helping prevent erosion—as a result of natural channel meandering and the roughness of the stream bottom and banks;
- replace closed underground deteriorating culvert with an open drainage system that can be more easily monitored and repaired;
- improve *water quality* by exposing water to air, sun- light, vegetation, and soil, all of which help transform, bind up, or otherwise neutralize pollutants;
- recreate *aquatic habitat* and improve fish passage;
- recreate valuable riparian habitat and corridors for wildlife movement;
- provide recreational amenities,



Example of Daylighting a Culvert



Fernald Center Wetland Study

Cottage Street Campus Existing Condition

Greenspace, Aquatic Habitat and Flood Storage Restoration Project

FIGURE 6.1
Recommendations - Phase I





Fernald Center Wetland Study

Cottage Street Campus Conceptual Rendering
 Greenspace, Aquatic Habitat and Flood Storage Restoration Project



FIGURE 6.2
 Recommendations - Phase I

- such as a place for children to play, or a streamside bench for people to relax upon;
- link Western Greenway and paths for pedestrians and bicyclists;
- serve as an "outdoor laboratory" for schools;
- beautify neighborhoods serving as a focal point of a new park or neighborhood revitalization project;
- increase property values;
- benefit nearby businesses by creating a new amenity that attracts people to the area;
- build civic spirit and relationships as local residents, businesses, and governments come together to create the project;
- reconnect people to nature through the look, feel, and smell of open water and riparian vegetation, and through contact with aquatic and streamside creatures;
- give people a sense of "setting right something that has been altered."

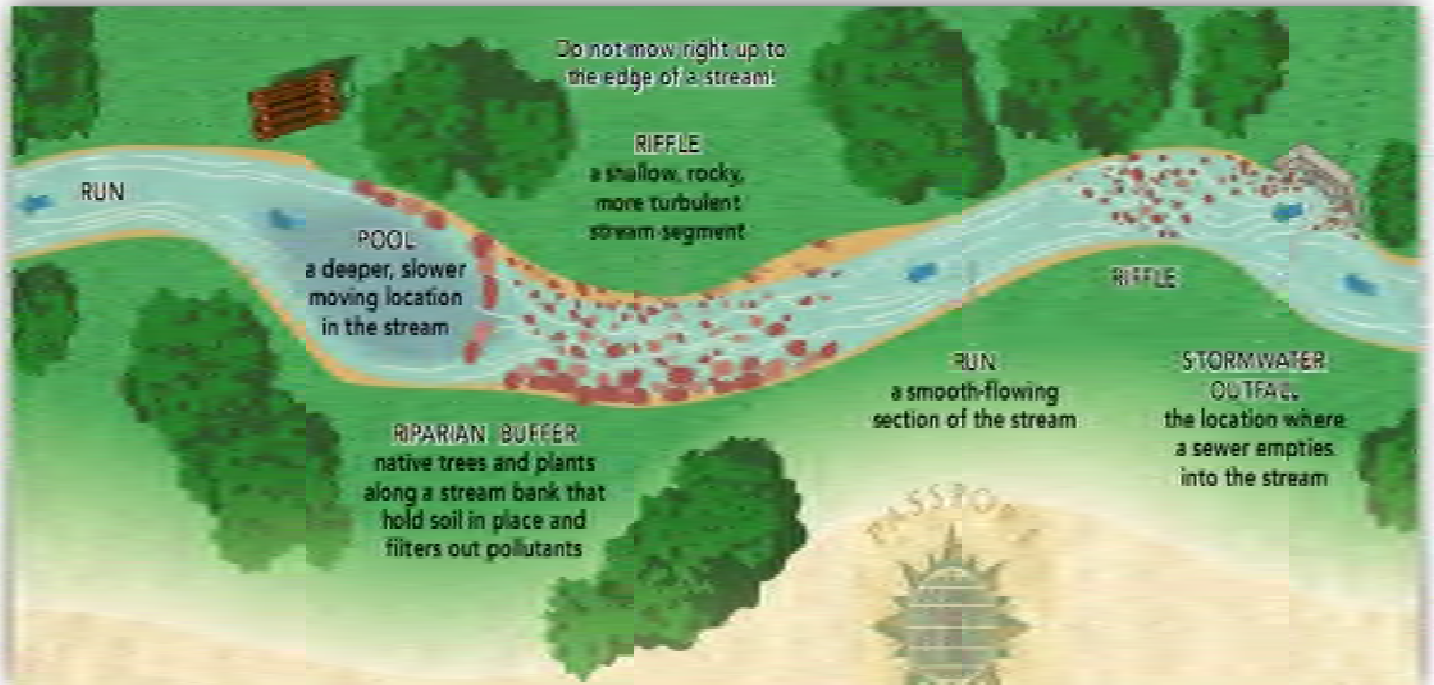
The City could also pursue additional sources of funding and available local, state and federal agency grants such as section 319 Nonpoint source (MADEP), section 604(b) watershed assessment and planning grants (MADEP), Coastal Pollution Remediation Funding (MACZM), Green Infrastructure Resilience Grant Program (CZM), Lake and Pond Funding (DCR) and many other programs.

Planning level costs for implementing this phase may be in the range of **\$1.2 to \$1.5 million** and higher depending on specific site conditions. Major factors that could significantly impact these costs include:

- any contamination discovered in the existing soils and groundwater
- type of crossing near the entrance to the Chapel and roadway redesign

The planning level costs include the following:

- Engineering assessment, design, permitting related to wetlands/surface water resources
- Construction, construction administration and resident inspection
- Post construction monitoring, repair and maintenance (2-years following construction)
- Follow up monitoring (up to 3-years following the 2-years post construction monitoring)



Creating Sinuosity of Daylighted Stream with Riparian Zones

Phase II - Stormwater Masterplan

This project could become a part of the Stormwater Masterplan for the entire Fernald Center. Alternatively, if the City initiates a campus-wide utilities master plan, this could be made a part of that Plan.

Based on the results of the hydrologic and hydraulic modeling additional flood storage could be created by an additional pond (Storage Pond 2) near the area of the existing detention basin south of the Chapel Building. To further help attenuate the existing flooding downstream the City could create additional storage (Storage Pond 3) north of the abandoned railroad spur and Clematis Brook wetlands.

As part of the masterplan the City could identify, locate and perform a structural review of the existing culvert crossings and the storm drainage system piping discharging to the unnamed stream, potential stream restoration of the segment south of Pine Street in concert with planned passive recreational features.

Phase III - Stormwater Utility The improvements proposed under Phase II could be funded through creation of "Fernald Center Stormwater Utility". The funding could be assessed to any developer/development that will be proposed within Parcel 2. The developer would have to purchase stormwater storage credits per unit area of development proposed or an equivalent metric.

Phase IV - Alleviate Existing Flooding - Shirley Road Area There is no existing storm drainage system in the Shirley Road/Upton Road area. Runoff from approximately 8.6 acres of area near the northeast corner of the Fernald Center ultimately drains to this area causing flooding of the residences and also resulting in deterioration of the existing sewer system via excessive infiltration. An H/H model has been setup and included with this study so that the City could utilize this to design an appropriate storm drainage system for the area to alleviate the frequent flooding in this area. A copy of the output from HydroCAD is included in Appendix G.

The existing wetlands east of 180 Trapelo Road can be enhanced to enable infiltration of flows and provide additional storage to assist in mitigation of flooding. In addition, flows from portion of the northern slope of Kelley Hall could be diverted towards the proposed Storage Pond 1 proposed under Phase I. This will reduce the resulting flows to the Shirley Road area while diverting flows towards Storage Pond 1.

FERNALD CENTER REHABILITATION WETLAND STUDY REPORT

APRIL 2016

APPENDICES

LIST OF APPENDICES

APPENDIX A SITE PHOTOS AND POND OVERFLOW REPORT

APPENDIX B SOILS REPORT

APPENDIX C AERIAL PHOTO DECADE PACKAGE

APPENDIX D HISTORICAL TOPOGRAPHIC MAPS

APPENDIX E DCAM - SEWER MAIN REPLACEMENT DESIGN

APPENDIX F 1975 WETLAND RESOURCE AREA MAPS - CITY OF WALTHAM

APPENDIX G HYDROCAD MODEL OUTPUT REPORTS

APPENDIX H PRESENTATION TO CPC - MARCH 10, 2015

APPENDIX I HISTORIC STREAM AND WETLAND LOCATION AND ALIGNMENTS

APPENDICES

FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

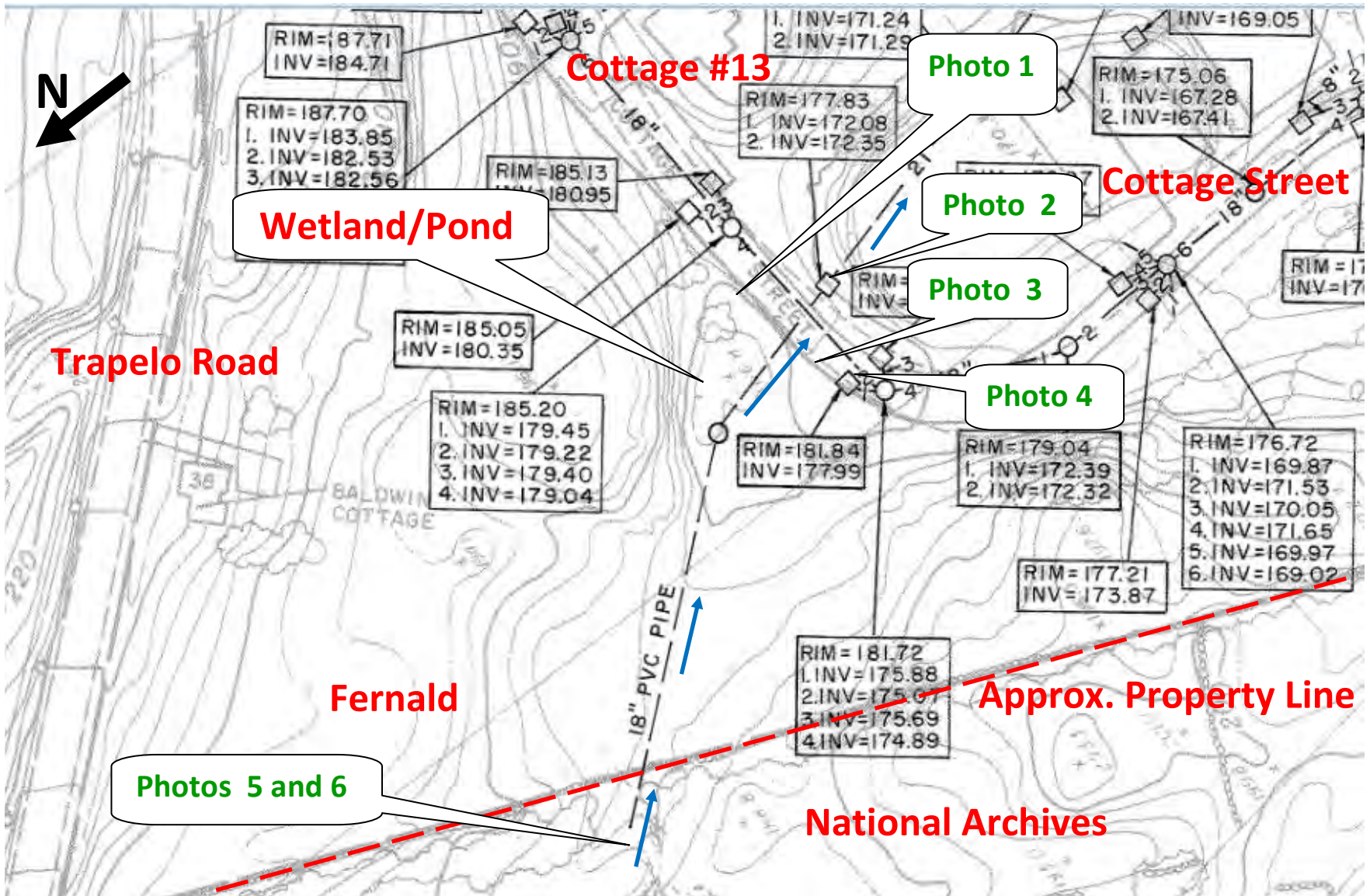
APRIL 2016

APPENDIX A

SITE PHOTOS AND POND OVERFLOW REPORT

APPENDICES

Fernald Center
Wetland/Pond Overflow - Site Visit Location and Photo Log
March 27, 2015 Sam Bade and Diane Young



Location Map and Photo Numbers

**Fernald Center
Wetland/Pond Overflow - Site Visit Location and Photo Log
March 27, 2015 Sam Bade and Diane Young**



Photo 1 Overflow from the Earthen Berm

**Fernald Center
Wetland/Pond Overflow - Site Visit Location and Photo Log
March 27, 2015 Sam Bade and Diane Young**



Photo 2 Catch Basin Over 21-inch Drain - Minimal Flow Through

**Fernald Center
Wetland/Pond Overflow - Site Visit Location and Photo Log
March 27, 2015 Sam Bade and Diane Young**



Photo 3 Earthen Berm Installed by the State

**Fernald Center
Wetland/Pond Overflow - Site Visit Location and Photo Log
March 27, 2015 Sam Bade and Diane Young**



Photo 4 Recently Installed 4-inch Pipe by the State Discharging to Catch Basin

**Fernald Center
Wetland/Pond Overflow - Site Visit Location and Photo Log
March 27, 2015 Sam Bade and Diane Young**



Photo 5 18-inch Inlet (covered in sediment) on National Archives Property

**Fernald Center
Wetland/Pond Overflow - Site Visit Location and Photo Log
March 27, 2015 Sam Bade and Diane Young**



Photo 6 18-inch Inlet (covered in sediment) on National Archives Property

FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

APRIL 2016

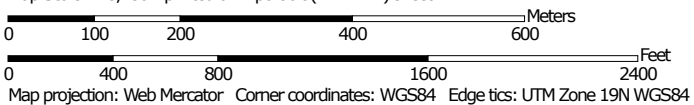
APPENDIX B
SOILS REPORT

APPENDICES

Soil Map—Middlesex County, Massachusetts
(Fernald Center Waltham, MA Soils)




Map Scale: 1:8,780 if printed on B portrait (11" x 17") sheet.



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


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 14, Sep 19, 2014

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

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

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

Map Unit Legend

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30B	Raynham silt loam, 0 to 5 percent slopes	4.2	1.0%
44A	Birdsall mucky silt loam, 0 to 1 percent slopes	6.1	1.5%
53A	Freetown muck, ponded, 0 to 1 percent slopes MLRA 144A	16.5	4.0%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	7.3	1.8%
103D	Charlton-Hollis-Rock outcrop complex, 15 to 25 percent slopes	21.6	5.2%
106C	Narragansett-Hollis-Rock outcrop complex, 3 to 15 percent slopes	69.7	16.8%
106D	Narragansett-Hollis-Rock outcrop complex, 15 to 25 percent slopes	14.1	3.4%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	2.4	0.6%
300C	Montauk fine sandy loam, 8 to 15 percent slopes	7.9	1.9%
302B	Montauk fine sandy loam, 3 to 8 percent slopes, extremely stony	10.0	2.4%
302C	Montauk fine sandy loam, 8 to 15 percent slopes, extremely stony	3.3	0.8%
302D	Montauk fine sandy loam, 15 to 25 percent slopes, extremely stony	5.8	1.4%
325D	Newport channery fine sandy loam, 8 to 25 percent slopes	1.4	0.3%
420B	Canton fine sandy loam, 3 to 8 percent slopes	13.3	3.2%
602	Urban land	4.2	1.0%
603	Urban land, wet substratum	1.1	0.3%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.4	0.1%
629C	Canton-Charlton-Urban land complex, 3 to 15 percent slopes	27.5	6.6%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	105.7	25.4%

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
654	Udorthents, loamy	12.8	3.1%
655	Udorthents, wet substratum	12.9	3.1%
656	Udorthents-Urban land complex	67.9	16.3%
Totals for Area of Interest		416.0	100.0%

FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

APRIL 2016

APPENDIX C

AERIAL PHOTO DECADE PACKAGE

APPENDICES



INQUIRY #: 2508314.5

YEAR: 1938

| = 500'





INQUIRY #: 2508314.5

YEAR: 1955

| = 750'





INQUIRY #: 2508314.5

YEAR: 1960

| = 1000'





INQUIRY #: 2508314.5

YEAR: 1978

| = 750'





INQUIRY #: 2508314.5

YEAR: 1980

| = 750'





INQUIRY #: 2508314.5

YEAR: 1987

| = 1000'





INQUIRY #: 2508314.5

YEAR: 1995



| = 750'



INQUIRY #: 2508314.5

YEAR: 2006

| = 501'

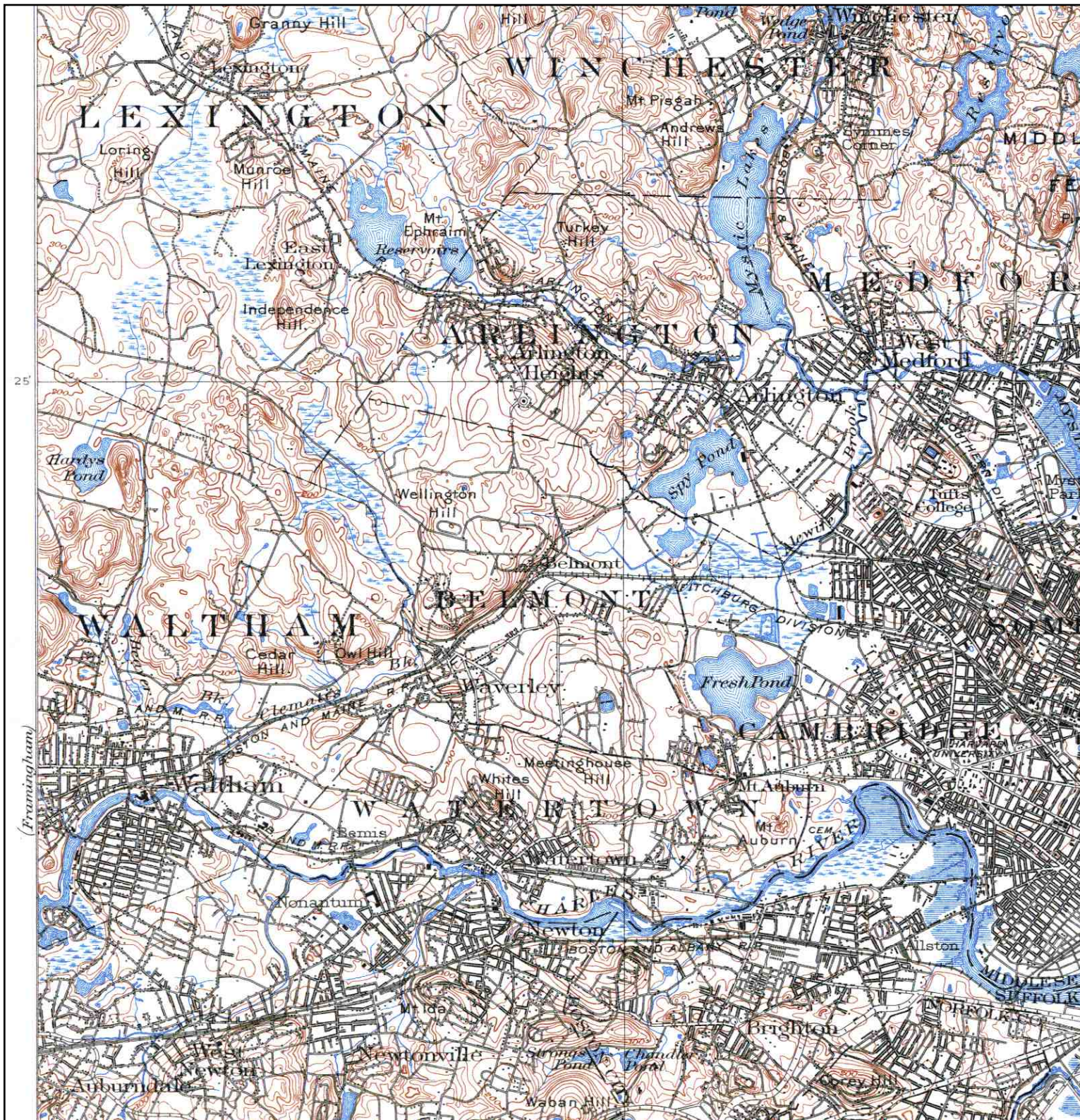


FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

APRIL 2016

APPENDIX D
HISTORICAL TOPOGRAPHIC MAPS

Historical Topographic Map



<p>N</p>	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.
	NAME: BOSTON	ADDRESS:	200 Trapelo Road	CONTACT:	Melanie Littman
	MAP YEAR: 1903	LAT/LONG:	42.3915 / 71.2068	INQUIRY#:	2508314.4
	SERIES: 15			RESEARCH DATE:	06/01/2009
	SCALE: 1:62500				

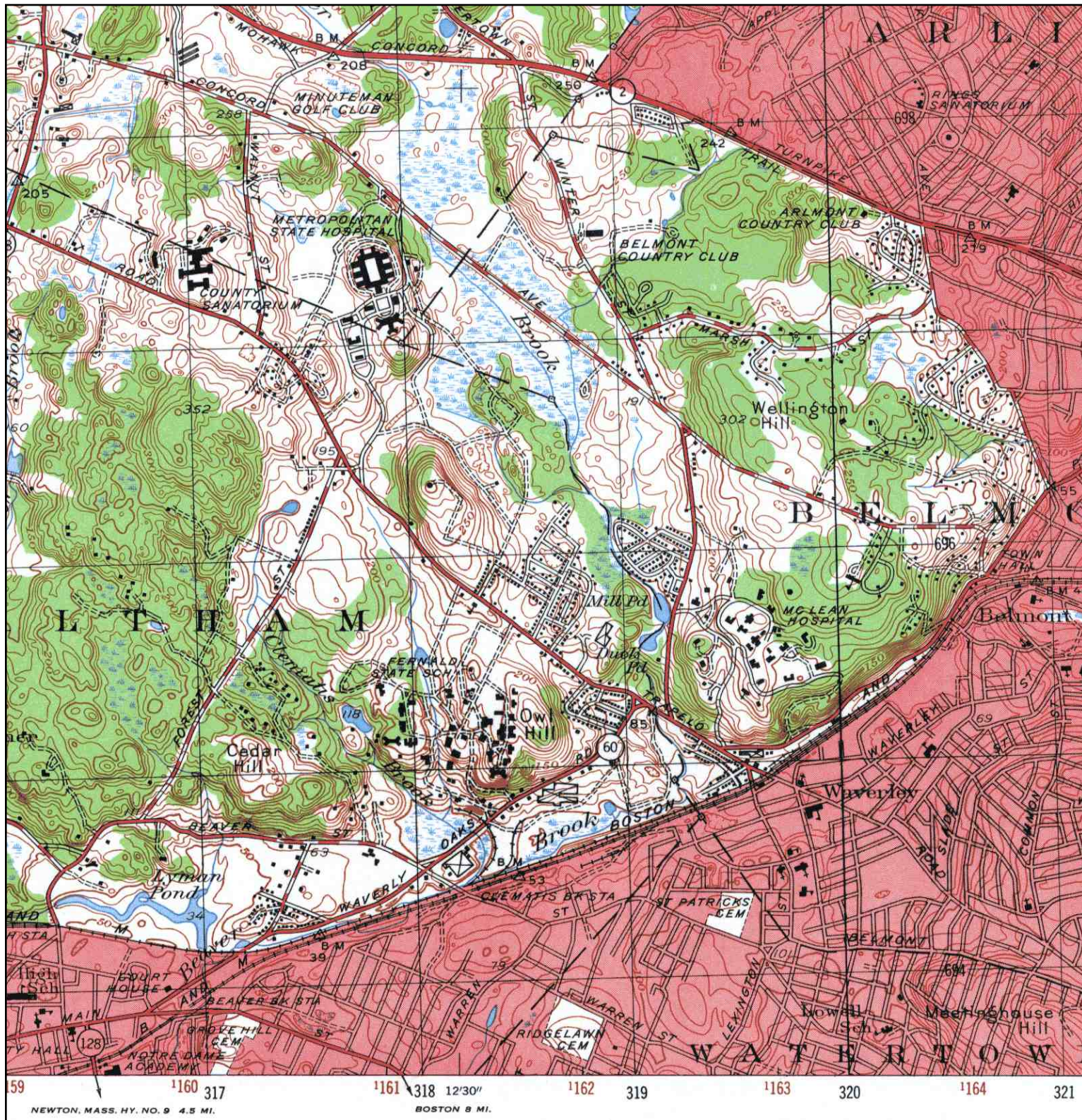
Historical Topographic Map




(Framingham)

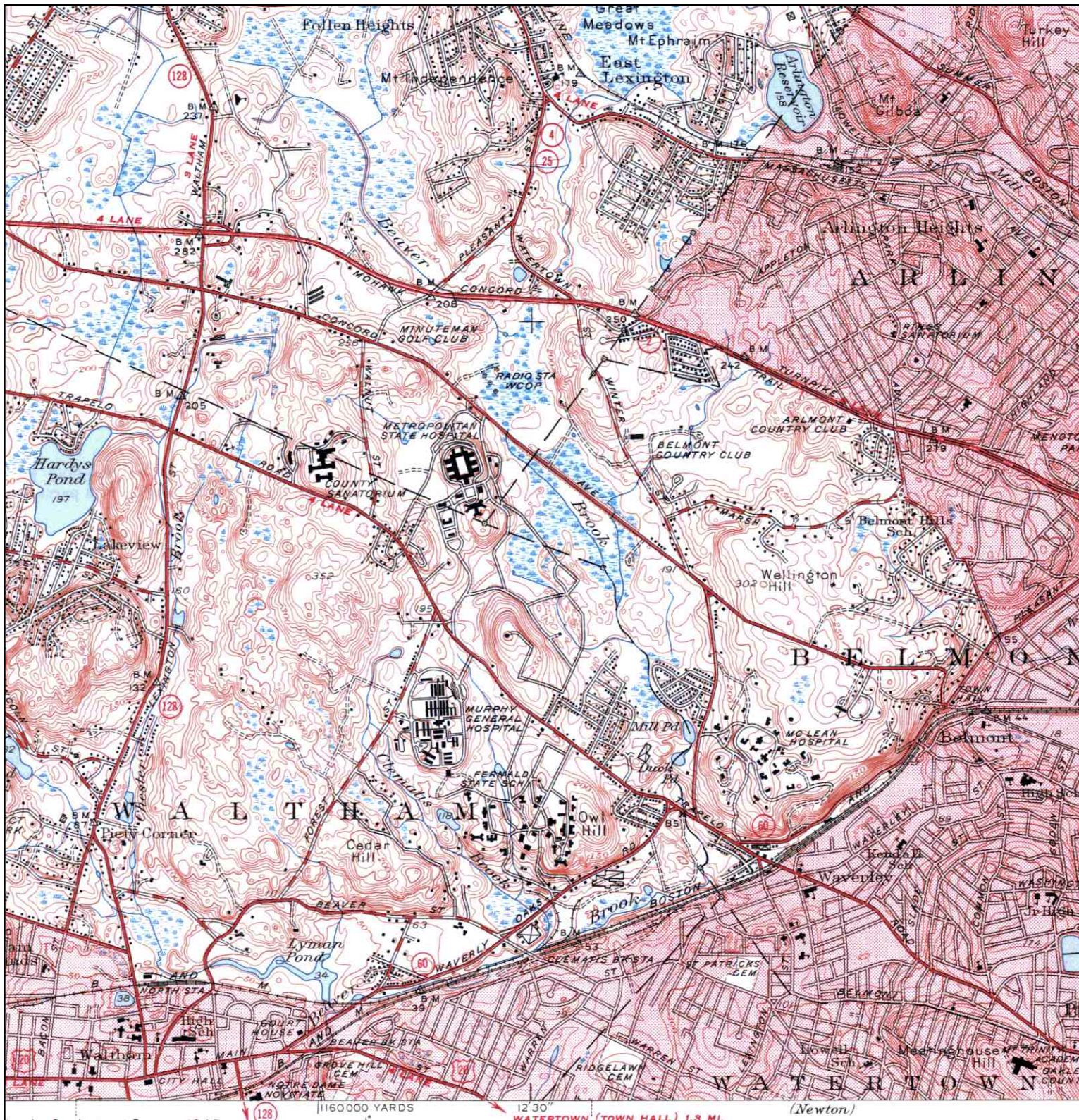
<p>N ↑</p>	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.
	NAME: BOSTON AND VICINITY	ADDRESS:	200 Trapelo Road Waltham, MA 02452	CONTACT:	Melanie Littman
	MAP YEAR: 1903	LAT/LONG:	42.3915 / 71.2068	INQUIRY#:	2508314.4
	SERIES: 15			RESEARCH DATE:	06/01/2009
	SCALE: 1:62500				

Historical Topographic Map



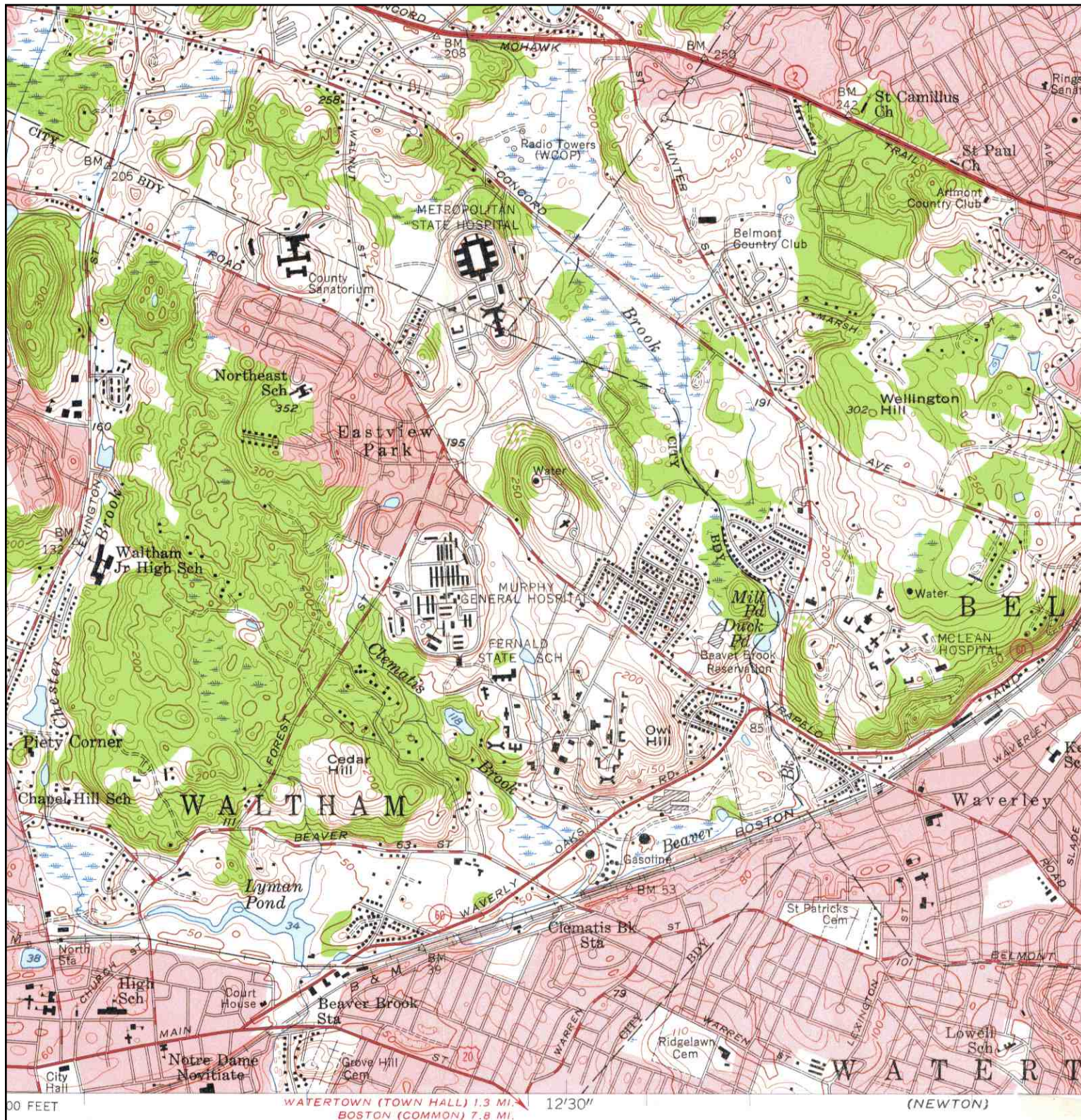
	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.
	NAME: LEXINGTON	ADDRESS:	200 Trapelo Road	CONTACT:	Melanie Littman
	MAP YEAR: 1947	LAT/LONG:	42.3915 / 71.2068	INQUIRY#:	2508314.4
	SERIES: 7.5			RESEARCH DATE:	06/01/2009
	SCALE: 1:25000				

Historical Topographic Map



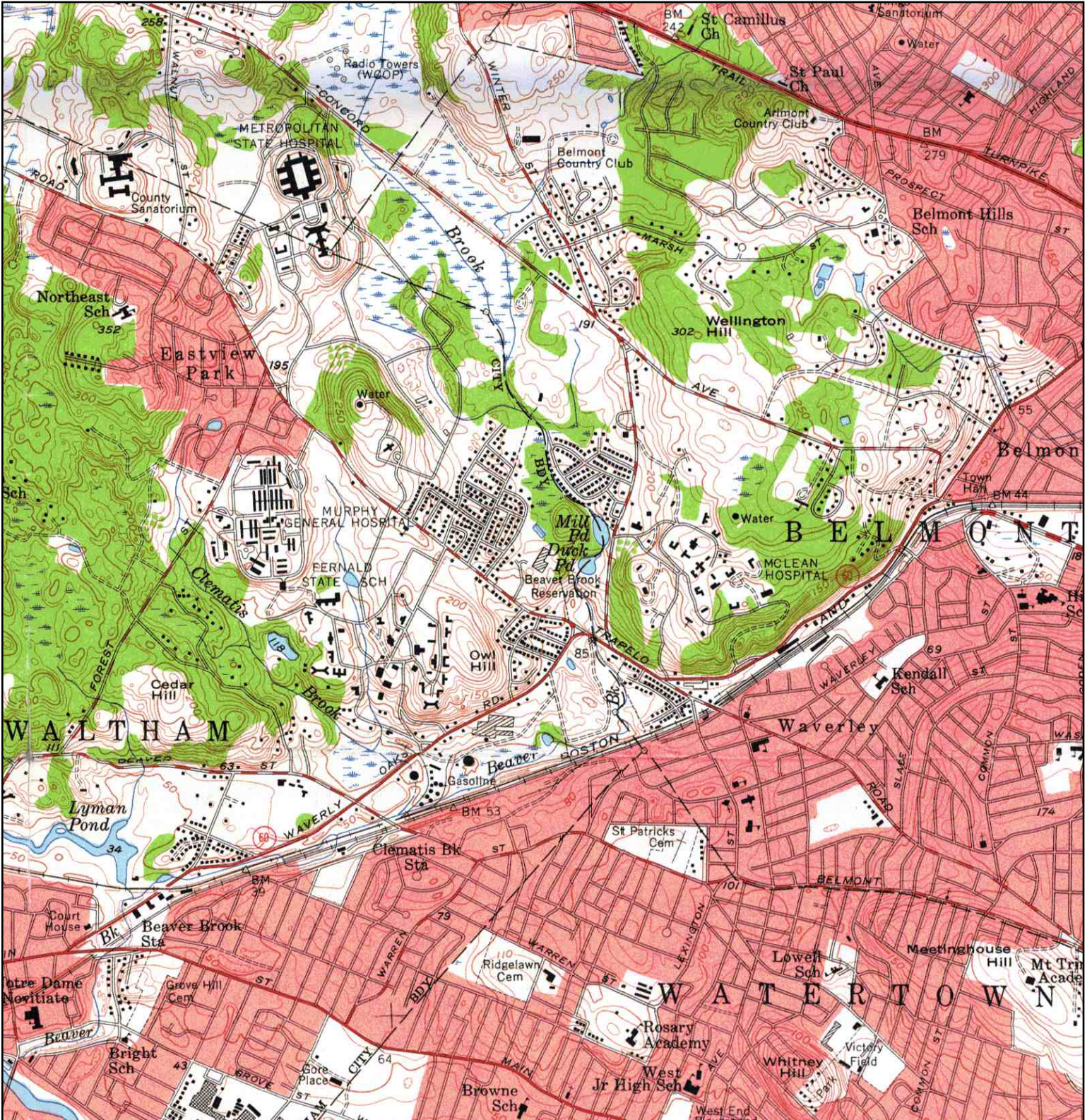
<p>N ↑</p>	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.	
	NAME:	LEXINGTON	ADDRESS:	200 Trapelo Road	CONTACT:	Melanie Littman
	MAP YEAR:	1950	ADDRESS:	Waltham, MA 02452	INQUIRY#:	2508314.4
	REVISED FROM:	1946	LAT/LONG:	42.3915 / 71.2068	RESEARCH DATE:	06/01/2009
	SERIES:	7.5				
	SCALE:	1:31680				

Historical Topographic Map



<p>N</p>	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.	
	NAME:	LEXINGTON	ADDRESS:	200 Trapelo Road	CONTACT:	Melanie Littman
	MAP YEAR:	1956		Waltham, MA 02452	INQUIRY#:	2508314.4
	SERIES:	7.5	LAT/LONG:	42.3915 / 71.2068	RESEARCH DATE:	06/01/2009
	SCALE:	1:24000				

Historical Topographic Map



<p>N</p>	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.
	NAME: BOSTON VICINITY 1 OF 4	ADDRESS:	200 Trapelo Road Waltham, MA 02452	CONTACT:	Melanie Littman
	MAP YEAR: 1958	LAT/LONG:	42.3915 / 71.2068	INQUIRY#:	2508314.4
	SERIES: 7.5			RESEARCH DATE:	06/01/2009
	SCALE: 1:31680				


Historical Topographic Map



<p>N ↑</p>	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.	
	NAME:	LEXINGTON	ADDRESS:	200 Trapelo Road	CONTACT:	Melanie Littman
	MAP YEAR:	1971		Waltham, MA 02452	INQUIRY#:	2508314.4
	SERIES:	7.5	LAT/LONG:	42.3915 / 71.2068	RESEARCH DATE:	06/01/2009
	SCALE:	1:25000				

Historical Topographic Map



	TARGET QUAD	SITE NAME:	Fernald Development Center	CLIENT:	TechLaw, Inc.
	NAME: BOSTON NORTH	ADDRESS:	200 Trapelo Road	CONTACT:	Melanie Littman
	MAP YEAR: 1985	LAT/LONG:	42.3915 / 71.2068	INQUIRY#:	2508314.4
	SERIES: 7.5			RESEARCH DATE:	06/01/2009
	SCALE: 1:25000				

FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

APRIL 2016

APPENDIX E

DCAM - SEWER MAIN REPLACEMENT DESIGN

APPENDICES

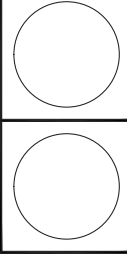
Project Name:
**SEWER MAIN
REPLACEMENT**

DCAMM Project Number
DDS 1405 HC-1

Project Location
**Fernald
Development
Center
Waltham, MA**

Project Architect
CBI
359 DORCHESTER AVE
BOSTON, MA 02127
P: (617) 268-8977
F: (617) 464-9791
CB@CBICONULTINGINC.COM
CBI JOB #: 00008-K

Project Consultant
Nilsch Engineering, Inc
2 Center Plaza, Suite 430
Boston, MA 02108
(617) 338-0063



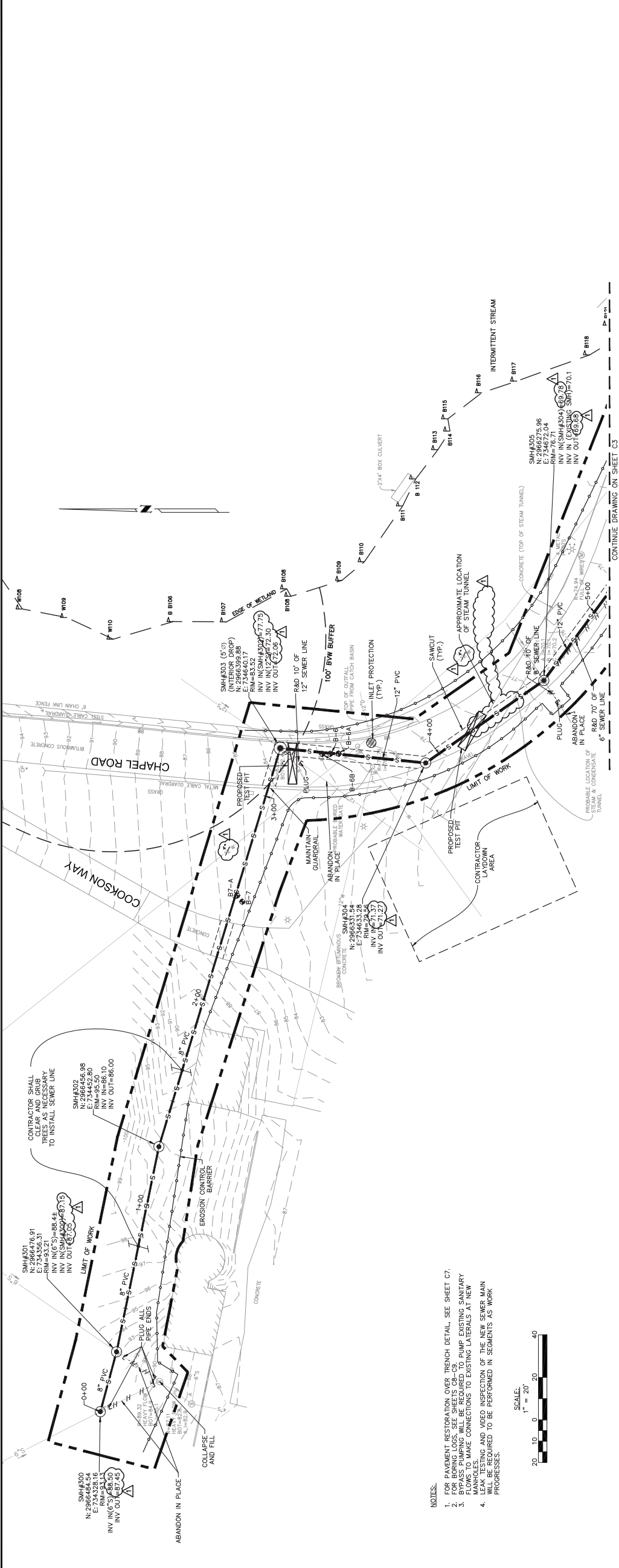
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CAMS Number: DMR27
Building Number: N/A
Secretariat:
EXECUTIVE OFFICE
OF HEALTH & HUMAN
SERVICES

Original Issue Date
08/25-2014 BID DOCUMENTS

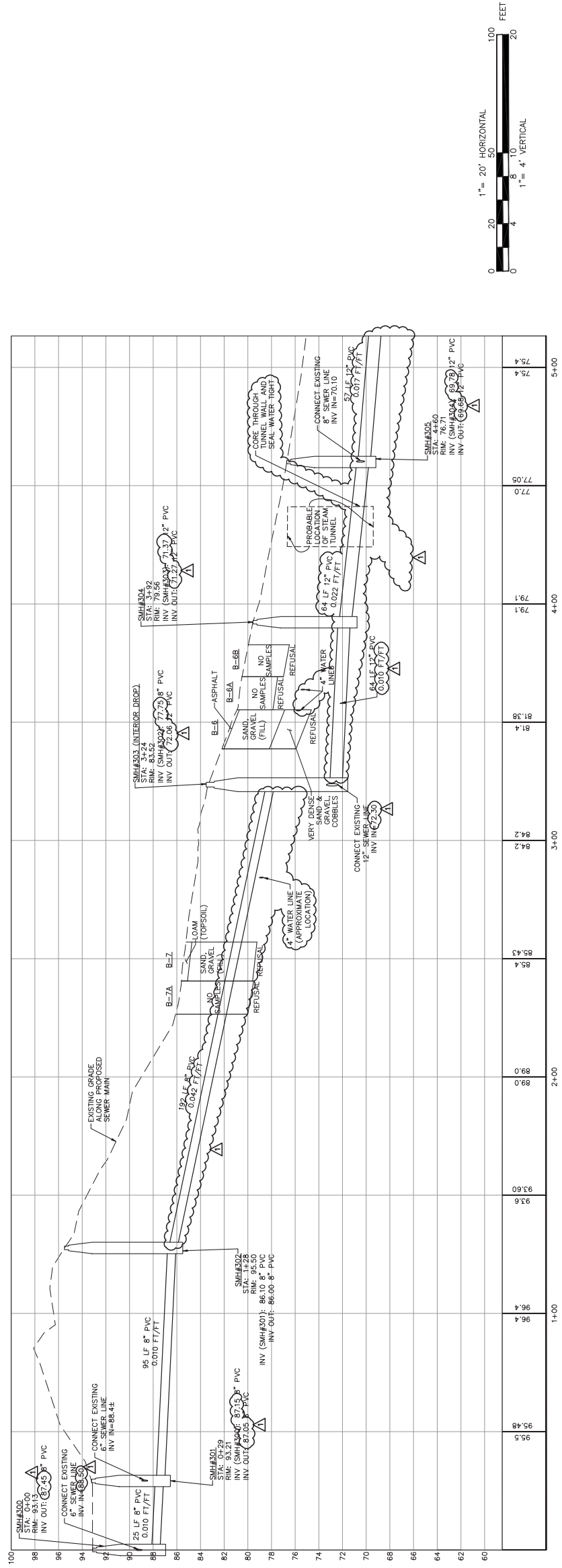
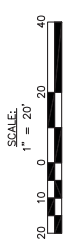
Revisions
No. Description Date
1 CHANGE ORDER #1 12/12/14

Plan Name:
**CONSTRUCTION
PLAN & PROFILE**

Drawing Number:
C3
Drawing 5 of 11



- NOTES:
1. FOR PAVEMENT RESTORATION OVER TRENCH DETAIL, SEE SHEET C7.
2. FOR BORING LOGS, SEE SHEETS C8-C9.
3. BYPASS PUMPING WILL BE REQUIRED TO PUMP EXISTING SANITARY MANHOLES. MAKE CONNECTIONS TO EXISTING LATERALS AT NEW MANHOLES.
4. LEAK TESTING AND VIDEO INSPECTION OF THE NEW SEWER MAIN WILL BE REQUIRED TO BE PERFORMED IN SEGMENTS AS WORK PROGRESSES.



Key Plan: SEE COVER SHEET

Project Name:
**SEWER MAIN
 REPLACEMENT**

DCAMM Project Number
 DDS 1405 HC-1

Project Location
**Fernald
 Development
 Center
 Waltham, MA**

Project Architect
CBI
 359 DORCHESTER AVE
 BOSTON, MA 02127
 P: (617) 268-8977
 F: (617) 464-2971
 CB@CBICONULTINGINC.COM
 CONSULTING INC.
 CBI JOB #: 00008-K

Project Consultant
 Nilsch Engineering, Inc
 2 Center Plaza, Suite 430
 Boston, MA 02216
 (617) 335-0063

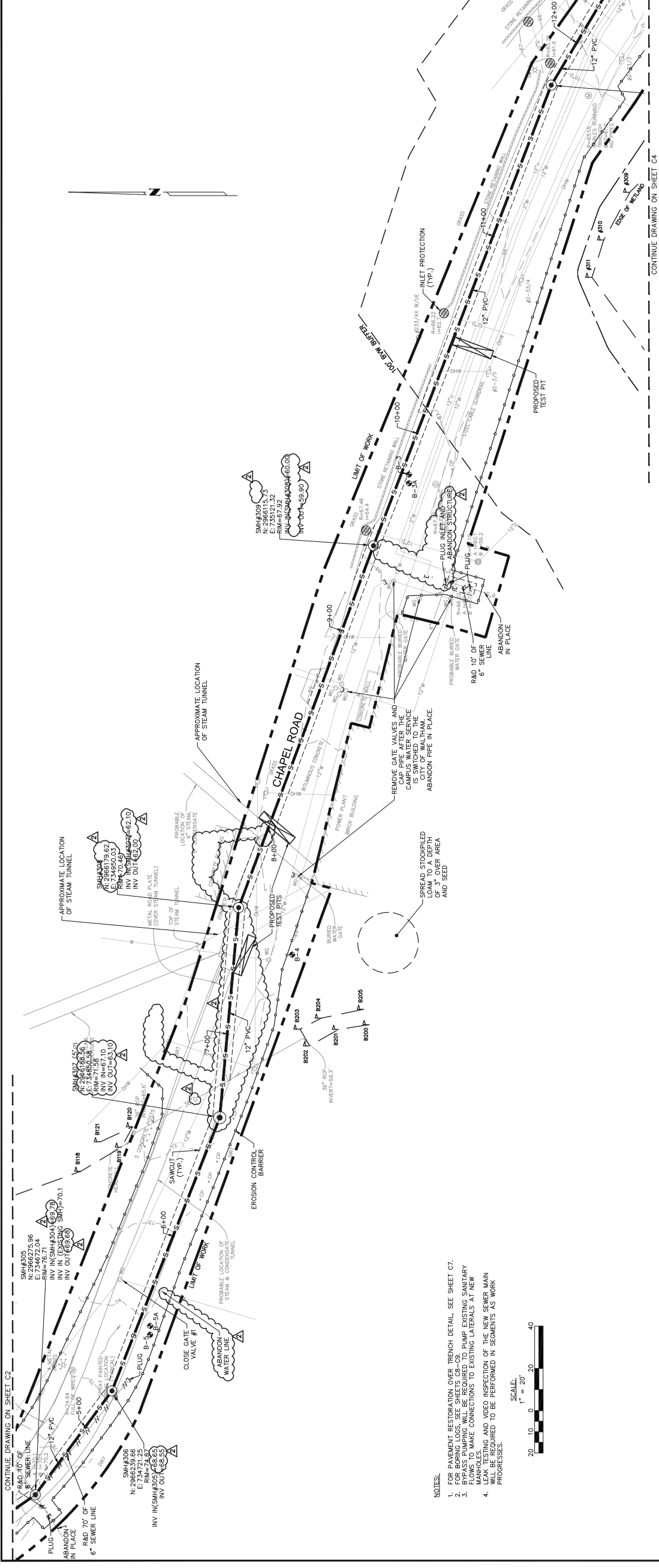
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 CAMIS Number: DMR27
 Building Number: N/A
 Secretariat: EXECUTIVE OFFICE
 OF HEALTH & HUMAN
 SERVICES

Original Issue Date
08/25-2014 BID DOCUMENTS

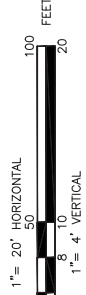
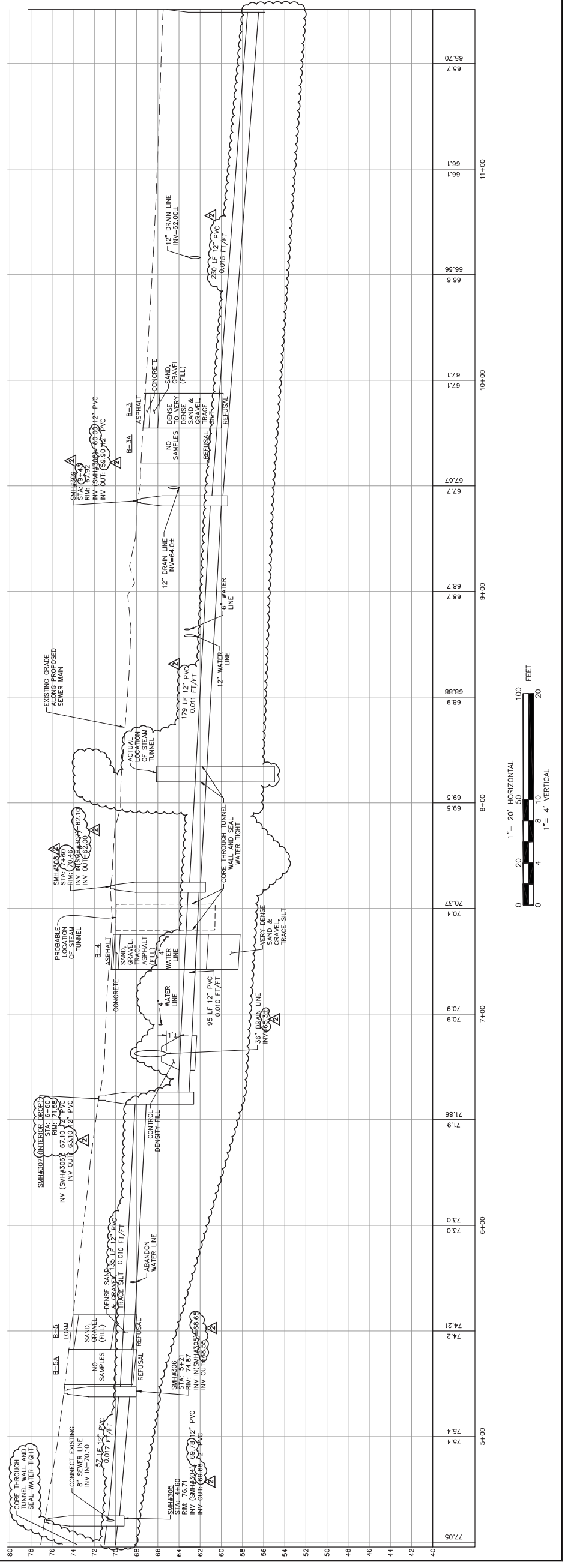
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2	CHANGE ORDER #1		12/12/14

Plan Name:
**CONSTRUCTION
 PLAN & PROFILE**

Drawing Number
C4
 Drawing 6 of 11



- NOTES:
1. FOR PAVEMENT RESTORATION OVER TRENCH DETAIL SEE SHEET C7.
 2. FOR BORING LOGS, SEE SHEETS CB-C9, RUMP EXISTING SANITARY MANHOLES.
 3. FLOWS TO MAKE CONNECTIONS TO EXISTING LATERALS AT NEW MANHOLES.
 4. ALL TESTING AND VIDEO INSPECTION OF THE NEW SEWER MAIN SEGMENTS TO BE PERFORMED IN SEGMENTS AS WORK PROGRESSES.



Key Plan: SEE COVER SHEET

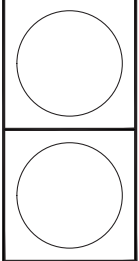
Project Name:
**SEWER MAIN
 REPLACEMENT**

DCAMM Project Number
 DDS 1405 HC-1

Project Location
**Fernald
 Development
 Center
 Waltham, MA**

Project Architect
CBI
 350 DORCHESTER AVE
 BOSTON, MA 02127
 PH: (617) 268-8977
 FX: (617) 462-2911
 CB@CBIENGINEERING.COM
 CBI JOB # 09008-K

Project Consultant
 Nilsch Engineering, Inc
 2 Center Plaza, Suite 430
 Boston, MA 02210
 (617) 335-0065



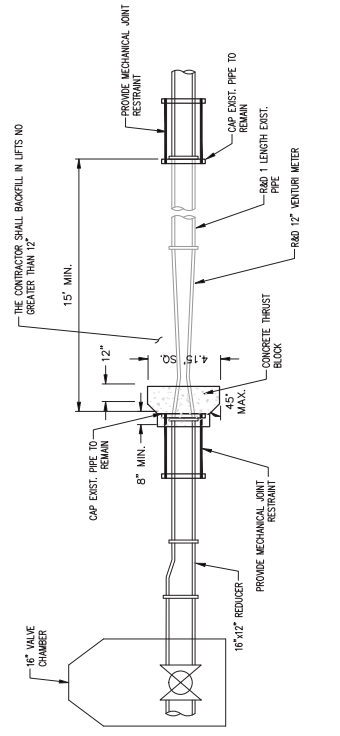
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 CAMIS Number: DMR27
 Building Number: N/A
 Secretariat: EXECUTIVE OFFICE
 OF HEALTH & HUMAN
 SERVICES

Original Issue Date
08/25-2014 BID DOCUMENTS

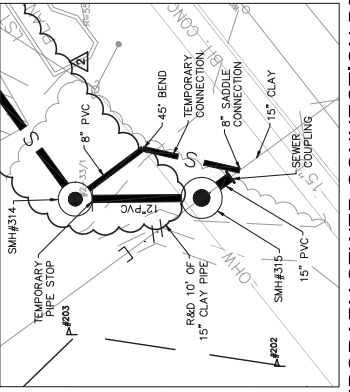
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2	CHANGE ORDER #1		12/12/14

Plan Name:
**CONSTRUCTION
 PLAN & PROFILE**

Drawing Number
C5
 Drawing 7 of 11



SECTION A - A
 NOT TO SCALE

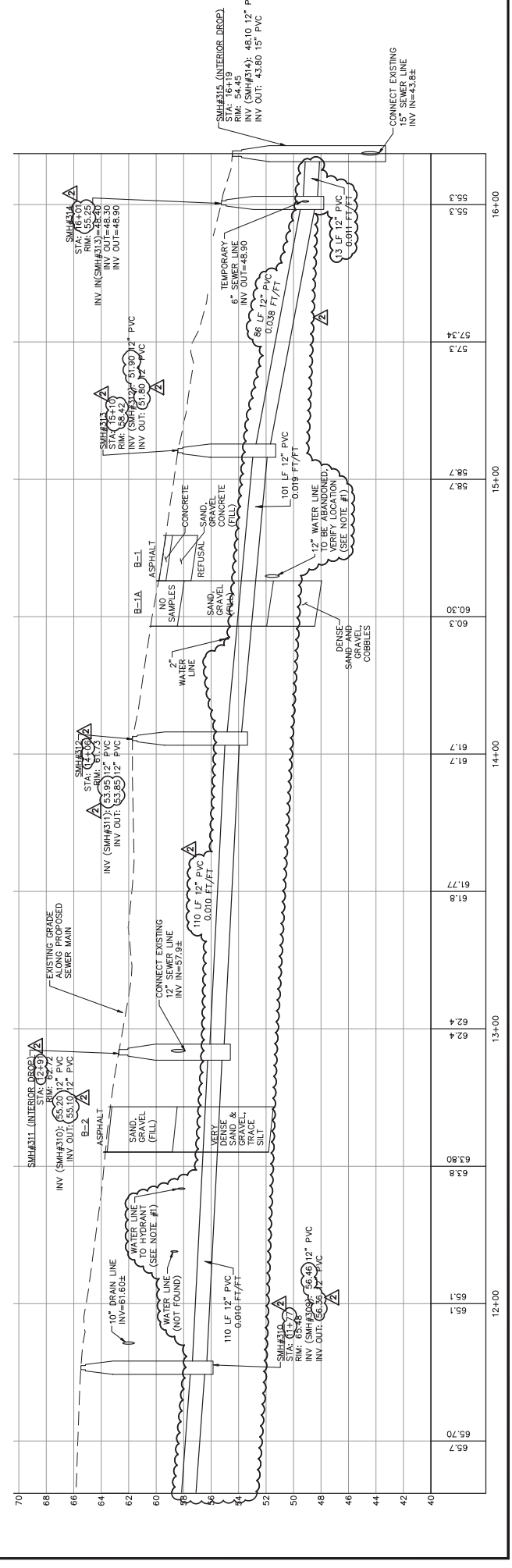
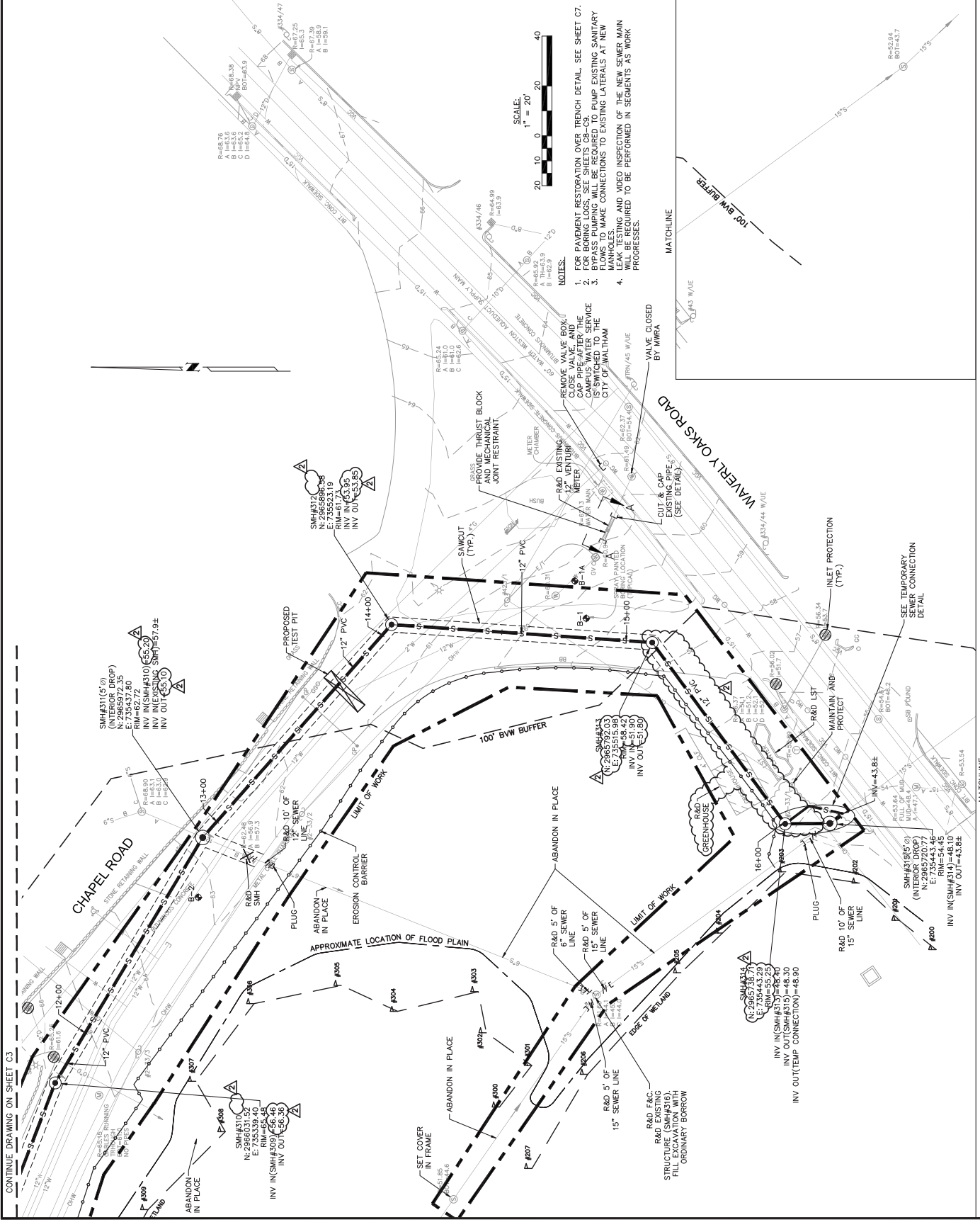
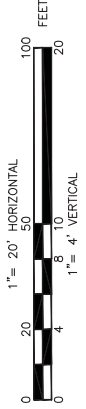


TEMPORARY SEWER CONNECTION DETAIL

SCALE: 1" = 10'

- FINISHING NOTES:**
- SEWAGE SHALL FLOW FROM SMH#314 TO EXISTING 15" CLAY PIPE THROUGH TEMPORARY 8" PVC PIPE CONNECTION. THE 12" PVC INVERT OUT OF SMH#314 SHALL BE PLUGGED.
 - REMOVE AND DISPOSE THE FRAME AND COVER OF EXISTING SMH#316. REMOVE AND DISPOSE THE STRUCTURE AND FILL EXCAVATION WITH ORDINARY BORROW.
 - CONTRACTOR SHALL REMOVE AND DISPOSE 10' OF THE EXISTING 15" CLAY PIPE AND INSTALL SMH#315.
 - CONTRACTOR SHALL INSTALL 15" PVC PIPE AND CONNECT TO EXISTING 15" CLAY PIPE WITH SEWER COUPLING.
 - CONTRACTOR SHALL INSTALL 12" PVC PIPE FROM SMH#314 TO SMH#315.
 - CONTRACTOR SHALL PLUG THE 8" PVC OUTLET IN SMH#314 AND CAP SADDLE CONNECTION.
 - SEWAGE SHALL FLOW FROM SMH#314 TO SMH#315 AND ENTER THE EXISTING 15" CLAY PIPE.

NOTE:
 1. VERIFY ELEVATION OF EXISTING WATER MAIN CROSSINGS AT STA. 12+42 AND 14+65 BEFORE ORDERING MANHOLES.



FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

APRIL 2016

APPENDIX F

1975 WETLAND RESOURCE AREA MAPS - CITY OF WALTHAM

APPENDICES

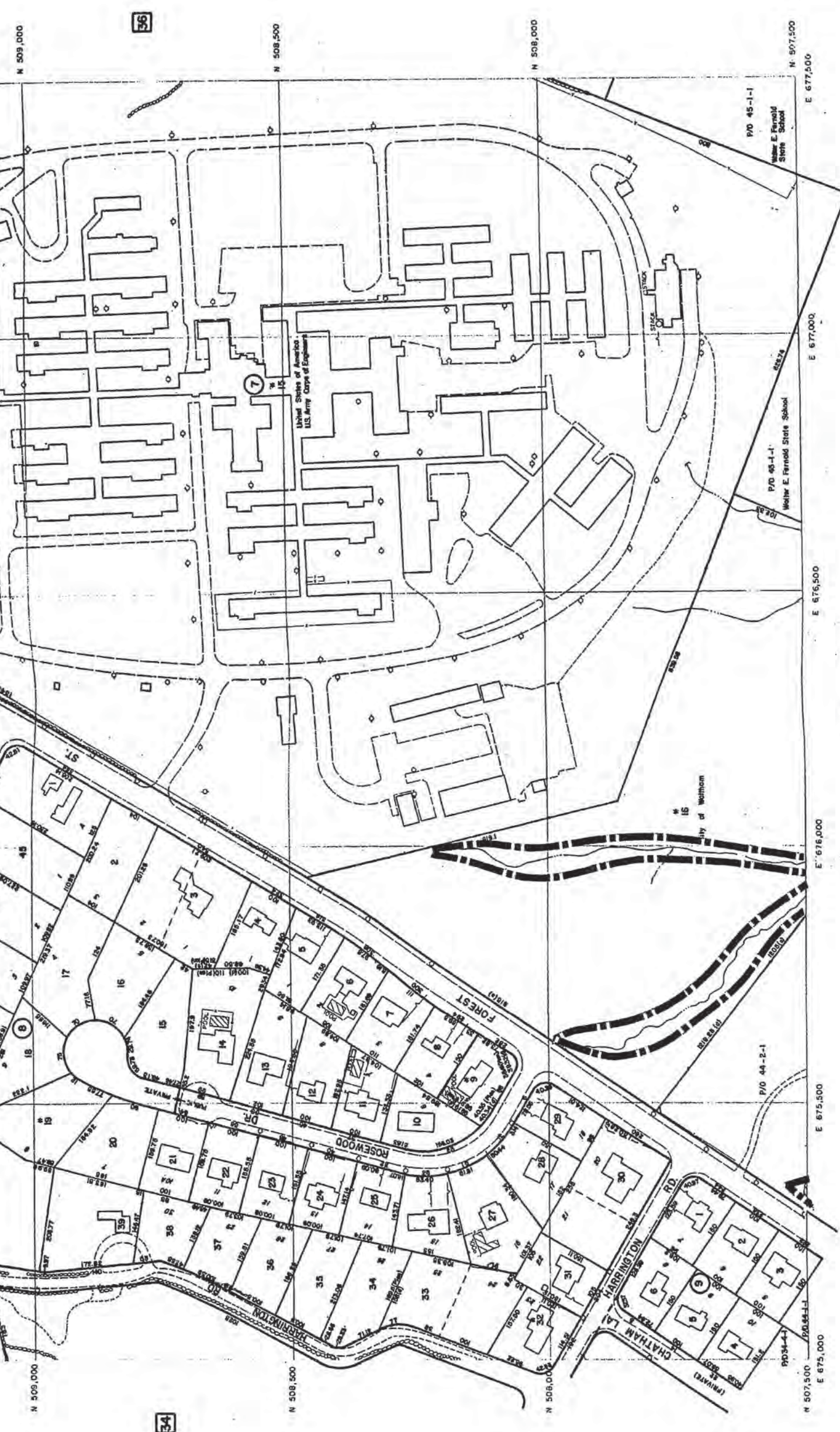
Atlas
City of Waltham
1975
Wetland
Resource
Areas



25

36

34



WETLAND LEGEND

	CITY BOUNDARY		RIVER
	WATER DITCHES		DUCTILE
	LAKES, PONDS		TRAILS
	ROADS		RETAINING WALLS
	UNDER CONSTRUCTION		OTHER

LEGS:

	PAVED		RAILROAD
	UNPAVED		ROAD
	RAILROAD		OTHER

WETLAND LIMIT OF 100 YEAR FLOODPLAIN

APPROXIMATE LIMIT OF WETLANDS

WETLAND RESOURCE AREAS

HMM ASSOCIATES
 Environmental Consultants, Engineers and Planners
 338 BAKER AVENUE
 CONCORD, MASSACHUSETTS 01742
 (617) 371-6992

hm

0 100 200 300 400 FEET

BASED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM

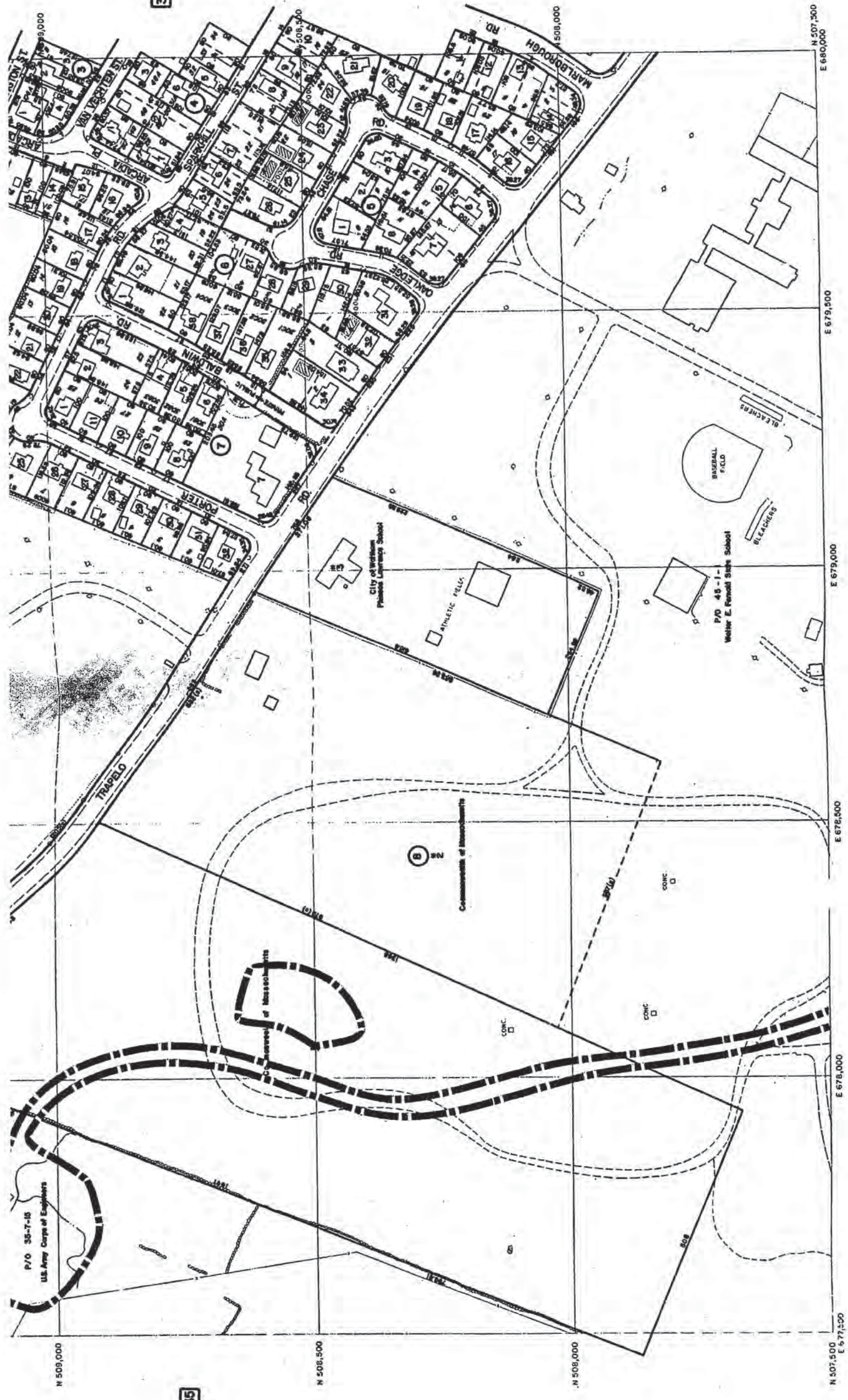
CITY OF WALTHAM, MASSACHUSETTS

MAPS PREPARED BY:
 HERRING & HERRING
 WALTHAM, MASSACHUSETTS

CONTROL BY SCOTFIELD BROTHERS, REGISTERED LAND SURVEYORS
 AND RAYMOND COMPANY,
 CONCORD, MASSACHUSETTS

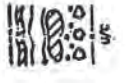
DATE OF PHOTOGRAPHY: APRIL, 1974





37

35



WETLAND RESOURCE AREAS

HMM ASSOCIATES
 Environmental Consultants, Engineers and Planners
 336 BAKER AVENUE
 CONCORD, MASSACHUSETTS 01742
 (617) 371-1882



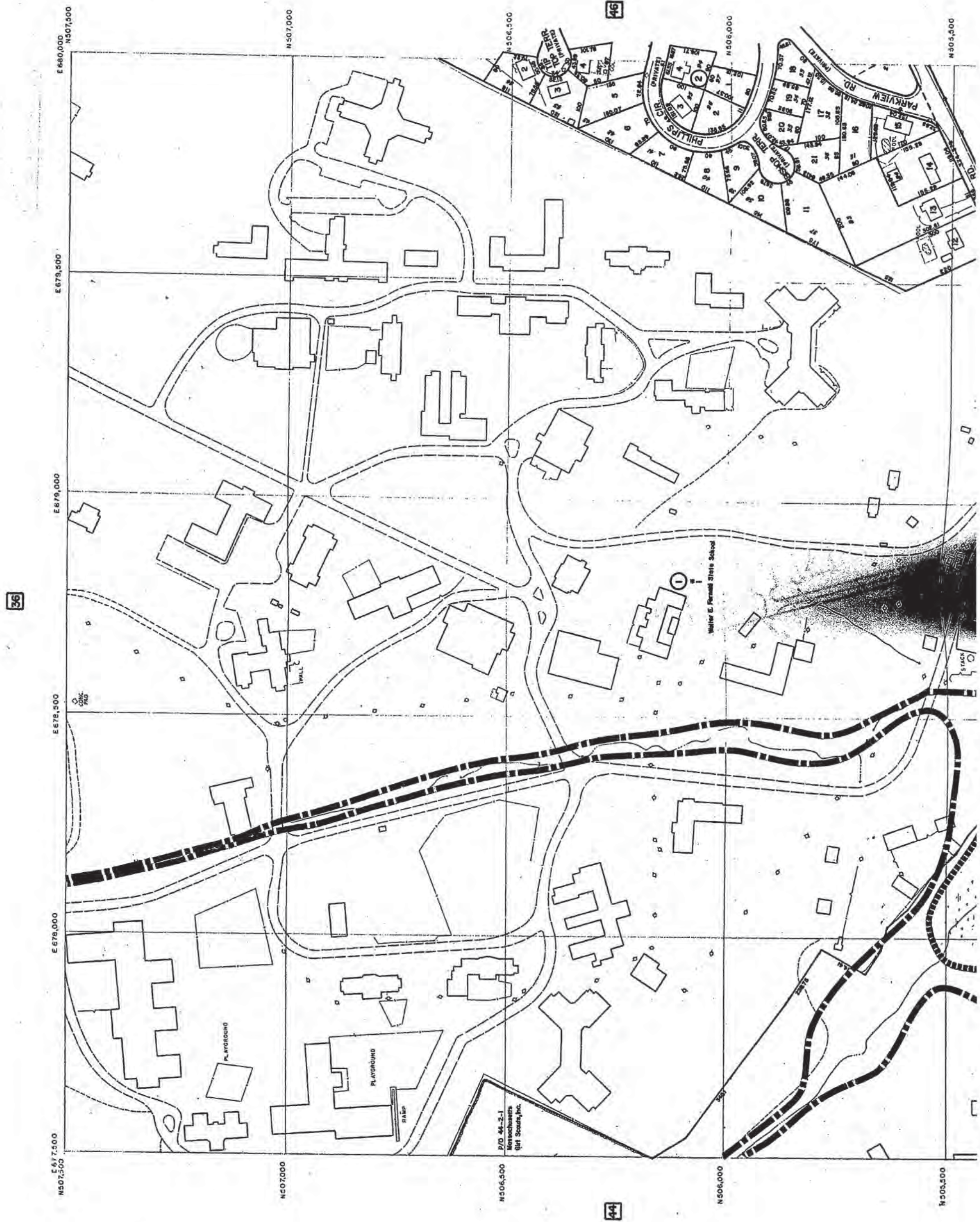
CITY OF WALTHAM, MASSACHUSETTS

MAPS PREPARED BY:
ENTRICK & ASSOCIATES
 WALTHAM, MASSACHUSETTS
 CONTROLLED BY SCOTT BROTHERS, REGISTERED LAND SURVEYORS
 AND RAYMOND COMPANY,
 COMPILED BY STEREOPHOTODIAGRAMMATIC METHOD
 DATE OF PHOTOGRAPHY, APRIL, 1974

WETLAND LEGEND

	CITY BOUNDARY
	WETLAND
	STREAM, DITCH
	CANAL
	SWAMP POND
	TREE
	MARSH CONSTRUCTION
	POLE
	UTILITY
	FENCE
	WALL
	RETAINING WALL
	OTHER
	ROAD
	PAVED AREA
	ATHLETIC FIELD
	BASEBALL FIELD
	BLEACHERS
	LEACHERY
	CONC.

APPROXIMATE LIMIT OF WETLANDS
 APPROXIMATE LIMIT OF 100 YEAR FLOODPLAIN



36

46

44

E 680,000 N 507,500
 E 679,500
 E 679,000
 E 678,500
 E 678,000
 E 677,500
 N 507,500
 N 507,000
 N 506,500
 N 506,000
 N 505,500

P/O 44-2-1
 Massachusetts
 Sign Systems, Inc.

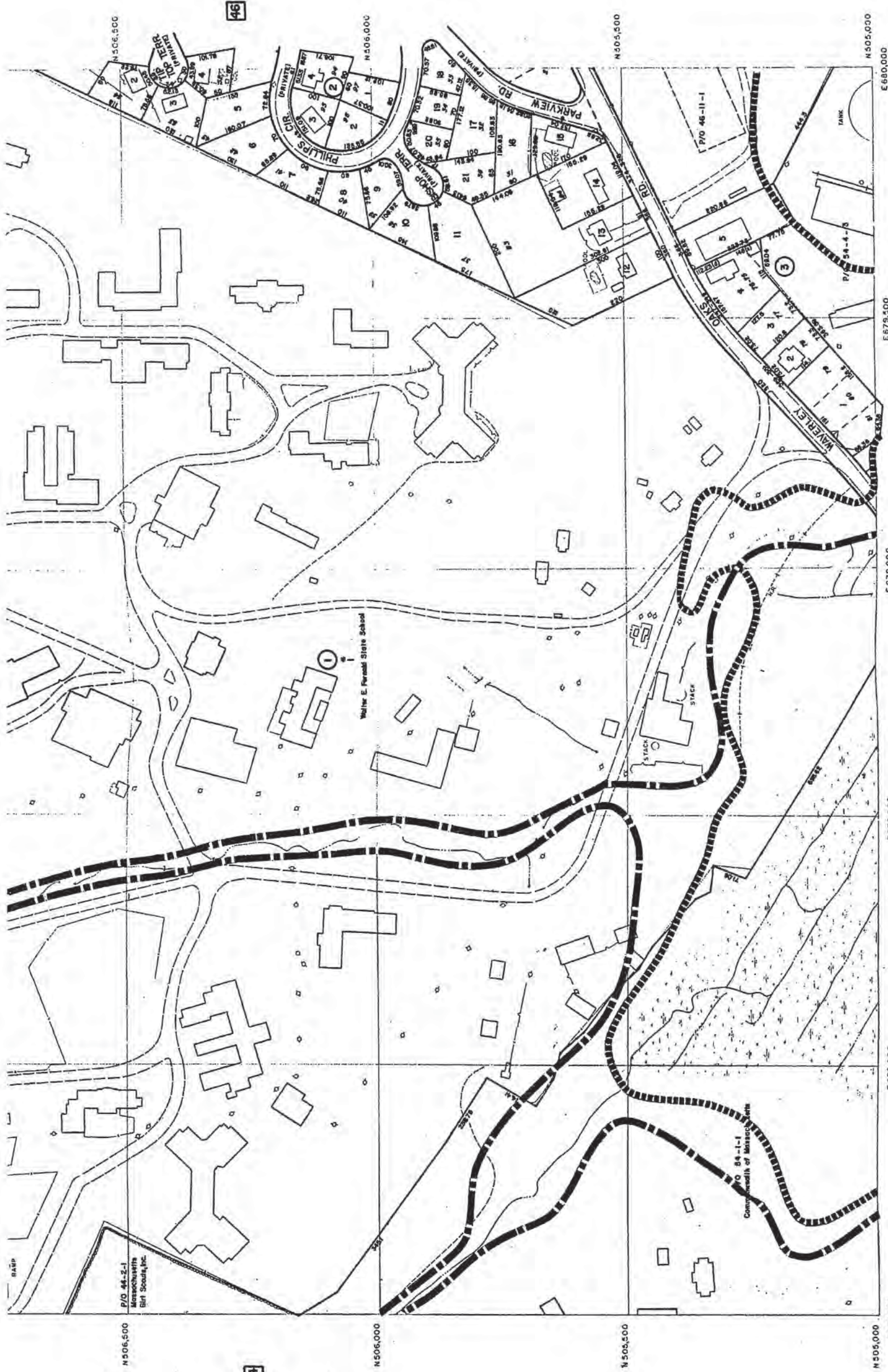
PLAYGROUND

PLAYGROUND

Walter E. Ferrell State School

PHILLIPS AVE

PARKVIEW RD



46

44

P/O 44-2-1
Massachusetts
Bird Society, Inc.

WETLAND LEGEND

APPROXIMATE LIMIT OF WETLANDS	POLE	CITY BOUNDARY
APPROXIMATE LIMIT OF 100 YEAR FLOODPLAIN	LIGHT	SEWERAL DITCHES
ROADS	PILE	WATER TOWER
UNPAVED	WALL	LARGE POND
PAVING	TRAIL	SWAMP
RAILROAD	RAILROAD	WETLAND
	RAILROAD	OTHER
		UNDER CONSTRUCTION

WETLAND RESOURCE AREAS

HMM ASSOCIATES
Environmental Consultants, Engineers and Planners
338 BAKER AVENUE
CONCORD, MASSACHUSETTS 01742
(617) 371-1892

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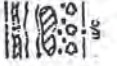
SCALE: 1" = 400 FEET

BASED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM

CITY OF WALTHAM, MASSACHUSETTS

MAPING PREPARED BY
Autometric
WALTHAM, MASSACHUSETTS

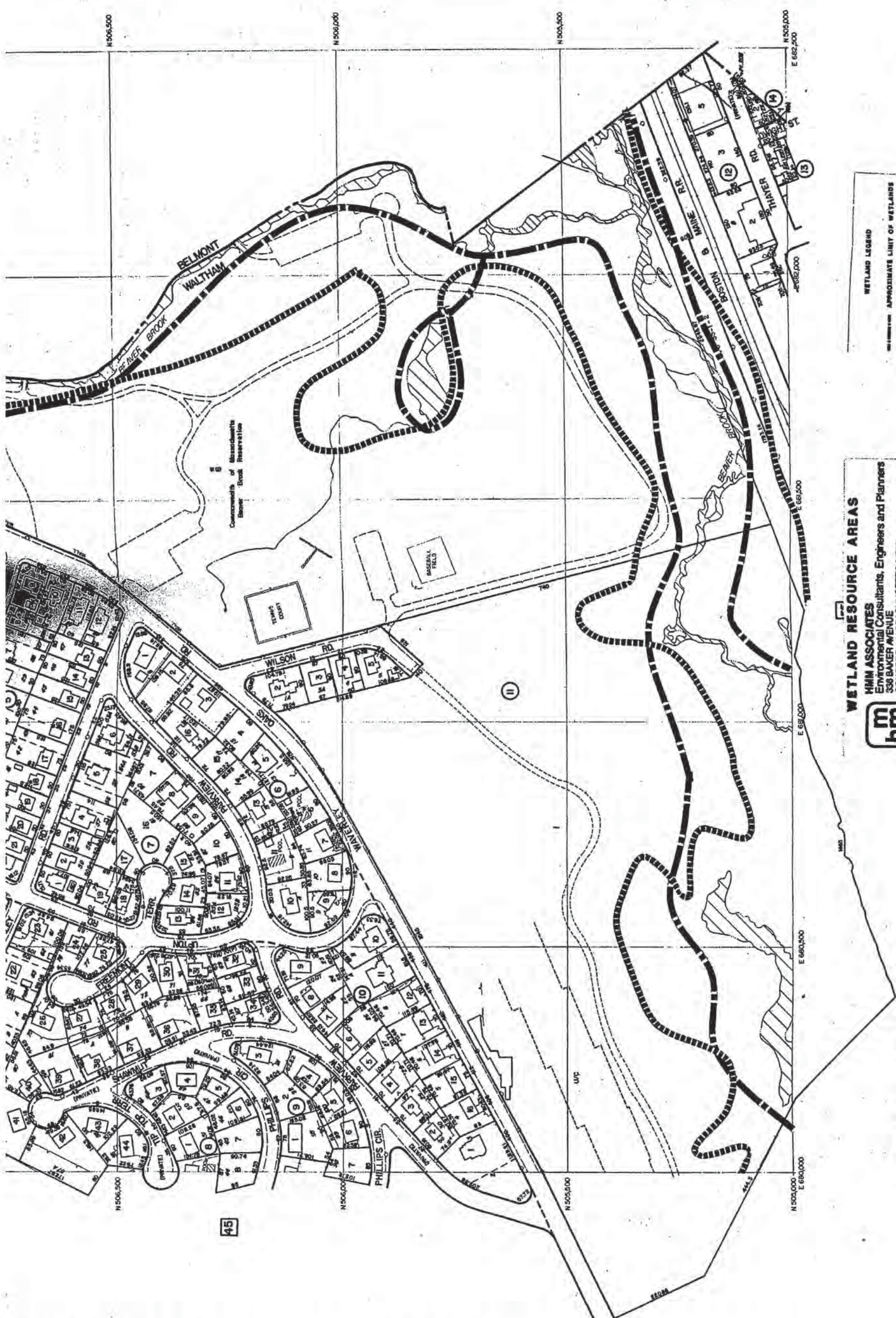
CONTROL BY SCHOFFEL BROTHERS, REGISTERED LAND SURVEYORS
AND RAYMOND COMPANY, PHOTOGRAMMETRIC METHODS
DATE OF PHOTOGRAPHY, APRIL, 1974





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WETLAND RESOURCE AREAS
 HMM ASSOCIATES
 Environmental Consultants, Engineers and Planners
 338 BAKER AVENUE
 CONCORD, MASSACHUSETTS 01742
 (617) 371-1892



MAP IS BASED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM

CITY OF WALTHAM, MASSACHUSETTS
 MAPS PREPARED BY:
 METTRON ENGINEERING
 WALTHAM, MASSACHUSETTS
 CONTROL BY SCOTCHFIELD BROTHERS, REGISTERED LAND SURVEYORS
 AND MAYHEW COMPANY
 COMPILED BY STEREOPHOTODUPLICATION METHOD
 DATE OF PHOTOGRAPHY, APRIL 1974

WETLAND LEGEND

APPROXIMATE LIMIT OF WETLANDS YEAR FLOODPLAIN	POLES
ROADS	LIGHT
PAVED AREAS	WYLL
UNPAVED AREAS	WALLS
TRAILS	STONE
RAILROADS	OTHER
RAILROAD	WELL

CITY BOUNDARY	U/C
STREETS, OFFICES	
LANDS	
WATER	
UNDER CONSTRUCTION	

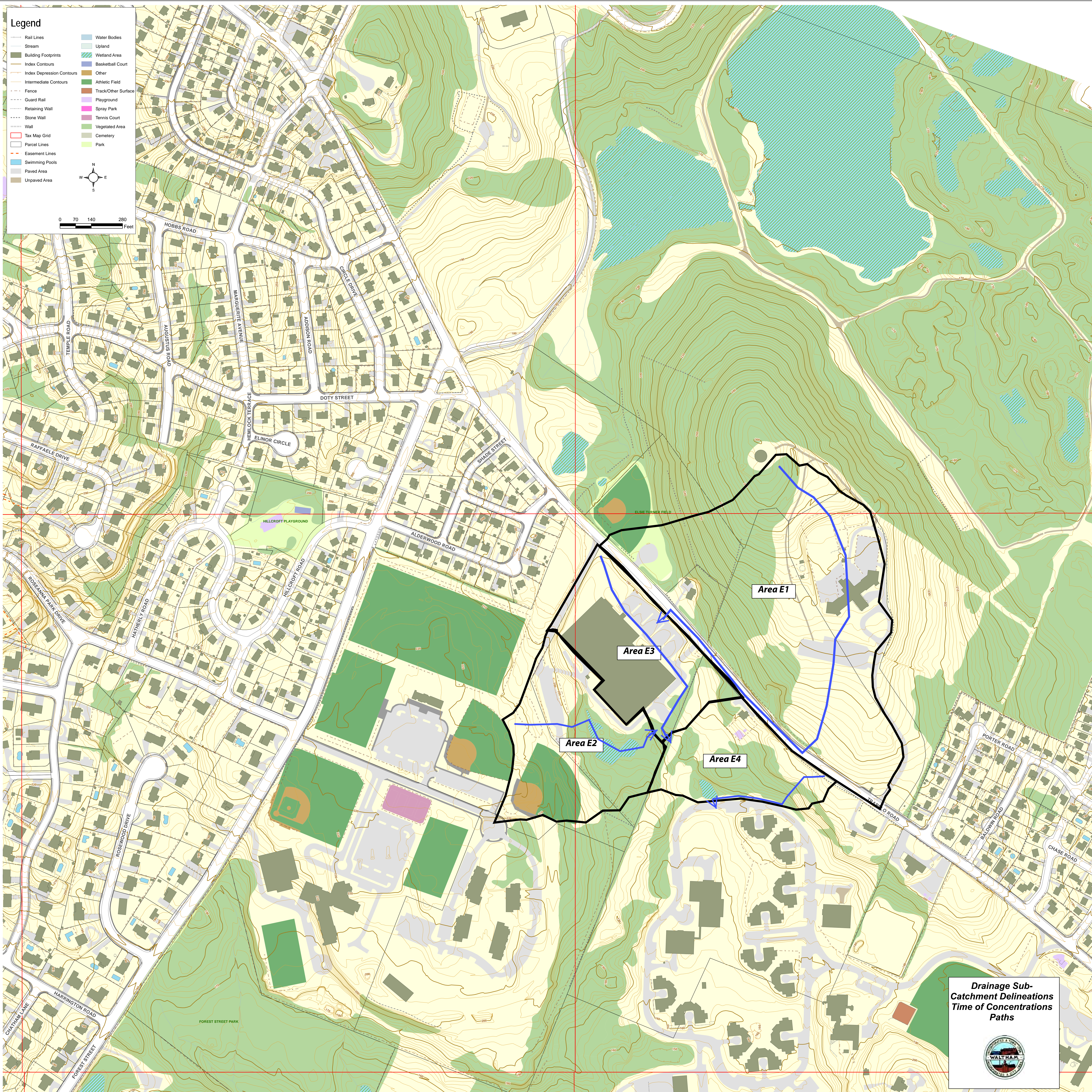
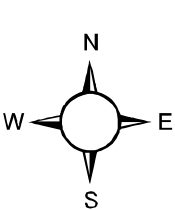
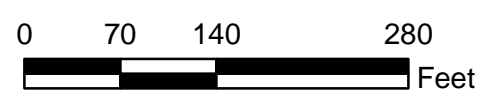
FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

APRIL 2016

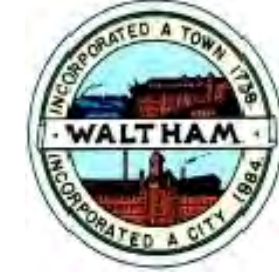
APPENDIX G
HYDROCAD MODEL OUTPUT REPORTS

Legend

- Rail Lines
- Stream
- Building Footprints
- Index Contours
- Intermediate Contours
- Fence
- Guard Rail
- Retaining Wall
- Stone Wall
- Wall
- Tax Map Grid
- Parcel Lines
- Easement Lines
- Swimming Pools
- Paved Area
- Unpaved Area
- Water Bodies
- Upland
- Wetland Area
- Basketball Court
- Other
- Athletic Field
- Track/Other Surface
- Playground
- Spray Park
- Tennis Court
- Vegetated Area
- Cemetery
- Park



**Drainage Sub-Catchment Delineations
Time of Concentration
Paths**



Legend

0 70 140 280 Feet

N
W E
S

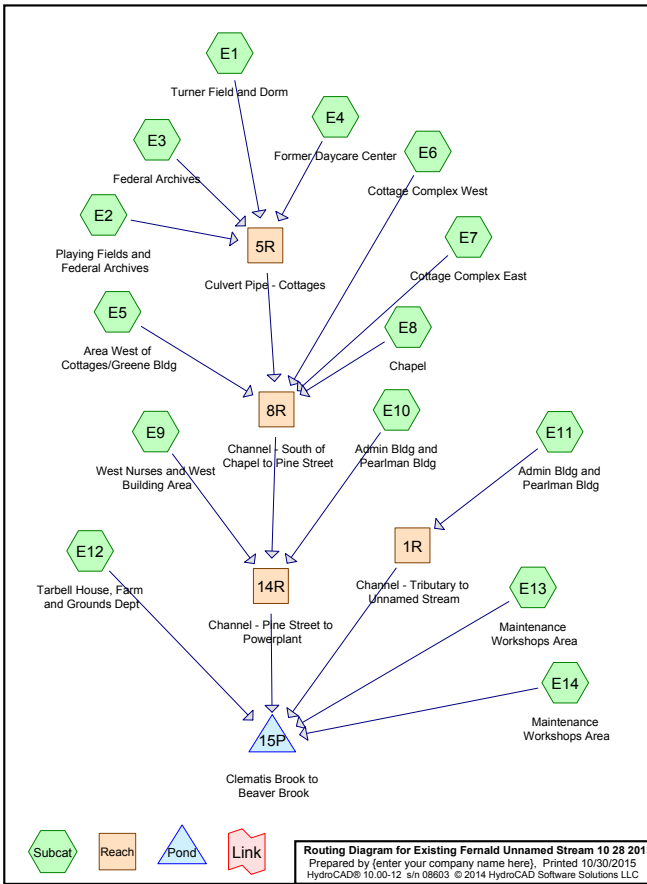


Drainage Sub-Catchment Delineations
Time of Concentrations
Paths

Sheet No.
50

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
123.490	79	50-75% Grass cover, Fair, HSG C (E1, E10, E11, E12, E13, E14, E2, E3, E4, E5, E6, E7, E8, E9)
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C (E10)
9.350	98	Paved parking and Roof area, HSG C (E2, E3, E4, E5)
10.540	98	Paved parking, HSG C (E1, E13, E9)
1.460	98	Paved parking, roofs, HSG C (E14)
3.490	98	Roads and Paved parking, HSG C (E6)
18.810	98	Roads, Roof and Paved parking, HSG C (E10, E11, E12, E7, E8)
0.020	98	Water Surface, 0% imp, HSG C (E12)
1.120	98	Water Surface/Wetlands, 0% imp, HSG C (E2, E4, E5)
168.620	84	TOTAL AREA



Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
168.620	HSG C	E1, E10, E11, E12, E13, E14, E2, E3, E4, E5, E6, E7, E8, E9
0.000	HSG D	
0.000	Other	
168.620	TOTAL AREA	

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatc Number
0.000	0.000	123.490	0.000	0.000	123.490	50-75% Grass cover, Fair	
0.000	0.000	0.340	0.000	0.000	0.340	Detention Basin, Water Surface, 0% imp	
0.000	0.000	10.540	0.000	0.000	10.540	Paved parking	
0.000	0.000	9.350	0.000	0.000	9.350	Paved parking and Roof area	
0.000	0.000	1.460	0.000	0.000	1.460	Paved parking, roofs	
0.000	0.000	3.490	0.000	0.000	3.490	Roads and Paved parking	
0.000	0.000	18.810	0.000	0.000	18.810	Roads, Roof and Paved parking	
0.000	0.000	0.020	0.000	0.000	0.020	Water Surface, 0% imp	
0.000	0.000	1.120	0.000	0.000	1.120	Water Surface/Wetlands, 0% imp	
0.000	0.000	168.620	0.000	0.000	168.620	TOTAL AREA	

Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 E1: Turner Field and Dorm	Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=1.61" Flow Length=2,460' Slope=0.0431 '/ Tc=9.5 min CN=83 Runoff=40.97 cfs 3.336 af
Subcatchment E10: Admin Bldg and	Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=2.00" Flow Length=1,487' Slope=0.0498 '/ Tc=6.3 min CN=88 Runoff=27.66 cfs 2.029 af
Subcatchment E11: Admin Bldg and	Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=1.76" Flow Length=1,243' Slope=0.0354 '/ Tc=7.1 min CN=85 Runoff=23.37 cfs 1.747 af
Subcatchment E12: Tarbell House, Farm	Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=1.76" Flow Length=1,362' Slope=0.0719 '/ Tc=5.3 min CN=85 Runoff=18.17 cfs 1.298 af
Subcatchment E13: Maintenance	Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=1.76" Flow Length=1,656' Slope=0.0797 '/ Tc=8.2 min CN=85 Runoff=24.62 cfs 1.913 af
Subcatchment E14: Maintenance	Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=1.54" Flow Length=1,106' Slope=0.1212 '/ Tc=6.0 min CN=82 Runoff=14.77 cfs 1.074 af
Subcatchment E2: Playing Fields and	Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=1.54" Flow Length=777' Slope=0.0438 '/ Tc=6.1 min CN=82 Runoff=15.56 cfs 1.134 af
Subcatchment E3: Federal Archives	Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=2.26" Flow Length=1,072' Slope=0.0112 '/ Tc=4.6 min CN=91 Runoff=20.81 cfs 1.470 af
Subcatchment E4: Former Daycare Center	Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=1.40" Flow Length=602' Slope=0.0698 '/ Tc=4.9 min CN=80 Runoff=9.14 cfs 0.653 af
Subcatchment E5: Area West of	Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=1.54" Flow Length=1,813' Slope=0.0386 '/ Tc=7.5 min CN=82 Runoff=39.98 cfs 3.043 af
Subcatchment E6: Cottage Complex West	Runoff Area=9.790 ac 35.65% Impervious Runoff Depth=1.84" Flow Length=830' Slope=0.0120 '/ Tc=10.7 min CN=86 Runoff=17.85 cfs 1.497 af
Subcatchment E7: Cottage Complex East	Runoff Area=19.670 ac 26.08% Impervious Runoff Depth=1.68" Flow Length=1,389' Slope=0.0216 '/ Tc=9.0 min CN=84 Runoff=34.31 cfs 2.758 af
Subcatchment E8: Chapel	Runoff Area=6.640 ac 27.86% Impervious Runoff Depth=1.68" Flow Length=1,086' Slope=0.0608 '/ Tc=5.5 min CN=84 Runoff=12.98 cfs 0.931 af
Subcatchment E9: West Nurses and West	Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=1.61" Flow Length=711' Slope=0.0408 '/ Tc=8.0 min CN=83 Runoff=12.54 cfs 0.970 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.46' Max Vel=8.96 fps Inflow=23.37 cfs 1.747 af n=0.030 L=1,000.0' S=0.1140 '/ Capacity=589.47 cfs Outflow=22.00 cfs 1.747 af
Reach 5R: Culvert Pipe - Cottages	Avg. Flow Depth=2.50' Max Vel=13.51 fps Inflow=82.45 cfs 6.594 af 30.0" Round Pipe n=0.013 L=1,890.0' S=0.0201 '/ Capacity=58.16 cfs Outflow=61.32 cfs 6.594 af

Reach 8R: Channel - South of Avg. Flow Depth=2.09' Max Vel=10.84 fps Inflow=162.61 cfs 14.822 af
n=0.022 L=700.0' S=0.0171 '/ Capacity=838.68 cfs Outflow=157.62 cfs 14.822 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=1.78' Max Vel=13.73 fps Inflow=191.46 cfs 17.820 af
n=0.030 L=1,120.0' S=0.0571 '/ Capacity=1,272.27 cfs Outflow=185.84 cfs 17.820 af

Pond 15P: Clematis Brook to Beaver Brook
Inflow=250.68 cfs 23.852 af
Primary=250.68 cfs 23.852 af

Total Runoff Area = 168.620 ac Runoff Volume = 23.852 af Average Runoff Depth = 1.70"
74.11% Pervious = 124.970 ac 25.89% Impervious = 43.650 ac

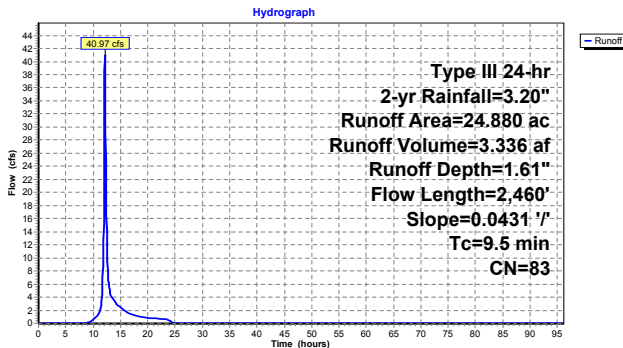
Summary for Subcatchment E1: Turner Field and Dorm

Runoff = 40.97 cfs @ 12.14 hrs, Volume= 3.336 af, Depth= 1.61"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment E1: Turner Field and Dorm



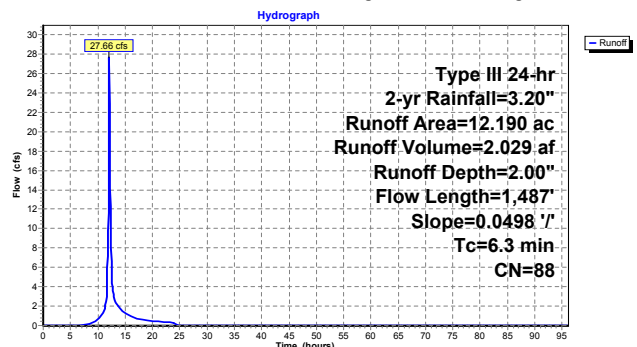
Summary for Subcatchment E10: Admin Bldg and Pearlman Bldg

Runoff = 27.66 cfs @ 12.09 hrs, Volume= 2.029 af, Depth= 2.00"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment E10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment E11: Admin Bldg and Pearlman Bldg

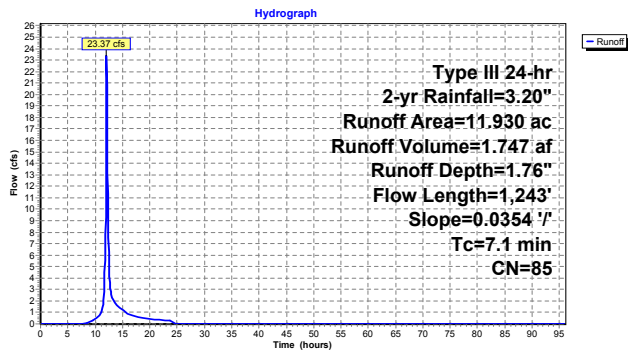
Runoff = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment E11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment E12: Tarbell House, Farm and Grounds Dept

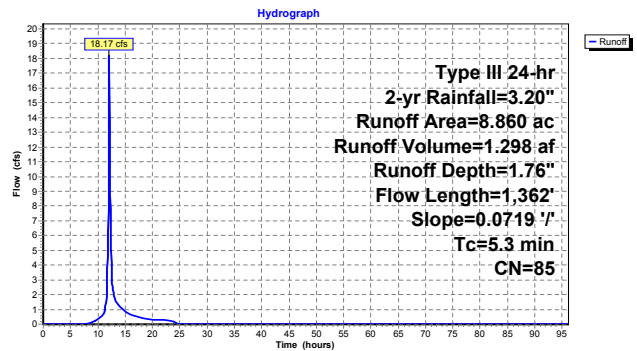
Runoff = 18.17 cfs @ 12.08 hrs, Volume= 1.298 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment E12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment E13: Maintenance Workshops Area

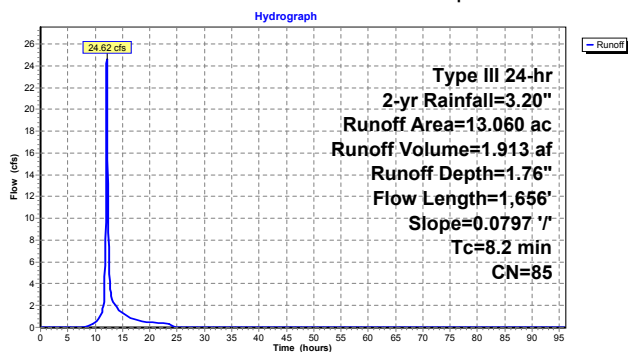
Runoff = 24.62 cfs @ 12.12 hrs, Volume= 1.913 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment E13: Maintenance Workshops Area



Summary for Subcatchment E14: Maintenance Workshops Area

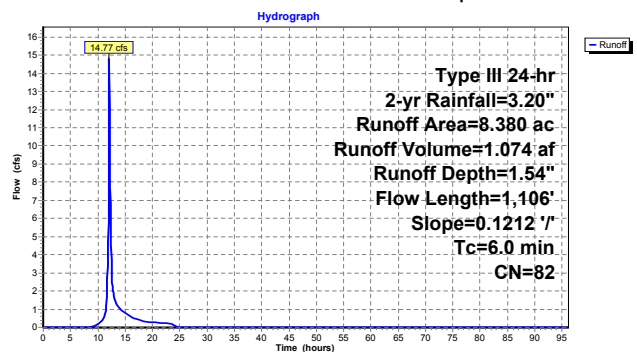
Runoff = 14.77 cfs @ 12.09 hrs, Volume= 1.074 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment E14: Maintenance Workshops Area



Summary for Subcatchment E2: Playing Fields and Federal Archives

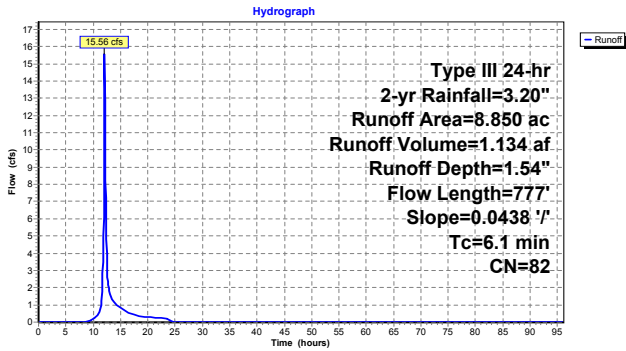
Runoff = 15.56 cfs @ 12.10 hrs, Volume= 1.134 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
* 1.030	98	Paved parking and Roof area, HSG C
* 0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment E2: Playing Fields and Federal Archives



Summary for Subcatchment E3: Federal Archives

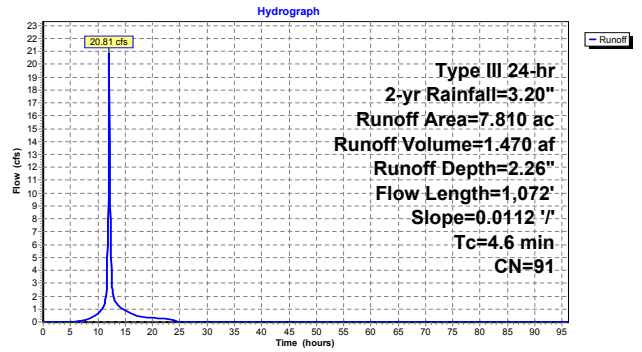
Runoff = 20.81 cfs @ 12.07 hrs, Volume= 1.470 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
* 4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment E3: Federal Archives



Summary for Subcatchment E4: Former Daycare Center

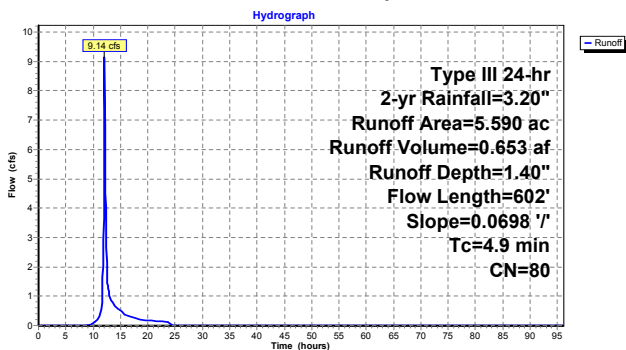
Runoff = 9.14 cfs @ 12.08 hrs, Volume= 0.653 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602				Total

Subcatchment E4: Former Daycare Center



Summary for Subcatchment E5: Area West of Cottages/Greene Bldg

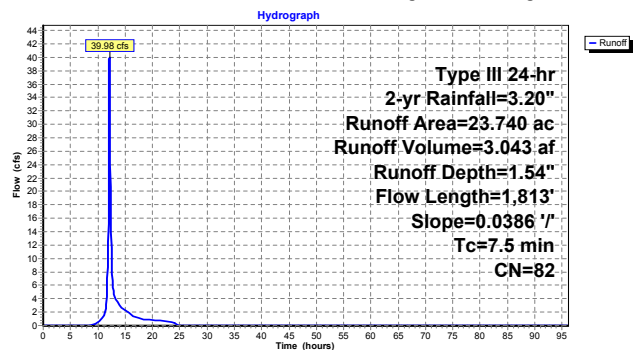
Runoff = 39.98 cfs @ 12.11 hrs, Volume= 3.043 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813				Total

Subcatchment E5: Area West of Cottages/Greene Bldg



Summary for Subcatchment E6: Cottage Complex West

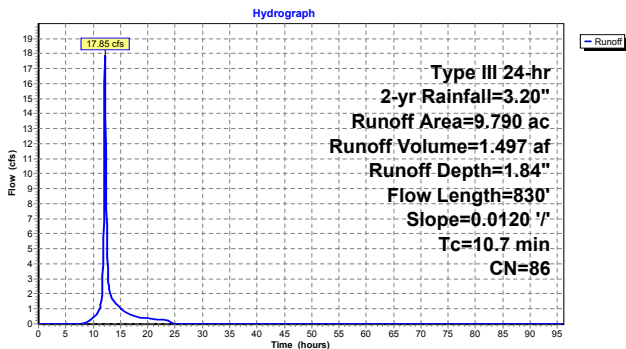
Runoff = 17.85 cfs @ 12.15 hrs, Volume= 1.497 af, Depth= 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
3.490	98	Roads and Paved parking, HSG C
9.790	86	Weighted Average
6.300		64.35% Pervious Area
3.490		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0120	0.12		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
10.7	830				Total

Subcatchment E6: Cottage Complex West



Summary for Subcatchment E7: Cottage Complex East

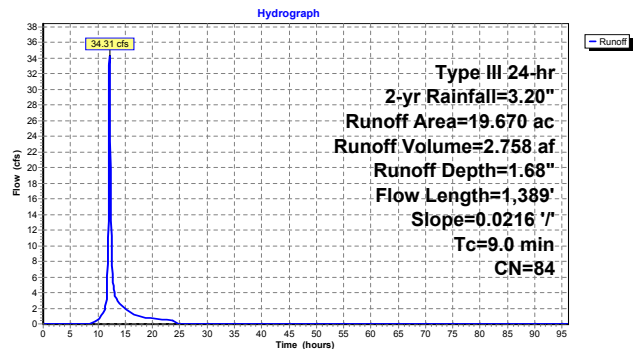
Runoff = 34.31 cfs @ 12.13 hrs, Volume= 2.758 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
14.540	79	50-75% Grass cover, Fair, HSG C
5.130	98	Roads, Roof and Paved parking, HSG C
19.670	84	Weighted Average
14.540		73.92% Pervious Area
5.130		26.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0216	0.15		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
9.0	1,389				Total

Subcatchment E7: Cottage Complex East



Summary for Subcatchment E8: Chapel

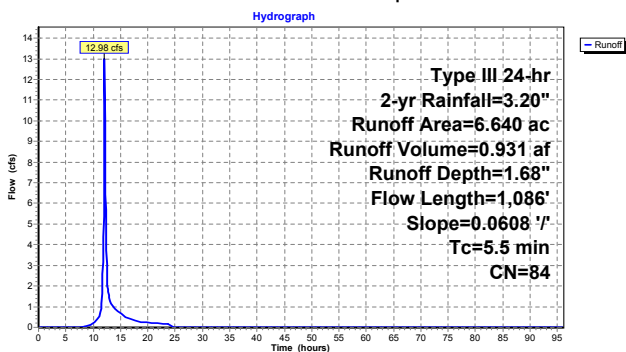
Runoff = 12.98 cfs @ 12.09 hrs, Volume= 0.931 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.790	79	50-75% Grass cover, Fair, HSG C
1.850	98	Roads, Roof and Paved parking, HSG C
6.640	84	Weighted Average
4.790		72.14% Pervious Area
1.850		27.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment E8: Chapel



Summary for Subcatchment E9: West Nurses and West Building Area

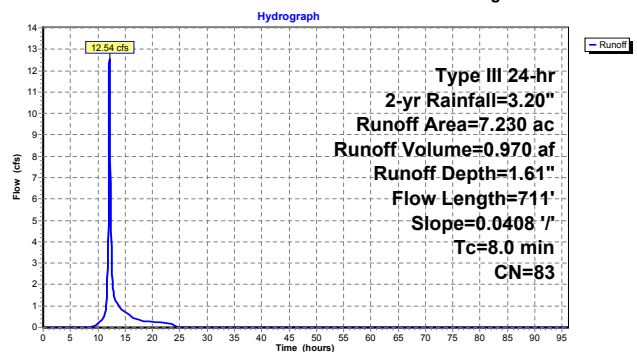
Runoff = 12.54 cfs @ 12.12 hrs, Volume= 0.970 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment E9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 1.76" for 2-yr event
 Inflow = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af
 Outflow = 22.00 cfs @ 12.16 hrs, Volume= 1.747 af, Atten= 6%, Lag= 3.4 min

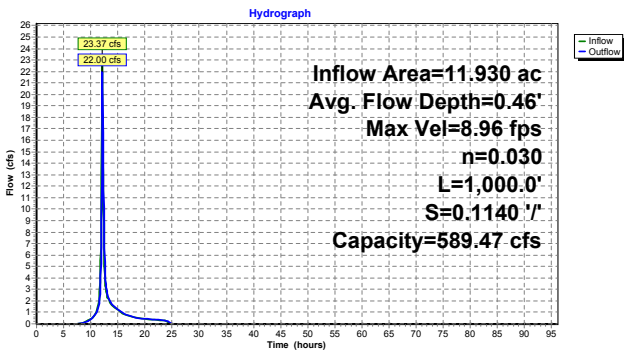
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.96 fps, Min. Travel Time= 1.9 min
 Avg. Velocity = 2.57 fps, Avg. Travel Time= 6.5 min

Peak Storage= 2,492 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.46'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 ' / '
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



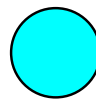
Summary for Reach 5R: Culvert Pipe - Cottages

Inflow Area = 47.130 ac, 22.45% Impervious, Inflow Depth = 1.68" for 2-yr event
 Inflow = 82.45 cfs @ 12.10 hrs, Volume= 6.594 af
 Outflow = 61.32 cfs @ 12.38 hrs, Volume= 6.594 af, Atten= 26%, Lag= 16.5 min

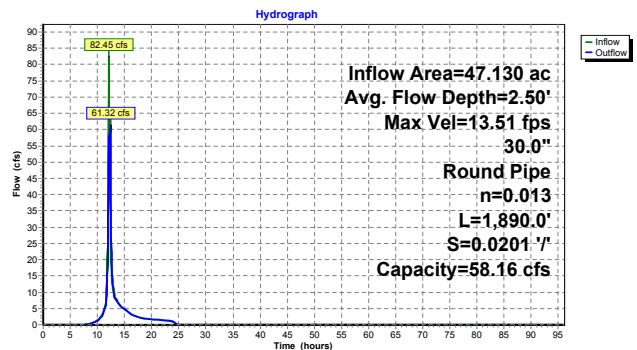
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.51 fps, Min. Travel Time= 2.3 min
 Avg. Velocity = 4.90 fps, Avg. Travel Time= 6.4 min

Peak Storage= 9,278 cf @ 12.10 hrs
 Average Depth at Peak Storage= 2.50'
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 58.16 cfs

30.0" Round Pipe
 n= 0.013 Concrete pipe, bends & connections
 Length= 1,890.0' Slope= 0.0201 ' / '
 Inlet Invert= 174.00', Outlet Invert= 136.00'



Reach 5R: Culvert Pipe - Cottages



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.970 ac, 22.91% Impervious, Inflow Depth = 1.66" for 2-yr event
 Inflow = 162.61 cfs @ 12.12 hrs, Volume= 14.822 af
 Outflow = 157.62 cfs @ 12.16 hrs, Volume= 14.822 af, Atten= 3%, Lag= 2.4 min

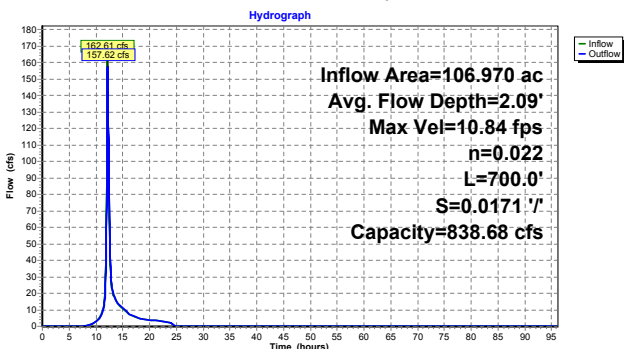
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 10.84 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 3.14 fps, Avg. Travel Time= 3.7 min

Peak Storage= 10,360 cf @ 12.14 hrs
 Average Depth at Peak Storage= 2.09'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 838.68 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0171 ' / '
 Inlet Invert= 136.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 24.86% Impervious, Inflow Depth = 1.69" for 2-yr event
 Inflow = 191.46 cfs @ 12.15 hrs, Volume= 17.820 af
 Outflow = 185.84 cfs @ 12.19 hrs, Volume= 17.820 af, Atten= 3%, Lag= 2.7 min

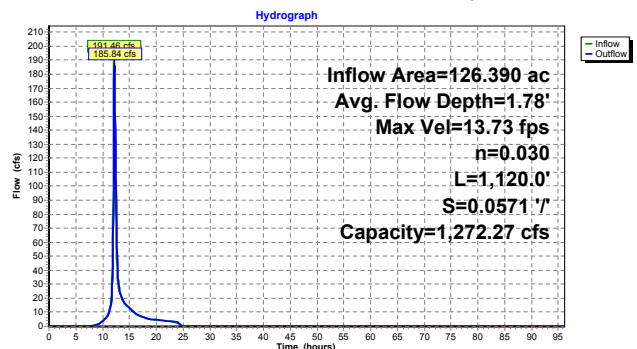
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.73 fps, Min. Travel Time= 1.4 min
 Avg. Velocity = 3.88 fps, Avg. Travel Time= 4.8 min

Peak Storage= 15,492 cf @ 12.17 hrs
 Average Depth at Peak Storage= 1.78'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

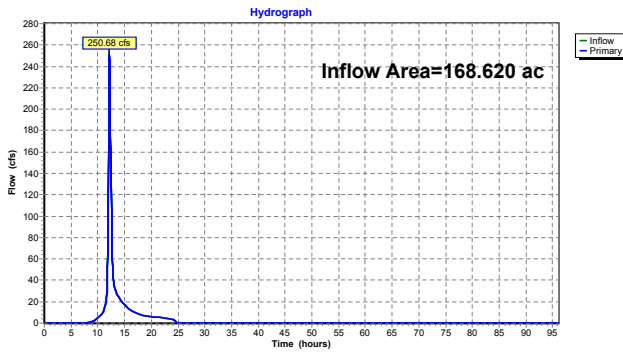


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 25.89% Impervious, Inflow Depth = 1.70" for 2-yr event
 Inflow = 250.68 cfs @ 12.17 hrs, Volume= 23.852 af
 Primary = 250.68 cfs @ 12.17 hrs, Volume= 23.852 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 E1: Turner Field and Dorm** Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=3.03"
 Flow Length=2,460' Slope=0.0431 '/' Tc=9.5 min CN=83 Runoff=77.00 cfs 6.282 af
- Subcatchment E10: Admin Bldg and** Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=3.52"
 Flow Length=1,487' Slope=0.0498 '/' Tc=6.3 min CN=88 Runoff=47.79 cfs 3.573 af
- Subcatchment E11: Admin Bldg and** Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=3.22"
 Flow Length=1,243' Slope=0.0354 '/' Tc=7.1 min CN=85 Runoff=42.44 cfs 3.202 af
- Subcatchment E12: Tarbell House, Farm** Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=3.22"
 Flow Length=1,362' Slope=0.0719 '/' Tc=5.3 min CN=85 Runoff=32.92 cfs 2.378 af
- Subcatchment E13: Maintenance** Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=3.22"
 Flow Length=1,656' Slope=0.0797 '/' Tc=8.2 min CN=85 Runoff=44.75 cfs 3.505 af
- Subcatchment E14: Maintenance** Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=2.94"
 Flow Length=1,106' Slope=0.1212 '/' Tc=6.0 min CN=82 Runoff=28.20 cfs 2.051 af
- Subcatchment E2: Playing Fields and** Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=2.94"
 Flow Length=777' Slope=0.0438 '/' Tc=6.1 min CN=82 Runoff=29.72 cfs 2.166 af
- Subcatchment E3: Federal Archives** Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=3.83"
 Flow Length=1,072' Slope=0.0112 '/' Tc=4.6 min CN=91 Runoff=34.41 cfs 2.491 af
- Subcatchment E4: Former Daycare Center** Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=2.75"
 Flow Length=602' Slope=0.0698 '/' Tc=4.9 min CN=80 Runoff=18.09 cfs 1.283 af
- Subcatchment E5: Area West of** Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=2.94"
 Flow Length=1,813' Slope=0.0386 '/' Tc=7.5 min CN=82 Runoff=76.52 cfs 5.809 af
- Subcatchment E6: Cottage Complex West** Runoff Area=9.790 ac 35.65% Impervious Runoff Depth=3.32"
 Flow Length=830' Slope=0.0120 '/' Tc=10.7 min CN=86 Runoff=31.92 cfs 2.707 af
- Subcatchment E7: Cottage Complex East** Runoff Area=19.670 ac 26.08% Impervious Runoff Depth=3.12"
 Flow Length=1,389' Slope=0.0216 '/' Tc=9.0 min CN=84 Runoff=63.39 cfs 5.121 af
- Subcatchment E8: Chapel** Runoff Area=6.640 ac 27.86% Impervious Runoff Depth=3.12"
 Flow Length=1,086' Slope=0.0608 '/' Tc=5.5 min CN=84 Runoff=23.92 cfs 1.729 af
- Subcatchment E9: West Nurses and West** Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=3.03"
 Flow Length=711' Slope=0.0408 '/' Tc=8.0 min CN=83 Runoff=23.59 cfs 1.825 af
- Reach 1R: Channel - Tributary to** Avg. Flow Depth=0.66' Max Vel=11.04 fps Inflow=42.44 cfs 3.202 af
 n=0.030 L=1,000.0' S=0.1140 '/' Capacity=589.47 cfs Outflow=40.10 cfs 3.202 af
- Reach 5R: Culvert Pipe - Cottages** Avg. Flow Depth=2.50' Max Vel=13.48 fps Inflow=152.41 cfs 12.221 af
 30.0' Round Pipe n=0.013 L=1,890.0' S=0.0201 '/' Capacity=58.16 cfs Outflow=59.93 cfs 12.221 af

Reach 8R: Channel - South of Avg. Flow Depth=2.65' Max Vel=12.18 fps Inflow=250.91 cfs 27.587 af
 n=0.022 L=700.0' S=0.0171 '/' Capacity=838.68 cfs Outflow=244.23 cfs 27.587 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=2.33' Max Vel=15.81 fps Inflow=307.59 cfs 32.985 af
 n=0.030 L=1,120.0' S=0.0571 '/' Capacity=1,272.27 cfs Outflow=301.03 cfs 32.985 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=427.74 cfs 44.120 af
 Primary=427.74 cfs 44.120 af

Total Runoff Area = 168.620 ac Runoff Volume = 44.120 af Average Runoff Depth = 3.14"
 74.11% Pervious = 124.970 ac 25.89% Impervious = 43.650 ac

Summary for Subcatchment E1: Turner Field and Dorm

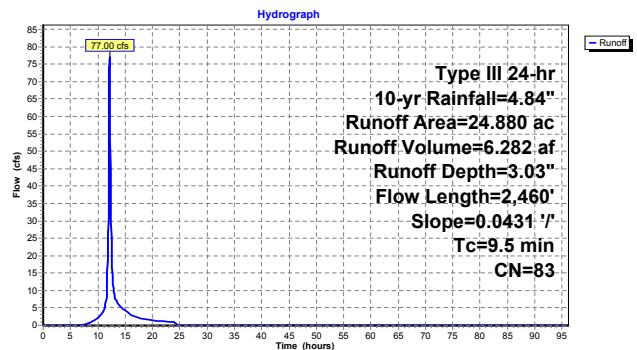
Runoff = 77.00 cfs @ 12.14 hrs, Volume= 6.282 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow
3.4	300	0.0431	1.45		Grass: Short n= 0.150 P2= 3.23 Shallow Concentrated Flow, Shallow Conc
2.0	2,110	0.0431	17.21	464.55	Short Grass Pasture Kv= 7.0 fps Channel Flow, open channel flow
					Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment E1: Turner Field and Dorm



Summary for Subcatchment E10: Admin Bldg and Pearlman Bldg

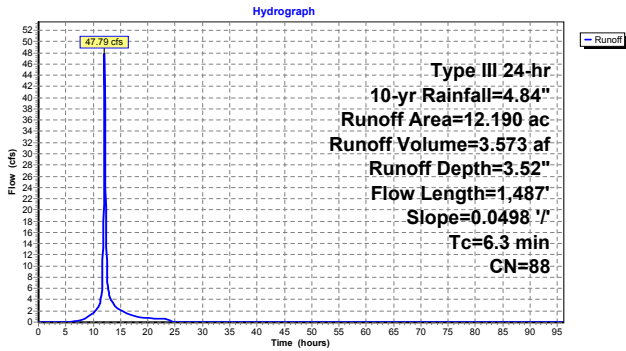
Runoff = 47.79 cfs @ 12.09 hrs, Volume= 3.573 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487				Total

Subcatchment E10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment E11: Admin Bldg and Pearlman Bldg

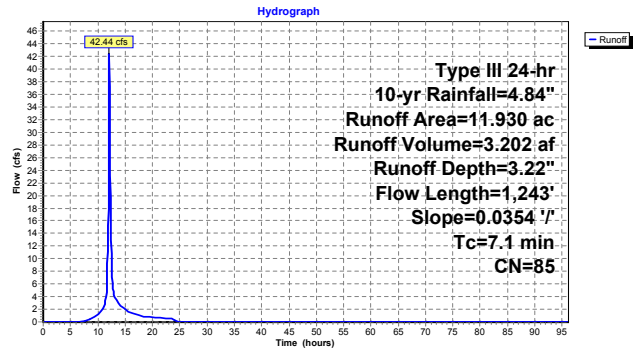
Runoff = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243				Total

Subcatchment E11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment E12: Tarbell House, Farm and Grounds Dept

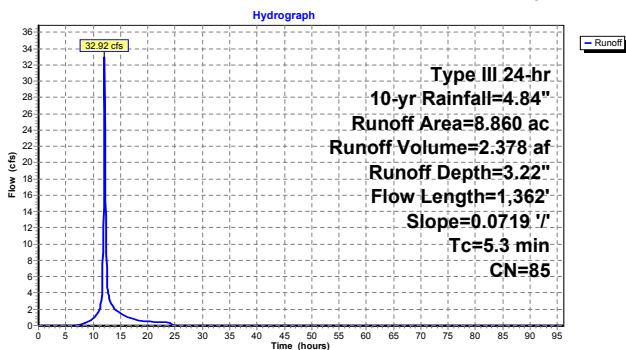
Runoff = 32.92 cfs @ 12.08 hrs, Volume= 2.378 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
* 2.560	98	Roads, Roof and Paved parking, HSG C
* 0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362				Total

Subcatchment E12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment E13: Maintenance Workshops Area

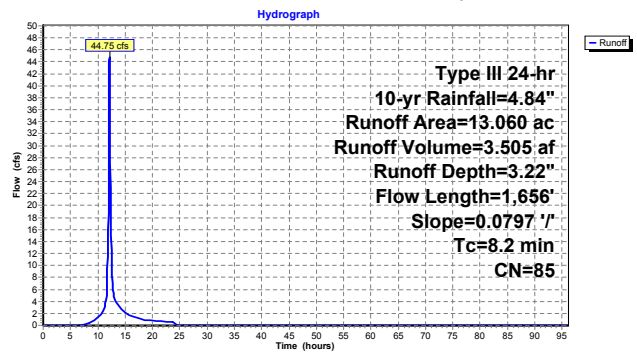
Runoff = 44.75 cfs @ 12.12 hrs, Volume= 3.505 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment E13: Maintenance Workshops Area



Summary for Subcatchment E14: Maintenance Workshops Area

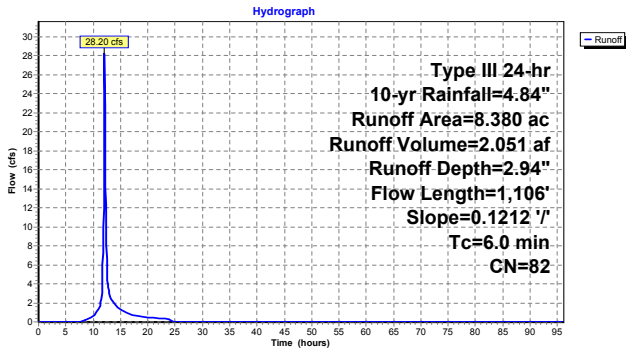
Runoff = 28.20 cfs @ 12.09 hrs, Volume= 2.051 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment E14: Maintenance Workshops Area



Summary for Subcatchment E2: Playing Fields and Federal Archives

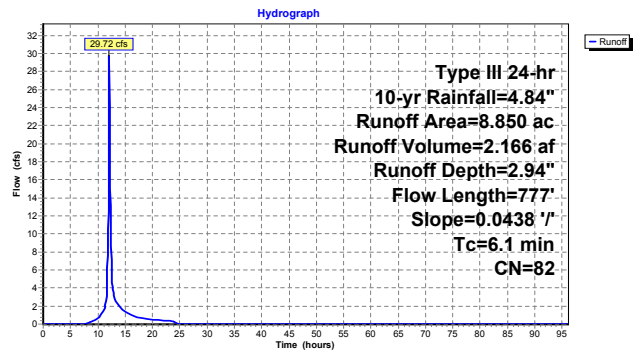
Runoff = 29.72 cfs @ 12.09 hrs, Volume= 2.166 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777	Total			

Subcatchment E2: Playing Fields and Federal Archives



Summary for Subcatchment E3: Federal Archives

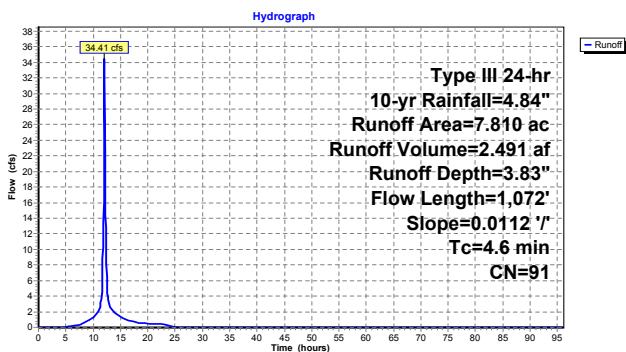
Runoff = 34.41 cfs @ 12.07 hrs, Volume= 2.491 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment E3: Federal Archives



Summary for Subcatchment E4: Former Daycare Center

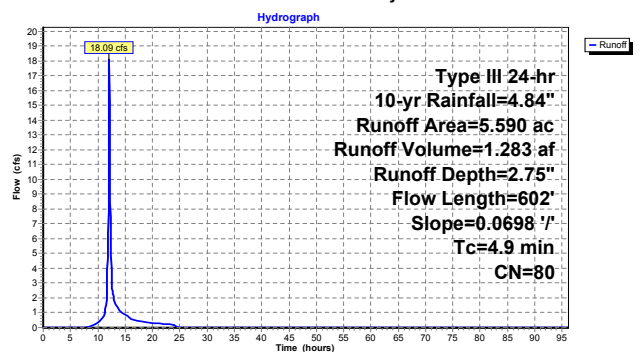
Runoff = 18.09 cfs @ 12.08 hrs, Volume= 1.283 af, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
0.060	98	Paved parking and Roof area, HSG C
0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment E4: Former Daycare Center



Summary for Subcatchment E5: Area West of Cottages/Greene Bldg

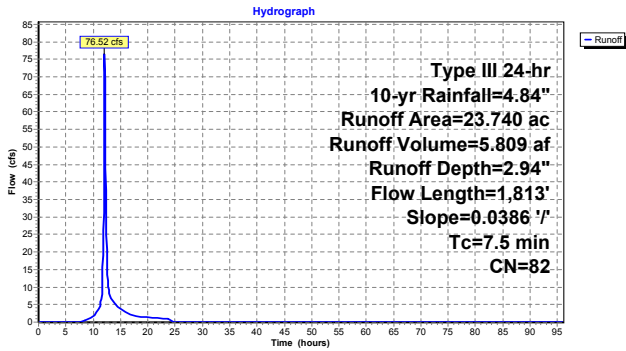
Runoff = 76.52 cfs @ 12.11 hrs, Volume= 5.809 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813				Total

Subcatchment E5: Area West of Cottages/Greene Bldg



Summary for Subcatchment E6: Cottage Complex West

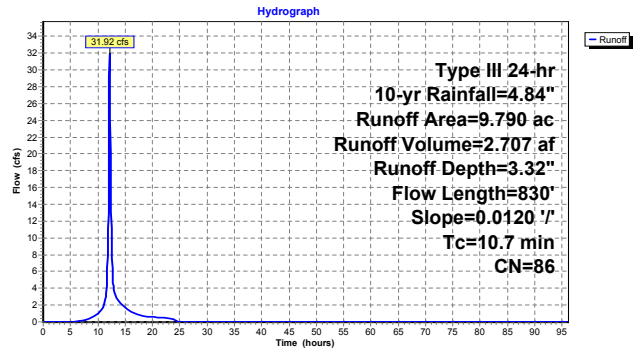
Runoff = 31.92 cfs @ 12.15 hrs, Volume= 2.707 af, Depth= 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
* 3.490	98	Roads and Paved parking, HSG C
9.790	86	Weighted Average
6.300		64.35% Pervious Area
3.490		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0120	0.12		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
10.7	830				Total

Subcatchment E6: Cottage Complex West



Summary for Subcatchment E7: Cottage Complex East

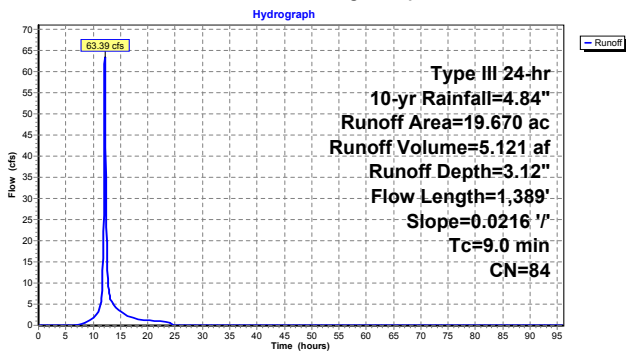
Runoff = 63.39 cfs @ 12.13 hrs, Volume= 5.121 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
14.540	79	50-75% Grass cover, Fair, HSG C
* 5.130	98	Roads, Roof and Paved parking, HSG C
19.670	84	Weighted Average
14.540		73.92% Pervious Area
5.130		26.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0216	0.15		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
9.0	1,389				Total

Subcatchment E7: Cottage Complex East



Summary for Subcatchment E8: Chapel

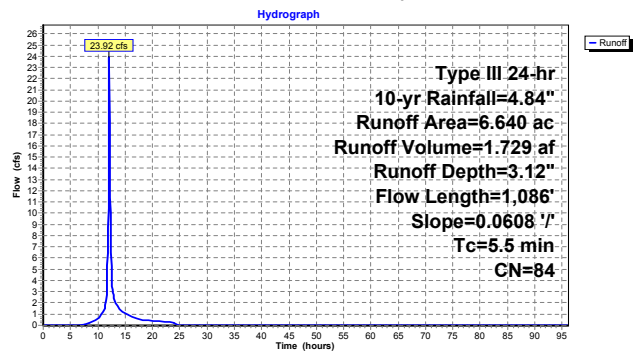
Runoff = 23.92 cfs @ 12.08 hrs, Volume= 1.729 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.790	79	50-75% Grass cover, Fair, HSG C
* 1.850	98	Roads, Roof and Paved parking, HSG C
6.640	84	Weighted Average
4.790		72.14% Pervious Area
1.850		27.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment E8: Chapel



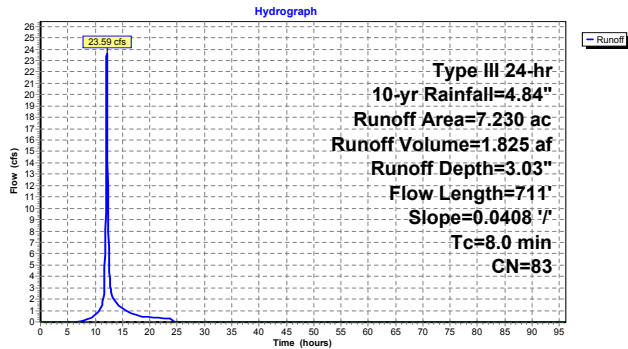
Summary for Subcatchment E9: West Nurses and West Building Area

Runoff = 23.59 cfs @ 12.11 hrs, Volume= 1.825 af, Depth= 3.03"
 Routing by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment E9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 3.22" for 10-yr event
 Inflow = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af
 Outflow = 40.10 cfs @ 12.15 hrs, Volume= 3.202 af, Atten= 6%, Lag= 2.8 min

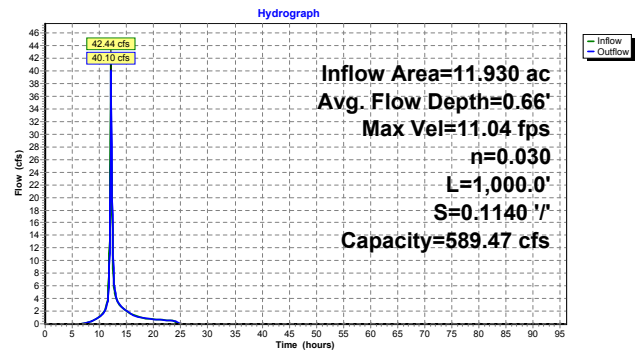
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 11.04 fps, Min. Travel Time= 1.5 min
 Avg. Velocity = 3.03 fps, Avg. Travel Time= 5.5 min

Peak Storage= 3,724 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.66"
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



Summary for Reach 5R: Culvert Pipe - Cottages

Inflow Area = 47.130 ac, 22.45% Impervious, Inflow Depth = 3.11" for 10-yr event
 Inflow = 152.41 cfs @ 12.10 hrs, Volume= 12.221 af
 Outflow = 59.93 cfs @ 12.02 hrs, Volume= 12.221 af, Atten= 61%, Lag= 0.0 min

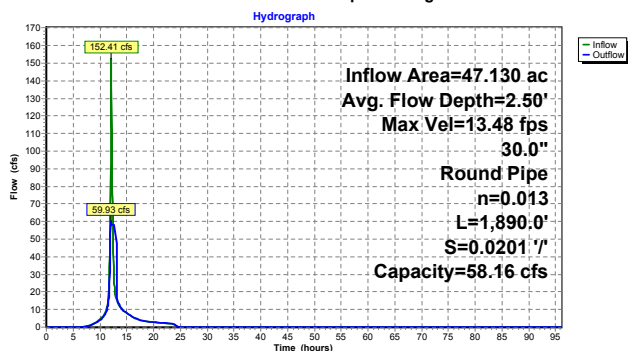
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.48 fps, Min. Travel Time= 2.3 min
 Avg. Velocity = 5.65 fps, Avg. Travel Time= 5.6 min

Peak Storage= 9,278 cf @ 12.00 hrs
 Average Depth at Peak Storage= 2.50"
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 58.16 cfs

30.0" Round Pipe
 n= 0.013 Concrete pipe, bends & connections
 Length= 1,890.0' Slope= 0.0201 '/'
 Inlet Invert= 174.00', Outlet Invert= 136.00'



Reach 5R: Culvert Pipe - Cottages



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.970 ac, 22.91% Impervious, Inflow Depth = 3.09" for 10-yr event
 Inflow = 250.91 cfs @ 12.12 hrs, Volume= 27.587 af
 Outflow = 244.23 cfs @ 12.15 hrs, Volume= 27.587 af, Atten= 3%, Lag= 2.0 min

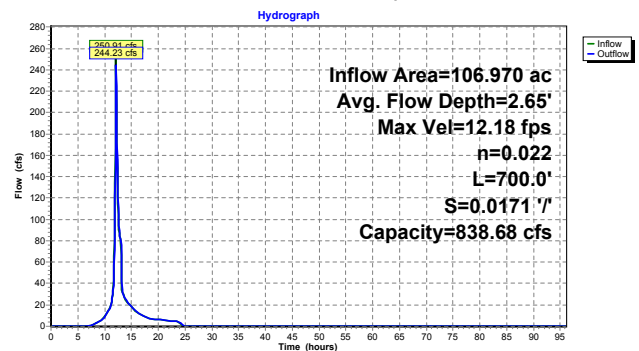
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.18 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 3.74 fps, Avg. Travel Time= 3.1 min

Peak Storage= 14,210 cf @ 12.13 hrs
 Average Depth at Peak Storage= 2.65"
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 838.68 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 15.00'
 Length= 700.0' Slope= 0.0171 '/'
 Inlet Invert= 136.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 24.86% Impervious, Inflow Depth = 3.13" for 10-yr event
 Inflow = 307.59 cfs @ 12.13 hrs, Volume= 32.985 af
 Outflow = 301.03 cfs @ 12.17 hrs, Volume= 32.985 af, Atten= 2%, Lag= 2.1 min

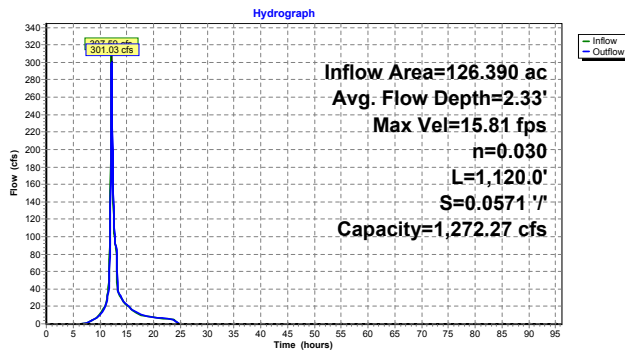
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 15.81 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 4.64 fps, Avg. Travel Time= 4.0 min

Peak Storage= 21,750 cf @ 12.15 hrs
 Average Depth at Peak Storage= 2.33'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00' Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

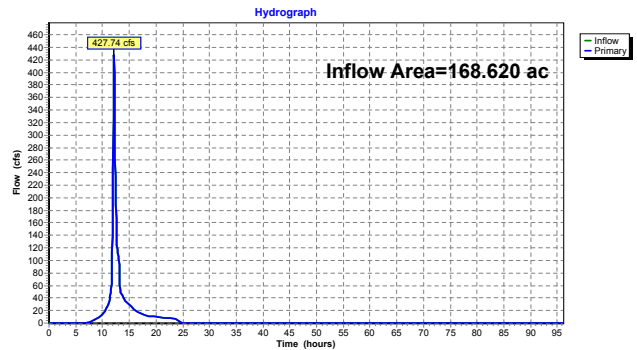


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 25.89% Impervious, Inflow Depth = 3.14" for 10-yr event
 Inflow = 427.74 cfs @ 12.15 hrs, Volume= 44.120 af
 Primary = 427.74 cfs @ 12.15 hrs, Volume= 44.120 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 E1: Turner Field and Dorm Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=4.22"
 Flow Length=2,460' Slope=0.0431 ' / ' Tc=9.5 min CN=83 Runoff=106.33 cfs 8,753 af

Subcatchment E10: Admin Bldg and Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=4.76"
 Flow Length=1,487' Slope=0.0498 ' / ' Tc=6.3 min CN=88 Runoff=63.73 cfs 4,836 af

Subcatchment E11: Admin Bldg and Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=4.43"
 Flow Length=1,243' Slope=0.0354 ' / ' Tc=7.1 min CN=85 Runoff=57.76 cfs 4,409 af

Subcatchment E12: Tarbell House, Farm Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=4.43"
 Flow Length=1,362' Slope=0.0719 ' / ' Tc=5.3 min CN=85 Runoff=44.78 cfs 3,274 af

Subcatchment E13: Maintenance Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=4.43"
 Flow Length=1,656' Slope=0.0797 ' / ' Tc=8.2 min CN=85 Runoff=60.95 cfs 4,826 af

Subcatchment E14: Maintenance Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=4.12"
 Flow Length=1,106' Slope=0.1212 ' / ' Tc=6.0 min CN=82 Runoff=39.19 cfs 2,874 af

Subcatchment E2: Playing Fields and Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=4.12"
 Flow Length=777' Slope=0.0438 ' / ' Tc=6.1 min CN=82 Runoff=41.30 cfs 3,036 af

Subcatchment E3: Federal Archives Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=5.09"
 Flow Length=1,072' Slope=0.0112 ' / ' Tc=4.6 min CN=91 Runoff=45.08 cfs 3,316 af

Subcatchment E4: Former Daycare Center Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=3.91"
 Flow Length=602' Slope=0.0698 ' / ' Tc=4.9 min CN=80 Runoff=25.73 cfs 1,820 af

Subcatchment E5: Area West of Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=4.12"
 Flow Length=1,813' Slope=0.0386 ' / ' Tc=7.5 min CN=82 Runoff=106.45 cfs 8,143 af

Subcatchment E6: Cottage Complex West Runoff Area=9.790 ac 35.65% Impervious Runoff Depth=4.54"
 Flow Length=830' Slope=0.0120 ' / ' Tc=10.7 min CN=86 Runoff=43.18 cfs 3,706 af

Subcatchment E7: Cottage Complex East Runoff Area=19.670 ac 26.08% Impervious Runoff Depth=4.33"
 Flow Length=1,389' Slope=0.0216 ' / ' Tc=9.0 min CN=84 Runoff=86.92 cfs 7,094 af

Subcatchment E8: Chapel Runoff Area=6.640 ac 27.86% Impervious Runoff Depth=4.33"
 Flow Length=1,086' Slope=0.0608 ' / ' Tc=5.5 min CN=84 Runoff=32.76 cfs 2,395 af

Subcatchment E9: West Nurses and West Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=4.22"
 Flow Length=711' Slope=0.0408 ' / ' Tc=8.0 min CN=83 Runoff=32.59 cfs 2,543 af

Reach 1R: Channel - Tributary to Avg. Flow Depth=0.79' Max Vel=12.27 fps Inflow=57.76 cfs 4,409 af
 n=0.030 L=1,000.0' S=0.1140 ' / ' Capacity=589.47 cfs Outflow=54.65 cfs 4,409 af

Reach 5R: Culvert Pipe - Cottages Avg. Flow Depth=2.50' Max Vel=13.42 fps Inflow=209.24 cfs 16,924 af
 30.0" Round Pipe n=0.013 L=1,890.0' S=0.0201 ' / ' Capacity=58.16 cfs Outflow=60.96 cfs 16,924 af

Reach 8R: Channel - South of Avg. Flow Depth=3.04' Max Vel=13.02 fps Inflow=323.48 cfs 38,262 af
 n=0.022 L=700.0' S=0.0171 ' / ' Capacity=838.68 cfs Outflow=314.43 cfs 38,262 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=2.70' Max Vel=17.02 fps Inflow=400.66 cfs 45,641 af
 n=0.030 L=1,120.0' S=0.0571 ' / ' Capacity=1,272.27 cfs Outflow=392.35 cfs 45,641 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=566.98 cfs 61,025 af
 Primary=566.98 cfs 61,025 af

Total Runoff Area = 168.620 ac Runoff Volume = 61.025 af Average Runoff Depth = 4.34"
74.11% Pervious = 124.970 ac 25.89% Impervious = 43.650 ac

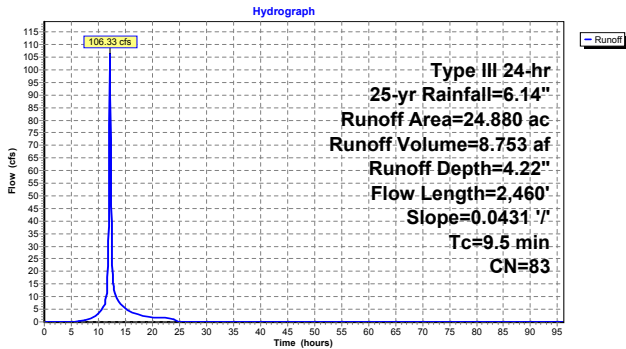
Summary for Subcatchment E1: Turner Field and Dorm

Runoff = 106.33 cfs @ 12.13 hrs, Volume= 8.753 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment E1: Turner Field and Dorm



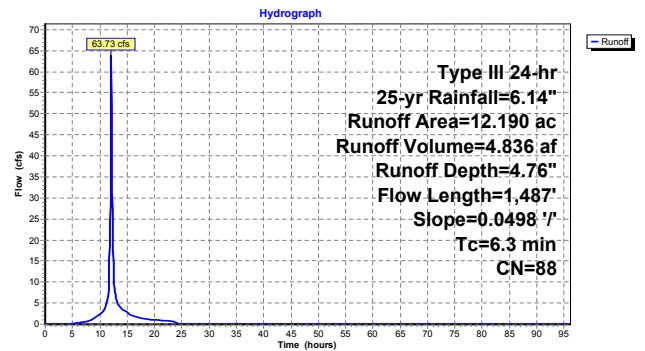
Summary for Subcatchment E10: Admin Bldg and Pearlman Bldg

Runoff = 63.73 cfs @ 12.09 hrs, Volume= 4.836 af, Depth= 4.76"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment E10: Admin Bldg and Pearlman Bldg



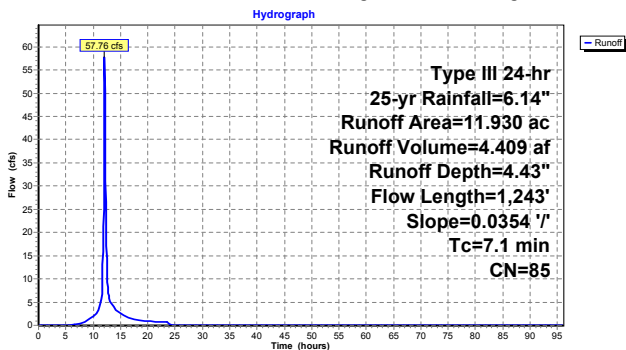
Summary for Subcatchment E11: Admin Bldg and Pearlman Bldg

Runoff = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af, Depth= 4.43"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment E11: Admin Bldg and Pearlman Bldg



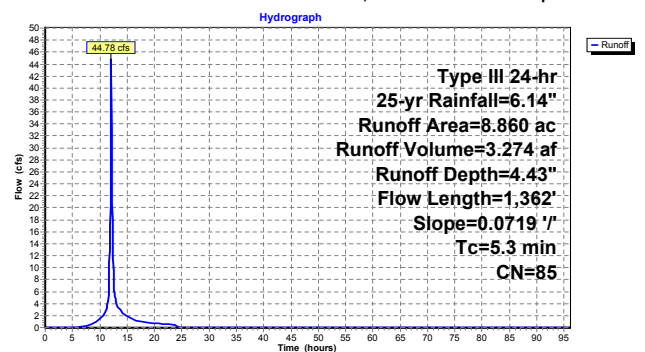
Summary for Subcatchment E12: Tarbell House, Farm and Grounds Dept

Runoff = 44.78 cfs @ 12.08 hrs, Volume= 3.274 af, Depth= 4.43"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment E12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment E13: Maintenance Workshops Area

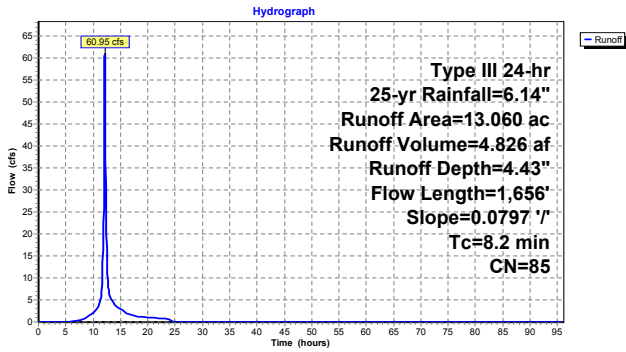
Runoff = 60.95 cfs @ 12.11 hrs, Volume= 4.826 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment E13: Maintenance Workshops Area



Summary for Subcatchment E14: Maintenance Workshops Area

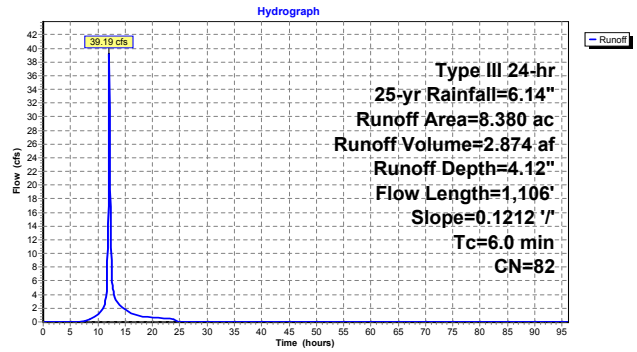
Runoff = 39.19 cfs @ 12.09 hrs, Volume= 2.874 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment E14: Maintenance Workshops Area



Summary for Subcatchment E2: Playing Fields and Federal Archives

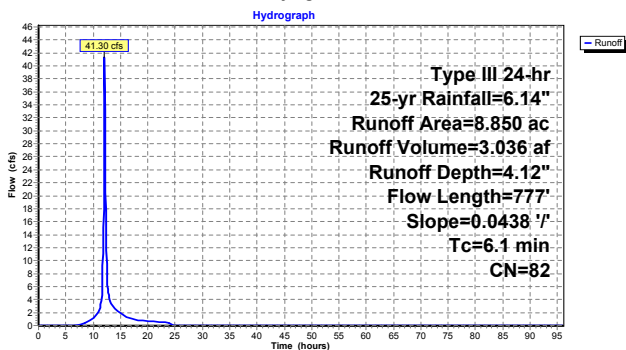
Runoff = 41.30 cfs @ 12.09 hrs, Volume= 3.036 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment E2: Playing Fields and Federal Archives



Summary for Subcatchment E3: Federal Archives

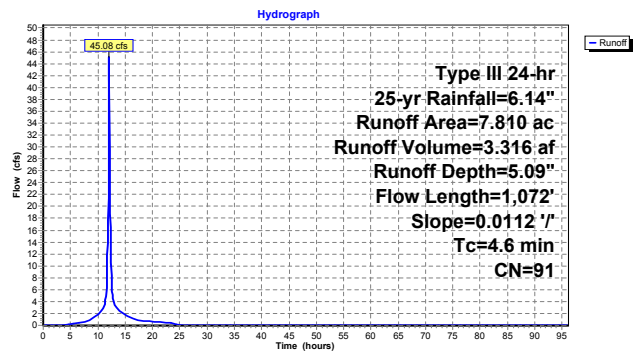
Runoff = 45.08 cfs @ 12.07 hrs, Volume= 3.316 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment E3: Federal Archives



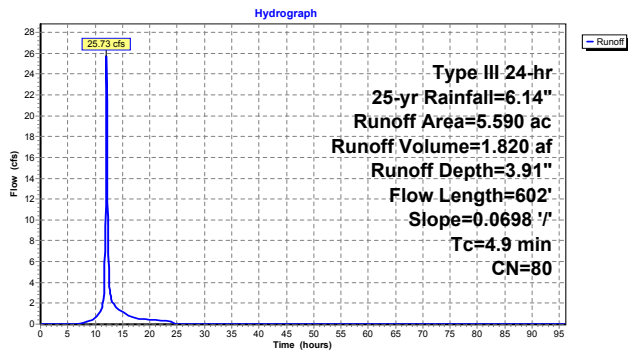
Summary for Subcatchment E4: Former Daycare Center

Runoff = 25.73 cfs @ 12.07 hrs, Volume= 1.820 af, Depth= 3.91"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	300	0.0698	3.96		Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602				Total

Subcatchment E4: Former Daycare Center



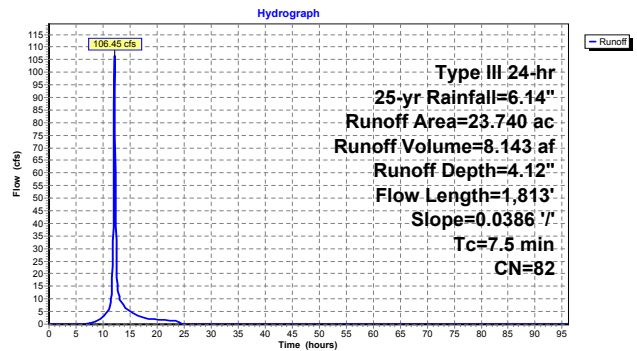
Summary for Subcatchment E5: Area West of Cottages/Greene Bldg

Runoff = 106.45 cfs @ 12.11 hrs, Volume= 8.143 af, Depth= 4.12"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.7	300	0.0386	2.95		Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
1.5	1,463	0.0386	16.28	439.63	
7.5	1,813				Total

Subcatchment E5: Area West of Cottages/Greene Bldg



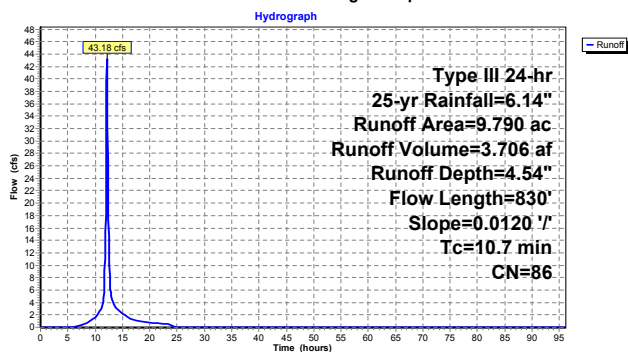
Summary for Subcatchment E6: Cottage Complex West

Runoff = 43.18 cfs @ 12.15 hrs, Volume= 3.706 af, Depth= 4.54"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
* 3.490	98	Roads and Paved parking, HSG C
9.790	86	Weighted Average
6.300		64.35% Pervious Area
3.490		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0120	0.12		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
3.0	300	0.0120	1.64		Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
0.8	480	0.0120	10.32	278.55	
10.7	830				Total

Subcatchment E6: Cottage Complex West



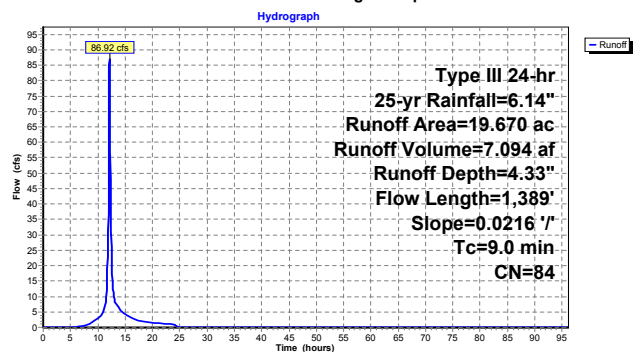
Summary for Subcatchment E7: Cottage Complex East

Runoff = 86.92 cfs @ 12.13 hrs, Volume= 7.094 af, Depth= 4.33"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
14.540	79	50-75% Grass cover, Fair, HSG C
* 5.130	98	Roads, Roof and Paved parking, HSG C
19.670	84	Weighted Average
14.540		73.92% Pervious Area
5.130		26.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0216	0.15		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
2.3	300	0.0216	2.20		Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
1.3	1,039	0.0216	13.84	373.71	
9.0	1,389				Total

Subcatchment E7: Cottage Complex East



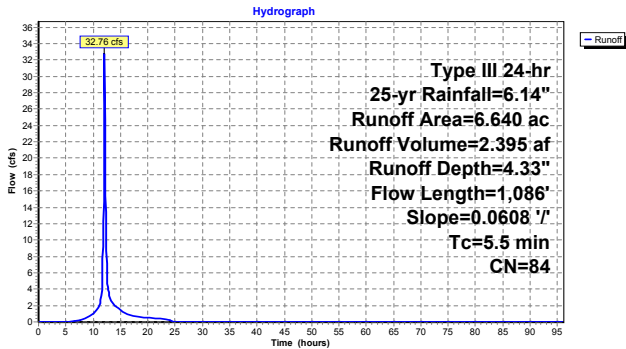
Summary for Subcatchment E8: Chapel

Runoff = 32.76 cfs @ 12.08 hrs, Volume= 2.395 af, Depth= 4.33"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.790	79	50-75% Grass cover, Fair, HSG C
1.850	98	Roads, Roof and Paved parking, HSG C
6.640	84	Weighted Average
4.790		72.14% Pervious Area
1.850		27.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086	Total			

Subcatchment E8: Chapel



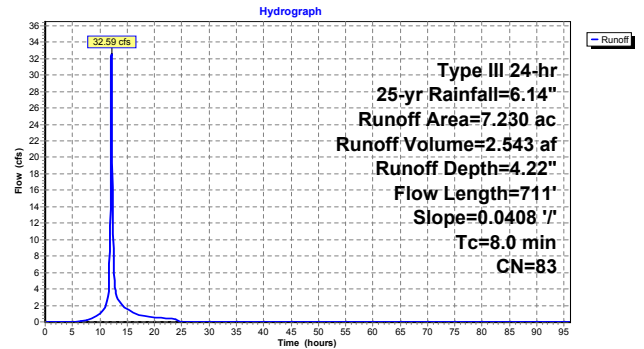
Summary for Subcatchment E9: West Nurses and West Building Area

Runoff = 32.59 cfs @ 12.11 hrs, Volume= 2.543 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment E9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 4.43" for 25-yr event
 Inflow = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af
 Outflow = 54.65 cfs @ 12.14 hrs, Volume= 4.409 af, Atten= 5%, Lag= 2.5 min

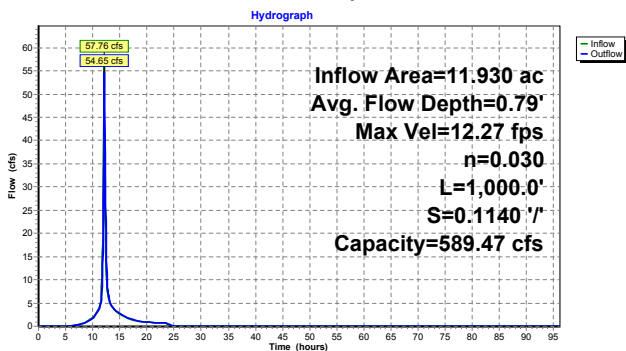
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.27 fps, Min. Travel Time= 1.4 min
 Avg. Velocity= 3.20 fps, Avg. Travel Time= 5.1 min

Peak Storage= 4,589 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.79'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



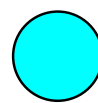
Summary for Reach 5R: Culvert Pipe - Cottages

Inflow Area = 47.130 ac, 22.45% Impervious, Inflow Depth = 4.31" for 25-yr event
 Inflow = 209.24 cfs @ 12.10 hrs, Volume= 18.924 af
 Outflow = 60.96 cfs @ 11.91 hrs, Volume= 18.924 af, Atten= 71%, Lag= 0.0 min

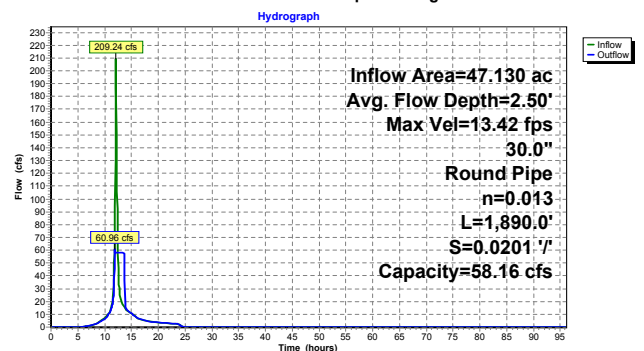
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.42 fps, Min. Travel Time= 2.3 min
 Avg. Velocity= 6.13 fps, Avg. Travel Time= 5.1 min

Peak Storage= 9,278 cf @ 11.90 hrs
 Average Depth at Peak Storage= 2.50'
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 58.16 cfs

30.0" Round Pipe
 n= 0.013 Concrete pipe, bends & connections
 Length= 1,890.0' Slope= 0.0201 '/
 Inlet Invert= 174.00', Outlet Invert= 136.00'



Reach 5R: Culvert Pipe - Cottages



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.970 ac, 22.91% Impervious, Inflow Depth = 4.29" for 25-yr event
 Inflow = 323.48 cfs @ 12.11 hrs, Volume= 38.262 af
 Outflow = 314.43 cfs @ 12.14 hrs, Volume= 38.262 af, Atten= 3%, Lag= 1.8 min

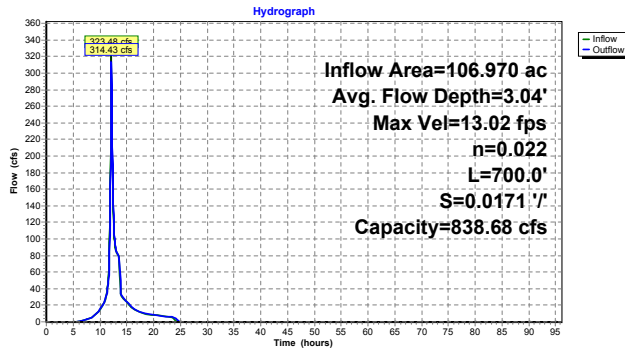
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.02 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 4.15 fps, Avg. Travel Time= 2.8 min

Peak Storage= 17,105 cf @ 12.13 hrs
 Average Depth at Peak Storage= 3.04'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 838.68 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0171 ' / '
 Inlet Invert= 136.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 24.86% Impervious, Inflow Depth = 4.33" for 25-yr event
 Inflow = 400.66 cfs @ 12.13 hrs, Volume= 45.641 af
 Outflow = 392.35 cfs @ 12.16 hrs, Volume= 45.641 af, Atten= 2%, Lag= 2.0 min

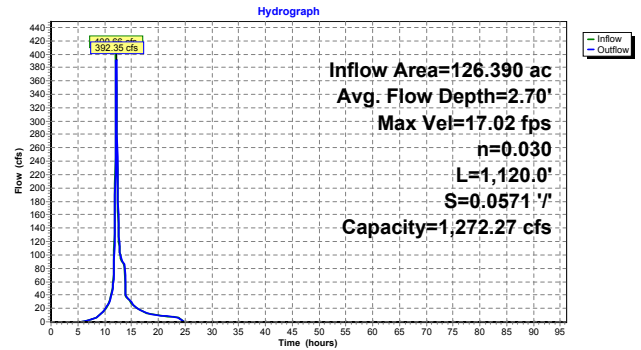
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 17.02 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 5.13 fps, Avg. Travel Time= 3.6 min

Peak Storage= 26,331 cf @ 12.15 hrs
 Average Depth at Peak Storage= 2.70'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

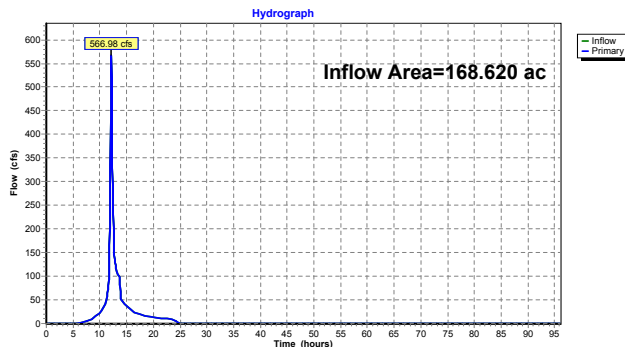


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 25.89% Impervious, Inflow Depth = 4.34" for 25-yr event
 Inflow = 566.98 cfs @ 12.14 hrs, Volume= 61.025 af
 Primary = 566.98 cfs @ 12.14 hrs, Volume= 61.025 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Time span= 0.00-96.00 hrs, dt= 0.05 hrs, 1921 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 E1: Turner Field and Dorm** Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=6.74"
 Flow Length=2,460' Slope=0.0431 ' / ' Tc=9.5 min CN=83 Runoff=166.54 cfs 13.983 af
- Subcatchment E10: Admin Bldg and** Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=7.35"
 Flow Length=1,487' Slope=0.0498 ' / ' Tc=6.3 min CN=88 Runoff=96.05 cfs 7.468 af
- Subcatchment E11: Admin Bldg and** Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=6.99"
 Flow Length=1,243' Slope=0.0354 ' / ' Tc=7.1 min CN=85 Runoff=89.01 cfs 6.947 af
- Subcatchment E12: Tarbell House, Farm** Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=6.99"
 Flow Length=1,362' Slope=0.0719 ' / ' Tc=5.3 min CN=85 Runoff=68.95 cfs 5.159 af
- Subcatchment E13: Maintenance** Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=6.99"
 Flow Length=1,656' Slope=0.0797 ' / ' Tc=8.2 min CN=85 Runoff=93.98 cfs 7.605 af
- Subcatchment E14: Maintenance** Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=6.62"
 Flow Length=1,106' Slope=0.1212 ' / ' Tc=6.0 min CN=82 Runoff=61.81 cfs 4.625 af
- Subcatchment E2: Playing Fields and** Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=6.62"
 Flow Length=777' Slope=0.0438 ' / ' Tc=6.1 min CN=82 Runoff=65.14 cfs 4.884 af
- Subcatchment E3: Federal Archives** Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=7.72"
 Flow Length=1,072' Slope=0.0112 ' / ' Tc=4.6 min CN=91 Runoff=66.68 cfs 5.021 af
- Subcatchment E4: Former Daycare Center** Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=6.38"
 Flow Length=602' Slope=0.0698 ' / ' Tc=4.9 min CN=80 Runoff=41.34 cfs 2.971 af
- Subcatchment E5: Area West of** Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=6.62"
 Flow Length=1,813' Slope=0.0386 ' / ' Tc=7.5 min CN=82 Runoff=168.09 cfs 13.101 af
- Subcatchment E6: Cottage Complex West** Runoff Area=9.790 ac 35.65% Impervious Runoff Depth=7.11"
 Flow Length=830' Slope=0.0120 ' / ' Tc=10.7 min CN=86 Runoff=66.08 cfs 5.800 af
- Subcatchment E7: Cottage Complex East** Runoff Area=19.670 ac 26.08% Impervious Runoff Depth=6.87"
 Flow Length=1,389' Slope=0.0216 ' / ' Tc=9.0 min CN=84 Runoff=135.92 cfs 11.254 af
- Subcatchment E8: Chapel** Runoff Area=6.640 ac 27.86% Impervious Runoff Depth=6.87"
 Flow Length=1,086' Slope=0.0608 ' / ' Tc=5.5 min CN=84 Runoff=50.83 cfs 3.799 af
- Subcatchment E9: West Nurses and West** Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=6.74"
 Flow Length=711' Slope=0.0408 ' / ' Tc=8.0 min CN=83 Runoff=51.05 cfs 4.063 af
- Reach 1R: Channel - Tributary to** Avg. Flow Depth=1.03' Max Vel=14.14 fps Inflow=89.01 cfs 6.947 af
 n=0.030 L=1,000.0' S=0.1140 ' / ' Capacity=589.47 cfs Outflow=84.36 cfs 6.947 af
- Reach 5R: Culvert Pipe - Cottages** Avg. Flow Depth=2.50' Max Vel=13.51 fps Inflow=325.85 cfs 26.859 af
 30.0" Round Pipe n=0.013 L=1,890.0' S=0.0201 ' / ' Capacity=58.16 cfs Outflow=58.16 cfs 26.859 af

Reach 8R: Channel - South of Avg. Flow Depth=3.72' Max Vel=14.37 fps Inflow=472.24 cfs 60.813 af
 n=0.022 L=700.0' S=0.0171' Capacity=838.68 cfs Outflow=458.41 cfs 60.813 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=3.34' Max Vel=18.92 fps Inflow=591.72 cfs 72.345 af
 n=0.030 L=1,120.0' S=0.0571' Capacity=1,272.27 cfs Outflow=580.23 cfs 72.345 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=853.87 cfs 96.679 af
 Primary=853.87 cfs 96.679 af

Total Runoff Area = 168.620 ac Runoff Volume = 96.679 af Average Runoff Depth = 6.88"
 74.11% Pervious = 124.970 ac 25.89% Impervious = 43.650 ac

Summary for Subcatchment E1: Turner Field and Dorm

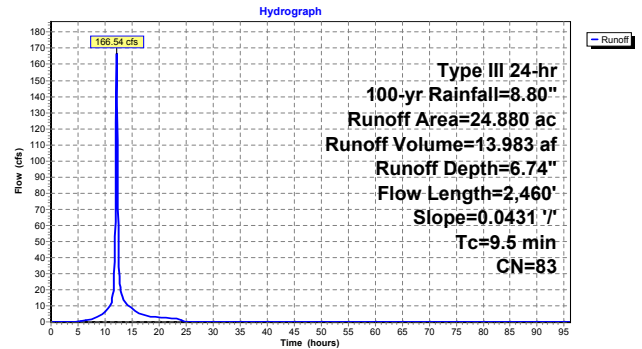
Runoff = 166.54 cfs @ 12.13 hrs, Volume= 13.983 af, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment E1: Turner Field and Dorm



Summary for Subcatchment E10: Admin Bldg and Pearlman Bldg

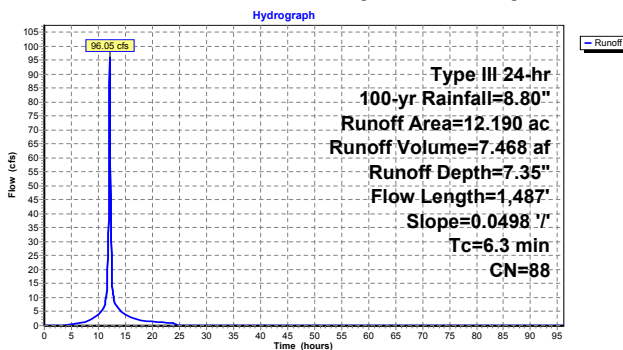
Runoff = 96.05 cfs @ 12.09 hrs, Volume= 7.468 af, Depth= 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment E10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment E11: Admin Bldg and Pearlman Bldg

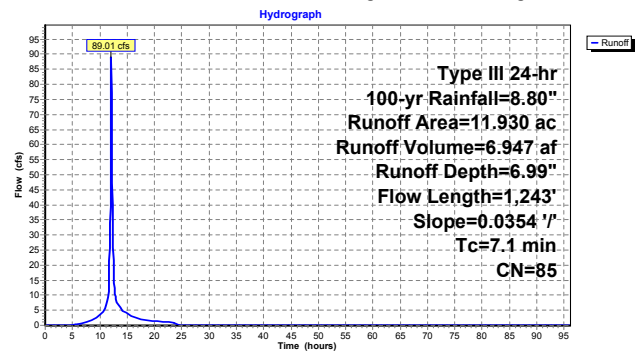
Runoff = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment E11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment E12: Tarbell House, Farm and Grounds Dept

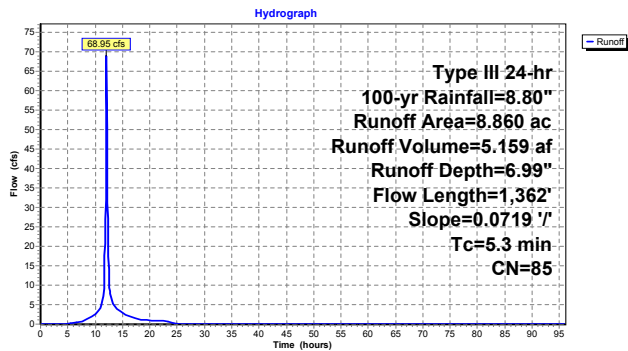
Runoff = 68.95 cfs @ 12.08 hrs, Volume= 5.159 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment E12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment E13: Maintenance Workshops Area

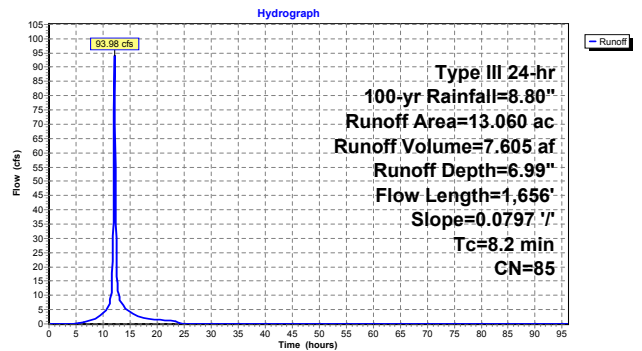
Runoff = 93.98 cfs @ 12.11 hrs, Volume= 7.605 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment E13: Maintenance Workshops Area



Summary for Subcatchment E14: Maintenance Workshops Area

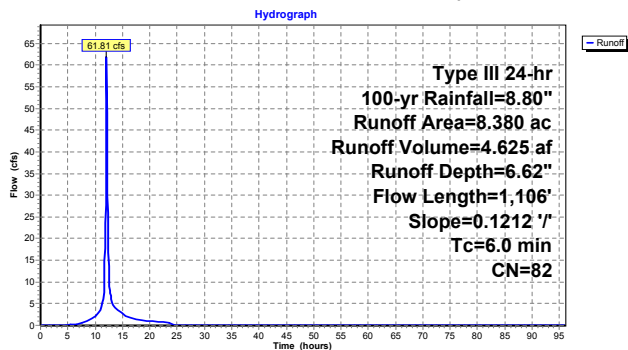
Runoff = 61.81 cfs @ 12.09 hrs, Volume= 4.625 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment E14: Maintenance Workshops Area



Summary for Subcatchment E2: Playing Fields and Federal Archives

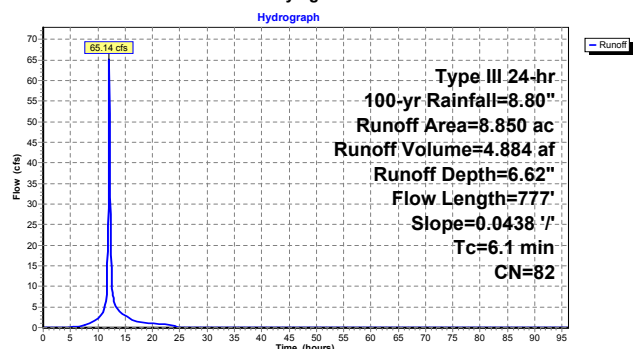
Runoff = 65.14 cfs @ 12.09 hrs, Volume= 4.884 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777	Total			

Subcatchment E2: Playing Fields and Federal Archives



Summary for Subcatchment E3: Federal Archives

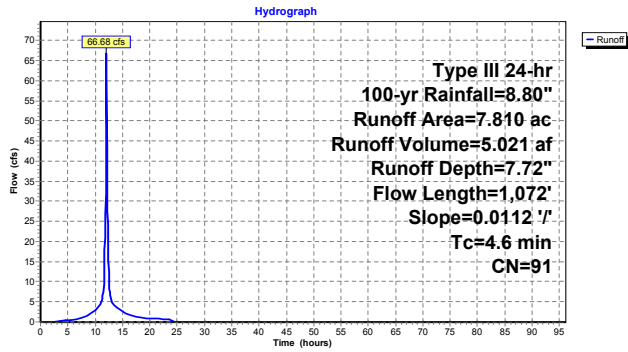
Runoff = 66.68 cfs @ 12.07 hrs, Volume= 5.021 af, Depth= 7.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved K _v = 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment E3: Federal Archives



Summary for Subcatchment E4: Former Daycare Center

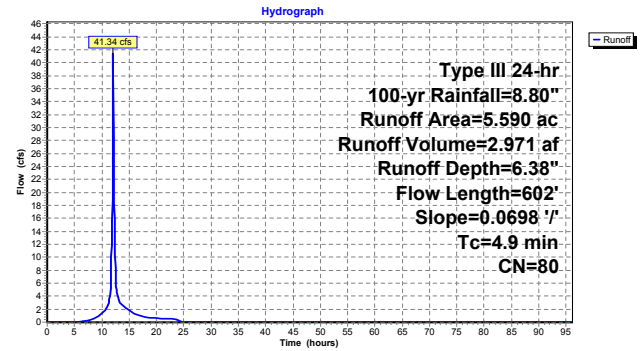
Runoff = 41.34 cfs @ 12.07 hrs, Volume= 2.971 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
0.060	98	Paved parking and Roof area, HSG C
0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway K _v = 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment E4: Former Daycare Center



Summary for Subcatchment E5: Area West of Cottages/Greene Bldg

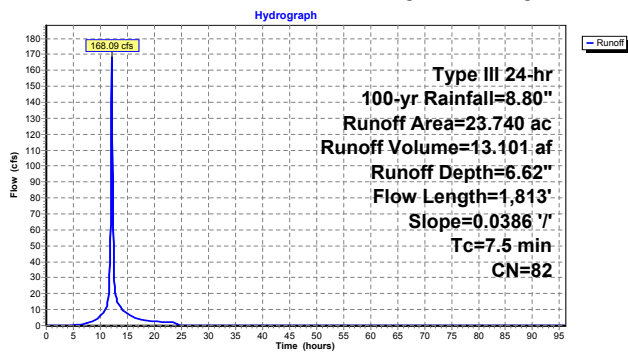
Runoff = 168.09 cfs @ 12.11 hrs, Volume= 13.101 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
3.460	98	Paved parking and Roof area, HSG C
0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway K _v = 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment E5: Area West of Cottages/Greene Bldg



Summary for Subcatchment E6: Cottage Complex West

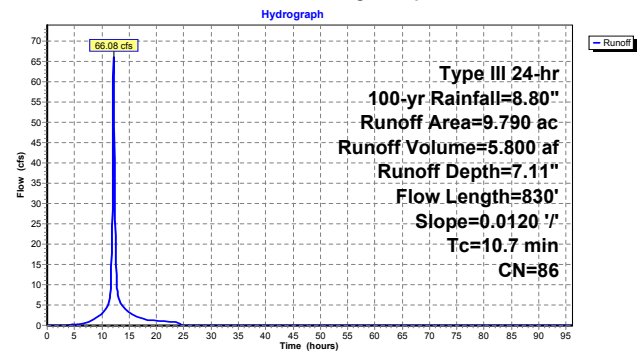
Runoff = 66.08 cfs @ 12.15 hrs, Volume= 5.800 af, Depth= 7.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
3.490	98	Roads and Paved parking, HSG C
9.790	86	Weighted Average
6.300		64.35% Pervious Area
3.490		35.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0120	0.12		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway K _v = 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
10.7	830	Total			

Subcatchment E6: Cottage Complex West



Summary for Subcatchment E7: Cottage Complex East

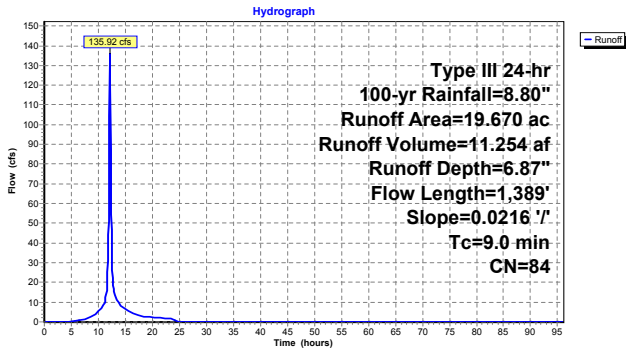
Runoff = 135.92 cfs @ 12.12 hrs, Volume= 11.254 af, Depth= 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
14.540	79	50-75% Grass cover, Fair, HSG C
5.130	98	Roads, Roof and Paved parking, HSG C
19.670	84	Weighted Average
14.540		73.92% Pervious Area
5.130		26.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0216	0.15		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
9.0	1,389	Total			

Subcatchment E7: Cottage Complex East



Summary for Subcatchment E8: Chapel

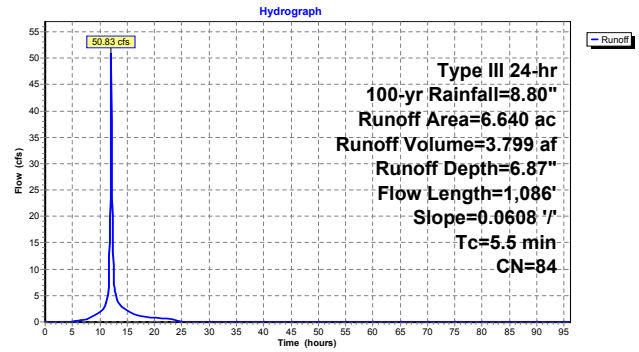
Runoff = 50.83 cfs @ 12.08 hrs, Volume= 3.799 af, Depth= 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.790	79	50-75% Grass cover, Fair, HSG C
1.850	98	Roads, Roof and Paved parking, HSG C
6.640	84	Weighted Average
4.790		72.14% Pervious Area
1.850		27.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086	Total			

Subcatchment E8: Chapel



Summary for Subcatchment E9: West Nurses and West Building Area

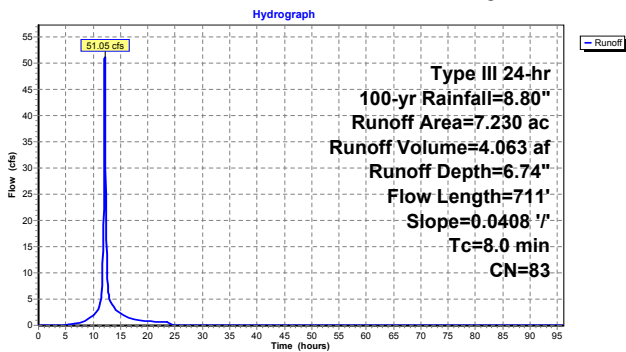
Runoff = 51.05 cfs @ 12.11 hrs, Volume= 4.063 af, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment E9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 6.99" for 100-yr event
 Inflow = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af
 Outflow = 84.36 cfs @ 12.14 hrs, Volume= 6.947 af, Atten= 5%, Lag= 2.2 min

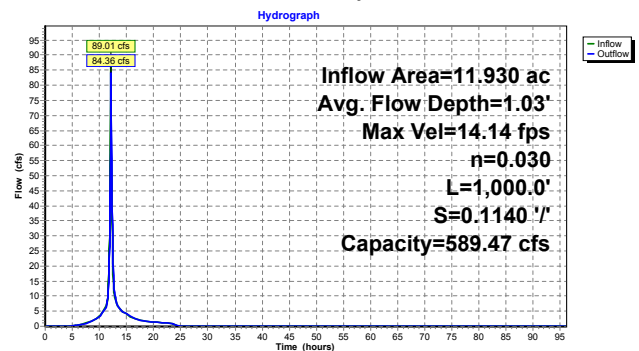
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity = 14.14 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 3.78 fps, Avg. Travel Time= 4.4 min

Peak Storage= 6,176 cf @ 12.12 hrs
 Average Depth at Peak Storage= 1.03'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



Summary for Reach 5R: Culvert Pipe - Cottages

Inflow Area = 47.130 ac, 22.45% Impervious, Inflow Depth = 6.84" for 100-yr event
 Inflow = 325.85 cfs @ 12.10 hrs, Volume= 26.859 af
 Outflow = 58.16 cfs @ 11.80 hrs, Volume= 26.859 af, Atten= 82%, Lag= 0.0 min

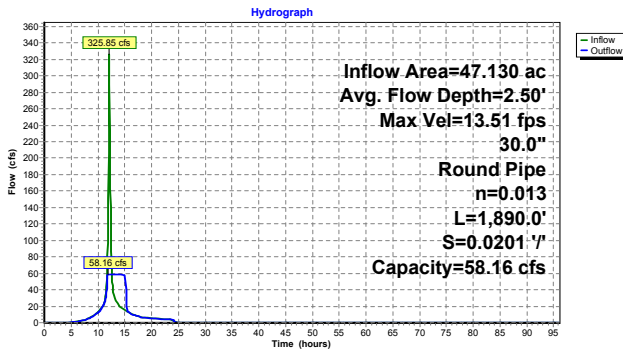
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.51 fps, Min. Travel Time= 2.3 min
 Avg. Velocity = 6.93 fps, Avg. Travel Time= 4.5 min

Peak Storage= 9,278 cf @ 11.75 hrs
 Average Depth at Peak Storage= 2.50'
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 58.16 cfs

30.0" Round Pipe
 n= 0.013 Concrete pipe, bends & connections
 Length= 1,890.0' Slope= 0.0201 1/1'
 Inlet Invert= 174.00', Outlet Invert= 136.00'



Reach 5R: Culvert Pipe - Cottages



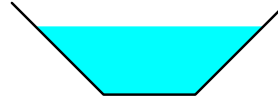
Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.970 ac, 22.91% Impervious, Inflow Depth = 6.82" for 100-yr event
 Inflow = 472.24 cfs @ 12.11 hrs, Volume= 60.813 af
 Outflow = 458.41 cfs @ 12.14 hrs, Volume= 60.813 af, Atten= 3%, Lag= 1.7 min

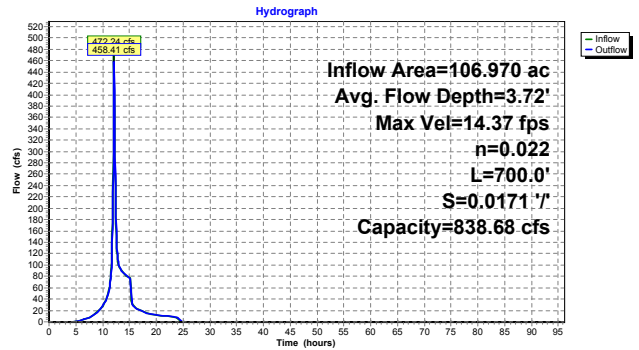
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 14.37 fps, Min. Travel Time= 0.8 min
 Avg. Velocity = 4.83 fps, Avg. Travel Time= 2.4 min

Peak Storage= 22,700 cf @ 12.12 hrs
 Average Depth at Peak Storage= 3.72'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 838.68 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 1/1 Top Width= 15.00'
 Length= 700.0' Slope= 0.0171 1/1'
 Inlet Invert= 136.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 24.86% Impervious, Inflow Depth = 6.87" for 100-yr event
 Inflow = 591.72 cfs @ 12.13 hrs, Volume= 72.345 af
 Outflow = 580.23 cfs @ 12.16 hrs, Volume= 72.345 af, Atten= 2%, Lag= 1.9 min

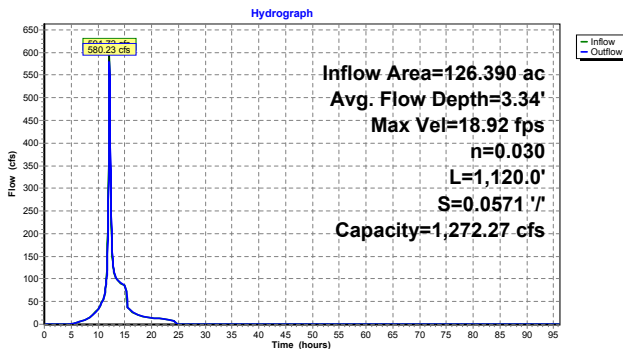
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 18.92 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 6.00 fps, Avg. Travel Time= 3.1 min

Peak Storage= 34,989 cf @ 12.14 hrs
 Average Depth at Peak Storage= 3.34'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 1/1 Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 1/1'
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

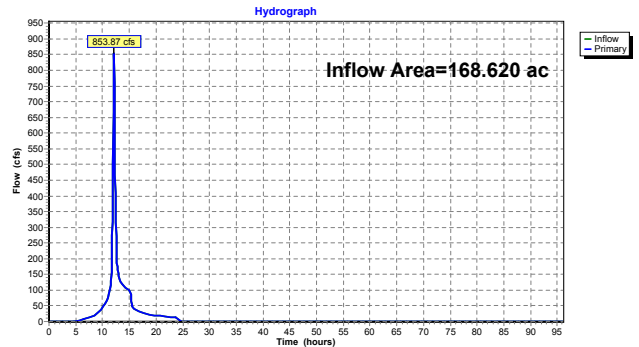


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 25.89% Impervious, Inflow Depth = 6.88" for 100-yr event
 Inflow = 853.87 cfs @ 12.14 hrs, Volume= 96.679 af
 Primary = 853.87 cfs @ 12.14 hrs, Volume= 96.679 af, Atten= 0%, Lag= 0.0 min

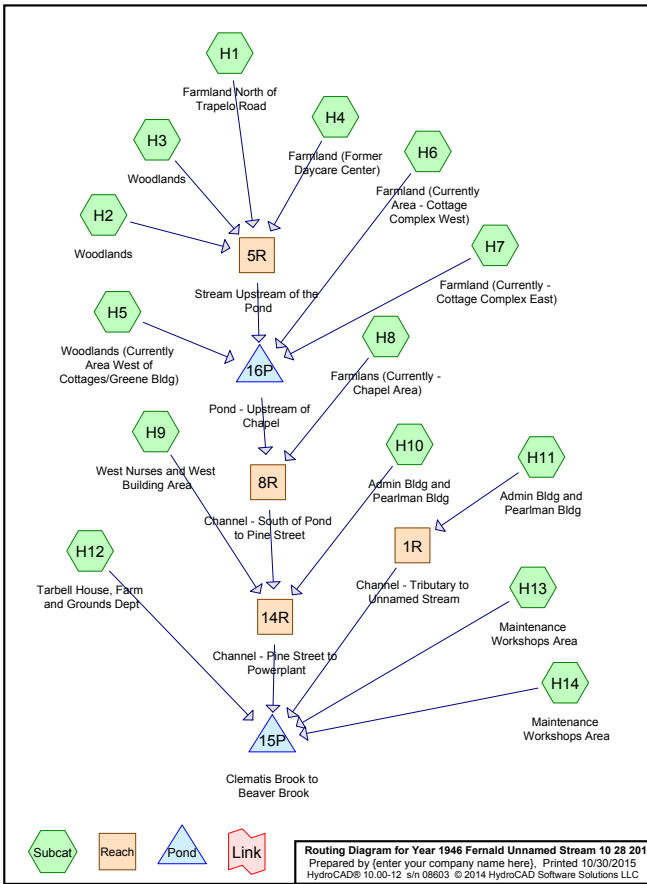
Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
45.140	79	50-75% Grass cover, Fair, HSG C (H10, H11, H12, H13, H14, H9)
5.850	98	Paved parking, HSG C (H13, H9)
1.460	98	Paved parking, roofs, HSG C (H14)
9.200	98	Roads, Roof and Paved parking, HSG C (H10, H11, H12)
64.460	88	Row crops, straight row, Poor, HSG C (H1, H4, H6, H7, H8)
2.120	98	Water Surface, 0% imp, HSG C (H6, H7)
0.590	98	Water Surface/Wetlands, 0% imp, HSG C (H5)
39.800	76	Woods/grass comb., Fair, HSG C (H2, H3, H5)
168.620	84	TOTAL AREA



Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
168.620	HSG C	H1, H10, H11, H12, H13, H14, H2, H3, H4, H5, H6, H7, H8, H9
0.000	HSG D	
0.000	Other	
168.620	TOTAL AREA	

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	45.140	0.000	0.000	45.140	50-75% Grass cover, Fair	H 10 , H 11 , H 12 , H 13 , H 14 , H 9
0.000	0.000	5.850	0.000	0.000	5.850	Paved parking	H 13 , H 9
0.000	0.000	1.460	0.000	0.000	1.460	Paved parking, roofs	H 14
0.000	0.000	9.200	0.000	0.000	9.200	Roads, Roof and Paved parking	H 10 , H 11 , H 12
0.000	0.000	64.460	0.000	0.000	64.460	Row crops, straight row, Poor	H 1, H 4, H 6, H 7, H 8

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.120	0.000	0.000	2.120	Water Surface, 0% imp	H 6, H 7
0.000	0.000	0.590	0.000	0.000	0.590	Water Surface/Wetlands, 0% imp	H 5
0.000	0.000	39.800	0.000	0.000	39.800	Woods/grass comb., Fair	H 2, H 3, H 5
0.000	0.000	168.620	0.000	0.000	168.620	TOTAL AREA	

Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 H1: Farmland North of	Runoff Area=24.890 ac	0.00% Impervious	Runoff Depth=2.00"
Flow Length=2,460'	Slope=0.0431 '/'	Tc=9.3 min	CN=88
Runoff=51.01 cfs	4.142 af		
Subcatchment H10: Admin Bldg and	Runoff Area=12.190 ac	21.58% Impervious	Runoff Depth=1.61"
Flow Length=1,487'	Slope=0.0498 '/'	Tc=6.3 min	CN=83
Runoff=22.36 cfs	1.635 af		
Subcatchment H11: Admin Bldg and	Runoff Area=11.930 ac	33.61% Impervious	Runoff Depth=1.76"
Flow Length=1,243'	Slope=0.0354 '/'	Tc=7.1 min	CN=85
Runoff=23.37 cfs	1.747 af		
Subcatchment H12: Tarbell House, Farm	Runoff Area=8.860 ac	28.89% Impervious	Runoff Depth=1.68"
Flow Length=1,362'	Slope=0.0719 '/'	Tc=5.3 min	CN=84
Runoff=17.39 cfs	1.242 af		
Subcatchment H13: Maintenance	Runoff Area=13.060 ac	32.16% Impervious	Runoff Depth=1.76"
Flow Length=1,656'	Slope=0.0797 '/'	Tc=8.2 min	CN=85
Runoff=24.62 cfs	1.913 af		
Subcatchment H14: Maintenance	Runoff Area=8.380 ac	17.42% Impervious	Runoff Depth=1.54"
Flow Length=1,106'	Slope=0.1212 '/'	Tc=6.0 min	CN=82
Runoff=14.77 cfs	1.074 af		
Subcatchment H2: Woodlands	Runoff Area=8.850 ac	0.00% Impervious	Runoff Depth=1.15"
Flow Length=777'	Slope=0.0438 '/'	Tc=14.2 min	CN=76
Runoff=8.83 cfs	0.850 af		
Subcatchment H3: Woodlands	Runoff Area=7.810 ac	0.00% Impervious	Runoff Depth=1.15"
Flow Length=1,072'	Slope=0.0112 '/'	Tc=26.3 min	CN=76
Runoff=6.07 cfs	0.750 af		
Subcatchment H4: Farmland (Former)	Runoff Area=5.590 ac	0.00% Impervious	Runoff Depth=2.00"
Flow Length=602'	Slope=0.0698 '/'	Tc=6.1 min	CN=88
Runoff=12.74 cfs	0.930 af		
Subcatchment H5: Woodlands (Currently)	Runoff Area=23.730 ac	0.00% Impervious	Runoff Depth=1.21"
Flow Length=1,813'	Slope=0.0386 '/'	Tc=16.0 min	CN=77
Runoff=23.90 cfs	2.396 af		
Subcatchment H6: Farmland (Currently Area)	Runoff Area=9.790 ac	0.00% Impervious	Runoff Depth=2.08"
Flow Length=830'	Slope=0.0120 '/'	Tc=17.5 min	CN=89
Runoff=16.87 cfs	1.698 af		
Subcatchment H7: Farmland (Currently -	Runoff Area=19.670 ac	0.00% Impervious	Runoff Depth=2.08"
Flow Length=1,389'	Slope=0.0216 '/'	Tc=20.0 min	CN=89
Runoff=32.18 cfs	3.412 af		
Subcatchment H8: Farmlands (Currently -	Runoff Area=6.640 ac	0.00% Impervious	Runoff Depth=2.00"
Flow Length=1,086'	Slope=0.0608 '/'	Tc=12.5 min	CN=88
Runoff=12.48 cfs	1.105 af		
Subcatchment H9: West Nurses and West	Runoff Area=7.230 ac	22.82% Impervious	Runoff Depth=1.61"
Flow Length=711'	Slope=0.0408 '/'	Tc=8.0 min	CN=83
Runoff=12.54 cfs	0.970 af		
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.46'	Max Vel=8.96 fps	Inflow=23.37 cfs
n=0.030	L=1,000.0'	S=0.1140 '/'	Capacity=589.47 cfs
Outflow=22.00 cfs	1.747 af		
Reach 5R: Stream Upstream of the	Avg. Flow Depth=1.25'	Max Vel=10.67 fps	Inflow=72.61 cfs
n=0.013	L=1,890.0'	S=0.0106 '/'	Capacity=969.59 cfs
Outflow=69.93 cfs	6.672 af		

Reach 8R: Channel - South of Pond	Avg. Flow Depth=1.38'	Max Vel=13.86 fps	Inflow=121.85 cfs	15.283 af
n=0.022	L=700.0'	S=0.0429 '/'	Capacity=1,326.06 cfs	Outflow=121.06 cfs
15.283 af				
Reach 14R: Channel - Pine Street to	Avg. Flow Depth=1.46'	Max Vel=12.41 fps	Inflow=135.54 cfs	17.887 af
n=0.030	L=1,120.0'	S=0.0571 '/'	Capacity=1,272.27 cfs	Outflow=134.47 cfs
17.887 af				
Pond 15P: Clematis Brook to Beaver Brook	Inflow=166.51 cfs	23.864 af		
Primary=166.51 cfs	23.864 af			
Pond 16P: Pond - Upstream of Chapel	Peak Elev=155.94'	Storage=1.938 af	Inflow=141.15 cfs	14.178 af
Outflow=114.22 cfs	14.178 af			

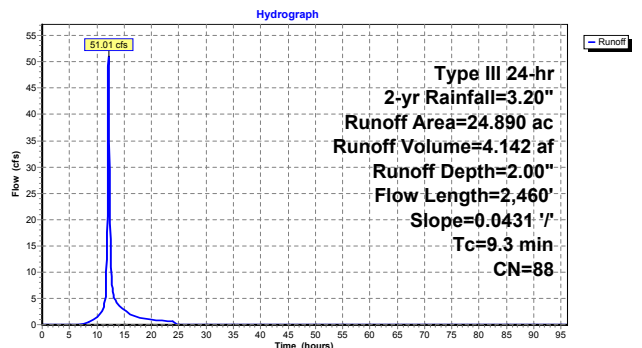
Total Runoff Area = 168.620 ac **Runoff Volume = 23.864 af** **Average Runoff Depth = 1.70"**
90.21% Pervious = 152.110 ac **9.79% Impervious = 16.510 ac**

Summary for Subcatchment H1: Farmland North of Trapelo Road

Runoff = 51.01 cfs @ 12.13 hrs, Volume= 4.142 af, Depth= 2.00"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description			
24.890	88	Row crops, straight row, Poor, HSG C			
24.890		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0431	0.18		Sheet Flow, Sheet Flow
					Cultivated: Residue=20% n= 0.170 P2= 3.23"
2.7	300	0.0431	1.87		Shallow Concentrated Flow, Shallow Conc
					Cultivated Straight Rows Kv= 9.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow
					Area= 27.0 sf Perim= 16.4' r= 1.65'
					n= 0.025 Earth, clean & winding
9.3	2,460	Total			

Subcatchment H1: Farmland North of Trapelo Road



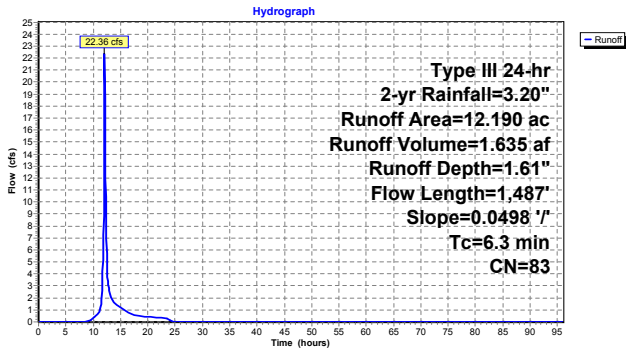
Summary for Subcatchment H10: Admin Bldg and Pearlman Bldg

Runoff = 22.36 cfs @ 12.10 hrs, Volume= 1.635 af, Depth= 1.61"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
9.560	79	50-75% Grass cover, Fair, HSG C
2.630	98	Roads, Roof and Paved parking, HSG C
12.190	83	Weighted Average
9.560		78.42% Pervious Area
2.630		21.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment H10: Admin Bldg and Pearlman Bldg



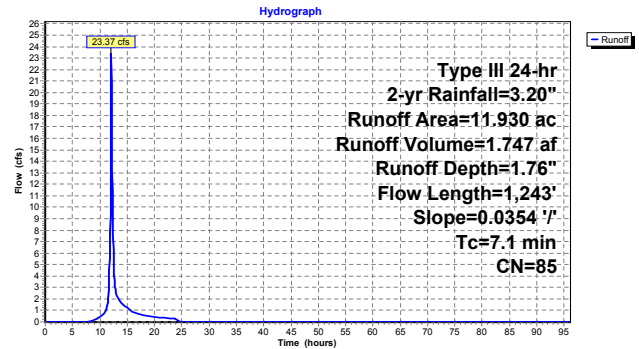
Summary for Subcatchment H11: Admin Bldg and Pearlman Bldg

Runoff = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af, Depth= 1.76"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment H11: Admin Bldg and Pearlman Bldg



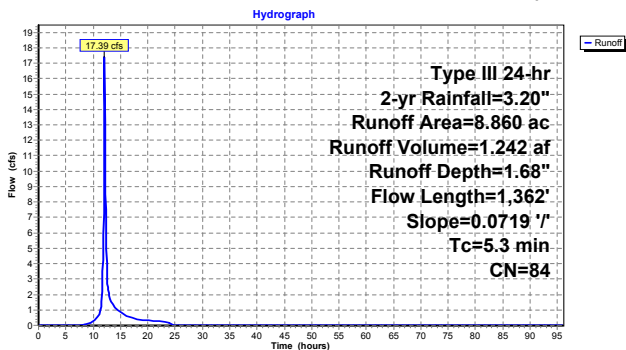
Summary for Subcatchment H12: Tarbell House, Farm and Grounds Dept

Runoff = 17.39 cfs @ 12.08 hrs, Volume= 1.242 af, Depth= 1.68"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
8.860	84	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment H12: Tarbell House, Farm and Grounds Dept



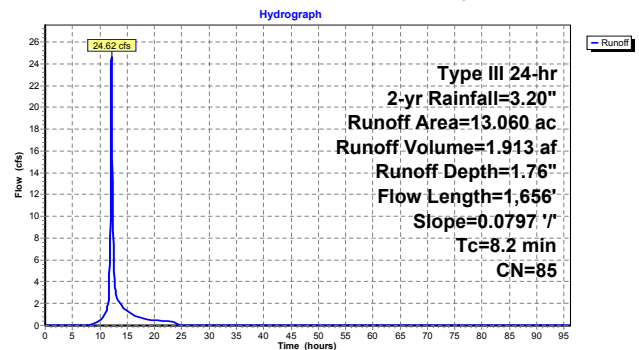
Summary for Subcatchment H13: Maintenance Workshops Area

Runoff = 24.62 cfs @ 12.12 hrs, Volume= 1.913 af, Depth= 1.76"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment H13: Maintenance Workshops Area



Summary for Subcatchment H14: Maintenance Workshops Area

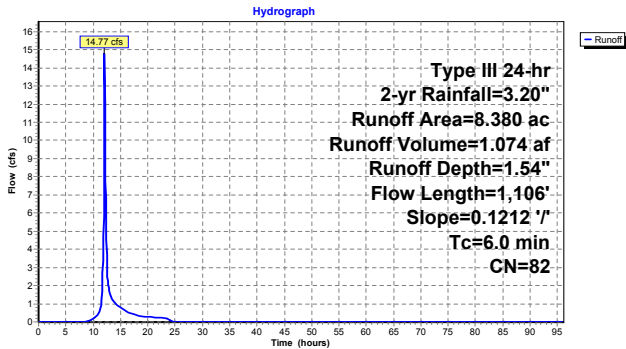
Runoff = 14.77 cfs @ 12.09 hrs, Volume= 1.074 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, open channel flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment H14: Maintenance Workshops Area



Summary for Subcatchment H2: Woodlands

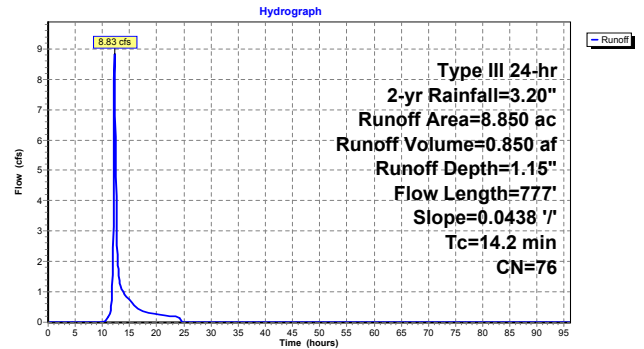
Runoff = 8.83 cfs @ 12.21 hrs, Volume= 0.850 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
8.850	76	Woods/grass comb., Fair, HSG C
8.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0438	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
4.8	300	0.0438	1.05		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
14.2	777	Total			

Subcatchment H2: Woodlands



Summary for Subcatchment H3: Woodlands

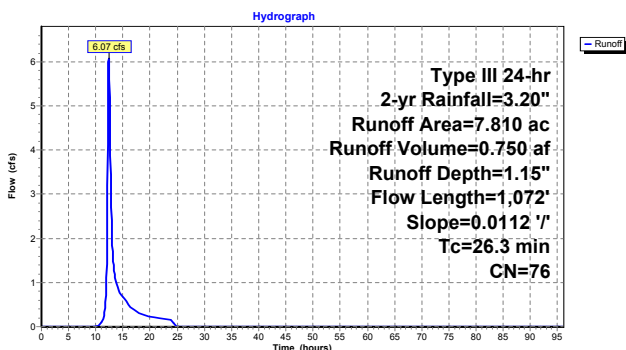
Runoff = 6.07 cfs @ 12.39 hrs, Volume= 0.750 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.810	76	Woods/grass comb., Fair, HSG C
7.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	50	0.0112	0.05		Sheet Flow, Sheet Flow Woods: Residue>20% n= 0.170 P2= 3.23"
9.4	300	0.0112	0.53		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
26.3	1,072	Total			

Subcatchment H3: Woodlands



Summary for Subcatchment H4: Farmland (Former Daycare Center)

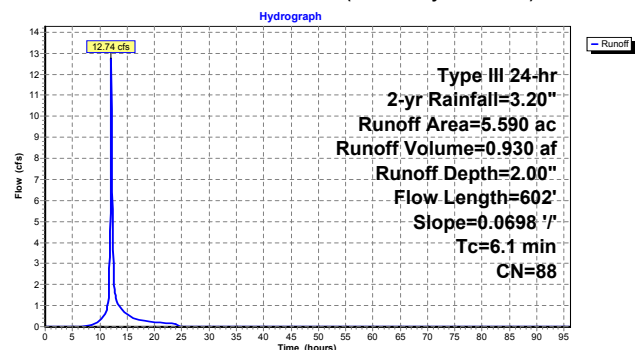
Runoff = 12.74 cfs @ 12.09 hrs, Volume= 0.930 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
5.590	88	Row crops, straight row, Poor, HSG C
5.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0698	0.22		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
2.1	300	0.0698	2.38		Shallow Concentrated Flow, Shallow Conc Cultivated Straight Rows Kv= 9.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	602	Total			

Subcatchment H4: Farmland (Former Daycare Center)



Summary for Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)

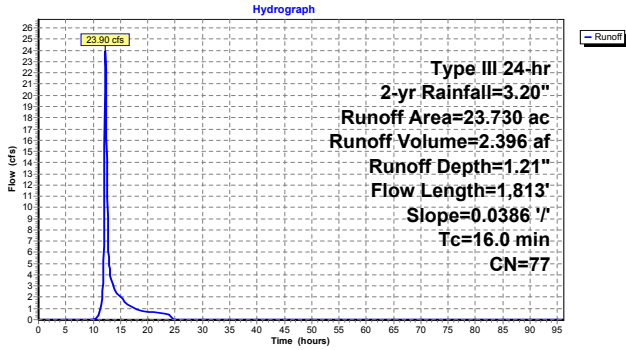
Runoff = 23.90 cfs @ 12.23 hrs, Volume= 2,396 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
23.140	76	Woods/grass comb., Fair, HSG C
0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.730	77	Weighted Average
23.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0386	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
5.1	300	0.0386	0.98		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
16.0	1,813				Total

Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)



Summary for Subcatchment H6: Farmland (Currently Area - Cottage Complex West)

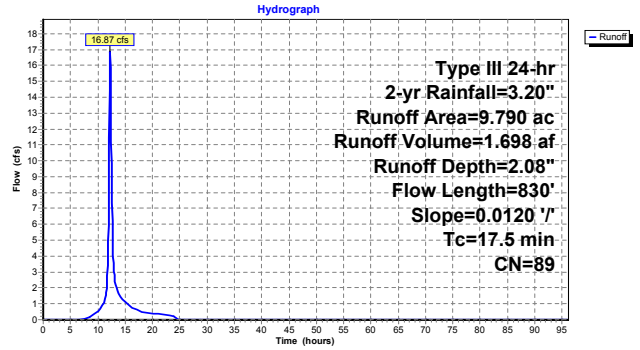
Runoff = 16.87 cfs @ 12.24 hrs, Volume= 1,698 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
8.760	88	Row crops, straight row, Poor, HSG C
1.030	98	Water Surface, 0% imp, HSG C
9.790	89	Weighted Average
9.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0120	0.11		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
9.1	300	0.0120	0.55		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
17.5	830				Total

Subcatchment H6: Farmland (Currently Area - Cottage Complex West)



Summary for Subcatchment H7: Farmland (Currently - Cottage Complex East)

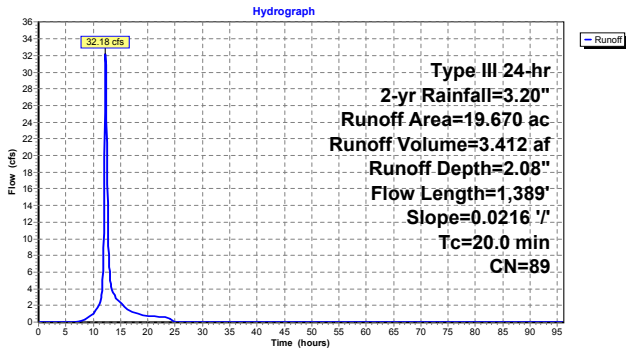
Runoff = 32.18 cfs @ 12.27 hrs, Volume= 3,412 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
18.580	88	Row crops, straight row, Poor, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.670	89	Weighted Average
19.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0216	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
6.8	300	0.0216	0.73		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
20.0	1,389				Total

Subcatchment H7: Farmland (Currently - Cottage Complex East)



Summary for Subcatchment H8: Farmlands (Currently - Chapel Area)

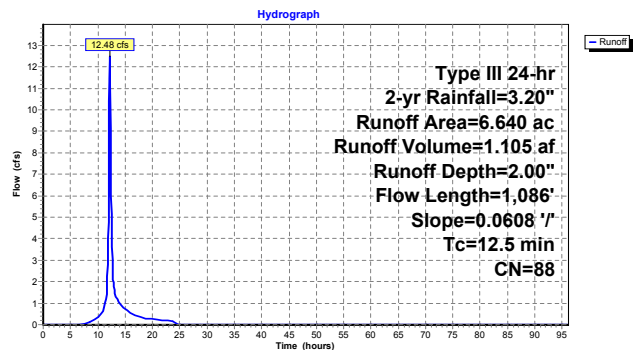
Runoff = 12.48 cfs @ 12.17 hrs, Volume= 1,105 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.640	88	Row crops, straight row, Poor, HSG C
6.640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0608	0.11		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
4.1	300	0.0608	1.23		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
12.5	1,086				Total

Subcatchment H8: Farmlands (Currently - Chapel Area)



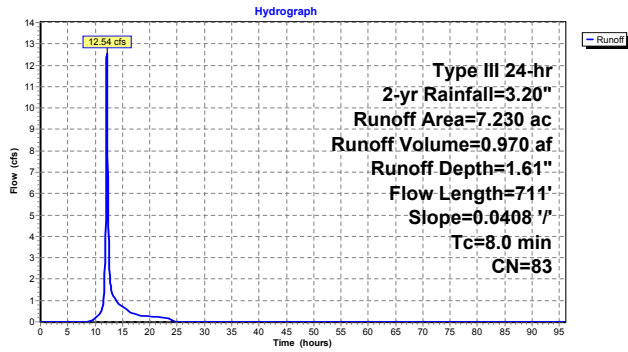
Summary for Subcatchment H9: West Nurses and West Building Area

Runoff = 12.54 cfs @ 12.12 hrs, Volume= 0.970 af, Depth= 1.61"
 Routing by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment H9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

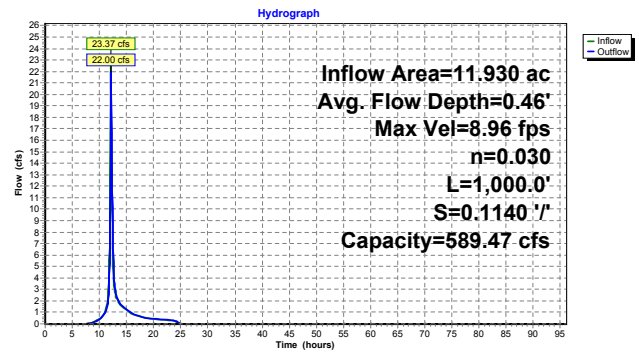
Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 1.76" for 2-yr event
 Inflow = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af
 Outflow = 22.00 cfs @ 12.16 hrs, Volume= 1.747 af, Atten= 6%, Lag= 3.4 min
 Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.96 fps, Min. Travel Time= 1.9 min
 Avg. Velocity = 2.57 fps, Avg. Travel Time= 6.5 min

Peak Storage= 2,492 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.46'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/ Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



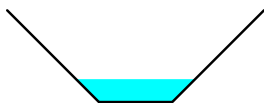
Summary for Reach 5R: Stream Upstream of the Pond

Inflow Area = 47.140 ac, 0.00% Impervious, Inflow Depth = 1.70" for 2-yr event
 Inflow = 72.61 cfs @ 12.13 hrs, Volume= 6.672 af
 Outflow = 69.93 cfs @ 12.22 hrs, Volume= 6.672 af, Atten= 4%, Lag= 5.2 min

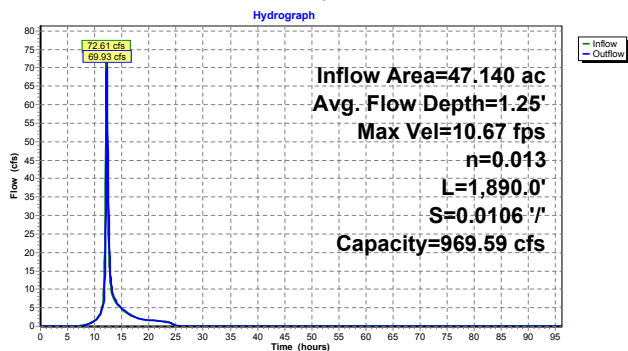
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 10.67 fps, Min. Travel Time= 3.0 min
 Avg. Velocity = 3.31 fps, Avg. Travel Time= 9.5 min

Peak Storage= 12,358 cf @ 12.17 hrs
 Average Depth at Peak Storage= 1.25'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 '/ Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 '/
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 5R: Stream Upstream of the Pond



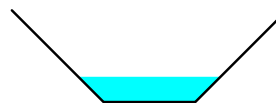
Summary for Reach 8R: Channel - South of Pond to Pine Street

Inflow Area = 106.970 ac, 0.00% Impervious, Inflow Depth = 1.71" for 2-yr event
 Inflow = 121.85 cfs @ 12.36 hrs, Volume= 15.283 af
 Outflow = 121.06 cfs @ 12.38 hrs, Volume= 15.283 af, Atten= 1%, Lag= 1.5 min

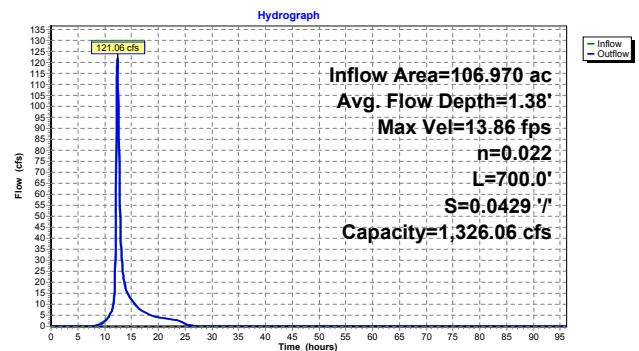
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.86 fps, Min. Travel Time= 0.8 min
 Avg. Velocity = 3.84 fps, Avg. Travel Time= 3.0 min

Peak Storage= 6,150 cf @ 12.37 hrs
 Average Depth at Peak Storage= 1.38'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 '/ Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 '/
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Pond to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 3.39% Impervious, Inflow Depth = 1.70" for 2-yr event
 Inflow = 135.54 cfs @ 12.37 hrs, Volume= 17.887 af
 Outflow = 134.47 cfs @ 12.41 hrs, Volume= 17.887 af, Atten= 1%, Lag= 2.8 min

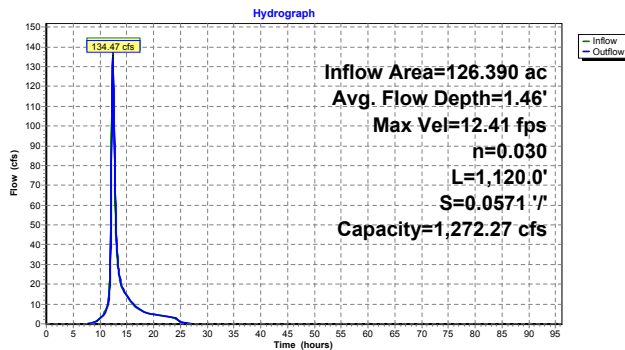
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.41 fps, Min. Travel Time= 1.5 min
 Avg. Velocity = 3.40 fps, Avg. Travel Time= 5.5 min

Peak Storage= 12,179 cf @ 12.38 hrs
 Average Depth at Peak Storage= 1.46'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 '/
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

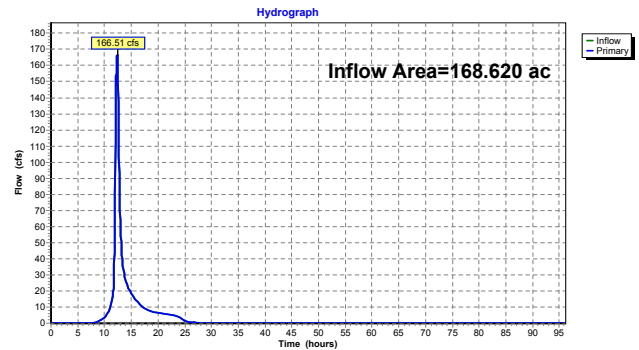


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 9.79% Impervious, Inflow Depth = 1.70" for 2-yr event
 Inflow = 166.51 cfs @ 12.37 hrs, Volume= 23.864 af
 Primary = 166.51 cfs @ 12.37 hrs, Volume= 23.864 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond - Upstream of Chapel

Inflow Area = 100.330 ac, 0.00% Impervious, Inflow Depth = 1.70" for 2-yr event
 Inflow = 141.15 cfs @ 12.23 hrs, Volume= 14.178 af
 Outflow = 114.22 cfs @ 12.37 hrs, Volume= 14.178 af, Atten= 19%, Lag= 8.0 min
 Primary = 114.22 cfs @ 12.37 hrs, Volume= 14.178 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 155.94' @ 12.37 hrs Surf.Area= 0.000 ac Storage= 1.938 af

Plug-Flow detention time= 24.4 min calculated for 14.171 af (100% of inflow)
 Center-of-Mass det. time= 24.5 min (861.5 - 837.0)

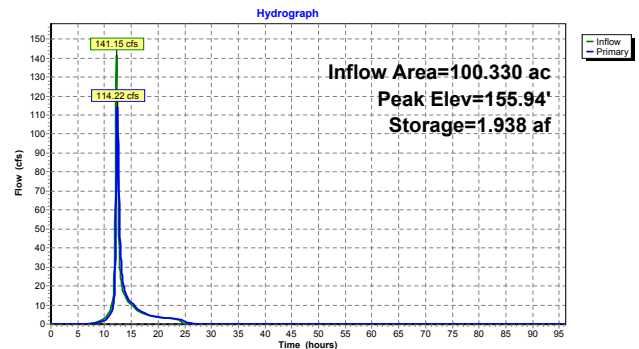
Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
154.00	0.000
156.00	2.000
158.00	4.000
160.00	6.000
162.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=113.56 cfs @ 12.37 hrs HW=155.93' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 113.56 cfs @ 4.22 fps)

Pond 16P: Pond - Upstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 H1: Farmland North of	Runoff Area=24.890 ac	0.00% Impervious	Runoff Depth=3.52"
Flow Length=2,460'	Slope=0.0431 '/	Tc=9.3 min	CN=88
			Runoff=88.27 cfs
Subcatchment H10: Admin Bldg and	Runoff Area=12.190 ac	21.58% Impervious	Runoff Depth=3.03"
Flow Length=1,487'	Slope=0.0498 '/	Tc=6.3 min	CN=83
			Runoff=41.95 cfs
Subcatchment H11: Admin Bldg and	Runoff Area=11.930 ac	33.61% Impervious	Runoff Depth=3.22"
Flow Length=1,243'	Slope=0.0354 '/	Tc=7.1 min	CN=85
			Runoff=42.44 cfs
Subcatchment H12: Tarbell House, Farm	Runoff Area=8.860 ac	28.89% Impervious	Runoff Depth=3.12"
Flow Length=1,362'	Slope=0.0719 '/	Tc=5.3 min	CN=84
			Runoff=32.04 cfs
Subcatchment H13: Maintenance	Runoff Area=13.060 ac	32.16% Impervious	Runoff Depth=3.22"
Flow Length=1,656'	Slope=0.0797 '/	Tc=8.2 min	CN=85
			Runoff=44.75 cfs
Subcatchment H14: Maintenance	Runoff Area=8.380 ac	17.42% Impervious	Runoff Depth=2.94"
Flow Length=1,106'	Slope=0.1212 '/	Tc=6.0 min	CN=82
			Runoff=28.20 cfs
Subcatchment H2: Woodlands	Runoff Area=8.850 ac	0.00% Impervious	Runoff Depth=2.40"
Flow Length=777'	Slope=0.0438 '/	Tc=14.2 min	CN=76
			Runoff=19.10 cfs
Subcatchment H3: Woodlands	Runoff Area=7.810 ac	0.00% Impervious	Runoff Depth=2.40"
Flow Length=1,072'	Slope=0.0112 '/	Tc=26.3 min	CN=76
			Runoff=13.14 cfs
Subcatchment H4: Farmland (Former	Runoff Area=5.590 ac	0.00% Impervious	Runoff Depth=3.52"
Flow Length=602'	Slope=0.0698 '/	Tc=6.1 min	CN=88
			Runoff=22.01 cfs
Subcatchment H5: Woodlands (Currently	Runoff Area=23.730 ac	0.00% Impervious	Runoff Depth=2.49"
Flow Length=1,813'	Slope=0.0386 '/	Tc=16.0 min	CN=77
			Runoff=50.85 cfs
Subcatchment H6: Farmland (Currently Area	Runoff Area=9.790 ac	0.00% Impervious	Runoff Depth=3.62"
Flow Length=830'	Slope=0.0120 '/	Tc=17.5 min	CN=89
			Runoff=28.80 cfs
Subcatchment H7: Farmland (Currently -	Runoff Area=19.670 ac	0.00% Impervious	Runoff Depth=3.62"
Flow Length=1,389'	Slope=0.0216 '/	Tc=20.0 min	CN=89
			Runoff=54.98 cfs
Subcatchment H8: Farmlands (Currently -	Runoff Area=6.640 ac	0.00% Impervious	Runoff Depth=3.52"
Flow Length=1,086'	Slope=0.0608 '/	Tc=12.5 min	CN=88
			Runoff=21.64 cfs
Subcatchment H9: West Nurses and West	Runoff Area=7.230 ac	22.82% Impervious	Runoff Depth=3.03"
Flow Length=711'	Slope=0.0408 '/	Tc=8.0 min	CN=83
			Runoff=23.59 cfs
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.66'	Max Vel=11.04 fps	Inflow=42.44 cfs
	n=0.030	L=1,000.0'	S=0.1140 '/
		Capacity=589.47 cfs	Outflow=40.10 cfs
Reach 5R: Stream Upstream of the	Avg. Flow Depth=1.75'	Max Vel=12.69 fps	Inflow=131.36 cfs
	n=0.013	L=1,890.0'	S=0.0106 '/
		Capacity=969.59 cfs	Outflow=126.82 cfs

Reach 8R: Channel - South of Pond	Avg. Flow Depth=2.02'	Max Vel=16.81 fps	Inflow=238.37 cfs
	n=0.022	L=700.0'	S=0.0429 '/
		Capacity=1,326.06 cfs	Outflow=236.50 cfs
Reach 14R: Channel - Pine Street to	Avg. Flow Depth=2.14'	Max Vel=15.15 fps	Inflow=265.31 cfs
	n=0.030	L=1,120.0'	S=0.0571 '/
		Capacity=1,272.27 cfs	Outflow=263.03 cfs
Pond 15P: Clematis Brook to Beaver Brook	Inflow=326.32 cfs	43.993 af	
	Primary=326.32 cfs	43.993 af	
Pond 16P: Pond - Upstream of Chapel	Peak Elev=156.92'	Storage=2.922 af	Inflow=259.03 cfs
			Outflow=223.78 cfs

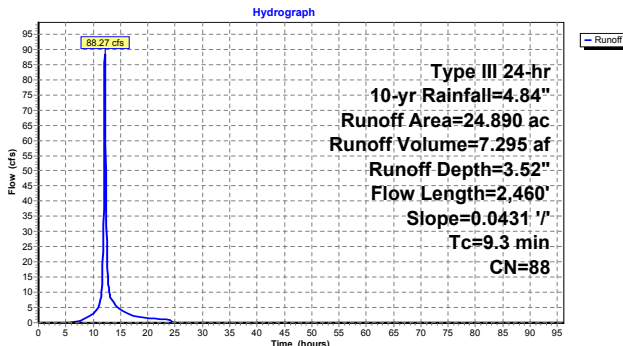
Total Runoff Area = 168.620 ac **Runoff Volume = 43.993 af** **Average Runoff Depth = 3.13"**
90.21% Pervious = 152.110 ac **9.79% Impervious = 16.510 ac**

Summary for Subcatchment H1: Farmland North of Trapelo Road

Runoff = 88.27 cfs @ 12.13 hrs, Volume= 7.295 af, Depth= 3.52"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description			
24.890	88	Row crops, straight row, Poor, HSG C			
24.890		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0431	0.18		Sheet Flow, Sheet Flow
					Cultivated; Residue=20% n= 0.170 P2= 3.23"
2.7	300	0.0431	1.87		Shallow Concentrated Flow, Shallow Conc
					Cultivated Straight Rows Kv= 9.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow
					Area= 27.0 sf Perim= 16.4' r= 1.65'
					n= 0.025 Earth, clean & winding
9.3	2,460				Total

Subcatchment H1: Farmland North of Trapelo Road

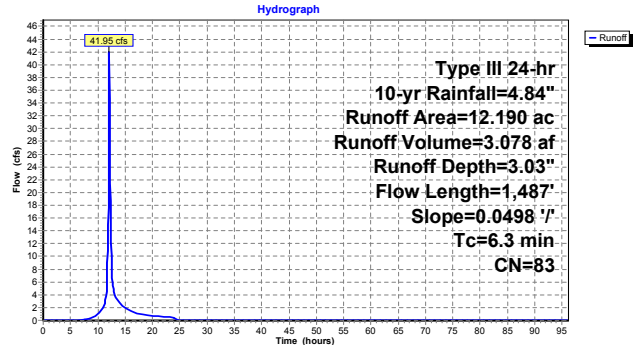


Summary for Subcatchment H10: Admin Bldg and Pearlman Bldg

Runoff = 41.95 cfs @ 12.09 hrs, Volume= 3.078 af, Depth= 3.03"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description			
9.560	79	50-75% Grass cover, Fair, HSG C			
* 2.630	98	Roads, Roof and Paved parking, HSG C			
12.190	83	Weighted Average			
9.560		78.42% Pervious Area			
2.630		21.58% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow
					Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc
					Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow
					Area= 27.0 sf Perim= 16.4' r= 1.65'
					n= 0.022 Earth, clean & straight
6.3	1,487				Total

Subcatchment H10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment H11: Admin Bldg and Pearlman Bldg

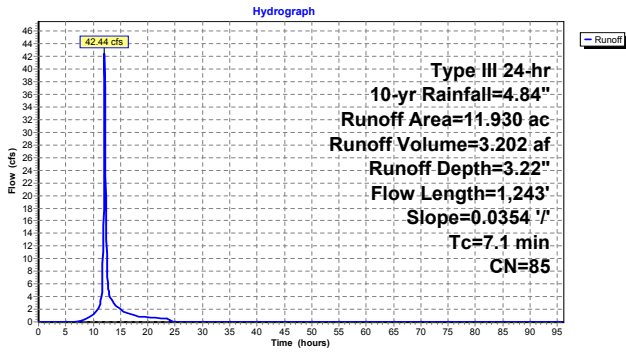
Runoff = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment H11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment H12: Tarbell House, Farm and Grounds Dept

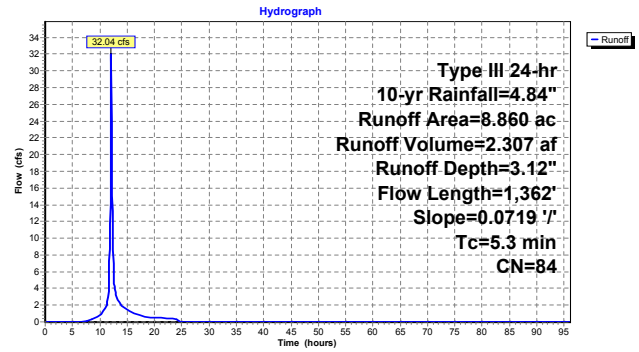
Runoff = 32.04 cfs @ 12.08 hrs, Volume= 2.307 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
8.860	84	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment H12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment H13: Maintenance Workshops Area

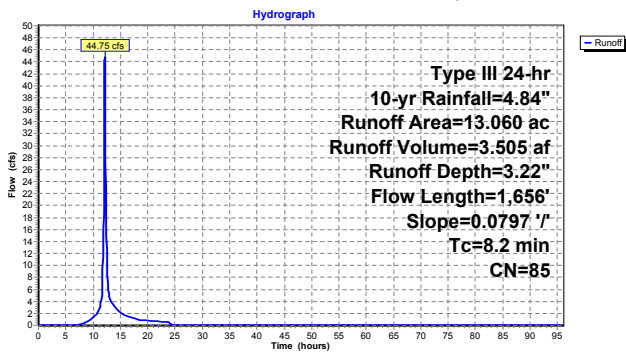
Runoff = 44.75 cfs @ 12.12 hrs, Volume= 3.505 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment H13: Maintenance Workshops Area



Summary for Subcatchment H14: Maintenance Workshops Area

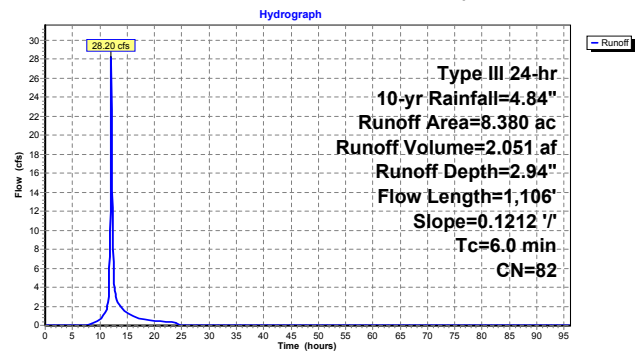
Runoff = 28.20 cfs @ 12.09 hrs, Volume= 2.051 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment H14: Maintenance Workshops Area



Summary for Subcatchment H2: Woodlands

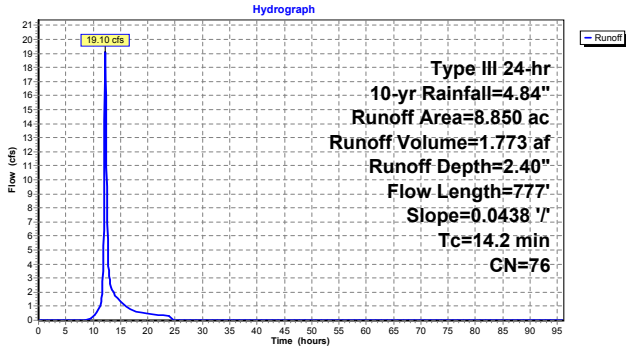
Runoff = 19.10 cfs @ 12.20 hrs, Volume= 1.773 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
8.850	76	Woods/grass comb., Fair, HSG C
8.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0438	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
4.8	300	0.0438	1.05		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
14.2	777	Total			

Subcatchment H2: Woodlands



Summary for Subcatchment H3: Woodlands

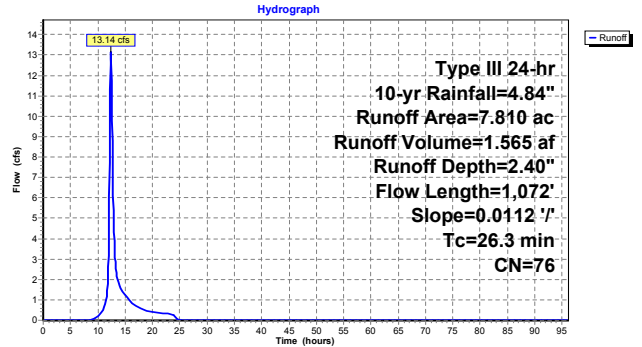
Runoff = 13.14 cfs @ 12.37 hrs, Volume= 1.565 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.810	76	Woods/grass comb., Fair, HSG C
7.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	50	0.0112	0.05		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
9.4	300	0.0112	0.53		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
26.3	1,072	Total			

Subcatchment H3: Woodlands



Summary for Subcatchment H4: Farmland (Former Daycare Center)

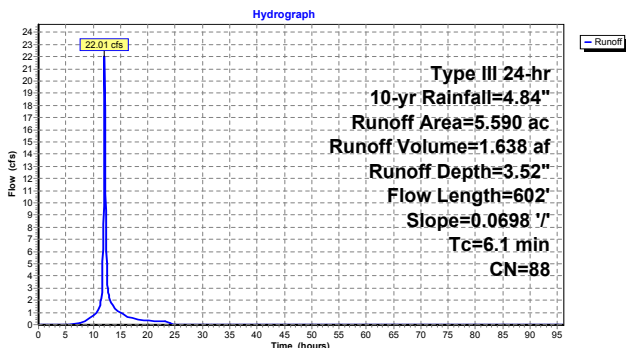
Runoff = 22.01 cfs @ 12.09 hrs, Volume= 1.638 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
5.590	88	Row crops, straight row, Poor, HSG C
5.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0698	0.22		Sheet Flow, Sheet Flow Cultivated: Residue=20% n= 0.170 P2= 3.23"
2.1	300	0.0698	2.38		Shallow Concentrated Flow, Shallow Conc Cultivated Straight Rows Kv= 9.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	602	Total			

Subcatchment H4: Farmland (Former Daycare Center)



Summary for Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)

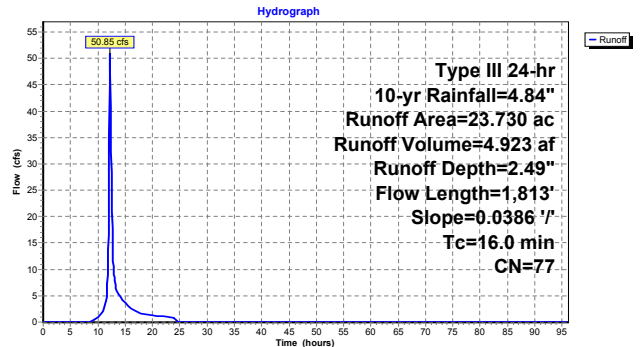
Runoff = 50.85 cfs @ 12.22 hrs, Volume= 4.923 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
23.140	76	Woods/grass comb., Fair, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.730	77	Weighted Average
23.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0386	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
5.1	300	0.0386	0.98		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
16.0	1,813	Total			

Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)



Summary for Subcatchment H6: Farmland (Currently Area - Cottage Complex West)

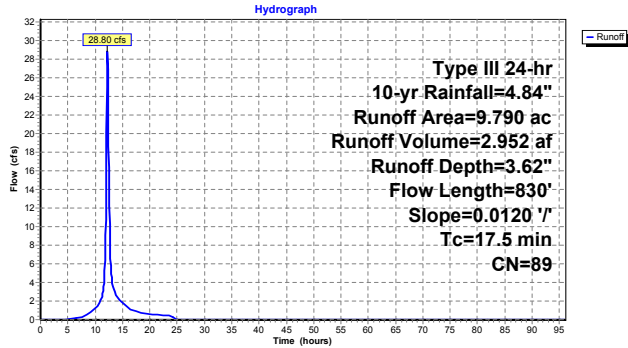
Runoff = 28.80 cfs @ 12.24 hrs, Volume= 2.952 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
8.760	88	Row crops, straight row, Poor, HSG C
1.030	98	Water Surface, 0% imp, HSG C
9.790	89	Weighted Average
9.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0120	0.11		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
9.1	300	0.0120	0.55		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
17.5	830				Total

Subcatchment H6: Farmland (Currently Area - Cottage Complex West)



Summary for Subcatchment H7: Farmland (Currently - Cottage Complex East)

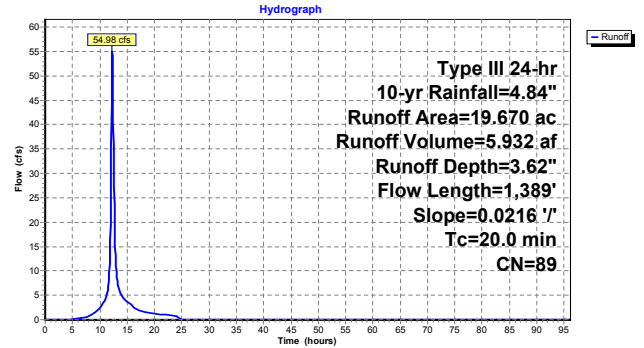
Runoff = 54.98 cfs @ 12.27 hrs, Volume= 5.932 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
18.580	88	Row crops, straight row, Poor, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.670	89	Weighted Average
19.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0216	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
6.8	300	0.0216	0.73		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
20.0	1,389				Total

Subcatchment H7: Farmland (Currently - Cottage Complex East)



Summary for Subcatchment H8: Farmlans (Currently - Chapel Area)

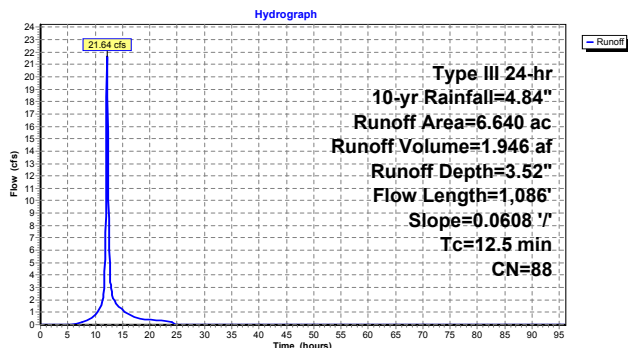
Runoff = 21.64 cfs @ 12.17 hrs, Volume= 1.946 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.640	88	Row crops, straight row, Poor, HSG C
6.640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0608	0.11		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
4.1	300	0.0608	1.23		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
12.5	1,086				Total

Subcatchment H8: Farmlans (Currently - Chapel Area)



Summary for Subcatchment H9: West Nurses and West Building Area

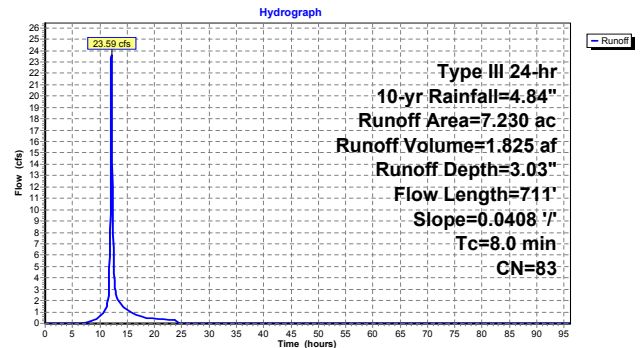
Runoff = 23.59 cfs @ 12.11 hrs, Volume= 1.825 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment H9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 3.22" for 10-yr event
 Inflow = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af
 Outflow = 40.10 cfs @ 12.15 hrs, Volume= 3.202 af, Atten= 6%, Lag= 2.8 min

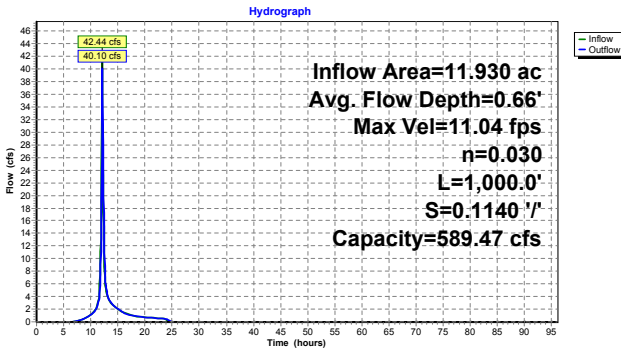
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 11.04 fps, Min. Travel Time= 1.5 min
 Avg. Velocity = 3.03 fps, Avg. Travel Time= 5.5 min

Peak Storage= 3,724 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.66'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 ' / '
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



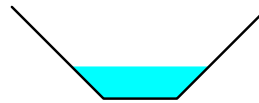
Summary for Reach 5R: Stream Upstream of the Pond

Inflow Area = 47.140 ac, 0.00% Impervious, Inflow Depth = 3.12" for 10-yr event
 Inflow = 131.36 cfs @ 12.13 hrs, Volume= 12.272 af
 Outflow = 126.82 cfs @ 12.21 hrs, Volume= 12.272 af, Atten= 3%, Lag= 4.6 min

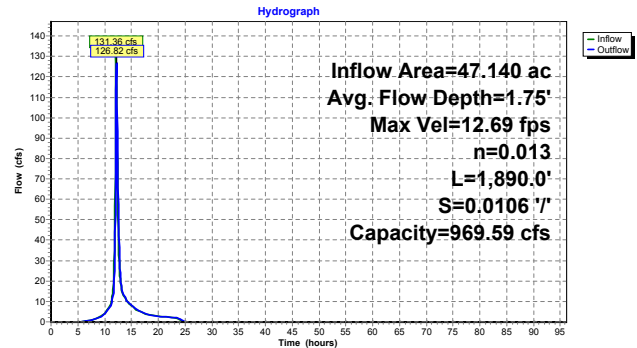
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.69 fps, Min. Travel Time= 2.5 min
 Avg. Velocity = 3.87 fps, Avg. Travel Time= 8.1 min

Peak Storage= 19,042 cf @ 12.17 hrs
 Average Depth at Peak Storage= 1.75'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 5R: Stream Upstream of the Pond



Summary for Reach 8R: Channel - South of Pond to Pine Street

Inflow Area = 106.970 ac, 0.00% Impervious, Inflow Depth = 3.14" for 10-yr event
 Inflow = 238.37 cfs @ 12.32 hrs, Volume= 28.026 af
 Outflow = 236.50 cfs @ 12.34 hrs, Volume= 28.026 af, Atten= 1%, Lag= 1.4 min

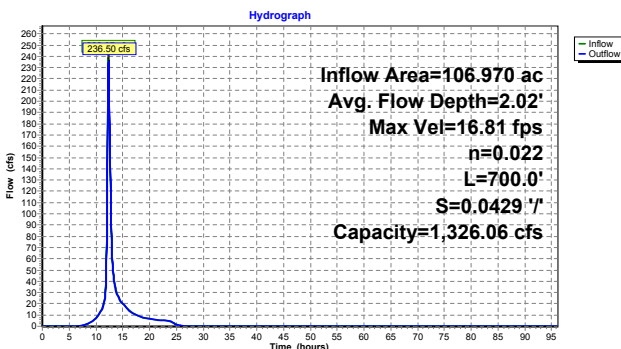
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.81 fps, Min. Travel Time= 0.7 min
 Avg. Velocity = 4.46 fps, Avg. Travel Time= 2.6 min

Peak Storage= 9,905 cf @ 12.32 hrs
 Average Depth at Peak Storage= 2.02'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Pond to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 3.39% Impervious, Inflow Depth = 3.13" for 10-yr event
 Inflow = 265.31 cfs @ 12.32 hrs, Volume= 32.929 af
 Outflow = 263.03 cfs @ 12.36 hrs, Volume= 32.929 af, Atten= 1%, Lag= 2.3 min

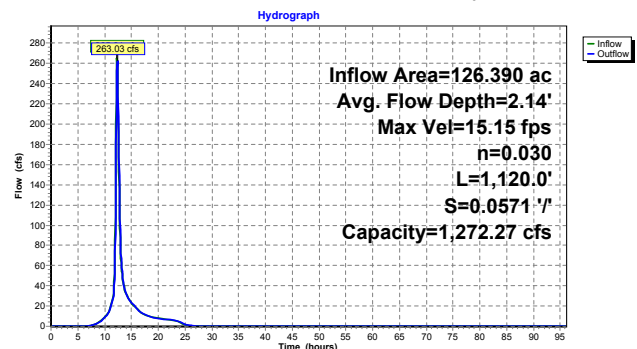
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 15.15 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 3.97 fps, Avg. Travel Time= 4.7 min

Peak Storage= 19,554 cf @ 12.34 hrs
 Average Depth at Peak Storage= 2.14'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

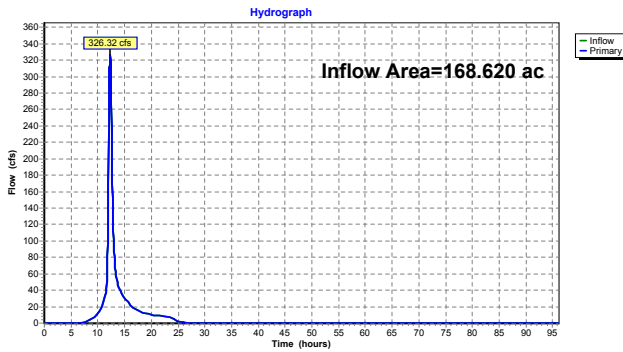


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 9.79% Impervious, Inflow Depth = 3.13" for 10-yr event
 Inflow = 326.32 cfs @ 12.33 hrs, Volume= 43.993 af
 Primary = 326.32 cfs @ 12.33 hrs, Volume= 43.993 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond - Upstream of Chapel

Inflow Area = 100.330 ac, 0.00% Impervious, Inflow Depth = 3.12" for 10-yr event
 Inflow = 259.03 cfs @ 12.22 hrs, Volume= 26.079 af
 Outflow = 223.78 cfs @ 12.32 hrs, Volume= 26.079 af, Atten= 14%, Lag= 6.1 min
 Primary = 223.78 cfs @ 12.32 hrs, Volume= 26.079 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 156.92' @ 12.32 hrs Surf.Area= 0.000 ac Storage= 2.922 af

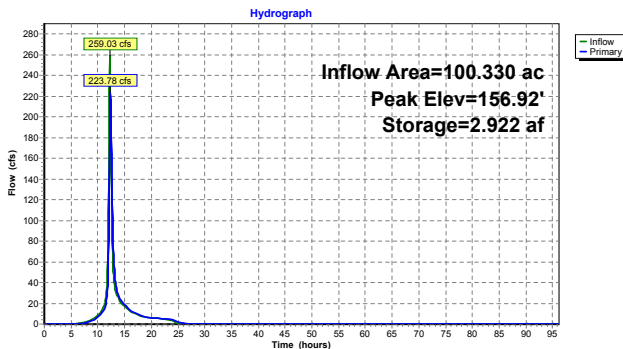
Plug-Flow detention time= 20.0 min calculated for 26.066 af (100% of inflow)
 Center-of-Mass det. time= 20.1 min (840.4 - 820.3)

Volume #1	Invert	Avail.Storage	Storage Description
	154.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=221.82 cfs @ 12.32 hrs HW=156.91' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 221.82 cfs @ 5.12 fps)

Pond 16P: Pond - Upstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 H1: Farmland North of	Runoff Area=24.890 ac 0.00% Impervious Runoff Depth=4.76" Flow Length=2,460' Slope=0.0431 '/' Tc=9.3 min CN=88 Runoff=117.81 cfs 9.875 af
Subcatchment H10: Admin Bldg and	Runoff Area=12.190 ac 21.58% Impervious Runoff Depth=4.22" Flow Length=1,487' Slope=0.0498 '/' Tc=6.3 min CN=83 Runoff=57.88 cfs 4.288 af
Subcatchment H11: Admin Bldg and	Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=4.43" Flow Length=1,243' Slope=0.0354 '/' Tc=7.1 min CN=85 Runoff=57.76 cfs 4.409 af
Subcatchment H12: Tarbell House, Farm	Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=4.33" Flow Length=1,362' Slope=0.0719 '/' Tc=5.3 min CN=84 Runoff=43.88 cfs 3.195 af
Subcatchment H13: Maintenance	Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=4.43" Flow Length=1,656' Slope=0.0797 '/' Tc=8.2 min CN=85 Runoff=60.95 cfs 4.826 af
Subcatchment H14: Maintenance	Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=4.12" Flow Length=1,106' Slope=0.1212 '/' Tc=6.0 min CN=82 Runoff=39.19 cfs 2.874 af
Subcatchment H2: Woodlands	Runoff Area=8.850 ac 0.00% Impervious Runoff Depth=3.50" Flow Length=777' Slope=0.0438 '/' Tc=14.2 min CN=76 Runoff=27.91 cfs 2.582 af
Subcatchment H3: Woodlands	Runoff Area=7.810 ac 0.00% Impervious Runoff Depth=3.50" Flow Length=1,072' Slope=0.0112 '/' Tc=26.3 min CN=76 Runoff=19.21 cfs 2.279 af
Subcatchment H4: Farmland (Former)	Runoff Area=5.590 ac 0.00% Impervious Runoff Depth=4.76" Flow Length=602' Slope=0.0698 '/' Tc=6.1 min CN=88 Runoff=29.36 cfs 2.218 af
Subcatchment H5: Woodlands (Currently)	Runoff Area=23.730 ac 0.00% Impervious Runoff Depth=3.60" Flow Length=1,813' Slope=0.0386 '/' Tc=16.0 min CN=77 Runoff=73.73 cfs 7.122 af
Subcatchment H6: Farmland (Currently Area)	Runoff Area=9.790 ac 0.00% Impervious Runoff Depth=4.87" Flow Length=830' Slope=0.0120 '/' Tc=17.5 min CN=89 Runoff=38.23 cfs 3.974 af
Subcatchment H7: Farmland (Currently)	Runoff Area=19.670 ac 0.00% Impervious Runoff Depth=4.87" Flow Length=1,389' Slope=0.0216 '/' Tc=20.0 min CN=89 Runoff=73.00 cfs 7.985 af
Subcatchment H8: Farmlands (Currently)	Runoff Area=6.640 ac 0.00% Impervious Runoff Depth=4.76" Flow Length=1,086' Slope=0.0608 '/' Tc=12.5 min CN=88 Runoff=28.90 cfs 2.634 af
Subcatchment H9: West Nurses and West	Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=4.22" Flow Length=711' Slope=0.0408 '/' Tc=8.0 min CN=83 Runoff=32.59 cfs 2.543 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.79' Max Vel=12.27 fps Inflow=57.76 cfs 4.409 af n=0.030 L=1,000.0' S=0.1140 '/' Capacity=589.47 cfs Outflow=54.65 cfs 4.409 af
Reach 5R: Stream Upstream of the	Avg. Flow Depth=2.08' Max Vel=13.84 fps Inflow=178.98 cfs 16.953 af n=0.013 L=1,890.0' S=0.0106 '/' Capacity=969.59 cfs Outflow=172.93 cfs 16.953 af

Reach 8R: Channel - South of Pond Avg. Flow Depth=2.44' Max Vel=18.51 fps Inflow=335.36 cfs 38.668 af
 n=0.022 L=700.0' S=0.0429'/' Capacity=1,326.06 cfs Outflow=333.71 cfs 38.668 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=2.60' Max Vel=16.68 fps Inflow=373.92 cfs 45.500 af
 n=0.030 L=1,120.0' S=0.0571'/' Capacity=1,272.27 cfs Outflow=370.40 cfs 45.500 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=460.38 cfs 60.805 af
 Primary=460.38 cfs 60.805 af

Pond 16P: Pond - Upstream of Chapel Peak Elev=157.58' Storage=3.583 af Inflow=354.32 cfs 36.034 af
 Outflow=315.06 cfs 36.034 af

Total Runoff Area = 168.620 ac Runoff Volume = 60.805 af Average Runoff Depth = 4.33"
 90.21% Pervious = 152.110 ac 9.79% Impervious = 16.510 ac

Summary for Subcatchment H1: Farmland North of Trapelo Road

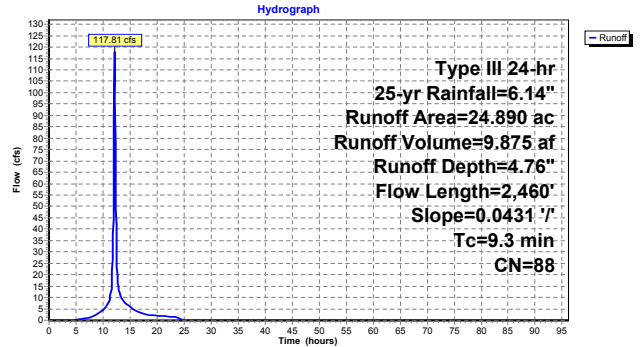
Runoff = 117.81 cfs @ 12.13 hrs, Volume= 9.875 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
24.890	88	Row crops, straight row, Poor, HSG C
24.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0431	0.18		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
2.7	300	0.0431	1.87		Shallow Concentrated Flow, Shallow Conc Cultivated Straight Rows Kv= 9.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.3	2,460				Total

Subcatchment H1: Farmland North of Trapelo Road



Summary for Subcatchment H10: Admin Bldg and Pearlman Bldg

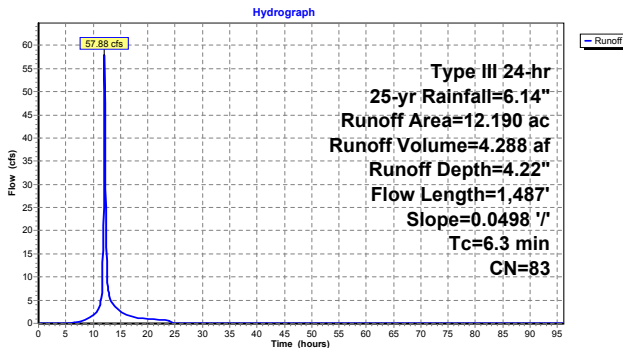
Runoff = 57.88 cfs @ 12.09 hrs, Volume= 4.288 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
9.560	79	50-75% Grass cover, Fair, HSG C
* 2.630	98	Roads, Roof and Paved parking, HSG C
12.190	83	Weighted Average
9.560		78.42% Pervious Area
2.630		21.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487				Total

Subcatchment H10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment H11: Admin Bldg and Pearlman Bldg

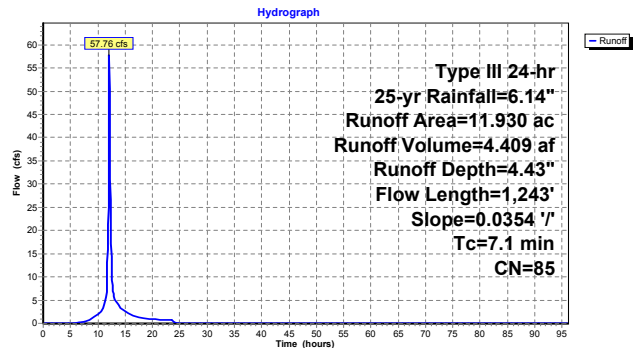
Runoff = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243				Total

Subcatchment H11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment H12: Tarbell House, Farm and Grounds Dept

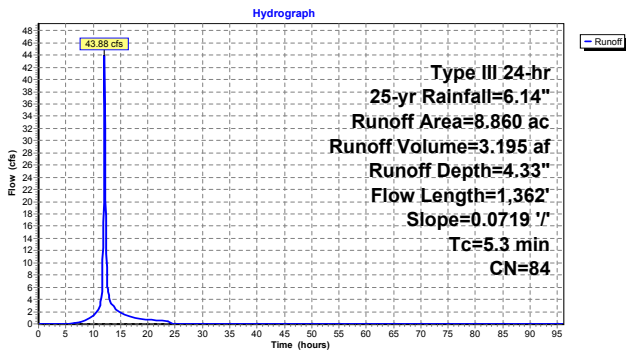
Runoff = 43.88 cfs @ 12.08 hrs, Volume= 3.195 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
8.860	84	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment H12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment H13: Maintenance Workshops Area

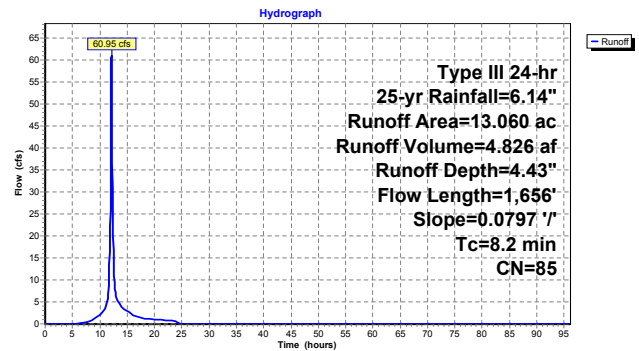
Runoff = 60.95 cfs @ 12.11 hrs, Volume= 4.826 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment H13: Maintenance Workshops Area



Summary for Subcatchment H14: Maintenance Workshops Area

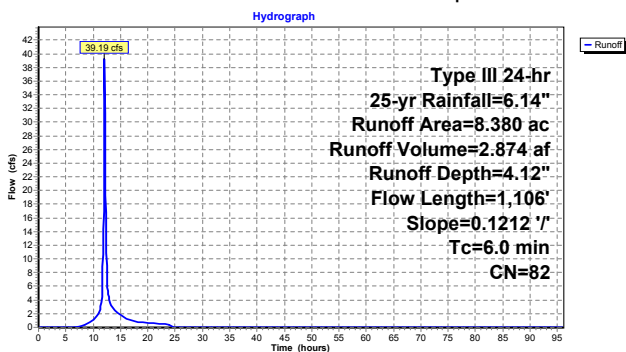
Runoff = 39.19 cfs @ 12.09 hrs, Volume= 2.874 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 1.65' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment H14: Maintenance Workshops Area



Summary for Subcatchment H2: Woodlands

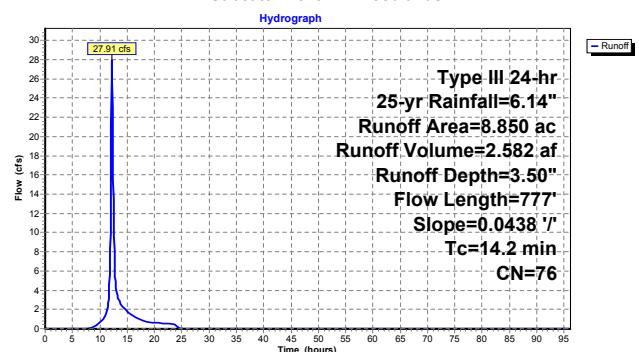
Runoff = 27.91 cfs @ 12.20 hrs, Volume= 2.582 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
8.850	76	Woods/grass comb., Fair, HSG C
8.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0438	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
4.8	300	0.0438	1.05		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
14.2	777	Total			

Subcatchment H2: Woodlands



Summary for Subcatchment H3: Woodlands

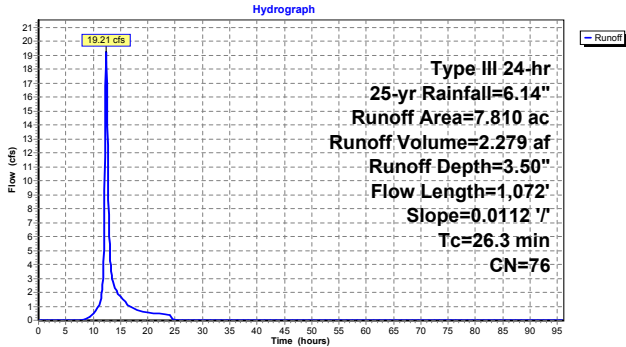
Runoff = 19.21 cfs @ 12.37 hrs, Volume= 2.279 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.810	76	Woods/grass comb., Fair, HSG C
7.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	50	0.0112	0.05		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
9.4	300	0.0112	0.53		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
26.3	1,072	Total			

Subcatchment H3: Woodlands



Summary for Subcatchment H4: Farmland (Former Daycare Center)

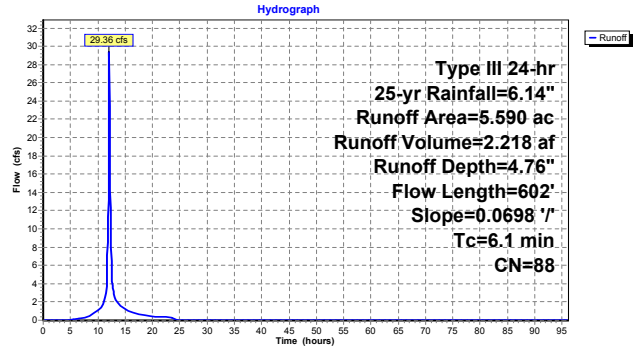
Runoff = 29.36 cfs @ 12.09 hrs, Volume= 2.218 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
5.590	88	Row crops, straight row, Poor, HSG C
5.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0698	0.22		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
2.1	300	0.0698	2.38		Shallow Concentrated Flow, Shallow Conc Cultivated Straight Rows Kv= 9.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	602	Total			

Subcatchment H4: Farmland (Former Daycare Center)



Summary for Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)

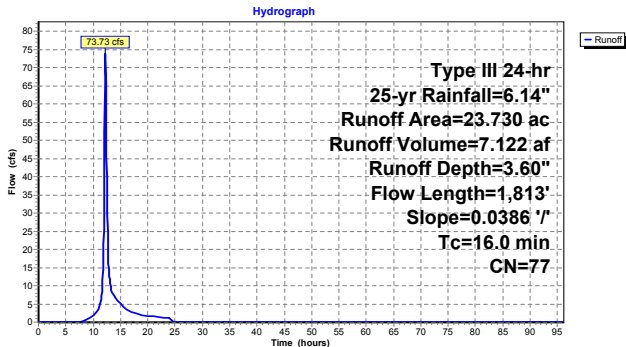
Runoff = 73.73 cfs @ 12.22 hrs, Volume= 7.122 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
23.140	76	Woods/grass comb., Fair, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.730	77	Weighted Average
23.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0386	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
5.1	300	0.0386	0.98		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
16.0	1,813	Total			

Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)



Summary for Subcatchment H6: Farmland (Currently Area - Cottage Complex West)

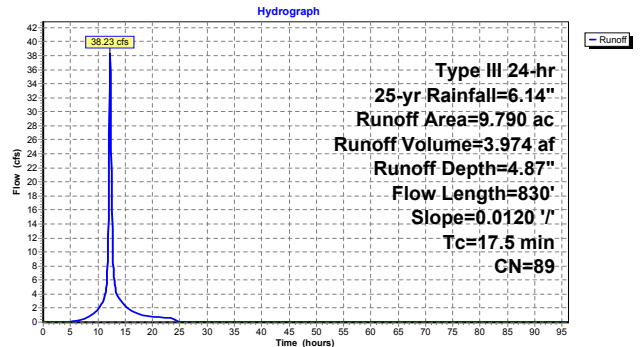
Runoff = 38.23 cfs @ 12.23 hrs, Volume= 3.974 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
8.760	88	Row crops, straight row, Poor, HSG C
1.030	98	Water Surface, 0% imp, HSG C
9.790	89	Weighted Average
9.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0120	0.11		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
9.1	300	0.0120	0.55		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
17.5	830	Total			

Subcatchment H6: Farmland (Currently Area - Cottage Complex West)



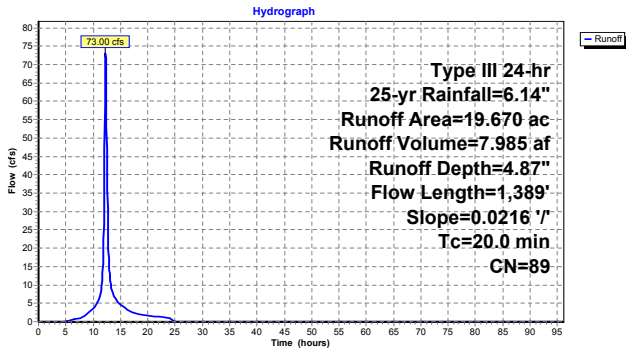
Summary for Subcatchment H7: Farmland (Currently - Cottage Complex East)

Runoff = 73.00 cfs @ 12.27 hrs, Volume= 7.985 af, Depth= 4.87"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
18.580	88	Row crops, straight row, Poor, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.670	89	Weighted Average
19.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0216	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
6.8	300	0.0216	0.73		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
20.0	1,389				Total

Subcatchment H7: Farmland (Currently - Cottage Complex East)



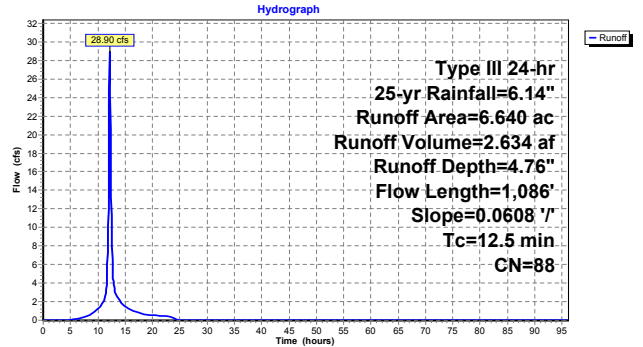
Summary for Subcatchment H8: Farmlans (Currently - Chapel Area)

Runoff = 28.90 cfs @ 12.17 hrs, Volume= 2.634 af, Depth= 4.76"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.640	88	Row crops, straight row, Poor, HSG C
6.640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0608	0.11		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
4.1	300	0.0608	1.23		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
12.5	1,086				Total

Subcatchment H8: Farmlans (Currently - Chapel Area)



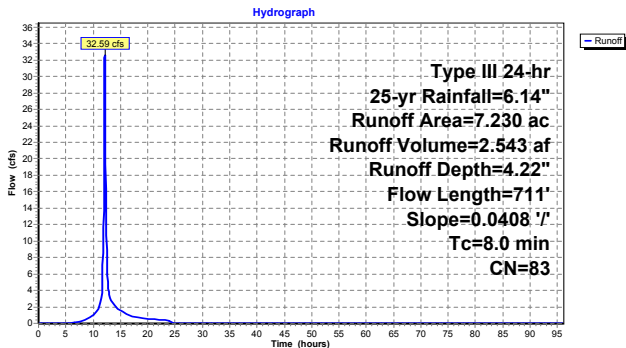
Summary for Subcatchment H9: West Nurses and West Building Area

Runoff = 32.59 cfs @ 12.11 hrs, Volume= 2.543 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment H9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 4.43" for 25-yr event
 Inflow = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af
 Outflow = 54.65 cfs @ 12.14 hrs, Volume= 4.409 af, Atten= 5%, Lag= 2.5 min

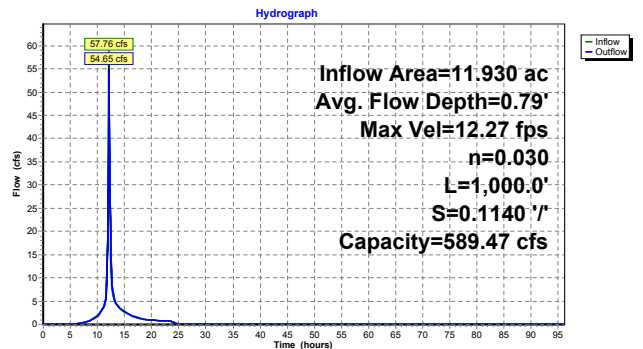
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.27 fps, Min. Travel Time= 1.4 min
 Avg. Velocity= 3.30 fps, Avg. Travel Time= 5.1 min

Peak Storage= 4.589 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.79'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



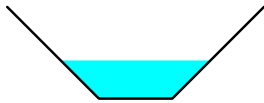
Summary for Reach 5R: Stream Upstream of the Pond

Inflow Area = 47.140 ac, 0.00% Impervious, Inflow Depth = 4.32" for 25-yr event
 Inflow = 178.98 cfs @ 12.13 hrs, Volume= 16.953 af
 Outflow = 172.93 cfs @ 12.20 hrs, Volume= 16.953 af, Atten= 3%, Lag= 4.4 min

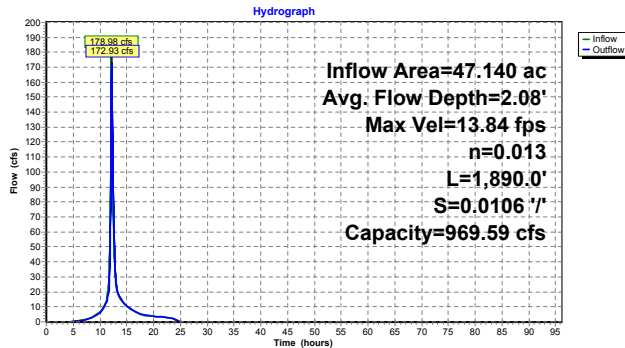
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.84 fps, Min. Travel Time= 2.3 min
 Avg. Velocity = 4.23 fps, Avg. Travel Time= 7.5 min

Peak Storage= 23,918 cf @ 12.16 hrs
 Average Depth at Peak Storage= 2.08'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 5R: Stream Upstream of the Pond



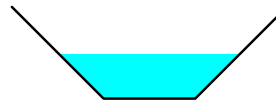
Summary for Reach 8R: Channel - South of Pond to Pine Street

Inflow Area = 106.970 ac, 0.00% Impervious, Inflow Depth = 4.34" for 25-yr event
 Inflow = 335.36 cfs @ 12.30 hrs, Volume= 38.668 af
 Outflow = 333.71 cfs @ 12.32 hrs, Volume= 38.668 af, Atten= 0%, Lag= 1.1 min

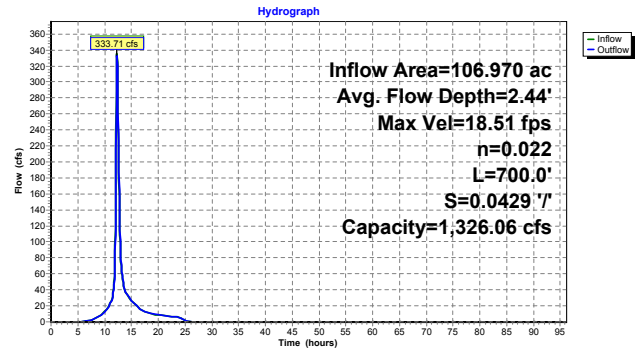
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 18.51 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 4.87 fps, Avg. Travel Time= 2.4 min

Peak Storage= 12,683 cf @ 12.31 hrs
 Average Depth at Peak Storage= 2.44'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Pond to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 3.39% Impervious, Inflow Depth = 4.32" for 25-yr event
 Inflow = 373.92 cfs @ 12.31 hrs, Volume= 45.500 af
 Outflow = 370.40 cfs @ 12.34 hrs, Volume= 45.500 af, Atten= 1%, Lag= 2.1 min

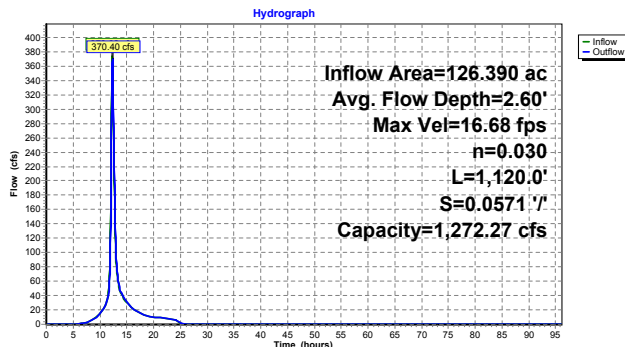
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.68 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 4.33 fps, Avg. Travel Time= 4.3 min

Peak Storage= 25,040 cf @ 12.32 hrs
 Average Depth at Peak Storage= 2.60'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

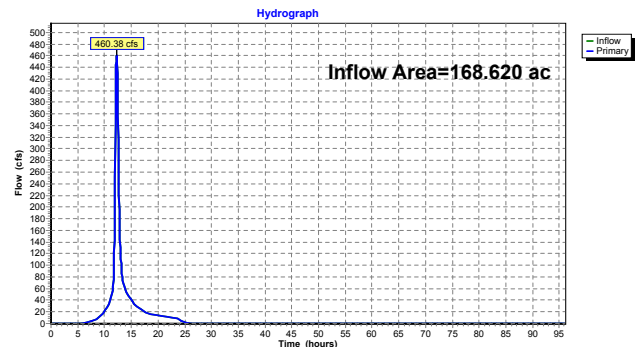


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 9.79% Impervious, Inflow Depth = 4.33" for 25-yr event
 Inflow = 460.38 cfs @ 12.30 hrs, Volume= 60.805 af
 Primary = 460.38 cfs @ 12.30 hrs, Volume= 60.805 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond - Upstream of Chapel

Inflow Area = 100.330 ac, 0.00% Impervious, Inflow Depth = 4.31" for 25-yr event
 Inflow = 354.32 cfs @ 12.22 hrs, Volume= 36.034 af
 Outflow = 315.06 cfs @ 12.31 hrs, Volume= 36.034 af, Atten= 11%, Lag= 5.4 min
 Primary = 315.06 cfs @ 12.31 hrs, Volume= 36.034 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 157.58' @ 12.31 hrs Surf.Area= 0.000 ac Storage= 3.583 af

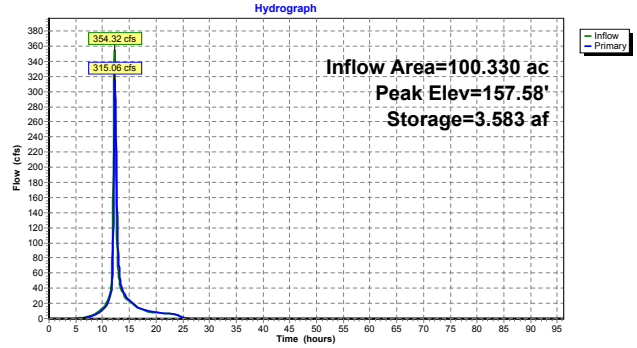
Plug-Flow detention time= 17.9 min calculated for 36.015 af (100% of inflow)
 Center-of-Mass det. time= 18.0 min (829.6 - 811.5)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8,000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=313.59 cfs @ 12.31 hrs HW=157.57' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 313.59 cfs @ 5.64 fps)

Pond 16P: Pond - Upstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 H1: Farmland North of	Runoff Area=24.890 ac 0.00% Impervious Runoff Depth=7.35" Flow Length=2,460' Slope=0.0431 ' Tc=9.3 min CN=88 Runoff=177.68 cfs 15,249 af
Subcatchment H10: Admin Bldg and	Runoff Area=12.190 ac 21.58% Impervious Runoff Depth=6.74" Flow Length=1,487' Slope=0.0498 ' Tc=6.3 min CN=83 Runoff=90.56 cfs 6,851 af
Subcatchment H11: Admin Bldg and	Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=6.99" Flow Length=1,243' Slope=0.0354 ' Tc=7.1 min CN=85 Runoff=89.01 cfs 6,947 af
Subcatchment H12: Tarbell House, Farm	Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=6.87" Flow Length=1,362' Slope=0.0719 ' Tc=5.3 min CN=84 Runoff=68.10 cfs 5,069 af
Subcatchment H13: Maintenance	Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=6.99" Flow Length=1,656' Slope=0.0797 ' Tc=8.2 min CN=85 Runoff=93.98 cfs 7,605 af
Subcatchment H14: Maintenance	Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=6.62" Flow Length=1,106' Slope=0.1212 ' Tc=6.0 min CN=82 Runoff=61.81 cfs 4,625 af
Subcatchment H2: Woodlands	Runoff Area=8.850 ac 0.00% Impervious Runoff Depth=5.89" Flow Length=777' Slope=0.0438 ' Tc=14.2 min CN=76 Runoff=46.60 cfs 4,345 af
Subcatchment H3: Woodlands	Runoff Area=7.810 ac 0.00% Impervious Runoff Depth=5.89" Flow Length=1,072' Slope=0.0112 ' Tc=26.3 min CN=76 Runoff=32.12 cfs 3,834 af
Subcatchment H4: Farmland (Former)	Runoff Area=5.590 ac 0.00% Impervious Runoff Depth=7.35" Flow Length=602' Slope=0.0698 ' Tc=6.1 min CN=88 Runoff=44.24 cfs 3,425 af
Subcatchment H5: Woodlands (Currently)	Runoff Area=23.730 ac 0.00% Impervious Runoff Depth=6.01" Flow Length=1,813' Slope=0.0386 ' Tc=16.0 min CN=77 Runoff=122.03 cfs 11,891 af
Subcatchment H6: Farmland (Currently Area)	Runoff Area=9.790 ac 0.00% Impervious Runoff Depth=7.47" Flow Length=830' Slope=0.0120 ' Tc=17.5 min CN=89 Runoff=57.34 cfs 6,097 af
Subcatchment H7: Farmland (Currently)	Runoff Area=19.670 ac 0.00% Impervious Runoff Depth=7.47" Flow Length=1,389' Slope=0.0216 ' Tc=20.0 min CN=89 Runoff=109.52 cfs 12,249 af
Subcatchment H8: Farmlands (Currently)	Runoff Area=6.640 ac 0.00% Impervious Runoff Depth=7.35" Flow Length=1,086' Slope=0.0608 ' Tc=12.5 min CN=88 Runoff=43.62 cfs 4,068 af
Subcatchment H9: West Nurses and West	Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=6.74" Flow Length=711' Slope=0.0408 ' Tc=8.0 min CN=83 Runoff=51.05 cfs 4,063 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=1.03' Max Vel=14.14 fps Inflow=89.01 cfs 6,947 af n=0.030 L=1,000.0' S=0.1140 ' Capacity=589.47 cfs Outflow=84.36 cfs 6,947 af
Reach 5R: Stream Upstream of the	Avg. Flow Depth=2.64' Max Vel=15.58 fps Inflow=276.90 cfs 26,852 af n=0.013 L=1,890.0' S=0.0106 ' Capacity=969.59 cfs Outflow=267.75 cfs 26,852 af

Reach 8R: Channel - South of Pond	Avg. Flow Depth=3.14' Max Vel=21.01 fps Inflow=538.12 cfs 61,156 af n=0.022 L=700.0' S=0.0429 ' Capacity=1,326.06 cfs Outflow=535.64 cfs 61,156 af
Reach 14R: Channel - Pine Street to	Avg. Flow Depth=3.37' Max Vel=19.01 fps Inflow=601.36 cfs 72,070 af n=0.030 L=1,120.0' S=0.0571 ' Capacity=1,272.27 cfs Outflow=596.78 cfs 72,070 af
Pond 15P: Clematis Brook to Beaver Brook	Inflow=742.74 cfs 96,315 af Primary=742.74 cfs 96,315 af
Pond 16P: Pond - Upstream of Chapel	Peak Elev=158.72' Storage=4.719 af Inflow=550.37 cfs 57,088 af Outflow=505.35 cfs 57,088 af

Total Runoff Area = 168.620 ac Runoff Volume = 96.315 af Average Runoff Depth = 6.85"
90.21% Pervious = 152.110 ac 9.79% Impervious = 16.510 ac

Summary for Subcatchment H1: Farmland North of Trapelo Road

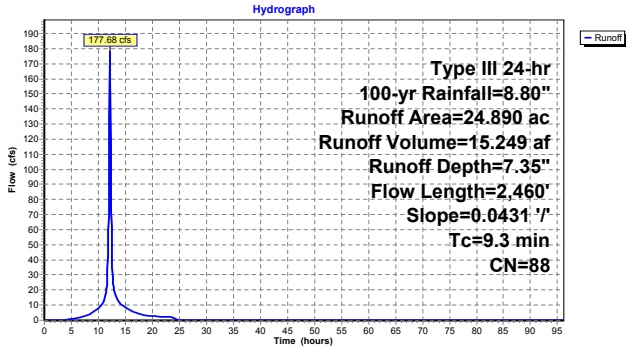
Runoff = 177.68 cfs @ 12.13 hrs, Volume= 15.249 af, Depth= 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
24.890	88	Row crops, straight row, Poor, HSG C
24.890		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.0431	0.18		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
2.7	300	0.0431	1.87		Shallow Concentrated Flow, Shallow Conc Cultivated Straight Rows Kv= 9.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.3	2,460				Total

Subcatchment H1: Farmland North of Trapelo Road



Summary for Subcatchment H10: Admin Bldg and Pearlman Bldg

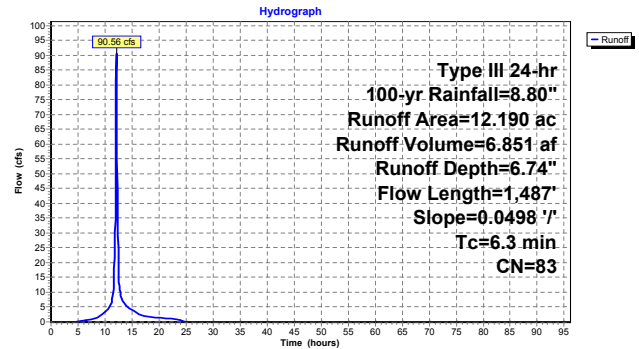
Runoff = 90.56 cfs @ 12.09 hrs, Volume= 6.851 af, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
9.560	79	50-75% Grass cover, Fair, HSG C
2.630	98	Roads, Roof and Paved parking, HSG C
12.190	83	Weighted Average
9.560		78.42% Pervious Area
2.630		21.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487				Total

Subcatchment H10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment H11: Admin Bldg and Pearlman Bldg

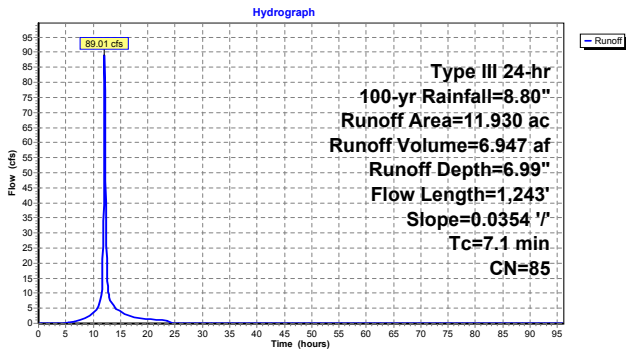
Runoff = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243				Total

Subcatchment H11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment H12: Tarbell House, Farm and Grounds Dept

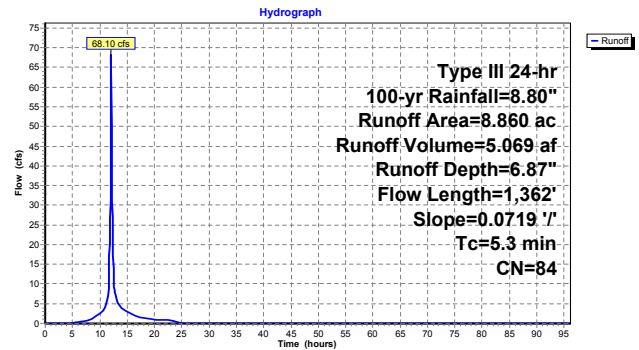
Runoff = 68.10 cfs @ 12.08 hrs, Volume= 5.069 af, Depth= 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.300	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
8.860	84	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362				Total

Subcatchment H12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment H13: Maintenance Workshops Area

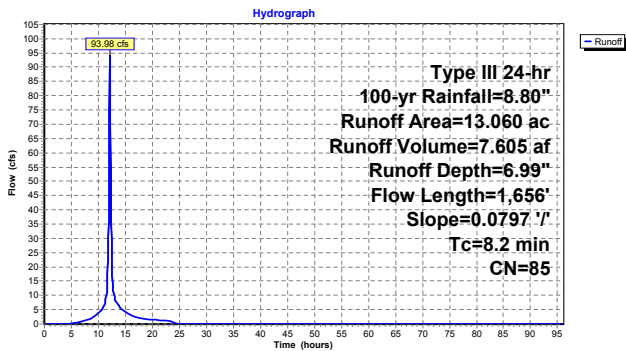
Runoff = 93.98 cfs @ 12.11 hrs, Volume= 7.605 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment H13: Maintenance Workshops Area



Summary for Subcatchment H14: Maintenance Workshops Area

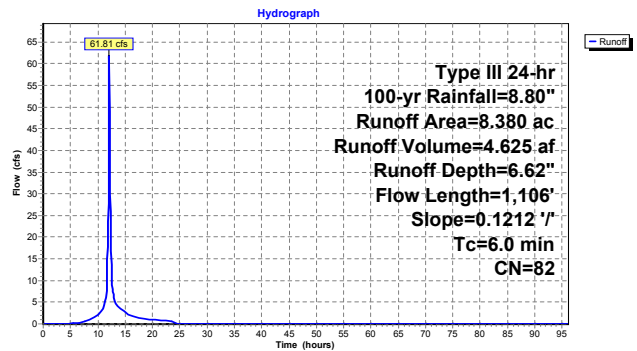
Runoff = 61.81 cfs @ 12.09 hrs, Volume= 4.625 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment H14: Maintenance Workshops Area



Summary for Subcatchment H2: Woodlands

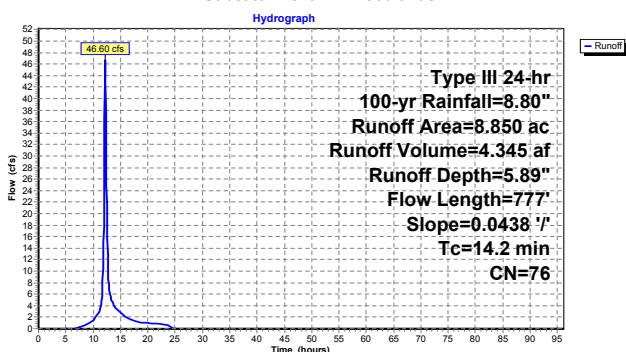
Runoff = 46.60 cfs @ 12.20 hrs, Volume= 4.345 af, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
8.850	76	Woods/grass comb., Fair, HSG C
8.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	50	0.0438	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
4.8	300	0.0438	1.05		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
14.2	777	Total			

Subcatchment H2: Woodlands



Summary for Subcatchment H3: Woodlands

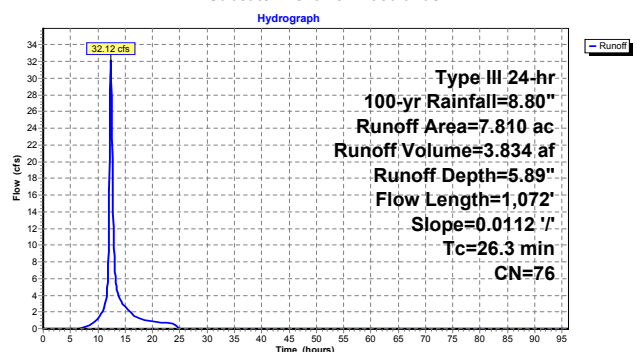
Runoff = 32.12 cfs @ 12.36 hrs, Volume= 3.834 af, Depth= 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.810	76	Woods/grass comb., Fair, HSG C
7.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	50	0.0112	0.05		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
9.4	300	0.0112	0.53		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
26.3	1,072	Total			

Subcatchment H3: Woodlands



Summary for Subcatchment H4: Farmland (Former Daycare Center)

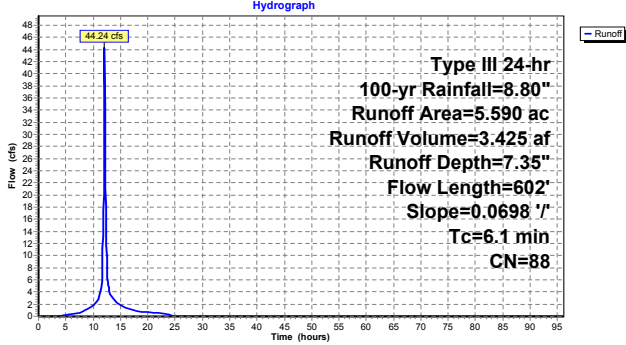
Runoff = 44.24 cfs @ 12.09 hrs, Volume= 3.425 af, Depth= 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
5.590	88	Row crops, straight row, Poor, HSG C
5.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	50	0.0698	0.22		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
2.1	300	0.0698	2.38		Shallow Concentrated Flow, Shallow Conc Cultivated Straight Rows Kv= 9.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	602	Total			

Subcatchment H4: Farmland (Former Daycare Center)



Summary for Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)

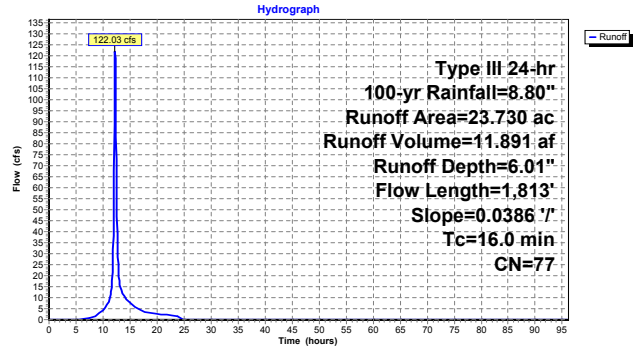
Runoff = 122.03 cfs @ 12.22 hrs, Volume= 11.891 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
23.140	76	Woods/grass comb., Fair, HSG C
0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.730	77	Weighted Average
23.730		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0386	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
5.1	300	0.0386	0.98		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
16.0	1,813	Total			

Subcatchment H5: Woodlands (Currently Area West of Cottages/Greene Bldg)



Summary for Subcatchment H6: Farmland (Currently Area - Cottage Complex West)

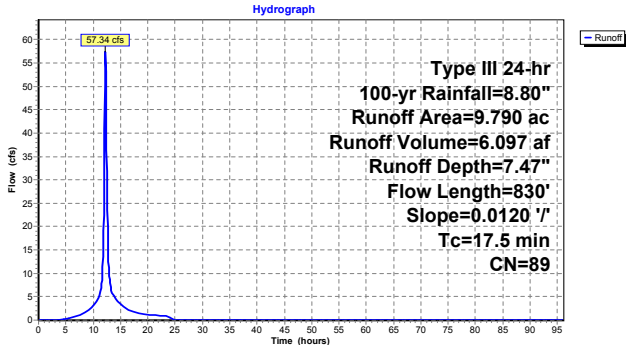
Runoff = 57.34 cfs @ 12.23 hrs, Volume= 6.097 af, Depth= 7.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
8.760	88	Row crops, straight row, Poor, HSG C
1.030	98	Water Surface, 0% imp, HSG C
9.790	89	Weighted Average
9.790		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	50	0.0120	0.11		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 3.23"
9.1	300	0.0120	0.55		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
17.5	830	Total			

Subcatchment H6: Farmland (Currently Area - Cottage Complex West)



Summary for Subcatchment H7: Farmland (Currently - Cottage Complex East)

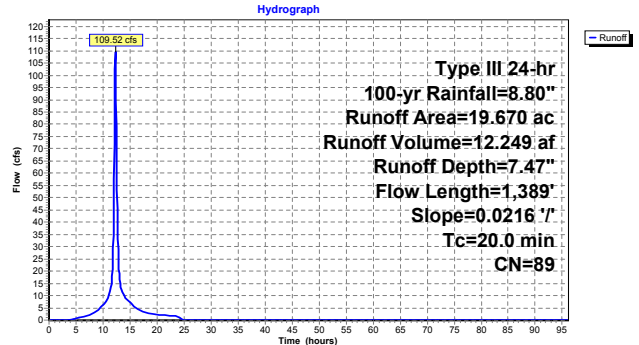
Runoff = 109.52 cfs @ 12.26 hrs, Volume= 12.249 af, Depth= 7.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
18.580	88	Row crops, straight row, Poor, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.670	89	Weighted Average
19.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0216	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23"
6.8	300	0.0216	0.73		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
20.0	1,389	Total			

Subcatchment H7: Farmland (Currently - Cottage Complex East)



Summary for Subcatchment H8: Farmlans (Currently - Chapel Area)

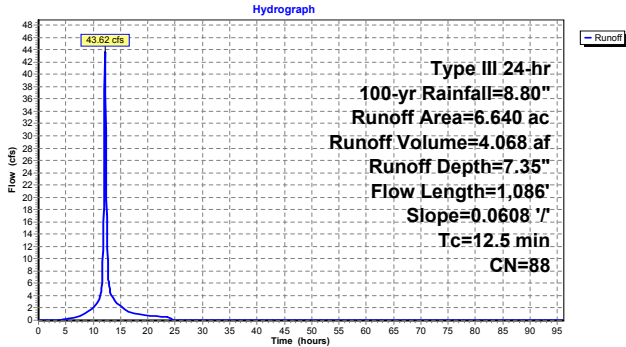
Runoff = 43.62 cfs @ 12.17 hrs, Volume= 4.068 af, Depth= 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.640	88	Row crops, straight row, Poor, HSG C
6.640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0608	0.11		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 3.23" Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
4.1	300	0.0608	1.23		Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
12.5	1,086	Total			

Subcatchment H8: Farmlans (Currently - Chapel Area)



Summary for Subcatchment H9: West Nurses and West Building Area

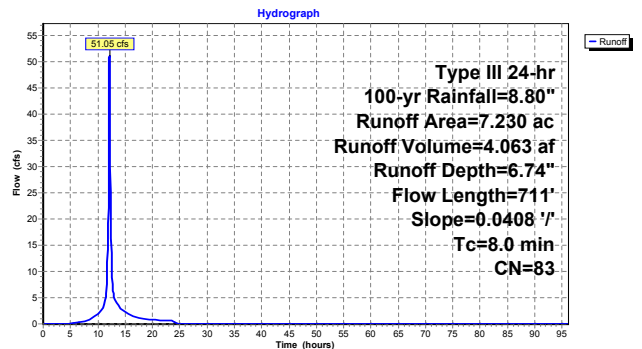
Runoff = 51.05 cfs @ 12.11 hrs, Volume= 4.063 af, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23" Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
3.5	300	0.0408	1.41		Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment H9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 6.99" for 100-yr event
 Inflow = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af
 Outflow = 84.36 cfs @ 12.14 hrs, Volume= 6.947 af, Atten= 5%, Lag= 2.2 min

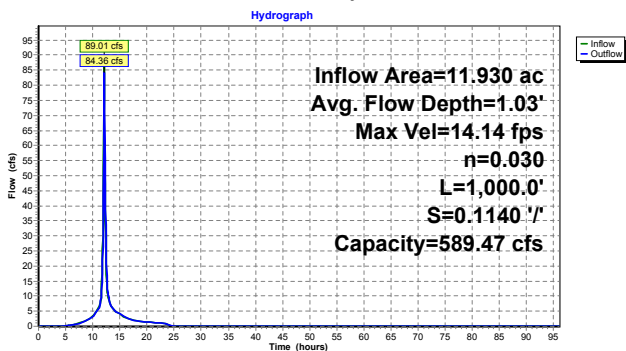
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity = 14.14 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 3.78 fps, Avg. Travel Time= 4.4 min

Peak Storage= 6,176 cf @ 12.12 hrs
 Average Depth at Peak Storage= 1.03'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



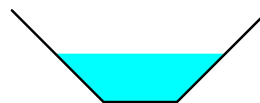
Summary for Reach 5R: Stream Upstream of the Pond

Inflow Area = 47.140 ac, 0.00% Impervious, Inflow Depth = 6.84" for 100-yr event
 Inflow = 276.90 cfs @ 12.13 hrs, Volume= 26.852 af
 Outflow = 267.75 cfs @ 12.20 hrs, Volume= 26.852 af, Atten= 3%, Lag= 4.0 min

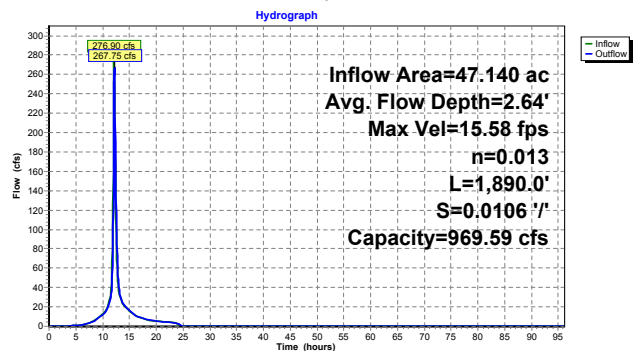
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity = 15.58 fps, Min. Travel Time= 2.0 min
 Avg. Velocity = 4.83 fps, Avg. Travel Time= 6.5 min

Peak Storage= 33,073 cf @ 12.16 hrs
 Average Depth at Peak Storage= 2.64'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 '/' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 '/'
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 5R: Stream Upstream of the Pond



Summary for Reach 8R: Channel - South of Pond to Pine Street

Inflow Area = 106.970 ac, 0.00% Impervious, Inflow Depth = 6.86" for 100-yr event
 Inflow = 538.12 cfs @ 12.28 hrs, Volume= 61.156 af
 Outflow = 535.64 cfs @ 12.30 hrs, Volume= 61.156 af, Atten= 0%, Lag= 1.2 min

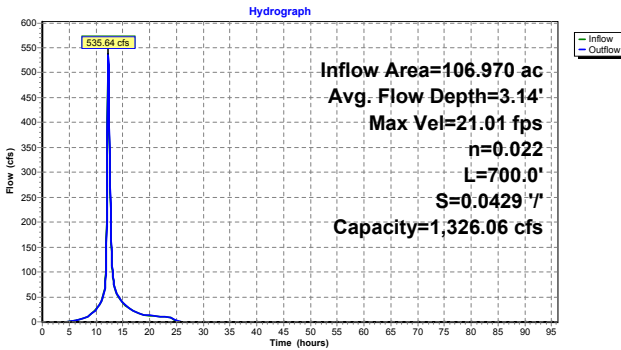
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 21.01 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 5.54 fps, Avg. Travel Time= 2.1 min

Peak Storage= 17,924 cf @ 12.29 hrs
 Average Depth at Peak Storage= 3.14'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Pond to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.390 ac, 3.39% Impervious, Inflow Depth = 6.84" for 100-yr event
 Inflow = 601.36 cfs @ 12.28 hrs, Volume= 72.070 af
 Outflow = 596.78 cfs @ 12.31 hrs, Volume= 72.070 af, Atten= 1%, Lag= 1.8 min

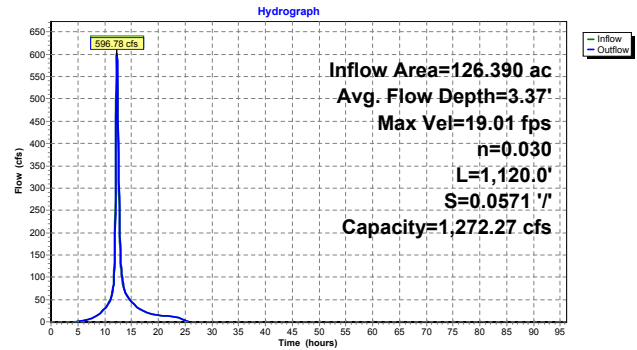
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 19.01 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 4.94 fps, Avg. Travel Time= 3.8 min

Peak Storage= 35,402 cf @ 12.30 hrs
 Average Depth at Peak Storage= 3.37'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

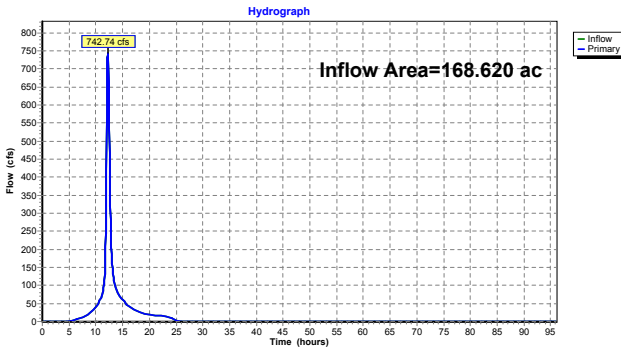


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.620 ac, 9.79% Impervious, Inflow Depth = 6.85" for 100-yr event
 Inflow = 742.74 cfs @ 12.27 hrs, Volume= 96.315 af
 Primary = 742.74 cfs @ 12.27 hrs, Volume= 96.315 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond - Upstream of Chapel

Inflow Area = 100.330 ac, 0.00% Impervious, Inflow Depth = 6.83" for 100-yr event
 Inflow = 550.37 cfs @ 12.21 hrs, Volume= 57.088 af
 Outflow = 505.35 cfs @ 12.29 hrs, Volume= 57.088 af, Atten= 8%, Lag= 4.4 min
 Primary = 505.35 cfs @ 12.29 hrs, Volume= 57.088 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 158.72' @ 12.29 hrs Surf.Area= 0.000 ac Storage= 4.719 af

Plug-Flow detention time= 15.4 min calculated for 57.059 af (100% of inflow)
 Center-of-Mass det. time= 15.5 min (814.8 - 799.3)

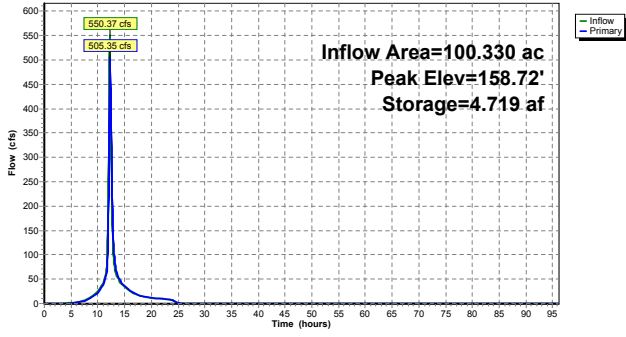
Volume	Invert	Avail. Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum. Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=502.15 cfs @ 12.29 hrs HW=158.70' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 502.15 cfs @ 6.39 fps)

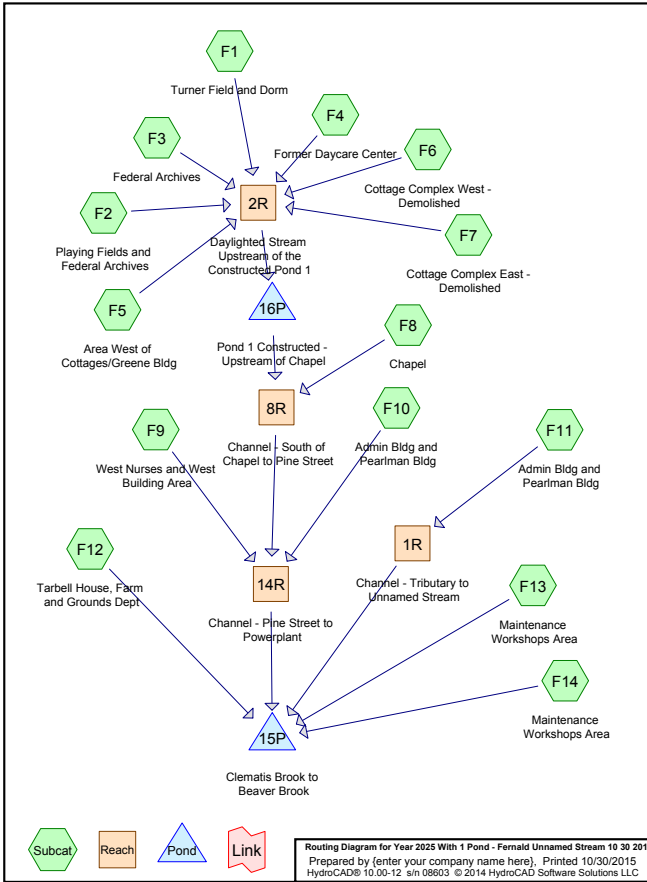
Pond 16P: Pond - Upstream of Chapel

Hydrograph



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
102.800	79	50-75% Grass cover, Fair, HSG C (F1, F10, F11, F12, F13, F14, F2, F3, F4, F5, F8, F9)
26.110	74	>75% Grass cover, Good, HSG C (F6, F7)
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C (F10)
9.350	98	Paved parking and Roof area, HSG C (F2, F3, F4, F5)
10.540	98	Paved parking, HSG C (F1, F13, F9)
1.460	98	Paved parking, roofs, HSG C (F14)
14.740	98	Roads, Roof and Paved parking, HSG C (F10, F11, F12, F7, F8)
2.143	98	Water Surface, 0% imp, HSG C (F12, F6, F7)
1.120	98	Water Surface/Wetlands, 0% imp, HSG C (F2, F4, F5)
168.603	83	TOTAL AREA



Routing Diagram for Year 2025 With 1 Pond - Fernald Unnamed Stream 10 30 2015
Prepared by {enter your company name here}, Printed 10/30/2015
HydroCAD® 10.00-12 s/n 08603 © 2014 HydroCAD Software Solutions LLC

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
168.603	HSG C	F1, F10, F11, F12, F13, F14, F2, F3, F4, F5, F6, F7, F8, F9
0.000	HSG D	
0.000	Other	
168.603	TOTAL AREA	

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatc Number
0.000	0.000	102.800	0.000	0.000	102.800	50-75% Grass cover, Fair	
0.000	0.000	26.110	0.000	0.000	26.110	>75% Grass cover, Good	
0.000	0.000	0.340	0.000	0.000	0.340	Detention Basin, Water Surface, 0% imp	
0.000	0.000	10.540	0.000	0.000	10.540	Paved parking	
0.000	0.000	9.350	0.000	0.000	9.350	Paved parking and Roof area	
0.000	0.000	1.460	0.000	0.000	1.460	Paved parking, roofs	
0.000	0.000	14.740	0.000	0.000	14.740	Roads, Roof and Paved parking	
0.000	0.000	2.143	0.000	0.000	2.143	Water Surface, 0% imp	
0.000	0.000	1.120	0.000	0.000	1.120	Water Surface/Wetlands, 0% imp	
0.000	0.000	168.603	0.000	0.000	168.603	TOTAL AREA	

Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm	Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=1.61" Flow Length=2,460' Slope=0.0431 '/ Tc=9.5 min CN=83 Runoff=40.97 cfs 3.336 af
Subcatchment F10: Admin Bldg and	Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=2.00" Flow Length=1,487' Slope=0.0498 '/ Tc=6.3 min CN=88 Runoff=27.66 cfs 2.029 af
Subcatchment F11: Admin Bldg and	Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=1.76" Flow Length=1,243' Slope=0.0354 '/ Tc=7.1 min CN=85 Runoff=23.37 cfs 1.747 af
Subcatchment F12: Tarbell House, Farm	Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=1.76" Flow Length=1,362' Slope=0.0719 '/ Tc=5.3 min CN=85 Runoff=18.17 cfs 1.298 af
Subcatchment F13: Maintenance	Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=1.76" Flow Length=1,656' Slope=0.0797 '/ Tc=8.2 min CN=85 Runoff=24.62 cfs 1.913 af
Subcatchment F14: Maintenance	Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=1.54" Flow Length=1,106' Slope=0.1212 '/ Tc=6.0 min CN=82 Runoff=14.77 cfs 1.074 af
Subcatchment F2: Playing Fields and	Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=1.54" Flow Length=777' Slope=0.0438 '/ Tc=6.1 min CN=82 Runoff=15.56 cfs 1.134 af
Subcatchment F3: Federal Archives	Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=2.26" Flow Length=1,072' Slope=0.0112 '/ Tc=4.6 min CN=91 Runoff=20.81 cfs 1.470 af
Subcatchment F4: Former Daycare Center	Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=1.40" Flow Length=602' Slope=0.0698 '/ Tc=4.9 min CN=80 Runoff=9.14 cfs 0.653 af
Subcatchment F5: Area West of	Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=1.54" Flow Length=1,813' Slope=0.0386 '/ Tc=7.5 min CN=82 Runoff=39.98 cfs 3.043 af
Subcatchment F6: Cottage Complex West -	Runoff Area=9.793 ac 0.00% Impervious Runoff Depth=1.21" Flow Length=830' Slope=0.0120 '/ Tc=13.8 min CN=77 Runoff=10.46 cfs 0.989 af
Subcatchment F7: Cottage Complex East -	Runoff Area=19.660 ac 6.21% Impervious Runoff Depth=1.21" Flow Length=1,389' Slope=0.0216 '/ Tc=11.5 min CN=77 Runoff=22.43 cfs 1.985 af
Subcatchment F8: Chapel	Runoff Area=6.630 ac 25.49% Impervious Runoff Depth=1.68" Flow Length=1,086' Slope=0.0608 '/ Tc=5.5 min CN=84 Runoff=12.96 cfs 0.929 af
Subcatchment F9: West Nurses and West	Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=1.61" Flow Length=711' Slope=0.0408 '/ Tc=8.0 min CN=83 Runoff=12.54 cfs 0.970 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.46' Max Vel=8.96 fps Inflow=23.37 cfs 1.747 af n=0.030 L=1,000.0' S=0.1140 '/ Capacity=589.47 cfs Outflow=22.00 cfs 1.747 af
Reach 2R: Daylighted Stream	Avg. Flow Depth=1.87' Max Vel=13.15 fps Inflow=150.05 cfs 12.611 af n=0.013 L=1,890.0' S=0.0106 '/ Capacity=969.59 cfs Outflow=142.32 cfs 12.611 af

Reach 8R: Channel - South of	Avg. Flow Depth=1.32' Max Vel=13.54 fps Inflow=113.34 cfs 13.540 af n=0.022 L=700.0' S=0.0429 '/ Capacity=1,326.06 cfs Outflow=112.31 cfs 13.540 af
Reach 14R: Channel - Pine Street to	Avg. Flow Depth=1.42' Max Vel=12.26 fps Inflow=130.17 cfs 16.538 af n=0.030 L=1,120.0' S=0.0571 '/ Capacity=1,272.27 cfs Outflow=128.86 cfs 16.538 af
Pond 15P: Clematis Brook to Beaver Brook	Inflow=165.07 cfs 22.570 af Primary=165.07 cfs 22.570 af
Pond 16P: Pond 1 Constructed -	Peak Elev=155.87' Storage=1.870 af Inflow=142.32 cfs 12.611 af Outflow=107.87 cfs 12.611 af

**Total Runoff Area = 168.603 ac Runoff Volume = 22.570 af Average Runoff Depth = 1.61"
 78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac**

Summary for Subcatchment F1: Turner Field and Dorm

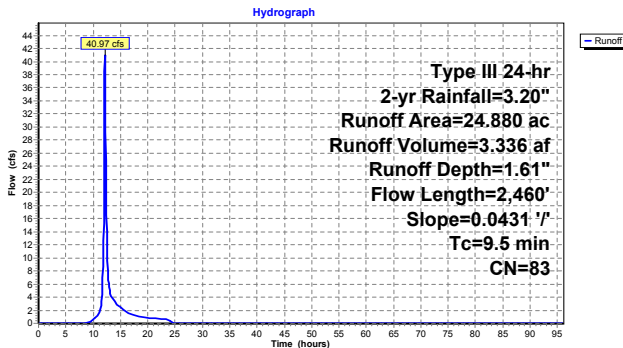
Runoff = 40.97 cfs @ 12.14 hrs, Volume= 3.336 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span=0.00-96.00 hrs, dt=0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

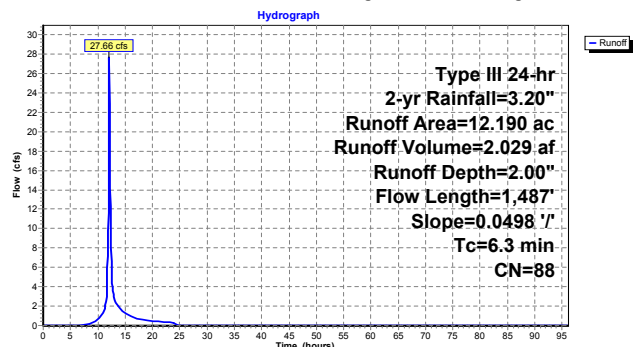
Runoff = 27.66 cfs @ 12.09 hrs, Volume= 2.029 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span=0.00-96.00 hrs, dt=0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

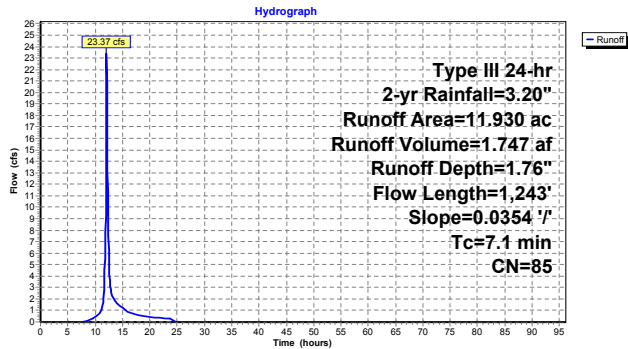
Runoff = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

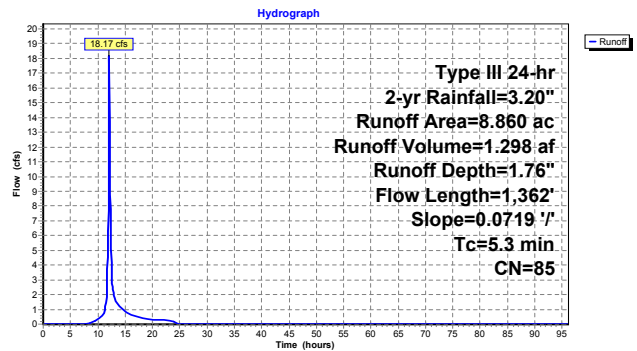
Runoff = 18.17 cfs @ 12.08 hrs, Volume= 1.298 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

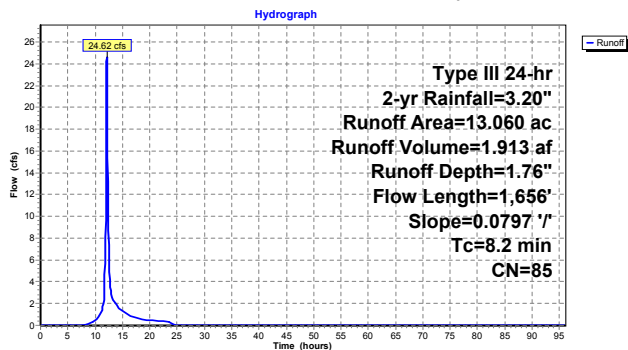
Runoff = 24.62 cfs @ 12.12 hrs, Volume= 1.913 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

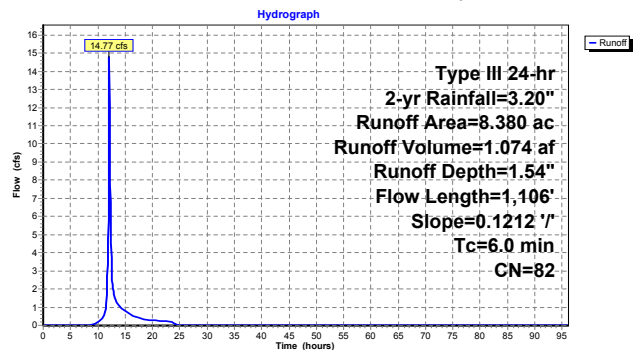
Runoff = 14.77 cfs @ 12.09 hrs, Volume= 1.074 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

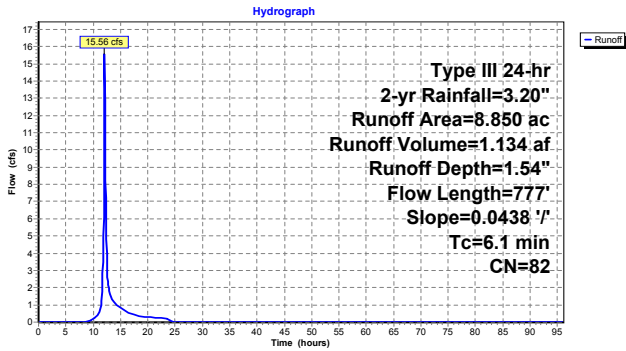
Runoff = 15.56 cfs @ 12.10 hrs, Volume= 1.134 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
* 1.030	98	Paved parking and Roof area, HSG C
* 0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777	Total			

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

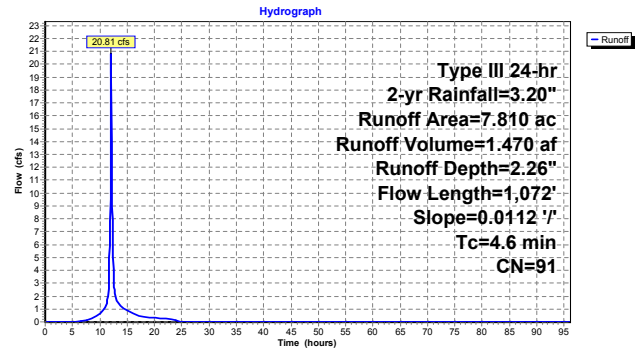
Runoff = 20.81 cfs @ 12.07 hrs, Volume= 1.470 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
* 4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

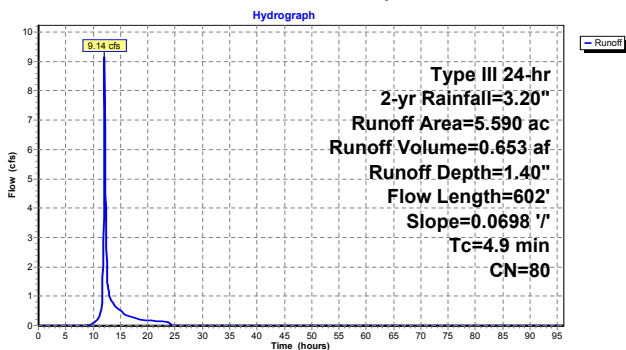
Runoff = 9.14 cfs @ 12.08 hrs, Volume= 0.653 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

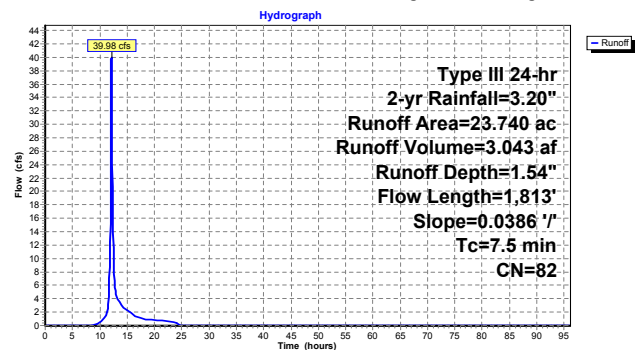
Runoff = 39.98 cfs @ 12.11 hrs, Volume= 3.043 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

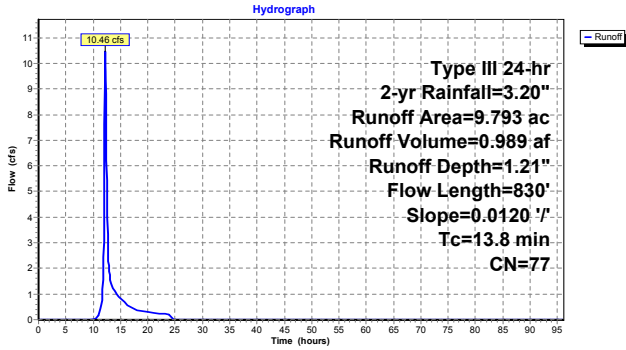
Runoff = 10.46 cfs @ 12.20 hrs, Volume= 0.989 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830				Total

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

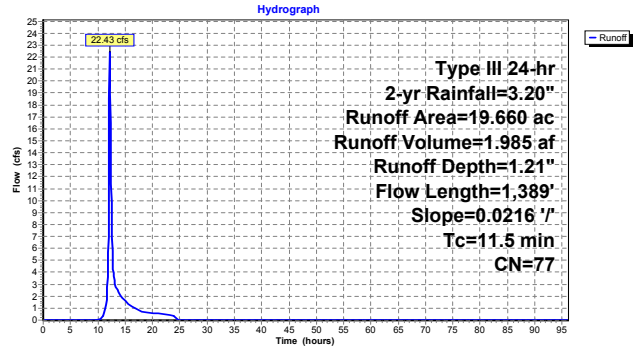
Runoff = 22.43 cfs @ 12.17 hrs, Volume= 1.985 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

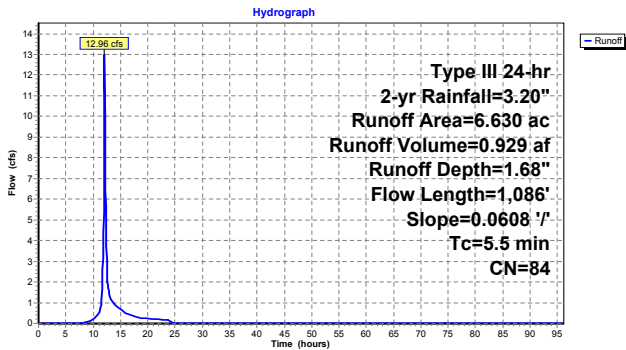
Runoff = 12.96 cfs @ 12.09 hrs, Volume= 0.929 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



Summary for Subcatchment F9: West Nurses and West Building Area

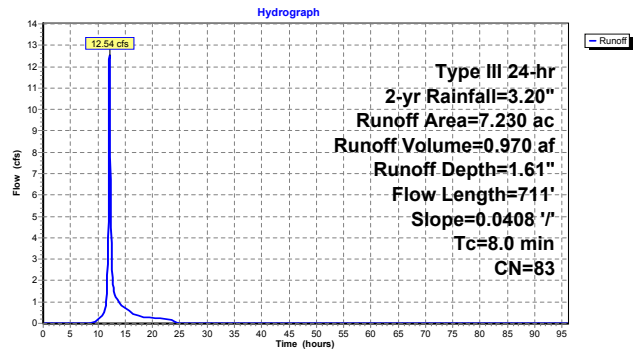
Runoff = 12.54 cfs @ 12.12 hrs, Volume= 0.970 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 1.76" for 2-yr event
 Inflow = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af
 Outflow = 22.00 cfs @ 12.16 hrs, Volume= 1.747 af, Atten= 6%, Lag= 3.4 min

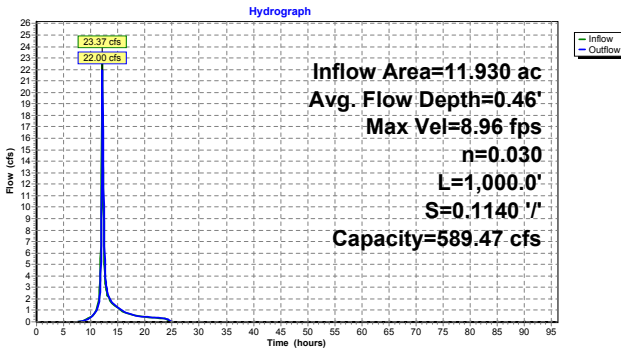
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.96 fps, Min. Travel Time= 1.9 min
 Avg. Velocity = 2.57 fps, Avg. Travel Time= 6.5 min

Peak Storage= 2,492 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.46'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 ' / '
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



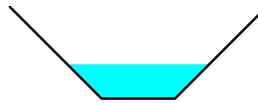
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 1.51" for 2-yr event
 Inflow = 150.05 cfs @ 12.12 hrs, Volume= 12.611 af
 Outflow = 142.32 cfs @ 12.20 hrs, Volume= 12.611 af, Atten= 5%, Lag= 4.7 min

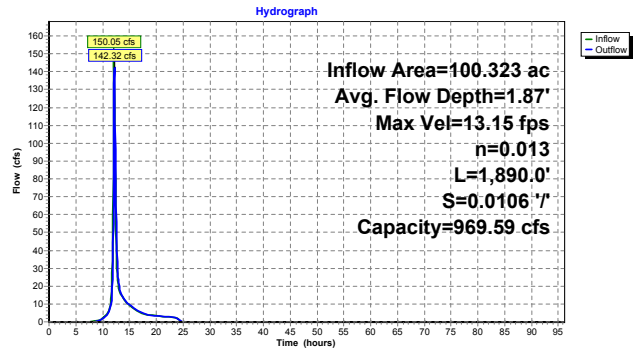
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.15 fps, Min. Travel Time= 2.4 min
 Avg. Velocity = 3.86 fps, Avg. Travel Time= 8.2 min

Peak Storage= 20,766 cf @ 12.15 hrs
 Average Depth at Peak Storage= 1.87'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 1.52" for 2-yr event
 Inflow = 112.31 cfs @ 12.31 hrs, Volume= 13.540 af
 Outflow = 112.31 cfs @ 12.34 hrs, Volume= 13.540 af, Atten= 1%, Lag= 1.7 min

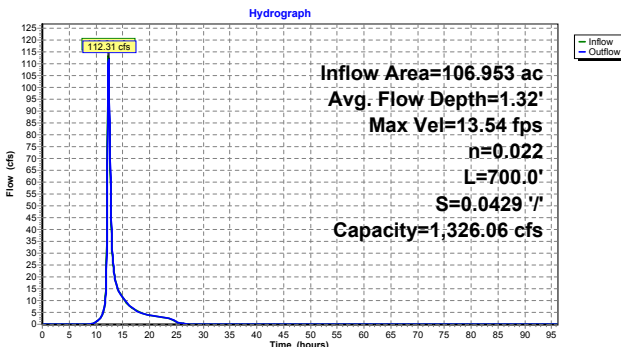
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.54 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 3.63 fps, Avg. Travel Time= 3.2 min

Peak Storage= 5,847 cf @ 12.32 hrs
 Average Depth at Peak Storage= 1.32'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



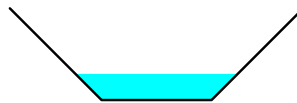
Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 1.57" for 2-yr event
 Inflow = 128.86 cfs @ 12.32 hrs, Volume= 16.538 af
 Outflow = 128.86 cfs @ 12.37 hrs, Volume= 16.538 af, Atten= 1%, Lag= 2.8 min

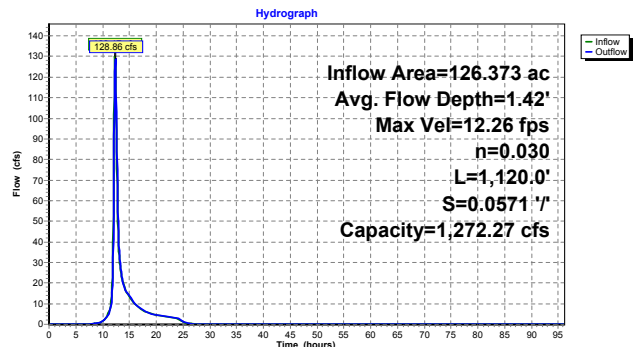
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.26 fps, Min. Travel Time= 1.5 min
 Avg. Velocity = 3.26 fps, Avg. Travel Time= 5.7 min

Peak Storage= 11,837 cf @ 12.34 hrs
 Average Depth at Peak Storage= 1.42'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

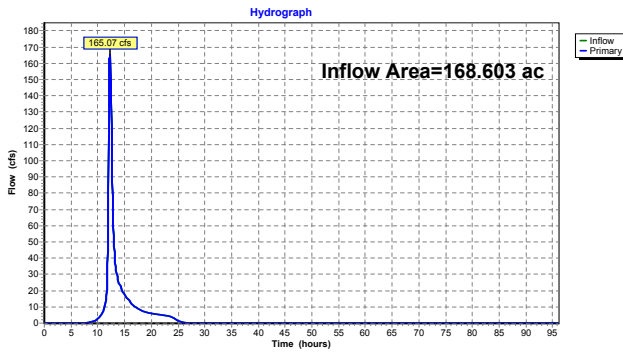


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 1.61" for 2-yr event
 Inflow = 165.07 cfs @ 12.33 hrs, Volume= 22,570 af
 Primary = 165.07 cfs @ 12.33 hrs, Volume= 22,570 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 1.51" for 2-yr event
 Inflow = 142.32 cfs @ 12.20 hrs, Volume= 12,611 af
 Outflow = 107.87 cfs @ 12.32 hrs, Volume= 12,611 af, Atten= 24%, Lag= 7.3 min
 Primary = 107.87 cfs @ 12.32 hrs, Volume= 12,611 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 155.87' @ 12.32 hrs Surf.Area= 0.000 ac Storage= 1.870 af

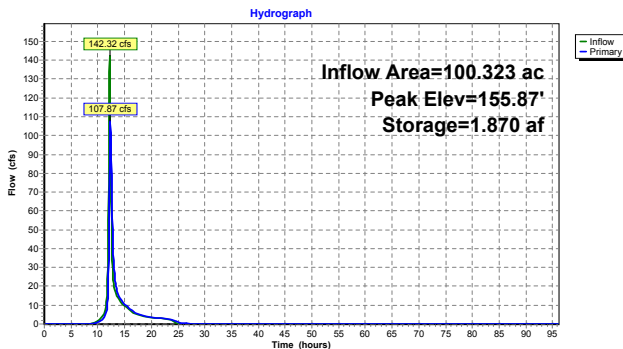
Plug-Flow detention time= 25.0 min calculated for 12,604 af (100% of inflow)
 Center-of-Mass det. time= 25.2 min (870.3 - 845.1)

Volume #1	Invert	Avail. Storage	Storage Description
	154.00'	8,000 af	Custom Stage Data Listed below
Elevation (feet)	Cum. Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=107.03 cfs @ 12.32 hrs HW=155.86' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 107.03 cfs @ 4.15 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm	Runoff Area=24,880 ac 18.85% Impervious Runoff Depth=3.03" Flow Length=2,460' Slope=0.0431 1/ Tc=9.5 min CN=83 Runoff=77.00 cfs 3,282 af
Subcatchment F10: Admin Bldg and	Runoff Area=12,190 ac 43.15% Impervious Runoff Depth=3.52" Flow Length=1,487' Slope=0.0498 1/ Tc=6.3 min CN=88 Runoff=47.79 cfs 3,573 af
Subcatchment F11: Admin Bldg and	Runoff Area=11,930 ac 33.61% Impervious Runoff Depth=3.22" Flow Length=1,243' Slope=0.0354 1/ Tc=7.1 min CN=85 Runoff=42.44 cfs 3,202 af
Subcatchment F12: Tarbell House, Farm	Runoff Area=8,860 ac 28.89% Impervious Runoff Depth=3.22" Flow Length=1,362' Slope=0.0719 1/ Tc=5.3 min CN=85 Runoff=32.92 cfs 2,378 af
Subcatchment F13: Maintenance	Runoff Area=13,060 ac 32.16% Impervious Runoff Depth=3.22" Flow Length=1,656' Slope=0.0797 1/ Tc=8.2 min CN=85 Runoff=44.75 cfs 3,505 af
Subcatchment F14: Maintenance	Runoff Area=8,380 ac 17.42% Impervious Runoff Depth=2.94" Flow Length=1,106' Slope=0.1212 1/ Tc=6.0 min CN=82 Runoff=28.20 cfs 2,051 af
Subcatchment F2: Playing Fields and	Runoff Area=8,850 ac 11.64% Impervious Runoff Depth=2.94" Flow Length=777' Slope=0.0438 1/ Tc=6.1 min CN=82 Runoff=29.72 cfs 2,166 af
Subcatchment F3: Federal Archives	Runoff Area=7,810 ac 61.46% Impervious Runoff Depth=3.83" Flow Length=1,072' Slope=0.0112 1/ Tc=4.6 min CN=91 Runoff=34.41 cfs 2,491 af
Subcatchment F4: Former Daycare Center	Runoff Area=5,590 ac 1.07% Impervious Runoff Depth=2.75" Flow Length=602' Slope=0.0698 1/ Tc=4.9 min CN=80 Runoff=18.09 cfs 1,283 af
Subcatchment F5: Area West of	Runoff Area=23,740 ac 14.57% Impervious Runoff Depth=2.94" Flow Length=1,813' Slope=0.0386 1/ Tc=7.5 min CN=82 Runoff=76.52 cfs 5,809 af
Subcatchment F6: Cottage Complex West -	Runoff Area=9,793 ac 0.00% Impervious Runoff Depth=2.49" Flow Length=830' Slope=0.0120 1/ Tc=13.8 min CN=77 Runoff=22.13 cfs 2,032 af
Subcatchment F7: Cottage Complex East -	Runoff Area=19,660 ac 6.21% Impervious Runoff Depth=2.49" Flow Length=1,389' Slope=0.0216 1/ Tc=11.5 min CN=77 Runoff=47.47 cfs 4,079 af
Subcatchment F8: Chapel	Runoff Area=6,630 ac 25.49% Impervious Runoff Depth=3.12" Flow Length=1,086' Slope=0.0608 1/ Tc=5.5 min CN=84 Runoff=23.88 cfs 1,726 af
Subcatchment F9: West Nurses and West	Runoff Area=7,230 ac 22.82% Impervious Runoff Depth=3.03" Flow Length=711' Slope=0.0408 1/ Tc=8.0 min CN=83 Runoff=23.59 cfs 1,825 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.66' Max Vel=11.04 fps Inflow=42.44 cfs 3,202 af n=0.030 L=1,000.0' S=0.1140 1/ Capacity=589.47 cfs Outflow=40.10 cfs 3,202 af
Reach 2R: Daylighted Stream	Avg. Flow Depth=2.67' Max Vel=15.70 fps Inflow=288.88 cfs 24,141 af n=0.013 L=1,890.0' S=0.0106 1/ Capacity=969.59 cfs Outflow=273.74 cfs 24,141 af

Reach 8R: Channel - South of Avg. Flow Depth=2.02' Max Vel=16.81 fps Inflow=239.37 cfs 25.867 af
 n=0.022 L=700.0' S=0.0429'/' Capacity=1,326.06 cfs Outflow=236.69 cfs 25.867 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=2.17' Max Vel=15.25 fps Inflow=271.34 cfs 31.265 af
 n=0.030 L=1,120.0' S=0.0571'/' Capacity=1,272.27 cfs Outflow=268.47 cfs 31.265 af

Pond 15P: Clematis Brook to Beaver Brook
 Inflow=342.18 cfs 42.400 af
 Primary=342.18 cfs 42.400 af

Pond 16P: Pond 1 Constructed - Peak Elev=156.96' Storage=2.960 af Inflow=273.74 cfs 24.141 af
 Outflow=228.61 cfs 24.141 af

Total Runoff Area = 168.603 ac Runoff Volume = 42.400 af Average Runoff Depth = 3.02"
78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

Summary for Subcatchment F1: Turner Field and Dorm

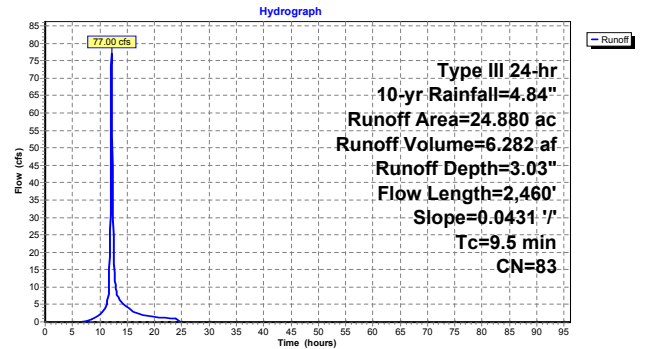
Runoff = 77.00 cfs @ 12.14 hrs, Volume= 6.282 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

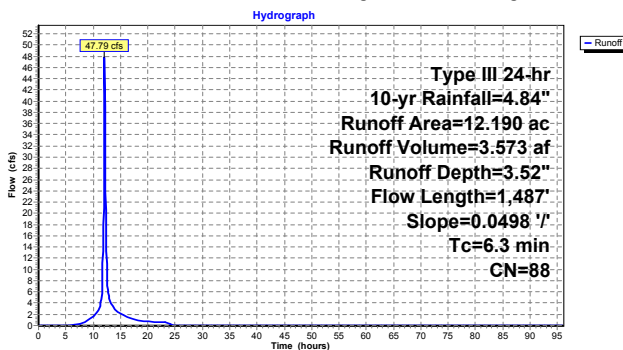
Runoff = 47.79 cfs @ 12.09 hrs, Volume= 3.573 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

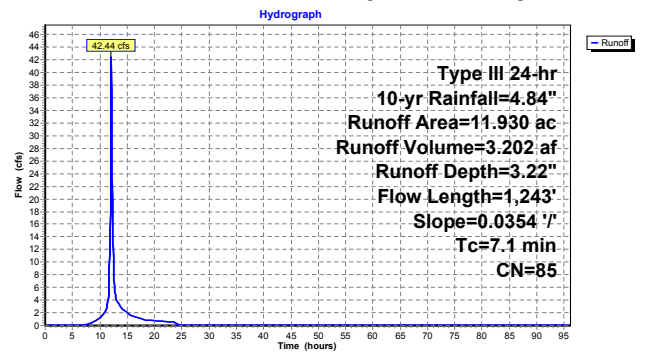
Runoff = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

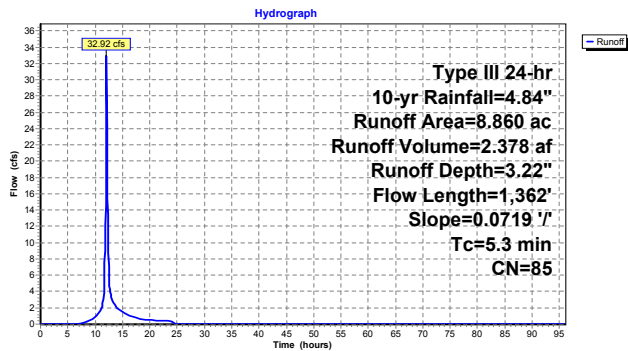
Runoff = 32.92 cfs @ 12.08 hrs, Volume= 2.378 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362				Total

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

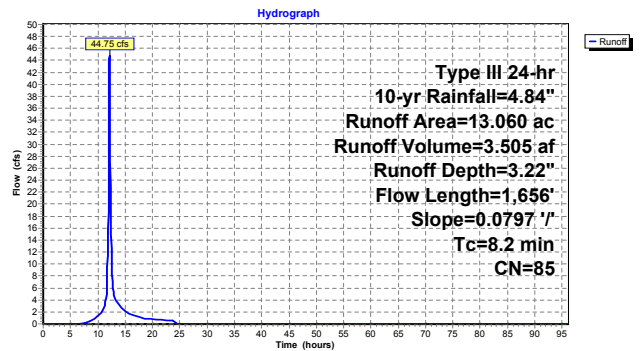
Runoff = 44.75 cfs @ 12.12 hrs, Volume= 3.505 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

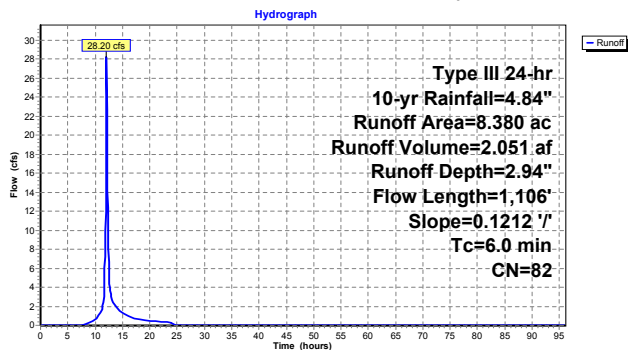
Runoff = 28.20 cfs @ 12.09 hrs, Volume= 2.051 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

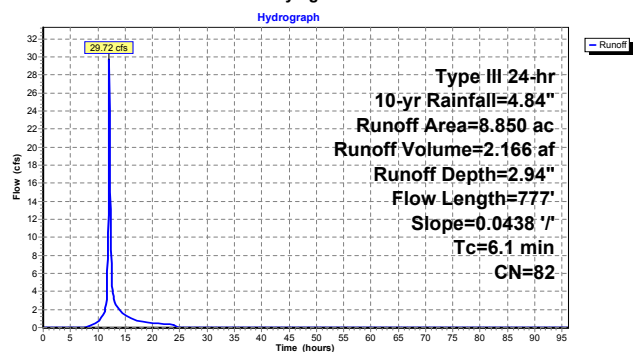
Runoff = 29.72 cfs @ 12.09 hrs, Volume= 2.166 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

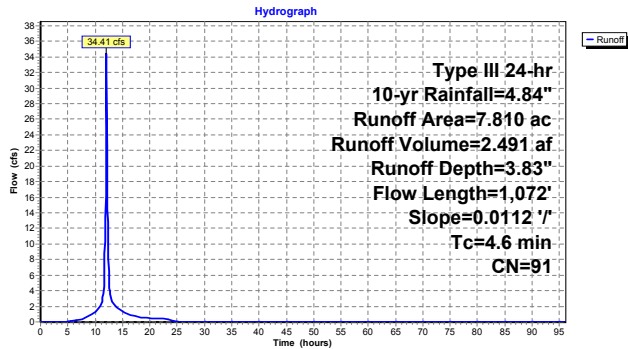
Runoff = 34.41 cfs @ 12.07 hrs, Volume= 2.491 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

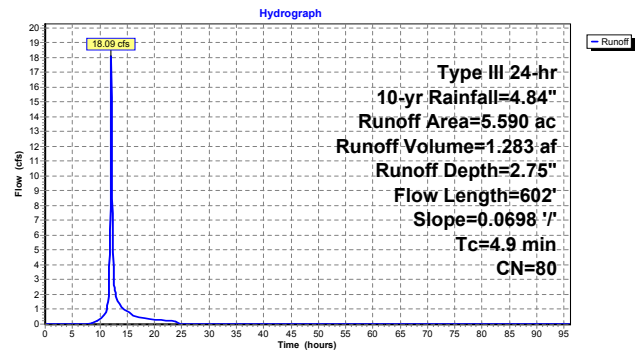
Runoff = 18.09 cfs @ 12.08 hrs, Volume= 1.283 af, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
0.060	98	Paved parking and Roof area, HSG C
0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

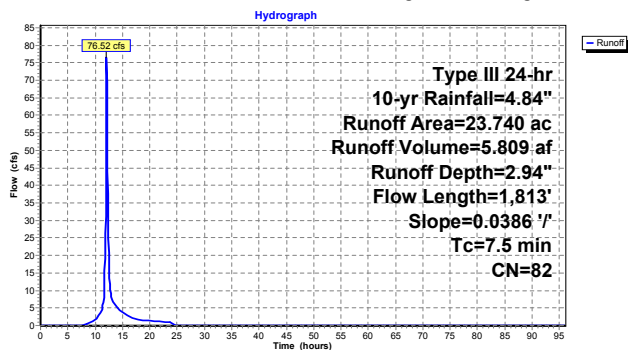
Runoff = 76.52 cfs @ 12.11 hrs, Volume= 5.809 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
3.460	98	Paved parking and Roof area, HSG C
0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

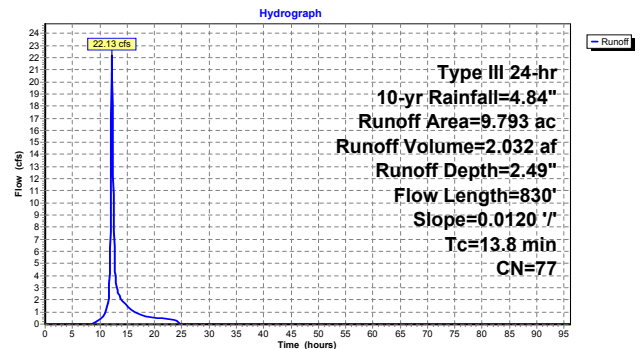
Runoff = 22.13 cfs @ 12.20 hrs, Volume= 2.032 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830	Total			

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

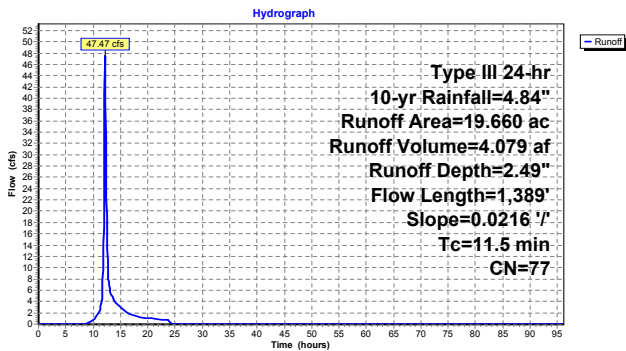
Runoff = 47.47 cfs @ 12.16 hrs, Volume= 4.079 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

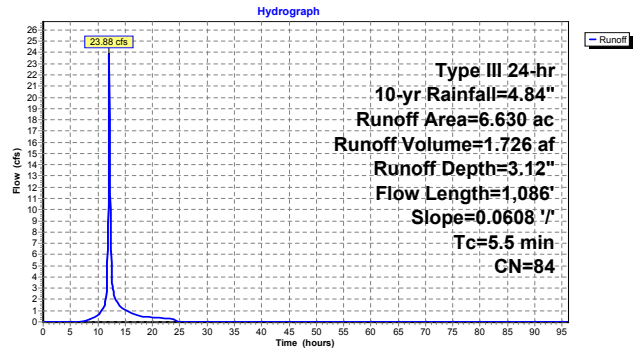
Runoff = 23.88 cfs @ 12.08 hrs, Volume= 1.726 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



Summary for Subcatchment F9: West Nurses and West Building Area

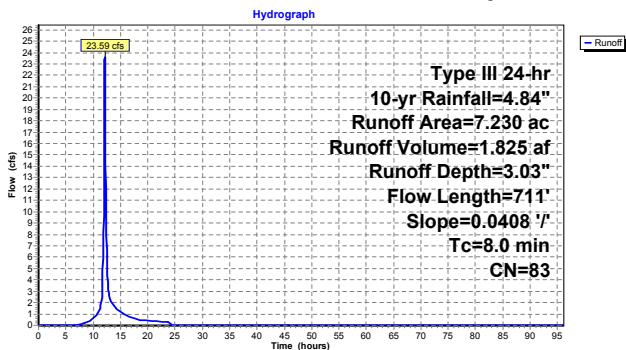
Runoff = 23.59 cfs @ 12.11 hrs, Volume= 1.825 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 3.22" for 10-yr event
 Inflow = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af
 Outflow = 40.10 cfs @ 12.15 hrs, Volume= 3.202 af, Atten= 6%, Lag= 2.8 min

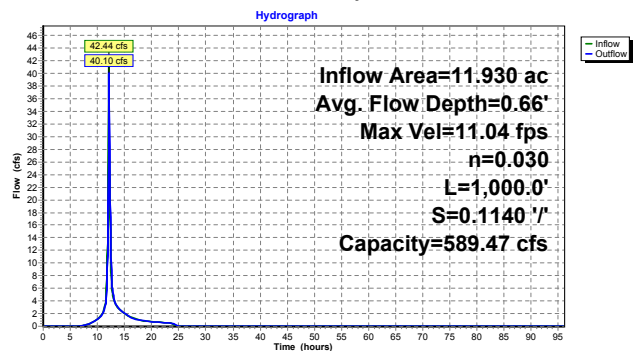
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 11.04 fps, Min. Travel Time= 1.5 min
 Avg. Velocity= 3.03 fps, Avg. Travel Time= 5.5 min

Peak Storage= 3,724 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.66'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0 '/' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



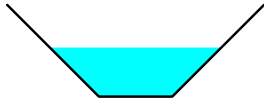
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 2.89" for 10-yr event
 Inflow = 288.88 cfs @ 12.11 hrs, Volume= 24.141 af
 Outflow = 273.74 cfs @ 12.18 hrs, Volume= 24.141 af, Atten= 5%, Lag= 3.9 min

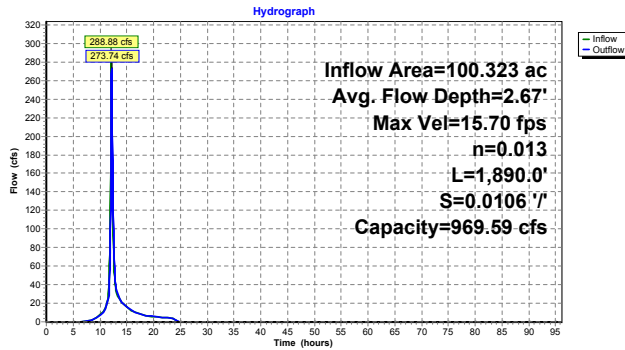
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 15.70 fps, Min. Travel Time= 2.0 min
 Avg. Velocity = 4.58 fps, Avg. Travel Time= 6.9 min

Peak Storage= 33,728 cf @ 12.15 hrs
 Average Depth at Peak Storage= 2.67"
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



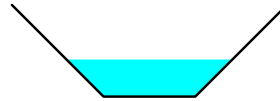
Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 2.90" for 10-yr event
 Inflow = 239.37 cfs @ 12.27 hrs, Volume= 25.867 af
 Outflow = 236.69 cfs @ 12.29 hrs, Volume= 25.867 af, Atten= 1%, Lag= 1.4 min

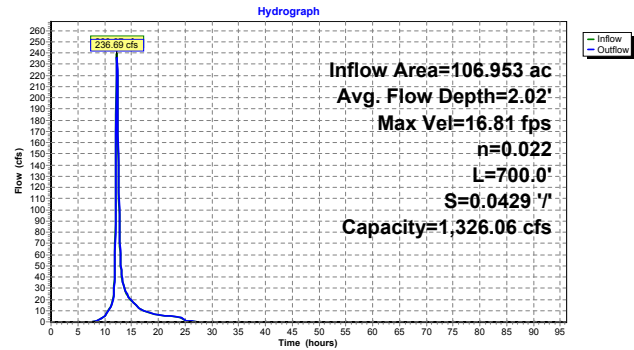
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.81 fps, Min. Travel Time= 0.7 min
 Avg. Velocity = 4.25 fps, Avg. Travel Time= 2.7 min

Peak Storage= 9,932 cf @ 12.27 hrs
 Average Depth at Peak Storage= 2.02"
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 2.97" for 10-yr event
 Inflow = 271.34 cfs @ 12.27 hrs, Volume= 31.265 af
 Outflow = 268.47 cfs @ 12.31 hrs, Volume= 31.265 af, Atten= 1%, Lag= 2.2 min

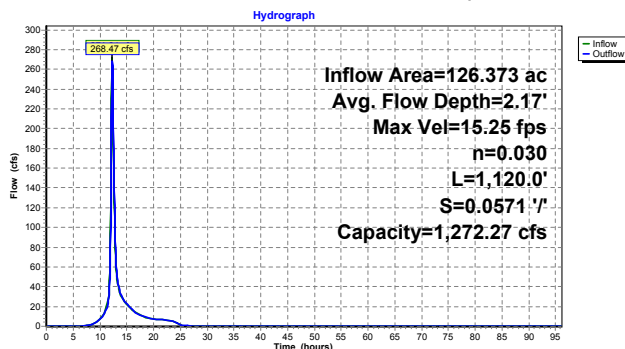
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 15.25 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 3.83 fps, Avg. Travel Time= 4.9 min

Peak Storage= 19,875 cf @ 12.29 hrs
 Average Depth at Peak Storage= 2.17"
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

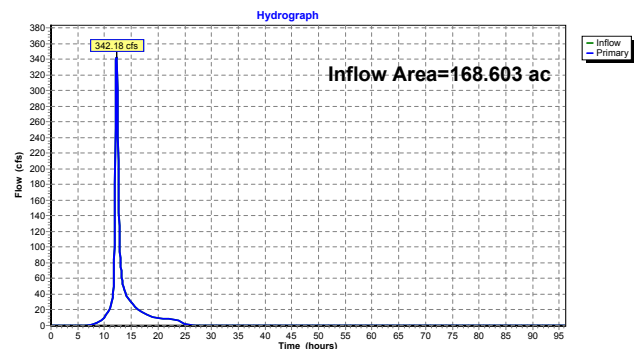


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 3.02" for 10-yr event
 Inflow = 342.18 cfs @ 12.24 hrs, Volume= 42.400 af
 Primary = 342.18 cfs @ 12.24 hrs, Volume= 42.400 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 2.89" for 10-yr event
 Inflow = 273.74 cfs @ 12.18 hrs, Volume= 24.141 af
 Outflow = 228.61 cfs @ 12.27 hrs, Volume= 24.141 af, Atten= 16%, Lag= 5.4 min
 Primary = 228.61 cfs @ 12.27 hrs, Volume= 24.141 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 156.96' @ 12.27 hrs Surf.Area= 0.000 ac Storage= 2.960 af

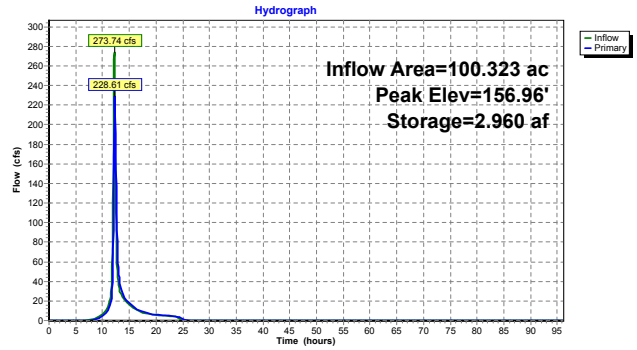
Plug-Flow detention time= 20.1 min calculated for 24.128 af (100% of inflow)
 Center-of-Mass det. time= 20.3 min (846.2 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8,000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=225.90 cfs @ 12.27 hrs HW=156.94' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 225.90 cfs @ 5.15 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=4.22"
 Flow Length=2,460' Slope=0.0431 '/' Tc=9.5 min CN=83 Runoff=106.33 cfs 4,753 af

Subcatchment F10: Admin Bldg and Runoff Area=12,190 ac 43.15% Impervious Runoff Depth=4.76"
 Flow Length=1,487' Slope=0.0498 '/' Tc=6.3 min CN=88 Runoff=63.73 cfs 4,836 af

Subcatchment F11: Admin Bldg and Runoff Area=11,930 ac 33.61% Impervious Runoff Depth=4.43"
 Flow Length=1,243' Slope=0.0354 '/' Tc=7.1 min CN=85 Runoff=57.76 cfs 4,409 af

Subcatchment F12: Tarbell House, Farm Runoff Area=8,860 ac 28.89% Impervious Runoff Depth=4.43"
 Flow Length=1,362' Slope=0.0719 '/' Tc=5.3 min CN=85 Runoff=44.78 cfs 3,274 af

Subcatchment F13: Maintenance Runoff Area=13,060 ac 32.16% Impervious Runoff Depth=4.43"
 Flow Length=1,656' Slope=0.0797 '/' Tc=8.2 min CN=85 Runoff=60.95 cfs 4,826 af

Subcatchment F14: Maintenance Runoff Area=8,380 ac 17.42% Impervious Runoff Depth=4.12"
 Flow Length=1,106' Slope=0.1212 '/' Tc=6.0 min CN=82 Runoff=39.19 cfs 2,874 af

Subcatchment F2: Playing Fields and Runoff Area=8,850 ac 11.64% Impervious Runoff Depth=4.12"
 Flow Length=777' Slope=0.0438 '/' Tc=6.1 min CN=82 Runoff=41.30 cfs 3,036 af

Subcatchment F3: Federal Archives Runoff Area=7,810 ac 61.46% Impervious Runoff Depth=5.09"
 Flow Length=1,072' Slope=0.0112 '/' Tc=4.6 min CN=91 Runoff=45.08 cfs 3,316 af

Subcatchment F4: Former Daycare Center Runoff Area=5,590 ac 1.07% Impervious Runoff Depth=3.91"
 Flow Length=602' Slope=0.0698 '/' Tc=4.9 min CN=80 Runoff=25.73 cfs 1,820 af

Subcatchment F5: Area West of Runoff Area=23,740 ac 14.57% Impervious Runoff Depth=4.12"
 Flow Length=1,813' Slope=0.0386 '/' Tc=7.5 min CN=82 Runoff=106.45 cfs 8,143 af

Subcatchment F6: Cottage Complex West Runoff Area=9,793 ac 0.00% Impervious Runoff Depth=3.60"
 Flow Length=830' Slope=0.0120 '/' Tc=13.8 min CN=77 Runoff=32.06 cfs 2,939 af

Subcatchment F7: Cottage Complex East Runoff Area=19,860 ac 6.21% Impervious Runoff Depth=3.60"
 Flow Length=1,389' Slope=0.0216 '/' Tc=11.5 min CN=77 Runoff=68.78 cfs 5,901 af

Subcatchment F8: Chapel Runoff Area=6,630 ac 25.49% Impervious Runoff Depth=4.33"
 Flow Length=1,086' Slope=0.0608 '/' Tc=5.5 min CN=84 Runoff=32.71 cfs 2,391 af

Subcatchment F9: West Nurses and West Runoff Area=7,230 ac 22.82% Impervious Runoff Depth=4.22"
 Flow Length=711' Slope=0.0408 '/' Tc=8.0 min CN=83 Runoff=32.59 cfs 2,543 af

Reach 1R: Channel - Tributary to Avg. Flow Depth=0.79' Max Vel=12.27 fps Inflow=57.76 cfs 4,409 af
 n=0.030 L=1,000.0' S=0.1140 '/' Capacity=589.47 cfs Outflow=54.65 cfs 4,409 af

Reach 2R: Daylighted Stream Avg. Flow Depth=3.19' Max Vel=17.13 fps Inflow=403.34 cfs 33,907 af
 n=0.013 L=1,890.0' S=0.0106 '/' Capacity=969.59 cfs Outflow=384.76 cfs 33,907 af

Reach 8R: Channel - South of Avg. Flow Depth=2.48' Max Vel=18.68 fps Inflow=346.83 cfs 36,298 af
 n=0.022 L=700.0' S=0.0429 '/' Capacity=1,326.06 cfs Outflow=344.10 cfs 36,298 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=2.67' Max Vel=16.90 fps Inflow=392.81 cfs 43,678 af
 n=0.030 L=1,120.0' S=0.0571 '/' Capacity=1,272.27 cfs Outflow=388.24 cfs 43,678 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=497.68 cfs 59,062 af
 Primary=497.68 cfs 59,062 af

Pond 16P: Pond 1 Constructed- Peak Elev=157.69' Storage=3.693 af Inflow=384.76 cfs 33,907 af
 Outflow=331.60 cfs 33,907 af

Total Runoff Area = 168.603 ac Runoff Volume = 59.062 af Average Runoff Depth = 4.20"
78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

Summary for Subcatchment F1: Turner Field and Dorm

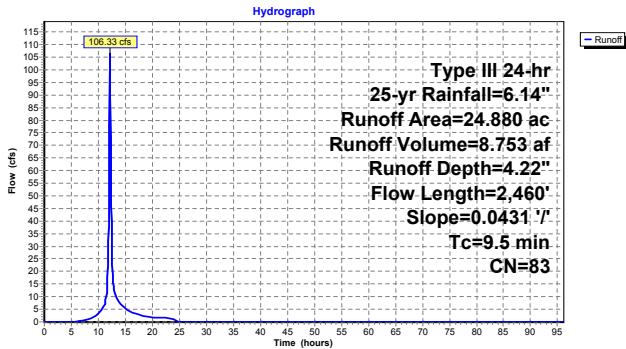
Runoff = 106.33 cfs @ 12.13 hrs, Volume= 8.753 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

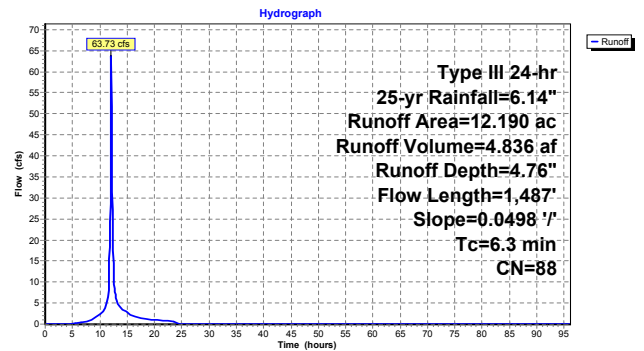
Runoff = 63.73 cfs @ 12.09 hrs, Volume= 4.836 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

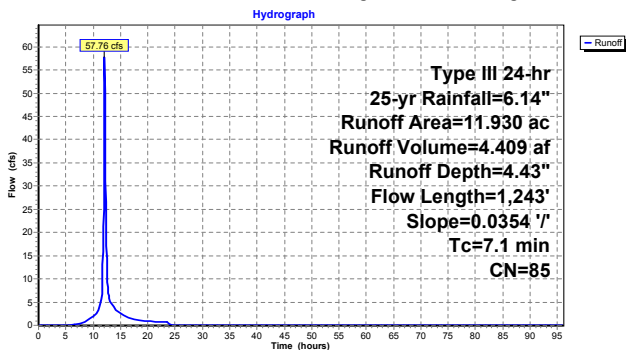
Runoff = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

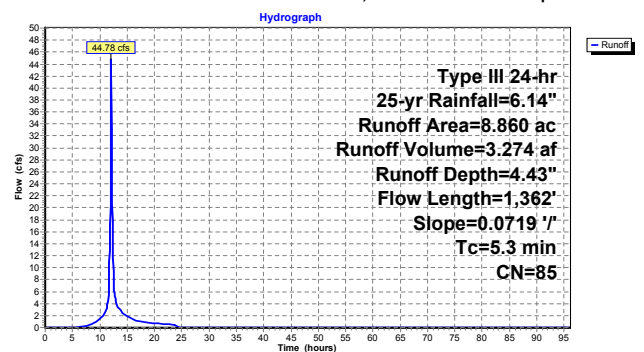
Runoff = 44.78 cfs @ 12.08 hrs, Volume= 3.274 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

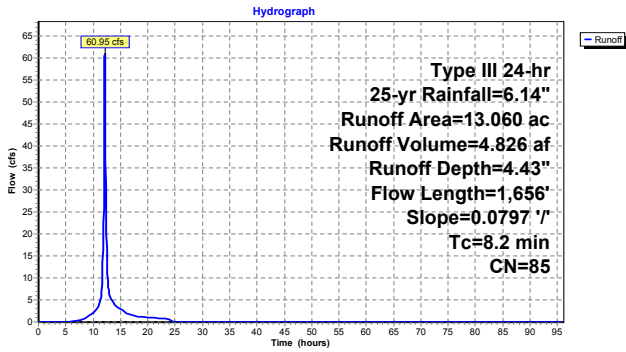
Runoff = 60.95 cfs @ 12.11 hrs, Volume= 4.826 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

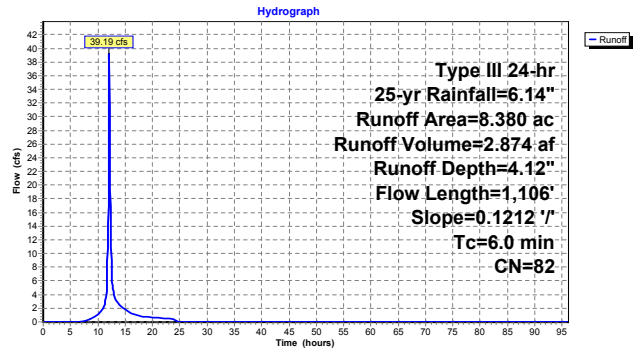
Runoff = 39.19 cfs @ 12.09 hrs, Volume= 2.874 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

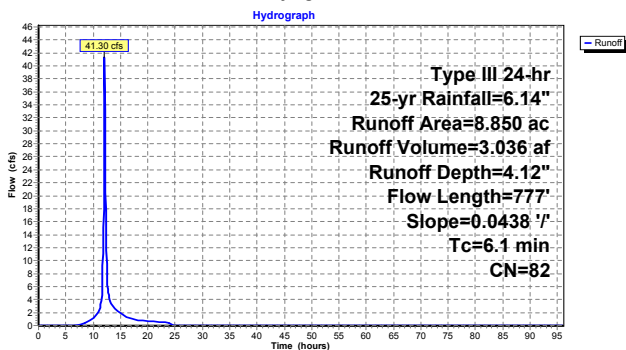
Runoff = 41.30 cfs @ 12.09 hrs, Volume= 3.036 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

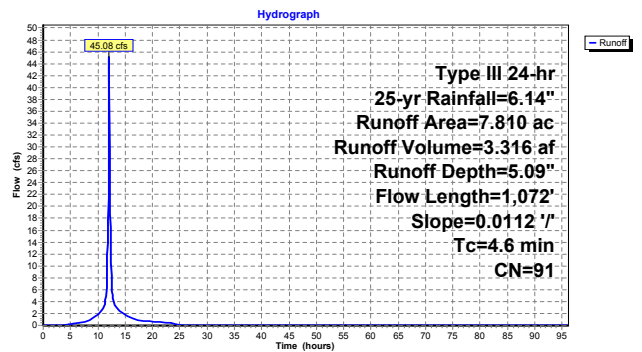
Runoff = 45.08 cfs @ 12.07 hrs, Volume= 3.316 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

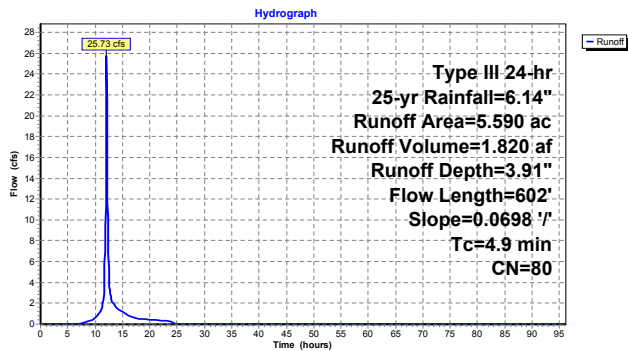
Runoff = 25.73 cfs @ 12.07 hrs, Volume= 1.820 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

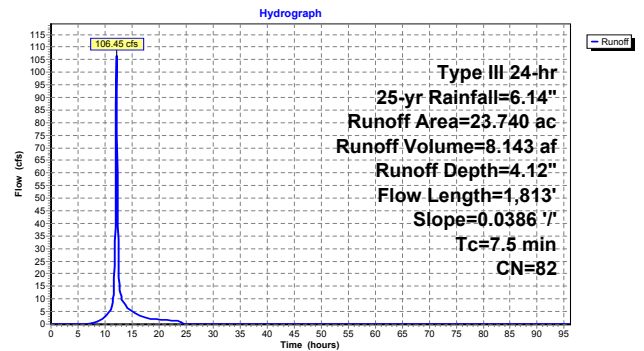
Runoff = 106.45 cfs @ 12.11 hrs, Volume= 8.143 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

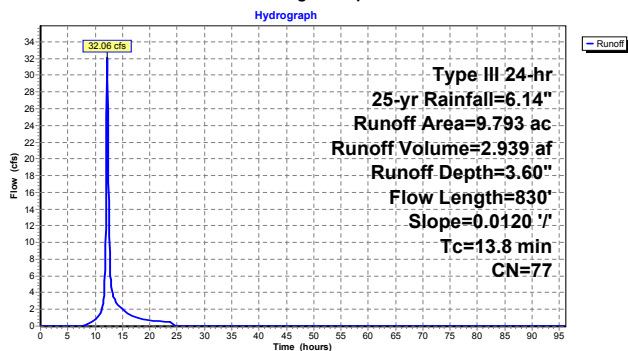
Runoff = 32.06 cfs @ 12.19 hrs, Volume= 2.939 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830	Total			

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

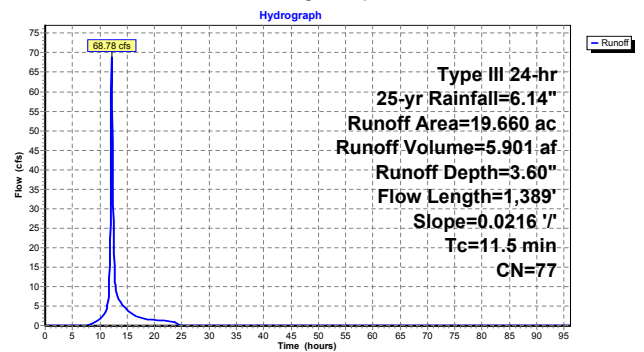
Runoff = 68.78 cfs @ 12.16 hrs, Volume= 5.901 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
* 1.220	98	Roads, Roof and Paved parking, HSG C
* 1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389	Total			

Subcatchment F7: Cottage Complex East - Demolished



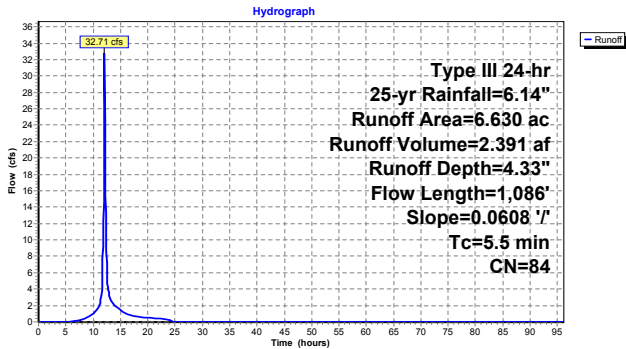
Summary for Subcatchment F8: Chapel

Runoff = 32.71 cfs @ 12.08 hrs, Volume= 2.391 af, Depth= 4.33"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086	Total			

Subcatchment F8: Chapel



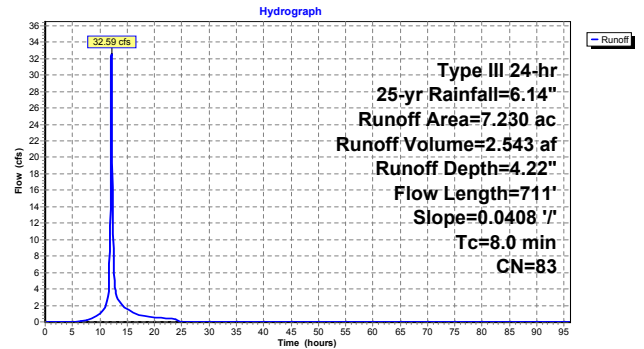
Summary for Subcatchment F9: West Nurses and West Building Area

Runoff = 32.59 cfs @ 12.11 hrs, Volume= 2.543 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 4.43" for 25-yr event
 Inflow = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af
 Outflow = 54.65 cfs @ 12.14 hrs, Volume= 4.409 af, Atten= 5%, Lag= 2.5 min

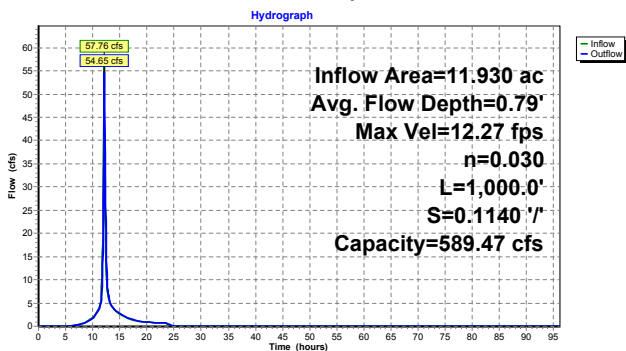
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.27 fps, Min. Travel Time= 1.4 min
 Avg. Velocity= 3.30 fps, Avg. Travel Time= 5.1 min

Peak Storage= 4,589 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.79'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140'/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



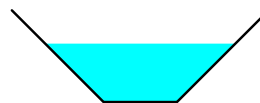
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 4.06" for 25-yr event
 Inflow = 403.34 cfs @ 12.11 hrs, Volume= 33.907 af
 Outflow = 384.76 cfs @ 12.17 hrs, Volume= 33.907 af, Atten= 5%, Lag= 3.6 min

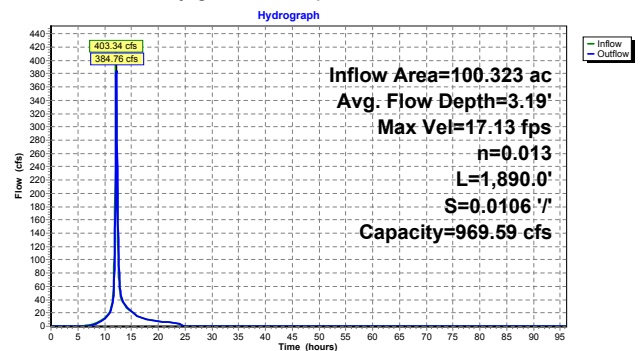
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 17.13 fps, Min. Travel Time= 1.8 min
 Avg. Velocity= 5.04 fps, Avg. Travel Time= 6.2 min

Peak Storage= 43,275 cf @ 12.14 hrs
 Average Depth at Peak Storage= 3.19'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106'/'
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 4.07" for 25-yr event
 Inflow = 346.83 cfs @ 12.25 hrs, Volume= 36.298 af
 Outflow = 344.10 cfs @ 12.27 hrs, Volume= 36.298 af, Atten= 1%, Lag= 1.1 min

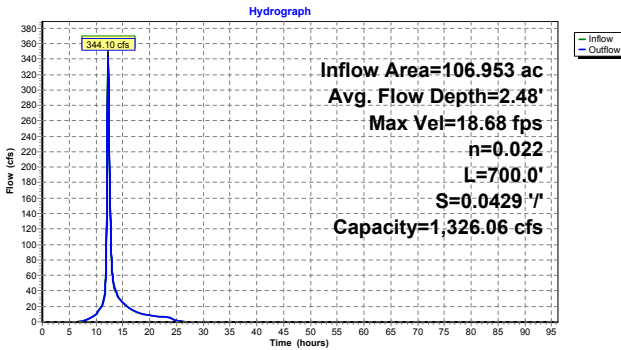
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 18.68 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 4.65 fps, Avg. Travel Time= 2.5 min

Peak Storage= 12,997 cf @ 12.26 hrs
 Average Depth at Peak Storage= 2.48'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 4.15" for 25-yr event
 Inflow = 392.81 cfs @ 12.25 hrs, Volume= 43.678 af
 Outflow = 388.24 cfs @ 12.29 hrs, Volume= 43.678 af, Atten= 1%, Lag= 2.0 min

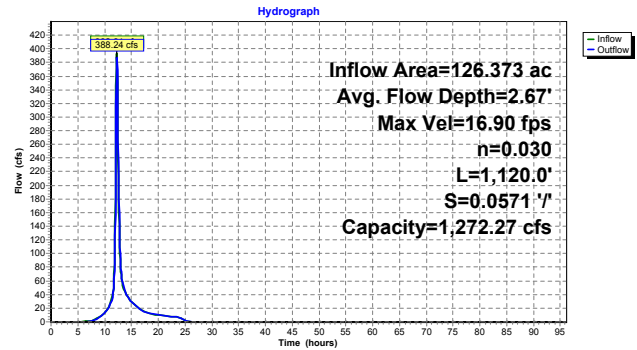
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.90 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 4.19 fps, Avg. Travel Time= 4.5 min

Peak Storage= 25,907 cf @ 12.27 hrs
 Average Depth at Peak Storage= 2.67'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

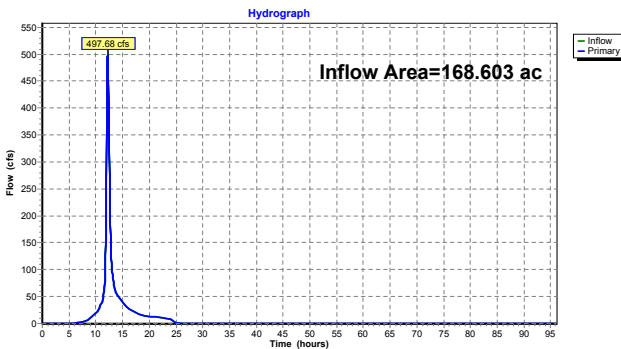


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 4.20" for 25-yr event
 Inflow = 497.68 cfs @ 12.21 hrs, Volume= 59.062 af
 Primary = 497.68 cfs @ 12.21 hrs, Volume= 59.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 4.06" for 25-yr event
 Inflow = 384.76 cfs @ 12.17 hrs, Volume= 33.907 af
 Outflow = 331.60 cfs @ 12.25 hrs, Volume= 33.907 af, Atten= 14%, Lag= 4.8 min
 Primary = 331.60 cfs @ 12.25 hrs, Volume= 33.907 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 157.69' @ 12.25 hrs Surf.Area= 0.000 ac Storage= 3.693 af

Plug-Flow detention time= 18.0 min calculated for 33.889 af (100% of inflow)
 Center-of-Mass det. time= 18.1 min (834.2 - 816.1)

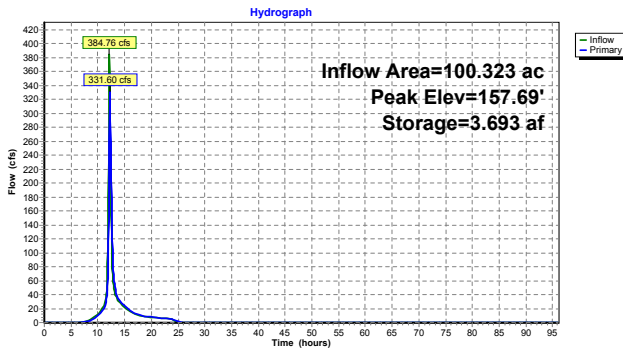
Volume	Invert	Avail. Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below

Elevation (feet)	Cum. Store (acre-feet)
154.00	0.000
156.00	2.000
158.00	4.000
160.00	6.000
162.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=330.42 cfs @ 12.25 hrs HW=157.68' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 330.42 cfs @ 5.72 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm	Runoff Area=24,880 ac	18.85% Impervious	Runoff Depth=6.74"
	Flow Length=2,460'	Slope=0.0431 1/100'	Tc=9.5 min CN=83 Runoff=166.54 cfs 13,983 af
Subcatchment F10: Admin Bldg and	Runoff Area=12,190 ac	43.15% Impervious	Runoff Depth=7.35"
	Flow Length=1,487'	Slope=0.0498 1/100'	Tc=6.3 min CN=88 Runoff=96.05 cfs 7,468 af
Subcatchment F11: Admin Bldg and	Runoff Area=11,930 ac	33.61% Impervious	Runoff Depth=6.99"
	Flow Length=1,243'	Slope=0.0354 1/100'	Tc=7.1 min CN=85 Runoff=89.01 cfs 6,947 af
Subcatchment F12: Tarbell House, Farm	Runoff Area=8,860 ac	28.89% Impervious	Runoff Depth=6.99"
	Flow Length=1,362'	Slope=0.0719 1/100'	Tc=5.3 min CN=85 Runoff=68.95 cfs 5,159 af
Subcatchment F13: Maintenance	Runoff Area=13,060 ac	32.16% Impervious	Runoff Depth=6.99"
	Flow Length=1,656'	Slope=0.0797 1/100'	Tc=8.2 min CN=85 Runoff=93.98 cfs 7,605 af
Subcatchment F14: Maintenance	Runoff Area=8,380 ac	17.42% Impervious	Runoff Depth=6.62"
	Flow Length=1,106'	Slope=0.1212 1/100'	Tc=6.0 min CN=82 Runoff=61.81 cfs 4,625 af
Subcatchment F2: Playing Fields and	Runoff Area=8,850 ac	11.64% Impervious	Runoff Depth=6.62"
	Flow Length=777'	Slope=0.0438 1/100'	Tc=6.1 min CN=82 Runoff=65.14 cfs 4,884 af
Subcatchment F3: Federal Archives	Runoff Area=7,810 ac	61.46% Impervious	Runoff Depth=7.72"
	Flow Length=1,072'	Slope=0.0112 1/100'	Tc=4.6 min CN=91 Runoff=66.68 cfs 5,021 af
Subcatchment F4: Former Daycare Center	Runoff Area=5,590 ac	1.07% Impervious	Runoff Depth=6.38"
	Flow Length=602'	Slope=0.0698 1/100'	Tc=4.9 min CN=80 Runoff=41.34 cfs 2,971 af
Subcatchment F5: Area West of	Runoff Area=23,740 ac	14.57% Impervious	Runoff Depth=6.62"
	Flow Length=1,813'	Slope=0.0386 1/100'	Tc=7.5 min CN=82 Runoff=168.09 cfs 13,101 af
Subcatchment F6: Cottage Complex West -	Runoff Area=9,793 ac	0.00% Impervious	Runoff Depth=6.01"
	Flow Length=830'	Slope=0.0120 1/100'	Tc=13.8 min CN=77 Runoff=53.02 cfs 4,907 af
Subcatchment F7: Cottage Complex East -	Runoff Area=19,660 ac	6.21% Impervious	Runoff Depth=6.01"
	Flow Length=1,389'	Slope=0.0216 1/100'	Tc=11.5 min CN=77 Runoff=113.71 cfs 9,851 af
Subcatchment F8: Chapel	Runoff Area=6,630 ac	25.49% Impervious	Runoff Depth=6.87"
	Flow Length=1,086'	Slope=0.0608 1/100'	Tc=5.5 min CN=84 Runoff=50.75 cfs 3,793 af
Subcatchment F9: West Nurses and West	Runoff Area=7,230 ac	22.82% Impervious	Runoff Depth=6.74"
	Flow Length=711'	Slope=0.0408 1/100'	Tc=8.0 min CN=83 Runoff=51.05 cfs 4,063 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=1.03'	Max Vel=14.14 fps	Inflow=89.01 cfs 6,947 af
	n=0.030 L=1,000.0' S=0.1140 1/100'	Capacity=589.47 cfs	Outflow=84.36 cfs 6,947 af
Reach 2R: Daylighted Stream	Avg. Flow Depth=4.03'	Max Vel=19.28 fps	Inflow=640.25 cfs 54,719 af
	n=0.013 L=1,890.0' S=0.0106 1/100'	Capacity=969.59 cfs	Outflow=612.94 cfs 54,719 af

Reach 8R: Channel - South of Avg. Flow Depth=3.25' Max Vel=21.36 fps Inflow=573.98 cfs 58,512 af
 n=0.022 L=700.0' S=0.0429 1/100' Capacity=1,326.06 cfs Outflow=570.23 cfs 58,512 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=3.52' Max Vel=19.40 fps Inflow=650.97 cfs 70,043 af
 n=0.030 L=1,120.0' S=0.0571 1/100' Capacity=1,272.27 cfs Outflow=644.50 cfs 70,043 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=833.48 cfs 94,378 af
 Primary=833.48 cfs 94,378 af

Pond 16P: Pond 1 Constructed - Peak Elev=158.95' Storage=4,948 af Inflow=612.94 cfs 54,719 af
 Outflow=548.75 cfs 54,719 af

Total Runoff Area = 168.603 ac Runoff Volume = 94.378 af Average Runoff Depth = 6.72"
78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

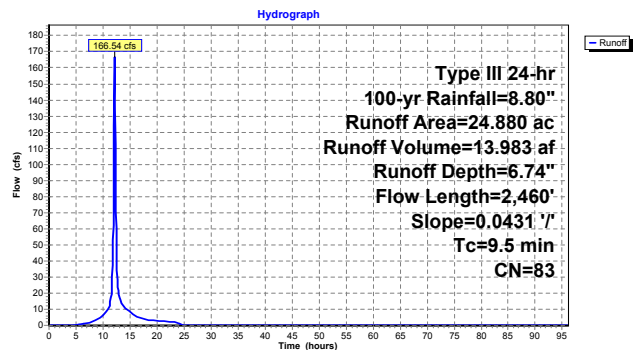
Summary for Subcatchment F1: Turner Field and Dorm

Runoff = 166.54 cfs @ 12.13 hrs, Volume= 13,983 af, Depth= 6.74"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
20,190	79	50-75% Grass cover, Fair, HSG C
4,690	98	Paved parking, HSG C
24,880	83	Weighted Average
20,190		81.15% Pervious Area
4,690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow
3.4	300	0.0431	1.45		Grass: Short n=0.150 P2= 3.23" Shallow Concentrated Flow, Shallow Conc
2.0	2,110	0.0431	17.21	464.55	Short Grass Pasture Kv= 7.0 fps Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65" n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

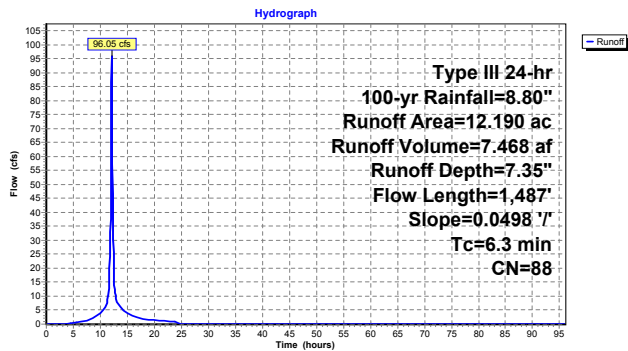
Runoff = 96.05 cfs @ 12.09 hrs, Volume= 7.468 af, Depth= 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

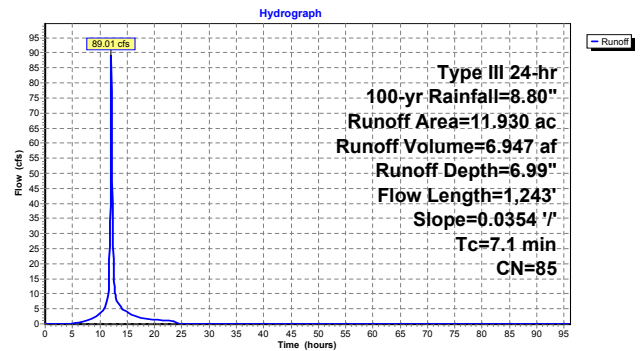
Runoff = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

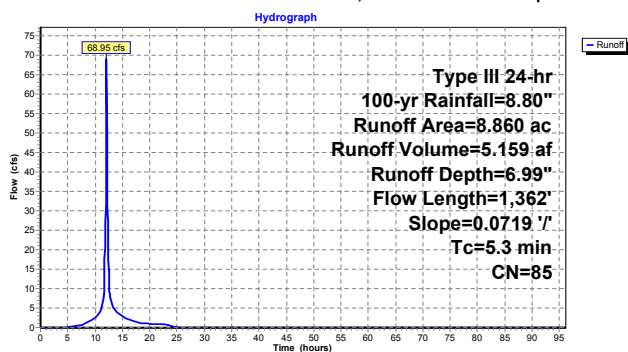
Runoff = 68.95 cfs @ 12.08 hrs, Volume= 5.159 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
* 2.560	98	Roads, Roof and Paved parking, HSG C
* 0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

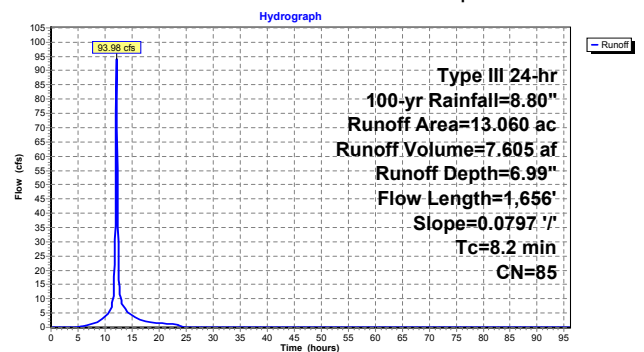
Runoff = 93.98 cfs @ 12.11 hrs, Volume= 7.605 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

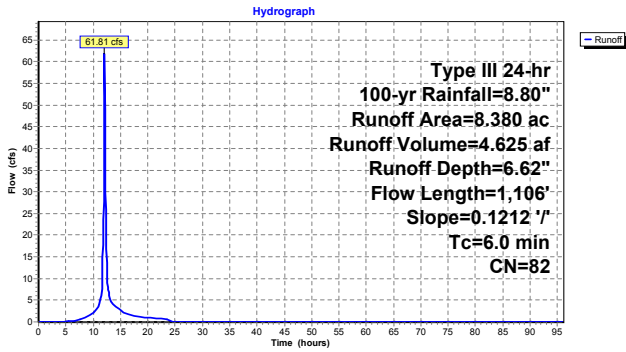
Runoff = 61.81 cfs @ 12.09 hrs, Volume= 4.625 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, open channel flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

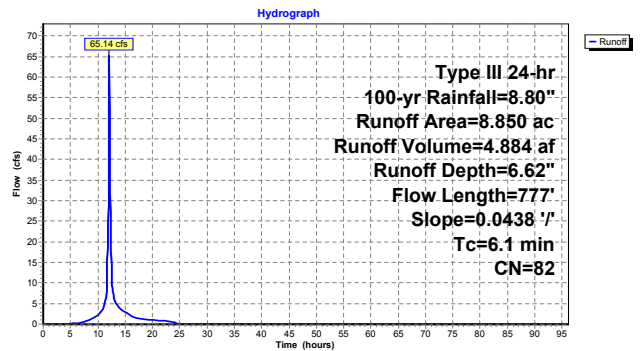
Runoff = 65.14 cfs @ 12.09 hrs, Volume= 4.884 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

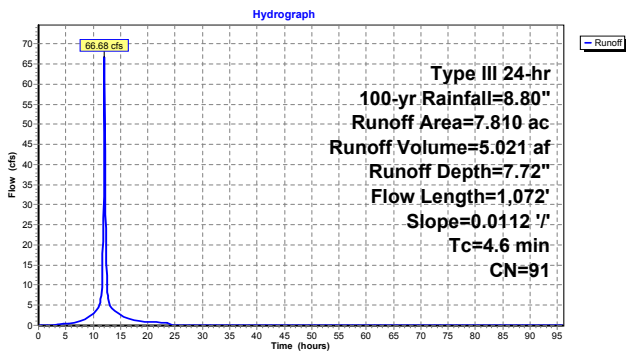
Runoff = 66.68 cfs @ 12.07 hrs, Volume= 5.021 af, Depth= 7.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

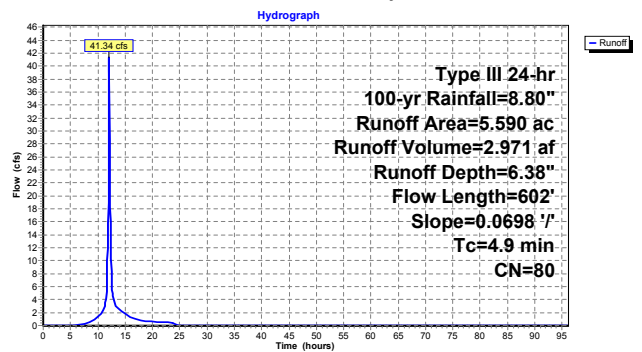
Runoff = 41.34 cfs @ 12.07 hrs, Volume= 2.971 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
0.060	98	Paved parking and Roof area, HSG C
0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602				Total

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

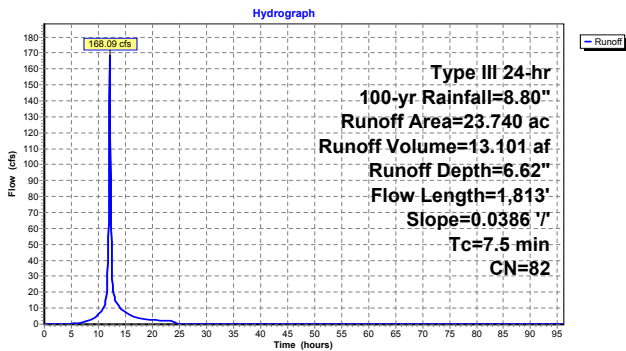
Runoff = 168.09 cfs @ 12.11 hrs, Volume= 13.101 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813				Total

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

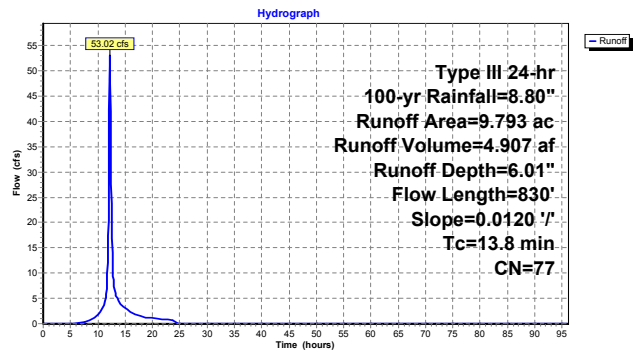
Runoff = 53.02 cfs @ 12.19 hrs, Volume= 4.907 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830				Total

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

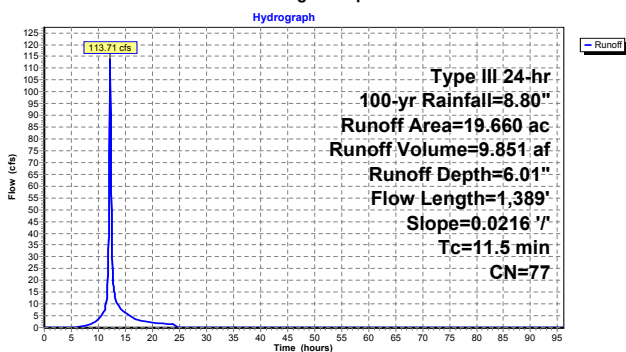
Runoff = 113.71 cfs @ 12.16 hrs, Volume= 9.851 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
* 1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

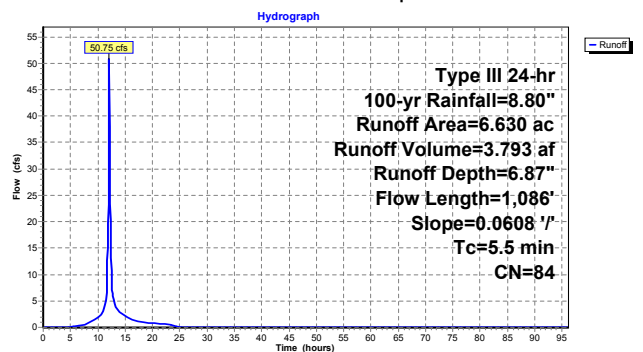
Runoff = 50.75 cfs @ 12.08 hrs, Volume= 3.793 af, Depth= 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
* 1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



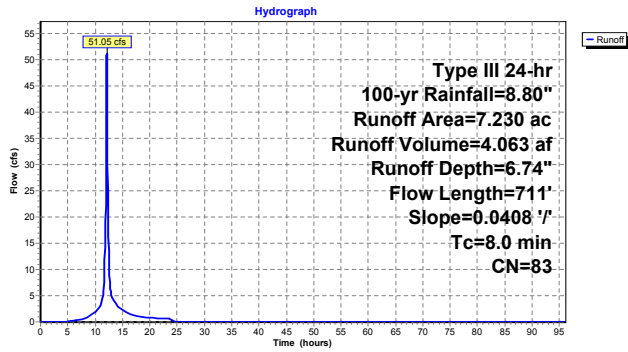
Summary for Subcatchment F9: West Nurses and West Building Area

Runoff = 51.05 cfs @ 12.11 hrs, Volume= 4.063 af, Depth= 6.74"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

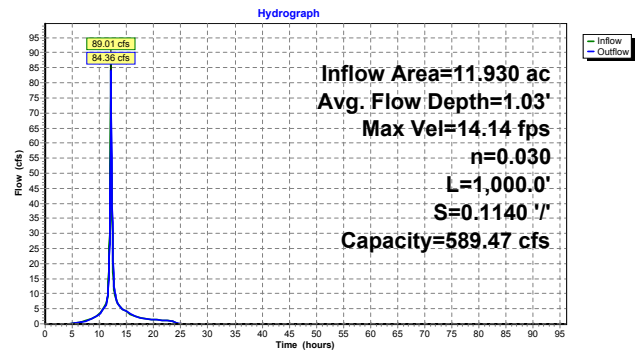
Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 6.99" for 100-yr event
 Inflow = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af
 Outflow = 84.36 cfs @ 12.14 hrs, Volume= 6.947 af, Atten= 5%, Lag= 2.2 min
 Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 14.14 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 3.78 fps, Avg. Travel Time= 4.4 min

Peak Storage= 6,176 cf @ 12.12 hrs
 Average Depth at Peak Storage= 1.03'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



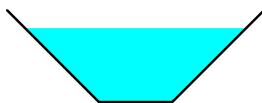
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 6.56" for 100-yr event
 Inflow = 640.25 cfs @ 12.11 hrs, Volume= 54,719 af
 Outflow = 612.94 cfs @ 12.17 hrs, Volume= 54,719 af, Atten= 4%, Lag= 3.2 min

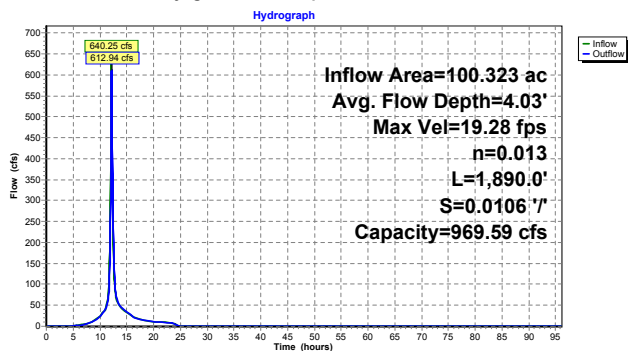
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 19.28 fps, Min. Travel Time= 1.6 min
 Avg. Velocity = 5.82 fps, Avg. Travel Time= 5.4 min

Peak Storage= 61,212 cf @ 12.14 hrs
 Average Depth at Peak Storage= 4.03'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 '/
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



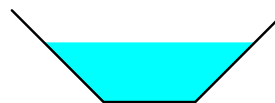
Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 6.56" for 100-yr event
 Inflow = 573.98 cfs @ 12.23 hrs, Volume= 58,512 af
 Outflow = 570.23 cfs @ 12.24 hrs, Volume= 58,512 af, Atten= 1%, Lag= 1.1 min

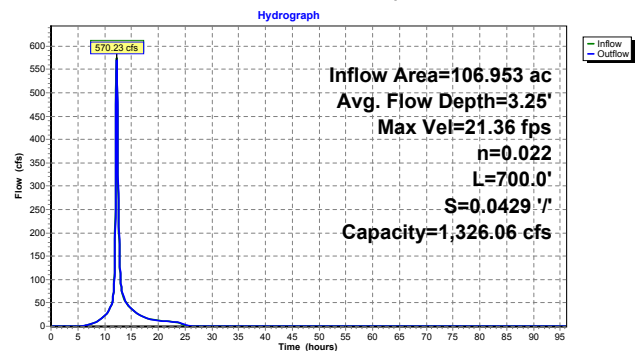
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 21.36 fps, Min. Travel Time= 0.5 min
 Avg. Velocity = 5.33 fps, Avg. Travel Time= 2.2 min

Peak Storage= 18,799 cf @ 12.23 hrs
 Average Depth at Peak Storage= 3.25'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 '/
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 6.65" for 100-yr event
 Inflow = 650.97 cfs @ 12.23 hrs, Volume= 70.043 af
 Outflow = 644.50 cfs @ 12.25 hrs, Volume= 70.043 af, Atten= 1%, Lag= 1.6 min

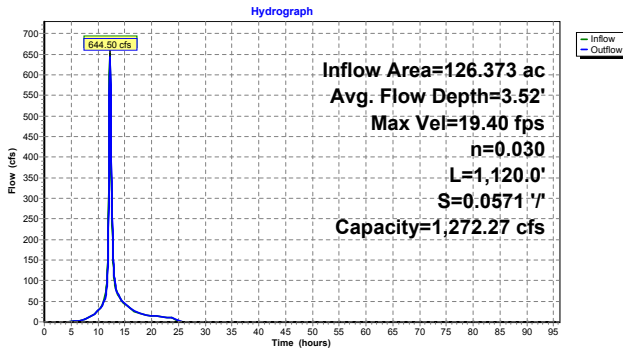
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 19.40 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 4.81 fps, Avg. Travel Time= 3.9 min

Peak Storage= 37,492 cf @ 12.24 hrs
 Average Depth at Peak Storage= 3.52'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

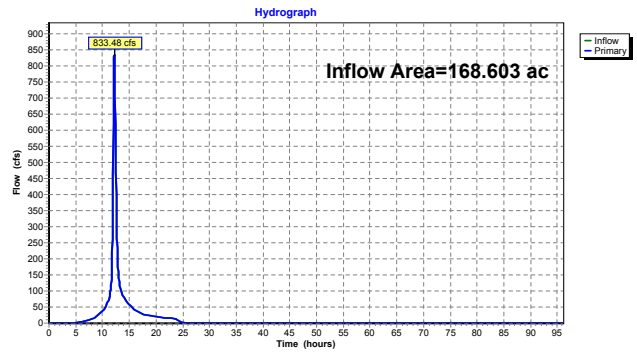


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 6.72" for 100-yr event
 Inflow = 833.48 cfs @ 12.19 hrs, Volume= 94.378 af
 Primary = 833.48 cfs @ 12.19 hrs, Volume= 94.378 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 6.55" for 100-yr event
 Inflow = 612.94 cfs @ 12.17 hrs, Volume= 54.719 af
 Outflow = 548.75 cfs @ 12.23 hrs, Volume= 54.719 af, Atten= 10%, Lag= 3.9 min
 Primary = 548.75 cfs @ 12.23 hrs, Volume= 54.719 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 158.95' @ 12.23 hrs Surf.Area= 0.000 ac Storage= 4.948 af

Plug-Flow detention time= 15.4 min calculated for 54.690 af (100% of inflow)
 Center-of-Mass det. time= 15.5 min (817.9 - 802.4)

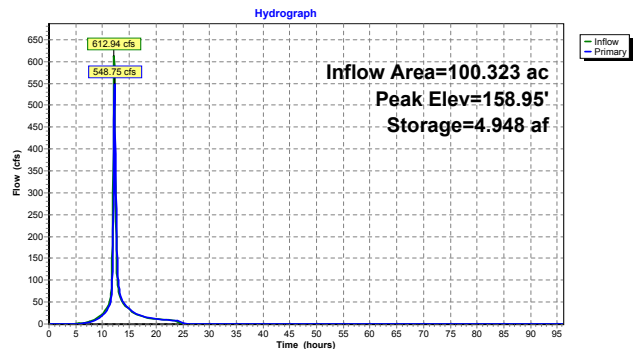
Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
154.00	0.000
156.00	2.000
158.00	4.000
160.00	6.000
162.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

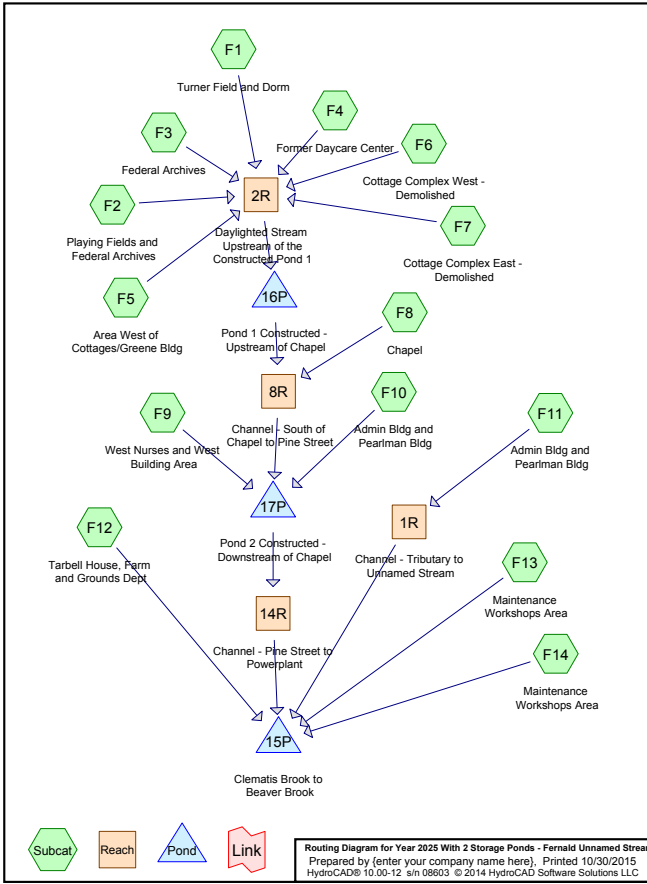
Primary OutFlow Max=542.90 cfs @ 12.23 hrs HW=158.92' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 542.90 cfs @ 6.53 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
102.800	79	50-75% Grass cover, Fair, HSG C (F1, F10, F11, F12, F13, F14, F2, F3, F4, F5, F8, F9)
26.110	74	>75% Grass cover, Good, HSG C (F6, F7)
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C (F10)
9.350	98	Paved parking and Roof area, HSG C (F2, F3, F4, F5)
10.540	98	Paved parking, HSG C (F1, F13, F9)
1.460	98	Paved parking, roofs, HSG C (F14)
14.740	98	Roads, Roof and Paved parking, HSG C (F10, F11, F12, F7, F8)
2.143	98	Water Surface, 0% imp, HSG C (F12, F6, F7)
1.120	98	Water Surface/Wetlands, 0% imp, HSG C (F2, F4, F5)
168.603	83	TOTAL AREA



Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
168.603	HSG C	F1, F10, F11, F12, F13, F14, F2, F3, F4, F5, F6, F7, F8, F9
0.000	HSG D	
0.000	Other	
168.603	TOTAL AREA	

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatc Number
0.000	0.000	102.800	0.000	0.000	102.800	50-75% Grass cover, Fair	
0.000	0.000	26.110	0.000	0.000	26.110	>75% Grass cover, Good	
0.000	0.000	0.340	0.000	0.000	0.340	Detention Basin, Water Surface, 0% imp	
0.000	0.000	10.540	0.000	0.000	10.540	Paved parking	
0.000	0.000	9.350	0.000	0.000	9.350	Paved parking and Roof area	
0.000	0.000	1.460	0.000	0.000	1.460	Paved parking, roofs	
0.000	0.000	14.740	0.000	0.000	14.740	Roads, Roof and Paved parking	
0.000	0.000	2.143	0.000	0.000	2.143	Water Surface, 0% imp	
0.000	0.000	1.120	0.000	0.000	1.120	Water Surface/Wetlands, 0% imp	
0.000	0.000	168.603	0.000	0.000	168.603	TOTAL AREA	

Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm	Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=1.61" Flow Length=2,460' Slope=0.0431 '/ Tc=9.5 min CN=83 Runoff=40.97 cfs 3.336 af
Subcatchment F10: Admin Bldg and	Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=2.00" Flow Length=1,487' Slope=0.0498 '/ Tc=6.3 min CN=88 Runoff=27.66 cfs 2.029 af
Subcatchment F11: Admin Bldg and	Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=1.76" Flow Length=1,243' Slope=0.0354 '/ Tc=7.1 min CN=85 Runoff=23.37 cfs 1.747 af
Subcatchment F12: Tarbell House, Farm	Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=1.76" Flow Length=1,362' Slope=0.0719 '/ Tc=5.3 min CN=85 Runoff=18.17 cfs 1.298 af
Subcatchment F13: Maintenance	Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=1.76" Flow Length=1,656' Slope=0.0797 '/ Tc=8.2 min CN=85 Runoff=24.62 cfs 1.913 af
Subcatchment F14: Maintenance	Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=1.54" Flow Length=1,106' Slope=0.1212 '/ Tc=6.0 min CN=82 Runoff=14.77 cfs 1.074 af
Subcatchment F2: Playing Fields and	Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=1.54" Flow Length=777' Slope=0.0438 '/ Tc=6.1 min CN=82 Runoff=15.56 cfs 1.134 af
Subcatchment F3: Federal Archives	Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=2.26" Flow Length=1,072' Slope=0.0112 '/ Tc=4.6 min CN=91 Runoff=20.81 cfs 1.470 af
Subcatchment F4: Former Daycare Center	Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=1.40" Flow Length=602' Slope=0.0698 '/ Tc=4.9 min CN=80 Runoff=9.14 cfs 0.653 af
Subcatchment F5: Area West of	Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=1.54" Flow Length=1,813' Slope=0.0386 '/ Tc=7.5 min CN=82 Runoff=39.98 cfs 3.043 af
Subcatchment F6: Cottage Complex West -	Runoff Area=9.793 ac 0.00% Impervious Runoff Depth=1.21" Flow Length=830' Slope=0.0120 '/ Tc=13.8 min CN=77 Runoff=10.46 cfs 0.989 af
Subcatchment F7: Cottage Complex East -	Runoff Area=19.660 ac 6.21% Impervious Runoff Depth=1.21" Flow Length=1,389' Slope=0.0216 '/ Tc=11.5 min CN=77 Runoff=22.43 cfs 1.985 af
Subcatchment F8: Chapel	Runoff Area=6.630 ac 25.49% Impervious Runoff Depth=1.68" Flow Length=1,086' Slope=0.0608 '/ Tc=5.5 min CN=84 Runoff=12.96 cfs 0.929 af
Subcatchment F9: West Nurses and West	Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=1.61" Flow Length=711' Slope=0.0408 '/ Tc=8.0 min CN=83 Runoff=12.54 cfs 0.970 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.46' Max Vel=8.96 fps Inflow=23.37 cfs 1.747 af n=0.030 L=1,000.0' S=0.1140 '/ Capacity=589.47 cfs Outflow=22.00 cfs 1.747 af
Reach 2R: Daylighted Stream	Avg. Flow Depth=1.87' Max Vel=13.15 fps Inflow=150.05 cfs 12.611 af n=0.013 L=1,890.0' S=0.0106 '/ Capacity=969.59 cfs Outflow=142.32 cfs 12.611 af

Reach 8R: Channel - South of	Avg. Flow Depth=1.32' Max Vel=13.54 fps Inflow=113.34 cfs 13.540 af n=0.022 L=700.0' S=0.0429 '/ Capacity=1,326.06 cfs Outflow=112.31 cfs 13.540 af
Reach 14R: Channel - Pine Street to	Avg. Flow Depth=1.33' Max Vel=11.80 fps Inflow=114.89 cfs 16.538 af n=0.030 L=1,120.0' S=0.0571 '/ Capacity=1,272.27 cfs Outflow=114.19 cfs 16.538 af
Pond 15P: Clematis Brook to Beaver Brook	Inflow=139.89 cfs 22.570 af Primary=139.89 cfs 22.570 af
Pond 16P: Pond 1 Constructed -	Peak Elev=155.87' Storage=1.870 af Inflow=142.32 cfs 12.611 af Outflow=107.87 cfs 12.611 af
Pond 17P: Pond 2 Constructed -	Peak Elev=125.94' Storage=1.945 af Inflow=130.17 cfs 16.538 af Outflow=114.89 cfs 16.538 af
Total Runoff Area = 168.603 ac Runoff Volume = 22.570 af Average Runoff Depth = 1.61" 78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac	

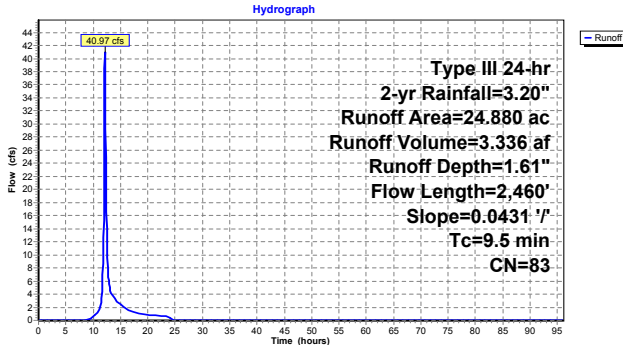
Summary for Subcatchment F1: Turner Field and Dorm

Runoff = 40.97 cfs @ 12.14 hrs, Volume= 3.336 af, Depth= 1.61"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



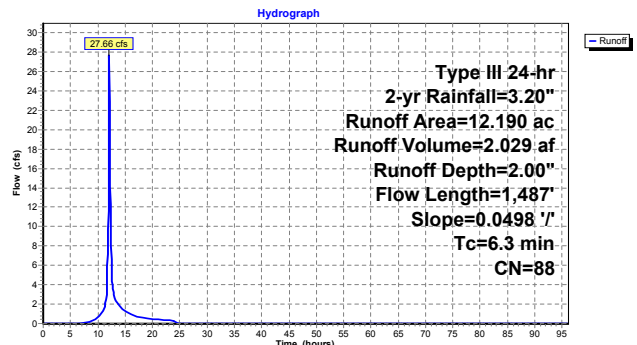
Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

Runoff = 27.66 cfs @ 12.09 hrs, Volume= 2.029 af, Depth= 2.00"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

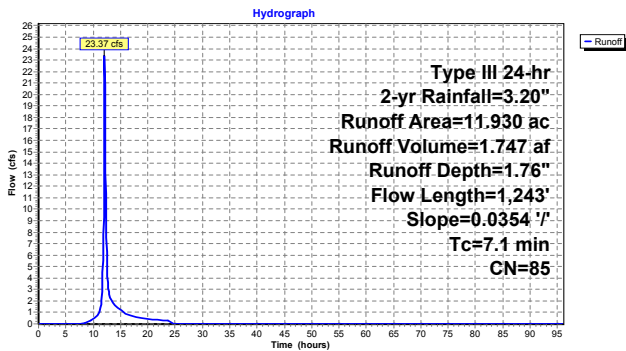
Runoff = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243				Total

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

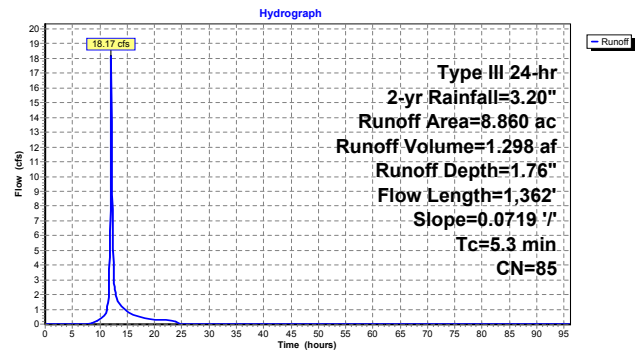
Runoff = 18.17 cfs @ 12.08 hrs, Volume= 1.298 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362				Total

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

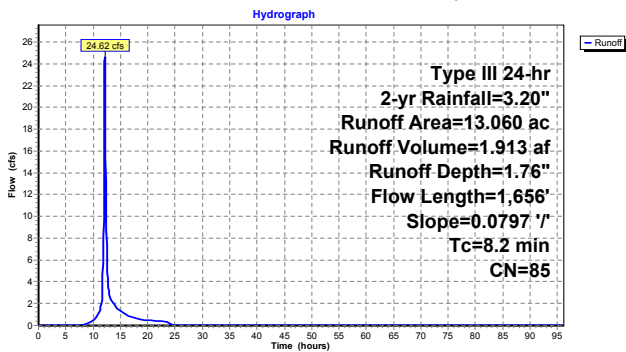
Runoff = 24.62 cfs @ 12.12 hrs, Volume= 1.913 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

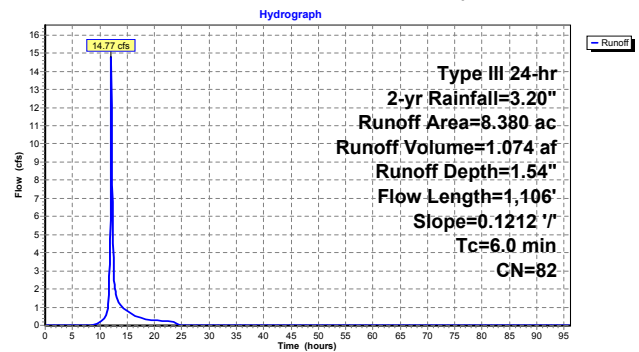
Runoff = 14.77 cfs @ 12.09 hrs, Volume= 1.074 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

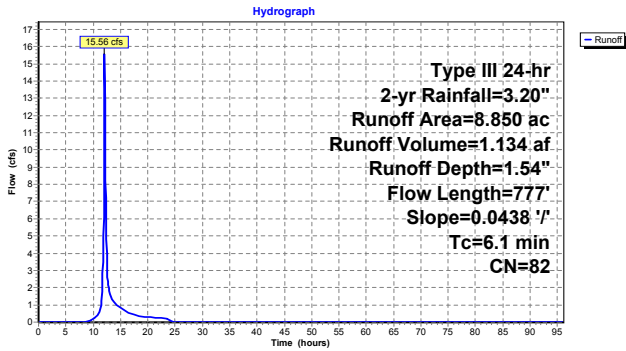
Runoff = 15.56 cfs @ 12.10 hrs, Volume= 1.134 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
* 1.030	98	Paved parking and Roof area, HSG C
* 0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777	Total			

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

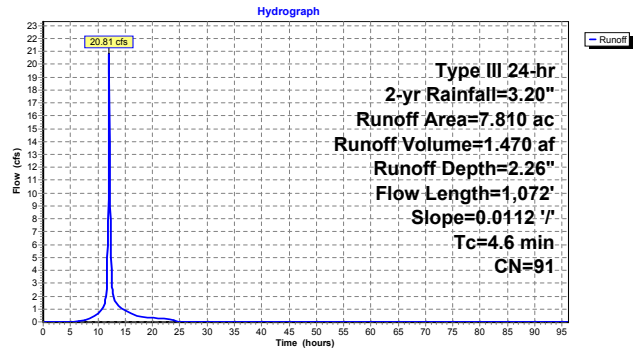
Runoff = 20.81 cfs @ 12.07 hrs, Volume= 1.470 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
* 4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

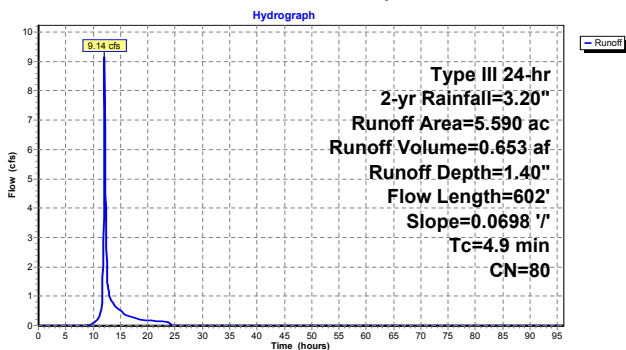
Runoff = 9.14 cfs @ 12.08 hrs, Volume= 0.653 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

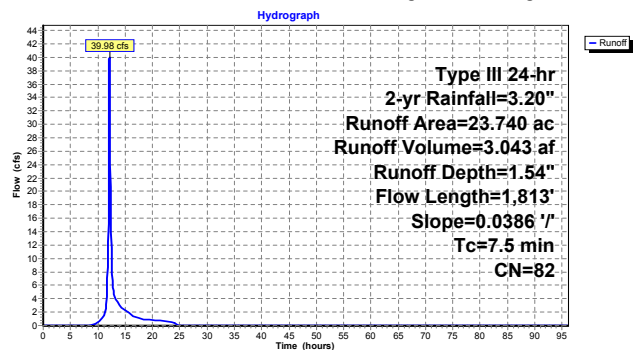
Runoff = 39.98 cfs @ 12.11 hrs, Volume= 3.043 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

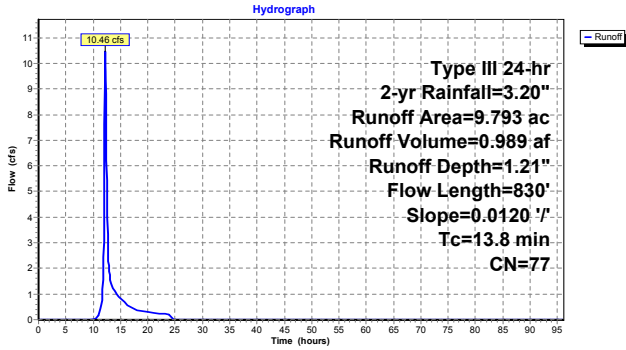
Runoff = 10.46 cfs @ 12.20 hrs, Volume= 0.989 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830				Total

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

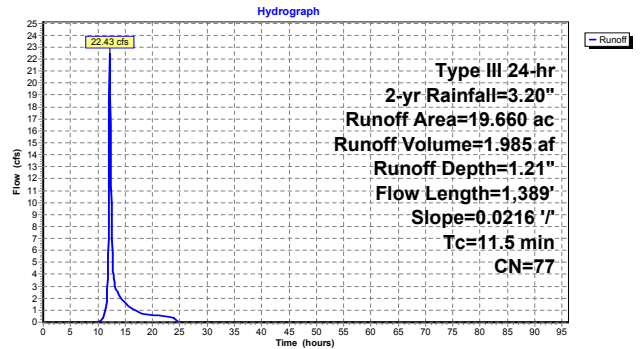
Runoff = 22.43 cfs @ 12.17 hrs, Volume= 1.985 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

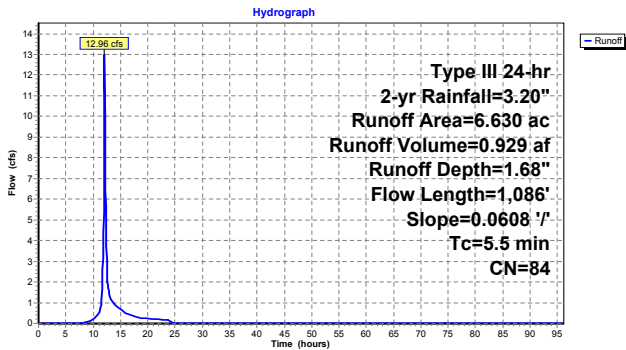
Runoff = 12.96 cfs @ 12.09 hrs, Volume= 0.929 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



Summary for Subcatchment F9: West Nurses and West Building Area

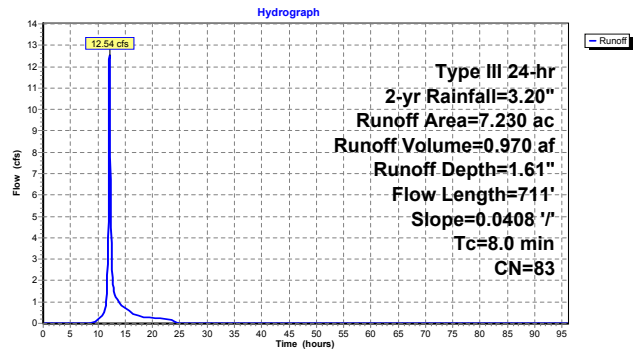
Runoff = 12.54 cfs @ 12.12 hrs, Volume= 0.970 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 1.76" for 2-yr event
 Inflow = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af
 Outflow = 22.00 cfs @ 12.16 hrs, Volume= 1.747 af, Atten= 6%, Lag= 3.4 min

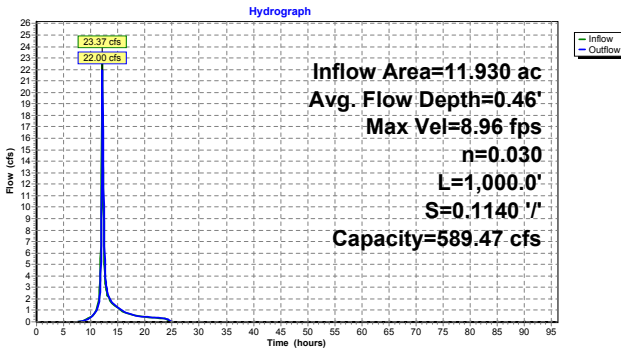
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.96 fps, Min. Travel Time= 1.9 min
 Avg. Velocity = 2.57 fps, Avg. Travel Time= 6.5 min

Peak Storage= 2,492 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.46'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 ' / '
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



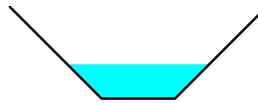
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 1.51" for 2-yr event
 Inflow = 150.05 cfs @ 12.12 hrs, Volume= 12.611 af
 Outflow = 142.32 cfs @ 12.20 hrs, Volume= 12.611 af, Atten= 5%, Lag= 4.7 min

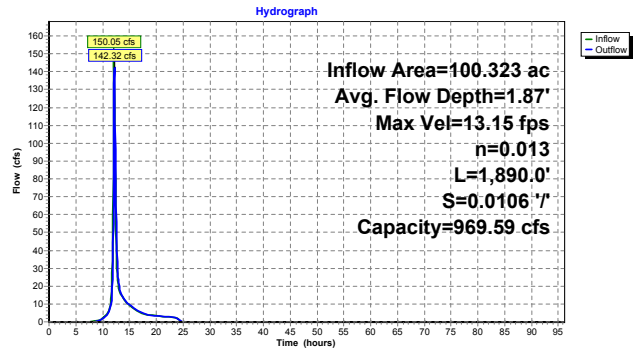
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.15 fps, Min. Travel Time= 2.4 min
 Avg. Velocity = 3.86 fps, Avg. Travel Time= 8.2 min

Peak Storage= 20,766 cf @ 12.15 hrs
 Average Depth at Peak Storage= 1.87'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 1.52" for 2-yr event
 Inflow = 112.31 cfs @ 12.31 hrs, Volume= 13.540 af
 Outflow = 112.31 cfs @ 12.34 hrs, Volume= 13.540 af, Atten= 1%, Lag= 1.7 min

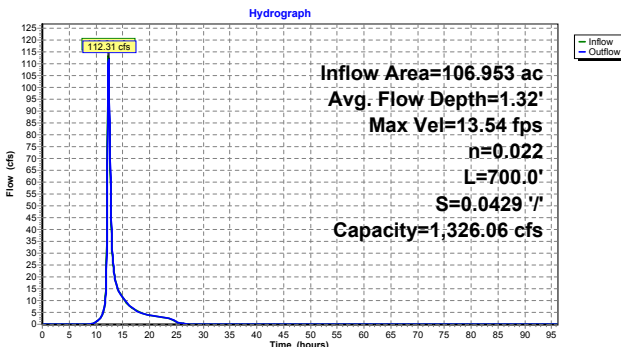
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.54 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 3.63 fps, Avg. Travel Time= 3.2 min

Peak Storage= 5,847 cf @ 12.32 hrs
 Average Depth at Peak Storage= 1.32'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 1.57" for 2-yr event
 Inflow = 114.19 cfs @ 12.45 hrs, Volume= 16.538 af
 Outflow = 114.19 cfs @ 12.50 hrs, Volume= 16.538 af, Atten= 1%, Lag= 2.8 min

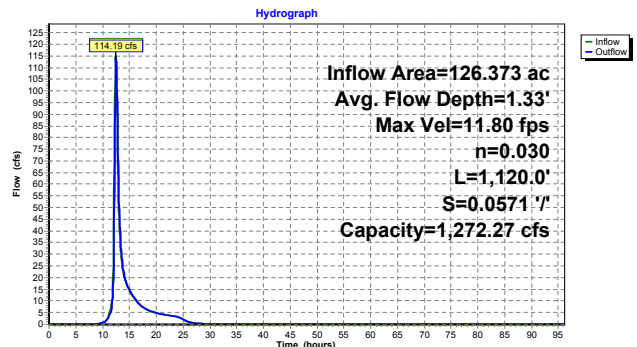
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 11.80 fps, Min. Travel Time= 1.6 min
 Avg. Velocity = 3.14 fps, Avg. Travel Time= 5.9 min

Peak Storage= 10,877 cf @ 12.47 hrs
 Average Depth at Peak Storage= 1.33'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

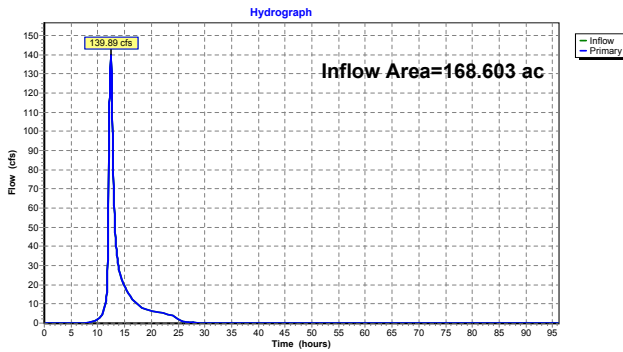


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 1.61" for 2-yr event
 Inflow = 139.89 cfs @ 12.44 hrs, Volume= 22,570 af
 Primary = 139.89 cfs @ 12.44 hrs, Volume= 22,570 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 1.51" for 2-yr event
 Inflow = 142.32 cfs @ 12.20 hrs, Volume= 12,611 af
 Outflow = 107.87 cfs @ 12.32 hrs, Volume= 12,611 af, Atten= 24%, Lag= 7.3 min
 Primary = 107.87 cfs @ 12.32 hrs, Volume= 12,611 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 155.87' @ 12.32 hrs Surf.Area= 0.000 ac Storage= 1.870 af

Plug-Flow detention time= 25.0 min calculated for 12,604 af (100% of inflow)
 Center-of-Mass det. time= 25.2 min (870.3 - 845.1)

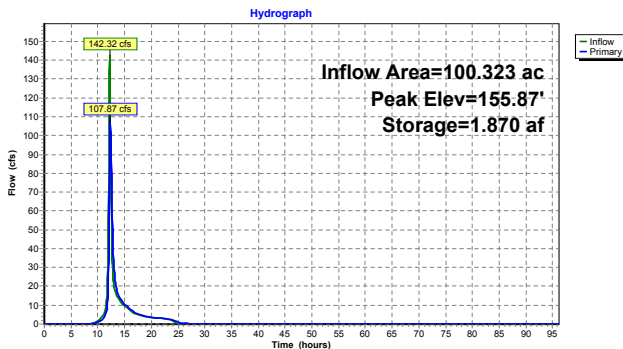
Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8,000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
154.00	0.000
156.00	2.000
158.00	4.000
160.00	6.000
162.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=107.03 cfs @ 12.32 hrs HW=155.86' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 107.03 cfs @ 4.15 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 1.57" for 2-yr event
 Inflow = 130.17 cfs @ 12.32 hrs, Volume= 18,538 af
 Outflow = 114.89 cfs @ 12.45 hrs, Volume= 18,538 af, Atten= 12%, Lag= 7.8 min
 Primary = 114.89 cfs @ 12.45 hrs, Volume= 18,538 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 125.94' @ 12.45 hrs Surf.Area= 0.000 ac Storage= 1.945 af

Plug-Flow detention time= 23.4 min calculated for 16,530 af (100% of inflow)
 Center-of-Mass det. time= 23.5 min (884.7 - 861.2)

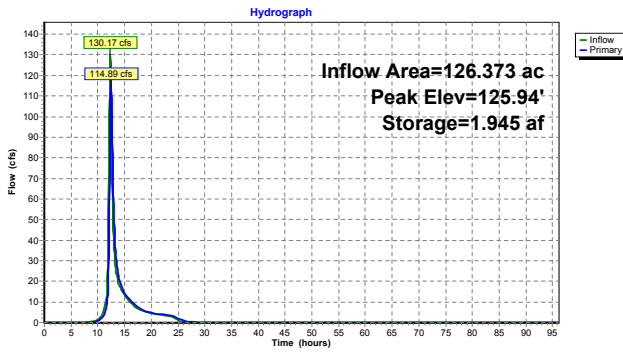
Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	8,000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
124.00	0.000
126.00	2.000
128.00	4.000
130.00	6.000
132.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=114.84 cfs @ 12.45 hrs HW=125.94' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 114.84 cfs @ 4.24 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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	Description	Runoff Area	Impervious %	Runoff Depth	Flow Length	Slope	Tc	CN	Runoff
Subcatchment F1:	Turner Field and Dorm	24,880 ac	18.85%	3.03"	2,460'	0.0431 1/1	9.5 min	83	77.00 cfs
Subcatchment F10:	Admin Bldg and	12,190 ac	43.15%	3.52"	1,487'	0.0498 1/1	6.3 min	88	47.79 cfs
Subcatchment F11:	Admin Bldg and	11,930 ac	33.61%	3.22"	1,243'	0.0354 1/1	7.1 min	85	42.44 cfs
Subcatchment F12:	Tarbell House, Farm	8,860 ac	28.89%	3.22"	1,362'	0.0719 1/1	5.3 min	85	32.92 cfs
Subcatchment F13:	Maintenance	13,060 ac	32.16%	3.22"	1,656'	0.0797 1/1	8.2 min	85	44.75 cfs
Subcatchment F14:	Maintenance	8,380 ac	17.42%	2.94"	1,106'	0.1212 1/1	6.0 min	82	28.20 cfs
Subcatchment F2:	Playing Fields and	8,850 ac	11.64%	2.94"	777'	0.0438 1/1	6.1 min	82	29.72 cfs
Subcatchment F3:	Federal Archives	7,810 ac	61.46%	3.83"	1,072'	0.0112 1/1	4.6 min	91	34.41 cfs
Subcatchment F4:	Former Daycare Center	5,590 ac	1.07%	2.75"	602'	0.0698 1/1	4.9 min	80	18.09 cfs
Subcatchment F5:	Area West of	23,740 ac	14.57%	2.94"	1,813'	0.0386 1/1	7.5 min	82	76.52 cfs
Subcatchment F6:	Cottage Complex West -	9,793 ac	0.00%	2.49"	830'	0.0120 1/1	13.8 min	77	22.13 cfs
Subcatchment F7:	Cottage Complex East -	19,660 ac	6.21%	2.49"	1,389'	0.0216 1/1	11.5 min	77	47.47 cfs
Subcatchment F8:	Chapel	6,630 ac	25.49%	3.12"	1,086'	0.0608 1/1	5.5 min	84	23.88 cfs
Subcatchment F9:	West Nurses and West	7,230 ac	22.82%	3.03"	711'	0.0408 1/1	8.0 min	83	23.59 cfs
Reach 1R:	Channel - Tributary to			0.66'					42.44 cfs
Reach 2R:	Daylighted Stream			2.67'					288.88 cfs

Reach 8R:	Channel - South of	Avg. Flow Depth=2.02'	Max Vel=16.81 fps	Inflow=239.37 cfs	25.867 af
Reach 14R:	Channel - Pine Street to	Avg. Flow Depth=2.07'	Max Vel=14.87 fps	Inflow=249.17 cfs	31.265 af
Pond 15P:	Clematis Brook to Beaver Brook	Inflow=304.00 cfs	42.400 af	Primary=304.00 cfs	42.400 af
Pond 16P:	Pond 1 Constructed-	Peak Elev=156.96'	Storage=2.960 af	Inflow=273.74 cfs	24.141 af
Pond 17P:	Pond 2 Constructed-	Peak Elev=127.12'	Storage=3.116 af	Inflow=271.34 cfs	31.265 af

Total Runoff Area = 168.603 ac **Runoff Volume = 42.400 af** **Average Runoff Depth = 3.02"**
78.59% Pervious = 132.513 ac **21.41% Impervious = 36.090 ac**

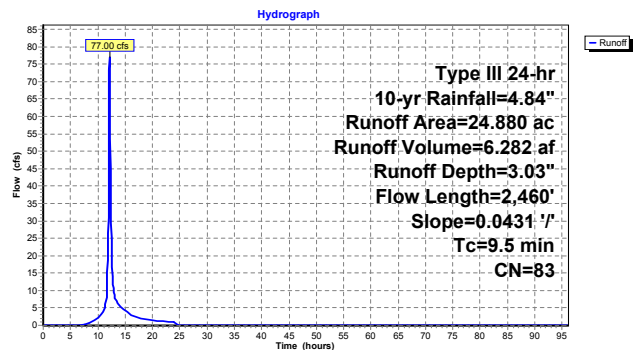
Summary for Subcatchment F1: Turner Field and Dorm

Runoff = 77.00 cfs @ 12.14 hrs, Volume= 6.282 af, Depth= 3.03"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
20,190	79	50-75% Grass cover, Fair, HSG C
4,690	98	Paved parking, HSG C
24,880	83	Weighted Average
20,190		81.15% Pervious Area
4,690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

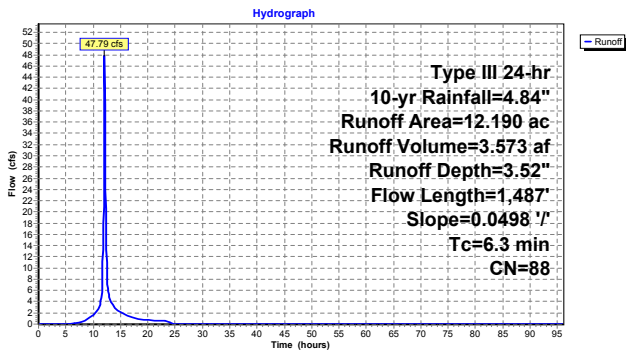
Runoff = 47.79 cfs @ 12.09 hrs, Volume= 3.573 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487				Total

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

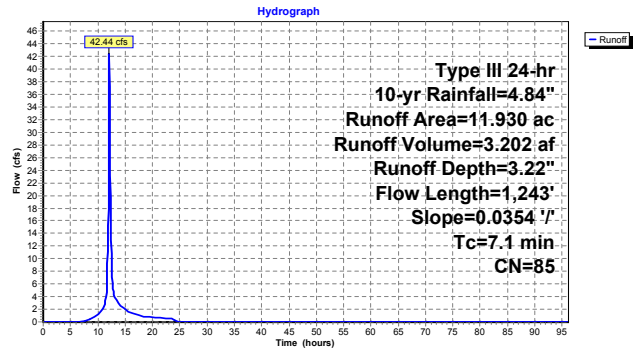
Runoff = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243				Total

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

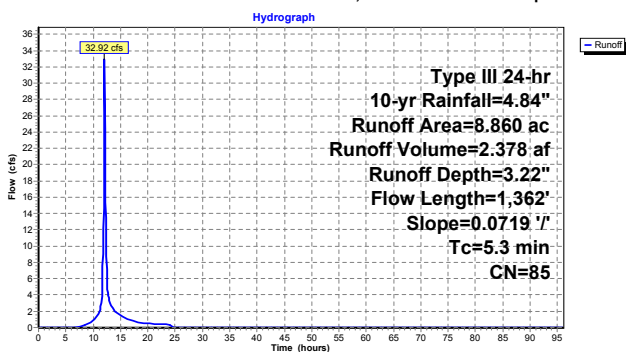
Runoff = 32.92 cfs @ 12.08 hrs, Volume= 2.378 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
* 2.560	98	Roads, Roof and Paved parking, HSG C
* 0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362				Total

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

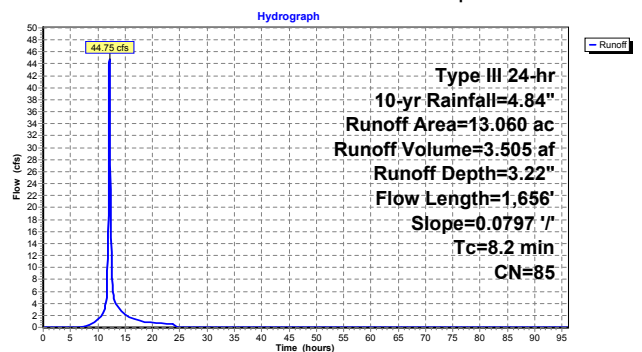
Runoff = 44.75 cfs @ 12.12 hrs, Volume= 3.505 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

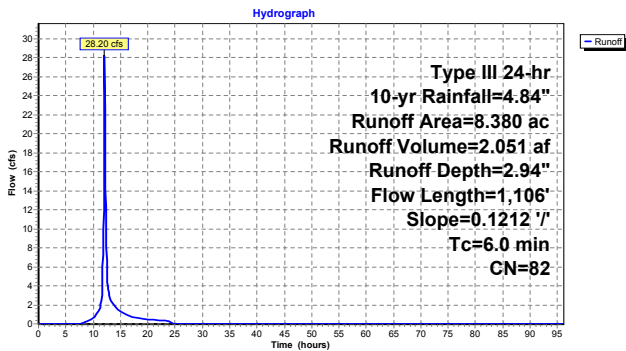
Runoff = 28.20 cfs @ 12.09 hrs, Volume= 2.051 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
* 1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

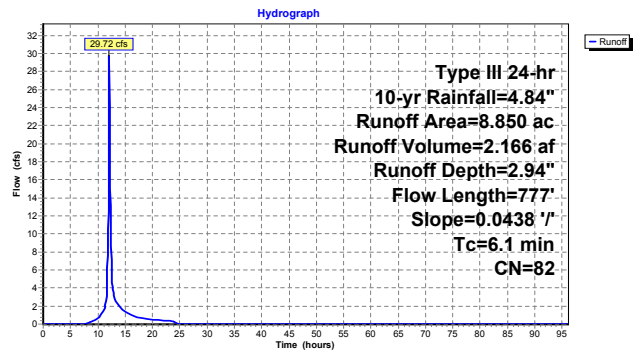
Runoff = 29.72 cfs @ 12.09 hrs, Volume= 2.166 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
* 7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
* 0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777	Total			

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

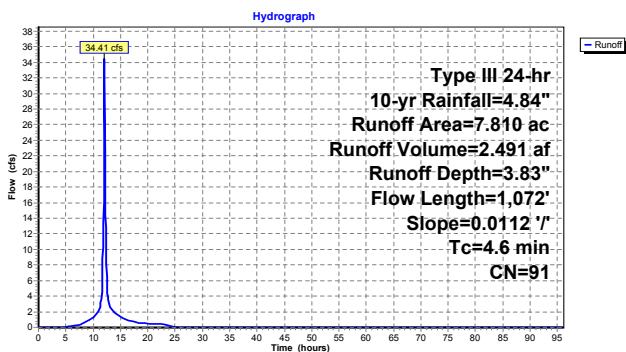
Runoff = 34.41 cfs @ 12.07 hrs, Volume= 2.491 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
* 4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

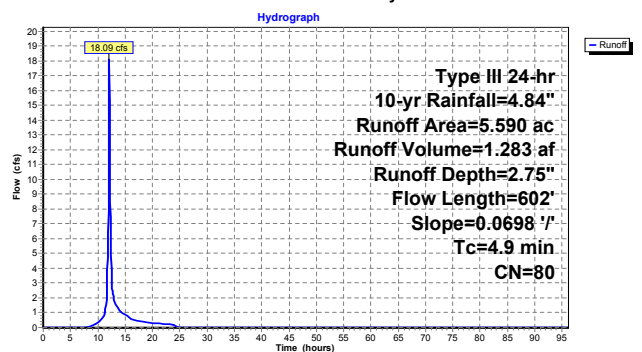
Runoff = 18.09 cfs @ 12.08 hrs, Volume= 1.283 af, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

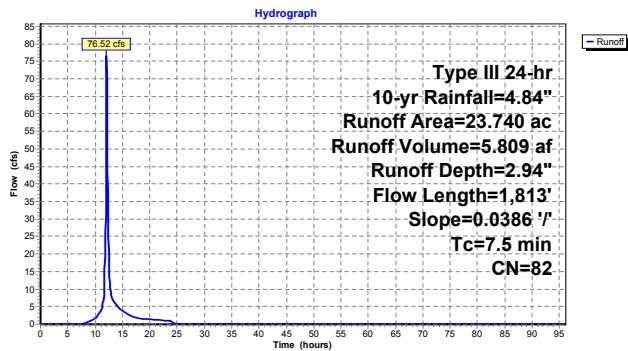
Runoff = 76.52 cfs @ 12.11 hrs, Volume= 5.809 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813				Total

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

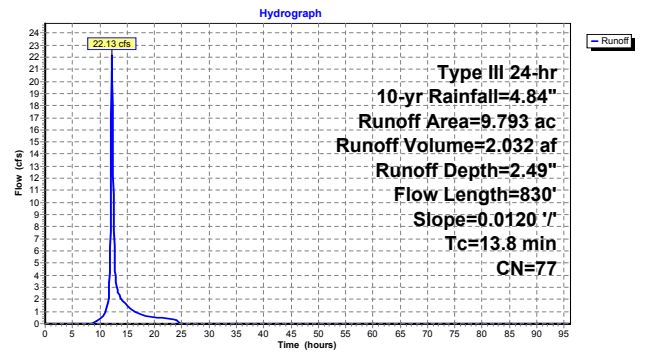
Runoff = 22.13 cfs @ 12.20 hrs, Volume= 2.032 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830				Total

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

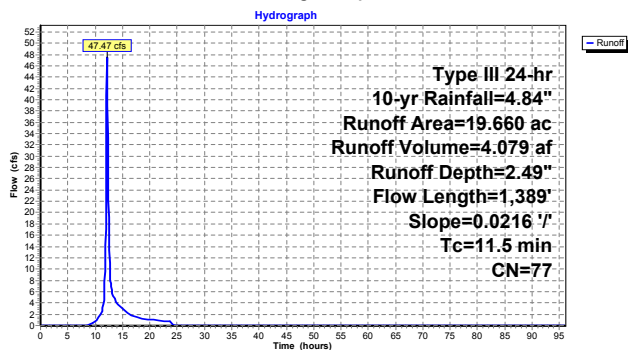
Runoff = 47.47 cfs @ 12.16 hrs, Volume= 4.079 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
* 1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

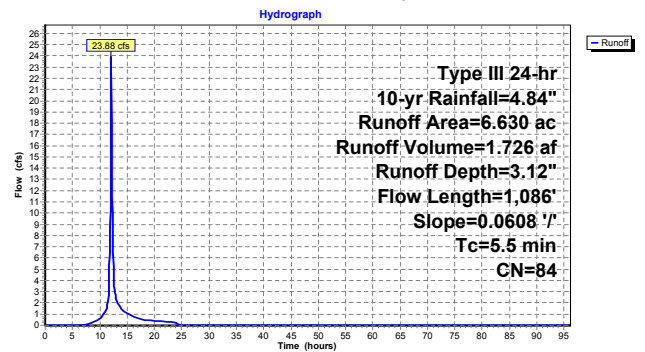
Runoff = 23.88 cfs @ 12.08 hrs, Volume= 1.726 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
* 1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



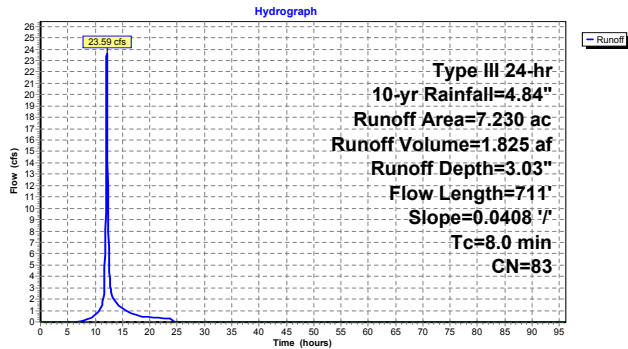
Summary for Subcatchment F9: West Nurses and West Building Area

Runoff = 23.59 cfs @ 12.11 hrs, Volume= 1.825 af, Depth= 3.03"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture K _v = 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

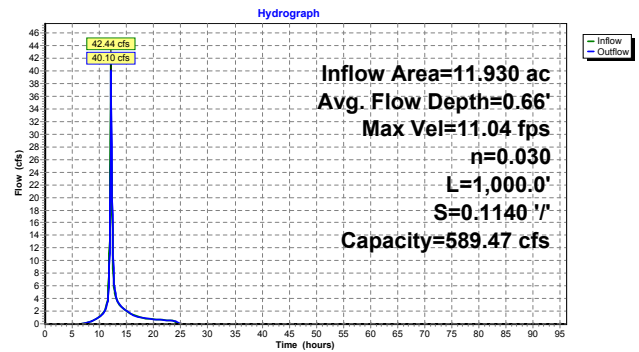
Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 3.22" for 10-yr event
 Inflow = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af
 Outflow = 40.10 cfs @ 12.15 hrs, Volume= 3.202 af, Atten= 6%, Lag= 2.8 min
 Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 11.04 fps, Min. Travel Time= 1.5 min
 Avg. Velocity = 3.03 fps, Avg. Travel Time= 5.5 min

Peak Storage= 3,724 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.66'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



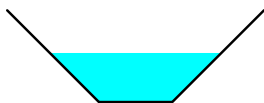
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 2.89" for 10-yr event
 Inflow = 288.88 cfs @ 12.11 hrs, Volume= 24.141 af
 Outflow = 273.74 cfs @ 12.18 hrs, Volume= 24.141 af, Atten= 5%, Lag= 3.9 min

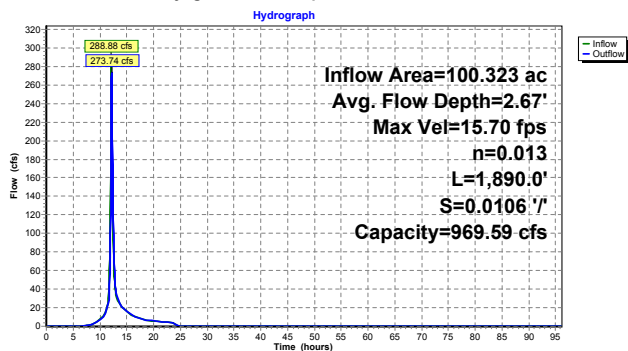
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 15.70 fps, Min. Travel Time= 2.0 min
 Avg. Velocity = 4.58 fps, Avg. Travel Time= 6.9 min

Peak Storage= 33,728 cf @ 12.15 hrs
 Average Depth at Peak Storage= 2.67'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 '/
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



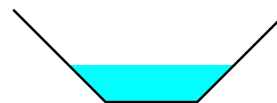
Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 2.90" for 10-yr event
 Inflow = 239.37 cfs @ 12.27 hrs, Volume= 25.867 af
 Outflow = 236.69 cfs @ 12.29 hrs, Volume= 25.867 af, Atten= 1%, Lag= 1.4 min

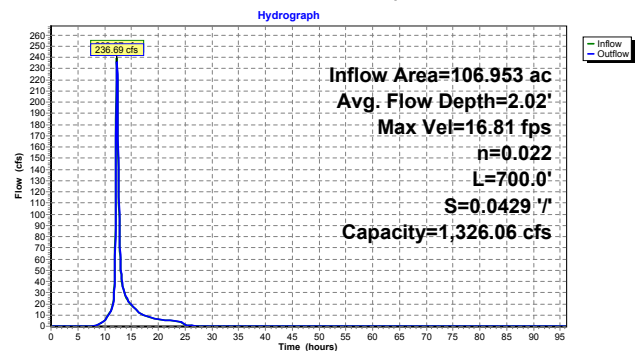
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.81 fps, Min. Travel Time= 0.7 min
 Avg. Velocity = 4.25 fps, Avg. Travel Time= 2.7 min

Peak Storage= 9,932 cf @ 12.27 hrs
 Average Depth at Peak Storage= 2.02'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 '/
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 2.97" for 10-yr event
 Inflow = 249.17 cfs @ 12.36 hrs, Volume= 31.265 af
 Outflow = 247.19 cfs @ 12.40 hrs, Volume= 31.265 af, Atten= 1%, Lag= 2.3 min

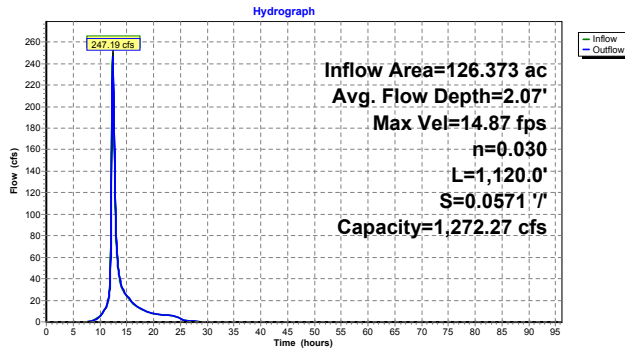
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 14.87 fps, Min. Travel Time= 1.3 min
 Avg. Velocity = 3.67 fps, Avg. Travel Time= 5.1 min

Peak Storage= 18,696 cf @ 12.38 hrs
 Average Depth at Peak Storage= 2.07'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

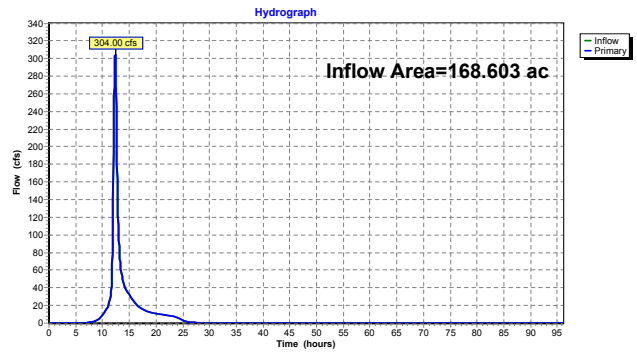


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 3.02" for 10-yr event
 Inflow = 304.00 cfs @ 12.37 hrs, Volume= 42.400 af
 Primary = 304.00 cfs @ 12.37 hrs, Volume= 42.400 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 2.89" for 10-yr event
 Inflow = 273.74 cfs @ 12.18 hrs, Volume= 24.141 af
 Outflow = 228.61 cfs @ 12.27 hrs, Volume= 24.141 af, Atten= 16%, Lag= 5.4 min
 Primary = 228.61 cfs @ 12.27 hrs, Volume= 24.141 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 156.96' @ 12.27 hrs Surf.Area= 0.000 ac Storage= 2,960 af

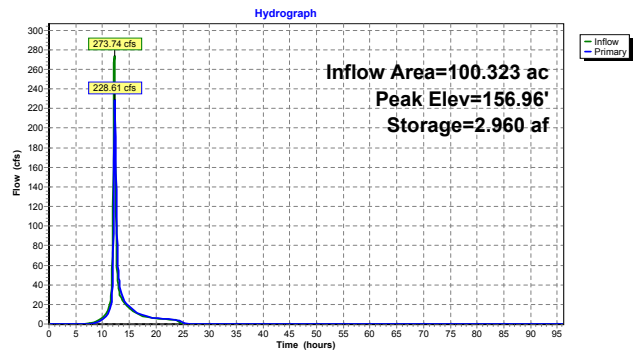
Plug-Flow detention time= 20.1 min calculated for 24.128 af (100% of inflow)
 Center-of-Mass det. time= 20.3 min (846.2 - 825.9)

Volume	Invert	Avail. Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum. Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=225.90 cfs @ 12.27 hrs HW=156.94' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 225.90 cfs @ 5.15 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 2.97" for 10-yr event
 Inflow = 271.34 cfs @ 12.27 hrs, Volume= 31.265 af
 Outflow = 249.17 cfs @ 12.36 hrs, Volume= 31.265 af, Atten= 8%, Lag= 5.4 min
 Primary = 249.17 cfs @ 12.36 hrs, Volume= 31.265 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 127.12' @ 12.36 hrs Surf.Area= 0.000 ac Storage= 3.116 af

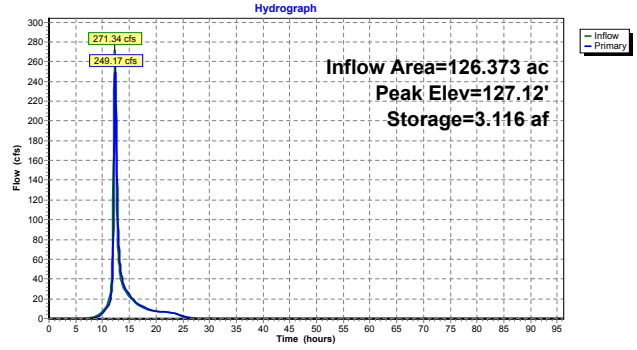
Plug-Flow detention time= 18.8 min calculated for 31.249 af (100% of inflow)
 Center-of-Mass det. time= 18.8 min (857.7 - 838.9)

Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	8,000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
124.00	0.000		
126.00	2.000		
128.00	4.000		
130.00	6.000		
132.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=247.90 cfs @ 12.36 hrs HW=127.11' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 247.90 cfs @ 5.28 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=4.22"
 Flow Length=2,460' Slope=0.0431 '/' Tc=9.5 min CN=83 Runoff=106.33 cfs 4,753 af

Subcatchment F10: Admin Bldg and Runoff Area=12,190 ac 43.15% Impervious Runoff Depth=4.76"
 Flow Length=1,487' Slope=0.0498 '/' Tc=6.3 min CN=88 Runoff=63.73 cfs 4,836 af

Subcatchment F11: Admin Bldg and Runoff Area=11,930 ac 33.61% Impervious Runoff Depth=4.43"
 Flow Length=1,243' Slope=0.0354 '/' Tc=7.1 min CN=85 Runoff=57.76 cfs 4,409 af

Subcatchment F12: Tarbell House, Farm Runoff Area=8,860 ac 28.89% Impervious Runoff Depth=4.43"
 Flow Length=1,362' Slope=0.0719 '/' Tc=5.3 min CN=85 Runoff=44.78 cfs 3,274 af

Subcatchment F13: Maintenance Runoff Area=13,060 ac 32.16% Impervious Runoff Depth=4.43"
 Flow Length=1,656' Slope=0.0797 '/' Tc=8.2 min CN=85 Runoff=60.95 cfs 4,826 af

Subcatchment F14: Maintenance Runoff Area=8,380 ac 17.42% Impervious Runoff Depth=4.12"
 Flow Length=1,106' Slope=0.1212 '/' Tc=6.0 min CN=82 Runoff=39.19 cfs 2,874 af

Subcatchment F2: Playing Fields and Runoff Area=8,850 ac 11.64% Impervious Runoff Depth=4.12"
 Flow Length=777' Slope=0.0438 '/' Tc=6.1 min CN=82 Runoff=41.30 cfs 3,036 af

Subcatchment F3: Federal Archives Runoff Area=7,810 ac 61.46% Impervious Runoff Depth=5.09"
 Flow Length=1,072' Slope=0.0112 '/' Tc=4.6 min CN=91 Runoff=45.08 cfs 3,316 af

Subcatchment F4: Former Daycare Center Runoff Area=5,590 ac 1.07% Impervious Runoff Depth=3.91"
 Flow Length=602' Slope=0.0698 '/' Tc=4.9 min CN=80 Runoff=25.73 cfs 1,820 af

Subcatchment F5: Area West of Runoff Area=23,740 ac 14.57% Impervious Runoff Depth=4.12"
 Flow Length=1,813' Slope=0.0386 '/' Tc=7.5 min CN=82 Runoff=106.45 cfs 8,143 af

Subcatchment F6: Cottage Complex West Runoff Area=9,793 ac 0.00% Impervious Runoff Depth=3.60"
 Flow Length=830' Slope=0.0120 '/' Tc=13.8 min CN=77 Runoff=32.06 cfs 2,939 af

Subcatchment F7: Cottage Complex East Runoff Area=19,860 ac 6.21% Impervious Runoff Depth=3.60"
 Flow Length=1,389' Slope=0.0216 '/' Tc=11.5 min CN=77 Runoff=68.78 cfs 5,901 af

Subcatchment F8: Chapel Runoff Area=6,630 ac 25.49% Impervious Runoff Depth=4.33"
 Flow Length=1,086' Slope=0.0608 '/' Tc=5.5 min CN=84 Runoff=32.71 cfs 2,391 af

Subcatchment F9: West Nurses and West Runoff Area=7,230 ac 22.82% Impervious Runoff Depth=4.22"
 Flow Length=711' Slope=0.0408 '/' Tc=8.0 min CN=83 Runoff=32.59 cfs 2,543 af

Reach 1R: Channel - Tributary to Avg. Flow Depth=0.79' Max Vel=12.27 fps Inflow=57.76 cfs 4,409 af
 n=0.030 L=1,000.0' S=0.1140 '/' Capacity=589.47 cfs Outflow=54.65 cfs 4,409 af

Reach 2R: Daylighted Stream Avg. Flow Depth=3.19' Max Vel=17.13 fps Inflow=403.34 cfs 33,907 af
 n=0.013 L=1,890.0' S=0.0106 '/' Capacity=969.59 cfs Outflow=384.76 cfs 33,907 af

Reach 8R: Channel - South of Avg. Flow Depth=2.48' Max Vel=18.68 fps Inflow=346.83 cfs 36,298 af
 n=0.022 L=700.0' S=0.0429 '/' Capacity=1,326.06 cfs Outflow=344.10 cfs 36,298 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=2.57' Max Vel=16.60 fps Inflow=365.91 cfs 43,678 af
 n=0.030 L=1,120.0' S=0.0571 '/' Capacity=1,272.27 cfs Outflow=363.37 cfs 43,678 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=447.33 cfs 59,062 af
 Primary=447.33 cfs 59,062 af

Pond 16P: Pond 1 Constructed- Peak Elev=157.69' Storage=3.693 af Inflow=384.76 cfs 33,907 af
 Outflow=331.60 cfs 33,907 af

Pond 17P: Pond 2 Constructed- Peak Elev=127.91' Storage=3.913 af Inflow=392.81 cfs 43,678 af
 Outflow=365.91 cfs 43,678 af

Total Runoff Area = 168.603 ac Runoff Volume = 59.062 af Average Runoff Depth = 4.20"
78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

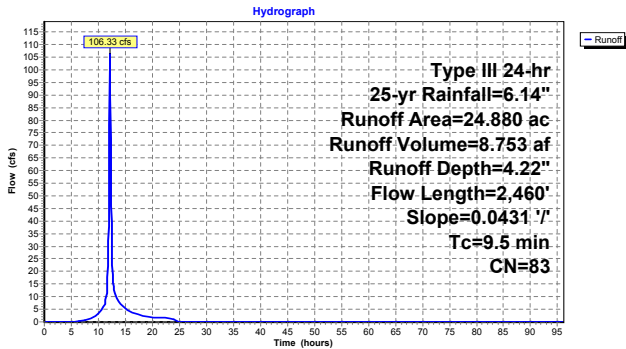
Summary for Subcatchment F1: Turner Field and Dorm

Runoff = 106.33 cfs @ 12.13 hrs, Volume= 8.753 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



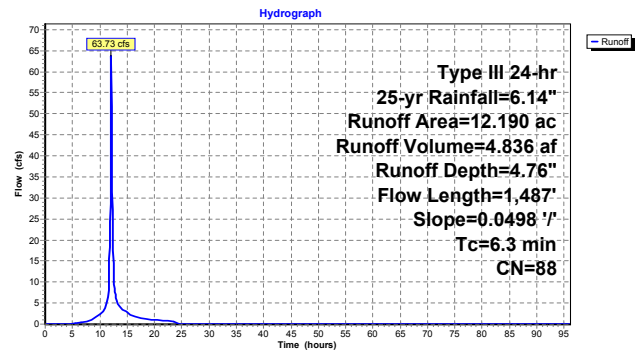
Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

Runoff = 63.73 cfs @ 12.09 hrs, Volume= 4.836 af, Depth= 4.76"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



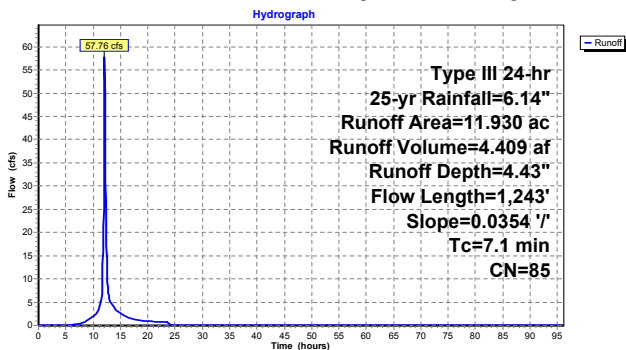
Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

Runoff = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af, Depth= 4.43"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



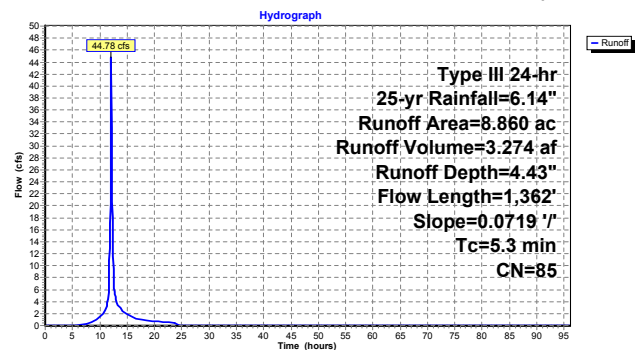
Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

Runoff = 44.78 cfs @ 12.08 hrs, Volume= 3.274 af, Depth= 4.43"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

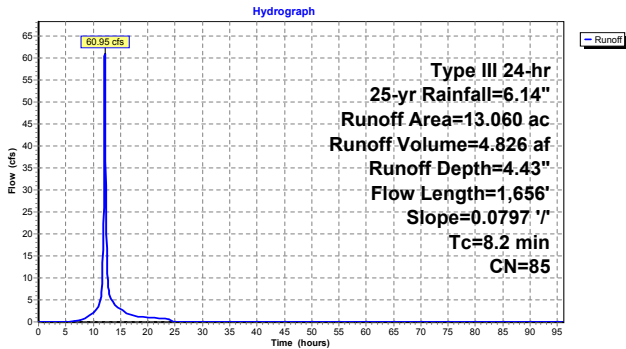
Runoff = 60.95 cfs @ 12.11 hrs, Volume= 4.826 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

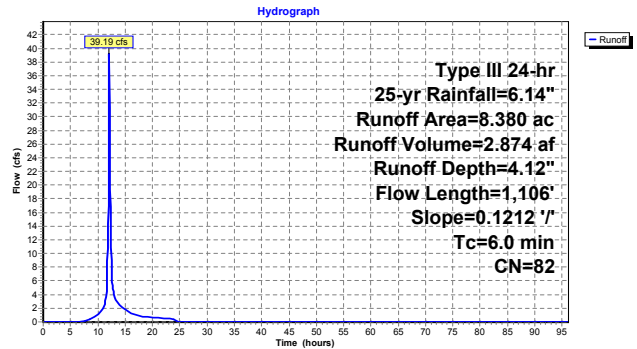
Runoff = 39.19 cfs @ 12.09 hrs, Volume= 2.874 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

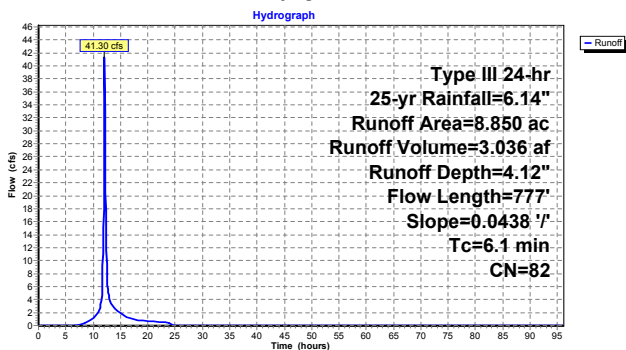
Runoff = 41.30 cfs @ 12.09 hrs, Volume= 3.036 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

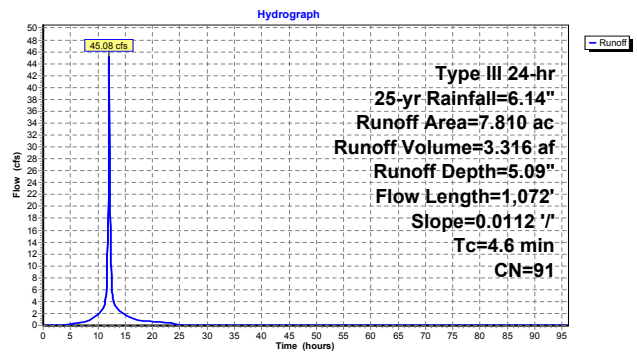
Runoff = 45.08 cfs @ 12.07 hrs, Volume= 3.316 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

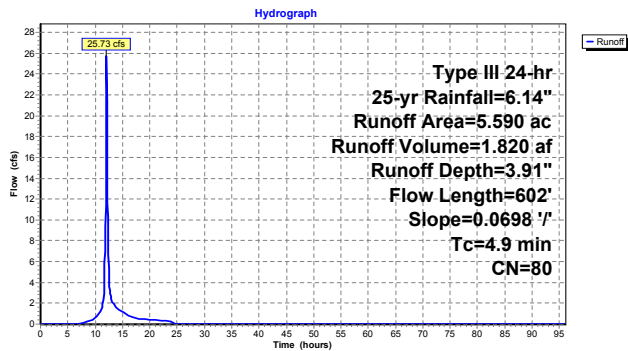
Runoff = 25.73 cfs @ 12.07 hrs, Volume= 1.820 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

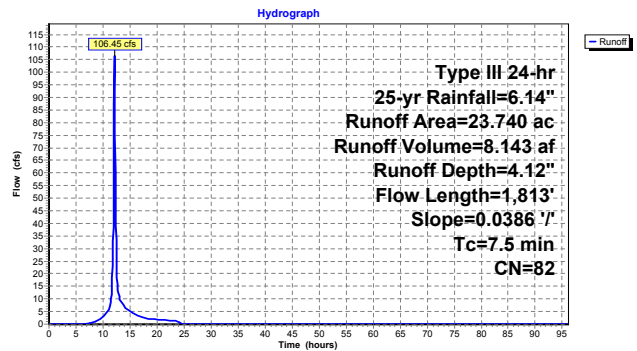
Runoff = 106.45 cfs @ 12.11 hrs, Volume= 8.143 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

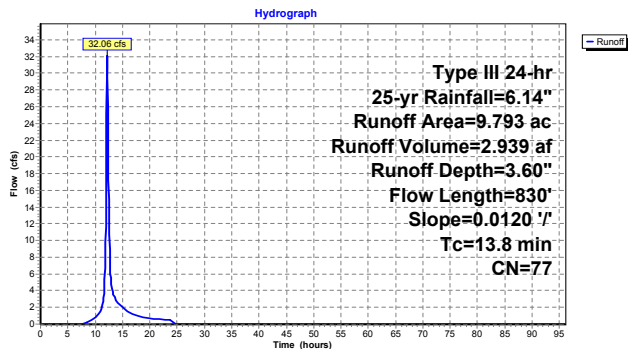
Runoff = 32.06 cfs @ 12.19 hrs, Volume= 2.939 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830	Total			

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

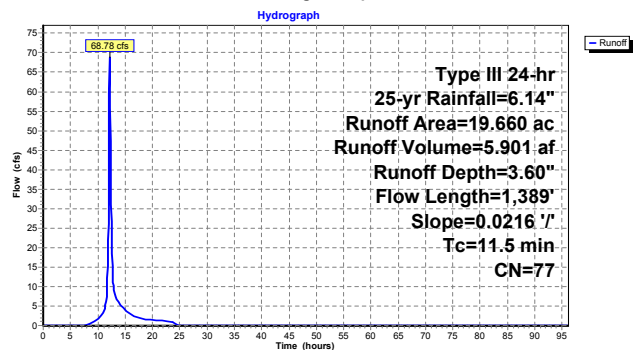
Runoff = 68.78 cfs @ 12.16 hrs, Volume= 5.901 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
* 1.220	98	Roads, Roof and Paved parking, HSG C
* 1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389	Total			

Subcatchment F7: Cottage Complex East - Demolished



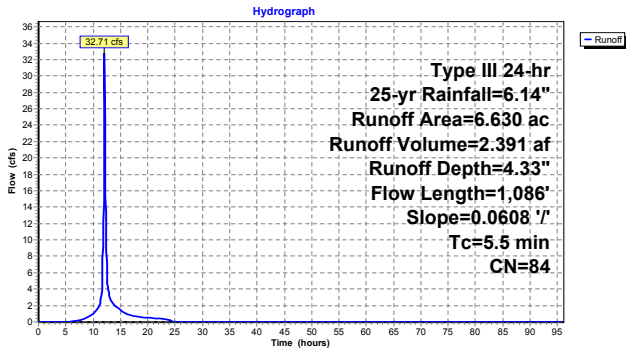
Summary for Subcatchment F8: Chapel

Runoff = 32.71 cfs @ 12.08 hrs, Volume= 2.391 af, Depth= 4.33"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086	Total			

Subcatchment F8: Chapel



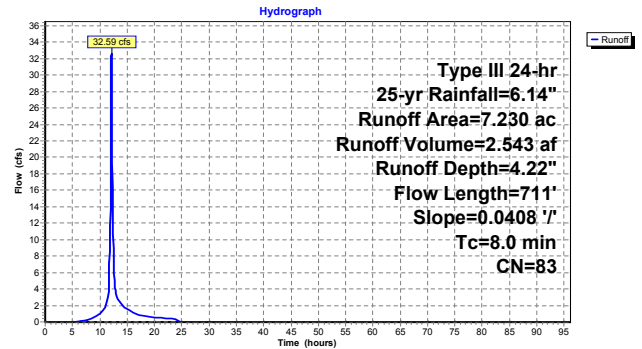
Summary for Subcatchment F9: West Nurses and West Building Area

Runoff = 32.59 cfs @ 12.11 hrs, Volume= 2.543 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 4.43" for 25-yr event
 Inflow = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af
 Outflow = 54.65 cfs @ 12.14 hrs, Volume= 4.409 af, Atten= 5%, Lag= 2.5 min

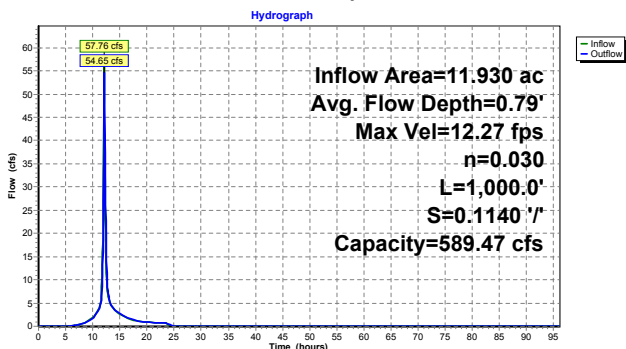
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.27 fps, Min. Travel Time= 1.4 min
 Avg. Velocity= 3.30 fps, Avg. Travel Time= 5.1 min

Peak Storage= 4,589 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.79'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



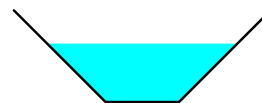
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 4.06" for 25-yr event
 Inflow = 403.34 cfs @ 12.11 hrs, Volume= 33.907 af
 Outflow = 384.76 cfs @ 12.17 hrs, Volume= 33.907 af, Atten= 5%, Lag= 3.6 min

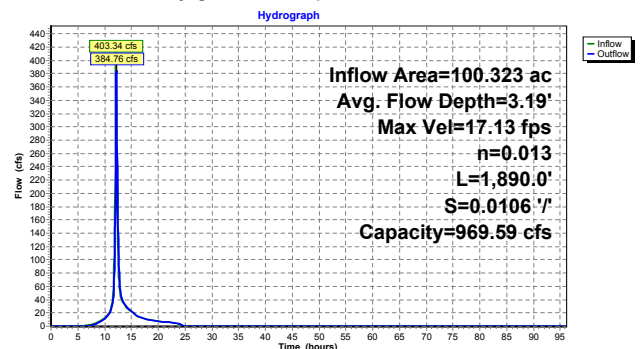
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 17.13 fps, Min. Travel Time= 1.8 min
 Avg. Velocity= 5.04 fps, Avg. Travel Time= 6.2 min

Peak Storage= 43,275 cf @ 12.14 hrs
 Average Depth at Peak Storage= 3.19'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 '/' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 '/'
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



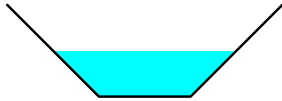
Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 4.07" for 25-yr event
 Inflow = 346.83 cfs @ 12.25 hrs, Volume= 36.298 af
 Outflow = 344.10 cfs @ 12.27 hrs, Volume= 36.298 af, Atten= 1%, Lag= 1.1 min

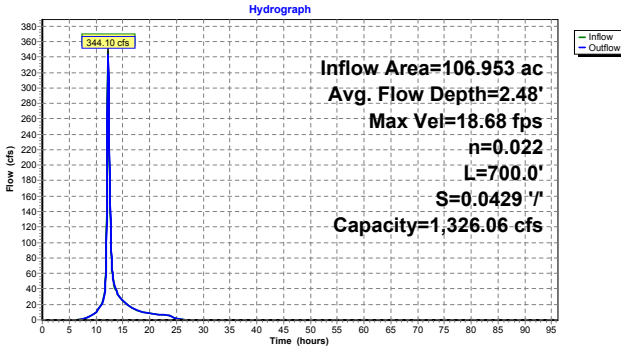
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 18.68 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 4.65 fps, Avg. Travel Time= 2.5 min

Peak Storage= 12,997 cf @ 12.26 hrs
 Average Depth at Peak Storage= 2.48'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 4.15" for 25-yr event
 Inflow = 365.91 cfs @ 12.33 hrs, Volume= 43.678 af
 Outflow = 363.37 cfs @ 12.36 hrs, Volume= 43.678 af, Atten= 1%, Lag= 2.1 min

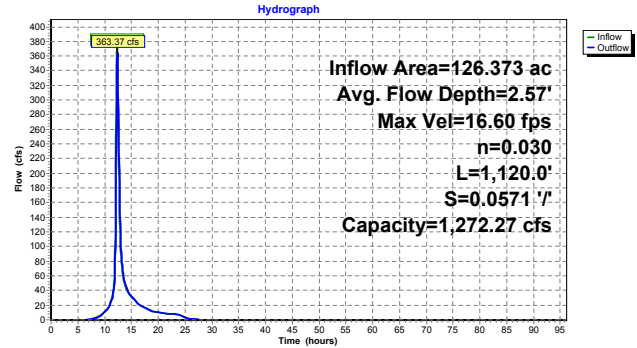
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.60 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 4.01 fps, Avg. Travel Time= 4.7 min

Peak Storage= 24,663 cf @ 12.34 hrs
 Average Depth at Peak Storage= 2.57'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

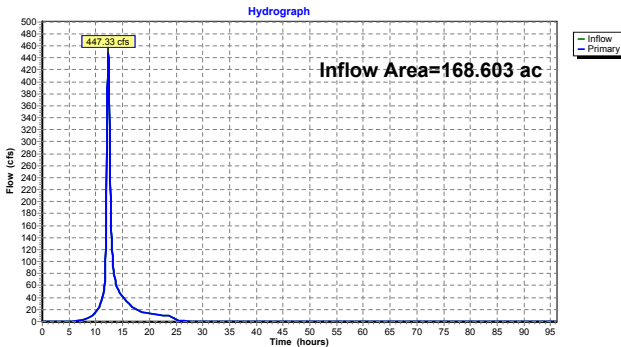


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 4.20" for 25-yr event
 Inflow = 447.33 cfs @ 12.33 hrs, Volume= 59.062 af
 Primary = 447.33 cfs @ 12.33 hrs, Volume= 59.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 4.06" for 25-yr event
 Inflow = 384.76 cfs @ 12.17 hrs, Volume= 33.907 af
 Outflow = 331.60 cfs @ 12.25 hrs, Volume= 33.907 af, Atten= 14%, Lag= 4.8 min
 Primary = 331.60 cfs @ 12.25 hrs, Volume= 33.907 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 157.69' @ 12.25 hrs Surf.Area= 0.000 ac Storage= 3.693 af

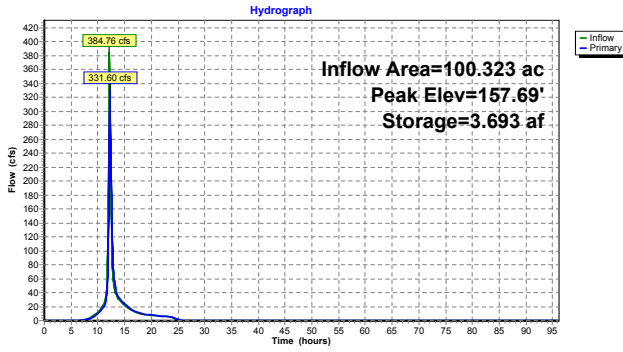
Plug-Flow detention time= 18.0 min calculated for 33.889 af (100% of inflow)
 Center-of-Mass det. time= 18.1 min (834.2 - 816.1)

Volume	Invert	Avail. Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum. Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=330.42 cfs @ 12.25 hrs HW=157.68' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 330.42 cfs @ 5.72 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 4.15' for 25-yr event
 Inflow = 392.81 cfs @ 12.25 hrs, Volume= 43.678 af
 Outflow = 365.91 cfs @ 12.33 hrs, Volume= 43.678 af, Atten= 7%, Lag= 4.5 min
 Primary = 365.91 cfs @ 12.33 hrs, Volume= 43.678 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 127.91' @ 12.33 hrs Surf.Area= 0.000 ac Storage= 3.913 af

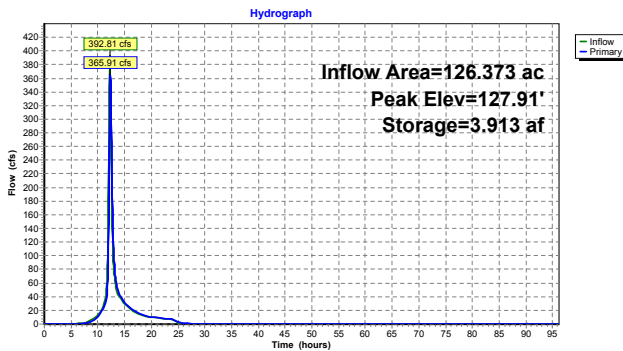
Plug-Flow detention time= 16.8 min calculated for 43.678 af (100% of inflow)
 Center-of-Mass det. time= 16.8 min (844.4 - 827.6)

Volume #1	Invert	Avail.Storage	Storage Description
	124.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
124.00	0.000		
126.00	2.000		
128.00	4.000		
130.00	6.000		
132.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=363.80 cfs @ 12.33 hrs HW=127.90' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 363.80 cfs @ 5.87 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm** Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=6.74"
 Flow Length=2,460' Slope=0.0431 '/' Tc=9.5 min CN=83 Runoff=166.54 cfs 13.983 af
- Subcatchment F10: Admin Bldg and** Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=7.35"
 Flow Length=1,487' Slope=0.0498 '/' Tc=6.3 min CN=88 Runoff=96.05 cfs 7.468 af
- Subcatchment F11: Admin Bldg and** Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=6.99"
 Flow Length=1,243' Slope=0.0354 '/' Tc=7.1 min CN=85 Runoff=89.01 cfs 6.947 af
- Subcatchment F12: Tarbell House, Farm** Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=6.99"
 Flow Length=1,362' Slope=0.0719 '/' Tc=5.3 min CN=85 Runoff=68.95 cfs 5.159 af
- Subcatchment F13: Maintenance** Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=6.99"
 Flow Length=1,656' Slope=0.0797 '/' Tc=8.2 min CN=85 Runoff=93.98 cfs 7.605 af
- Subcatchment F14: Maintenance** Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=6.62"
 Flow Length=1,106' Slope=0.1212 '/' Tc=6.0 min CN=82 Runoff=61.81 cfs 4.625 af
- Subcatchment F2: Playing Fields and** Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=6.62"
 Flow Length=777' Slope=0.0438 '/' Tc=6.1 min CN=82 Runoff=65.14 cfs 4.884 af
- Subcatchment F3: Federal Archives** Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=7.72"
 Flow Length=1,072' Slope=0.0112 '/' Tc=4.6 min CN=91 Runoff=66.68 cfs 5.021 af
- Subcatchment F4: Former Daycare Center** Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=6.38"
 Flow Length=602' Slope=0.0698 '/' Tc=4.9 min CN=80 Runoff=41.34 cfs 2.971 af
- Subcatchment F5: Area West of** Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=6.62"
 Flow Length=1,813' Slope=0.0386 '/' Tc=7.5 min CN=82 Runoff=168.09 cfs 13.101 af
- Subcatchment F6: Cottage Complex West** Runoff Area=9.793 ac 0.00% Impervious Runoff Depth=6.01"
 Flow Length=830' Slope=0.0120 '/' Tc=13.8 min CN=77 Runoff=53.02 cfs 4.907 af
- Subcatchment F7: Cottage Complex East** Runoff Area=19.660 ac 6.21% Impervious Runoff Depth=6.01"
 Flow Length=1,389' Slope=0.0216 '/' Tc=11.5 min CN=77 Runoff=113.71 cfs 9.851 af
- Subcatchment F8: Chapel** Runoff Area=6.630 ac 25.49% Impervious Runoff Depth=6.87"
 Flow Length=1,086' Slope=0.0608 '/' Tc=5.5 min CN=84 Runoff=50.75 cfs 3.793 af
- Subcatchment F9: West Nurses and West** Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=6.74"
 Flow Length=711' Slope=0.0408 '/' Tc=8.0 min CN=83 Runoff=51.05 cfs 4.063 af
- Reach 1R: Channel - Tributary to** Avg. Flow Depth=1.03' Max Vel=14.14 fps Inflow=89.01 cfs 6.947 af
 n=0.030 L=1,000.0' S=0.1140 '/' Capacity=589.47 cfs Outflow=84.36 cfs 6.947 af
- Reach 2R: Daylighted Stream** Avg. Flow Depth=4.03' Max Vel=19.28 fps Inflow=640.25 cfs 54.719 af
 n=0.013 L=1,890.0' S=0.0106 '/' Capacity=969.59 cfs Outflow=612.94 cfs 54.719 af

Reach 8R: Channel - South of Avg. Flow Depth=3.25' Max Vel=21.36 fps Inflow=573.98 cfs 58,512 af
 n=0.022 L=700.0' S=0.0429'/' Capacity=1,326.06 cfs Outflow=570.23 cfs 58,512 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=3.43' Max Vel=19.16 fps Inflow=619.10 cfs 70,043 af
 n=0.030 L=1,120.0' S=0.0571'/' Capacity=1,272.27 cfs Outflow=614.06 cfs 70,043 af

Pond 15P: Clematis Brook to Beaver Brook
 Inflow=758.55 cfs 94,378 af
 Primary=758.55 cfs 94,378 af

Pond 16P: Pond 1 Constructed - Peak Elev=158.95' Storage=4.948 af Inflow=612.94 cfs 54,719 af
 Outflow=548.75 cfs 54,719 af

Pond 17P: Pond 2 Constructed - Peak Elev=129.30' Storage=5.299 af Inflow=650.97 cfs 70,043 af
 Outflow=619.10 cfs 70,043 af

Total Runoff Area = 168.603 ac Runoff Volume = 94.378 af Average Runoff Depth = 6.72"
78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

Summary for Subcatchment F1: Turner Field and Dorm

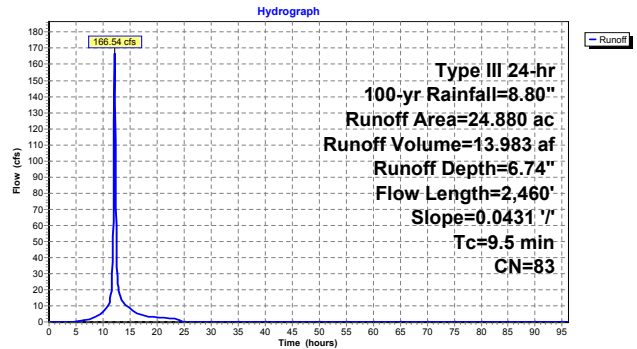
Runoff = 166.54 cfs @ 12.13 hrs, Volume= 13.983 af, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

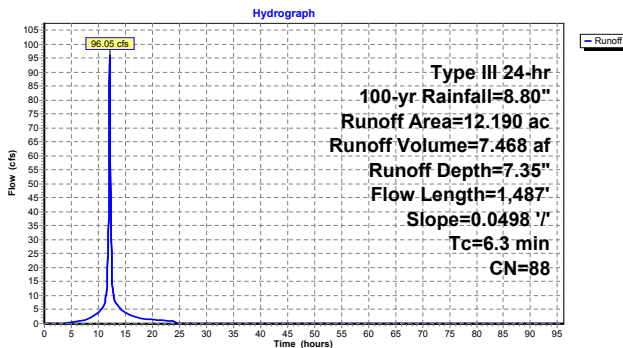
Runoff = 96.05 cfs @ 12.09 hrs, Volume= 7.468 af, Depth= 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

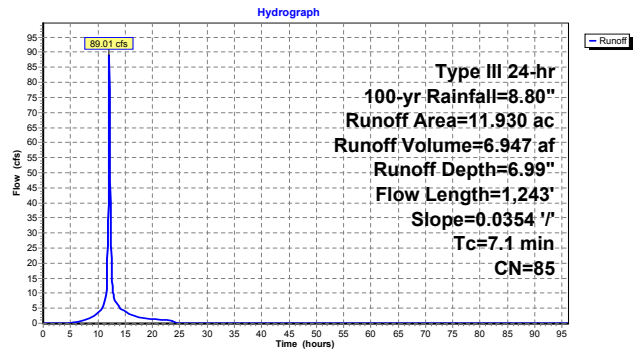
Runoff = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

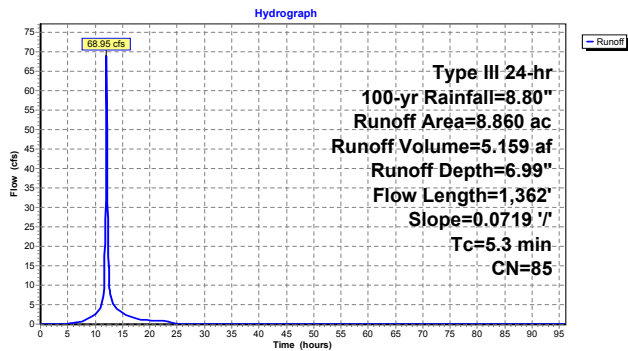
Runoff = 68.95 cfs @ 12.08 hrs, Volume= 5.159 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362				Total

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

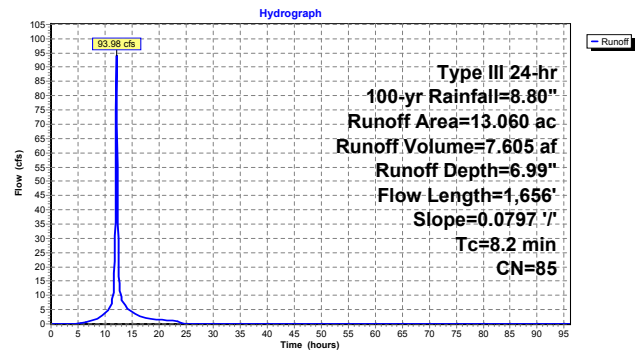
Runoff = 93.98 cfs @ 12.11 hrs, Volume= 7.605 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

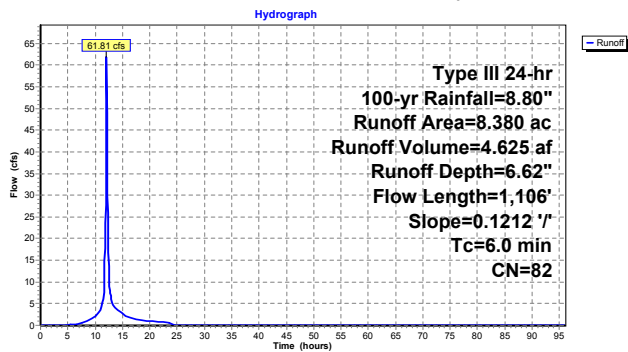
Runoff = 61.81 cfs @ 12.09 hrs, Volume= 4.625 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

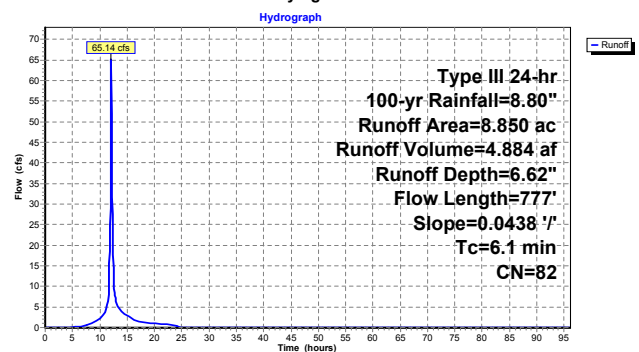
Runoff = 65.14 cfs @ 12.09 hrs, Volume= 4.884 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

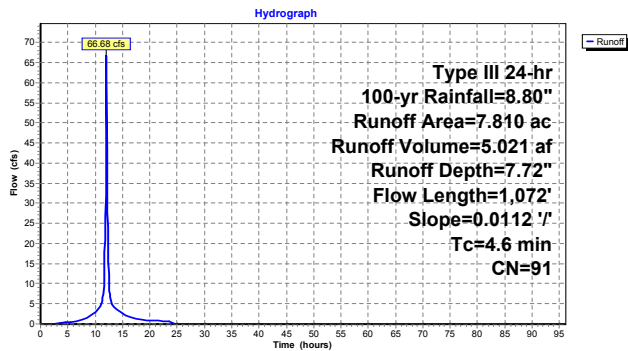
Runoff = 66.68 cfs @ 12.07 hrs, Volume= 5.021 af, Depth= 7.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved K _v = 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

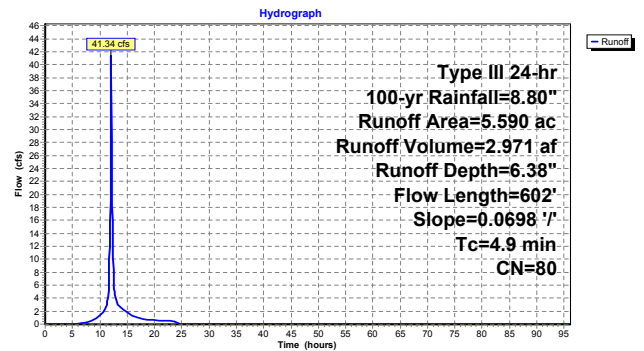
Runoff = 41.34 cfs @ 12.07 hrs, Volume= 2.971 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
0.060	98	Paved parking and Roof area, HSG C
0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway K _v = 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

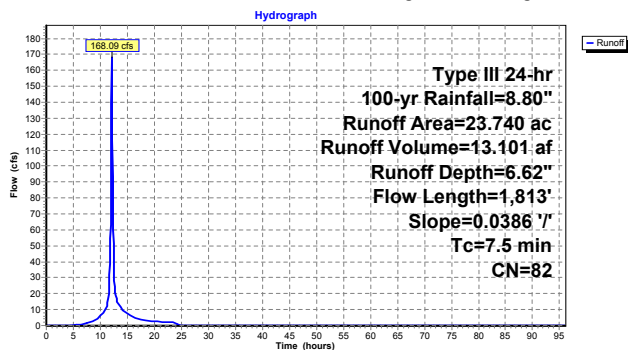
Runoff = 168.09 cfs @ 12.11 hrs, Volume= 13.101 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
3.460	98	Paved parking and Roof area, HSG C
0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway K _v = 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

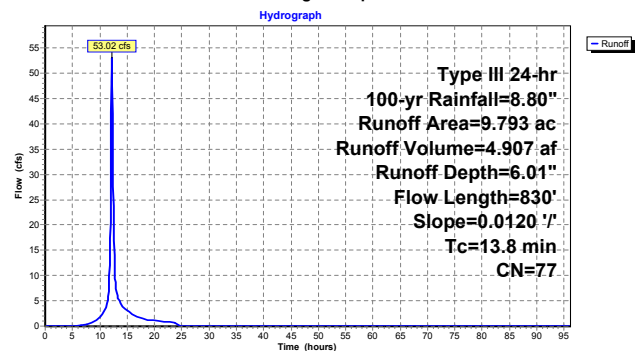
Runoff = 53.02 cfs @ 12.19 hrs, Volume= 4.907 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway K _v = 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830	Total			

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

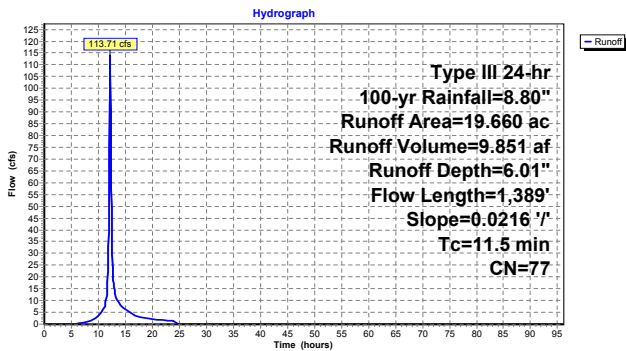
Runoff = 113.71 cfs @ 12.16 hrs, Volume= 9.851 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Short n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

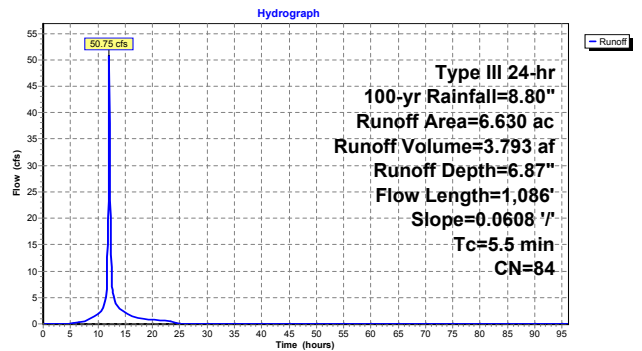
Runoff = 50.75 cfs @ 12.08 hrs, Volume= 3.793 af, Depth= 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



Summary for Subcatchment F9: West Nurses and West Building Area

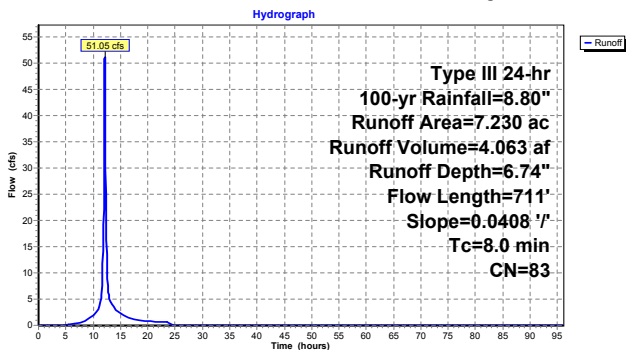
Runoff = 51.05 cfs @ 12.11 hrs, Volume= 4.063 af, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 6.99" for 100-yr event
 Inflow = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af
 Outflow = 84.36 cfs @ 12.14 hrs, Volume= 6.947 af, Atten= 5%, Lag= 2.2 min

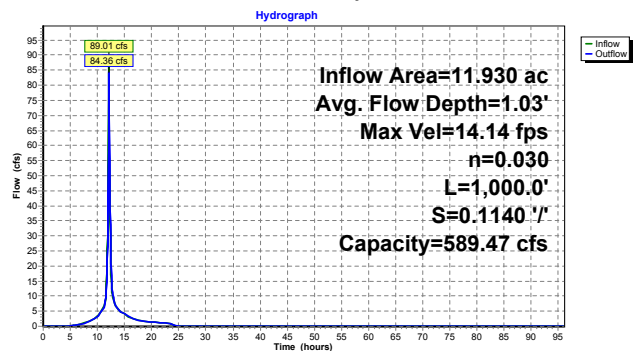
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 14.14 fps, Min. Travel Time= 1.2 min
 Avg. Velocity= 3.78 fps, Avg. Travel Time= 4.4 min

Peak Storage= 6,176 cf @ 12.12 hrs
 Average Depth at Peak Storage= 1.03'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0 '/' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



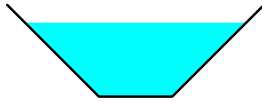
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 6.55" for 100-yr event
 Inflow = 640.25 cfs @ 12.11 hrs, Volume= 54.719 af
 Outflow = 612.94 cfs @ 12.17 hrs, Volume= 54.719 af, Atten= 4%, Lag= 3.2 min

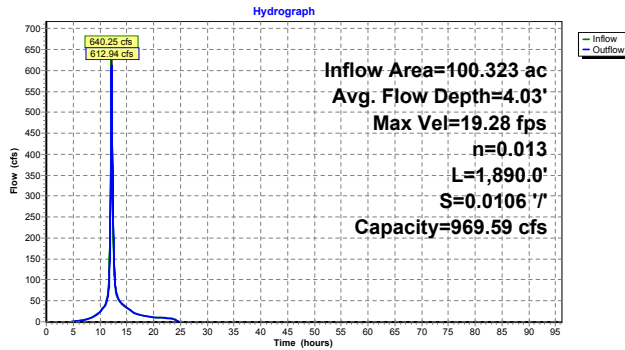
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 19.28 fps, Min. Travel Time= 1.6 min
 Avg. Velocity = 5.82 fps, Avg. Travel Time= 5.4 min

Peak Storage= 61,212 cf @ 12.14 hrs
 Average Depth at Peak Storage= 4.03'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



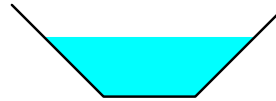
Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 6.56" for 100-yr event
 Inflow = 573.98 cfs @ 12.23 hrs, Volume= 58.512 af
 Outflow = 570.23 cfs @ 12.24 hrs, Volume= 58.512 af, Atten= 1%, Lag= 1.1 min

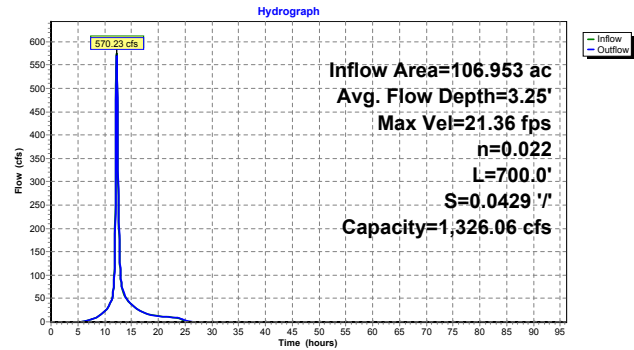
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 21.36 fps, Min. Travel Time= 0.5 min
 Avg. Velocity = 5.33 fps, Avg. Travel Time= 2.2 min

Peak Storage= 18,799 cf @ 12.23 hrs
 Average Depth at Peak Storage= 3.25'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 6.65" for 100-yr event
 Inflow = 619.10 cfs @ 12.29 hrs, Volume= 70.043 af
 Outflow = 614.06 cfs @ 12.32 hrs, Volume= 70.043 af, Atten= 1%, Lag= 1.7 min

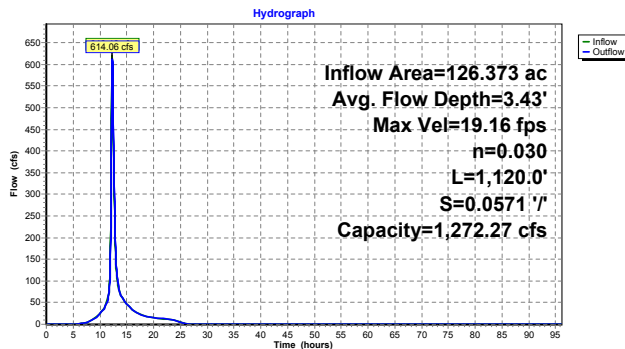
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 19.16 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 4.58 fps, Avg. Travel Time= 4.1 min

Peak Storage= 36,158 cf @ 12.30 hrs
 Average Depth at Peak Storage= 3.43'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

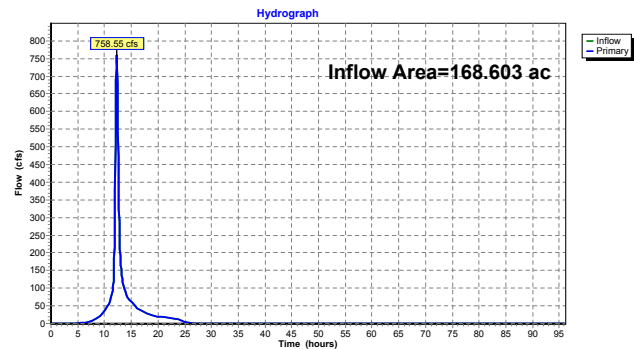


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 6.72" for 100-yr event
 Inflow = 758.55 cfs @ 12.29 hrs, Volume= 94.378 af
 Primary = 758.55 cfs @ 12.29 hrs, Volume= 94.378 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 6.55" for 100-yr event
 Inflow = 612.94 cfs @ 12.17 hrs, Volume= 54.719 af
 Outflow = 548.75 cfs @ 12.23 hrs, Volume= 54.719 af, Atten= 10%, Lag= 3.9 min
 Primary = 548.75 cfs @ 12.23 hrs, Volume= 54.719 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 158.95' @ 12.23 hrs Surf.Area= 0.000 ac Storage= 4.948 af

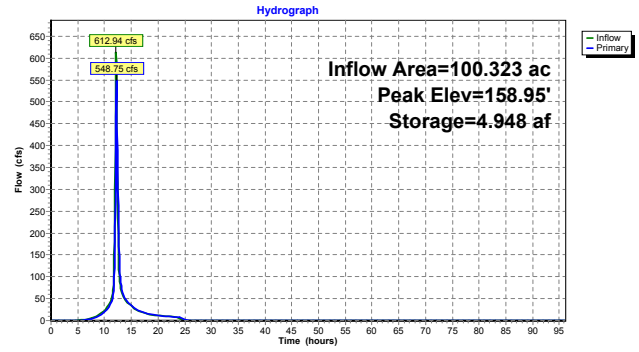
Plug-Flow detention time= 15.4 min calculated for 54.690 af (100% of inflow)
 Center-of-Mass det. time= 15.5 min (817.9 - 802.4)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=542.90 cfs @ 12.23 hrs HW=158.92' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 542.90 cfs @ 6.53 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 6.65" for 100-yr event
 Inflow = 650.97 cfs @ 12.23 hrs, Volume= 70.043 af
 Outflow = 619.10 cfs @ 12.29 hrs, Volume= 70.043 af, Atten= 5%, Lag= 3.6 min
 Primary = 619.10 cfs @ 12.29 hrs, Volume= 70.043 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 129.30' @ 12.29 hrs Surf.Area= 0.000 ac Storage= 5.299 af

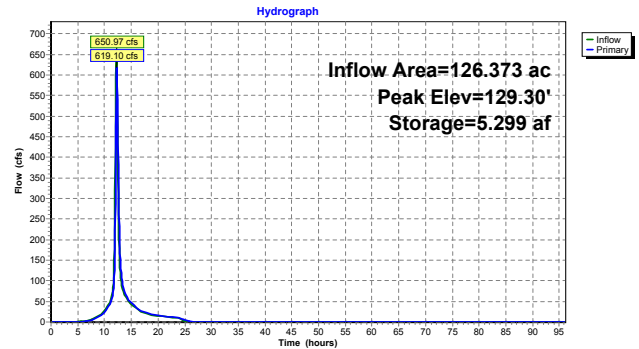
Plug-Flow detention time= 14.3 min calculated for 70.007 af (100% of inflow)
 Center-of-Mass det. time= 14.3 min (826.5 - 812.2)

Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
124.00	0.000		
126.00	2.000		
128.00	4.000		
130.00	6.000		
132.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

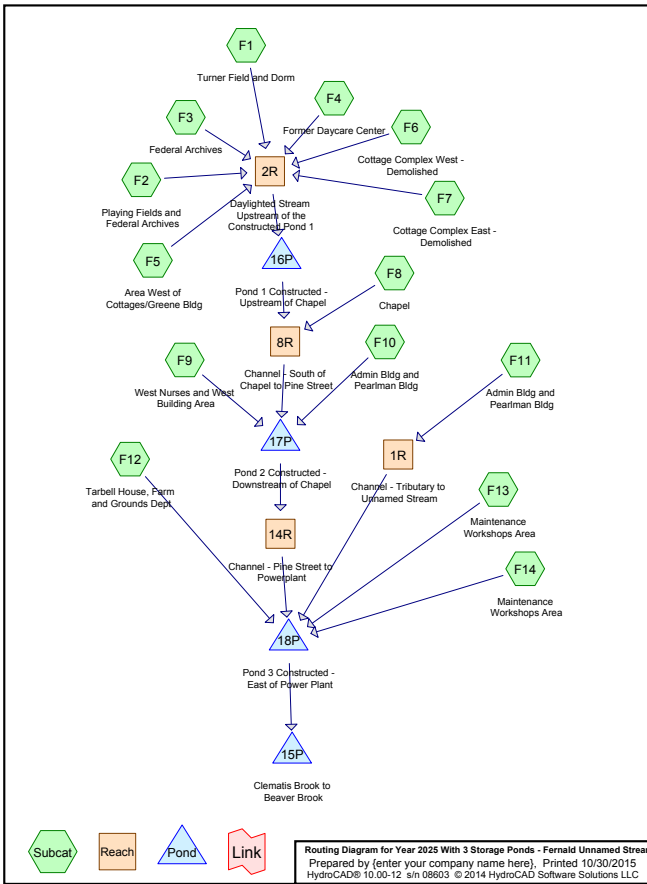
Primary OutFlow Max=615.58 cfs @ 12.29 hrs HW=129.28' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 615.58 cfs @ 6.74 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
102.800	79	50-75% Grass cover, Fair, HSG C (F1, F10, F11, F12, F13, F14, F2, F3, F4, F5, F8, F9)
26.110	74	>75% Grass cover, Good, HSG C (F6, F7)
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C (F10)
9.350	98	Paved parking and Roof area, HSG C (F2, F3, F4, F5)
10.540	98	Paved parking, HSG C (F1, F13, F9)
1.460	98	Paved parking, roofs, HSG C (F14)
14.740	98	Roads, Roof and Paved parking, HSG C (F10, F11, F12, F7, F8)
2.143	98	Water Surface, 0% imp, HSG C (F12, F6, F7)
1.120	98	Water Surface/Wetlands, 0% imp, HSG C (F2, F4, F5)
168.603	83	TOTAL AREA



Routing Diagram for Year 2025 With 3 Storage Ponds - Fernald Unnamed Stream
Prepared by {enter your company name here}, Printed 10/30/2015
HydroCAD® 10.00-12 s/n 08603 © 2014 HydroCAD Software Solutions LLC

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
168.603	HSG C	F1, F10, F11, F12, F13, F14, F2, F3, F4, F5, F6, F7, F8, F9
0.000	HSG D	
0.000	Other	
168.603	TOTAL AREA	

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatc Number
0.000	0.000	102.800	0.000	0.000	102.800	50-75% Grass cover, Fair	
0.000	0.000	26.110	0.000	0.000	26.110	>75% Grass cover, Good	
0.000	0.000	0.340	0.000	0.000	0.340	Detention Basin, Water Surface, 0% imp	
0.000	0.000	10.540	0.000	0.000	10.540	Paved parking	
0.000	0.000	9.350	0.000	0.000	9.350	Paved parking and Roof area	
0.000	0.000	1.460	0.000	0.000	1.460	Paved parking, roofs	
0.000	0.000	14.740	0.000	0.000	14.740	Roads, Roof and Paved parking	
0.000	0.000	2.143	0.000	0.000	2.143	Water Surface, 0% imp	
0.000	0.000	1.120	0.000	0.000	1.120	Water Surface/Wetlands, 0% imp	
0.000	0.000	168.603	0.000	0.000	168.603	TOTAL AREA	

Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm	Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=1.61" Flow Length=2,460' Slope=0.0431 ' /' Tc=9.5 min CN=83 Runoff=40.97 cfs 3.336 af
Subcatchment F10: Admin Bldg and	Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=2.00" Flow Length=1,487' Slope=0.0498 ' /' Tc=6.3 min CN=88 Runoff=27.66 cfs 2.029 af
Subcatchment F11: Admin Bldg and	Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=1.76" Flow Length=1,243' Slope=0.0354 ' /' Tc=7.1 min CN=85 Runoff=23.37 cfs 1.747 af
Subcatchment F12: Tarbell House, Farm	Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=1.76" Flow Length=1,362' Slope=0.053 min CN=85 Runoff=18.17 cfs 1.298 af
Subcatchment F13: Maintenance	Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=1.76" Flow Length=1,656' Slope=0.0797 ' /' Tc=8.2 min CN=85 Runoff=24.62 cfs 1.913 af
Subcatchment F14: Maintenance	Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=1.54" Flow Length=1,106' Slope=0.1212 ' /' Tc=6.0 min CN=82 Runoff=14.77 cfs 1.074 af
Subcatchment F2: Playing Fields and	Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=1.54" Flow Length=777' Slope=0.0438 ' /' Tc=6.1 min CN=82 Runoff=15.56 cfs 1.134 af
Subcatchment F3: Federal Archives	Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=2.26" Flow Length=1,072' Slope=0.0112 ' /' Tc=4.6 min CN=91 Runoff=20.81 cfs 1.470 af
Subcatchment F4: Former Daycare Center	Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=1.40" Flow Length=602' Slope=0.0698 ' /' Tc=4.9 min CN=80 Runoff=9.14 cfs 0.653 af
Subcatchment F5: Area West of	Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=1.54" Flow Length=1,813' Slope=0.0386 ' /' Tc=7.5 min CN=82 Runoff=39.98 cfs 3.043 af
Subcatchment F6: Cottage Complex West -	Runoff Area=9.793 ac 0.00% Impervious Runoff Depth=1.21" Flow Length=830' Slope=0.0120 ' /' Tc=13.8 min CN=77 Runoff=10.46 cfs 0.989 af
Subcatchment F7: Cottage Complex East -	Runoff Area=19.660 ac 6.21% Impervious Runoff Depth=1.21" Flow Length=1,389' Slope=0.0216 ' /' Tc=11.5 min CN=77 Runoff=22.43 cfs 1.985 af
Subcatchment F8: Chapel	Runoff Area=6.630 ac 25.49% Impervious Runoff Depth=1.68" Flow Length=1,086' Slope=0.0608 ' /' Tc=5.5 min CN=84 Runoff=12.96 cfs 0.929 af
Subcatchment F9: West Nurses and West	Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=1.61" Flow Length=711' Slope=0.0408 ' /' Tc=8.0 min CN=83 Runoff=12.54 cfs 0.970 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.46' Max Vel=8.96 fps Inflow=23.37 cfs 1.747 af n=0.030 L=1,000.0' S=0.1140 ' /' Capacity=589.47 cfs Outflow=22.00 cfs 1.747 af
Reach 2R: Daylighted Stream	Avg. Flow Depth=1.87' Max Vel=13.15 fps Inflow=150.05 cfs 12.611 af n=0.013 L=1,890.0' S=0.0106 ' /' Capacity=969.59 cfs Outflow=142.32 cfs 12.611 af

Reach 8R: Channel - South of	Avg. Flow Depth=1.32' Max Vel=13.54 fps Inflow=113.34 cfs 13.540 af n=0.022 L=700.0' S=0.0429 ' /' Capacity=1,326.06 cfs Outflow=112.31 cfs 13.540 af
Reach 14R: Channel - Pine Street to	Avg. Flow Depth=1.33' Max Vel=11.80 fps Inflow=114.89 cfs 16.538 af n=0.030 L=1,120.0' S=0.0571 ' /' Capacity=1,272.27 cfs Outflow=114.19 cfs 16.538 af
Pond 15P: Clematis Brook to Beaver Brook	Inflow=131.52 cfs 22.570 af Primary=131.52 cfs 22.570 af
Pond 16P: Pond 1 Constructed -	Peak Elev=155.87' Storage=1.870 af Inflow=142.32 cfs 12.611 af Outflow=107.87 cfs 12.611 af
Pond 17P: Pond 2 Constructed -	Peak Elev=125.94' Storage=1.945 af Inflow=130.17 cfs 16.538 af Outflow=114.89 cfs 16.538 af
Pond 18P: Pond 3 Constructed - East of	Peak Elev=62.11' Storage=2.114 af Inflow=139.89 cfs 22.570 af Outflow=131.52 cfs 22.570 af
Total Runoff Area = 168.603 ac Runoff Volume = 22.570 af Average Runoff Depth = 1.61" 78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac	

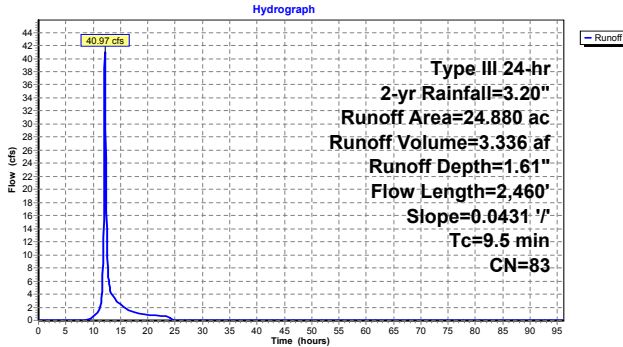
Summary for Subcatchment F1: Turner Field and Dorm

Runoff = 40.97 cfs @ 12.14 hrs, Volume= 3.336 af, Depth= 1.61"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



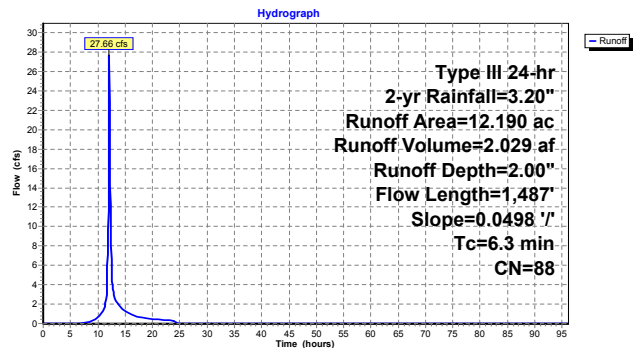
Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

Runoff = 27.66 cfs @ 12.09 hrs, Volume= 2.029 af, Depth= 2.00"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

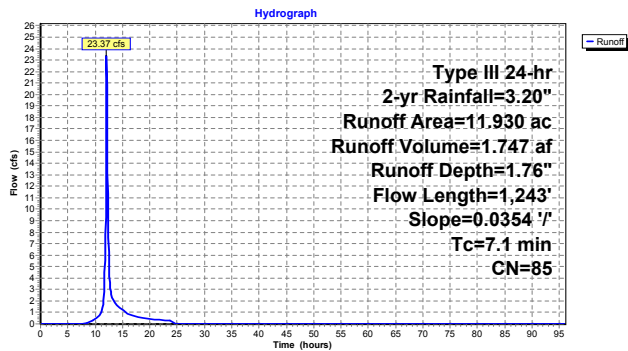
Runoff = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

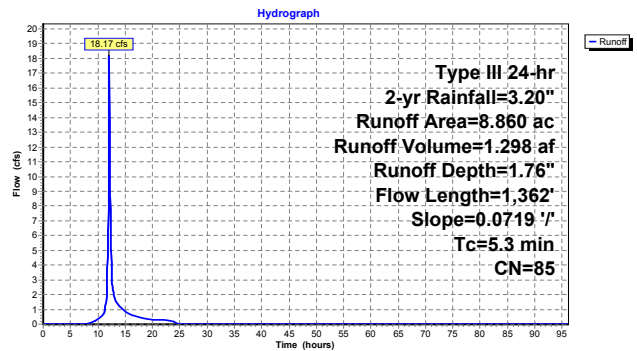
Runoff = 18.17 cfs @ 12.08 hrs, Volume= 1.298 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

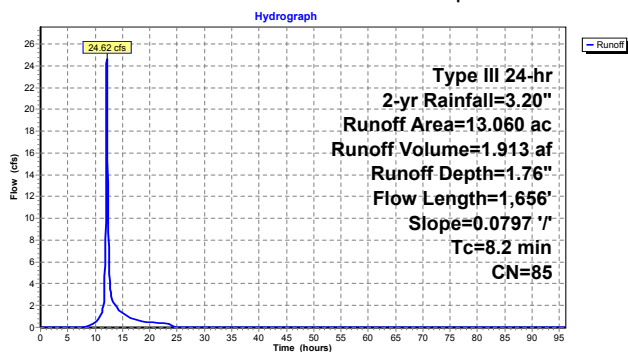
Runoff = 24.62 cfs @ 12.12 hrs, Volume= 1.913 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

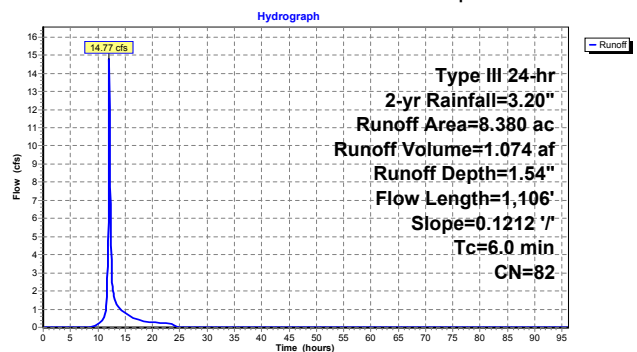
Runoff = 14.77 cfs @ 12.09 hrs, Volume= 1.074 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

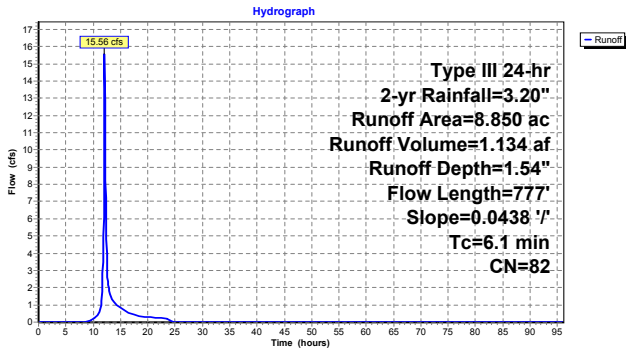
Runoff = 15.56 cfs @ 12.10 hrs, Volume= 1.134 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
* 1.030	98	Paved parking and Roof area, HSG C
* 0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

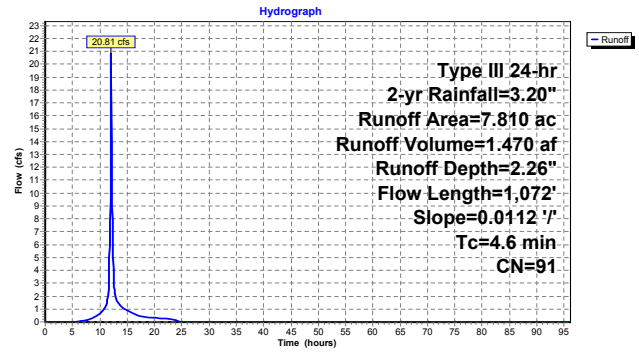
Runoff = 20.81 cfs @ 12.07 hrs, Volume= 1.470 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
* 4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

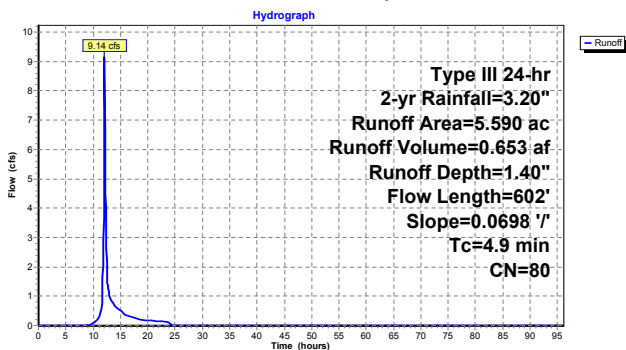
Runoff = 9.14 cfs @ 12.08 hrs, Volume= 0.653 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602				Total

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

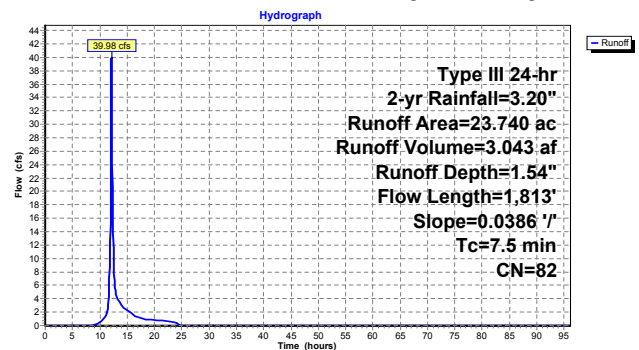
Runoff = 39.98 cfs @ 12.11 hrs, Volume= 3.043 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813				Total

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

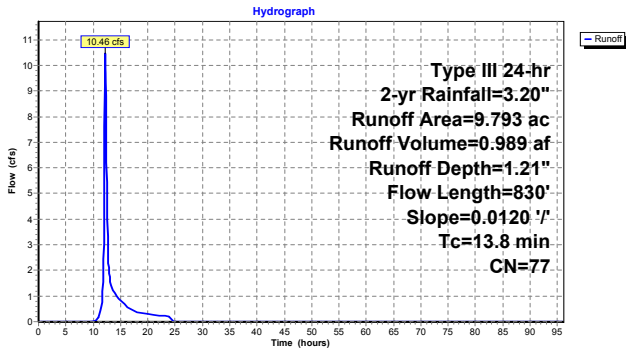
Runoff = 10.46 cfs @ 12.20 hrs, Volume= 0.989 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830				Total

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

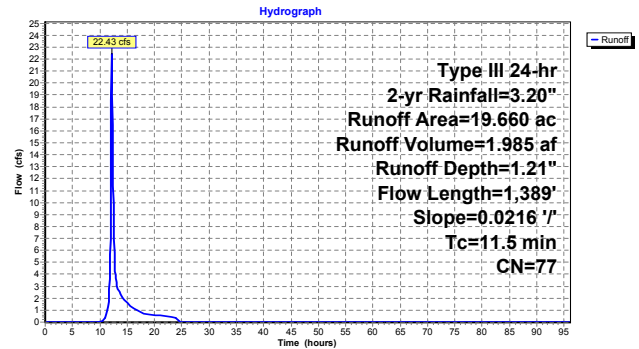
Runoff = 22.43 cfs @ 12.17 hrs, Volume= 1.985 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

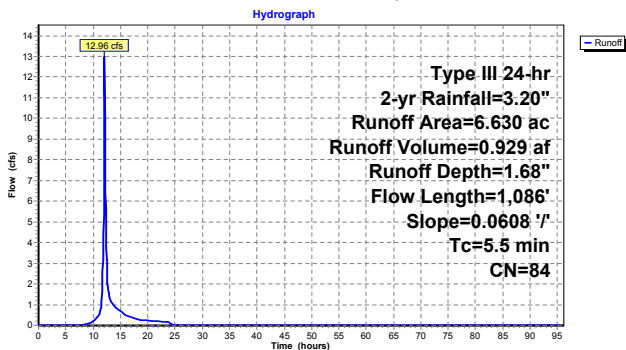
Runoff = 12.96 cfs @ 12.09 hrs, Volume= 0.929 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



Summary for Subcatchment F9: West Nurses and West Building Area

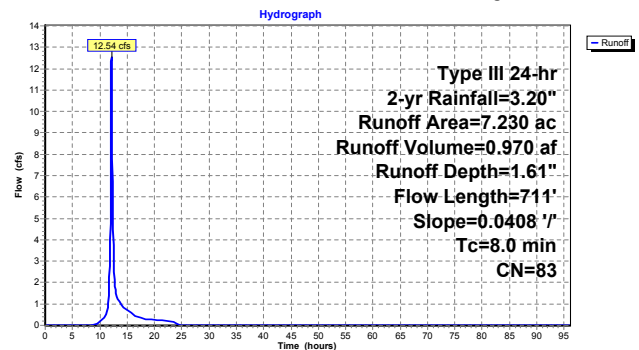
Runoff = 12.54 cfs @ 12.12 hrs, Volume= 0.970 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 1.76" for 2-yr event
 Inflow = 23.37 cfs @ 12.11 hrs, Volume= 1.747 af
 Outflow = 22.00 cfs @ 12.16 hrs, Volume= 1.747 af, Atten= 6%, Lag= 3.4 min

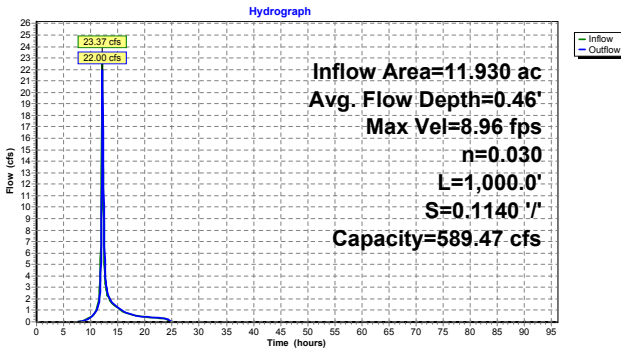
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 8.96 fps, Min. Travel Time= 1.9 min
 Avg. Velocity = 2.57 fps, Avg. Travel Time= 6.5 min

Peak Storage= 2,492 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.46'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 ' / '
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



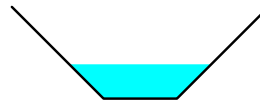
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 1.51" for 2-yr event
 Inflow = 150.05 cfs @ 12.12 hrs, Volume= 12.611 af
 Outflow = 142.32 cfs @ 12.20 hrs, Volume= 12.611 af, Atten= 5%, Lag= 4.7 min

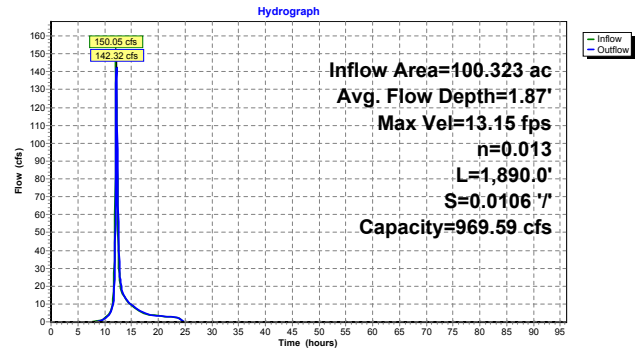
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.15 fps, Min. Travel Time= 2.4 min
 Avg. Velocity = 3.86 fps, Avg. Travel Time= 8.2 min

Peak Storage= 20,766 cf @ 12.15 hrs
 Average Depth at Peak Storage= 1.87'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 1.52" for 2-yr event
 Inflow = 112.31 cfs @ 12.31 hrs, Volume= 13.540 af
 Outflow = 112.31 cfs @ 12.34 hrs, Volume= 13.540 af, Atten= 1%, Lag= 1.7 min

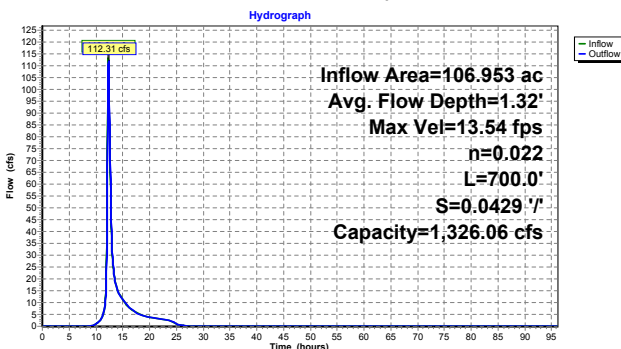
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 13.54 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 3.63 fps, Avg. Travel Time= 3.2 min

Peak Storage= 5,847 cf @ 12.32 hrs
 Average Depth at Peak Storage= 1.32'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 1.57" for 2-yr event
 Inflow = 114.89 cfs @ 12.45 hrs, Volume= 16.538 af
 Outflow = 114.19 cfs @ 12.50 hrs, Volume= 16.538 af, Atten= 1%, Lag= 2.8 min

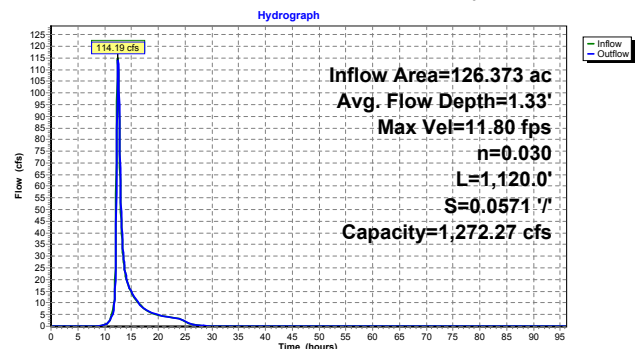
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 11.80 fps, Min. Travel Time= 1.6 min
 Avg. Velocity = 3.14 fps, Avg. Travel Time= 5.9 min

Peak Storage= 10,877 cf @ 12.47 hrs
 Average Depth at Peak Storage= 1.33'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

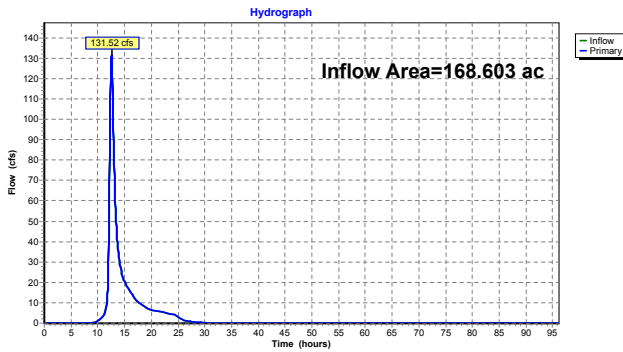


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 1.61" for 2-yr event
 Inflow = 131.52 cfs @ 12.55 hrs, Volume= 22,570 af
 Primary = 131.52 cfs @ 12.55 hrs, Volume= 22,570 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 1.51" for 2-yr event
 Inflow = 142.32 cfs @ 12.20 hrs, Volume= 12,611 af
 Outflow = 107.87 cfs @ 12.32 hrs, Volume= 12,611 af, Atten= 24%, Lag= 7.3 min
 Primary = 107.87 cfs @ 12.32 hrs, Volume= 12,611 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 155.87' @ 12.32 hrs Surf.Area= 0.000 ac Storage= 1.870 af

Plug-Flow detention time= 25.0 min calculated for 12,604 af (100% of inflow)
 Center-of-Mass det. time= 25.2 min (870.3 - 845.1)

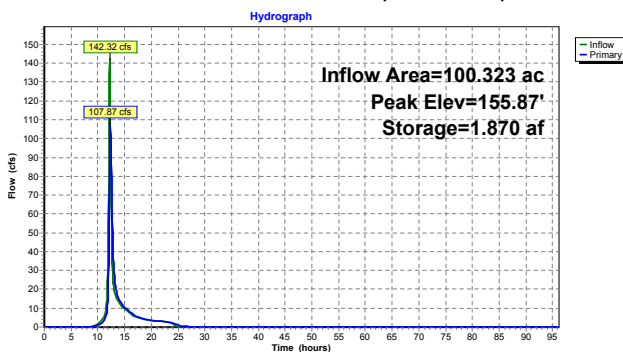
Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8,000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
154.00	0.000
156.00	2.000
158.00	4.000
160.00	6.000
162.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=107.03 cfs @ 12.32 hrs HW=155.86' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 107.03 cfs @ 4.15 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 1.57" for 2-yr event
 Inflow = 130.17 cfs @ 12.32 hrs, Volume= 18,538 af
 Outflow = 114.89 cfs @ 12.45 hrs, Volume= 18,538 af, Atten= 12%, Lag= 7.8 min
 Primary = 114.89 cfs @ 12.45 hrs, Volume= 18,538 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 125.94' @ 12.45 hrs Surf.Area= 0.000 ac Storage= 1.945 af

Plug-Flow detention time= 23.4 min calculated for 16,530 af (100% of inflow)
 Center-of-Mass det. time= 23.5 min (884.7 - 861.2)

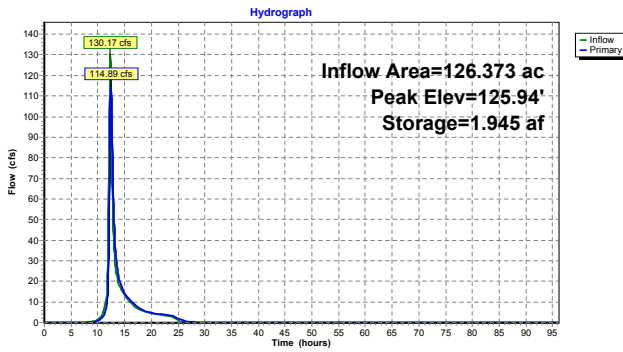
Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	8,000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
124.00	0.000
126.00	2.000
128.00	4.000
130.00	6.000
132.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=114.84 cfs @ 12.45 hrs HW=125.94' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 114.84 cfs @ 4.24 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Summary for Pond 18P: Pond 3 Constructed - East of Power Plant

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 1.61" for 2-yr event
 Inflow = 139.89 cfs @ 12.44 hrs, Volume= 22,570 af
 Outflow = 131.52 cfs @ 12.55 hrs, Volume= 22,570 af, Atten= 6%, Lag= 6.3 min
 Primary = 131.52 cfs @ 12.55 hrs, Volume= 22,570 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.11' @ 12.55 hrs Surf.Area= 0.000 ac Storage= 2.114 af

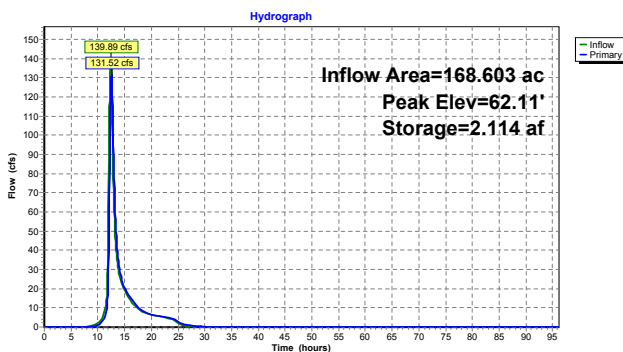
Plug-Flow detention time= 21.4 min calculated for 22,559 af (100% of inflow)
 Center-of-Mass det. time= 21.4 min (894.9 - 873.5)

Volume #1	Invert	Avail.Storage	Storage Description
	60.00'	8,000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
60.00	0.000		
62.00	2.000		
64.00	4.000		
66.00	6.000		
68.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=131.46 cfs @ 12.55 hrs HW=62.11' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 131.46 cfs @ 4.41 fps)

Pond 18P: Pond 3 Constructed - East of Power Plant



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm** Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=3.03"
Flow Length=2,460' Slope=0.0431 ' / ' Tc=9.5 min CN=83 Runoff=77.00 cfs 6,282 af
- Subcatchment F10: Admin Bldg and** Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=3.52"
Flow Length=1,487' Slope=0.0498 ' / ' Tc=6.3 min CN=88 Runoff=47.79 cfs 3,573 af
- Subcatchment F11: Admin Bldg and** Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=3.22"
Flow Length=1,243' Slope=0.0354 ' / ' Tc=7.1 min CN=85 Runoff=42.44 cfs 3,202 af
- Subcatchment F12: Tarbell House, Farm** Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=3.22"
Flow Length=1,362' Slope=0.0719 ' / ' Tc=5.3 min CN=85 Runoff=32.92 cfs 2,378 af
- Subcatchment F13: Maintenance** Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=3.22"
Flow Length=1,656' Slope=0.0797 ' / ' Tc=8.2 min CN=85 Runoff=44.75 cfs 3,505 af
- Subcatchment F14: Maintenance** Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=2.94"
Flow Length=1,106' Slope=0.1212 ' / ' Tc=6.0 min CN=82 Runoff=28.20 cfs 2,051 af
- Subcatchment F2: Playing Fields and** Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=2.94"
Flow Length=777' Slope=0.0438 ' / ' Tc=6.1 min CN=82 Runoff=29.72 cfs 2,166 af
- Subcatchment F3: Federal Archives** Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=3.83"
Flow Length=1,072' Slope=0.0112 ' / ' Tc=4.6 min CN=91 Runoff=34.41 cfs 2,491 af
- Subcatchment F4: Former Daycare Center** Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=2.75"
Flow Length=602' Slope=0.0698 ' / ' Tc=4.9 min CN=80 Runoff=18.09 cfs 1,283 af
- Subcatchment F5: Area West of** Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=2.94"
Flow Length=1,813' Slope=0.0386 ' / ' Tc=7.5 min CN=82 Runoff=76.52 cfs 5,809 af
- Subcatchment F6: Cottage Complex West** Runoff Area=9.793 ac 0.00% Impervious Runoff Depth=2.49"
Flow Length=830' Slope=0.0120 ' / ' Tc=13.8 min CN=77 Runoff=22.13 cfs 2,032 af
- Subcatchment F7: Cottage Complex East** Runoff Area=19.660 ac 6.21% Impervious Runoff Depth=2.49"
Flow Length=1,389' Slope=0.0216 ' / ' Tc=11.5 min CN=77 Runoff=47.47 cfs 4,079 af
- Subcatchment F8: Chapel** Runoff Area=6.630 ac 25.49% Impervious Runoff Depth=3.12"
Flow Length=1,086' Slope=0.0608 ' / ' Tc=5.5 min CN=84 Runoff=23.88 cfs 1,726 af
- Subcatchment F9: West Nurses and West** Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=3.03"
Flow Length=711' Slope=0.0408 ' / ' Tc=8.0 min CN=83 Runoff=23.59 cfs 1,825 af
- Reach 1R: Channel - Tributary to** Avg. Flow Depth=0.66' Max Vel=11.04 fps Inflow=42.44 cfs 3,202 af
n=0.030 L=1,000.0' S=0.1140 ' / ' Capacity=589.47 cfs Outflow=40.10 cfs 3,202 af
- Reach 2R: Daylighted Stream** Avg. Flow Depth=2.67' Max Vel=15.70 fps Inflow=288.88 cfs 24,141 af
n=0.013 L=1,890.0' S=0.0106 ' / ' Capacity=969.59 cfs Outflow=273.74 cfs 24,141 af

Reach 8R: Channel - South of Avg. Flow Depth=2.02' Max Vel=16.81 fps Inflow=239.37 cfs 25.867 af
 n=0.022 L=700.0' S=0.0429'/' Capacity=1,326.06 cfs Outflow=236.69 cfs 25.867 af

Reach 14R: Channel - Pine Street to Avg. Flow Depth=2.07' Max Vel=14.87 fps Inflow=249.17 cfs 31.265 af
 n=0.030 L=1,120.0' S=0.0571'/' Capacity=1,272.27 cfs Outflow=247.19 cfs 31.265 af

Pond 15P: Clematis Brook to Beaver Brook Inflow=292.07 cfs 42.400 af
 Primary=292.07 cfs 42.400 af

Pond 16P: Pond 1 Constructed - Peak Elev=156.96' Storage=2.960 af Inflow=273.74 cfs 24.141 af
 Outflow=228.61 cfs 24.141 af

Pond 17P: Pond 2 Constructed - Peak Elev=127.12' Storage=3.116 af Inflow=271.34 cfs 31.265 af
 Outflow=249.17 cfs 31.265 af

Pond 18P: Pond 3 Constructed - East of Peak Elev=63.43' Storage=3.426 af Inflow=304.00 cfs 42.400 af
 Outflow=292.07 cfs 42.400 af

Total Runoff Area = 168.603 ac Runoff Volume = 42.400 af Average Runoff Depth = 3.02"
 78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

Summary for Subcatchment F1: Turner Field and Dorm

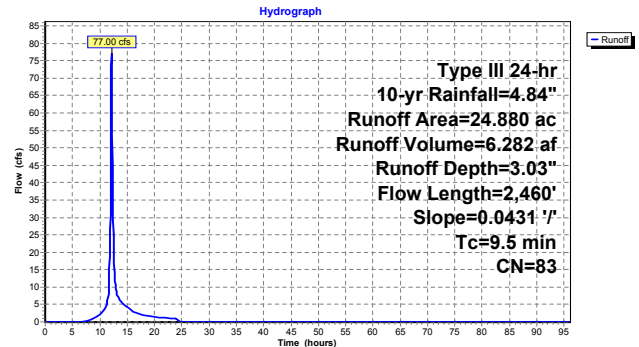
Runoff = 77.00 cfs @ 12.14 hrs, Volume= 6.282 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

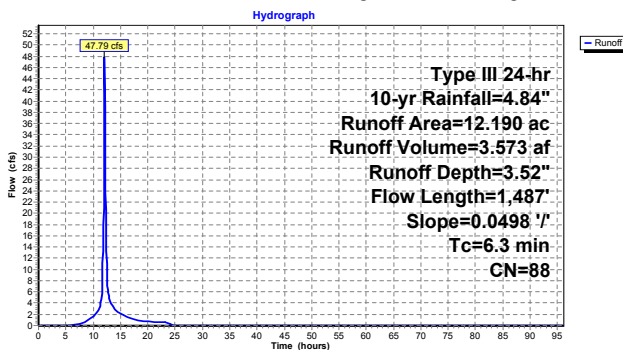
Runoff = 47.79 cfs @ 12.09 hrs, Volume= 3.573 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

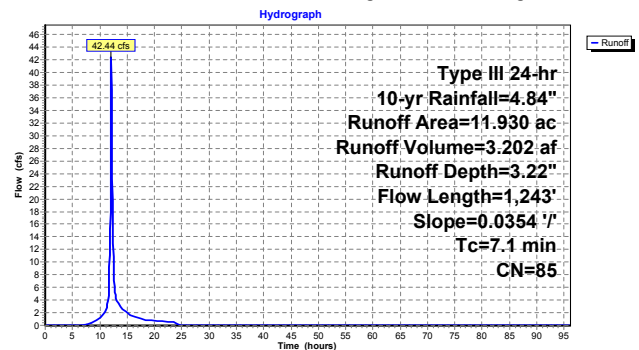
Runoff = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

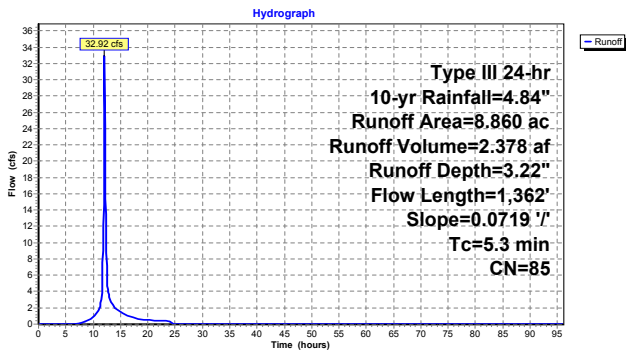
Runoff = 32.92 cfs @ 12.08 hrs, Volume= 2.378 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

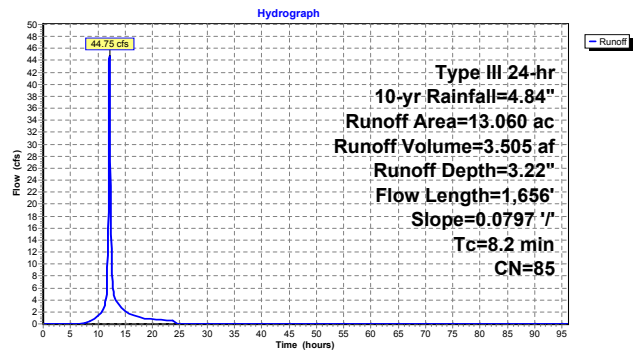
Runoff = 44.75 cfs @ 12.12 hrs, Volume= 3.505 af, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

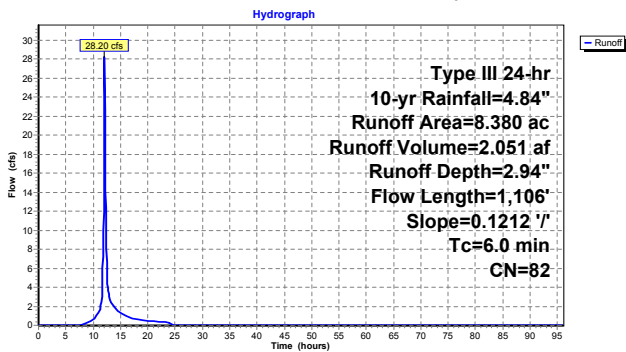
Runoff = 28.20 cfs @ 12.09 hrs, Volume= 2.051 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106	Total			

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

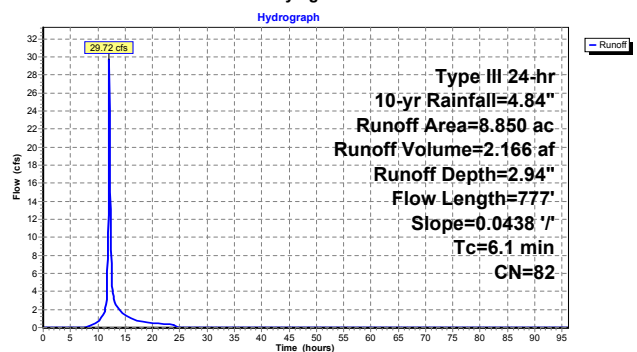
Runoff = 29.72 cfs @ 12.09 hrs, Volume= 2.166 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777	Total			

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

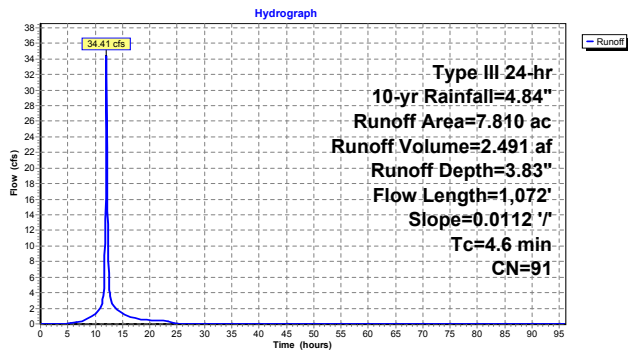
Runoff = 34.41 cfs @ 12.07 hrs, Volume= 2.491 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072	Total			

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

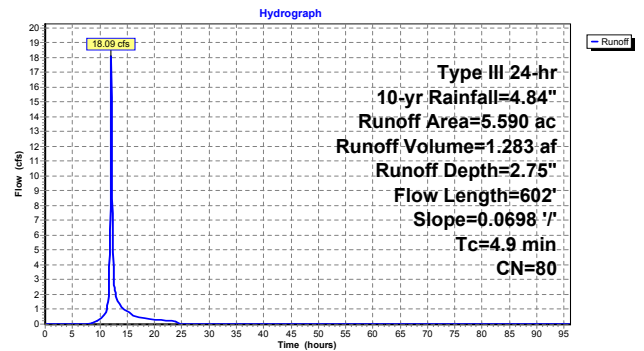
Runoff = 18.09 cfs @ 12.08 hrs, Volume= 1.283 af, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
0.060	98	Paved parking and Roof area, HSG C
0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602	Total			

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

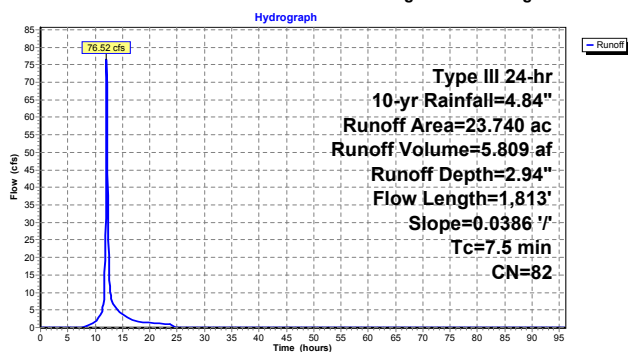
Runoff = 76.52 cfs @ 12.11 hrs, Volume= 5.809 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
3.460	98	Paved parking and Roof area, HSG C
0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813	Total			

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

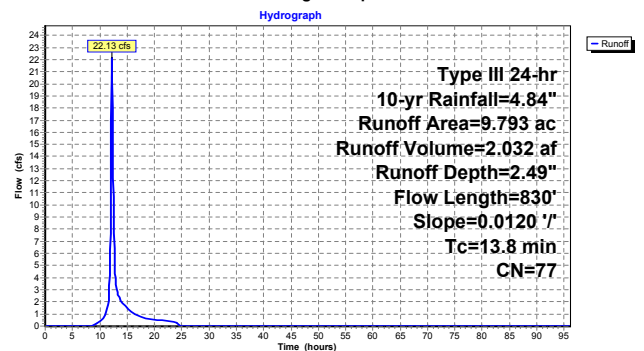
Runoff = 22.13 cfs @ 12.20 hrs, Volume= 2.032 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830	Total			

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

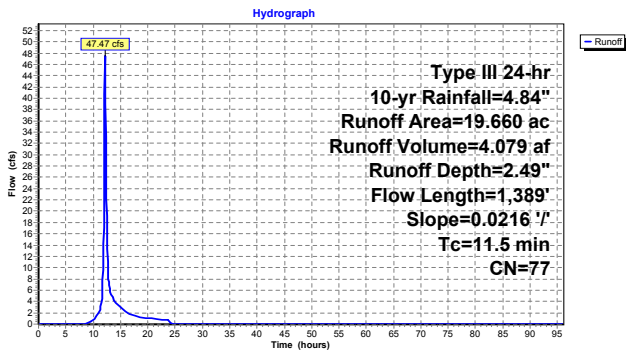
Runoff = 47.47 cfs @ 12.16 hrs, Volume= 4.079 af, Depth= 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

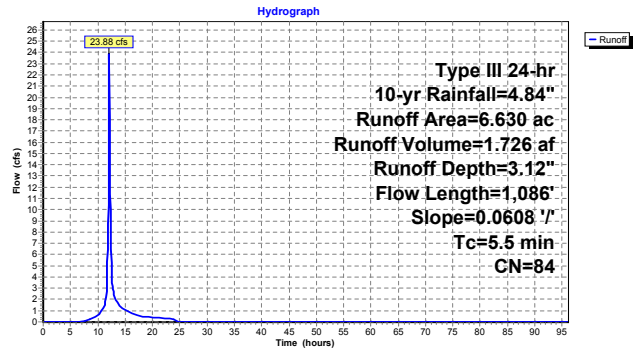
Runoff = 23.88 cfs @ 12.08 hrs, Volume= 1.726 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



Summary for Subcatchment F9: West Nurses and West Building Area

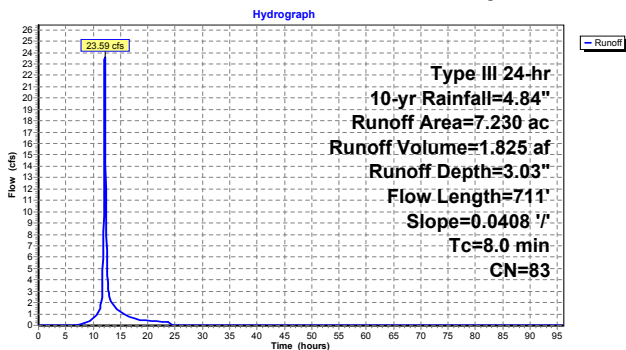
Runoff = 23.59 cfs @ 12.11 hrs, Volume= 1.825 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-yr Rainfall=4.84"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711				Total

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 3.22" for 10-yr event
 Inflow = 42.44 cfs @ 12.10 hrs, Volume= 3.202 af
 Outflow = 40.10 cfs @ 12.15 hrs, Volume= 3.202 af, Atten= 6%, Lag= 2.8 min

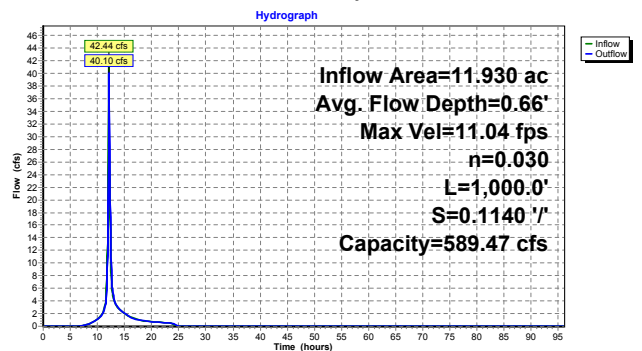
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 11.04 fps, Min. Travel Time= 1.5 min
 Avg. Velocity= 3.03 fps, Avg. Travel Time= 5.5 min

Peak Storage= 3,724 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.66'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0 '/' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



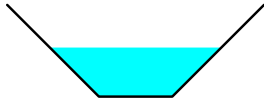
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 2.89" for 10-yr event
 Inflow = 288.88 cfs @ 12.11 hrs, Volume= 24.141 af
 Outflow = 273.74 cfs @ 12.18 hrs, Volume= 24.141 af, Atten= 5%, Lag= 3.9 min

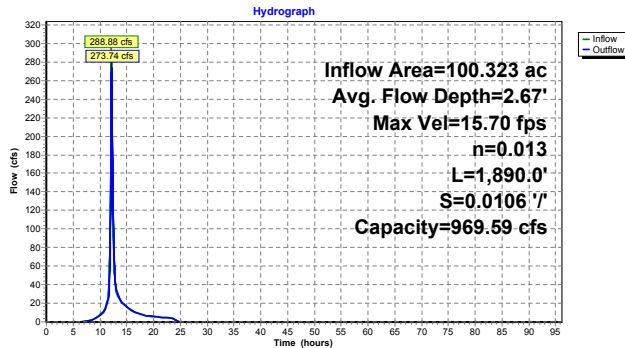
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 15.70 fps, Min. Travel Time= 2.0 min
 Avg. Velocity = 4.58 fps, Avg. Travel Time= 6.9 min

Peak Storage= 33,728 cf @ 12.15 hrs
 Average Depth at Peak Storage= 2.67'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 ' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 ' / '
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



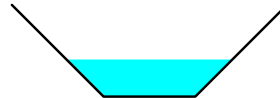
Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 2.90" for 10-yr event
 Inflow = 239.37 cfs @ 12.27 hrs, Volume= 25.867 af
 Outflow = 236.69 cfs @ 12.29 hrs, Volume= 25.867 af, Atten= 1%, Lag= 1.4 min

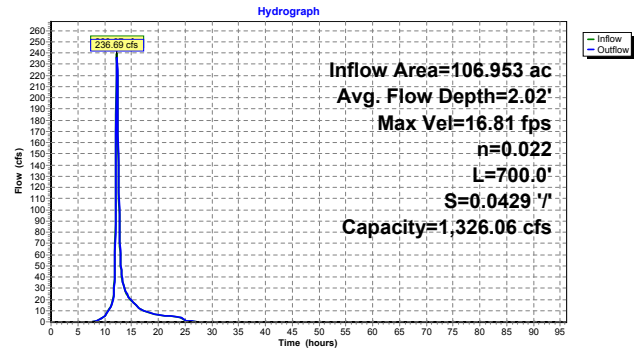
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.81 fps, Min. Travel Time= 0.7 min
 Avg. Velocity = 4.25 fps, Avg. Travel Time= 2.7 min

Peak Storage= 9,932 cf @ 12.27 hrs
 Average Depth at Peak Storage= 2.02'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 2.97" for 10-yr event
 Inflow = 249.17 cfs @ 12.36 hrs, Volume= 31.265 af
 Outflow = 247.19 cfs @ 12.40 hrs, Volume= 31.265 af, Atten= 1%, Lag= 2.3 min

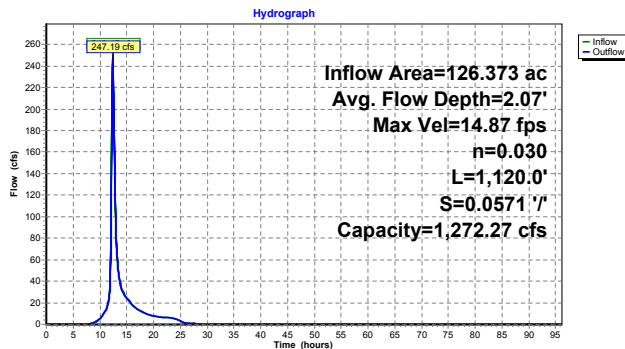
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 14.87 fps, Min. Travel Time= 1.3 min
 Avg. Velocity = 3.67 fps, Avg. Travel Time= 5.1 min

Peak Storage= 18,696 cf @ 12.38 hrs
 Average Depth at Peak Storage= 2.07'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

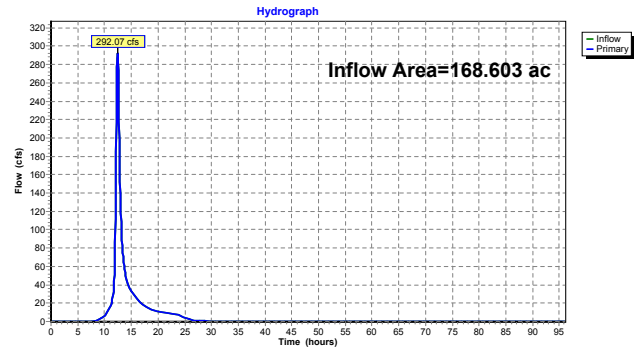


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 3.02" for 10-yr event
 Inflow = 292.07 cfs @ 12.44 hrs, Volume= 42.400 af
 Primary = 292.07 cfs @ 12.44 hrs, Volume= 42.400 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 2.89" for 10-yr event
 Inflow = 273.74 cfs @ 12.18 hrs, Volume= 24.141 af
 Outflow = 228.61 cfs @ 12.27 hrs, Volume= 24.141 af, Atten= 16%, Lag= 5.4 min
 Primary = 228.61 cfs @ 12.27 hrs, Volume= 24.141 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 156.96' @ 12.27 hrs Surf.Area= 0.000 ac Storage= 2.960 af

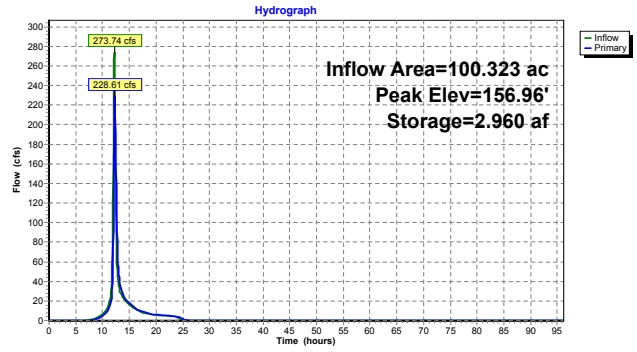
Plug-Flow detention time= 20.1 min calculated for 24.128 af (100% of inflow)
 Center-of-Mass det. time= 20.3 min (846.2 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
154.00	0.000		
156.00	2.000		
158.00	4.000		
160.00	6.000		
162.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=225.90 cfs @ 12.27 hrs HW=156.94' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 225.90 cfs @ 5.15 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 2.97" for 10-yr event
 Inflow = 271.34 cfs @ 12.27 hrs, Volume= 31.265 af
 Outflow = 249.17 cfs @ 12.36 hrs, Volume= 31.265 af, Atten= 8%, Lag= 5.4 min
 Primary = 249.17 cfs @ 12.36 hrs, Volume= 31.265 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 127.12' @ 12.36 hrs Surf.Area= 0.000 ac Storage= 3.116 af

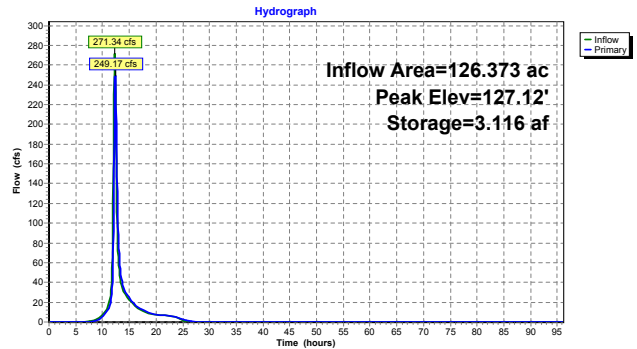
Plug-Flow detention time= 18.8 min calculated for 31.249 af (100% of inflow)
 Center-of-Mass det. time= 18.8 min (857.7 - 838.9)

Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
124.00	0.000		
126.00	2.000		
128.00	4.000		
130.00	6.000		
132.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=247.90 cfs @ 12.36 hrs HW=127.11' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 247.90 cfs @ 5.28 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Summary for Pond 18P: Pond 3 Constructed - East of Power Plant

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 3.02" for 10-yr event
 Inflow = 304.00 cfs @ 12.37 hrs, Volume= 42.400 af
 Outflow = 292.07 cfs @ 12.44 hrs, Volume= 42.400 af, Atten= 4%, Lag= 4.5 min
 Primary = 292.07 cfs @ 12.44 hrs, Volume= 42.400 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 63.43' @ 12.44 hrs Surf.Area= 0.000 ac Storage= 3.426 af

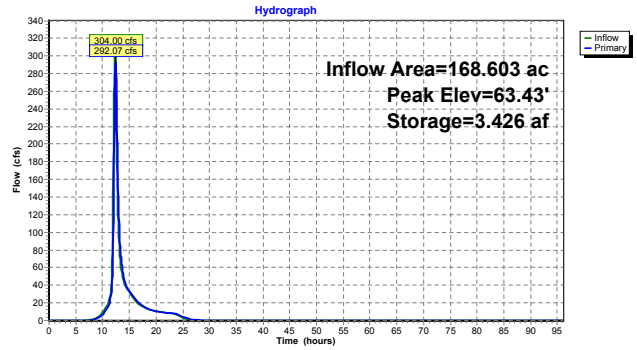
Plug-Flow detention time= 17.0 min calculated for 42.378 af (100% of inflow)
 Center-of-Mass det. time= 17.1 min (865.7 - 848.6)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	8,000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
60.00	0.000		
62.00	2.000		
64.00	4.000		
66.00	6.000		
68.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=291.47 cfs @ 12.44 hrs HW=63.42' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 291.47 cfs @ 5.52 fps)

Pond 18P: Pond 3 Constructed - East of Power Plant



Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm	Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=4.22" Flow Length=2,460' Slope=0.0431 ' / ' Tc=9.5 min CN=83 Runoff=106.33 cfs 4,753 af
Subcatchment F10: Admin Bldg and	Runoff Area=12,190 ac 43.15% Impervious Runoff Depth=4.76" Flow Length=1,487' Slope=0.0498 ' / ' Tc=6.3 min CN=88 Runoff=63.73 cfs 4,836 af
Subcatchment F11: Admin Bldg and	Runoff Area=11,930 ac 33.61% Impervious Runoff Depth=4.43" Flow Length=1,243' Slope=0.0354 ' / ' Tc=7.1 min CN=85 Runoff=57.76 cfs 4,409 af
Subcatchment F12: Tarbell House, Farm	Runoff Area=8,860 ac 28.89% Impervious Runoff Depth=4.43" Flow Length=1,362' Slope=0.0719 ' / ' Tc=5.3 min CN=85 Runoff=44.78 cfs 3,274 af
Subcatchment F13: Maintenance	Runoff Area=13,060 ac 32.16% Impervious Runoff Depth=4.43" Flow Length=1,656' Slope=0.0797 ' / ' Tc=8.2 min CN=85 Runoff=60.95 cfs 4,826 af
Subcatchment F14: Maintenance	Runoff Area=8,380 ac 17.42% Impervious Runoff Depth=4.12" Flow Length=1,106' Slope=0.1212 ' / ' Tc=6.0 min CN=82 Runoff=39.19 cfs 2,874 af
Subcatchment F2: Playing Fields and	Runoff Area=8,850 ac 11.64% Impervious Runoff Depth=4.12" Flow Length=777' Slope=0.0438 ' / ' Tc=6.1 min CN=82 Runoff=41.30 cfs 3,036 af
Subcatchment F3: Federal Archives	Runoff Area=7,810 ac 61.46% Impervious Runoff Depth=5.09" Flow Length=1,072' Slope=0.0112 ' / ' Tc=4.6 min CN=91 Runoff=45.08 cfs 3,316 af
Subcatchment F4: Former Daycare Center	Runoff Area=5,590 ac 1.07% Impervious Runoff Depth=3.91" Flow Length=602' Slope=0.0698 ' / ' Tc=4.9 min CN=80 Runoff=25.73 cfs 1,820 af
Subcatchment F5: Area West of	Runoff Area=23,740 ac 14.57% Impervious Runoff Depth=4.12" Flow Length=1,813' Slope=0.0386 ' / ' Tc=7.5 min CN=82 Runoff=106.45 cfs 8,143 af
Subcatchment F6: Cottage Complex West	Runoff Area=9,793 ac 0.00% Impervious Runoff Depth=3.60" Flow Length=830' Slope=0.0120 ' / ' Tc=13.8 min CN=77 Runoff=32.06 cfs 2,939 af
Subcatchment F7: Cottage Complex East	Runoff Area=19,660 ac 6.21% Impervious Runoff Depth=3.60" Flow Length=1,389' Slope=0.0216 ' / ' Tc=11.5 min CN=77 Runoff=68.78 cfs 5,901 af
Subcatchment F8: Chapel	Runoff Area=6,630 ac 25.49% Impervious Runoff Depth=4.33" Flow Length=1,086' Slope=0.0608 ' / ' Tc=5.5 min CN=84 Runoff=32.71 cfs 2,391 af
Subcatchment F9: West Nurses and West	Runoff Area=7,230 ac 22.82% Impervious Runoff Depth=4.22" Flow Length=711' Slope=0.0408 ' / ' Tc=8.0 min CN=83 Runoff=32.59 cfs 2,543 af
Reach 1R: Channel - Tributary to	Avg. Flow Depth=0.79' Max Vel=12.27 fps Inflow=57.76 cfs 4,409 af n=0.030 L=1,000.0' S=0.1140 ' / ' Capacity=589.47 cfs Outflow=54.65 cfs 4,409 af
Reach 2R: Daylighted Stream	Avg. Flow Depth=3.19' Max Vel=17.13 fps Inflow=403.34 cfs 33,907 af n=0.013 L=1,890.0' S=0.0106 ' / ' Capacity=969.59 cfs Outflow=384.76 cfs 33,907 af

Reach 8R: Channel - South of	Avg. Flow Depth=2.48' Max Vel=18.68 fps Inflow=346.83 cfs 36,298 af n=0.022 L=700.0' S=0.0429 ' / ' Capacity=1,326.06 cfs Outflow=344.10 cfs 36,298 af
Reach 14R: Channel - Pine Street to	Avg. Flow Depth=2.57' Max Vel=16.60 fps Inflow=365.91 cfs 43,678 af n=0.030 L=1,120.0' S=0.0571 ' / ' Capacity=1,272.27 cfs Outflow=363.37 cfs 43,678 af
Pond 15P: Clematis Brook to Beaver Brook	Inflow=433.46 cfs 59,062 af Primary=433.46 cfs 59,062 af
Pond 16P: Pond 1 Constructed-	Peak Elev=157.69' Storage=3.693 af Inflow=384.76 cfs 33,907 af Outflow=331.60 cfs 33,907 af
Pond 17P: Pond 2 Constructed-	Peak Elev=127.91' Storage=3.913 af Inflow=392.81 cfs 43,678 af Outflow=365.91 cfs 43,678 af
Pond 18P: Pond 3 Constructed - East of	Peak Elev=64.32' Storage=4.319 af Inflow=447.33 cfs 59,062 af Outflow=433.46 cfs 59,062 af

Total Runoff Area = 168.603 ac Runoff Volume = 59.062 af Average Runoff Depth = 4.20"
78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

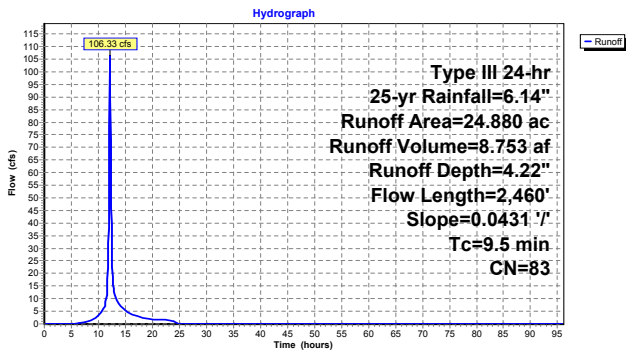
Summary for Subcatchment F1: Turner Field and Dorm

Runoff = 106.33 cfs @ 12.13 hrs, Volume= 8.753 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



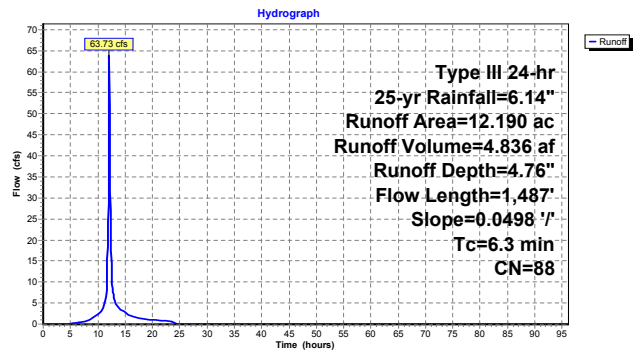
Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

Runoff = 63.73 cfs @ 12.09 hrs, Volume= 4.836 af, Depth= 4.76"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
5.260	98	Roads, Roof and Paved parking, HSG C
0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



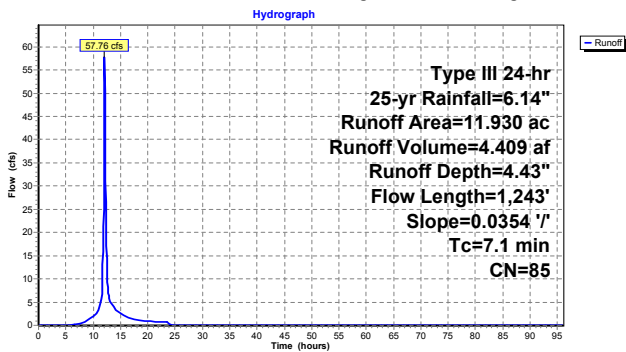
Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

Runoff = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af, Depth= 4.43"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



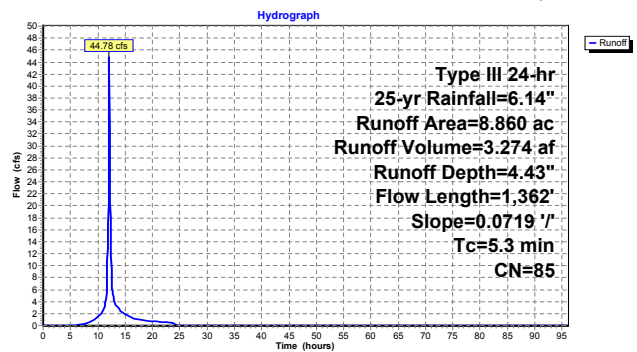
Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

Runoff = 44.78 cfs @ 12.08 hrs, Volume= 3.274 af, Depth= 4.43"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
2.560	98	Roads, Roof and Paved parking, HSG C
0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

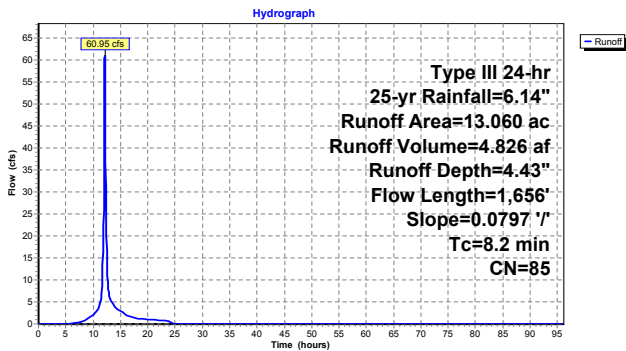
Runoff = 60.95 cfs @ 12.11 hrs, Volume= 4.826 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656				Total

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

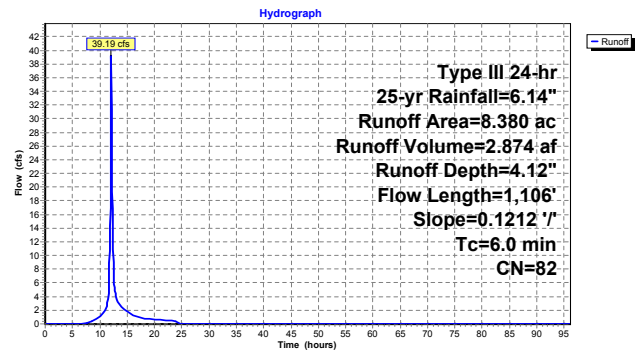
Runoff = 39.19 cfs @ 12.09 hrs, Volume= 2.874 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

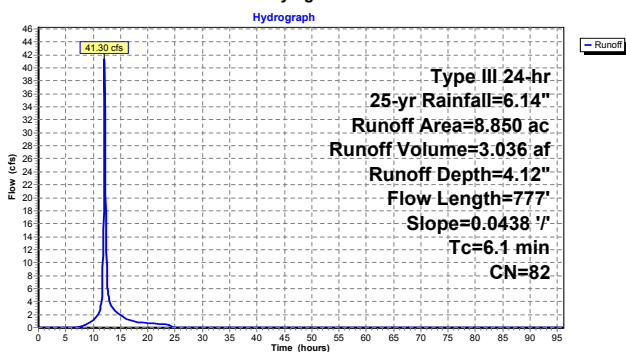
Runoff = 41.30 cfs @ 12.09 hrs, Volume= 3.036 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

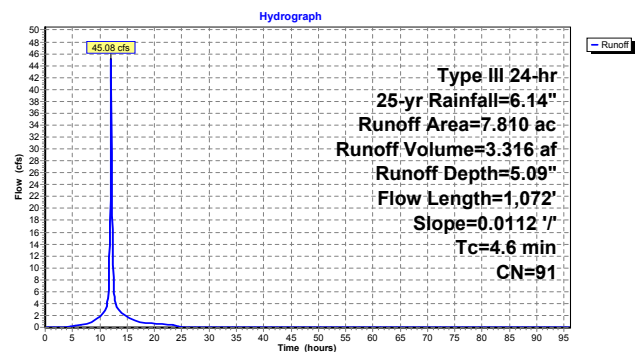
Runoff = 45.08 cfs @ 12.07 hrs, Volume= 3.316 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

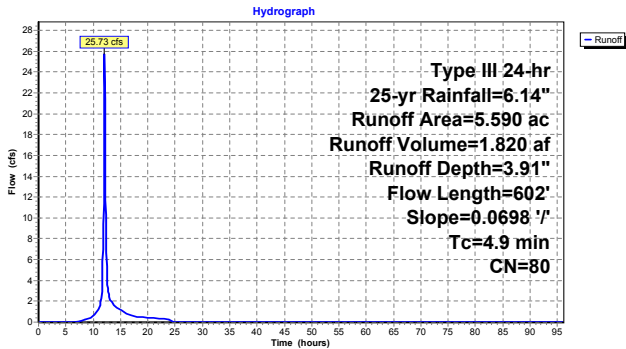
Runoff = 25.73 cfs @ 12.07 hrs, Volume= 1.820 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602				Total

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

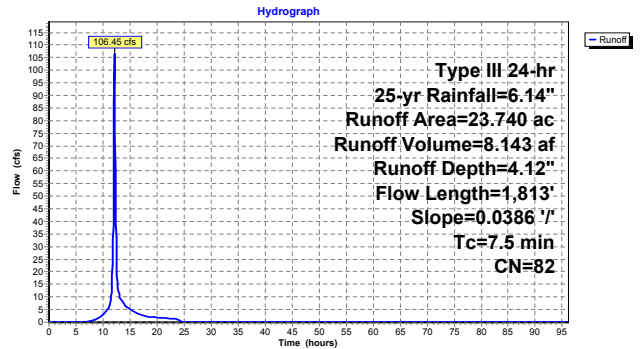
Runoff = 106.45 cfs @ 12.11 hrs, Volume= 8.143 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813				Total

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

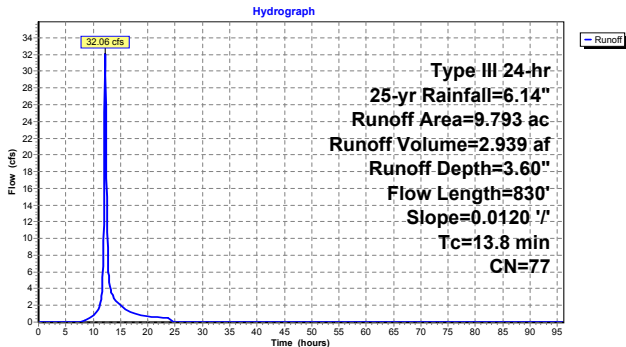
Runoff = 32.06 cfs @ 12.19 hrs, Volume= 2.939 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830				Total

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

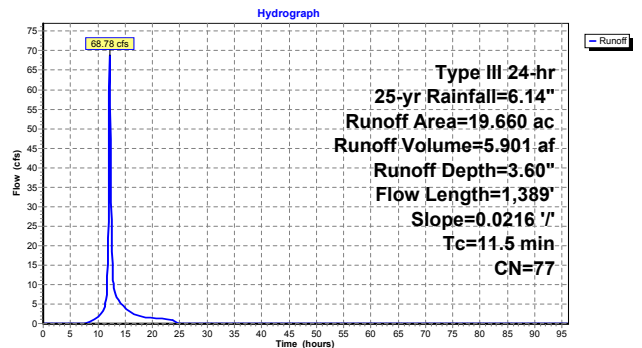
Runoff = 68.78 cfs @ 12.16 hrs, Volume= 5.901 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
* 1.220	98	Roads, Roof and Paved parking, HSG C
* 1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



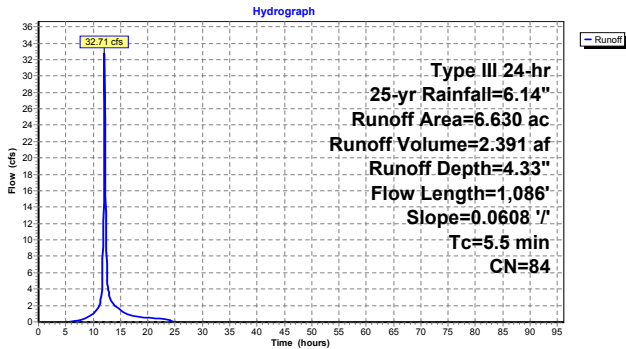
Summary for Subcatchment F8: Chapel

Runoff = 32.71 cfs @ 12.08 hrs, Volume= 2.391 af, Depth= 4.33"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086	Total			

Subcatchment F8: Chapel



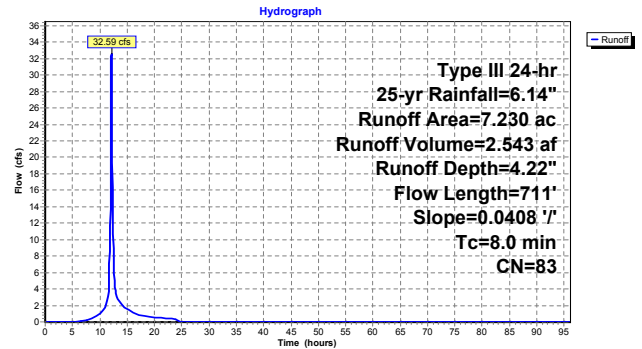
Summary for Subcatchment F9: West Nurses and West Building Area

Runoff = 32.59 cfs @ 12.11 hrs, Volume= 2.543 af, Depth= 4.22"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-yr Rainfall=6.14"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture Kv= 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 4.43" for 25-yr event
 Inflow = 57.76 cfs @ 12.10 hrs, Volume= 4.409 af
 Outflow = 54.65 cfs @ 12.14 hrs, Volume= 4.409 af, Atten= 5%, Lag= 2.5 min

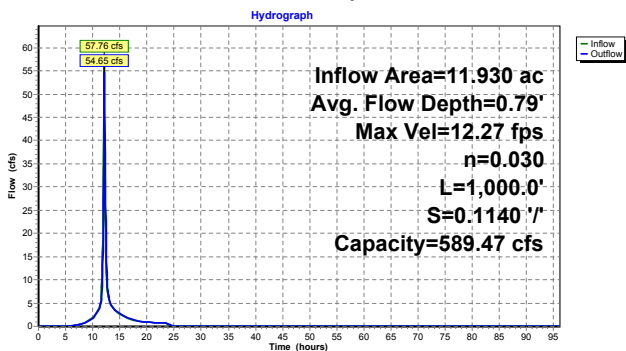
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 12.27 fps, Min. Travel Time= 1.4 min
 Avg. Velocity= 3.30 fps, Avg. Travel Time= 5.1 min

Peak Storage= 4,589 cf @ 12.12 hrs
 Average Depth at Peak Storage= 0.79'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140'/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream



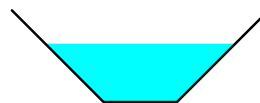
Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 4.06" for 25-yr event
 Inflow = 403.34 cfs @ 12.11 hrs, Volume= 33.907 af
 Outflow = 384.76 cfs @ 12.17 hrs, Volume= 33.907 af, Atten= 5%, Lag= 3.6 min

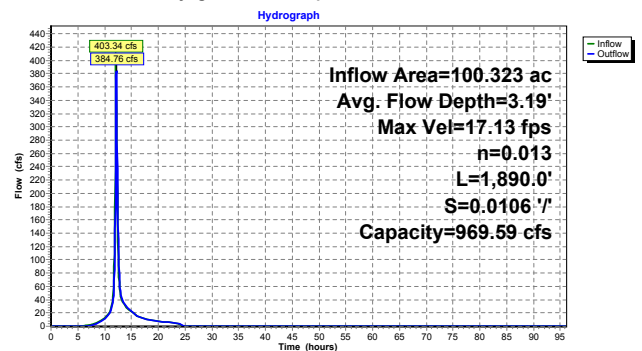
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 17.13 fps, Min. Travel Time= 1.8 min
 Avg. Velocity= 5.04 fps, Avg. Travel Time= 6.2 min

Peak Storage= 43,275 cf @ 12.14 hrs
 Average Depth at Peak Storage= 3.19'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106'/'
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1



Summary for Reach 8R: Channel - South of Chapel to Pine Street

Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 4.07" for 25-yr event
 Inflow = 346.83 cfs @ 12.25 hrs, Volume= 36.298 af
 Outflow = 344.10 cfs @ 12.27 hrs, Volume= 36.298 af, Atten= 1%, Lag= 1.1 min

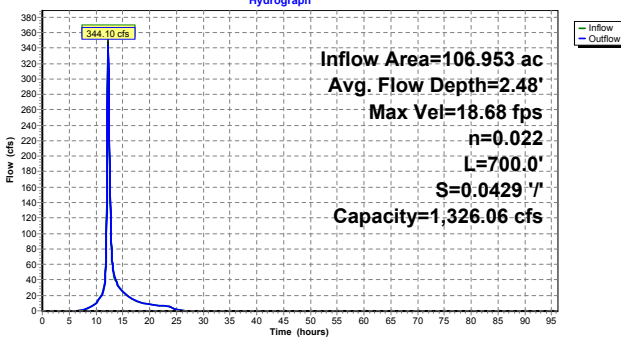
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 18.68 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 4.65 fps, Avg. Travel Time= 2.5 min

Peak Storage= 12,997 cf @ 12.26 hrs
 Average Depth at Peak Storage= 2.48'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 ' / '
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 4.15" for 25-yr event
 Inflow = 365.91 cfs @ 12.33 hrs, Volume= 43.678 af
 Outflow = 363.37 cfs @ 12.36 hrs, Volume= 43.678 af, Atten= 1%, Lag= 2.1 min

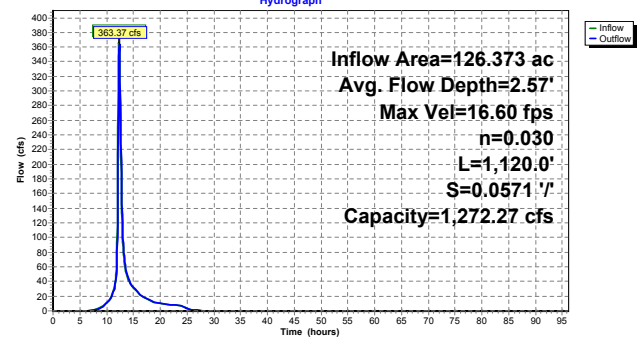
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 16.60 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 4.01 fps, Avg. Travel Time= 4.7 min

Peak Storage= 24,663 cf @ 12.34 hrs
 Average Depth at Peak Storage= 2.57'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

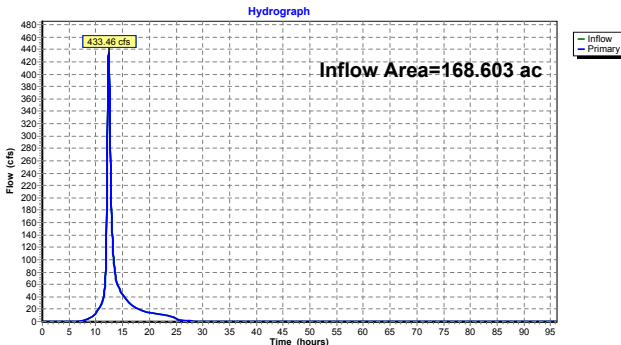


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 4.20" for 25-yr event
 Inflow = 433.46 cfs @ 12.39 hrs, Volume= 59.062 af
 Primary = 433.46 cfs @ 12.39 hrs, Volume= 59.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 4.06" for 25-yr event
 Inflow = 384.76 cfs @ 12.17 hrs, Volume= 33.907 af
 Outflow = 331.60 cfs @ 12.25 hrs, Volume= 33.907 af, Atten= 14%, Lag= 4.8 min
 Primary = 331.60 cfs @ 12.25 hrs, Volume= 33.907 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 157.69' @ 12.25 hrs Surf.Area= 0.000 ac Storage= 3.693 af

Plug-Flow detention time= 18.0 min calculated for 33.889 af (100% of inflow)
 Center-of-Mass det. time= 18.1 min (834.2 - 816.1)

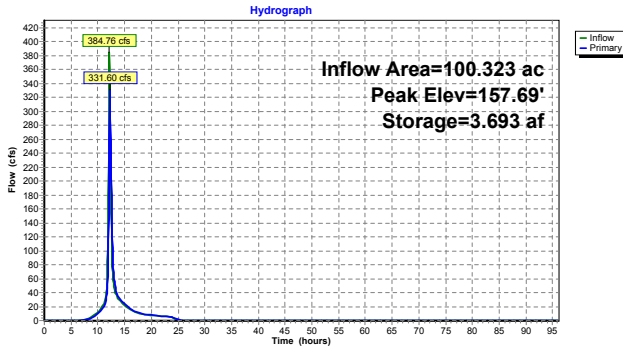
Volume	Invert	Avail. Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below

Elevation (feet)	Cum. Store (acre-feet)
154.00	0.000
156.00	2.000
158.00	4.000
160.00	6.000
162.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=330.42 cfs @ 12.25 hrs HW=157.68' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 330.42 cfs @ 5.72 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 4.15" for 25-yr event
 Inflow = 392.81 cfs @ 12.25 hrs, Volume= 43.678 af
 Outflow = 365.91 cfs @ 12.33 hrs, Volume= 43.678 af, Atten= 7%, Lag= 4.5 min
 Primary = 365.91 cfs @ 12.33 hrs, Volume= 43.678 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 127.91' @ 12.33 hrs Surf.Area= 0.000 ac Storage= 3.913 af

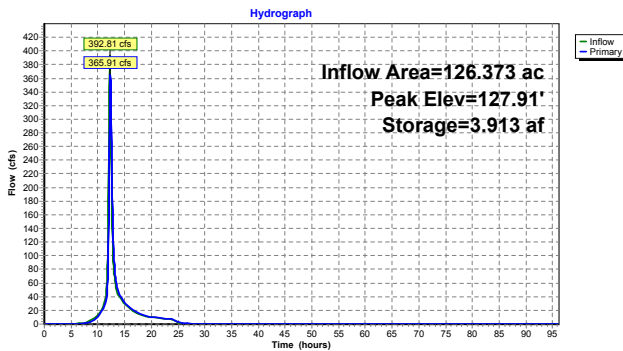
Plug-Flow detention time= 16.8 min calculated for 43.678 af (100% of inflow)
 Center-of-Mass det. time= 16.8 min (844.4 - 827.6)

Volume #1	Invert	Avail.Storage	Storage Description
	124.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
124.00	0.000		
126.00	2.000		
128.00	4.000		
130.00	6.000		
132.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=363.80 cfs @ 12.33 hrs HW=127.90' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 363.80 cfs @ 5.87 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Summary for Pond 18P: Pond 3 Constructed - East of Power Plant

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 4.20" for 25-yr event
 Inflow = 447.33 cfs @ 12.33 hrs, Volume= 59.062 af
 Outflow = 433.46 cfs @ 12.39 hrs, Volume= 59.062 af, Atten= 3%, Lag= 3.7 min
 Primary = 433.46 cfs @ 12.39 hrs, Volume= 59.062 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 64.32' @ 12.39 hrs Surf.Area= 0.000 ac Storage= 4.319 af

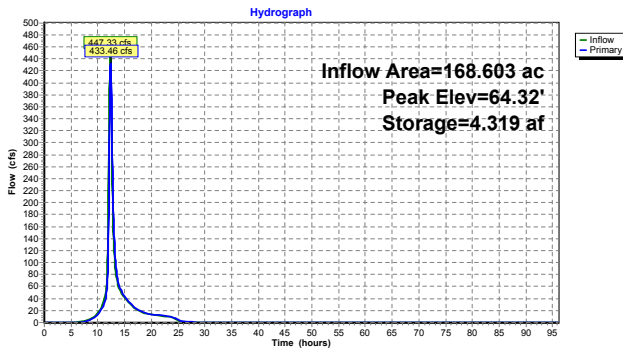
Plug-Flow detention time= 15.2 min calculated for 59.031 af (100% of inflow)
 Center-of-Mass det. time= 15.2 min (851.4 - 836.2)

Volume #1	Invert	Avail.Storage	Storage Description
	60.00'	8.000 af	Custom Stage Data Listed below
Elevation (feet)	Cum.Store (acre-feet)		
60.00	0.000		
62.00	2.000		
64.00	4.000		
66.00	6.000		
68.00	8.000		

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=432.71 cfs @ 12.39 hrs HW=64.31' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 432.71 cfs @ 6.15 fps)

Pond 18P: Pond 3 Constructed - East of Power Plant



- Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 F1: Turner Field and Dorm** Runoff Area=24.880 ac 18.85% Impervious Runoff Depth=6.74"
 Flow Length=2,460' Slope=0.0431 ' Tc=9.5 min CN=83 Runoff=166.54 cfs 13.983 af
 - Subcatchment F10: Admin Bldg and** Runoff Area=12.190 ac 43.15% Impervious Runoff Depth=7.35"
 Flow Length=1,487' Slope=0.0498 ' Tc=6.3 min CN=88 Runoff=96.05 cfs 7.468 af
 - Subcatchment F11: Admin Bldg and** Runoff Area=11.930 ac 33.61% Impervious Runoff Depth=6.99"
 Flow Length=1,243' Slope=0.0354 ' Tc=7.1 min CN=85 Runoff=89.01 cfs 6.947 af
 - Subcatchment F12: Tarbell House, Farm** Runoff Area=8.860 ac 28.89% Impervious Runoff Depth=6.99"
 Flow Length=1,362' Slope=0.0719 ' Tc=5.3 min CN=85 Runoff=68.95 cfs 5.159 af
 - Subcatchment F13: Maintenance** Runoff Area=13.060 ac 32.16% Impervious Runoff Depth=6.99"
 Flow Length=1,656' Slope=0.0797 ' Tc=8.2 min CN=85 Runoff=93.98 cfs 7.605 af
 - Subcatchment F14: Maintenance** Runoff Area=8.380 ac 17.42% Impervious Runoff Depth=6.62"
 Flow Length=1,106' Slope=0.1212 ' Tc=6.0 min CN=82 Runoff=61.81 cfs 4.625 af
 - Subcatchment F2: Playing Fields and** Runoff Area=8.850 ac 11.64% Impervious Runoff Depth=6.62"
 Flow Length=777' Slope=0.0438 ' Tc=6.1 min CN=82 Runoff=65.14 cfs 4.884 af
 - Subcatchment F3: Federal Archives** Runoff Area=7.810 ac 61.46% Impervious Runoff Depth=7.72"
 Flow Length=1,072' Slope=0.0112 ' Tc=4.6 min CN=91 Runoff=66.68 cfs 5.021 af
 - Subcatchment F4: Former Daycare Center** Runoff Area=5.590 ac 1.07% Impervious Runoff Depth=6.38"
 Flow Length=602' Slope=0.0698 ' Tc=4.9 min CN=80 Runoff=41.34 cfs 2.971 af
 - Subcatchment F5: Area West of** Runoff Area=23.740 ac 14.57% Impervious Runoff Depth=6.62"
 Flow Length=1,813' Slope=0.0386 ' Tc=7.5 min CN=82 Runoff=168.09 cfs 13.101 af
 - Subcatchment F6: Cottage Complex West -** Runoff Area=9.793 ac 0.00% Impervious Runoff Depth=6.01"
 Flow Length=830' Slope=0.0120 ' Tc=13.8 min CN=77 Runoff=53.02 cfs 4.907 af
 - Subcatchment F7: Cottage Complex East -** Runoff Area=19.660 ac 6.21% Impervious Runoff Depth=6.01"
 Flow Length=1,389' Slope=0.0216 ' Tc=11.5 min CN=77 Runoff=113.71 cfs 9.851 af
 - Subcatchment F8: Chapel** Runoff Area=6.630 ac 25.49% Impervious Runoff Depth=6.87"
 Flow Length=1,086' Slope=0.0608 ' Tc=5.5 min CN=84 Runoff=50.75 cfs 3.793 af
 - Subcatchment F9: West Nurses and West** Runoff Area=7.230 ac 22.82% Impervious Runoff Depth=6.74"
 Flow Length=711' Slope=0.0408 ' Tc=8.0 min CN=83 Runoff=51.05 cfs 4.063 af
 - Reach 1R: Channel - Tributary to** Avg. Flow Depth=1.03' Max Vel=14.14 fps Inflow=89.01 cfs 6.947 af
 n=0.030 L=1,000.0' S=0.1140 ' Capacity=589.47 cfs Outflow=84.36 cfs 6.947 af
 - Reach 2R: Daylighted Stream** Avg. Flow Depth=4.03' Max Vel=19.28 fps Inflow=640.25 cfs 54.719 af
 n=0.013 L=1,890.0' S=0.0106 ' Capacity=969.59 cfs Outflow=612.94 cfs 54.719 af

- Reach 8R: Channel - South of** Avg. Flow Depth=3.25' Max Vel=21.36 fps Inflow=573.98 cfs 58.512 af
 n=0.022 L=700.0' S=0.0429 ' Capacity=1,326.06 cfs Outflow=570.23 cfs 58.512 af
- Reach 14R: Channel - Pine Street to** Avg. Flow Depth=3.43' Max Vel=19.16 fps Inflow=619.10 cfs 70.043 af
 n=0.030 L=1,120.0' S=0.0571 ' Capacity=1,272.27 cfs Outflow=614.06 cfs 70.043 af
- Pond 15P: Clematis Brook to Beaver Brook** Inflow=742.14 cfs 94.378 af
 Primary=742.14 cfs 94.378 af
- Pond 16P: Pond 1 Constructed -** Peak Elev=158.95' Storage=4.948 af Inflow=612.94 cfs 54.719 af
 Outflow=548.75 cfs 54.719 af
- Pond 17P: Pond 2 Constructed -** Peak Elev=129.30' Storage=5.299 af Inflow=650.97 cfs 70.043 af
 Outflow=619.10 cfs 70.043 af
- Pond 18P: Pond 3 Constructed - East of** Peak Elev=65.87' Storage=5.870 af Inflow=758.55 cfs 94.378 af
 Outflow=742.14 cfs 94.378 af

Total Runoff Area = 168.603 ac Runoff Volume = 94.378 af Average Runoff Depth = 6.72"
 78.59% Pervious = 132.513 ac 21.41% Impervious = 36.090 ac

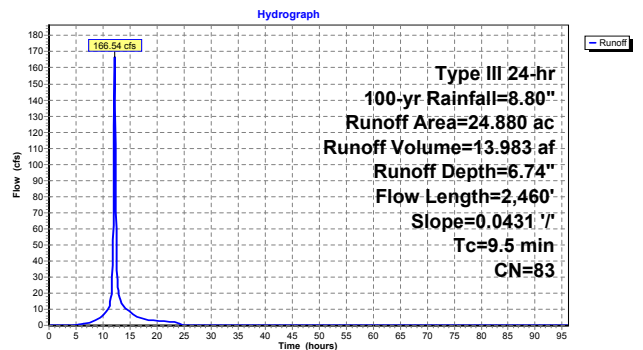
Summary for Subcatchment F1: Turner Field and Dorm

Runoff = 166.54 cfs @ 12.13 hrs, Volume= 13.983 af, Depth= 6.74"
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
20.190	79	50-75% Grass cover, Fair, HSG C
4.690	98	Paved parking, HSG C
24.880	83	Weighted Average
20.190		81.15% Pervious Area
4.690		18.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0431	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.4	300	0.0431	1.45		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.0	2,110	0.0431	17.21	464.55	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
9.5	2,460	Total			

Subcatchment F1: Turner Field and Dorm



Summary for Subcatchment F10: Admin Bldg and Pearlman Bldg

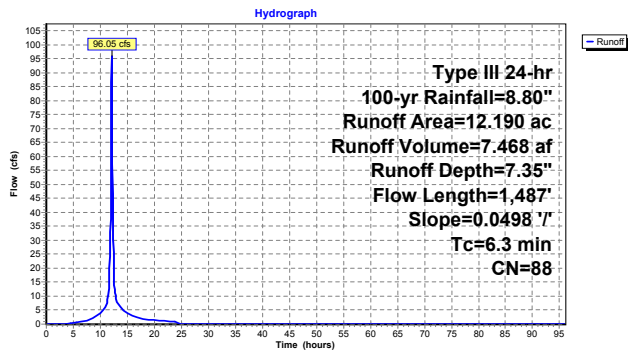
Runoff = 96.05 cfs @ 12.09 hrs, Volume= 7.468 af, Depth= 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.590	79	50-75% Grass cover, Fair, HSG C
* 5.260	98	Roads, Roof and Paved parking, HSG C
* 0.340	98	Detention Basin, Water Surface, 0% imp, HSG C
12.190	88	Weighted Average
6.930		56.85% Pervious Area
5.260		43.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0498	0.21		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.5	300	0.0498	3.35		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.9	1,137	0.0498	21.02	567.44	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
6.3	1,487	Total			

Subcatchment F10: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F11: Admin Bldg and Pearlman Bldg

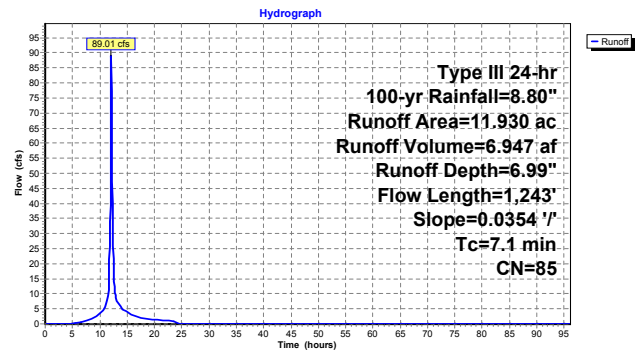
Runoff = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
7.920	79	50-75% Grass cover, Fair, HSG C
* 4.010	98	Roads, Roof and Paved parking, HSG C
11.930	85	Weighted Average
7.920		66.39% Pervious Area
4.010		33.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0354	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.8	300	0.0354	2.82		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	893	0.0354	17.72	478.42	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
7.1	1,243	Total			

Subcatchment F11: Admin Bldg and Pearlman Bldg



Summary for Subcatchment F12: Tarbell House, Farm and Grounds Dept

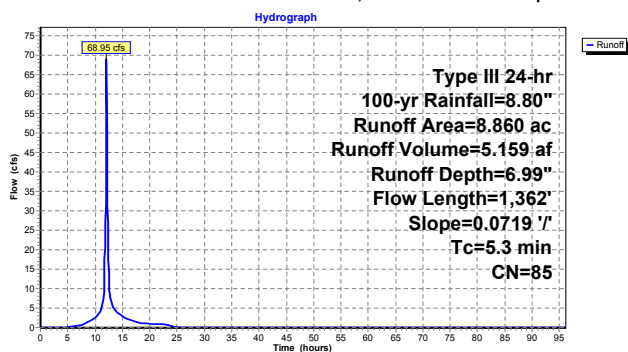
Runoff = 68.95 cfs @ 12.08 hrs, Volume= 5.159 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
6.280	79	50-75% Grass cover, Fair, HSG C
* 2.560	98	Roads, Roof and Paved parking, HSG C
* 0.020	98	Water Surface, 0% imp, HSG C
8.860	85	Weighted Average
6.300		71.11% Pervious Area
2.560		28.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0719	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.2	300	0.0719	4.02		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.7	1,012	0.0719	25.25	681.82	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.3	1,362	Total			

Subcatchment F12: Tarbell House, Farm and Grounds Dept



Summary for Subcatchment F13: Maintenance Workshops Area

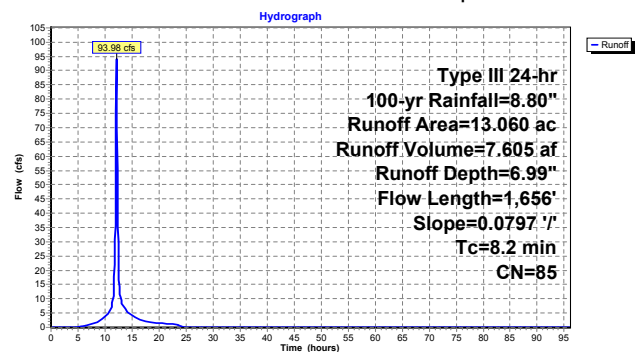
Runoff = 93.98 cfs @ 12.11 hrs, Volume= 7.605 af, Depth= 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.200	98	Paved parking, HSG C
8.860	79	50-75% Grass cover, Fair, HSG C
13.060	85	Weighted Average
8.860		67.84% Pervious Area
4.200		32.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0797	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.5	300	0.0797	1.98		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
2.5	1,306	0.0797	8.81	27.31	Channel Flow, Channel Flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
8.2	1,656	Total			

Subcatchment F13: Maintenance Workshops Area



Summary for Subcatchment F14: Maintenance Workshops Area

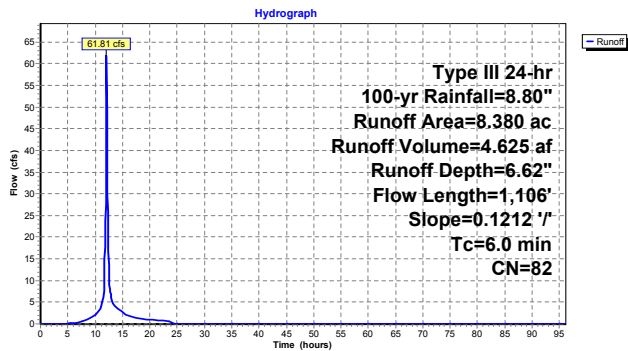
Runoff = 61.81 cfs @ 12.09 hrs, Volume= 4.625 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
* 1.460	98	Paved parking, roofs, HSG C
6.920	79	50-75% Grass cover, Fair, HSG C
8.380	82	Weighted Average
6.920		82.58% Pervious Area
1.460		17.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1212	0.31		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
2.1	300	0.1212	2.44		Shallow Concentrated Flow, Shallow Conc Short Grass Pasture Kv= 7.0 fps
1.2	756	0.1212	10.86	33.68	Channel Flow, open channel flow Area= 3.1 sf Perim= 6.2' r= 0.50' n= 0.030 Stream, clean & straight
6.0	1,106				Total

Subcatchment F14: Maintenance Workshops Area



Summary for Subcatchment F2: Playing Fields and Federal Archives

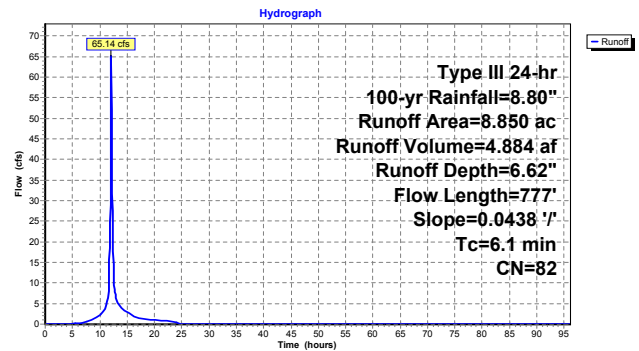
Runoff = 65.14 cfs @ 12.09 hrs, Volume= 4.884 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
* 7.400	79	50-75% Grass cover, Fair, HSG C
1.030	98	Paved parking and Roof area, HSG C
* 0.420	98	Water Surface/Wetlands, 0% imp, HSG C
8.850	82	Weighted Average
7.820		88.36% Pervious Area
1.030		11.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0438	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.6	300	0.0438	3.14		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.4	427	0.0438	17.34	468.30	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
6.1	777				Total

Subcatchment F2: Playing Fields and Federal Archives



Summary for Subcatchment F3: Federal Archives

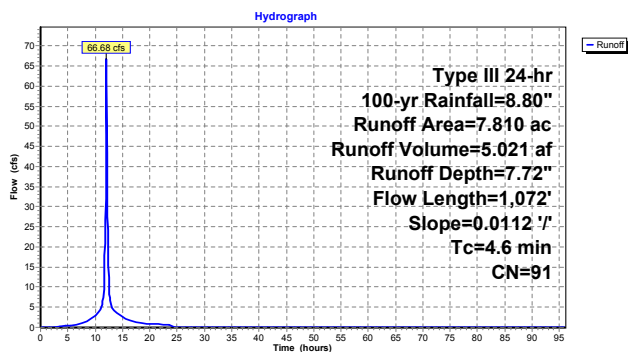
Runoff = 66.68 cfs @ 12.07 hrs, Volume= 5.021 af, Depth= 7.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
3.010	79	50-75% Grass cover, Fair, HSG C
* 4.800	98	Paved parking and Roof area, HSG C
7.810	91	Weighted Average
3.010		38.54% Pervious Area
4.800		61.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0112	0.95		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 3.23"
2.3	300	0.0112	2.15		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.4	722	0.0112	8.77	236.81	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.6	1,072				Total

Subcatchment F3: Federal Archives



Summary for Subcatchment F4: Former Daycare Center

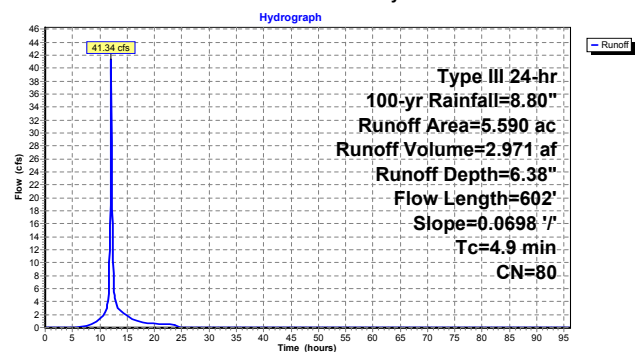
Runoff = 41.34 cfs @ 12.07 hrs, Volume= 2.971 af, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
5.420	79	50-75% Grass cover, Fair, HSG C
* 0.060	98	Paved parking and Roof area, HSG C
* 0.110	98	Water Surface/Wetlands, 0% imp, HSG C
5.590	80	Weighted Average
5.530		98.93% Pervious Area
0.060		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0698	0.25		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.3	300	0.0698	3.96		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.2	252	0.0698	21.90	591.18	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
4.9	602				Total

Subcatchment F4: Former Daycare Center



Summary for Subcatchment F5: Area West of Cottages/Greene Bldg

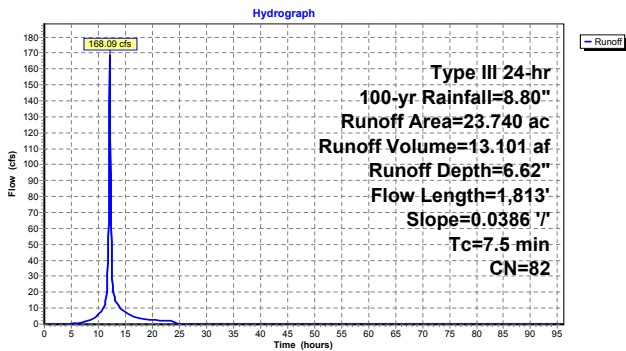
Runoff = 168.09 cfs @ 12.11 hrs, Volume= 13.101 af, Depth= 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
19.690	79	50-75% Grass cover, Fair, HSG C
* 3.460	98	Paved parking and Roof area, HSG C
* 0.590	98	Water Surface/Wetlands, 0% imp, HSG C
23.740	82	Weighted Average
20.280		85.43% Pervious Area
3.460		14.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0386	0.19		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.7	300	0.0386	2.95		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.5	1,463	0.0386	16.28	439.63	Channel Flow, open channel flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.025 Earth, clean & winding
7.5	1,813				Total

Subcatchment F5: Area West of Cottages/Greene Bldg



Summary for Subcatchment F6: Cottage Complex West - Demolished

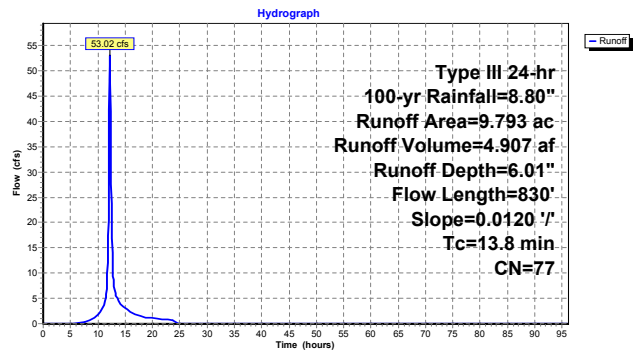
Runoff = 53.02 cfs @ 12.19 hrs, Volume= 4.907 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
8.760	74	>75% Grass cover, Good, HSG C
1.033	98	Water Surface, 0% imp, HSG C
9.793	77	Weighted Average
9.793		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0120	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
3.0	300	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.8	480	0.0120	10.32	278.55	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
13.8	830				Total

Subcatchment F6: Cottage Complex West - Demolished



Summary for Subcatchment F7: Cottage Complex East - Demolished

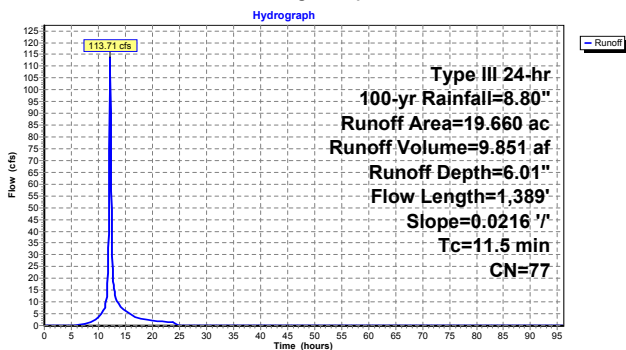
Runoff = 113.71 cfs @ 12.16 hrs, Volume= 9.851 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
17.350	74	>75% Grass cover, Good, HSG C
* 1.220	98	Roads, Roof and Paved parking, HSG C
1.090	98	Water Surface, 0% imp, HSG C
19.660	77	Weighted Average
18.440		93.79% Pervious Area
1.220		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0216	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 3.23"
2.3	300	0.0216	2.20		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
1.3	1,039	0.0216	13.84	373.71	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
11.5	1,389				Total

Subcatchment F7: Cottage Complex East - Demolished



Summary for Subcatchment F8: Chapel

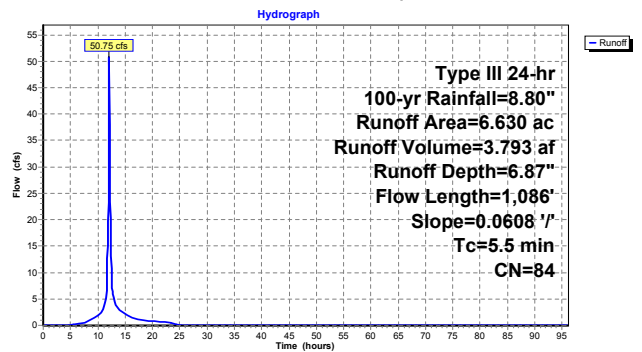
Runoff = 50.75 cfs @ 12.08 hrs, Volume= 3.793 af, Depth= 6.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
4.940	79	50-75% Grass cover, Fair, HSG C
* 1.690	98	Roads, Roof and Paved parking, HSG C
6.630	84	Weighted Average
4.940		74.51% Pervious Area
1.690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0608	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
1.4	300	0.0608	3.70		Shallow Concentrated Flow, Shallow Conc Grassed Waterway Kv= 15.0 fps
0.5	736	0.0608	23.22	626.99	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
5.5	1,086				Total

Subcatchment F8: Chapel



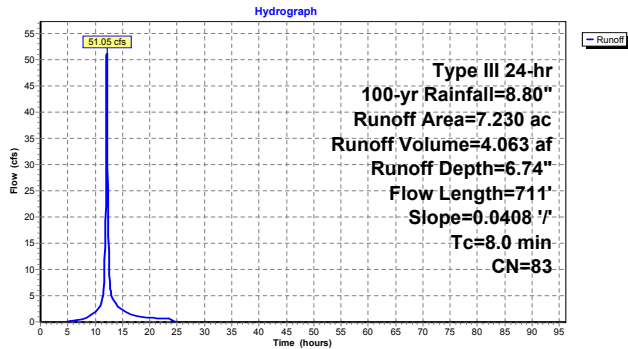
Summary for Subcatchment F9: West Nurses and West Building Area

Runoff = 51.05 cfs @ 12.11 hrs, Volume= 4.063 af, Depth= 6.74"
 Routing by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-yr Rainfall=8.80"

Area (ac)	CN	Description
1.650	98	Paved parking, HSG C
5.580	79	50-75% Grass cover, Fair, HSG C
7.230	83	Weighted Average
5.580		77.18% Pervious Area
1.650		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.0408	0.20		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 3.23"
3.5	300	0.0408	1.41		Shallow Concentrated Flow, Shallow Concentrated Flow Short Grass Pasture K _v = 7.0 fps
0.3	361	0.0408	19.02	513.61	Channel Flow, Channel Flow Area= 27.0 sf Perim= 16.4' r= 1.65' n= 0.022 Earth, clean & straight
8.0	711	Total			

Subcatchment F9: West Nurses and West Building Area



Summary for Reach 1R: Channel - Tributary to Unnamed Stream

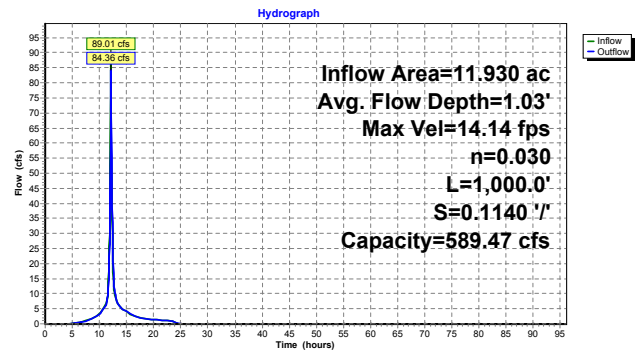
Inflow Area = 11.930 ac, 33.61% Impervious, Inflow Depth = 6.99" for 100-yr event
 Inflow = 89.01 cfs @ 12.10 hrs, Volume= 6.947 af
 Outflow = 84.36 cfs @ 12.14 hrs, Volume= 6.947 af, Atten= 5%, Lag= 2.2 min
 Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 14.14 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 3.78 fps, Avg. Travel Time= 4.4 min

Peak Storage= 6,176 cf @ 12.12 hrs
 Average Depth at Peak Storage= 1.03'
 Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 589.47 cfs

5.00' x 3.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 11.00'
 Length= 1,000.0' Slope= 0.1140 '/'
 Inlet Invert= 174.00', Outlet Invert= 60.00'



Reach 1R: Channel - Tributary to Unnamed Stream

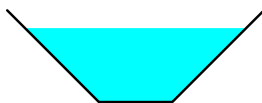


Summary for Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

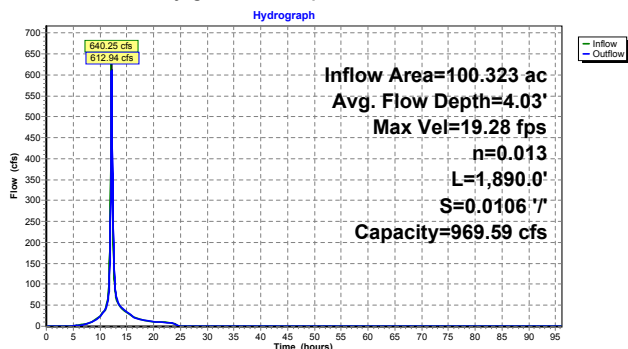
Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 6.56" for 100-yr event
 Inflow = 640.25 cfs @ 12.11 hrs, Volume= 54,719 af
 Outflow = 612.94 cfs @ 12.17 hrs, Volume= 54,719 af, Atten= 4%, Lag= 3.2 min
 Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 19.28 fps, Min. Travel Time= 1.6 min
 Avg. Velocity = 5.82 fps, Avg. Travel Time= 5.4 min

Peak Storage= 61,212 cf @ 12.14 hrs
 Average Depth at Peak Storage= 4.03'
 Bank-Full Depth= 5.00' Flow Area= 45.0 sf, Capacity= 969.59 cfs

4.00' x 5.00' deep channel, n= 0.013 Concrete pipe, bends & connections
 Side Slope Z-value= 1.0 '/' Top Width= 14.00'
 Length= 1,890.0' Slope= 0.0106 '/'
 Inlet Invert= 174.00', Outlet Invert= 154.00'



Reach 2R: Daylighted Stream Upstream of the Constructed Pond 1

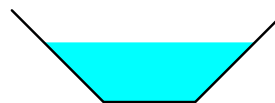


Summary for Reach 8R: Channel - South of Chapel to Pine Street

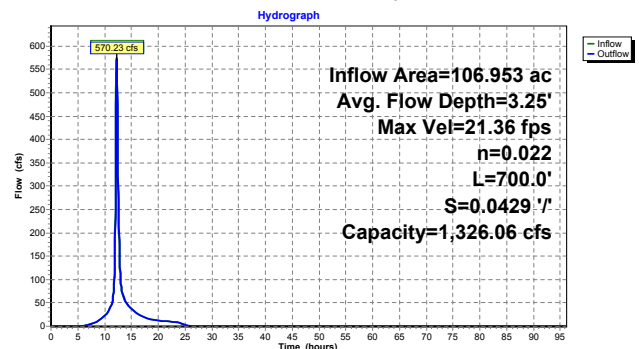
Inflow Area = 106.953 ac, 15.85% Impervious, Inflow Depth = 6.56" for 100-yr event
 Inflow = 573.98 cfs @ 12.23 hrs, Volume= 58,512 af
 Outflow = 570.23 cfs @ 12.24 hrs, Volume= 58,512 af, Atten= 1%, Lag= 1.1 min
 Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 21.36 fps, Min. Travel Time= 0.5 min
 Avg. Velocity = 5.33 fps, Avg. Travel Time= 2.2 min

Peak Storage= 18,799 cf @ 12.23 hrs
 Average Depth at Peak Storage= 3.25'
 Bank-Full Depth= 5.00' Flow Area= 50.0 sf, Capacity= 1,326.06 cfs

5.00' x 5.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 1.0 '/' Top Width= 15.00'
 Length= 700.0' Slope= 0.0429 '/'
 Inlet Invert= 154.00', Outlet Invert= 124.00'



Reach 8R: Channel - South of Chapel to Pine Street



Summary for Reach 14R: Channel - Pine Street to Powerplant

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 6.65" for 100-yr event
 Inflow = 619.10 cfs @ 12.29 hrs, Volume= 70.043 af
 Outflow = 614.06 cfs @ 12.32 hrs, Volume= 70.043 af, Atten= 1%, Lag= 1.7 min

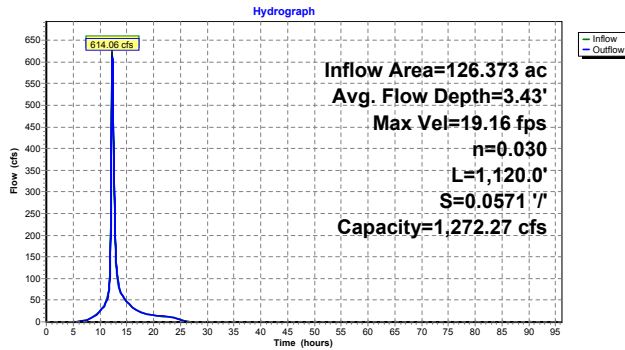
Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Max. Velocity= 19.16 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 4.58 fps, Avg. Travel Time= 4.1 min

Peak Storage= 36,158 cf @ 12.30 hrs
 Average Depth at Peak Storage= 3.43'
 Bank-Full Depth= 5.00' Flow Area= 55.0 sf, Capacity= 1,272.27 cfs

6.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
 Side Slope Z-value= 1.0 ' Top Width= 16.00'
 Length= 1,120.0' Slope= 0.0571 ' / '
 Inlet Invert= 124.00', Outlet Invert= 60.00'



Reach 14R: Channel - Pine Street to Powerplant

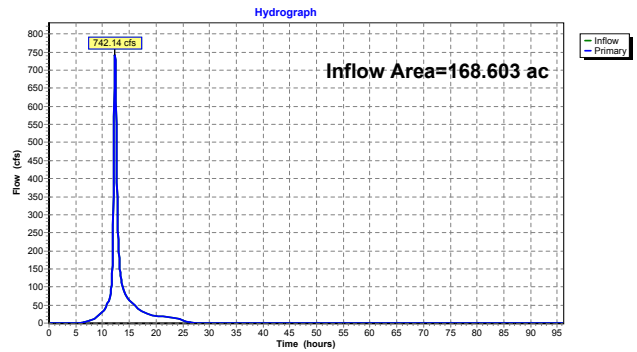


Summary for Pond 15P: Clematis Brook to Beaver Brook

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 6.72" for 100-yr event
 Inflow = 742.14 cfs @ 12.33 hrs, Volume= 94.378 af
 Primary = 742.14 cfs @ 12.33 hrs, Volume= 94.378 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs

Pond 15P: Clematis Brook to Beaver Brook



Summary for Pond 16P: Pond 1 Constructed - Upstream of Chapel

Inflow Area = 100.323 ac, 15.21% Impervious, Inflow Depth = 6.55" for 100-yr event
 Inflow = 612.94 cfs @ 12.17 hrs, Volume= 54.719 af
 Outflow = 548.75 cfs @ 12.23 hrs, Volume= 54.719 af, Atten= 10%, Lag= 3.9 min
 Primary = 548.75 cfs @ 12.23 hrs, Volume= 54.719 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 158.95' @ 12.23 hrs Surf.Area= 0.000 ac Storage= 4.948 af

Plug-Flow detention time= 15.4 min calculated for 54.690 af (100% of inflow)
 Center-of-Mass det. time= 15.5 min (817.9 - 802.4)

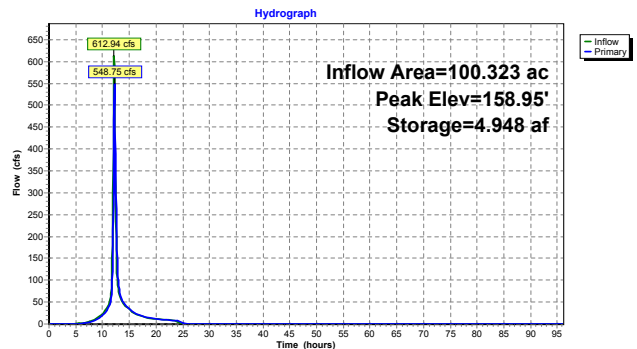
Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	8.000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
154.00	0.000
156.00	2.000
158.00	4.000
160.00	6.000
162.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	154.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=542.90 cfs @ 12.23 hrs HW=158.92' (Free Discharge)
 1=Sharp-Crested Vee/Trap Weir (Weir Controls 542.90 cfs @ 6.53 fps)

Pond 16P: Pond 1 Constructed - Upstream of Chapel



Summary for Pond 17P: Pond 2 Constructed - Downstream of Chapel

Inflow Area = 126.373 ac, 18.88% Impervious, Inflow Depth = 6.65" for 100-yr event
 Inflow = 650.97 cfs @ 12.23 hrs, Volume= 70.043 af
 Outflow = 619.10 cfs @ 12.29 hrs, Volume= 70.043 af, Atten= 5%, Lag= 3.6 min
 Primary = 619.10 cfs @ 12.29 hrs, Volume= 70.043 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 129.30' @ 12.29 hrs Surf.Area= 0.000 ac Storage= 5.299 af

Plug-Flow detention time= 14.3 min calculated for 70.007 af (100% of inflow)
 Center-of-Mass det. time= 14.3 min (826.5 - 812.2)

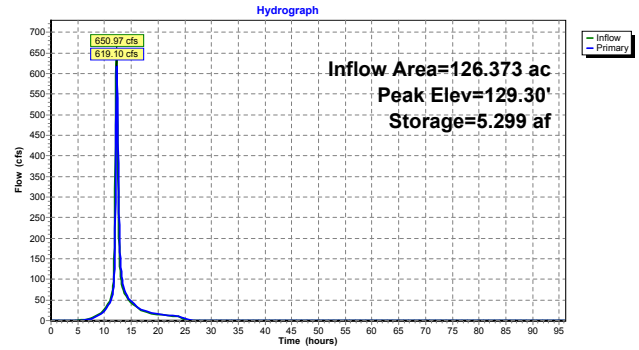
Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	8.000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
124.00	0.000
126.00	2.000
128.00	4.000
130.00	6.000
132.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	124.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=615.58 cfs @ 12.29 hrs HW=129.28' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 615.58 cfs @ 6.74 fps)

Pond 17P: Pond 2 Constructed - Downstream of Chapel



Summary for Pond 18P: Pond 3 Constructed - East of Power Plant

Inflow Area = 168.603 ac, 21.41% Impervious, Inflow Depth = 6.72" for 100-yr event
 Inflow = 758.55 cfs @ 12.29 hrs, Volume= 94.378 af
 Outflow = 742.14 cfs @ 12.33 hrs, Volume= 94.378 af, Atten= 2%, Lag= 3.0 min
 Primary = 742.14 cfs @ 12.33 hrs, Volume= 94.378 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 65.87' @ 12.33 hrs Surf.Area= 0.000 ac Storage= 5.870 af

Plug-Flow detention time= 13.0 min calculated for 94.378 af (100% of inflow)
 Center-of-Mass det. time= 12.9 min (832.3 - 819.4)

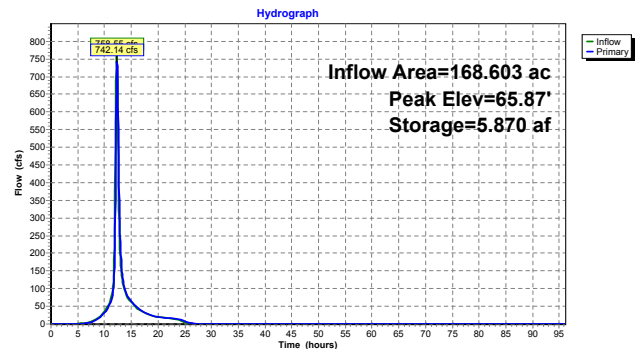
Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	8.000 af	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (acre-feet)
60.00	0.000
62.00	2.000
64.00	4.000
66.00	6.000
68.00	8.000

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	90.0 deg x 12.0' long x 6.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=739.09 cfs @ 12.33 hrs HW=65.86' (Free Discharge)
 #1=Sharp-Crested Vee/Trap Weir (Weir Controls 739.09 cfs @ 7.07 fps)

Pond 18P: Pond 3 Constructed - East of Power Plant



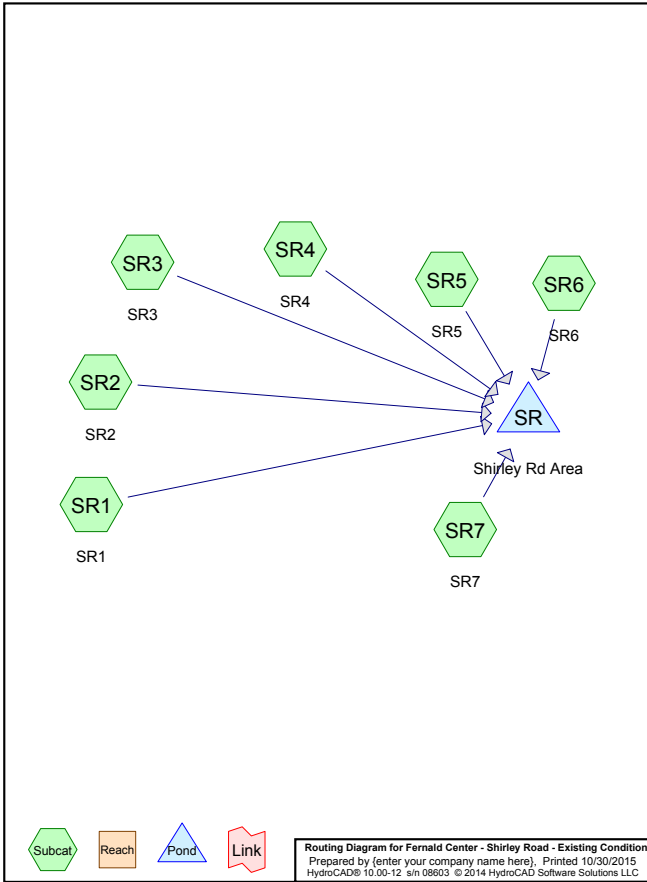
Fernald Center - Shirley Road - Existing Conditions

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.610	79	50-75% Grass cover, Fair, HSG C (SR1, SR2, SR3, SR4, SR5, SR6, SR7)
8.610	79	TOTAL AREA



Fernald Center - Shirley Road - Existing Conditions

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
8.610	HSG C	SR1, SR2, SR3, SR4, SR5, SR6, SR7
0.000	HSG D	
0.000	Other	
8.610	TOTAL AREA	

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	8.610	0.000	0.000	8.610	50-75% Grass cover, Fair	SR1, SR2, SR3, SR4, SR5, SR6, SR7
0.000	0.000	8.610	0.000	0.000	8.610	TOTAL AREA	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 SR1: SR1**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=1.26"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=1.76 cfs 0.121 af
 - Subcatchment SR2: SR2**
 Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=1.26"
 Flow Length=294' Tc=5.6 min CN=79 Runoff=1.61 cfs 0.115 af
 - Subcatchment SR3: SR3**
 Runoff Area=79,872 sf 0.00% Impervious Runoff Depth=1.26"
 Flow Length=222' Tc=5.6 min CN=79 Runoff=2.70 cfs 0.193 af
 - Subcatchment SR4: SR4**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=1.26"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=1.76 cfs 0.121 af
 - Subcatchment SR5: SR5**
 Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=1.26"
 Flow Length=294' Tc=5.6 min CN=79 Runoff=1.61 cfs 0.115 af
 - Subcatchment SR6: SR6**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=1.26"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=1.76 cfs 0.121 af
 - Subcatchment SR7: SR7**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=1.26"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=1.76 cfs 0.121 af
- Pond SR: Shirley Rd Area**
 Inflow=12.91 cfs 0.906 af
 Primary=12.91 cfs 0.906 af
- Total Runoff Area = 8,610 ac Runoff Volume = 0.906 af Average Runoff Depth = 1.26"**
100.00% Pervious = 8,610 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment SR1: SR1

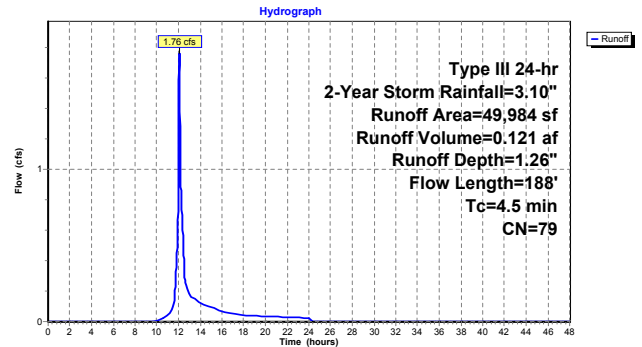
Runoff = 1.76 cfs @ 12.07 hrs, Volume= 0.121 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Storm Rainfall=3.10"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR1: SR1



Summary for Subcatchment SR2: SR2

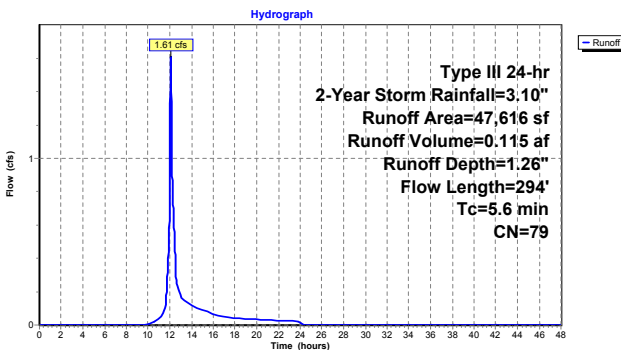
Runoff = 1.61 cfs @ 12.09 hrs, Volume= 0.115 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Storm Rainfall=3.10"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294	Total			

Subcatchment SR2: SR2



Summary for Subcatchment SR3: SR3

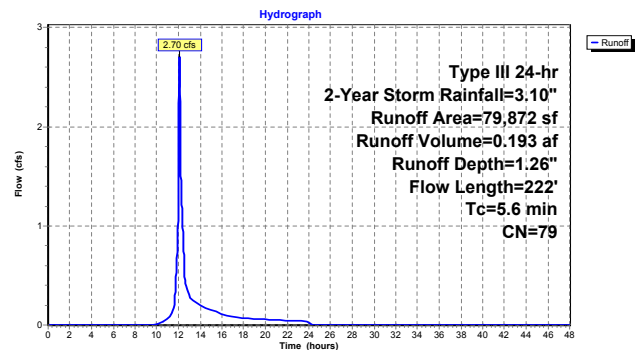
Runoff = 2.70 cfs @ 12.09 hrs, Volume= 0.193 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Storm Rainfall=3.10"

Area (sf)	CN	Description
79,872	79	50-75% Grass cover, Fair, HSG C
79,872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	64	0.0470	0.22		Sheet Flow, E3 Sheet flow Grass: Short n= 0.150 P2= 3.10"
0.7	158	0.0570	3.58		Shallow Concentrated Flow, E3 Shallow Conc Flow Grassed Waterway Kv= 15.0 fps
5.6	222	Total			

Subcatchment SR3: SR3



Summary for Subcatchment SR4: SR4

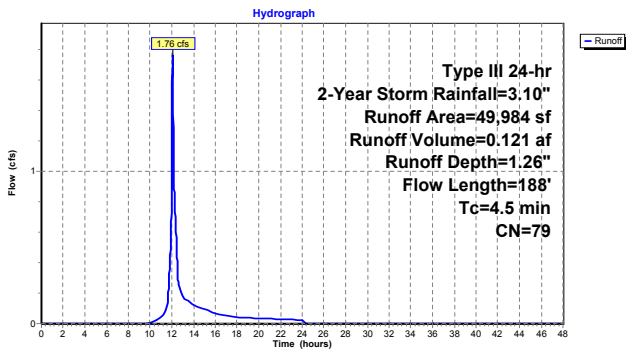
Runoff = 1.76 cfs @ 12.07 hrs, Volume= 0.121 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Storm Rainfall=3.10"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR4: SR4



Summary for Subcatchment SR5: SR5

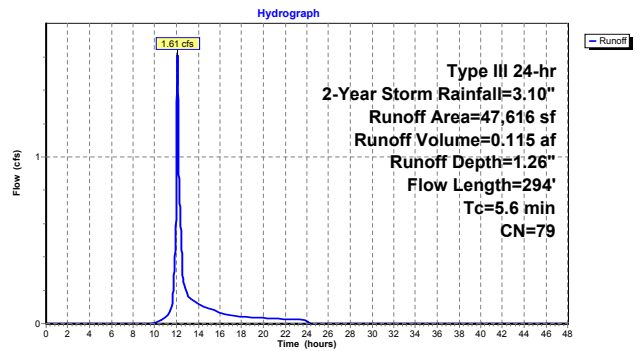
Runoff = 1.61 cfs @ 12.09 hrs, Volume= 0.115 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Storm Rainfall=3.10"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294	Total			

Subcatchment SR5: SR5



Summary for Subcatchment SR6: SR6

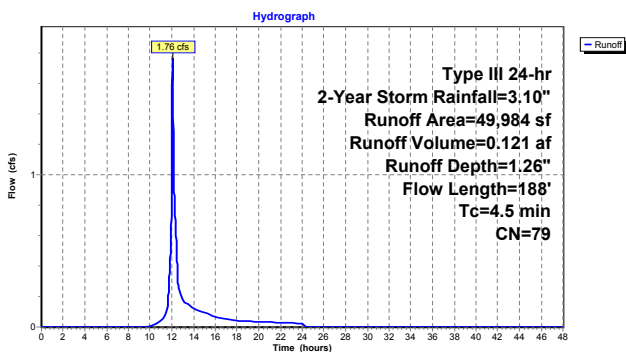
Runoff = 1.76 cfs @ 12.07 hrs, Volume= 0.121 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Storm Rainfall=3.10"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR6: SR6



Summary for Subcatchment SR7: SR7

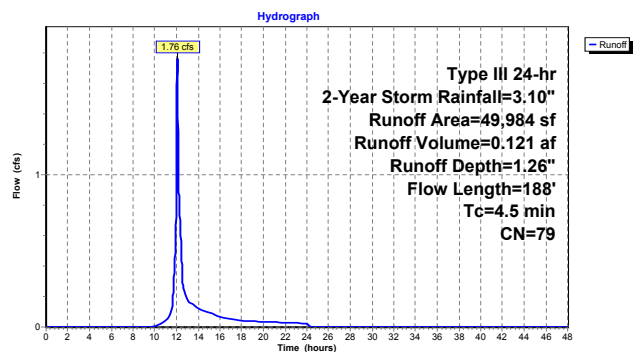
Runoff = 1.76 cfs @ 12.07 hrs, Volume= 0.121 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Storm Rainfall=3.10"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR7: SR7

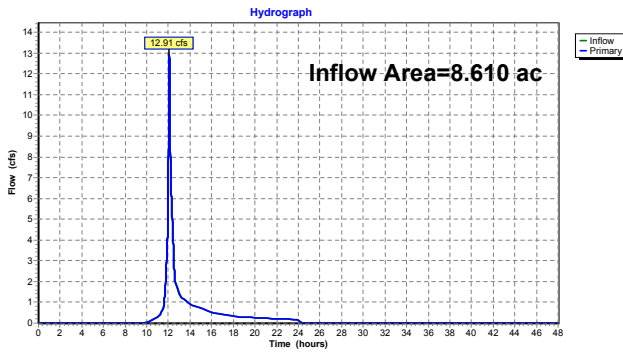


Summary for Pond SR: Shirley Rd Area

Inflow Area = 8.610 ac, 0.00% Impervious, Inflow Depth = 1.26" for 2-Year Storm event
 Inflow = 12.91 cfs @ 12.08 hrs, Volume= 0.906 af
 Primary = 12.91 cfs @ 12.08 hrs, Volume= 0.906 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond SR: Shirley Rd Area



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 SR1: SR1**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=2.46"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=3.50 cfs 0.235 af
 - Subcatchment SR2: SR2**
 Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=2.46"
 Flow Length=294' Tc=5.6 min CN=79 Runoff=3.20 cfs 0.224 af
 - Subcatchment SR3: SR3**
 Runoff Area=79,872 sf 0.00% Impervious Runoff Depth=2.46"
 Flow Length=222' Tc=5.6 min CN=79 Runoff=5.37 cfs 0.376 af
 - Subcatchment SR4: SR4**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=2.46"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=3.50 cfs 0.235 af
 - Subcatchment SR5: SR5**
 Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=2.46"
 Flow Length=294' Tc=5.6 min CN=79 Runoff=3.20 cfs 0.224 af
 - Subcatchment SR6: SR6**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=2.46"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=3.50 cfs 0.235 af
 - Subcatchment SR7: SR7**
 Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=2.46"
 Flow Length=188' Tc=4.5 min CN=79 Runoff=3.50 cfs 0.235 af
- Pond SR: Shirley Rd Area**
 Inflow=25.62 cfs 1.765 af
 Primary=25.62 cfs 1.765 af
- Total Runoff Area = 8.610 ac Runoff Volume = 1.765 af Average Runoff Depth = 2.46"**
100.00% Pervious = 8.610 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment SR1: SR1

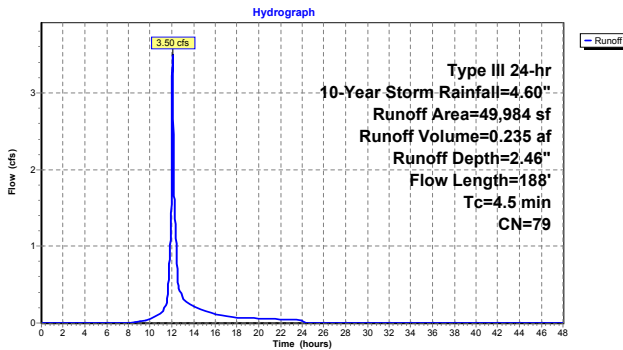
Runoff = 3.50 cfs @ 12.07 hrs, Volume= 0.235 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188				Total

Subcatchment SR1: SR1



Summary for Subcatchment SR2: SR2

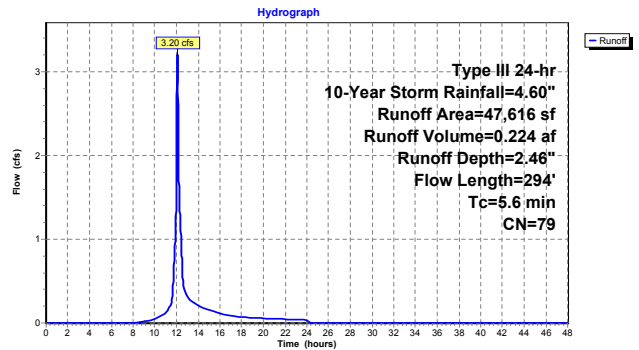
Runoff = 3.20 cfs @ 12.08 hrs, Volume= 0.224 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294				Total

Subcatchment SR2: SR2



Summary for Subcatchment SR3: SR3

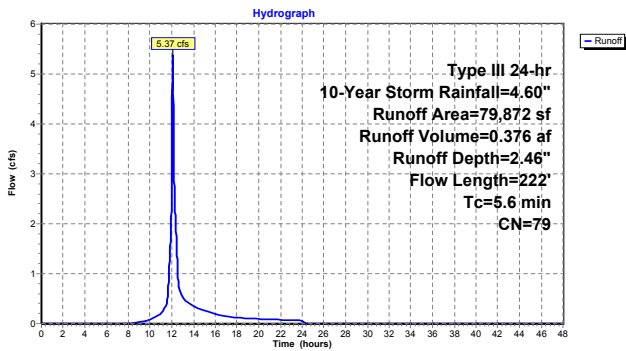
Runoff = 5.37 cfs @ 12.08 hrs, Volume= 0.376 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
79,872	79	50-75% Grass cover, Fair, HSG C
79,872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	64	0.0470	0.22		Sheet Flow, E3 Sheet flow Grass: Short n= 0.150 P2= 3.10"
0.7	158	0.0570	3.58		Shallow Concentrated Flow, E3 Shallow Conc Flow Grassed Waterway Kv= 15.0 fps
5.6	222	Total			

Subcatchment SR3: SR3



Summary for Subcatchment SR4: SR4

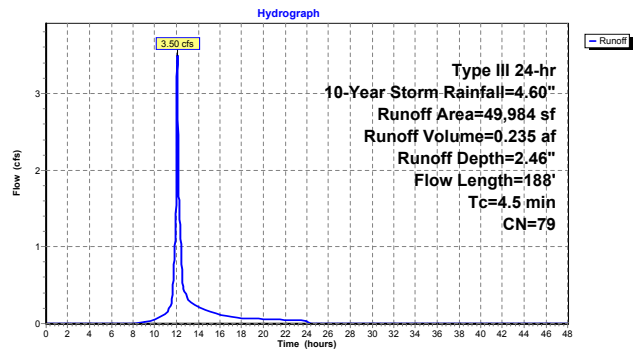
Runoff = 3.50 cfs @ 12.07 hrs, Volume= 0.235 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR4: SR4



Summary for Subcatchment SR5: SR5

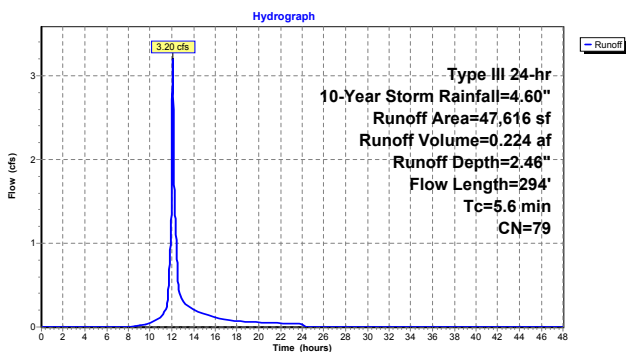
Runoff = 3.20 cfs @ 12.08 hrs, Volume= 0.224 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294	Total			

Subcatchment SR5: SR5



Summary for Subcatchment SR6: SR6

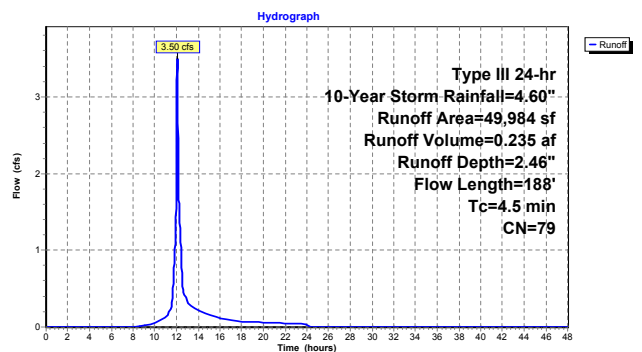
Runoff = 3.50 cfs @ 12.07 hrs, Volume= 0.235 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR6: SR6



Summary for Subcatchment SR7: SR7

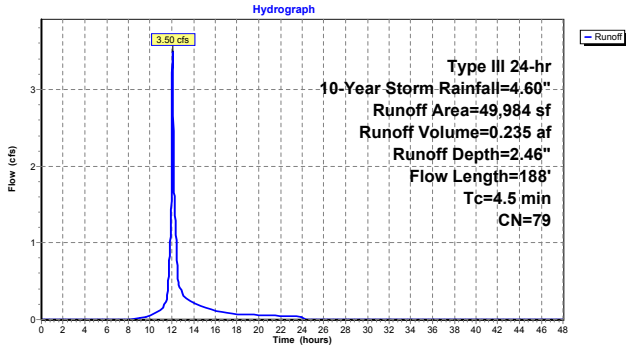
Runoff = 3.50 cfs @ 12.07 hrs, Volume= 0.235 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-Year Storm Rainfall=4.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR7: SR7

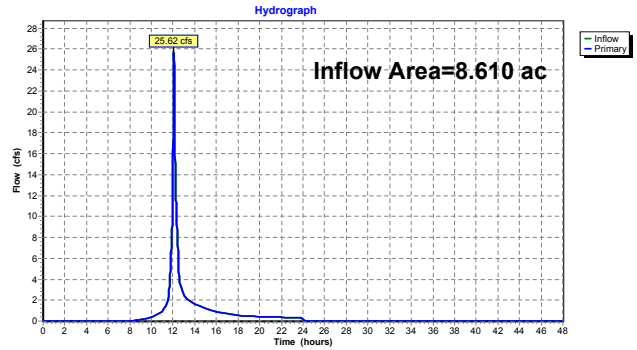


Summary for Pond SR: Shirley Rd Area

Inflow Area = 8.610 ac, 0.00% Impervious, Inflow Depth = 2.46" for 10-Year Storm event
 Inflow = 25.62 cfs @ 12.07 hrs, Volume= 1.765 af
 Primary = 25.62 cfs @ 12.07 hrs, Volume= 1.765 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond SR: Shirley Rd Area



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 SR1: SR1** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=188' Tc=4.5 min CN=79 Runoff=4.47 cfs 0.301 af
- Subcatchment SR2: SR2** Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=294' Tc=5.6 min CN=79 Runoff=4.09 cfs 0.287 af
- Subcatchment SR3: SR3** Runoff Area=79,872 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=222' Tc=5.6 min CN=79 Runoff=6.87 cfs 0.481 af
- Subcatchment SR4: SR4** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=188' Tc=4.5 min CN=79 Runoff=4.47 cfs 0.301 af
- Subcatchment SR5: SR5** Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=294' Tc=5.6 min CN=79 Runoff=4.09 cfs 0.287 af
- Subcatchment SR6: SR6** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=188' Tc=4.5 min CN=79 Runoff=4.47 cfs 0.301 af
- Subcatchment SR7: SR7** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=188' Tc=4.5 min CN=79 Runoff=4.47 cfs 0.301 af

Pond SR: Shirley Rd Area Inflow=32.77 cfs 2.259 af
Primary=32.77 cfs 2.259 af

Total Runoff Area = 8.610 ac Runoff Volume = 2.259 af Average Runoff Depth = 3.15"
100.00% Pervious = 8.610 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment SR1: SR1

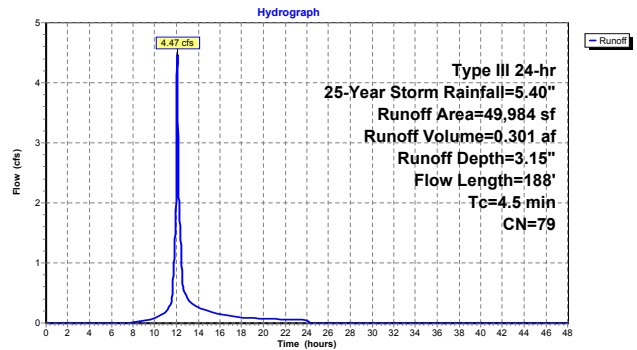
Runoff = 4.47 cfs @ 12.07 hrs, Volume= 0.301 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR1: SR1



Summary for Subcatchment SR2: SR2

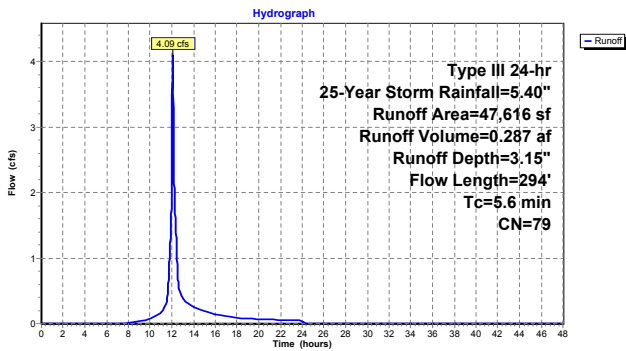
Runoff = 4.09 cfs @ 12.08 hrs, Volume= 0.287 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294	Total			

Subcatchment SR2: SR2



Summary for Subcatchment SR3: SR3

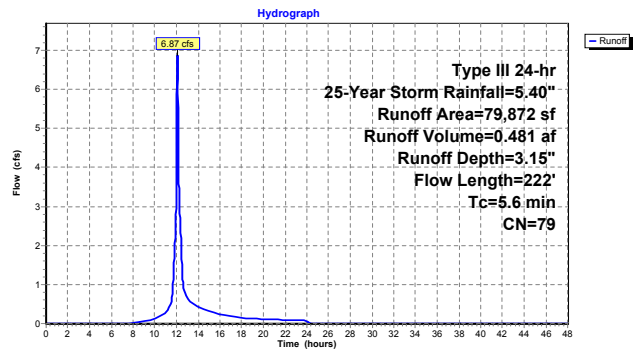
Runoff = 6.87 cfs @ 12.08 hrs, Volume= 0.481 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
79,872	79	50-75% Grass cover, Fair, HSG C
79,872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	64	0.0470	0.22		Sheet Flow, E3 Sheet flow Grass: Short n= 0.150 P2= 3.10"
0.7	158	0.0570	3.58		Shallow Concentrated Flow, E3 Shallow Conc Flow Grassed Waterway Kv= 15.0 fps
5.6	222	Total			

Subcatchment SR3: SR3



Summary for Subcatchment SR4: SR4

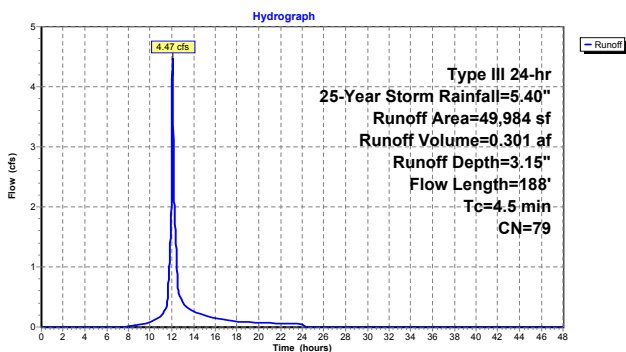
Runoff = 4.47 cfs @ 12.07 hrs, Volume= 0.301 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR4: SR4



Summary for Subcatchment SR5: SR5

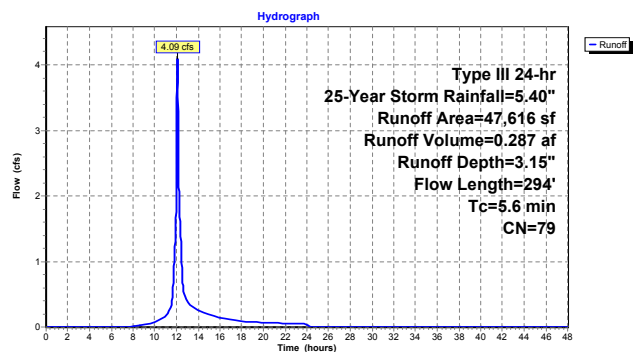
Runoff = 4.09 cfs @ 12.08 hrs, Volume= 0.287 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294	Total			

Subcatchment SR5: SR5



Summary for Subcatchment SR6: SR6

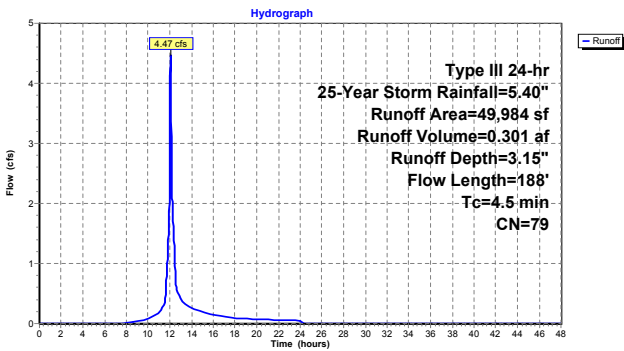
Runoff = 4.47 cfs @ 12.07 hrs, Volume= 0.301 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR6: SR6



Summary for Subcatchment SR7: SR7

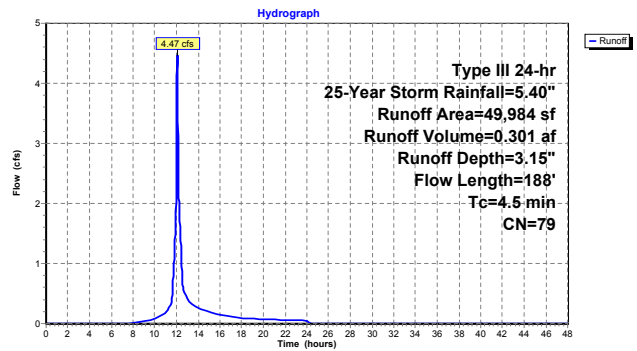
Runoff = 4.47 cfs @ 12.07 hrs, Volume= 0.301 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-Year Storm Rainfall=5.40"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR7: SR7

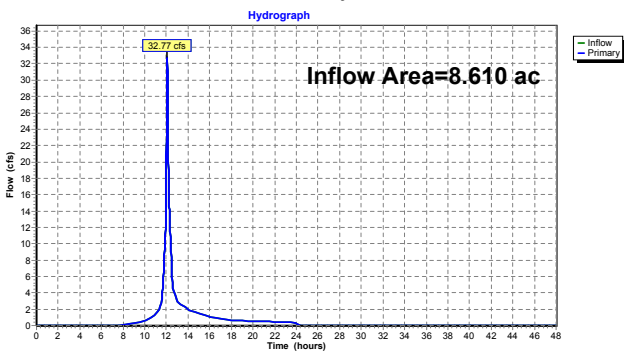


Summary for Pond SR: Shirley Rd Area

Inflow Area = 8.610 ac, 0.00% Impervious, Inflow Depth = 3.15" for 25-Year Storm event
 Inflow = 32.77 cfs @ 12.07 hrs, Volume= 2.259 af
 Primary = 32.77 cfs @ 12.07 hrs, Volume= 2.259 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond SR: Shirley Rd Area



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 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 SR1: SR1** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=4.22"
Flow Length=188' Tc=4.5 min CN=79 Runoff=5.96 cfs 0.404 af
- Subcatchment SR2: SR2** Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=4.22"
Flow Length=294' Tc=5.6 min CN=79 Runoff=5.46 cfs 0.384 af
- Subcatchment SR3: SR3** Runoff Area=79,872 sf 0.00% Impervious Runoff Depth=4.22"
Flow Length=222' Tc=5.6 min CN=79 Runoff=9.16 cfs 0.645 af
- Subcatchment SR4: SR4** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=4.22"
Flow Length=188' Tc=4.5 min CN=79 Runoff=5.96 cfs 0.404 af
- Subcatchment SR5: SR5** Runoff Area=47,616 sf 0.00% Impervious Runoff Depth=4.22"
Flow Length=294' Tc=5.6 min CN=79 Runoff=5.46 cfs 0.384 af
- Subcatchment SR6: SR6** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=4.22"
Flow Length=188' Tc=4.5 min CN=79 Runoff=5.96 cfs 0.404 af
- Subcatchment SR7: SR7** Runoff Area=49,984 sf 0.00% Impervious Runoff Depth=4.22"
Flow Length=188' Tc=4.5 min CN=79 Runoff=5.96 cfs 0.404 af
- Pond SR: Shirley Rd Area** Inflow=43.70 cfs 3.028 af
Primary=43.70 cfs 3.028 af

Total Runoff Area = 8.610 ac Runoff Volume = 3.028 af Average Runoff Depth = 4.22"
100.00% Pervious = 8.610 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment SR1: SR1

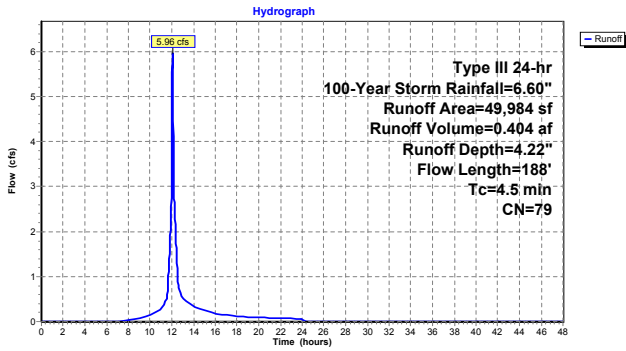
Runoff = 5.96 cfs @ 12.07 hrs, Volume= 0.404 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR1: SR1



Summary for Subcatchment SR2: SR2

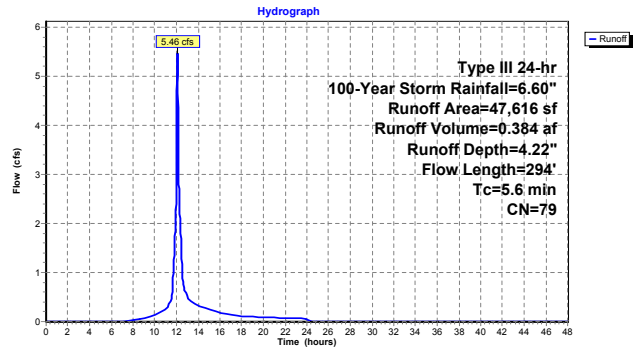
Runoff = 5.46 cfs @ 12.08 hrs, Volume= 0.384 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294	Total			

Subcatchment SR2: SR2



Summary for Subcatchment SR3: SR3

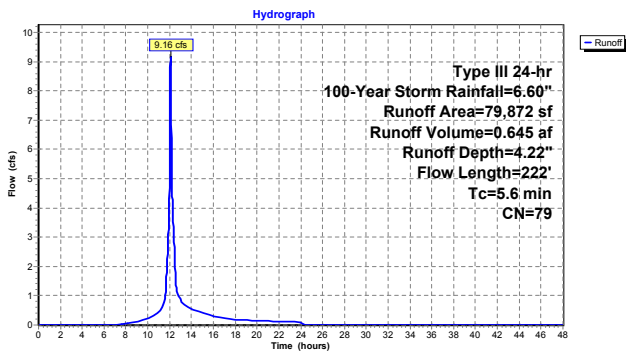
Runoff = 9.16 cfs @ 12.08 hrs, Volume= 0.645 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
79,872	79	50-75% Grass cover, Fair, HSG C
79,872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	64	0.0470	0.22		Sheet Flow, E3 Sheet flow Grass: Short n= 0.150 P2= 3.10"
0.7	158	0.0570	3.58		Shallow Concentrated Flow, E3 Shallow Conc Flow Grassed Waterway Kv= 15.0 fps
5.6	222	Total			

Subcatchment SR3: SR3



Summary for Subcatchment SR4: SR4

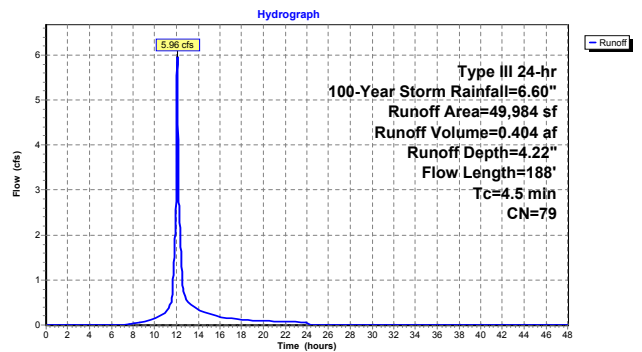
Runoff = 5.96 cfs @ 12.07 hrs, Volume= 0.404 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR4: SR4



Summary for Subcatchment SR5: SR5

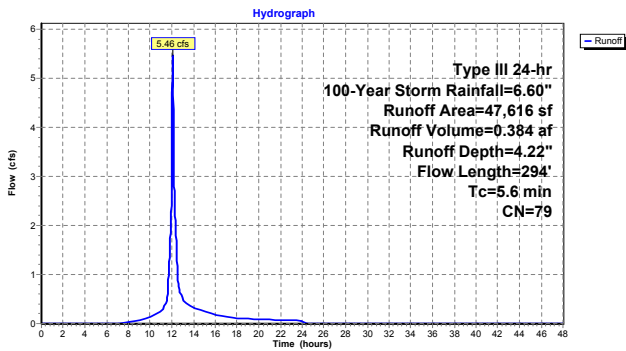
Runoff = 5.46 cfs @ 12.08 hrs, Volume= 0.384 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
47,616	79	50-75% Grass cover, Fair, HSG C
47,616		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	70	0.0570	0.24		Sheet Flow, E2 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.7	224	0.1160	5.11		Shallow Concentrated Flow, E2 Shallow conc Flow Grassed Waterway Kv= 15.0 fps
5.6	294	Total			

Subcatchment SR5: SR5



Summary for Subcatchment SR6: SR6

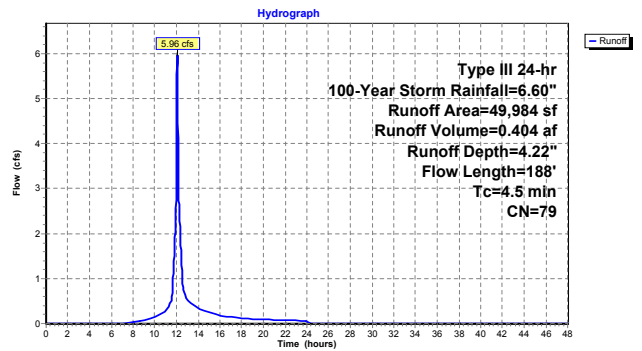
Runoff = 5.96 cfs @ 12.07 hrs, Volume= 0.404 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR6: SR6



Summary for Subcatchment SR7: SR7

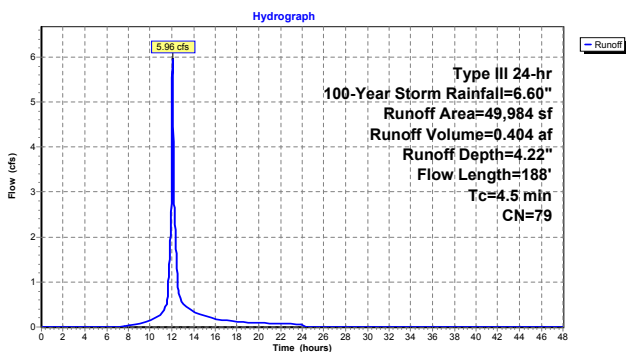
Runoff = 5.96 cfs @ 12.07 hrs, Volume= 0.404 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-Year Storm Rainfall=6.60"

Area (sf)	CN	Description
49,984	79	50-75% Grass cover, Fair, HSG C
49,984		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	88	0.1360	0.35		Sheet Flow, E1 Sheet Flow Grass: Short n= 0.150 P2= 3.10"
0.3	100	0.1800	6.36		Shallow Concentrated Flow, E1 Shallow Concentrated Flow Grassed Waterway Kv= 15.0 fps
4.5	188	Total			

Subcatchment SR7: SR7

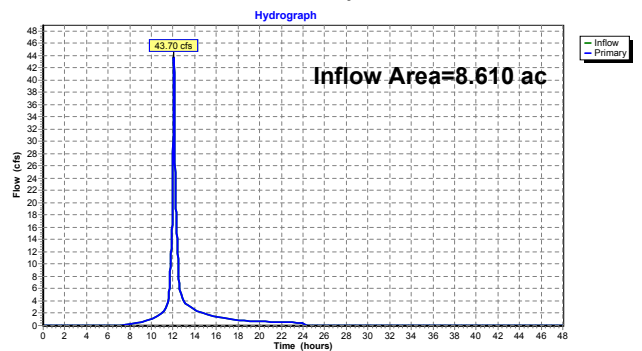


Summary for Pond SR: Shirley Rd Area

Inflow Area = 8.610 ac, 0.00% Impervious, Inflow Depth = 4.22" for 100-Year Storm event
 Inflow = 43.70 cfs @ 12.07 hrs, Volume= 3.028 af
 Primary = 43.70 cfs @ 12.07 hrs, Volume= 3.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond SR: Shirley Rd Area



FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

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APPENDIX H

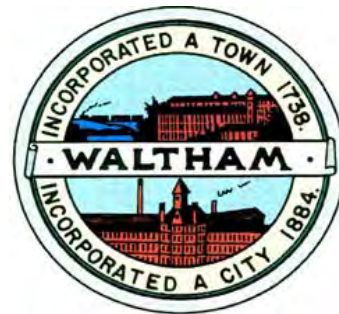
PRESENTATION TO CPC - MARCH 10, 2015

APPENDICES

Wetland Study Fernald Center, Waltham. MA



Presented To:



**Community Preservation
Committee**

Presented by:

Sam Bade

Craig Wood



Presentation Outline

- **Major Objectives**
- **Timeline of Development (1900-Current)**
- **Study Results**
- **Wetland/Stream Restoration Concept**
- **Input from the CPC/City**
- **Recommendations**



Major Objectives

1. Hydrologic/Hydrologic Analysis

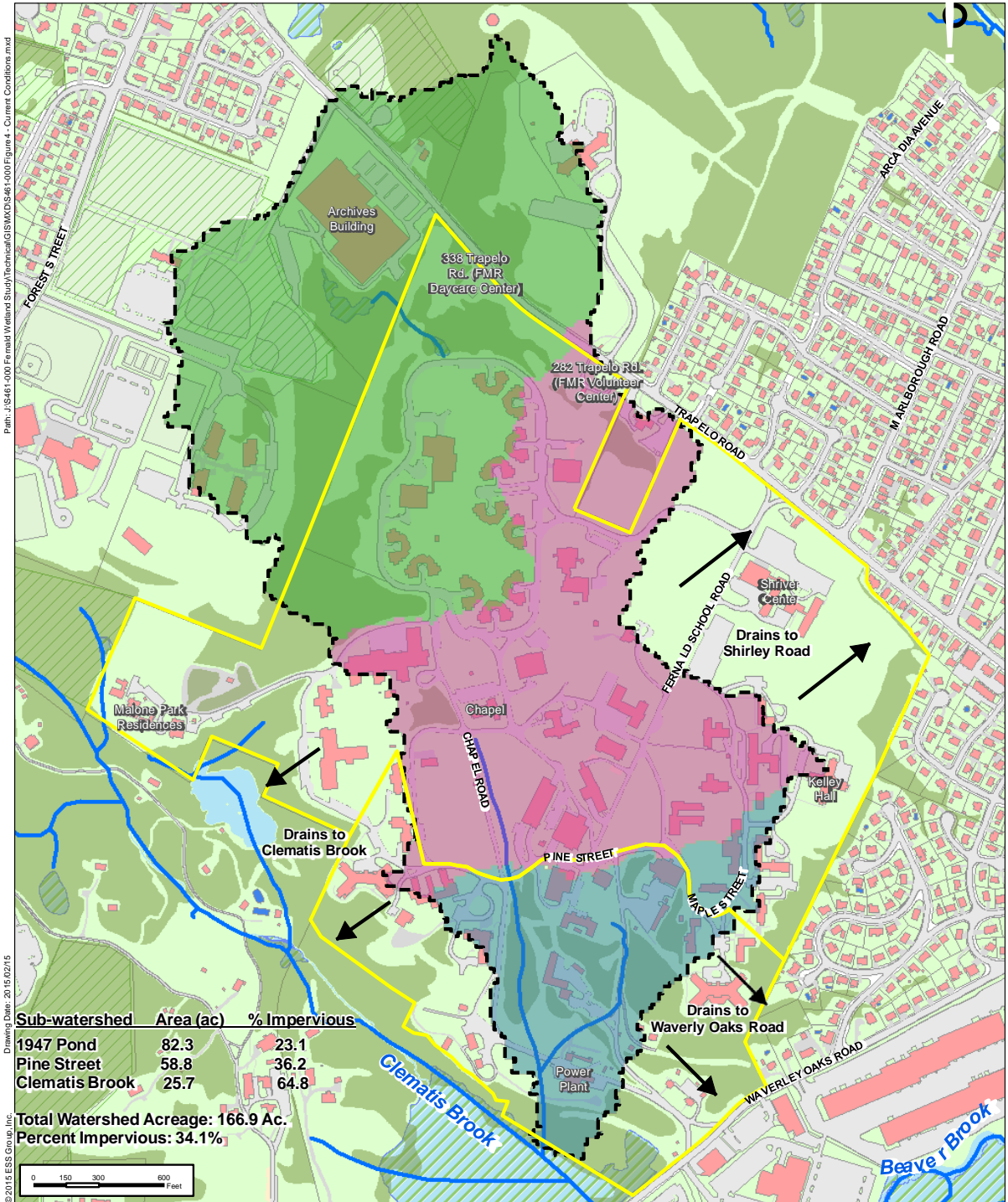
- Existing Conditions
- Pre-Existing Conditions (1947)
- Anticipated Future Conditions (Build-Out)

2. Evaluate Stream and Wetland Restoration Benefits

- Primary
 - Recreational Use
 - Establish Wildlife Corridor
- Secondary
 - Flood Mitigation Downstream



Fernald School – Year 2015



Fernald School Wetland Study
Waltham, Massachusetts
1 inch = 600 feet

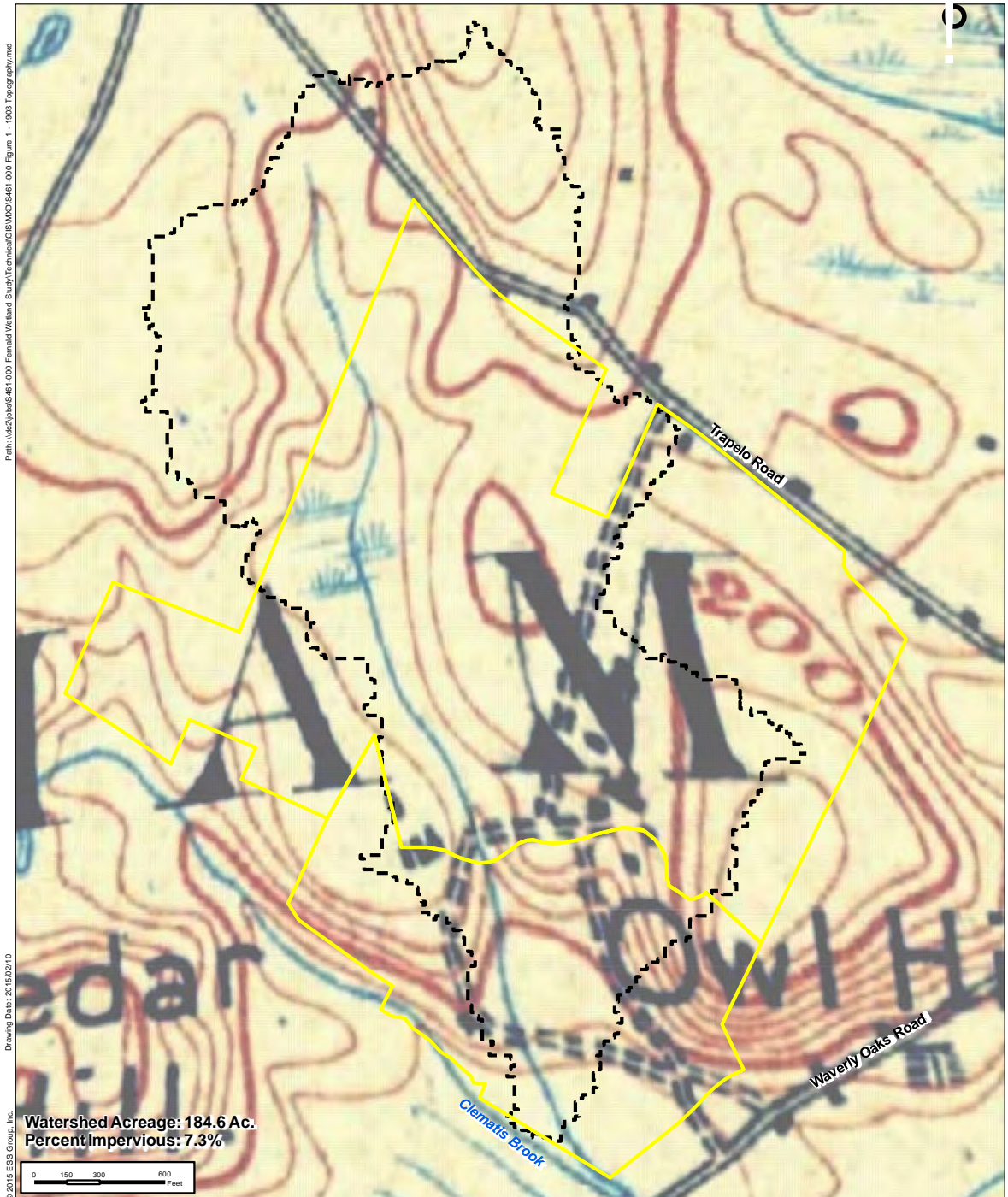
Source: 1) City of Waltham - Base Layer Data, 2011
2) Watersheds, ESS Group, 2015

- Legend**
- Parcel Boundary Delineation (140/50 ac)
 - Watershed Area to Existing Discharge Location
 - Existing Stream
 - Sub-Watershed to 1947 Pond Sub-
 - Watershed to Pine Street Sub-
 - Watershed to Clematis Brook

Current Conditions

Figure 4
Preliminary

Fernald School – Year 1903



Fernald School Wetland Study Waltham, Massachusetts

1 inch = 600 feet

- Source: 1) City of Waltham - MassGIS, Tax Parcels Data, 2011
2) USGS, Historic Topographic Maps, 1903
3) Existing Watershed, ESS Group, 2014

Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed Area to Existing Discharge Location

Historic Topography - 1903

Figure 1
Preliminary

Fernald School – Year 1947



Fernald School Wetland Study Waltham, Massachusetts

1 inch = 700 feet

- Source: 1) City of Waltham - MassGIS, Tax Parcels Data, 2011
2) USGS, Historic Topographic Maps, 1947
3) Existing Watershed, ESS Group, 2014

*Based on 1947 Topography

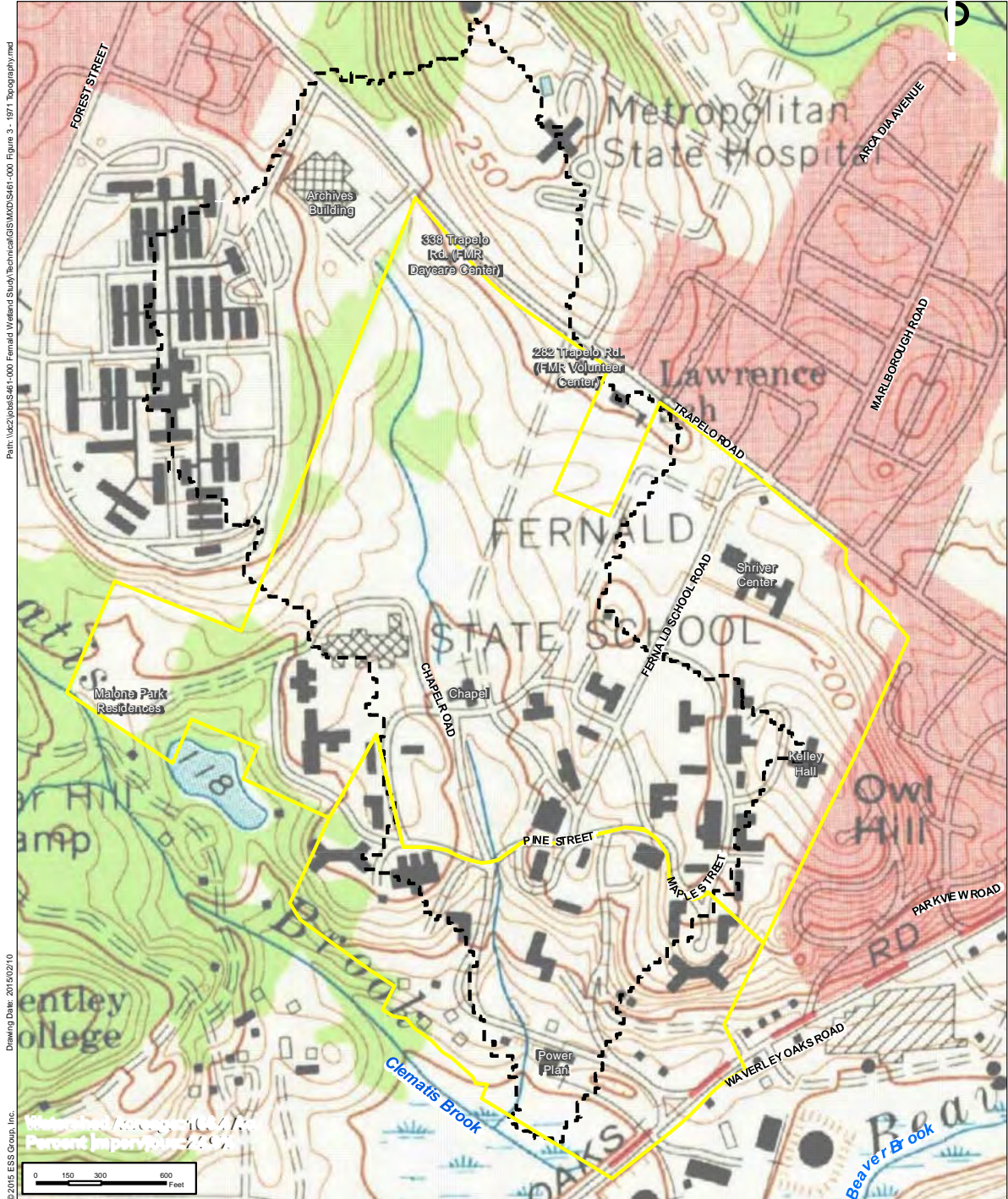
Historic Topography - 1947

Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed to Clematis Brook*
- Watershed Area to Existing Discharge Location

Figure 2
Preliminary

Fernald School – Year 1971



Fernald School Wetland Study Waltham, Massachusetts

1 inch = 600 feet

- Source: 1) City of Waltham - MassGIS, Tax Parcels Data, 2011
2) USGS, Historic Topographic Maps, 1971
3) Existing Watershed, ESS Group, 2014

*Based on 1947 Topography

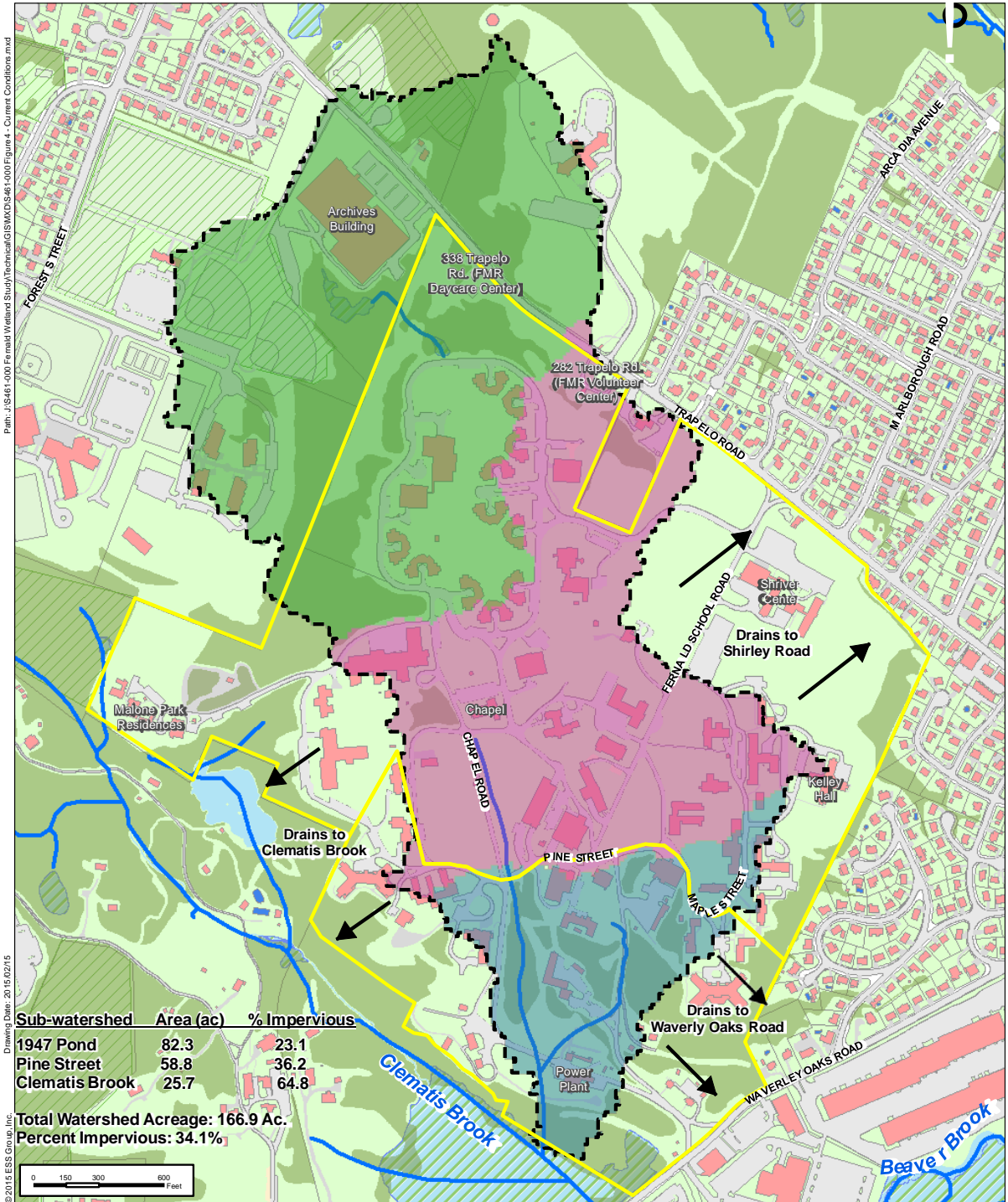
Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed Area to Existing Discharge Location

Historic Topography - 1971

Figure 3
Preliminary

Fernald School – Year 2015



Fernald School Wetland Study Waltham, Massachusetts

1 inch = 600 feet

Source: 1) City of Waltham - Base Layer Data, 2011
2) Watersheds, ESS Group, 2015

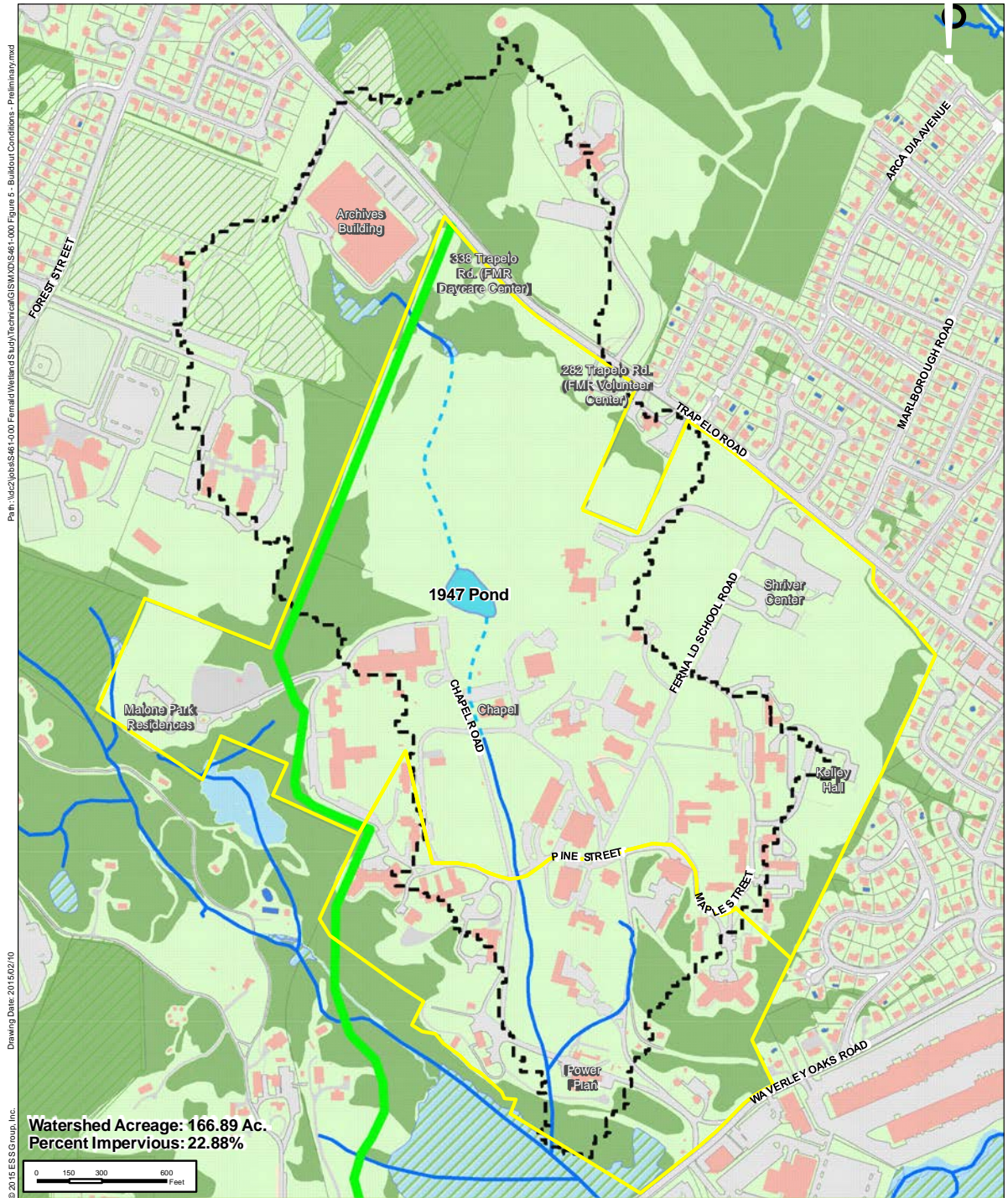
Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed Area to Existing Discharge Location
- Existing Stream
- Sub-Watershed to 1947 Pond Sub-
- Watershed to Pine Street Sub-
- Watershed to Clematis Brook

Current Conditions

Figure 4
Preliminary

Fernald School – Build-Out



Fernald School Wetland Study Waltham, Massachusetts

1 inch = 600 feet

- Source: 1) City of Waltham - Base Layer Data, 2011
2) USGS, Historic Topographic Maps, 1903-1947
3) Existing Watershed, ESS Group, 2014

Legend

- Parcel Boundary Delineation (140/50 ac)
- Watershed Area to Existing Discharge Location
- Existing Stream
- Restored Stream
- Future Segment of Western Greenway

Buildout Conditions - Preliminary

Figure 5
Preliminary

Preliminary Results

Wetland Restoration Benefits

Description	Reduction of Peak Flow Discharges Over Existing (%)		
	10-year Storm	25-year Storm	100-year Storm
Wetland Restoration and Stream Day-lighting	20	15	10
Additional Pond South of Chapel	32	27	21
Additional Detention East of Powerplant	60	50	48



Wetland/Stream Restoration



Fernald School Wetland Study

Cottage Street Campus Conceptual Rendering
Greenspace, Aquatic Habitat and Flood Storage Restoration Project



CPC/City Input

- **Daylight Culvert – Archives Building**
- **Daylight Stream West of Chapel**
- **Other**



Recommendations

- **Visioning/Masterplan**
- **Passive Recreation Goals**
- **Detailed Mapping - Sub-Surface Utilities**
- **Soil Investigation Program – Wetland / Stream Restoration**
- **Stream Flow and Ground Water Monitoring**
- **Wetland /Stream Restoration Design**



FERNALD CENTER REHABILITATION
WETLAND STUDY REPORT

APRIL 2016

APPENDIX I

HISTORIC STREAM AND WETLAND LOCATION AND ALIGNMENTS

APPENDICES

FERNALD CENTER STREAM ALIGNMENTS CITY OF WALTHAM



DISCLAIMER:
This map is for reference and planning purposes only. It is prepared for the inventory of real property within the City of Waltham and is compiled from tax maps, recorded deeds and plats. Users of this tax map are hereby notified that the aforementioned public primary information sources should be consulted for the verification of the information contained on this map. The City of Waltham and its mapping contractors assume no legal responsibility for the information contained herein.

DATA SOURCE:
The digital planimetric base map data was developed by Chas H Sells, Inc. and is based on a spring 2001 1" = 40' scale color orthophotographs. The parcel data are current as of January 2016.

Legend

- 1938 Aerial Photography
- 1903-1947 USGS Maps
- 1975 Wetland Resource Maps
- Stream
- Road Lines
- Building Footprints
- Water Bodies
- Upland
- Wetland Area
- Basketball Court
- Dirt
- Grass
- Playground
- Tennis Court
- Vegetated Area
- Park



0 75 150 300
Feet

1 inch = 300 feet

1	2	3			
4	5	6	7	8	
9	10	11	12	13	14
15	16	17	18	19	20
21	22	23	24	25	26
27	28	29	30	31	32
33	34	35	36	37	38
39	40	41	42	43	44
45	46	47	48	49	50
51	52	53	54	55	56
57	58	59	60	61	62
63	64	65	66	67	68
69	70	71	72	73	74
75	76	77	78	79	80
81					

