Founders Plaza
Parking Lot Improvements

323 & 321 Pitkin Street
East Hartford, Connecticut 06108

PREPARED FOR
Merchant 99-111 Founders LLC
111 Founders Plaza
Suite 101
East Hartford, CT 06108

PREPARED BY

vhb
100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
860.807.4300

May 15, 2018
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Stormwater Report Narrative

Project Description

The proposed project includes the reconfiguration of and addition to the existing parking lots serving the 111 Founders Plaza office building.

Site Description

The Project Site (the site) is comprised of two (2) parcels consisting of 323 Pitkin Street (±3.45-acres, Map Lot 4-38) and 321 Pitkin Street (±5.73-acres, Map Lot 4-38C) in East Hartford, Connecticut. The site is the location of an active office building and parking garage, with associated parking lots. The site has interconnection with the adjacent hotel located directly to the northwest of the site, with the adjacent office building located directly to the south of the site, and with the adjacent office buildings located directly to the east of the site. The Site is bounded by Pitkin Street to the north, East River Drive to the west, an office building to the south, and office buildings to the east.

Per the National Resources Conservation Service (NRCS), surface soils on the Site include Udorthents Urban Land Complex and Urban Land soils (Hydraulic Soil Group B and D, moderate and very slow infiltration rate potential respectively), see Appendix A for more information.

The site is not located within a FEMA 100-yr flood zone, per FEMA map no. 09003C0368G, effective September 16, 2011 (included in Appendix A). It is located within a Zone X, described as “0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depths less than one foot or with drainage areas of less than one square mile”. The site is protected from flood risk by levees constructed adjacent to the Connecticut River.

A geotechnical engineering evaluation of the adjacent property was performed by JGI Eastern, dated September 30, 2005. It is noted within the geotech report that bedrock was not encountered and that groundwater was encountered at depths between 10.5 and 15 feet below grade.
Existing Drainage Conditions

The existing site is developed with an office building, a parking garage, and associated parking lots. Untreated stormwater runoff from the site is generally captured by on-site catch basins and discharged to the south to Hartland Street. Based upon a review of available drainage mapping and topography within the town right-of-ways, it is anticipated that the entire proposed development area to the east of the parking garage drains to the Meadow Hill pumping station. The western portion of the area to the west of the parking garage drains to East River Drive, where it is captured by catch basins and conveyed north to the Pitkin Street pumping station. Figure 2 illustrates the existing drainage areas selected for the site. The following describes the four (4) drainage areas and their respective characteristics:

Area 1A – Untreated stormwater from this portion of the site, to the east of the parking garage, flows overland in an easterly direction where it is captured by an existing catch basin (Design Point 1). From this point, stormwater is discharged east and then south to the storm main in Hartland Street.

Area 2A – Untreated stormwater from this portion of the site, generally the northeast portions of the site, flows overland where it is captured by existing catch basins and discharged towards a common existing manhole (Design Point 2). From this point, stormwater is discharged south to the storm main in Hartland Street.

Area 3A – Untreated stormwater from this portion of the site flows overland to an existing catch basin (Design Point 3). From this point, stormwater is discharged west and then south to the storm main in Hartland Street.

Area 4A – Untreated stormwater from this portion of the site flows overland to East River Drive, where it is captured by an existing catch basin (Design Point 4). From this point, stormwater is discharged west and then north up East River Drive.

Table 1 below provides a summary of the existing conditions hydrologic data.

### Table 1
Existing Conditions Hydrologic Data

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Discharge Location</th>
<th>Area (sq ft)</th>
<th>Curve Number</th>
<th>Time of Concentration (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 1A (DP-1)</td>
<td>Onsite Catch Basin</td>
<td>41,610</td>
<td>94</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 2A (DP-2)</td>
<td>Onsite Manhole</td>
<td>123,645</td>
<td>90</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 3A (DP-3)</td>
<td>Onsite Catch Basin</td>
<td>21,351</td>
<td>96</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 4A (DP-4)</td>
<td>East River Drive Catch Basin</td>
<td>33,023</td>
<td>91</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Proposed Drainage Conditions

The redevelopment project includes the reconfiguration of portions of the existing parking lots and addition of new pavement areas. The sum of the proposed improvements will increase onsite imperviousness by approximately 26,400 square feet.

Under proposed conditions, existing drainage patterns will largely be unchanged, with the minor exception that a portion of the northeast grassed areas which drain overland to Pitkin Street today will be captured, treated, and discharged to the south to Hartland Street. The proposed stormwater management systems, which are comprised of four (4) separate subsurface infiltration chamber areas, have been sized, located, and designed to both provide water quality treatment of the tributary watershed areas, and to mitigate peak flows from the proposed development to pre-construction conditions.

The proposed use of open-bottom plastic chambers as infiltration galleries promotes retention and infiltration of the first inch of rainfall over all new impervious surfaces, which is in line with State water quality standards and the Town’s Stormwater Management Plan regarding the disconnection of impervious areas. As a side benefit of the project, approximately 21,300 square feet of currently-untreated existing pavement on the site are proposed to be connected to a stormwater management area and have the first inch of tributary rainfall retained and infiltrated.

Peak rates of runoff to East River Drive, Hartland Street, and Pitkin Street will be reduced by the proposed development. Rates to Pitkin Street will be reduced by virtue of the removal of tributary watershed and rates to East River Drive and Hartland Street will be reduced by the inclusion of subsurface stormwater management areas (see Table 2).

Figure 3 illustrates the proposed “post construction” drainage conditions for the project. Under proposed conditions, the site is divided into eight (8) drainage areas that discharge stormwater to the four (4) original design points (See Figure 3):

Area 1B – This area consists of the area to the east of the parking garage. It is proposed to install a new catch basin which will capture the runoff from this new pavement and discharge it to a subsurface infiltration system, prior to discharging to the existing catch basin (Design Point 1).

Area 1C – This area will continue to drain overland to the existing catch basin (Design Point 1).
Area 2B – This area consists of portion of existing pavement and a portion of new pavement, the runoff from which will be captured by an existing catch basin and discharged to a subsurface infiltration system. The outlet from this system will ultimately drain to the existing manhole (Design Point 2).

Area 2C – This area is primarily new pavement, the runoff from which will be captured by two new catch basins and discharged to a subsurface infiltration system. The outlet from this system will ultimately drain to the existing manhole (Design Point 2).

Area 2D – This area will continue to drain overland ultimately to the existing manhole (Design Point 2).

Area 3A – This area will continue to drain overland to the existing onsite catch basin (Design Point 3).

Area 4B – This area consists of the new parking stalls to the west of the parking garage and a portion of the existing garage ramp, the runoff from which will be captured by a new catch basin and discharged to a subsurface infiltration system. The outlet from this system will ultimately drain to the East River Drive catch basin (Design Point 4).

Area 4C – This area will continue to drain overland to the East River Drive catch basin (Design Point 4).

Table 2 below provides a summary of the proposed conditions hydrologic data.

### Table 2
Proposed Conditions Hydrologic Data

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Discharge Location</th>
<th>Area (sq ft)</th>
<th>Curve Number</th>
<th>Time of Concentration (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 1B (DP-1)</td>
<td>Infiltration 1B</td>
<td>8,063</td>
<td>94</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 1C (DP-1)</td>
<td>Onsite Catch Basin</td>
<td>33,547</td>
<td>97</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 2B (DP-2)</td>
<td>Infiltration 2B</td>
<td>25,908</td>
<td>94</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 2C (DP-2)</td>
<td>Infiltration 2C</td>
<td>10,949</td>
<td>95</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 2D (DP-2)</td>
<td>Onsite Manhole</td>
<td>93,858</td>
<td>94</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 3A (DP-3)</td>
<td>Onsite Catch Basin</td>
<td>21,351</td>
<td>96</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 4B (DP-4)</td>
<td>Infiltration 4B</td>
<td>3,093</td>
<td>98</td>
<td>5.0</td>
</tr>
<tr>
<td>Area 4C (DP-4)</td>
<td>East River Drive Catch Basin</td>
<td>29,933</td>
<td>91</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Hydrologic Analysis

The rainfall-runoff response of the site under existing and proposed conditions was evaluated for storm events with recurrence intervals of 2, 5, 10, 25 and 100-years. Rainfall volumes used for this analysis were based on the NOAA National Weather Service Type III, 24-hour storm event; they were 3.07, 4.06, 4.88, 6.01, and 7.75-inches, respectively. Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology (see Appendix B for calculations).

Drainage areas used in the analyses were described in previous sections and shown on Figures 2 and 3. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology. Detailed printouts of the HydroCAD analyses are included in Appendix D. Table 3 presents a summary of the existing and proposed conditions peak discharge rates.
Table 3
Peak Discharge Rates (cfs*)

<table>
<thead>
<tr>
<th>Design Point</th>
<th>2-year</th>
<th>5-year</th>
<th>10-year</th>
<th>25-year</th>
<th>100-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>2.69</td>
<td>3.69</td>
<td>4.51</td>
<td>5.64</td>
<td>7.36</td>
</tr>
<tr>
<td>Proposed</td>
<td>2.34</td>
<td>3.63</td>
<td>4.50</td>
<td>5.60</td>
<td>7.29</td>
</tr>
<tr>
<td><strong>Design Point 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Onsite Manhole</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing</td>
<td>6.98</td>
<td>10.00</td>
<td>12.49</td>
<td>15.90</td>
<td>21.12</td>
</tr>
<tr>
<td>Proposed</td>
<td>6.34</td>
<td>9.43</td>
<td>12.20</td>
<td>15.81</td>
<td>20.85</td>
</tr>
<tr>
<td><strong>Design Point 3:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Onsite Catch Basin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing</td>
<td>1.45</td>
<td>1.96</td>
<td>2.37</td>
<td>2.95</td>
<td>3.82</td>
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<tr>
<td>Proposed</td>
<td>1.42</td>
<td>1.93</td>
<td>2.35</td>
<td>2.93</td>
<td>3.81</td>
</tr>
<tr>
<td><strong>Design Point 4:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>East River Drive Catch Basin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing</td>
<td>1.93</td>
<td>2.74</td>
<td>3.40</td>
<td>4.31</td>
<td>5.70</td>
</tr>
<tr>
<td>Proposed</td>
<td>1.93</td>
<td>2.74</td>
<td>3.40</td>
<td>4.31</td>
<td>5.69</td>
</tr>
</tbody>
</table>

* Expressed in cubic feet per second

The results of the analysis indicate that there is no increase in peak flow runoff for all storm events between the pre- and post-development conditions at the Design Points.

Hydraulic Analysis

The only pipes proposed to accommodate the project are short runs of 18" HDPE pipes connecting the catch basins to the new subsurface galleries, and 12" RCP pipes outleting the subsurface systems to existing onsite structures. As such, the 12" RCP outlet pipes were analyzed using StormCAD, a HEC-22 based program, to safely convey the estimated 100-year flows exiting the subsurface systems. Pipe sizing calculations are included in Appendix D of this report.
Figure 1: Site Locus Map
FIGURE 1

Founders Plaza
Parking Lot Improvements
323 & 321 Pitkin Street
East Hartford, Connecticut
Figure 2: Existing Drainage Areas
Figure 2
Existing Drainage Conditions
Parking Lot Improvements
Founders Plaza, Pitkin Street, East Hartford

Legend

SYMBOLS

X
DESIGN POINT

X
DRAINAGE AREA DESIGNATION

X
SUBSURFACE STORAGE

UNIT TYPES

- DRAINAGE AREA BOUNDARY
- SOIL TYPE BOUNDARY

SCS SOIL CLASSIFICATIONS

306
UDORMENTS—URBAN LAND COMPLEX, HSG B

307
URBAN LAND, HSG D
Figure 3: Proposed Drainage Areas
Proposed Drainage Conditions

Parking Lot Improvements
Founders Plaza, Pitkin Street, East Hartford

05/15/2018
Appendix A
Additional Mapping
NRCS Web Soil Survey Mapping
MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Rating Polygons
  - A
  - A/D
  - B
  - B/D
  - C
  - C/D
  - D
  - Not rated or not available

Water Features
- Streams and Canals

Transportation
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 16, Sep 15, 2017

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

Date(s) aerial images were photographed: Mar 28, 2011—Apr 18, 2011

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.
Hydrologic Soil Group

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

### Table

<table>
<thead>
<tr>
<th>Map unit symbol</th>
<th>Map unit name</th>
<th>Rating</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>306</td>
<td>Udorthents-Urban land complex</td>
<td>B</td>
<td>38.7</td>
<td>27.3%</td>
</tr>
<tr>
<td>307</td>
<td>Urban land</td>
<td>D</td>
<td>69.1</td>
<td>48.7%</td>
</tr>
<tr>
<td>308</td>
<td>Udorthents, smoothed</td>
<td>C</td>
<td>0.3</td>
<td>0.2%</td>
</tr>
<tr>
<td>309</td>
<td>Udorthents, flood control</td>
<td>C</td>
<td>10.0</td>
<td>7.0%</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
<td></td>
<td>23.7</td>
<td>16.7%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td></td>
<td><strong>141.7</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Rating Options

Aggregation Method: Dominant Condition
Component Percent Cutoff: None Specified
Tie-break Rule: Higher
FEMA Mapping
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/16/2018 at 11:45:57 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.
Appendix B:
Long Term Operations and Maintenance Measures
# Project Information

## Site

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Founders Plaza Parking Lot Improvements</th>
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</thead>
<tbody>
<tr>
<td>Address or Locus</td>
<td>111 Founders Plaza (323 &amp; 321 Pitkin Street)</td>
</tr>
<tr>
<td>City, State &amp; Zip</td>
<td>East Hartford, Connecticut</td>
</tr>
</tbody>
</table>

## Developer

<table>
<thead>
<tr>
<th>Client Name</th>
<th>Merchant 99-111 Founders LLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Address</td>
<td>111 Founders Plaza, Suite 101</td>
</tr>
<tr>
<td>Client City, State &amp; Zip</td>
<td>East Hartford, Connecticut 06108</td>
</tr>
</tbody>
</table>

## Site Supervisor

<table>
<thead>
<tr>
<th>Site Manager Name</th>
<th>TBD</th>
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</thead>
<tbody>
<tr>
<td>Site Manager Address</td>
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</tr>
<tr>
<td>Site Manager City, State &amp; Zip</td>
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</tr>
<tr>
<td>Site Manager Telephone No.</td>
<td></td>
</tr>
<tr>
<td>Site Manager Cell Phone</td>
<td></td>
</tr>
<tr>
<td>Site Manager E-Mail</td>
<td></td>
</tr>
</tbody>
</table>
Long Term Stormwater Maintenance Measures

- Street Sweeping (Standard Pavement): Sweep or vacuum roads and parking areas 2x per year, preferably in late spring and late fall.
- Catch Basins with Deep Sumps and Oil/debris Traps: Inspect twice per year. Remove sediment once per year or whenever greater than 6 inches of sediment has accumulated.
- Trash/Litter: Routinely pick up and remove litter from entire property as required. Routinely inspect all dumpster and compactor locations for spills. Remove all trash litter from the enclosure and dispose of properly.
- Vegetated Areas: Inspect bi-annually. Replant bare areas upon identification. Routinely mow lawn and remove clippings, minimum once every 2 wks.
- Underground Infiltration Chambers: Inspect the system quarterly for the first year. Clean as needed via jet/vac in the first year. Subsequent to the first year, inspect the system two (2) times per year, preferably in the spring after snowmelt and before winter conditions. Clean the system once per year via jet/vac, preferably after snowmelt in the spring. Repair any damages immediately upon identification.
Long Term Best Management Practices Checklist

- The Long-Term BMP Maintenance/Evaluation Checklist is attached.
Parking Lot Improvements – 111 Founders Plaza, East Hartford, CT
Best Management Practices – Maintenance/ Evaluation Checklist

### Long Term Practices

<table>
<thead>
<tr>
<th>Best Management Practice</th>
<th>Inspection Frequency</th>
<th>Date Inspected</th>
<th>Inspector</th>
<th>Minimum Maintenance and Key Items to Check</th>
<th>Cleaning/Repair Needed</th>
<th>Date of Cleaning/Repair</th>
<th>Performed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Sweeping</td>
<td>2x per yr, preferably in late spring and late fall</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Catch Basins</td>
<td>Inspect/ Clean bi-annually</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetated Areas</td>
<td>Inspect bi-annually</td>
<td>Replant bare areas upon identification</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Trash/ Litter</td>
<td>Routinely pick up and remove litter from entire property as required. Routinely inspect all dumpster and compactor locations for spills. Remove all trash litter from the enclosure and dispose of properly.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underground Infiltration Chambers</td>
<td>Inspect the system quarterly for the first year. Clean as needed in the first year. Subsequent to the first year, inspect the system two (2) times per year, preferably in the spring after snowmelt and before winter conditions. Clean the system once per year via jet/vac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stormwater Control Manager _________________________________
Appendix C: Erosion and Sedimentation Control Measures
Erosion and Sedimentation Control Measures

The following erosion and sedimentation controls are for use during the earthwork and construction phases of the project. The following controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and owner in Compliance with EPA NPDES regulations.

Straw Bale Barriers

Straw bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff.

Silt Fencing

In areas where high runoff velocities or high sediment loads are expected, straw bale barriers will be backed up with silt fencing. This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and straw bale barrier will be replaced as determined by periodic field inspections.

Catch Basin Protection

Newly constructed and existing catch basins will be protected with straw bale barriers (where appropriate) or silt sacks throughout construction.

Vegetative Slope Stabilization

Stabilization of open soil surfaces will be implemented within 14 days after grading or construction activities have temporarily or permanently ceased, unless there is sufficient snow cover to prohibit implementation. Vegetative slope stabilization will be used to minimize erosion on slopes of 3:1 or flatter. Annual grasses, such as annual rye, will be used to ensure rapid germination and production of root mass. Permanent stabilization will be completed with the planting of perennial grasses or legumes. Establishment of temporary and permanent vegetative cover may be established by hydro-seeding or sodding. A suitable topsoil, good seedbed preparation, and adequate lime, fertilizer and water will be provided for effective establishment of these vegetative stabilization methods. Mulch will also be used after permanent seeding to
protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water.

**Maintenance**

- The contractor or subcontractor will be responsible for implementing each control shown on the Sedimentation and Erosion Control Plan. In accordance with EPA regulations, the contractor must sign a copy of a certification to verify that a plan has been prepared and that permit regulations are understood.

- The on-site contractor will inspect all sediment and erosion control structures periodically and after each rainfall event. Records of the inspections will be prepared and maintained on-site by the contractor.

- Silt shall be removed from behind barriers if greater than 6-inches deep or as needed.

- Damaged or deteriorated items will be repaired immediately after identification.

- The underside of straw bales should be kept in close contact with the earth and reset as necessary.

- Sediment that is collected in structures shall be disposed of properly and covered if stored on-site.

- Erosion control structures shall remain in place until all disturbed earth has been securely stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

The sedimentation and erosion control plan is included in project plan set; a reduced version and Erosion Control Maintenance checklist is included here for quick reference.
Construction Best Management Practices
- Maintenance/Evaluation Checklist
Parking Lot Improvements – 111 Founders Plaza, East Hartford, CT

**Best Management Practices – Maintenance/ Evaluation Checklist**

**Construction Practices**

<table>
<thead>
<tr>
<th>Best Management Practice</th>
<th>Inspection Frequency</th>
<th>Date Inspected</th>
<th>Inspector</th>
<th>Minimum Maintenance and Key Items to Check</th>
<th>Cleaning/Repair Needed</th>
<th>Date of Cleaning/Repair</th>
<th>Performed by</th>
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<tr>
<td>Straw Bales/Silt Fencing</td>
<td>Once per week or after a 1” or greater storm event</td>
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<td>Catch Basin Protection</td>
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<tr>
<td>Vegetated Slope Stabilization</td>
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**Stormwater Control Manager**

________________________
Appendix D
Hydrologic Computations

- Water Quality Design Calculations
- Rainfall Data
- HydroCAD Analysis: Existing Conditions
- HydroCAD Analysis: Proposed Conditions
- StormCAD Table (Hydraulic Spreadsheet)
Design Calculations

Water Quality Volume
## Water Quality Volume Calculations

**Project:** Founders Plaza  
**By:** SJK  
**Date:** 5/15/18  
**Location:** 111 Founders Plaza, East Hartford, CT  
**Checked:** PV  
**Date:** 5/15/18

<table>
<thead>
<tr>
<th>Basin Name</th>
<th>Infiltration 1B</th>
<th>Infiltration 2B</th>
<th>Infiltration 2C</th>
<th>Infiltration 4B</th>
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<tr>
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<td>1.0 in.</td>
<td>1.0 in.</td>
<td>1.0 in.</td>
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<tr>
<td>Area, A</td>
<td>0.19 ac</td>
<td>0.59 ac</td>
<td>0.25 ac</td>
<td>0.07 ac</td>
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<tr>
<td>Impervious Cover Area</td>
<td>0.15 ac</td>
<td>0.51 ac</td>
<td>0.23 ac</td>
<td>0.07 ac</td>
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<tr>
<td>% Impervious, I</td>
<td>79 %</td>
<td>87 %</td>
<td>90 %</td>
<td>100 %</td>
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<tr>
<td>Volumetric Runoff Coeff., R</td>
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<td>0.829</td>
<td>0.856</td>
<td>0.950</td>
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<tr>
<td>Required Water Quality Volume, WQV</td>
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<td>0.041 ac-ft</td>
<td>0.018 ac-ft</td>
<td>0.006 ac-ft</td>
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<td>509 cf</td>
<td>1,790 cf</td>
<td>781 cf</td>
<td>245 cf</td>
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<tr>
<td>Provided Water Quality Volume, WQV</td>
<td>0.015 ac-ft</td>
<td>0.055 ac-ft</td>
<td>0.018 ac-ft</td>
<td>0.006 ac-ft</td>
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<tr>
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<td>669 cf</td>
<td>2,397 cf</td>
<td>791 cf</td>
<td>246 cf</td>
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</table>

* The proposed stormwater management system will retain and treat the first inch of rainfall over 1.10 acres of impervious area. The project only proposes to add 0.61 acres of impervious area.

---

b. Area tributary to the stormwater management basin  
c. Impervious cover area tributary to the stormwater management basin  
d. R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual  
e. WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual  
f. Volumetric storage below the low-flow orifice; from Proposed HydroCAD output
Rainfall Data
01213456

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./00102345167819:3;<=16>819=?5@:A1B1
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C42@2;I=E176NOPQRS81C:AT@2;I=E1UOBNPVWWS1
F3Y=X482@9:AE
16RNP1H2MM
Z[\] 
YY89^_

`/a.b1̀cFJàab0ba/.1dcFeKF.Jf1FLbag0bFL

h798i87# i] 9#j89ik8#l8#mi#9^8in8#o #9
pnqqip#o99898 9i#98 8i]8#

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`d124s;34?

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t;?42@:A 6
B
V
6>
BV
V>
6>> B>> V>> 6>>>
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OUI4w }05Q'N~W&B2) }0)7'N~O2R'( }23P(N~Q'W'4 }(0O5N~P)R0& }'2R2N~V5>30 }6&6)>~N5R&2 })062B~N5Q'0 }54637~N3O4( }556)W~3N>(5 }50B3>~N0740
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PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.7639°, Longitude: -72.6588°

Average recurrence interval (years)

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Duration

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Maps & aerials

Small scale terrain
HydroCAD Analysis: Existing Conditions
### Area Listing (all nodes)

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<tr>
<th>Area (sq-ft)</th>
<th>CN</th>
<th>Description</th>
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<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B (2A)</td>
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<tr>
<td>47,709</td>
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<tr>
<td>85,338</td>
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<td>Paved parking, HSG D (2A)</td>
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<td>72,202</td>
<td>98</td>
<td>Unconnected pavement, HSG D (1A, 3A, 4A)</td>
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<tr>
<td><strong>219,629</strong></td>
<td><strong>92</strong></td>
<td><strong>TOTAL AREA</strong></td>
</tr>
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2-Year Storm Event – Existing
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Runoff Area</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff</th>
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<td>1A</td>
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<td>80.19%</td>
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<td>2.69 cfs 8,384 cf</td>
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<table>
<thead>
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<th>Link DP-2: DP-2</th>
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<td>6.98 cfs 21,107 cf</td>
<td>6.98 cfs 21,107 cf</td>
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<tr>
<th>Link DP-3: DP-3</th>
<th>Inflow</th>
<th>Primary</th>
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<tr>
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<td>1.45 cfs 4,663 cf</td>
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<thead>
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<th>Link DP-4: DP-4</th>
<th>Inflow</th>
<th>Primary</th>
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<tbody>
<tr>
<td></td>
<td>1.93 cfs 5,880 cf</td>
<td>1.93 cfs 5,880 cf</td>
</tr>
</tbody>
</table>

Total Runoff Area = 219,629 sf  Runoff Volume = 40,034 cf  Average Runoff Depth = 2.19"
28.27% Pervious = 62,089 sf  71.73% Impervious = 157,540 sf
Summary for Subcatchment 1A: 1A

Runoff = 2.69 cfs @ 12.07 hrs, Volume= 8,384 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
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</tr>
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<td></td>
</tr>
<tr>
<td>33,367</td>
<td>100.00% Unconnected</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 5.0 min

Direct Entry,

Subcatchment 1A: 1A

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=41,610 sf
Runoff Volume=8,384 cf
Runoff Depth=2.42"
Tc=5.0 min
CN=94
Summary for Subcatchment 2A: 2A

Runoff = 6.98 cfs @ 12.07 hrs, Volume= 21,107 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

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<td>69.02% Impervious Area</td>
<td></td>
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</table>

Tc = 5.0 min
Direct Entry,

Subcatchment 2A: 2A

Hydrograph

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=123,645 sf
Runoff Volume=21,107 cf
Runoff Depth=2.05"
Tc=5.0 min
CN=90
Summary for Subcatchment 3A: 3A

Runoff = 1.45 cfs @ 12.07 hrs, Volume = 4,663 cf, Depth = 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

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Tc = 5.0 min

Hydrograph

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=21,351 sf
Runoff Volume=4,663 cf
Runoff Depth=2.62"
Tc=5.0 min
CN=96
Summary for Subcatchment 4A: 4A

Runoff = 1.93 cfs @ 12.07 hrs, Volume=5,880 cf, Depth=2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span=0.00-30.00 hrs, dt=0.02 hrs
Type III 24-hr 2-year Rainfall=3.07"

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<td>100</td>
<td>100.00% Unconnected</td>
</tr>
</tbody>
</table>

Tc=5.0 min

Subcatchment 4A: 4A

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=33,023 sf
Runoff Volume=5,880 cf
Runoff Depth=2.14"
Tc=5.0 min
CN=91
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 2.42" for 2-year event

Inflow = 2.69 cfs @ 12.07 hrs, Volume = 8,384 cf
Primary = 2.69 cfs @ 12.07 hrs, Volume = 8,384 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-1: DP-1

Inflow Area=41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 2.05" for 2-year event
Inflow = 6.98 cfs @ 12.07 hrs, Volume= 21,107 cf
Primary = 6.98 cfs @ 12.07 hrs, Volume= 21,107 cf, Attenu= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 2.62" for 2-year event
Inflow = 1.45 cfs @ 12.07 hrs, Volume = 4,663 cf
Primary = 1.45 cfs @ 12.07 hrs, Volume = 4,663 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-3: DP-3

Inflow Area=21,351 sf
Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 2.14" for 2-year event
Inflow = 1.93 cfs @ 12.07 hrs, Volume= 5,880 cf
Primary = 1.93 cfs @ 12.07 hrs, Volume= 5,880 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Inflow Area=33,023 sf
5-Year Storm Event – Existing
Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A
Runoff Area=41,610 sf  80.19% Impervious  Runoff Depth=3.38"
  Tc=5.0 min  CN=94  Runoff=3.69 cfs  11,731 cf

Subcatchment2A: 2A
Runoff Area=123,645 sf  69.02% Impervious  Runoff Depth=2.98"
  Tc=5.0 min  CN=90  Runoff=10.00 cfs  30,665 cf

Subcatchment3A: 3A
Runoff Area=21,351 sf  86.13% Impervious  Runoff Depth=3.60"
  Tc=5.0 min  CN=96  Runoff=1.96 cfs  6,404 cf

Subcatchment4A: 4A
Runoff Area=33,023 sf  61.91% Impervious  Runoff Depth=3.07"
  Tc=5.0 min  CN=91  Runoff=2.74 cfs  8,462 cf

Link DP-1: DP-1
  Inflow=3.69 cfs  11,731 cf
  Primary=3.69 cfs  11,731 cf

Link DP-2: DP-2
  Inflow=10.00 cfs  30,665 cf
  Primary=10.00 cfs  30,665 cf

Link DP-3: DP-3
  Inflow=1.96 cfs  6,404 cf
  Primary=1.96 cfs  6,404 cf

Link DP-4: DP-4
  Inflow=2.74 cfs  8,462 cf
  Primary=2.74 cfs  8,462 cf

Total Runoff Area = 219,629 sf  Runoff Volume = 57,263 cf  Average Runoff Depth = 3.13"
28.27% Pervious = 62,089 sf  71.73% Impervious = 157,540 sf
Summary for Subcatchment 1A: 1A

Runoff \(=\) 3.69 cfs @ 12.07 hrs, Volume=11,731 cf, Depth=3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span=0.00-30.00 hrs, \(dt=0.02\) hrs
Type III 24-hr 5-year Rainfall=4.06"

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</tr>
<tr>
<td>33,367</td>
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<td></td>
</tr>
</tbody>
</table>

Tc = 5.0 min

Subcatchment 1A: 1A

![Hydrograph](image.png)

Type III 24-hr
5-year Rainfall=4.06"
Runoff Area=41,610 sf
Runoff Volume=11,731 cf
Runoff Depth=3.38"
Tc=5.0 min
CN=94
Summary for Subcatchment 2A: 2A

Runoff = 10.00 cfs @ 12.07 hrs, Volume = 30,665 cf, Depth = 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 5-year Rainfall=4.06"

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<td></td>
<td>69.02% Impervious Area</td>
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</table>

Tc = 5.0 min

Direct Entry,

Subcatchment 2A: 2A

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=123,645 sf
Runoff Volume=30,665 cf
Runoff Depth=2.98"
Tc=5.0 min
CN=90
Summary for Subcatchment 3A: 3A

Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,404 cf, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 5-year Rainfall=4.06"

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<tr>
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<th>Length (feet)</th>
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<td>5.0</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 3A: 3A

Type III 24-hr
5-year Rainfall=4.06"
Runoff Area=21,351 sf
Runoff Volume=6,404 cf
Runoff Depth=3.60"
Tc=5.0 min
CN=96
Summary for Subcatchment 4A: 4A

Runoff = 2.74 cfs @ 12.07 hrs, Volume= 8,462 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 5-year Rainfall=4.06"

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</tr>
</tbody>
</table>

Tc=5.0 min

Direct Entry,

Subcatchment 4A: 4A

Hydrograph

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=33,023 sf
Runoff Volume=8,462 cf
Runoff Depth=3.07"
Tc=5.0 min
CN=91
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 3.38" for 5-year event
Inflow = 3.69 cfs @ 12.07 hrs, Volume= 11,731 cf
Primary = 3.69 cfs @ 12.07 hrs, Volume= 11,731 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-1: DP-1

Inflow Area=41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 2.98" for 5-year event
Inflow = 10.00 cfs @ 12.07 hrs, Volume = 30,665 cf
Primary = 10.00 cfs @ 12.07 hrs, Volume = 30,665 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 3.60" for 5-year event
Inflow = 1.96 cfs @ 12.07 hrs, Volume= 6,404 cf
Primary = 1.96 cfs @ 12.07 hrs, Volume= 6,404 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 3.07" for 5-year event
Inflow = 2.74 cfs @ 12.07 hrs, Volume= 8,462 cf
Primary = 2.74 cfs @ 12.07 hrs, Volume= 8,462 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Inflow Area=33,023 sf
10-Year Storm Event – Existing
Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: 1A
Runoff Area=41,610 sf  80.19% Impervious  Runoff Depth=4.19"
  Tc=5.0 min   CN=94   Runoff=4.51 cfs  14,528 cf

Subcatchment2A: 2A
Runoff Area=123,645 sf  69.02% Impervious  Runoff Depth=3.76"
  Tc=5.0 min   CN=90   Runoff=12.49 cfs  38,749 cf

Subcatchment3A: 3A
Runoff Area=21,351 sf  86.13% Impervious  Runoff Depth=4.41"
  Tc=5.0 min   CN=96   Runoff=2.37 cfs  7,852 cf

Subcatchment4A: 4A
Runoff Area=33,023 sf  61.91% Impervious  Runoff Depth=3.87"
  Tc=5.0 min   CN=91   Runoff=3.40 cfs  10,638 cf

Link DP-1: DP-1
Inflow=4.51 cfs  14,528 cf
Primary=4.51 cfs  14,528 cf

Link DP-2: DP-2
Inflow=12.49 cfs  38,749 cf
Primary=12.49 cfs  38,749 cf

Link DP-3: DP-3
Inflow=2.37 cfs  7,852 cf
Primary=2.37 cfs  7,852 cf

Link DP-4: DP-4
Inflow=3.40 cfs  10,638 cf
Primary=3.40 cfs  10,638 cf

Total Runoff Area = 219,629 sf  Runoff Volume = 71,767 cf  Average Runoff Depth = 3.92"
28.27% Pervious = 62,089 sf  71.73% Impervious = 157,540 sf
Summary for Subcatchment 1A: 1A

Runoff = 4.51 cfs @ 12.07 hrs, Volume = 14,528 cf, Depth = 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

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<tr>
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</table>

Tc = 5.0 min

Subcatchment 1A: 1A

Hydrograph

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area=41,610 sf
Runoff Volume=14,528 cf
Runoff Depth=4.19"
Tc=5.0 min
CN=94
Summary for Subcatchment 2A: 2A

Runoff = 12.49 cfs @ 12.07 hrs, Volume= 38,749 cf, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

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Subcatchment 2A: 2A

Hydrograph

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area=123,645 sf
Runoff Volume=38,749 cf
Runoff Depth=3.76"
Tc=5.0 min
CN=90
Summary for Subcatchment 3A: 3A

Runoff = 2.37 cfs @ 12.07 hrs, Volume= 7,852 cf, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
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Subcatchment 3A: 3A

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area=21,351 sf
Runoff Volume=7,852 cf
Runoff Depth=4.41"
Tc=5.0 min
CN=96
Summary for Subcatchment 4A: 4A

Runoff = 3.40 cfs @ 12.07 hrs, Volume= 10,638 cf, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=4.88"

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Tc=5.0 min

Subcatchment 4A: 4A

Hydrograph

Type III 24-hr
10-year Rainfall=4.88"
Runoff Area=33,023 sf
Runoff Volume=10,638 cf
Runoff Depth=3.87"
Tc=5.0 min
CN=91
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 4.19" for 10-year event
Inflow = 4.51 cfs @ 12.07 hrs, Volume = 14,528 cf
Primary = 4.51 cfs @ 12.07 hrs, Volume = 14,528 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs

Inflow Area = 41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 3.76" for 10-year event
Inflow = 12.49 cfs @ 12.07 hrs, Volume = 38,749 cf
Primary = 12.49 cfs @ 12.07 hrs, Volume = 38,749 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs

Link DP-2: DP-2

Inflow Area = 123,645 sf
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% impervious, Inflow Depth = 4.41" for 10-year event
Inflow = 2.37 cfs @ 12.07 hrs, Volume = 7,852 cf
Primary = 2.37 cfs @ 12.07 hrs, Volume = 7,852 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs

Link DP-3: DP-3

Inflow Area = 21,351 sf
Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 3.87" for 10-year event
Inflow = 3.40 cfs @ 12.07 hrs, Volume = 10,638 cf
Primary = 3.40 cfs @ 12.07 hrs, Volume = 10,638 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-4: DP-4

Inflow Area=33,023 sf
25-Year Storm Event - Existing
Type III 24-hr 25-year Rainfall=6.01”

Time span=0.00-30.00 hrs, dt=0.02 hrs, 1501 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 1A: 1A
Runoff Area=41,610 sf  80.19% Impervious  Runoff Depth=5.31”
Tc=5.0 min  CN=94  Runoff=5.64 cfs  18,400 cf

Subcatchment 2A: 2A
Runoff Area=123,645 sf  69.02% Impervious  Runoff Depth=4.86”
Tc=5.0 min  CN=90  Runoff=15.90 cfs  50,031 cf

Subcatchment 3A: 3A
Runoff Area=21,351 sf  86.13% Impervious  Runoff Depth=5.54”
Tc=5.0 min  CN=96  Runoff=2.95 cfs  9,852 cf

Subcatchment 4A: 4A
Runoff Area=33,023 sf  61.91% Impervious  Runoff Depth=4.97”
Tc=5.0 min  CN=91  Runoff=4.31 cfs  13,669 cf

Link DP-1: DP-1
Inflow=5.64 cfs  18,400 cf
Primary=5.64 cfs  18,400 cf

Link DP-2: DP-2
Inflow=15.90 cfs  50,031 cf
Primary=15.90 cfs  50,031 cf

Link DP-3: DP-3
Inflow=2.95 cfs  9,852 cf
Primary=2.95 cfs  9,852 cf

Link DP-4: DP-4
Inflow=4.31 cfs  13,669 cf
Primary=4.31 cfs  13,669 cf

Total Runoff Area = 219,629 sf  Runoff Volume = 91,953 cf  Average Runoff Depth = 5.02”
28.27% Pervious = 62,089 sf  71.73% Impervious = 157,540 sf
Summary for Subcatchment 1A: 1A

Runoff = 5.64 cfs @ 12.07 hrs, Volume= 18,400 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Type III 24-hr 25-year Rainfall=6.01"

<table>
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<tr>
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<tbody>
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<td>33,367</td>
<td>98</td>
<td>Unconnected pavement, HSG D</td>
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<tr>
<td>8,243</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>41,610</td>
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<td>Weighted Average</td>
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<tr>
<td>8,243</td>
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</table>

Tc = 5.0 min

Direct Entry,

Subcatchment 1A: 1A

Type III 24-hr
25-year Rainfall=6.01"
Runoff Area=41,610 sf
Runoff Volume=18,400 cf
Runoff Depth=5.31"
Tc=5.0 min
CN=94
Summary for Subcatchment 2A: 2A

Runoff = 15.90 cfs @ 12.07 hrs, Volume= 50,031 cf, Depth= 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.01"

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<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>14,360</td>
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<tr>
<td>85,338</td>
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<td>69.02% Impervious Area</td>
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</tbody>
</table>

Tc = 5.0 min

Subcatchment 2A: 2A

Type III 24-hr 25-year Rainfall=6.01"
Runoff Area=123,645 sf
Runoff Volume=50,031 cf
Runoff Depth=4.86"
Tc=5.0 min
CN=90
Summary for Subcatchment 3A: 3A

Runoff = 2.95 cfs @ 12.07 hrs, Volume= 9,852 cf, Depth= 5.54" 

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.01"

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</table>

Tc   | Length | Slope | Velocity | Capacity | Description |
-----|--------|-------|----------|----------|-------------|
5.0  |        |       |          |          | Direct Entry, |

Hydrograph

Type III 24-hr 25-year Rainfall=6.01"
Runoff Area=21,351 sf
Runoff Volume=9,852 cf
Runoff Depth=5.54"
Tc=5.0 min
CN=96
Summary for Subcatchment 4A: 4A

Runoff = 4.31 cfs @ 12.07 hrs, Volume = 13,669 cf, Depth = 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs
Type III 24-hr 25-year Rainfall=6.01"

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<tr>
<td>20,445</td>
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<td>100.00% Unconnected</td>
</tr>
</tbody>
</table>

Tc = 5.0 min, Length = 5.00 feet, Slope = 0.00 (ft/ft), Velocity = 0.00 (ft/sec), Capacity = 4.31 cfs

Direct Entry,

Subcatchment 4A: 4A

Hydrograph
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 5.31" for 25-year event
Inflow = 5.64 cfs @ 12.07 hrs, Volume = 18,400 cf
Primary = 5.64 cfs @ 12.07 hrs, Volume = 18,400 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs

Link DP-1: DP-1

Inflow Area = 41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 4.86" for 25-year event

Inflow = 15.90 cfs @ 12.07 hrs, Volume = 50,031 cf

Primary = 15.90 cfs @ 12.07 hrs, Volume = 50,031 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-2: DP-2
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 5.54" for 25-year event
Inflow = 2.95 cfs @ 12.07 hrs, Volume= 9,852 cf
Primary = 2.95 cfs @ 12.07 hrs, Volume= 9,852 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Inflow Area=21,351 sf
Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 4.97" for 25-year event
Inflow = 4.31 cfs @ 12.07 hrs, Volume = 13,669 cf
Primary = 4.31 cfs @ 12.07 hrs, Volume = 13,669 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs

Link DP-4: DP-4

Hydrograph

Inflow Area = 33,023 sf
100-Year Storm Event – Existing
Type III 24-hr  100-year Rainfall=7.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: 1A
Runoff Area=41,610 sf  80.19% Impervious  Runoff Depth=7.03"
Tc=5.0 min  CN=94  Runoff=7.36 cfs  24,388 cf

Subcatchment 2A: 2A
Runoff Area=123,645 sf  69.02% Impervious  Runoff Depth=6.56"
Tc=5.0 min  CN=90  Runoff=21.12 cfs  67,588 cf

Subcatchment 3A: 3A
Runoff Area=21,351 sf  86.13% Impervious  Runoff Depth=7.27"
Tc=5.0 min  CN=96  Runoff=3.82 cfs  12,938 cf

Subcatchment 4A: 4A
Runoff Area=33,023 sf  61.91% Impervious  Runoff Depth=6.68"
Tc=5.0 min  CN=91  Runoff=5.70 cfs  18,376 cf

Link DP-1: DP-1
Inflow=7.36 cfs  24,388 cf
Primary=7.36 cfs  24,388 cf

Link DP-2: DP-2
Inflow=21.12 cfs  67,588 cf
Primary=21.12 cfs  67,588 cf

Link DP-3: DP-3
Inflow=3.82 cfs  12,938 cf
Primary=3.82 cfs  12,938 cf

Link DP-4: DP-4
Inflow=5.70 cfs  18,376 cf
Primary=5.70 cfs  18,376 cf

Total Runoff Area = 219,629 sf  Runoff Volume = 123,291 cf  Average Runoff Depth = 6.74"
28.27% Pervious = 62,089 sf  71.73% Impervious = 157,540 sf
Summary for Subcatchment 1A: 1A

Runoff = $7.36 \text{ cfs} @ 12.07 \text{ hrs}$, Volume= $24,388 \text{ cf}$, Depth= $7.03''$

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75''

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<td></td>
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<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 1A: 1A

Type III 24-hr 100-year Rainfall=7.75''
Runoff Area=41,610 sf
Runoff Volume=24,388 cf
Runoff Depth=7.03''
Tc=5.0 min
CN=94
Summary for Subcatchment 2A: 2A

Runoff = 21.12 cfs @ 12.07 hrs, Volume= 67,588 cf, Depth= 6.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75"

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<td>Weighted Average</td>
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<tr>
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<td>30.98% Pervious Area</td>
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<tr>
<td>85,338</td>
<td>69</td>
<td>69.02% Impervious Area</td>
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</tbody>
</table>

Tc = 5.0 min

Subcatchment 2A: 2A

Hydrograph

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=123,645 sf
Runoff Volume=67,588 cf
Runoff Depth=6.56"
Tc=5.0 min
CN=90
Summary for Subcatchment 3A: 3A

Runoff = 3.82 cfs @ 12.07 hrs, Volume= 12,938 cf, Depth= 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75"

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Tc = 5.0 min

Direct Entry,

Subcatchment 3A: 3A

Hydrograph

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=21,351 sf
Runoff Volume=12,938 cf
Runoff Depth=7.27"
Tc = 5.0 min
CN = 96
Summary for Subcatchment 4A: 4A

Runoff = 5.70 cfs @ 12.07 hrs, Volume= 18,376 cf, Depth= 6.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=7.75"

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Subcatchment 4A: 4A

Hydrograph

Type III 24-hr
100-year Rainfall=7.75"
Runoff Area=33,023 sf
Runoff Volume=18,376 cf
Runoff Depth=6.68"
Tc=5.0 min
CN=91
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 80.19% Impervious, Inflow Depth = 7.03" for 100-year event
Inflow = 7.36 cfs @ 12.07 hrs, Volume= 24,388 cf
Primary = 7.36 cfs @ 12.07 hrs, Volume= 24,388 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Inflow Area=41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 123,645 sf, 69.02% Impervious, Inflow Depth = 6.56" for 100-year event

Inflow = 21.12 cfs @ 12.07 hrs, Volume = 67,588 cf

Primary = 21.12 cfs @ 12.07 hrs, Volume = 67,588 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-30.00 hrs, dt = 0.02 hrs

Link DP-2: DP-2

Inflow Area = 123,645 sf
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.13% Impervious, Inflow Depth = 7.27" for 100-year event
Inflow = 3.82 cfs @ 12.07 hrs, Volume = 12,938 cf
Primary = 3.82 cfs @ 12.07 hrs, Volume = 12,938 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Inflow Area = 21,351 sf
Summary for Link DP-4: DP-4

Inflow Area = 33,023 sf, 61.91% Impervious, Inflow Depth = 6.68" for 100-year event
Inflow = 5.70 cfs @ 12.07 hrs, Volume= 18,376 cf
Primary = 5.70 cfs @ 12.07 hrs, Volume= 18,376 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.02 hrs

Link DP-4: DP-4

Inflow Area=33,023 sf
HydroCAD Analysis: Proposed Conditions
## Area Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (sq-ft)</th>
<th>CN</th>
<th>Description</th>
<th>(subcatchment-numbers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,149</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
<td>(2B, 2C, 2D)</td>
</tr>
<tr>
<td>39,410</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
<td>(1B, 1C, 2B, 2C, 2D, 3A, 4C)</td>
</tr>
<tr>
<td>184,143</td>
<td>98</td>
<td>Paved parking, HSG D</td>
<td>(1B, 1C, 2B, 2C, 2D, 3A, 4B, 4C)</td>
</tr>
<tr>
<td><strong>226,702</strong></td>
<td><strong>94</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
</tbody>
</table>
2-Year Storm Event – Proposed
Type III 24-hr 2-year Rainfall=3.07"

Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 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 1B: 1B
Runoff Area=8,063 sf 78.66% Impervious Runoff Depth=2.42"
Tc=5.0 min  CN=94  Runoff=0.52 cfs 1,625 cf

Subcatchment 1C: 1C
Runoff Area=33,547 sf 91.76% Impervious Runoff Depth=2.73"
Tc=5.0 min  CN=97  Runoff=2.34 cfs 7,626 cf

Subcatchment 2B: 2B
Runoff Area=25,908 sf 87.45% Impervious Runoff Depth=2.42"
Tc=5.0 min  CN=94  Runoff=1.68 cfs 5,220 cf

Subcatchment 2C: 2C
Runoff Area=10,949 sf 89.54% Impervious Runoff Depth=2.52"
Tc=5.0 min  CN=95  Runoff=0.73 cfs 2,297 cf

Subcatchment 2D: 2D
Runoff Area=93,858 sf 79.22% Impervious Runoff Depth=2.42"
Tc=5.0 min  CN=95  Runoff=6.08 cfs 18,911 cf

Subcatchment 3A: 3A
Runoff Area=21,351 sf 86.08% Impervious Runoff Depth=2.52"
Tc=5.0 min  CN=94  Runoff=1.42 cfs 4,480 cf

Subcatchment 4B: 4B
Runoff Area=3,093 sf 100.00% Impervious Runoff Depth=2.84"
Tc=5.0 min  CN=98  Runoff=0.22 cfs 731 cf

Subcatchment 4C: 4C
Runoff Area=29,933 sf 62.58% Impervious Runoff Depth=2.14"
Tc=5.0 min  CN=91  Runoff=1.76 cfs 5,329 cf

Pond INF 1B: INF 1B
Peak Elev=17.63’ Storage=785 cf Inflow=0.52 cfs 1,625 cf
Outflow=0.22 cfs 955 cf

Pond INF 2B: INF 2B
Peak Elev=16.26’ Storage=3,048 cf Inflow=1.68 cfs 5,220 cf
Outflow=0.28 cfs 2,815 cf

Pond INF 2C: INF 2C
Peak Elev=15.95’ Storage=983 cf Inflow=0.73 cfs 2,297 cf
Outflow=0.50 cfs 1,506 cf

Pond INF 4B: INF 4B
Peak Elev=20.21’ Storage=299 cf Inflow=0.22 cfs 731 cf
Outflow=0.19 cfs 486 cf

Link DP-1: DP-1
Inflow=2.34 cfs 8,581 cf
Primary=2.34 cfs 8,581 cf

Link DP-2: DP-2
Inflow=6.34 cfs 23,232 cf
Primary=6.34 cfs 23,232 cf

Link DP-3: DP-3
Inflow=1.42 cfs 4,480 cf
Primary=1.42 cfs 4,480 cf

Link DP-4: DP-4
Inflow=1.93 cfs 5,815 cf
Primary=1.93 cfs 5,815 cf
Total Runoff Area = 226,702 sf  Runoff Volume = 46,219 cf  Average Runoff Depth = 2.45" 
18.77% Pervious = 42,559 sf  81.23% Impervious = 184,143 sf
Summary for Subcatchment 1B: 1B

Runoff = 0.52 cfs @ 12.07 hrs, Volume = 1,625 cf, Depth = 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,342</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,721</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>8,063</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,721</td>
<td>21.34% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>6,342</td>
<td>78.66% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)

5.0 Direct Entry,

Subcatchment 1B: 1B

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=8,063 sf
Runoff Volume=1,625 cf
Runoff Depth=2.42"
Tc=5.0 min
CN=94
Summary for Subcatchment 1C: 1C

Runoff = 2.34 cfs @ 12.07 hrs, Volume= 7,626 cf, Depth= 2.73" 

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tr>
<td>30,784</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>2,763</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>33,547</td>
<td>97</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,763</td>
<td>8.24% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>30,784</td>
<td>91.76% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
5.0

Direct Entry,

Subcatchment 1C: 1C

Type III 24-hr
2-year Rainfall=3.07"
Runoff Area=33,547 sf
Runoff Volume=7,626 cf
Runoff Depth=2.73"
Tc=5.0 min
CN=97
Summary for Subcatchment 2B: 2B

Runoff = 1.68 cfs @ 12.07 hrs, Volume= 5,220 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>22,657</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,214</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>2,037</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>25,908</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>3,251</td>
<td>12.55% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>22,657</td>
<td>87.45% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
5.0

Direct Entry, Subcatchment 2B: 2B

Hydrograph

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=25,908 sf
Runoff Volume=5,220 cf
Runoff Depth=2.42"
Tc=5.0 min
CN=94
Summary for Subcatchment 2C: 2C

Runoff = 0.73 cfs @ 12.07 hrs, Volume= 2,297 cf, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>9,804</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>343</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>802</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>10,949</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,145</td>
<td>10.46%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>9,804</td>
<td>89.54%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
5.0

Direct Entry,

Subcatchment 2C: 2C

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=10,949 sf
Runoff Volume=2,297 cf
Runoff Depth=2.52"
Tc=5.0 min
CN=95
Summary for Subcatchment 2D: 2D

Runoff = 6.08 cfs @ 12.07 hrs, Volume= 18,911 cf, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>74,350</td>
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<td>Paved parking, HSG D</td>
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<tr>
<td>19,198</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>310</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
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<tr>
<td>93,858</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>19,508</td>
<td></td>
<td>20.78% Pervious Area</td>
</tr>
<tr>
<td>74,350</td>
<td></td>
<td>79.22% Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 2D: 2D

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=93,858 sf
Runoff Volume=18,911 cf
Runoff Depth=2.42"
Tc=5.0 min
CN=94
Summary for Subcatchment 3A: 3A

Runoff = 1.42 cfs @ 12.07 hrs, Volume= 4,480 cf, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>18,380</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>2,971</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>21,351</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,971</td>
<td></td>
<td>13.92% Pervious Area</td>
</tr>
<tr>
<td>18,380</td>
<td></td>
<td>86.08% Impervious Area</td>
</tr>
</tbody>
</table>

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

Subcatchment 3A: 3A

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=21,351 sf
Runoff Volume=4,480 cf
Runoff Depth=2.52"
Tc=5.0 min
CN=95
Summary for Subcatchment 4B: 4B

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 731 cf, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,093</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>3,093</td>
<td>100.00% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 4B: 4B

Hydrograph

Type III 24-hr 2-year Rainfall=3.07"
Runoff Area=3,093 sf
Runoff Volume=731 cf
Runoff Depth=2.84"
Tc=5.0 min
CN=98
Summary for Subcatchment 4C: 4C

Runoff = 1.76 cfs @ 12.07 hrs, Volume= 5,329 cf, Depth= 2.14"  

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type III 24-hr  2-year Rainfall=3.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18,733</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,200</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>29,933</td>
<td>91</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>11,200</td>
<td>37.42% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>18,733</td>
<td>62.58% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

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

Subcatchment 4C: 4C

Type III 24-hr 2-year Rainfall=3.07"  
Runoff Area=29,933 sf  
Runoff Volume=5,329 cf  
Runoff Depth=2.14"  
Tc=5.0 min  
CN=91
Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 2.42" for 2-year event
Inflow = 0.52 cfs @ 12.07 hrs, Volume = 1,625 cf
Outflow = 0.22 cfs @ 12.25 hrs, Volume = 955 cf, Atten= 58%, Lag= 10.8 min
Primary = 0.22 cfs @ 12.25 hrs, Volume = 955 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.63' @ 12.25 hrs Surf.Area= 745 sf Storage= 785 cf

Plug-Flow detention time= 216.0 min calculated for 955 cf (59% of inflow)
Center-of-Mass det. time= 112.0 min (899.6 - 787.6)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>15.90'</td>
<td>587 cf</td>
<td>11.00'W x 67.70'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>16.40'</td>
<td>827 cf</td>
<td>ADS_StormTech SC-740 +Cap x 18 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Rows of 9 Chambers</td>
</tr>
</tbody>
</table>

1,414 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 17.40' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.22 cfs @ 12.25 hrs HW=17.63' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.22 cfs @ 1.63 fps)
Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

9 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 65.70' Row Length + 12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone
Pond INF 1B: INF 1B

Hydrograph

Inflow Area=8,063 sf
Peak Elev=17.63'
Storage=785 cf

0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0

0 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

Inflow
Primary

Time (hours)

Flow (cfs)
Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 2.42" for 2-year event
Inflow = 1.68 cfs @ 12.07 hrs, Volume= 5,220 cf
Outflow = 0.28 cfs @ 12.53 hrs, Volume= 2,815 cf, Atten= 83%, Lag= 27.4 min
Primary = 0.28 cfs @ 12.53 hrs, Volume= 2,815 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.26' @ 12.53 hrs Surf.Area= 3,327 sf Storage= 3,048 cf

Plug-Flow detention time= 289.6 min calculated for 2,814 cf (54% of inflow)
Center-of-Mass det. time= 180.5 min (968.1 - 787.6 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.80'</td>
<td>2,479 cf</td>
<td>25.25'W x 131.78'L x 3.50'H Field A</td>
</tr>
<tr>
<td>#2A</td>
<td>15.30'</td>
<td>4,135 cf</td>
<td>ADS_StormTech SC-740 +Cap x 90 Inside #1</td>
</tr>
</tbody>
</table>

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 16.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.28 cfs @ 12.53 hrs HW=16.26' (Free Discharge)
↑1=Orifice/Grate (Orifice Controls 0.28 cfs @ 1.73 fps)
Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone
Inflow Area=25,908 sf
Peak Elev=16.26'
Storage=3,048 cf
Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 2.52" for 2-year event
Inflow = 0.73 cfs @ 12.07 hrs, Volume= 2,297 cf
Outflow = 0.50 cfs @ 12.15 hrs, Volume= 1,506 cf, Atten= 31%, Lag= 4.5 min
Primary = 0.50 cfs @ 12.15 hrs, Volume= 1,506 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 15.95' @ 12.15 hrs Surf.Area= 810 sf Storage= 983 cf
Plug-Flow detention time= 192.4 min calculated for 1,506 cf (66% of inflow)
Center-of-Mass det. time= 95.1 min (876.4 - 781.3)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.00'</td>
<td>633 cf</td>
<td>25.25'W x 32.10'L x 3.50'H Field A</td>
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<tr>
<td>#2A</td>
<td>14.50'</td>
<td>919 cf</td>
<td>ADS_StormTech SC-740 +Cap x 20 Inside #1</td>
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</tbody>
</table>

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
5 Rows of 4 Chambers

1,552 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 15.60' **12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.50 cfs @ 12.15 hrs HW=15.95' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.50 cfs @ 2.02 fps)
Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10'
Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone
Pond INF 2C: INF 2C

**Hydrograph**

- Inflow Area: 10,949 sf
- Peak Elev: 15.95'
- Storage: 983 cf

Time (hours)

<table>
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<th>Flow (cfs)</th>
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</tr>
<tr>
<td>0.75</td>
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</tr>
<tr>
<td>0.6</td>
</tr>
<tr>
<td>0.55</td>
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<tr>
<td>0.5</td>
</tr>
<tr>
<td>0.45</td>
</tr>
<tr>
<td>0.4</td>
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<tr>
<td>0.35</td>
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<tr>
<td>0.1</td>
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<tr>
<td>0.05</td>
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Printed 5/23/2018
Prepared by VHB

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Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf, 100.00% Impervious, Inflow Depth = 2.84" for 2-year event
Inflow = 0.22 cfs @ 12.07 hrs, Volume= 731 cf
Outflow = 0.19 cfs @ 12.11 hrs, Volume= 486 cf, Atten= 12%, Lag= 2.5 min
Primary = 0.19 cfs @ 12.11 hrs, Volume= 486 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.21' @ 12.11 hrs   Surf.Area= 379 sf   Storage= 299 cf

Plug-Flow detention time= 198.9 min calculated for 486 cf (66% of inflow)
Center-of-Mass det. time= 100.3 min (856.7 - 756.4)

<table>
<thead>
<tr>
<th>Volume</th>
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<th>Avail.Storage</th>
<th>Storage Description</th>
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</thead>
<tbody>
<tr>
<td>#1A 18.80'</td>
<td>316 cf</td>
<td>6.25'W x 60.58'L x 3.50'H Field A</td>
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</tr>
<tr>
<td>#2A 19.30'</td>
<td>368 cf</td>
<td>ADS_StormTech SC-740 +Cap x 8 Inside #1</td>
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</tr>
</tbody>
</table>

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Volume Invert Outlet Devices

| Storage Group A created with Chamber Wizard |

<table>
<thead>
<tr>
<th>Device Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Primary 20.00'</td>
<td>12.0&quot; Vert. Orifice/Grate C= 0.600</td>
<td></td>
</tr>
</tbody>
</table>

Primary OutFlow Max=0.19 cfs @ 12.11 hrs   HW=20.21' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.19 cfs @ 1.57 fps)
Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

8 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 58.58' Row Length + 12.0" End Stone x 2 = 60.58'
Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone
Type III 24-hr 2-year Rainfall=3.07"

Pond INF 4B: INF 4B

Inflow Area=3,093 sf
Peak Elev=20.21'
Storage=299 cf
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 2.47" for 2-year event
Inflow = 2.34 cfs @ 12.07 hrs, Volume = 8,581 cf
Primary = 2.34 cfs @ 12.07 hrs, Volume = 8,581 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 2.13" for 2-year event
Inflow = 6.34 cfs @ 12.08 hrs, Volume = 23,232 cf
Primary = 6.34 cfs @ 12.08 hrs, Volume = 23,232 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 2.52" for 2-year event
Inflow = 1.42 cfs @ 12.07 hrs, Volume= 4,480 cf
Primary = 1.42 cfs @ 12.07 hrs, Volume= 4,480 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 2.11" for 2-year event

Inflow = 1.93 cfs @ 12.08 hrs, Volume = 5,815 cf
Primary = 1.93 cfs @ 12.08 hrs, Volume = 5,815 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
5-Year Storm Event – Proposed
Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 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 1B: 1B
Runoff Area=8,063 sf  78.66% Impervious  Runoff Depth=3.38"
  Tc=5.0 min  CN=94  Runoff=0.72 cfs  2,273 cf

Subcatchment 1C: 1C
Runoff Area=33,547 sf  91.76% Impervious  Runoff Depth=3.71"
  Tc=5.0 min  CN=97  Runoff=3.13 cfs  10,375 cf

Subcatchment 2B: 2B
Runoff Area=25,908 sf  87.45% Impervious  Runoff Depth=3.38"
  Tc=5.0 min  CN=94  Runoff=2.30 cfs  7,304 cf

Subcatchment 2C: 2C
Runoff Area=10,949 sf  89.54% Impervious  Runoff Depth=3.49"
  Tc=5.0 min  CN=95  Runoff=0.99 cfs  3,185 cf

Subcatchment 2D: 2D
Runoff Area=93,858 sf  79.22% Impervious  Runoff Depth=3.38"
  Tc=5.0 min  CN=94  Runoff=8.35 cfs  26,462 cf

Subcatchment 3A: 3A
Runoff Area=21,351 sf  86.08% Impervious  Runoff Depth=3.49"
  Tc=5.0 min  CN=94  Runoff=1.93 cfs  6,210 cf

Subcatchment 4B: 4B
Runoff Area=3,093 sf  100.00% Impervious  Runoff Depth=3.82"
  Tc=5.0 min  CN=98  Runoff=0.29 cfs  986 cf

Subcatchment 4C: 4C
Runoff Area=29,933 sf  62.58% Impervious  Runoff Depth=3.07"
  Tc=5.0 min  CN=91  Runoff=2.49 cfs  7,670 cf

Pond INF 1B: INF 1B
Peak Elev=17.79'  Storage=864 cf  Inflow=0.72 cfs  2,273 cf
  Outflow=0.60 cfs  1,604 cf

Pond INF 2B: INF 2B
Peak Elev=16.48'  Storage=3,582 cf  Inflow=2.30 cfs  7,304 cf
  Outflow=0.88 cfs  4,898 cf

Pond INF 2C: INF 2C
Peak Elev=16.08'  Storage=1,049 cf  Inflow=0.99 cfs  3,185 cf
  Outflow=0.88 cfs  2,393 cf

Pond INF 4B: INF 4B
Peak Elev=20.25'  Storage=309 cf  Inflow=0.29 cfs  986 cf
  Outflow=0.27 cfs  740 cf

Link DP-1: DP-1
Inflow=3.63 cfs  11,979 cf
  Primary=3.63 cfs  11,979 cf

Link DP-2: DP-2
Inflow=9.43 cfs  33,753 cf
  Primary=9.43 cfs  33,753 cf

Link DP-3: DP-3
Inflow=1.93 cfs  6,210 cf
  Primary=1.93 cfs  6,210 cf

Link DP-4: DP-4
Inflow=2.74 cfs  8,410 cf
  Primary=2.74 cfs  8,410 cf
Type III 24-hr 5-year Rainfall = 4.06" 

Total Runoff Area = 226,702 sf  Runoff Volume = 64,464 cf  Average Runoff Depth = 3.41" 
18.77% Pervious = 42,559 sf  81.23% Impervious = 184,143 sf
Summary for Subcatchment 1B: 1B

Runoff = 0.72 cfs @ 12.07 hrs, Volume= 2,273 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<th>Description</th>
</tr>
</thead>
<tbody>
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<td>98</td>
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<tr>
<td>1,721</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>8,063</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,721</td>
<td>21.34% Pervious Area</td>
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</tr>
<tr>
<td>6,342</td>
<td>78.66% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 5.0 min

Direct Entry,

Subcatchment 1B: 1B

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=8,063 sf
Runoff Volume=2,273 cf
Runoff Depth=3.38"

Tc=5.0 min
CN=94
Summary for Subcatchment 1C: 1C

Runoff = 3.13 cfs @ 12.07 hrs, Volume = 10,375 cf, Depth = 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Paved parking, HSG D</td>
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<tr>
<td>2,763</td>
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<tr>
<td>33,547</td>
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<td>Weighted Average</td>
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<tr>
<td>2,763</td>
<td>8.24% Pervious Area</td>
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<tr>
<td>30,784</td>
<td>91.76% Impervious Area</td>
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</tbody>
</table>

Tc = 5.0 min

Subcatchment 1C: 1C

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=33,547 sf
Runoff Volume=10,375 cf
Runoff Depth=3.71"
Tc=5.0 min
CN=97
Summary for Subcatchment 2B: 2B

Runoff = 2.30 cfs @ 12.07 hrs, Volume = 7,304 cf, Depth = 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Type III 24-hr 5-year Rainfall = 4.06"

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<tbody>
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<td>2,037</td>
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<td>&gt;75% Grass cover, Good, HSG B</td>
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<td>25,908</td>
<td>94</td>
<td>Weighted Average</td>
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<tr>
<td>3,251</td>
<td></td>
<td>12.55% Pervious Area</td>
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<tr>
<td>22,657</td>
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<td>87.45% Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<tr>
<td>5.0</td>
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<td></td>
<td></td>
<td>Direct Entry,</td>
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</table>

Subcatchment 2B: 2B

Type III 24-hr 5-year Rainfall = 4.06"
Runoff Area = 25,908 sf
Runoff Volume = 7,304 cf
Runoff Depth = 3.38"
Tc = 5.0 min
CN = 94
Summary for Subcatchment 2C: 2C

Runoff = 0.99 cfs @ 12.07 hrs, Volume= 3,185 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

<table>
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<tr>
<td>10,949</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,145</td>
<td></td>
<td>10.46% Pervious Area</td>
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<tr>
<td>9,804</td>
<td></td>
<td>89.54% Impervious Area</td>
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</table>

Tc Length Slope Velocity Capacity Description
---------- ---------- ---------- ---------- ----------
5.0        5.0        1.0        0.99        1.0          Direct Entry,

Subcatchment 2C: 2C

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=10,949 sf
Runoff Volume=3,185 cf
Runoff Depth=3.49"
Tc=5.0 min
CN=95
Summary for Subcatchment 2D: 2D

Runoff =  8.35 cfs @  12.07 hrs, Volume = 26,462 cf, Depth = 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
Type III 24-hr  5-year Rainfall=4.06"

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<td>19,198</td>
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<td>93,858</td>
<td>94</td>
<td>Weighted Average</td>
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<tr>
<td>19,508</td>
<td>20.78%</td>
<td>Pervious Area</td>
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<tr>
<td>74,350</td>
<td>79.22%</td>
<td>Impervious Area</td>
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Tc = 5.0 min

Subcatchment 2D: 2D

Hydrograph

Type III 24-hr  5-year Rainfall=4.06"
Runoff Area=93,858 sf
Runoff Volume=26,462 cf
Runoff Depth=3.38"

Tc=5.0 min
CN=94
Summary for Subcatchment 3A: 3A

Runoff = 1.93 cfs @ 12.07 hrs, Volume= 6,210 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<th>Description</th>
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<td>Paved parking, HSG D</td>
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<td>21,351</td>
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<td>Weighted Average</td>
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<tr>
<td>2,971</td>
<td>13.92% Pervious Area</td>
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<tr>
<td>18,380</td>
<td>86.08% Impervious Area</td>
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<thead>
<tr>
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<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>5.0</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 3A: 3A

Hydrograph

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=21,351 sf
Runoff Volume=6,210 cf
Runoff Depth=3.49"
Tc=5.0 min
CN=95
Summary for Subcatchment 4B: 4B

Runoff = 0.29 cfs @ 12.07 hrs, Volume= 986 cf, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,093</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>3,093</td>
<td>100.00% Impervious Area</td>
<td></td>
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</tbody>
</table>

Tc=5.0 min

Subcatchment 4B: 4B

Hydrograph

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=3,093 sf
Runoff Volume=986 cf
Runoff Depth=3.82"
Tc=5.0 min
CN=98
Summary for Subcatchment 4C: 4C

Runoff = 2.49 cfs @ 12.07 hrs, Volume= 7,670 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 5-year Rainfall=4.06"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18,733</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,200</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>29,933</td>
<td>91</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>11,200</td>
<td></td>
<td>37.42% Pervious Area</td>
</tr>
<tr>
<td>18,733</td>
<td></td>
<td>62.58% Impervious Area</td>
</tr>
</tbody>
</table>

Type III 24-hr 5-year Rainfall=4.06"
Runoff Area=29,933 sf
Runoff Volume=7,670 cf
Runoff Depth=3.07"
Tc=5.0 min
CN=91
## Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 3.38" for 5-year event

<table>
<thead>
<tr>
<th>Inflow Area</th>
<th>Inflow 0.72 cfs @ 12.07 hrs, Volume=2,273 cf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outflow 0.60 cfs @ 12.12 hrs, Volume=1,604 cf, Atten=16%, Lag=2.9 min</td>
<td></td>
</tr>
<tr>
<td>Primary 0.60 cfs @ 12.12 hrs, Volume=1,604 cf</td>
<td></td>
</tr>
</tbody>
</table>

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.79' @ 12.12 hrs Surf.Area= 745 sf Storage= 864 cf
Plug-Flow detention time=174.8 min calculated for 1,604 cf (71% of inflow)
Center-of-Mass det. time= 83.6 min (862.3 - 778.7)

### Volume Invert Available Storage Storage Description

<table>
<thead>
<tr>
<th>#1A</th>
<th>15.90'</th>
<th>587 cf</th>
<th><strong>11.00'W x 67.70'L x 3.50'H Field A</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>#2A</td>
<td>16.40'</td>
<td>827 cf</td>
<td><strong>ADS_StormTech SC-740 +Cap x 18 Inside #1</strong></td>
</tr>
</tbody>
</table>

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
2 Rows of 9 Chambers

1,414 cf Total Available Storage

Storage Group A created with Chamber Wizard

### Device Routing Invert Outlet Devices

| #1 Primary 17.40' | **12.0' Vert. Orifice/Grate** C= 0.600 |

Primary OutFlow Max=0.60 cfs @ 12.12 hrs HW=17.79' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.60 cfs @ 2.12 fps)
Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)

Effective Size = 44.6" W x 30.0" H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0" W x 30.0" H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

9 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 65.70' Row Length + 12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone
Pond INF 1B: INF 1B

Inflow Area=8,063 sf
Peak Elev=17.79'
Storage=864 cf
Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 3.38" for 5-year event
Inflow = 2.30 cfs @ 12.07 hrs, Volume= 7,304 cf
Outflow = 0.88 cfs @ 12.29 hrs, Volume= 4,898 cf, Atten= 62%, Lag= 13.0 min
Primary = 0.88 cfs @ 12.29 hrs, Volume= 4,898 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.48' @ 12.29 hrs Surf.Area= 3,327 sf Storage= 3,582 cf

Plug-Flow detention time= 224.9 min calculated for 4,898 cf (67% of inflow)
Center-of-Mass det. time= 129.2 min (907.9 - 778.7)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.80'</td>
<td>2,479 cf</td>
<td>25.25'W x 131.78'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>15.30'</td>
<td>4,135 cf</td>
<td>ADS_StormTech SC-740 +Cap x 90 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 Rows of 18 Chambers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6,613 cf Total Available Storage</td>
</tr>
</tbody>
</table>

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 16.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.88 cfs @ 12.29 hrs HW=16.48' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.88 cfs @ 2.36 fps)
Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 129.78' Row Length + 12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone
Pond INF 2B: INF 2B

Hydrograph

Inflow Area=25,908 sf
Peak Elev=16.48'
Storage=3,582 cf
## Summary for Pond INF 2C: INF 2C

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.00'</td>
<td>633 cf</td>
<td><strong>25.25' W x 32.10' L x 3.50' H Field A</strong>&lt;br&gt;2,837 cf Overall - 919 cf Embedded = 1,918 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>14.50'</td>
<td>919 cf</td>
<td><strong>ADS_StormTech SC-740 +Cap x 20</strong> Inside #1&lt;br&gt;Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf&lt;br&gt;Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap&lt;br&gt;5 Rows of 4 Chambers</td>
</tr>
</tbody>
</table>

1,552 cf Total Available Storage

Storage Group A created with Chamber Wizard

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>15.60'</td>
<td><strong>12.0'' Vert. Orifice/Grate</strong> C= 0.600</td>
</tr>
</tbody>
</table>

**Primary OutFlow** Max=0.88 cfs @ 12.11 hrs  HW=16.08' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.88 cfs @ 2.36 fps)
Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6" W x 30.0" H => 6.45 sf x 7.12' L = 45.9 cf
Overall Size = 51.0" W x 30.0" H x 7.56' L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

4 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 30.10' Row Length + 12.0" End Stone x 2 = 32.10' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone
Pond INF 2C: INF 2C

Inflow Area = 10,949 sf
Peak Elev = 16.08'
Storage = 1,049 cf
Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf, 100.00% Impervious, Inflow Depth = 3.82" for 5-year event
Inflow = 0.29 cfs @ 12.07 hrs, Volume= 986 cf
Outflow = 0.27 cfs @ 12.10 hrs, Volume= 740 cf, Atten= 8%, Lag= 1.9 min
Primary = 0.27 cfs @ 12.10 hrs, Volume= 740 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.25' @ 12.10 hrs Surf.Area= 379 sf Storage= 309 cf

Plug-Flow detention time= 171.7 min calculated for 740 cf (75% of inflow)
Center-of-Mass det. time= 85.3 min (836.1 - 750.8)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>18.80'</td>
<td>316 cf</td>
<td>6.25&quot;W x 60.58'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>19.30'</td>
<td>368 cf</td>
<td>ADS_StormTech SC-740 +Cap x 8 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
</tbody>
</table>

684 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 20.00’ 12.0” Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.27 cfs @ 12.10 hrs HW=20.25’ (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.27 cfs @ 1.71 fps)
Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

8 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 58.58' Row Length +12.0" End Stone x 2 = 60.58'
Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage
1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone
Pond INF 4B: INF 4B

Hydrograph

Inflow Area=3,093 sf
Peak Elev=20.25'
Storage=309 cf
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 3.45" for 5-year event
Inflow = 3.63 cfs @ 12.08 hrs, Volume = 11,979 cf
Primary = 3.63 cfs @ 12.08 hrs, Volume = 11,979 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Link DP-1: DP-1

Inflow Area = 41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 3.10" for 5-year event
Inflow = 9.43 cfs @ 12.08 hrs, Volume = 33,753 cf
Primary = 9.43 cfs @ 12.08 hrs, Volume = 33,753 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Inflow Area = 130,715 sf
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 3.49" for 5-year event
Inflow = 1.93 cfs @ 12.07 hrs, Volume = 6,210 cf
Primary = 1.93 cfs @ 12.07 hrs, Volume = 6,210 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Inflow Area = 21,351 sf
Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 3.06" for 5-year event
Inflow = 2.74 cfs @ 12.07 hrs, Volume = 8,410 cf
Primary = 2.74 cfs @ 12.07 hrs, Volume = 8,410 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
10-Year Storm Event - Proposed
**Subcatchment 1B: 1B**
- Runoff Area: 8,063 sf
- Impervious: 78.66%
- Runoff Depth: 4.19"
- Tc: 5.0 min
- CN: 94
- Runoff: 0.88 cfs
- 2,815 cf

**Subcatchment 1C: 1C**
- Runoff Area: 33,547 sf
- Impervious: 91.76%
- Runoff Depth: 4.53"
- Tc: 5.0 min
- CN: 97
- Runoff: 3.78 cfs
- 12,657 cf

**Subcatchment 2B: 2B**
- Runoff Area: 25,908 sf
- Impervious: 87.45%
- Runoff Depth: 4.19"
- Tc: 5.0 min
- CN: 94
- Runoff: 2.82 cfs
- 9,045 cf

**Subcatchment 2C: 2C**
- Runoff Area: 10,949 sf
- Impervious: 89.54%
- Runoff Depth: 4.30"
- Tc: 5.0 min
- CN: 95
- Runoff: 1.21 cfs
- 3,924 cf

**Subcatchment 2D: 2D**
- Runoff Area: 93,858 sf
- Impervious: 79.22%
- Runoff Depth: 4.19"
- Tc: 5.0 min
- CN: 98
- Runoff: 10.21 cfs
- 32,769 cf

**Subcatchment 3A: 3A**
- Runoff Area: 21,351 sf
- Impervious: 100.00%
- Runoff Depth: 4.30"
- Tc: 5.0 min
- CN: 94
- Runoff: 2.35 cfs
- 7,652 cf

**Subcatchment 4B: 4B**
- Runoff Area: 3,093 sf
- Impervious: 100.00%
- Runoff Depth: 4.64"
- Tc: 5.0 min
- CN: 98
- Runoff: 4.50 cfs
- 14,803 cf

**Pond INF 1B: INF 1B**
- Peak Elev: 17.85'
- Storage: 893 cf
- Inflow: 0.88 cfs
- Outflow: 0.79 cfs

**Pond INF 2B: INF 2B**
- Peak Elev: 16.65'
- Storage: 3,987 cf
- Inflow: 2.82 cfs
- Outflow: 1.49 cfs

**Pond INF 2C: INF 2C**
- Peak Elev: 16.14'
- Storage: 1,080 cf
- Inflow: 1.21 cfs
- Outflow: 1.09 cfs

**Pond INF 4B: INF 4B**
- Peak Elev: 20.28'
- Storage: 316 cf
- Inflow: 0.35 cfs
- Outflow: 0.33 cfs

**Link DP-1: DP-1**
- Primary: 4.50 cfs
- Inflow: 4.50 cfs

**Link DP-2: DP-2**
- Primary: 12.20 cfs
- Inflow: 12.20 cfs

**Link DP-3: DP-3**
- Primary: 2.35 cfs
- Inflow: 2.35 cfs

**Link DP-4: DP-4**
- Primary: 3.40 cfs
- Inflow: 3.40 cfs
Total Runoff Area = 226,702 sf  Runoff Volume = 79,702 cf  Average Runoff Depth = 4.22"
18.77% Pervious = 42,559 sf  81.23% Impervious = 184,143 sf
Summary for Subcatchment 1B: 1B

Runoff = 0.88 cfs @ 12.07 hrs, Volume= 2,815 cf, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
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<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
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<td>6,342</td>
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<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,721</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>8,063</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,721</td>
<td>21.34% Pervious Area</td>
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</tr>
<tr>
<td>6,342</td>
<td>78.66% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 5.0 min

Subcatchment 1B: 1B

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area=8,063 sf
Runoff Volume=2,815 cf
Runoff Depth=4.19"
Tc=5.0 min
CN=94
Summary for Subcatchment 1C: 1C

Runoff = 3.78 cfs @ 12.07 hrs, Volume= 12,657 cf, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>30,784</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>2,763</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>33,547</td>
<td>97</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,763</td>
<td>8.24% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>30,784</td>
<td>91.76% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc=5.0 min

Direct Entry,

Subcatchment 1C: 1C

Hydrograph

Type III 24-hr
10-year Rainfall=4.88"
Runoff Area=33,547 sf
Runoff Volume=12,657 cf
Runoff Depth=4.53"
Tc=5.0 min
CN=97
Summary for Subcatchment 2B: 2B

Runoff = 2.82 cfs @ 12.07 hrs, Volume= 9,045 cf, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
<thead>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tr>
<td>22,657</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>1,214</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>2,037</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>25,908</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>3,251</td>
<td>12.55%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>22,657</td>
<td>87.45%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
5.0 (min) (feet) (ft/ft) (ft/sec) (cfs)

Direct Entry, Subcatchment 2B: 2B

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area=25,908 sf
Runoff Volume=9,045 cf
Runoff Depth=4.19"
Tc=5.0 min
CN=94
Summary for Subcatchment 2C: 2C

Runoff = 1.21 cfs @ 12.07 hrs, Volume = 3,924 cf, Depth = 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
Type III 24-hr 10-year Rainfall = 4.88"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,804</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>343</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>802</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>10,949</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,145</td>
<td></td>
<td>10.46% Pervious Area</td>
</tr>
<tr>
<td>9,804</td>
<td></td>
<td>89.54% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 5.0 min

Subcatchment 2C: 2C

Hydrograph

Type III 24-hr 10-year Rainfall = 4.88"
Runoff Area = 10,949 sf
Runoff Volume = 3,924 cf
Runoff Depth = 4.30"
Tc = 5.0 min
CN = 95
Summary for Subcatchment 2D: 2D

Runoff = 10.21 cfs @ 12.07 hrs, Volume= 32,769 cf, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<tbody>
<tr>
<td>74,350</td>
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<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>19,198</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>310</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>93,858</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>19,508</td>
<td></td>
<td>20.78% Pervious Area</td>
</tr>
<tr>
<td>74,350</td>
<td></td>
<td>79.22% Impervious Area</td>
</tr>
</tbody>
</table>

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

Subcatchment 2D: 2D

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area=93,858 sf
Runoff Volume=32,769 cf
Runoff Depth=4.19"
Tc=5.0 min
CN=94
Summary for Subcatchment 3A: 3A

Runoff = 2.35 cfs @ 12.07 hrs, Volume= 7,652 cf, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18,380</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>2,971</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>21,351</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,971</td>
<td>13.92% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>18,380</td>
<td>86.08% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

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

Subcatchment 3A: 3A

Hydrograph

Type III 24-hr
10-year Rainfall=4.88"
Runoff Area=21,351 sf
Runoff Volume=7,652 cf
Runoff Depth=4.30"
Tc=5.0 min
CN=95
Summary for Subcatchment 4B: 4B

Runoff = 0.35 cfs @ 12.07 hrs, Volume = 1,197 cf, Depth = 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,093</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>3,093</td>
<td>100% Impervious Area</td>
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</tr>
</tbody>
</table>

Tc = 5.0 min

Direct Entry,

Subcatchment 4B: 4B

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area = 3,093 sf
Runoff Volume = 1,197 cf
Runoff Depth = 4.64"
Tc = 5.0 min
CN = 98
Summary for Subcatchment 4C: 4C

Runoff = 3.09 cfs @ 12.07 hrs, Volume= 9,643 cf, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.88"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18,733</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,200</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>29,933</td>
<td>91</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>11,200</td>
<td></td>
<td>37.42% Pervious Area</td>
</tr>
<tr>
<td>18,733</td>
<td></td>
<td>62.58% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description

5.0  Direct Entry,

Subcatchment 4C: 4C

Hydrograph

Type III 24-hr 10-year Rainfall=4.88"
Runoff Area=29,933 sf
Runoff Volume=9,643 cf
Runoff Depth=3.87"
Tc=5.0 min
CN=91
Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 4.19" for 10-year event
Inflow = 0.88 cfs @ 12.07 hrs, Volume= 2,815 cf
Outflow = 0.79 cfs @ 12.11 hrs, Volume= 2,146 cf, Atten= 11%, Lag= 2.3 min
Primary = 0.79 cfs @ 12.11 hrs, Volume= 2,146 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.85' @ 12.11 hrs  Surf.Area= 745 sf  Storage= 893 cf
Plug-Flow detention time= 156.2 min calculated for 2,146 cf (76% of inflow)
Center-of-Mass det. time= 73.6 min (846.9 - 773.2)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>15.90'</td>
<td>587 cf</td>
<td>11.00'W x 67.70'L x 3.50'H Field A</td>
</tr>
<tr>
<td>#2A</td>
<td>16.40'</td>
<td>827 cf</td>
<td>ADS_StormTech SC-740 +Cap x 18 Inside #1</td>
</tr>
</tbody>
</table>

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 17.40' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.78 cfs @ 12.11 hrs HW=17.85' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.78 cfs @ 2.28 fps)
Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6" W x 30.0" H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0" W x 30.0" H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

9 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 65.70' Row Length + 12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone
Pond INF 1B: INF 1B

Inflow Area = 8,063 sf
Peak Elev = 17.85'
Storage = 893 cf
Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 4.19" for 10-year event
Inflow = 2.82 cfs @ 12.07 hrs, Volume= 9,045 cf
Outflow = 1.49 cfs @ 12.19 hrs, Volume= 6,639 cf, Atten= 47%, Lag= 6.9 min
Primary = 1.49 cfs @ 12.19 hrs, Volume= 6,639 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.65' @ 12.19 hrs Surf.Area= 3,327 sf Storage= 3,987 cf

Plug-Flow detention time= 198.2 min calculated for 6,639 cf (73% of inflow)
Center-of-Mass det. time= 111.0 min ( 884.2 - 773.2 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.80'</td>
<td>2,479 cf</td>
<td>25.25'W x 131.78'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>15.30'</td>
<td>4,135 cf</td>
<td>ADS_StormTech SC-740 +Cap x 90 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 Rows of 18 Chambers</td>
</tr>
</tbody>
</table>

6,613 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 16.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.49 cfs @ 12.19 hrs HW=16.65' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.49 cfs @ 2.75 fps)
Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6" W x 30.0" H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0" W x 30.0" H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage
11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone
Inflow Area = 25,908 sf
Peak Elev = 16.65'
Storage = 3,987 cf
Summary for Pond INF 2C: INF 2C

| Inflow Area = | 10,949 sf, 89.54% Impervious, | Inflow Depth = 4.30" for 10-year event |
| Inflow = | 1.21 cfs @ 12.07 hrs, Volume= 3,924 cf |
| Outflow = | 1.09 cfs @ 12.11 hrs, Volume= 3,133 cf, Atten= 9%, Lag= 2.1 min |
| Primary = | 1.09 cfs @ 12.11 hrs, Volume= 3,133 cf |

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.14' @ 12.11 hrs Surf.Area= 810 sf Storage= 1,080 cf

Plug-Flow detention time= 144.8 min calculated for 3,133 cf (80% of inflow)
Center-of-Mass det. time= 68.9 min ( 836.8 - 767.9 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.00'</td>
<td>633 cf</td>
<td>25.25'W x 32.10'L x 3.50'H Field A</td>
</tr>
<tr>
<td>#2A</td>
<td>14.50'</td>
<td>919 cf</td>
<td>ADS_StormTech SC-740 +Cap x 20 Inside #1 Effect size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf Overall size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' overlap 5 rows of 4 chambers</td>
</tr>
</tbody>
</table>

1,552 cf Total Available Storage

Storage Group A created with Chamber Wizard

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>15.60'</td>
<td>12.0&quot; Vert. Orifice/Grate C= 0.600</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=1.09 cfs @ 12.11 hrs HW=16.14' (Free Discharge)
↑ 1=Orifice/Grate (Orifice Controls 1.09 cfs @ 2.51 fps)
Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone
Pond INF 2C: INF 2C

Hydrograph

Inflow Area = 10,949 sf
Peak Elev = 16.14'
Storage = 1,080 cf
Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf, 100.00% Impervious, Inflow Depth = 4.64" for 10-year event
Inflow = 0.35 cfs @ 12.07 hrs, Volume= 1,197 cf
Outflow = 0.33 cfs @ 12.10 hrs, Volume= 951 cf, Atten= 7%, Lag= 1.8 min
Primary = 0.33 cfs @ 12.10 hrs, Volume= 951 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.28' @ 12.10 hrs Surf.Area= 379 sf Storage= 316 cf

Plug-Flow detention time= 156.2 min calculated for 951 cf (79% of inflow)
Center-of-Mass det. time= 77.9 min (825.4 - 747.5)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>18.80'</td>
<td>316 cf</td>
<td>6.25'W x 60.58'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>19.30'</td>
<td>368 cf</td>
<td>ADS_StormTech SC-740 +Cap x 8 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>684 cf</td>
<td>Total Available Storage</td>
</tr>
</tbody>
</table>

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 20.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.33 cfs @ 12.10 hrs HW=20.28' (Free Discharge)  
1=Orifice/Grate (Orifice Controls 0.33 cfs @ 1.80 fps)
Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

8 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 58.58' Row Length + 12.0" End Stone x 2 = 60.58'
Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage
1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone
Pond INF 4B: INF 4B

Hydrograph

Inflow Area=3,093 sf
Peak Elev=20.28'
Storage=316 cf
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 4.27" for 10-year event
Inflow = 4.50 cfs @ 12.08 hrs, Volume = 14,803 cf
Primary = 4.50 cfs @ 12.08 hrs, Volume = 14,803 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Inflow Area = 41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 3.91" for 10-year event
Inflow = 12.20 cfs @ 12.08 hrs, Volume = 42,541 cf
Primary = 12.20 cfs @ 12.08 hrs, Volume = 42,541 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Inflow Area = 130,715 sf
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 4.30" for 10-year event
Inflow = 2.35 cfs @ 12.07 hrs, Volume= 7,652 cf
Primary = 2.35 cfs @ 12.07 hrs, Volume= 7,652 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Inflow Area=21,351 sf
Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 3.85" for 10-year event
Inflow = 3.40 cfs @ 12.07 hrs, Volume= 10,594 cf
Primary = 3.40 cfs @ 12.07 hrs, Volume= 10,594 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
25-Year Storm Event - Proposed
Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 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 1B: 1B
Runoff Area=8,063 sf  78.66% Impervious  Runoff Depth=5.31"
  Tc=5.0 min  CN=94  Runoff=1.10 cfs  3,566 cf

Subcatchment 1C: 1C
Runoff Area=33,547 sf  91.76% Impervious  Runoff Depth=5.65"
  Tc=5.0 min  CN=97  Runoff=4.68 cfs  15,807 cf

Subcatchment 2B: 2B
Runoff Area=25,908 sf  87.45% Impervious  Runoff Depth=5.31"
  Tc=5.0 min  CN=94  Runoff=3.52 cfs  11,457 cf

Subcatchment 2C: 2C
Runoff Area=10,949 sf  89.54% Impervious  Runoff Depth=5.42"
  Tc=5.0 min  CN=95  Runoff=1.50 cfs  4,947 cf

Subcatchment 2D: 2D
Runoff Area=93,858 sf  79.22% Impervious  Runoff Depth=5.31"
  Tc=5.0 min  CN=95  Runoff=12.76 cfs  41,505 cf

Subcatchment 3A: 3A
Runoff Area=21,351 sf  86.08% Impervious  Runoff Depth=5.42"
  Tc=5.0 min  CN=94  Runoff=2.93 cfs  9,646 cf

Subcatchment 4B: 4B
Runoff Area=3,093 sf  100.00% Impervious  Runoff Depth=5.77"
  Tc=5.0 min  CN=98  Runoff=0.43 cfs  1,488 cf

Subcatchment 4C: 4C
Runoff Area=29,933 sf  62.58% Impervious  Runoff Depth=4.97"
  Tc=5.0 min  CN=91  Runoff=1.50 cfs  4,947 cf

Pond INF 1B: INF 1B
Peak Elev=17.92'  Storage=924 cf  Inflow=1.10 cfs  3,566 cf  Outflow=1.00 cfs  2,896 cf

Pond INF 2B: INF 2B
Peak Elev=16.84'  Storage=4,418 cf  Inflow=3.52 cfs  11,457 cf  Outflow=2.21 cfs  9,050 cf

Pond INF 2C: INF 2C
Peak Elev=16.22'  Storage=1,118 cf  Inflow=1.50 cfs  4,947 cf  Outflow=1.38 cfs  4,155 cf

Pond INF 4B: INF 4B
Peak Elev=20.32'  Storage=325 cf  Inflow=0.43 cfs  1,488 cf  Outflow=0.41 cfs  1,242 cf

Link DP-1: DP-1
Inflow=5.60 cfs  18,703 cf  Primary=5.60 cfs  18,703 cf

Link DP-2: DP-2
Inflow=15.81 cfs  54,711 cf  Primary=15.81 cfs  54,711 cf

Link DP-3: DP-3
Inflow=2.93 cfs  9,646 cf  Primary=2.93 cfs  9,646 cf

Link DP-4: DP-4
Inflow=4.31 cfs  13,632 cf  Primary=4.31 cfs  13,632 cf
Total Runoff Area = 226,702 sf  Runoff Volume = 100,804 cf  Average Runoff Depth = 5.34"
18.77% Pervious = 42,559 sf  81.23% Impervious = 184,143 sf
Summary for Subcatchment 1B: 1B

Runoff = 1.10 cfs @ 12.07 hrs, Volume= 3,566 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,342</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,721</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>8,063</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,721</td>
<td>21.34% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>6,342</td>
<td>78.66% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc=5.0 min

Direct Entry,

Subcatchment 1B: 1B

Type III 24-hr 25-year Rainfall=6.01"
Runoff Area=8,063 sf
Runoff Volume=3,566 cf
Runoff Depth=5.31"
Tc=5.0 min
CN=94
Summary for Subcatchment 1C: 1C

Runoff = 4.68 cfs @ 12.07 hrs, Volume= 15,807 cf, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>30,784</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>2,763</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>33,547</td>
<td>97</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,763</td>
<td></td>
<td>8.24% Pervious Area</td>
</tr>
<tr>
<td>30,784</td>
<td></td>
<td>91.76% Impervious Area</td>
</tr>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5.0</td>
<td>Direct Entry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subcatchment 1C: 1C

Type III 24-hr 25-year Rainfall=6.01"
Runoff Area=33,547 sf
Runoff Volume=15,807 cf
Runoff Depth=5.65"
Tc=5.0 min
CN=97
Summary for Subcatchment 2B: 2B

Runoff = 3.52 cfs @ 12.07 hrs, Volume= 11,457 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr  25-year Rainfall=6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>22,657</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,214</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>2,037</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>25,908</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>3,251</td>
<td>12.55% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>22,657</td>
<td>87.45% Impervious Area</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5.0</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 2B: 2B

Type III 24-hr  25-year Rainfall=6.01"
Runoff Area=25,908 sf
Runoff Volume=11,457 cf
Runoff Depth=5.31"
Tc=5.0 min
CN=94
Summary for Subcatchment 2C: 2C

Runoff = 1.50 cfs @ 12.07 hrs, Volume = 4,947 cf, Depth = 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr  25-year Rainfall=6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,804</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>343</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>802</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>10,949</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,145</td>
<td>10.46% Pervious Area</td>
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<tr>
<td>9,804</td>
<td>89.54% Impervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>5.0</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 2C: 2C

Hydrograph

Type III 24-hr 25-year Rainfall=6.01"
Runoff Area=10,949 sf
Runoff Volume=4,947 cf
Runoff Depth=5.42"
Tc=5.0 min
CN=95
Summary for Subcatchment 2D: 2D

Runoff = 12.76 cfs @ 12.07 hrs, Volume= 41,505 cf, Depth= 5.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr  25-year Rainfall=6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>74,350</td>
<td>98</td>
<td>Paved parking, HSG D</td>
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<tr>
<td>19,198</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>310</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>93,858</td>
<td>94</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>19,508</td>
<td>20.78%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>74,350</td>
<td>79.22%</td>
<td>Impervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>min</td>
<td>(feet)</td>
<td>(ft/ft)</td>
<td>(ft/sec)</td>
<td>(cfs)</td>
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</table>

Subcatchment 2D: 2D

Hydrograph

Type III 24-hr  25-year Rainfall=6.01"
Runoff Area=93,858 sf
Runoff Volume=41,505 cf
Runoff Depth=5.31"
Tc=5.0 min
CN=94
Summary for Subcatchment 3A: 3A

Runoff = 2.93 cfs @ 12.07 hrs, Volume= 9,646 cf, Depth= 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18,380</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>2,971</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>21,351</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,971</td>
<td>13.92% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>18,380</td>
<td>86.08% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 3A: 3A

Type III 24-hr 25-year Rainfall=6.01"
Runoff Area=21,351 sf
Runoff Volume=9,646 cf
Runoff Depth=5.42"
Tc=5.0 min
CN=95
Summary for Subcatchment 4B: 4B

Runoff = 0.43 cfs @ 12.07 hrs, Volume = 1,488 cf, Depth = 5.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
Type III 24-hr 25-year Rainfall = 6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,093</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>3,093</td>
<td>100.00% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc = 5.0 min
Length = Direct Entry,
Slope =
Velocity =
Capacity =
Description =

Subcatchment 4B: 4B

Hydrograph

Type III 24-hr 25-year Rainfall = 6.01"
Runoff Area = 3,093 sf
Runoff Volume = 1,488 cf
Runoff Depth = 5.77"
Tc = 5.0 min
CN = 98
Summary for Subcatchment 4C: 4C

Runoff  =  3.92 cfs @  12.07 hrs, Volume=  12,390 cf, Depth=  4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span=  0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr  25-year Rainfall=6.01"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18,733</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>11,200</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
</tr>
<tr>
<td>29,933</td>
<td>91</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>11,200</td>
<td></td>
<td>37.42% Pervious Area</td>
</tr>
<tr>
<td>18,733</td>
<td></td>
<td>62.58% Impervious Area</td>
</tr>
</tbody>
</table>

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

Subcatchment 4C: 4C

Type III 24-hr 25-year Rainfall=6.01"
Runoff Area=29,933 sf
Runoff Volume=12,390 cf
Runoff Depth=4.97"
Tc=5.0 min
CN=91
Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 5.31” for 25-year event
Inflow = 1.10 cfs @ 12.07 hrs, Volume= 3,566 cf
Outflow = 1.00 cfs @ 12.10 hrs, Volume= 2,896 cf, Atten= 9%, Lag= 2.1 min
Primary = 1.00 cfs @ 12.10 hrs, Volume= 2,896 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.92’ @ 12.10 hrs Surf.Area= 745 sf Storage= 924 cf
Plug-Flow detention time= 138.6 min calculated for 2,896 cf (81% of inflow)
Center-of-Mass det. time= 65.9 min ( 833.4 - 767.5 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>15.90’</td>
<td>587 cf</td>
<td>11.00'W x 67.70'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>16.40’</td>
<td>827 cf</td>
<td>ADS StormTech SC-740 +Cap x 18 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Rows of 9 Chambers</td>
</tr>
</tbody>
</table>

1,414 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 17.40’ 12.0” Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.00 cfs @ 12.10 hrs HW=17.91’ (Free Discharge)
↓1=Orifice/Grate (Orifice Controls 1.00 cfs @ 2.44 fps)
Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing
9 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 65.70' Row Length + 12.0'' End Stone x 2 = 67.70'
Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone
Pond INF 1B: INF 1B

Inflow Area=8,063 sf
Peak Elev=17.92'
Storage=924 cf
Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 5.31" for 25-year event
Inflow = 3.52 cfs @ 12.07 hrs, Volume= 11,457 cf
Outflow = 2.21 cfs @ 12.16 hrs, Volume= 9,050 cf, Atten= 37%, Lag= 5.3 min
Primary = 2.21 cfs @ 12.16 hrs, Volume= 9,050 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.84' @ 12.16 hrs Surf.Area= 3,327 sf Storage= 4,418 cf
Plug-Flow detention time= 174.5 min calculated for 9,048 cf (79% of inflow)
Center-of-Mass det. time= 97.2 min (864.8 - 767.5)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.80'</td>
<td>2,479 cf</td>
<td>25.25'W x 131.78'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>15.30'</td>
<td>4,135 cf</td>
<td>ADS_StormTech SC-740 +Cap x 90 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 Rows of 18 Chambers</td>
</tr>
</tbody>
</table>

6,613 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 16.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=2.21 cfs @ 12.16 hrs HW=16.84' (Free Discharge)
1=Orifice/Grate (Orifice Controls 2.21 cfs @ 3.13 fps)
Pond INF 2B: INF 2B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone
Pond INF 2B: INF 2B

Hydrograph

Inflow Area=25,908 sf
Peak Elev=16.84'
Storage=4,418 cf
Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 5.42" for 25-year event
Inflow = 1.50 cfs @ 12.07 hrs, Volume= 4,947 cf
Outflow = 1.38 cfs @ 12.10 hrs, Volume= 4,155 cf, Atten= 8%, Lag= 2.0 min
Primary = 1.38 cfs @ 12.10 hrs, Volume= 4,155 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.22' @ 12.10 hrs Surf.Area= 810 sf Storage= 1,118 cf

Plug-Flow detention time= 128.6 min calculated for 4,154 cf (84% of inflow)
Center-of-Mass det. time= 62.1 min (824.8 - 762.7)

Volume | Invert | Avail.Storage | Storage Description
---|---|---|---
#1A | 14.00' | 633 cf | 25.25'W x 32.10'L x 3.50'H Field A
#2A | 14.50' | 919 cf | ADS_StormTech SC-740 +Cap x 20 Inside #1

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
5 Rows of 4 Chambers

1,552 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device | Routing | Invert | Outlet Devices
---|---|---|---
#1 | Primary | 15.60' | 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.38 cfs @ 12.10 hrs HW=16.22' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.38 cfs @ 2.68 fps)
Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10'
Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone
Pond INF 2C: INF 2C

Inflow Area = 10,949 sf
Peak Elev = 16.22'
Storage = 1,118 cf
Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf, 100.00% Impervious, Inflow Depth = 5.77" for 25-year event
Inflow = 0.43 cfs @ 12.07 hrs, Volume= 1,488 cf
Outflow = 0.41 cfs @ 12.10 hrs, Volume= 1,242 cf, Atten= 6%, Lag= 1.6 min
Primary = 0.41 cfs @ 12.10 hrs, Volume= 1,242 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.32' @ 12.10 hrs Surf.Area= 379 sf Storage= 325 cf

Plug-Flow detention time= 139.6 min calculated for 1,242 cf (83% of inflow)
Center-of-Mass det. time= 70.2 min (814.4 - 744.2)

<table>
<thead>
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<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
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<tr>
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<td>316 cf</td>
<td>6.25'W x 60.58'L x 3.50'H Field A</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1,325 cf Overall - 368 cf Embedded = 958 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>19.30'</td>
<td>368 cf</td>
<td>ADS_StormTech SC-740 +Cap x 8 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
</tbody>
</table>

684 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 20.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.41 cfs @ 12.10 hrs HW=20.32' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.41 cfs @ 1.91 fps)
Pond INF 4B: INF 4B - Chamber Wizard Field A

**Chamber Model** = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)

Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

8 Chambers/Row x 7.12' Long + 0.81' Cap Length x 2 = 58.58' Row Length + 12.0" End Stone x 2 = 60.58'

Base Length

1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af

Overall Storage Efficiency = 51.6%

Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers

49.1 cy Field

35.5 cy Stone
Pond INF 4B: INF 4B

Hydrograph

Inflow Area=3,093 sf
Peak Elev=20.32'
Storage=325 cf

Time (hours)

Flow (cfs)

0.48
0.46
0.44
0.42
0.40
0.38
0.36
0.34
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.43 cfs
0.41 cfs
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 5.39" for 25-year event
Inflow = 5.60 cfs @ 12.07 hrs, Volume= 18,703 cf
Primary = 5.60 cfs @ 12.07 hrs, Volume= 18,703 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 5.02" for 25-year event
Inflow = 15.81 cfs @ 12.08 hrs, Volume = 54,711 cf
Primary = 15.81 cfs @ 12.08 hrs, Volume = 54,711 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Link DP-2: DP-2
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 5.42” for 25-year event
Inflow = 2.93 cfs @ 12.07 hrs, Volume = 9,646 cf
Primary = 2.93 cfs @ 12.07 hrs, Volume = 9,646 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs

Link DP-3: DP-3
Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 4.95" for 25-year event
Inflow = 4.31 cfs @ 12.07 hrs, Volume= 13,632 cf
Primary = 4.31 cfs @ 12.07 hrs, Volume= 13,632 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Inflow Area=33,026 sf
100-Year Storm Event – Proposed
Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 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 1B: 1B
- Runoff Area: 8,063 sf
- 78.66% Impervious
- Runoff Depth: 7.03"
- Tc: 5.0 min
- CN: 94
- Runoff: 1.43 cfs
- 4,726 cf

### Subcatchment 1C: 1C
- Runoff Area: 33,547 sf
- 91.76% Impervious
- Runoff Depth: 7.39"
- Tc: 5.0 min
- CN: 97
- Runoff: 6.05 cfs
- 20,662 cf

### Subcatchment 2B: 2B
- Runoff Area: 25,908 sf
- 87.45% Impervious
- Runoff Depth: 7.03"
- Tc: 5.0 min
- CN: 94
- Runoff: 4.60 cfs
- 15,185 cf

### Subcatchment 2C: 2C
- Runoff Area: 10,949 sf
- 89.54% Impervious
- Runoff Depth: 7.15"
- Tc: 5.0 min
- CN: 95
- Runoff: 1.96 cfs
- 6,526 cf

### Subcatchment 2D: 2D
- Runoff Area: 93,858 sf
- 79.22% Impervious
- Runoff Depth: 7.03"
- Tc: 5.0 min
- CN: 95
- Runoff: 16.66 cfs
- 55,011 cf

### Subcatchment 3A: 3A
- Runoff Area: 21,351 sf
- 86.08% Impervious
- Runoff Depth: 7.15"
- Tc: 5.0 min
- CN: 94
- Runoff: 3.81 cfs
- 12,726 cf

### Subcatchment 4B: 4B
- Runoff Area: 3,093 sf
- 100.00% Impervious
- Runoff Depth: 7.51"
- Tc: 5.0 min
- CN: 98
- Runoff: 0.56 cfs
- 1,936 cf

### Pond INF 1B: INF 1B
- Peak Elev: 18.01’
- Storage: 966 cf
- Inflow: 1.43 cfs
- Outflow: 1.32 cfs
- 4,726 cf

### Pond INF 2B: INF 2B
- Peak Elev: 17.09’
- Storage: 4,931 cf
- Inflow: 4.60 cfs
- Outflow: 2.90 cfs
- 15,185 cf

### Pond INF 2C: INF 2C
- Peak Elev: 16.34’
- Storage: 1,173 cf
- Inflow: 1.96 cfs
- Outflow: 1.81 cfs
- 6,526 cf

### Pond INF 4B: INF 4B
- Peak Elev: 20.36’
- Storage: 337 cf
- Inflow: 0.56 cfs
- Outflow: 0.53 cfs
- 1,936 cf

### Link DP-1: DP-1
- Inflow: 7.29 cfs
- Primary: 7.29 cfs
- 24,718 cf

### Link DP-2: DP-2
- Inflow: 20.85 cfs
- Primary: 20.85 cfs
- 73,524 cf

### Link DP-3: DP-3
- Inflow: 3.81 cfs
- Primary: 3.81 cfs
- 12,726 cf

### Link DP-4: DP-4
- Inflow: 5.69 cfs
- Primary: 5.69 cfs
- 18,347 cf
Total Runoff Area = 226,702 sf  Runoff Volume = 133,428 cf  Average Runoff Depth = 7.06"
18.77% Pervious = 42,559 sf  81.23% Impervious = 184,143 sf
Summary for Subcatchment 1B: 1B

Runoff = 1.43 cfs @ 12.07 hrs, Volume= 4,726 cf, Depth= 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>6,342</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>1,721</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>8,063</td>
<td>94</td>
<td>Weighted Average</td>
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<tr>
<td>1,721</td>
<td>21.34% Pervious Area</td>
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</tr>
<tr>
<td>6,342</td>
<td>78.66% Impervious Area</td>
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</table>

Tc=5.0 min

Direct Entry,

Subcatchment 1B: 1B

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=8,063 sf
Runoff Volume=4,726 cf
Runoff Depth=7.03"
Tc=5.0 min
CN=94
Summary for Subcatchment 1C: 1C

Runoff = 6.05 cfs @ 12.07 hrs, Volume= 20,662 cf, Depth= 7.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
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<td>Paved parking, HSG D</td>
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<td>2,763</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>33,547</td>
<td>97</td>
<td>Weighted Average</td>
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<tr>
<td>2,763</td>
<td>8.24% Pervious Area</td>
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<tr>
<td>30,784</td>
<td>91.76% Impervious Area</td>
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</table>

Tc=5.0 min

Subcatchment 1C: 1C

Hydrograph

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=33,547 sf
Runoff Volume=20,662 cf
Runoff Depth=7.39"
Tc=5.0 min
CN=97
Summary for Subcatchment 2B: 2B

Runoff = 4.60 cfs @ 12.07 hrs, Volume= 15,185 cf, Depth= 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

<table>
<thead>
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<td>2,037</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
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<td>25,908</td>
<td>94</td>
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<tr>
<td>3,251</td>
<td>12.55% Pervious Area</td>
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</tr>
<tr>
<td>22,657</td>
<td>87.45% Impervious Area</td>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<td>Direct Entry,</td>
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Subcatchment 2B: 2B

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=25,908 sf
Runoff Volume=15,185 cf
Runoff Depth=7.03"
Tc=5.0 min
CN=94
Summary for Subcatchment 2C: 2C

Runoff = 1.96 cfs @ 12.07 hrs, Volume= 6,526 cf, Depth= 7.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

<table>
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<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>802</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
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<tr>
<td>10,949</td>
<td>95</td>
<td>Weighted Average</td>
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<tr>
<td>1,145</td>
<td>10.46% Pervious Area</td>
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<tr>
<td>9,804</td>
<td>89.54% Impervious Area</td>
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<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tr>
<td>5.0</td>
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<td></td>
<td></td>
<td>Direct Entry,</td>
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</table>

Subcatchment 2C: 2C

Hydrograph

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=10,949 sf
Runoff Volume=6,526 cf
Runoff Depth=7.15"
Tc=5.0 min
CN=95
Summary for Subcatchment 2D: 2D

Runoff = 16.66 cfs @ 12.07 hrs, Volume= 55,011 cf, Depth= 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

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<td>&gt;75% Grass cover, Good, HSG D</td>
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<td>310</td>
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<td>&gt;75% Grass cover, Good, HSG B</td>
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<tr>
<td>93,858</td>
<td>94</td>
<td>Weighted Average</td>
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<tr>
<td>19,508</td>
<td></td>
<td>20.78% Pervious Area</td>
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<tr>
<td>74,350</td>
<td></td>
<td>79.22% Impervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
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</table>

Subcatchment 2D: 2D

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=93,858 sf
Runoff Volume=55,011 cf
Runoff Depth=7.03"
Tc=5.0 min
CN=94
Summary for Subcatchment 3A: 3A

Runoff = 3.81 cfs @ 12.07 hrs, Volume= 12,726 cf, Depth= 7.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

<table>
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<th>Description</th>
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<td>Paved parking, HSG D</td>
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<tr>
<td>2,971</td>
<td>80</td>
<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>21,351</td>
<td>95</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,971</td>
<td>13.92% Pervious Area</td>
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</tr>
<tr>
<td>18,380</td>
<td>86.08% Impervious Area</td>
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Tc = 5.0 min

Subcatchment 3A: 3A

Direct Entry,

Hydrograph

Type III 24-hr
100-year Rainfall=7.75"
Runoff Area=21,351 sf
Runoff Volume=12,726 cf
Runoff Depth=7.15"

Tc=5.0 min

CN=95
Summary for Subcatchment 4B: 4B

Runoff = 0.56 cfs @ 12.07 hrs, Volume= 1,936 cf, Depth= 7.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>3,093</td>
<td>98</td>
<td>Paved parking, HSG D</td>
</tr>
<tr>
<td>3,093</td>
<td>100.00% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

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

Subcatchment 4B: 4B

Hydrograph

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=3,093 sf
Runoff Volume=1,936 cf
Runoff Depth=7.51"
Tc=5.0 min
CN=98
Summary for Subcatchment 4C: 4C

Runoff = 5.18 cfs @ 12.07 hrs, Volume= 16,657 cf, Depth= 6.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.75"

<table>
<thead>
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<th>CN</th>
<th>Description</th>
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<td>Paved parking, HSG D</td>
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<tr>
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<td>&gt;75% Grass cover, Good, HSG D</td>
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<tr>
<td>29,933</td>
<td>91</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>11,200</td>
<td></td>
<td>37.42% Pervious Area</td>
</tr>
<tr>
<td>18,733</td>
<td></td>
<td>62.58% Impervious Area</td>
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</tbody>
</table>

Tc=5.0 min

Subcatchment 4C: 4C

Type III 24-hr 100-year Rainfall=7.75"
Runoff Area=29,933 sf
Runoff Volume=16,657 cf
Runoff Depth=6.68"
Tc=5.0 min
CN=91
Summary for Pond INF 1B: INF 1B

Inflow Area = 8,063 sf, 78.66% Impervious, Inflow Depth = 7.03" for 100-year event
Inflow = 1.43 cfs @ 12.07 hrs, Volume= 4,726 cf
Outflow = 1.32 cfs @ 12.10 hrs, Volume= 4,057 cf, Atten= 8%, Lag= 1.9 min
Primary = 1.32 cfs @ 12.10 hrs, Volume= 4,057 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 18.01' @ 12.10 hrs Surf.Area= 745 sf Storage= 966 cf

Plug-Flow detention time= 119.9 min calculated for 4,056 cf (86% of inflow)
Center-of-Mass det. time= 58.1 min (819.3 - 761.2)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>15.90'</td>
<td>587 cf</td>
<td>11.00'W x 67.70'L x 3.50'H Field A</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2,606 cf Overall - 827 cf Embedded = 1,779 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>16.40'</td>
<td>827 cf</td>
<td>ADS_StormTech SC-740 +Cap x 18 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Rows of 9 Chambers</td>
</tr>
</tbody>
</table>

1,414 cf Total Available Storage

Storage Group A created with Chamber Wizard

Primary OutFlow Max=1.32 cfs @ 12.10 hrs HW=18.01' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.32 cfs @ 2.65 fps)
Pond INF 1B: INF 1B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

9 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 65.70' Row Length +12.0" End Stone x 2 = 67.70' Base Length
2 Rows x 51.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.00' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

18 Chambers x 45.9 cf = 826.9 cf Chamber Storage

2,606.3 cf Field - 826.9 cf Chambers = 1,779.4 cf Stone x 33.0% Voids = 587.2 cf Stone Storage

Chamber Storage + Stone Storage = 1,414.1 cf = 0.032 af
Overall Storage Efficiency = 54.3%
Overall System Size = 67.70' x 11.00' x 3.50'

18 Chambers
96.5 cy Field
65.9 cy Stone
Pond INF 1B: INF 1B

Inflow Area=8,063 sf
Peak Elev=18.01'
Storage=966 cf
Summary for Pond INF 2B: INF 2B

Inflow Area = 25,908 sf, 87.45% Impervious, Inflow Depth = 7.03" for 100-year event
Inflow = 4.60 cfs @ 12.07 hrs, Volume= 15,185 cf
Outflow = 2.90 cfs @ 12.16 hrs, Volume= 12,778 cf, Atten= 37%, Lag= 5.2 min
Primary = 2.90 cfs @ 12.16 hrs, Volume= 12,778 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 17.09' @ 12.16 hrs Surf.Area= 3,327 sf Storage= 4,931 cf

Plug-Flow detention time= 151.6 min calculated for 12,778 cf (84% of inflow)
Center-of-Mass det. time= 85.2 min (846.4 - 761.2)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.80'</td>
<td>2,479 cf</td>
<td>25.25'W x 131.78'L x 3.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,646 cf Overall - 4,135 cf Embedded = 7,511 cf x 33.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>15.30'</td>
<td>4,135 cf</td>
<td>ADS_StormTech SC-740 +Cap x 90 Inside #1</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12'L = 45.9 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 Rows of 18 Chambers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6,613 cf Total Available Storage</td>
</tr>
</tbody>
</table>

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 16.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=2.90 cfs @ 12.16 hrs HW=17.09’ (Free Discharge)
↑1=Orifice/Grate (Orifice Controls 2.90 cfs @ 3.69 fps)
Chamber Model = ADS_ScormTechSC-740 +Cap (ADS StormTech®, SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

90 Chambers x 45.9 cf = 4,134.6 cf Chamber Storage

11,645.8 cf Field - 4,134.6 cf Chambers = 7,511.2 cf Stone x 33.0% Voids = 2,478.7 cf Stone Storage

Chamber Storage + Stone Storage = 6,613.3 cf = 0.152 af
Overall Storage Efficiency = 56.8%
Overall System Size = 131.78' x 25.25' x 3.50'

90 Chambers
431.3 cy Field
278.2 cy Stone
Pond INF 2B: INF 2B

Inflow Area=25,908 sf
Peak Elev=17.09'
Storage=4,931 cf
Summary for Pond INF 2C: INF 2C

Inflow Area = 10,949 sf, 89.54% Impervious, Inflow Depth = 7.15" for 100-year event
Inflow = 1.96 cfs @ 12.07 hrs, Volume= 6,526 cf
Outflow = 1.81 cfs @ 12.10 hrs, Volume= 5,735 cf, Atten= 7%, Lag= 1.8 min
Primary = 1.81 cfs @ 12.10 hrs, Volume= 5,735 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 16.34' @ 12.10 hrs Surf.Area= 810 sf Storage= 1,173 cf

Plug-Flow detention time= 110.8 min calculated for 5,733 cf (88% of inflow)
Center-of-Mass det. time= 54.6 min (811.4 - 756.8)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>14.00'</td>
<td>633 cf</td>
<td>25.25'W x 32.10'L x 3.50'H Field A</td>
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<tr>
<td>#2A</td>
<td>14.50'</td>
<td>919 cf</td>
<td>ADS_StormTech SC-740 +Cap x 20 Inside #1</td>
</tr>
</tbody>
</table>

2,837 cf Overall - 919 cf Embedded = 1,918 cf x 33.0% Voids
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
5 Rows of 4 Chambers

1,552 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 15.60' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.81 cfs @ 12.10 hrs HW=16.34' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.81 cfs @ 2.92 fps)
Pond INF 2C: INF 2C - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 +Cap (ADS StormTech® SC-740 with cap length)
Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

4 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 30.10' Row Length +12.0" End Stone x 2 = 32.10'
Base Length
5 Rows x 51.0" Wide + 6.0" Spacing x 4 + 12.0" Side Stone x 2 = 25.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

20 Chambers x 45.9 cf = 918.8 cf Chamber Storage

2,836.5 cf Field - 918.8 cf Chambers = 1,917.7 cf Stone x 33.0% Voids = 632.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,551.7 cf = 0.036 af
Overall Storage Efficiency = 54.7%
Overall System Size = 32.10' x 25.25' x 3.50'

20 Chambers
105.1 cy Field
71.0 cy Stone
Pond INF 2C: INF 2C

Inflow Area=10,949 sf
Peak Elev=16.34'
Storage=1,173 cf
Summary for Pond INF 4B: INF 4B

Inflow Area = 3,093 sf, 100.00% Impervious, Inflow Depth = 7.51" for 100-year event
Inflow = 0.56 cfs @ 12.07 hrs, Volume= 1,936 cf
Outflow = 0.53 cfs @ 12.09 hrs, Volume= 1,690 cf, Atten= 5%, Lag= 1.5 min
Primary = 0.53 cfs @ 12.09 hrs, Volume= 1,690 cf

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Peak Elev= 20.36' @ 12.09 hrs Surf.Area= 379 sf Storage= 337 cf

Plug-Flow detention time= 120.5 min calculated for 1,690 cf (87% of inflow)
Center-of-Mass det. time= 61.3 min (802.0 - 740.7)

Volume Invert Avail.Storage Storage Description
#1A 18.80' 316 cf 6.25'W x 60.58'L x 3.50'H Field A
#2A 19.30' 368 cf ADS_StormTech SC-740 +Cap x 8 Inside #1

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

684 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 20.00' 12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.53 cfs @ 12.09 hrs HW=20.36' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.53 cfs @ 2.05 fps)
Pond INF 4B: INF 4B - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-740 + Cap (ADS StormTech® SC-740 with cap length)
Effective Size = 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
Overall Size = 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

8 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 58.58' Row Length +12.0" End Stone x 2 = 60.58'
Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

8 Chambers x 45.9 cf = 367.5 cf Chamber Storage

1,325.1 cf Field - 367.5 cf Chambers = 957.6 cf Stone x 33.0% Voids = 316.0 cf Stone Storage

Chamber Storage + Stone Storage = 683.5 cf = 0.016 af
Overall Storage Efficiency = 51.6%
Overall System Size = 60.58' x 6.25' x 3.50'

8 Chambers
49.1 cy Field
35.5 cy Stone
Pond INF 4B: INF 4B

Inflow Area = 3,093 sf
Peak Elev = 20.36'
Storage = 337 cf

Hydrograph
Summary for Link DP-1: DP-1

Inflow Area = 41,610 sf, 89.22% Impervious, Inflow Depth = 7.13" for 100-year event
Inflow = 7.29 cfs @ 12.07 hrs, Volume= 24,718 cf
Primary = 7.29 cfs @ 12.07 hrs, Volume= 24,718 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Inflow Area=41,610 sf
Summary for Link DP-2: DP-2

Inflow Area = 130,715 sf, 81.71% Impervious, Inflow Depth = 6.75" for 100-year event
Inflow = 20.85 cfs @ 12.08 hrs, Volume = 73,524 cf
Primary = 20.85 cfs @ 12.08 hrs, Volume = 73,524 cf, Attenuation = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-40.00 hrs, dt = 0.01 hrs
Summary for Link DP-3: DP-3

Inflow Area = 21,351 sf, 86.08% Impervious, Inflow Depth = 7.15" for 100-year event
Inflow = 3.81 cfs @ 12.07 hrs, Volume= 12,726 cf
Primary = 3.81 cfs @ 12.07 hrs, Volume= 12,726 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Link DP-3: DP-3

Inflow Area=21,351 sf
Summary for Link DP-4: DP-4

Inflow Area = 33,026 sf, 66.09% Impervious, Inflow Depth = 6.67" for 100-year event
Inflow = 5.69 cfs @ 12.07 hrs, Volume= 18,347 cf
Primary = 5.69 cfs @ 12.07 hrs, Volume= 18,347 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Inflow Area=33,026 sf
StormCAD Table (Hydraulic Spreadsheet)
Scenario: Base
### FlexTable: Conduit Table

<table>
<thead>
<tr>
<th>Label</th>
<th>Start Node</th>
<th>Stop Node</th>
<th>Elevation Ground (Start) (ft)</th>
<th>Hydraulic Grade Line (In) (ft)</th>
<th>Invert (Start) (ft)</th>
<th>Elevation Ground (Stop) (ft)</th>
<th>Hydraulic Grade Line (Out) (ft)</th>
<th>Invert (Stop) (ft)</th>
<th>Length (User Defined) (ft)</th>
<th>Slope (Calculated) (ft/ft)</th>
<th>Section Type</th>
<th>Diameter (in)</th>
<th>Manning's n</th>
<th>Flow (cfs)</th>
<th>Velocity (ft/s)</th>
<th>Capacity (Full Flow) (cfs)</th>
<th>Flow / Capacity (Design) (%)</th>
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</thead>
<tbody>
<tr>
<td>1B</td>
<td>CB-CL 1</td>
<td>EX CB 1</td>
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