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May 30, 2018

Kate Newhall-Smith, Planner
Office of Planning and Development
Newburyport City Hall
60 Pleasant Street
Newburyport, MA 01950

Re: Response to Site Plan Review Comments
Application for Site Plan Review
Proposed Building Expansion
75 Parker Street
Newburyport, MA
Cornerstone Project: 18021-30

Dear Ms. Newhall-Smith:

On behalf of Port City Realty, LLC, Cornerstone has prepared this response to the Compliance Checklist and Site Plan Review Comments prepared by Christiansen & Sergi, Inc., Haverhill, MA, dated April 26, 2018 regarding the above referenced project. A copy of the Checklist and Review Comments received are presented in Attachment No. 1.

**Compliance Check List Comments:**

*Key to check boxes: Com = complete Inc = incomplete N/A = not applicable Var = variance required*

***XV-E MATERIALS FOR REVIEW* 1**

| *Com* | *Inc* | *N/A* | *Content:* |
|---|---|---|---|
| ☒ | ☐ | ☐ | XVE Plan Sheets 24" x 36" |
| ☐ | ☒ | ☐ | XVE Scale of not less than 1" =40' or 1" =8' for elevations **Scale is 1"=20'** |
| | | | **Response: A scale of 1" =20' is provided to facilitate the review of the stormwater management system design.** |
| ☐ | ☒ | ☐ | XVE Plans stamped by a registered architect, landscape architect, or professional engineer |

***XV-E (a) SUBMISSION REQUIREMENTS***:

***Com Inc N/A Content:***

☒ ☐ ☐ XVE(a)1. *Location and boundaries:*

The location and boundaries of the lot, zoning district, adjacent streets or ways, applicable information from section VI, Dimensional Controls, the location and owners' names of all adjacent properties. Plans shall also show any deeds of easement, rights-of-ways, covenants and any other agreements affecting the use of the site.

☐ ☒ ☐ XVE(a)2. *Structures:*

Existing and proposed structures, including dimensions, footprint, total gross floor area, number of stories, floor elevations, and building height(s). See section II, Definitions.

**No dimensions, elevations, number of stories, or gross floor areas provided for the existing building.**

**Response: Refer to Drawing C-2 Existing Conditions Plan, and A-101 and A-102 Proposed Elevations.**

☐ ☐ ☒ XVE(a)3. *Signage:*

The location, dimensions, height, lighting, and other characteristics of all proposed signs. **No new sign proposed.**

☐ ☒ ☐ XVE(a)4. *Landscaping*

Proposed landscape features including the locations and a description of buffer areas, screening, fencing, and a planting plan. A registered landscape architect shall prepare a planting plan, unless the planning board deems a licensed plant nursery person appropriate for small projects such as minor additions or alterations. **A Landscape Plan has been provided, however it was not stamped by a Register Landscape Architect.**

**Response: A request to waive this requirement was submitted in writing to the Planning Board.**

☐ ☒ ☐ XVE(a)5. *Traffic*

The plan shall show pedestrian, bicycle, and vehicular traffic flow patterns and show adequate access to and from the site and adequate circulation within the site. The planning board encourages accommodation of public transportation and/or private vanpooling arrangements**. Pedestrian and** b**icycle access is not provided from the street to the building except for riding within the drive.**

**Response: Refer to Drawing C-4 Site Layout Plan. The proposed sidewalk has been extended to the property line with Parker Street and a bike storage area provided. Please note that public sidewalks do not exist on Parker Street in the vicinity of the site.**

| *Com* | *Inc* | *N/A* | *Content:* |
|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(a)6. *Parking* |

The location of parking and loading areas, driveways, access and egress points, bicycle racks, and bus stops or drop-off areas. **No bike racks or drop-off areas have been provided**.

**Refer to Drawing C-4 Site Layout Plan. A bike storage area is provided at the site.**

☐ ☒ ☐ XVE(a)7. *Public Access*

The location and description of proposed public access areas, including parks, conservation areas, gardens, bikeways, pathways or sidewalk areas. Riverfront sites shall include indications of compliance with state and federal regulations. **None Proposed.**

**Response: Not Applicable**

☐ ☒ ☐ XVE(a)8. *Lighting*

Existing and proposed exterior lighting, including locations, lighting source, and fixture types. The planning board may require photometric analysis of proposed lighting. **No lighting was shown.**

**Response: Refer to Drawings A-101 and A-102 Proposed Elevations for exterior lighting. A catalog cut of the proposed wall mounted fixtures has been provided to the Planning Board.**

☐ ☒ ☐ XVE(a)9. *Topography*

Existing and proposed topography of the site including contours (two foot intervals), the location of wetlands streams, water bodies, aquifers, aquifer recharge areas, drainage swales, areas subject to flooding, and unique natural land features, including all stonewalls, trees over eight (8) inches in caliper, and the general location of the tree line. **Proposed contours are shown at one foot intervals and existing contours are at two foot intervals. One or the other showed be used not both.**

**Response: One foot contours and spot elevations were provided for the proposed site grading to facilitate site grading and installation of stormwater structures.**

☐ ☒ ☐ XVE(a)10. *Water and Waste Disposal, drainage and other utilities*

The locations and description of all existing and proposed septic systems, sanitary sewer water supply, storm drainage systems (including method and calculations for 10- and 100-year storm events), utilities, refuse and other waste disposal methods.

**See comment letter.**

XV-E (b) NARRATIVE SUBMITTALS – MAJOR PROJECTS:

| *Com* | *Inc* | *N/A* | *Content:* |
|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(b)1. *Surface and ground water pollution* |

A report on the impact of storm water runoff on adjacent and downstream water bodies, subsurface ground water, and water tables. **See comment letter**

| | | | |
|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(b)2. *Soils:* |

A report on the potential erosion and sedimentation caused by the operation and maintenance of the proposed development and the mitigation efforts proposed. To this end, high intensity soil mapping, i.e., test borings and analysis, may be required**. See comment letter**

| | | | |
|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(b)3. *Environmental and community impact analysis* |

For projects with significant environmental impact to wetlands, floodplains, or other sensitive resources the board may request a report following the submission requirements of Section 5.6 of the Newburyport Subdivision Rules and Regulations, including a report on the relationship of the proposed development to the natural and man-made environment, and compatibility of the proposed development with adjacent or surrounding land uses and neighborhoods. This analysis shall be a guide to the planning board in its deliberations and will build into the Board's decision-making process consideration of the environment and community impacts of the proposed development. An EIR required through the MEPA process, which addresses the Planning Board's concerns, may be substituted in lieu of this report. **Not provided.**

**<u>Response:</u> There are no significant environmental impact to wetlands, floodplains, or other sensitive resources associated with the proposed project. In addition, the proposed project does not exceed any regulatory thresholds requiring submission of an Environmental Notification Form or Environmental Impact Report under 301CMR 11.00 MEPA Regulations.**

| | | | |
|---|---|---|---|
| ☒ | ☐ | ☐ | *XVE(b)4: Traffic* |
| ☒ | ☐ | ☐ | XVE(b)4 I The nearest and/or most impacted public roadway intersection. |
| ☐ | ☒ | ☐ | XVE(b)4 ii The estimated average daily traffic generation, including composition and peak hour levels. |

**<u>Response:</u> Average daily traffic for the site is projected to be approximately 16 vehicles per day. Peak hour morning traffic at the site is expected to be 7:00 am to 8:00 am. Peak hour evening traffic at the site is anticipated to be 4:30 pm to 5:30 pm. Traffic to and from the site will consist chiefly of passenger vehicles. Truck traffic to the site is anticipated to be limited. As an example, Hawtan Leather currently ships one container per month from the site.**

| *Com* | *Inc* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XVE(b)4 iii | The directional flows resulting from the proposed development. |
| ☐ | ☒ | ☐ | XVE(b)4 iv | Any proposed methods to mitigate the estimated traffic impact such as promoting the use of public transportation, or other appropriate means.<br><br>**<u>Response:</u> The proposed sidewalk has been extended to the property line with Parker Street and a bike storage area provided to facilitate walking and bike riding to the site. The site is located approximately 600 feet west of the Clipper City Bike Trail and 300 feet west of the MBTA Commuter Rail Station access road.** |
| ☐ | ☒ | ☐ | XVE(b)4 v. | The methodology and sources used to derive existing data and estimations.<br><br>**<u>Response:</u> Traffic projections are based on traffic to the existing facility and anticipated traffic as a result of the proposed building addition.** |
| ☐ | ☒ | ☐ | XVE(b)4 vi. | The feasibility of traffic calming measures such as textured crosswalks, bike lanes, roundabouts, rumble strips, street trees, or bulb-outs.<br><br>**<u>Response:</u> Not Applicable.** |
| ☒ | ☐ | ☐ | XVE(b)4 vii. | A detailed traffic access and impact study may also be required for the project. At the applicant's expense, the planning board may engage a traffic consultant to review said report and make its recommendations to the planning board thirty (30) days before final action is required. |
| ☒ | ☐ | ☐ | XVE(b)5 | *Architectural Style*<br><br>Plans and other drawings shall include architectural elevations of all sides of all new buildings and of those sides of existing buildings which are proposed to be altered in any way. A registered architect who shall sign the plan and place his/her seal upon it shall prepare the renderings or elevations. The drawings shall be prepared at a minimum scale of 1/8" = 1' and shall show the following: |
| ☒ | ☐ | ☐ | XVE(b)5 i. | Exterior material, including trim, and colors. |
| ☐ | ☒ | ☐ | XVE(b)5 ii. | Type, pitch, and material of roofs.<br><br>**<u>Response:</u> See Below** |
| ☐ | ☒ | ☐ | XVE(b)5 iii | Size, type, and spacing of windows, doors and other openings.<br>**<u>Response:</u> See Below** |
| ☐ | ☐ | ☒ | XVE(b)5 iv. | Size, location, colors, and copy of signs affixed to or hanging from the building. Size of the sign was |

| Com | Inc | N/A | Content: | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XVE(b)5 v. | The relationship in massing, scale, and height to other existing structures in the immediate vicinity |
| ☒ | ☐ | ☐ | XVE(b)5 vi. | Elevations or renderings of new construction, renovation or expansions (or model may be provided at the option of the applicant). |

| Com | Inc | N/A | Content: | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(b)5 vii. | Cross-sections of the site and buildings. |
| | | | | **Response: See Below** |
| ☐ | ☒ | ☐ | XVE(b)5 viii. | Product literature on proposed light fixtures |
| | | | | **Response: Refer to Drawings A-101 and A-102 Proposed Elevations** |

*XVE(b)6: OTHER PERMITS REQUIRED*

| Com | Inc | N/A | Content: | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XVE(b)6i. | All completed or pending actions of the zoning board of appeals relative to the application, including an estimated schedule of application and approval |
| ☐ | ☒ | ☐ | XVE(b)6ii. | A listing of state and federal permits, licenses, and approvals necessary, including Chapter 91. **Response: The proposed project will require a Construction General Permit under the USEPA Multisector General Permit for Discharges from Construction Activities.** |

## XV-G. SITE PLAN REVIEW CRITERIA

***XV-G (a) Community Character: The proposed development:***

| Yes | No | N/A | Content: | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(a)1 | Minimizes obstruction of scenic views from publicly accessible locations; |
| ☒ | ☐ | ☐ | XV-G(a)2 | Minimizes impacts to important natural or historical features; |
| ☒ | ☐ | ☐ | XV-G(a)3 | Screens objectionable features such as large blank walls, open dumpster, loading or storage areas, from neighboring properties and roadways; |
| ☒ | ☐ | ☐ | XV-G(a)4 | Is in harmony with the architectural style of the adjacent buildings and immediate neighborhood; |
| ☐ | ☐ | ☒ | XV-G(a)5 | if located within the National Historic District, is consistent with the architectural style, scale, density, massing and setbacks in the district; |

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(a)6 | Promotes a design and architectural consistency regarding the architectural value and significance of the site, building or structure, the general design, arrangement and texture, materials and color of the features involved and the relation of each feature to similar features of building and structures in the immediate neighborhood and surrounding area; |
| ☒ | ☐ | ☐ | XV-G(a)7 | Is appropriate in regards to the size and shape of the buildings or structures both in relation to the land area upon which the building or structure is situated and to the adjacent buildings and structures within the neighborhood. |

***XV-G (b) Traffic. parking and public access:*** ***The proposed development:***

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G (b)1 | Minimizes vehicular traffic and safety impacts of the proposed development on adjacent highways or roads. |
| ☐ | ☒ | ☐ | XV-G(b)2 | Maximizes the convenience and safety of vehicular, bicycle, and pedestrian movement within the neighborhood and site**. No access for bicycles and pedestrians other than the access drives.**<br><br>**Response: Refer to Drawing C-4 Site Layout Plan. The proposed sidewalk has been extended to the property line with Parker Street and a bike storage area provided. Please note that public sidewalks do not exist on Parker Street in the vicinity of the site.** |
| ☐ | ☒ | ☐ | XV-G(b)3 | Minimizes adverse impacts on neighborhood on/off-street parking and includes incentives for the use of alternatives to single-occupant vehicles. **No incentives for the use of alternatives have been provided.**<br><br>**Response: The proposed sidewalk has been extended to the property line with Parker Street and a bike storage area provided. Sufficient parking is provided on site. The site is located approximately 600 feet west of the Clipper City Bike Trail and 300 feet west of the MBTA Commuter rail station access road.** |

***XV-G(c) Health:*** ***The proposed development:***

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(c)1 | Minimizes adverse air-quality impacts, noise, glare, and odors; |
| ☒ | ☐ | ☐ | XV-G(c)2 | Provides for appropriate handling and disposal of hazardous materials and transmissions. |

***XV-G(d) Public services and utilities:* The proposed development:**

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XV-G(d)1 | Is served with adequate water supply, wastewater systems, and solid waste disposal systems; |
| | | | | **Response: See comment letter** |
| ☒ | ☐ | ☐ | XV-G(d)2 | Is within the capacity of the city's infrastructure as defined by the water, sewer and DPW departments; |
| ☐ | ☒ | ☐ | XV-G(d)3 | Includes measures to prevent pollution of surface or groundwater, minimizing erosion and sedimentation, as well as measures to prevent changes in groundwater levels, increased run-off, and potential for flooding; |
| | | | | **Response: See comment letter:** |
| ☐ | ☒ | ☐ | XV-G(d)4 | Demonstrates an effort to conserve energy and water. |
| | | | | **No effort detailed.** |
| | | | | **Response: The existing structure is equipped with a photovoltaic solar array with power generated sold into the electrical grid. The proposed building addition will be designed to maximize energy efficiency and water conservation. In addition, the owners will evaluate the expansion of the existing solar array to the roof of the proposed building addition.** |

***XV-G (e) Land use planning:* The proposed development:**

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(e)1 | Is consistent with the land-use goals of the city's master plan. |

***XV-G (f) Open space and environmental protection:* The proposed development:**

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(f)1 | Minimizes adverse impacts to open space usage and retention and is integrated into the natural landscape. Minimizes adverse environmental impacts to such features as wetlands, floodplains, and aquifer recharge areas and minimizes tree, vegetation, and soil removal, and grade changes; |
| ☒ | ☐ | ☒ | XV-G(f)2 | Proposes a landscape design that favors native and drought-tolerant species and avoids invasive plants. |

***XV-H. DEVELOPMENT AND PERFORMANCE STANDARDS:***

***XV- H(a) Pedestrian and vehicular access and traffic impacts:*** Applicants must demonstrate that the project will minimize pedestrian and vehicular traffic and safety impacts on city roads. In the case of multi-tenant properties, these requirements are directed at the immediate vicinity of the proposed renovation, addition, expansion, or new building rather than the site as a whole.

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XV-H(a)1 | One access driveway per lot shall be permitted as a matter of right, except, the planning board may, in certain circumstances, require additional driveways as part of the site plan approval process where the access is shared or the project has frontage on two separate streets. To the extent feasible, access to businesses shall be provided via one of the following:<br>i. Access via a common driveway serving adjacent lots or premises;<br>ii. Access via an existing side street;<br>iii. Access via a cul-de-sac or loop road shared by adjacent lots or premises.<br><br>**Response: Refer to Drawing C-4 Site layout Plan. One access to the site is provided. An additional exit is proposed to facilitate the exiting of trucks utilizing the proposed loading docks from the site and provide access around the building perimeter for emergency vehicles. The proposed additional exit allows for the separation of passenger vehicle and truck traffic exiting the site enhancing the safety of vehicular and pedestrian movement within the site.** |
| ☐ | ☒ | ☐ | XV-H(a)2 | All proposed curb cuts shall be limited to the minimum width for safe entering and exiting, and shall in no case exceed 24 feet in width provided however; the board may require a curb cut to be up to 30 feet in width for commercial or industrial truck traffic. The location of driveway openings in relation to traffic and to adjacent streets must provide for the convenience and safety of vehicular and pedestrian movement within the site. The number of curb cuts on state and local roads shall be minimized. **Greater than 30'.**<br><br>**Response: Refer to Drawings C-4 Site Layout Plan and C-9 Conceptual Layout Plan. Drawing C-9 depicts turning movements of an emergency service pumper truck entering and exiting the site. The driveway width depicts are the minimum to accommodate the turning movements of a WB-55 trailer entering and exiting the site.** |

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(a)3 | All proposed driveways shall be designed to afford pedestrians, bicyclists, and motorists exiting to public ways with safe sight distance. Improvements may be required on the public way for vehicular turning movements in or out of the site and safe pedestrian access to adjoining sidewalks, paths, walking trails or bikeways. |
| ☐ | ☒ | ☐ | XV-H(a)4 | The proposed development shall assure safe interior circulation by separating pedestrian and vehicular traffic within its site. **No separate access for pedestrians is provided to the street**.<br><br>**<u>Response:</u> Refer to Drawing C-4 Site Layout Plan. A sidewalk has been provided for pedestrian access to the site. The proposed additional exit allows for the separation of passenger vehicles and trucks utilizing the facility.** |
| ☐ | ☐ | ☒ | XV-H(a)5 | All roadways and sidewalk construction within the site shall comply with Sections 6.8, 6.9 (except for all I districts), 6.10 and 6.11, of the Newburyport Subdivision Rules and Regulations. |
| ☐ | ☒ | ☐ | XV-H(a)6 | Sidewalks, crosswalks, walkways, bike racks, or other pedestrian access may be required to allow access to adjacent properties and between individual businesses within a development. **No sidewalks to the street, crosswalks or bike racks proposed.**<br><br>**<u>Response:</u> Refer to Drawing C-4 Site Layout Plan. The proposed sidewalk has been extended to the property line with Parker Street and a bike storage area provided. Please note that public sidewalks do not exist on Parker Street in the vicinity of the site.** |
| ☐ | ☐ | ☒ | XV-H(a)7 | If the property abuts a public bikeway/right-of-way, an improved access route to the bikeway may be requested. |
| ☒ | ☐ | ☐ | XV-H(a)8 | Unless a variance is granted by the ZBA pertaining to the requirements of Section VII, proposed projects or uses must comply with the parking and off-street loading requirements in Section VII. |
| ☒ | ☐ | ☐ | XV-H(a)9 | Where feasible, parking areas shall be located to the side or behind buildings so as to provide an appropriate setting for the building within the context of the site and neighborhood and allow parking areas to be shared with adjacent businesses. The planning board may require alternative parking lot layouts. Except where infeasible or inappropriate, all parking lots shall be accessible by driveways to the parking lots of adjacent nonresidential uses and land zoned for nonresidential uses. |
| ☒ | ☐ | ☐ | XV-H(a)10 | Except where physical constraints, site configuration, or safety considerations preclude strict compliance, no parking or loading shall be permitted within the required front yard setback. |

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XV-H(a)11 | Traffic calming measures such as crosswalks, bike lanes, rumble strips, and landscaped islands may be required. **No crosswalks, bike lanes or rumble strips proposed.**<br><br>**<u>Response:</u> Refer to Drawing C-4 Site Layout Plan. Site signage proposed is sufficient to control vehicle movements into and out of the site.** |
| ☐ | ☐ | ☒ | XV-H(a)12 | All off-site construction on state roadways shall comply with the Department of Massachusetts Highway Department (MHD) standards, specifications, or special conditions as applicable as well as requirements listed under CMR 521 as amended for the Massachusetts Architectural Access Board (MAAB) unless waived by MHD and or MAAB. |

***XV- H(b) <u>Site plan and architectural design</u>***

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(b)1 | Height |
| ☒ | ☐ | ☐ | XV-H(b)2 | Bulk and general massing (footprint, shape, articulation or detail) |
| ☒ | ☐ | ☐ | XV-H(b)3 | Major divisions or rhythms of the façade (height and width proportions, building lines, etc.) Where appropriate large continuous buildings shall be avoided and massing of buildings should be broken or staggered to reflect the historic scale of existing buildings and traditional development patterns of Newburyport. |
| ☐ | ☒ | ☐ | XV-H(b)4 | Rhythm of openings (i.e. # windows, spacing, window and doors relationships.)<br><br>**No spacing provided.**<br><br>**<u>Response:</u> Refer to Drawings A-101 and A-102 Proposed Elevations.** |
| ☐ | ☒ | ☐ | XV-H(b)5 | Roof treatments (slope, articulation surface). Rooftop mechanical equipment shall be screened from view by rook forms or other appropriate screening devices.<br><br>**<u>Response:</u> Refer to Drawings A-101 and A-102 Proposed Elevations.** |
| ☒ | ☐ | ☐ | XV-H(b)6 | Materials, colors, and textures of building and signage. In general, natural materials such as stone, brick, wood siding, shingles, slate, etc. are preferred to industrial or artificial materials such as exposed concrete, anodized or galvanized metal, tinted glass, plastics vinyl, etc. |

### *XV-H(b)7 General Architectural Character*

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(b)7i | Horizontal or vertical emphasis of building. |
| ☒ | ☐ | ☐ | XV-H(b)7ii | Scale (height and width proportions). |
| ☒ | ☐ | ☐ | XV-H(b)7iii | Stylistic features and themes. |
| *Yes* | *No* | *N/A* | *Content:* | |
| ☒ | ☐ | ☐ | XV-H(b)7iv | Setbacks. |
| ☐ | ☐ | ☒ | XV-H(b)7v | All proposed structures within a local historic district shall require a certificate of appropriateness form the historical commission. |
| ☐ | ☐ | ☒ | XV-H(b)7vi | additional dimensional and setback requirements, etc. |

### *XV- H(c) Lighting*

Protection of adjoining premises or open space areas against detrimental off-site glare or spillover light.

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XV-H(c)1 | The goal of exterior lighting shall be to make development safe and identify and accent key elements in the project's design. **Not provided.**<br><br>**Response: See below** |
| ☐ | ☒ | ☐ | XV-H(c)2 | Lighting poles and structures should be appropriately scaled and styled for the project. Pedestrian areas should have poles ten (10) to twelve (12) feet high and parking areas should have poles eighteen (18) to twenty-two (22) feet high. The pole heights should determine the overall spacing of the poles and fixtures shall be of the cutoff luminaire type. Off-site illumination to adjacent properties shall not exceed 0.2-foot candles as measured at the property line. Lamp type should be metal halide to provide a natural uniform quality of light. Parking and pedestrian light fixtures should be compatible with the building lighting to provide for a contiguous appearance of the project. **Not provided.**<br><br>**Response: See below** |
| ☐ | ☒ | ☐ | XV-H(c)3 | If requested by the board, a registered engineer or a lighting consultant shall prepare a photometric analysis of site lighting. **Not provided**.<br><br>**Response: Refer to Drawings A-101 and A-102 Proposed Elevations for exterior lighting. A catalog cut of the proposed wall mounted fixtures has been provided to the Planning Board. The proposed lighting is consistent with wall mounted lighting that currently exist at the site.** |

***XV- H(d) Landscaping:***

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(d)1 | Except for zoning districts where the setback requirements are less than 20 feet, a landscaped buffer strip at least twenty (20) feet wide, continuous except for approved driveways, shall be established adjacent to any public road to visually separate parking and other uses from the road. Unless waived by the board due to safety, pedestrian uses, or lot shape, the buffer strip shall be planted with grass, medium height shrubs, and shade trees having a minimum 3 inches in caliper planted at least every thirty (30) feet along the road frontage. At all street or driveway intersections, trees or shrubs shall be set back a sufficient distance from such intersections so that they do not present an obstruction to sightlines. |
| ☐ | ☐ | ☒ | XV-H(d)2 | Except for zoning districts with no side-yard setback requirements, a continuous landscaped buffer strip between business and industrial districts and any residential districts and/or property lines shall be provided for new development and maintained in perpetuity. In particular, circumstances where said buffer strip may be impractical to apply, given safety, land use, permitted setbacks, lot shape or historic preservation considerations, the planning board may vary the landscape buffer requirements. The landscape buffer strip shall be of a density to substantially screen the development in question from view, along the zoning district line in question. Plantings of various approved evergreen species are encouraged and shall be planted at a minimum height of six (6) feet. Fencing may be allowed in lieu or in conjunction with plantings. Design and height of said fencing shall be subject to the approval of the planning board**.** |
| ☒ | ☐ | ☐ | XV-H(d)3 | Other than for existing retaining walls, new retaining walls shall be constructed to a maximum height of six (6) feet. If site conditions require elevation changes of greater than six (6) feet, retaining walls shall be terraced and landscaped. New retaining walls facing residential districts shall be solid fieldstone or fieldstone veneer or other similar material. Unless used within the industrial districts, vertical cast in place concrete or concrete blocks shall not be permitted. |
| ☐ | ☐ | ☒ | XV-H(d)4 | Surface parking lots containing over 20 spaces shall have at least one shade tree per ten (10) parking spaces, such trees to be a minimum of 2 1/2 inches in diameter and located either in the parking area or within 10 feet of it. At least 5% of the interior of the parking area shall be maintained with landscaping, including trees, in landscape islands or plots of at least nine (9) feet in width with no more than 20 parking spaces between each island or plot. Trees shall be located to provide visual relief from sun |

and wind interruption within the parking area and assure safe patterns of internal pedestrian and vehicular traffic. Other traffic calming measures such as crosswalks, bike lanes, rumble-strips, and landscape islands may be required as necessary.

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XV-H(d)5 | Exposed storage areas, machinery, service areas, truck loading areas, utility buildings and structures and other unsightly uses shall be screened from view from neighboring properties and streets using dense, hardy evergreen plantings, or earthen berms, or wall or tight fence complemented by evergreen plantings. **Not screened.**<br><br>**<u>Response:</u> The proposed loading docks do not constitute an unsightly use and will be maintained in a clean and orderly manner. The neighboring property is occupied by a series of above ground storage tanks and above ground propane tanks.** |
| ☒ | ☐ | ☐ | XV-H(d)6 | All landscaped areas shall be properly maintained. Shrubs or trees, which die within the first year, shall be replaced within one growing season as a condition of approval. The board strongly encourages the use of drought resistant native plant species. |

***XV- H(e) <u>Storm water runoff:</u>***

The site plan shows or includes adequate provisions for measures to prevent pollution of surface or groundwater, minimizing erosion and sedimentation, and measures to prevent changes in groundwater levels, increased run-off, and potential for flooding. The plan shall include: **See specific comments on stormwater management**

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | XV-H(e)1 | A plan consistent with the Massachusetts Storm-Water Management Policy (SWMP), where the rate of surface water run-off from the site shall not be increased after construction. If needed to meet this requirement and maximize groundwater recharge, increased run-off from impervious surfaces shall be recharged on site by being diverted to vegetated surfaces for infiltration or through the use of subsurface infiltration systems, retention or detention ponds. Dry wells shall be used only where other methods are unfeasible and shall require oil, grease, and sediment traps to facilitate removal of contaminants. The plan shall also be consistent with the Phase III National Pollution Discharge Elimination System (NPDES) requirements as adopted by the City of Newburyport. |
| ☐ | ☐ | ☐ | XV-H(e)2 | Neighboring properties shall not be adversely affected by excessive run-off. |
| ☐ | ☐ | ☐ | XV-H(e)3 | A detailed stormwater management plan will also be required. |

***XV- H(f) Water Quality:***

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(f) | Groundwater recharge shall be maximized and groundwater quality shall be protected. Various techniques may be required to maximize recharge, such as perforated drainpipes, reduction of paved areas, and reduction of building coverage. Installing grease traps, and/or gas/oil separators to improve water quality may also be required. Where the groundwater elevation is close to the surface extra site grading precautions may be taken to maintain the protective function of the overburden. |

***XV- H(g) Wetlands:***

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☐ | ☒ | XV-H(g) | In order to minimize design and permitting conflicts, when wetland replacement or mitigation is required, the application shall include, if completed, a copy of the plan submitted in accordance with the regulations of the Newburyport Conservation Commission. |

***XV- H(h) Erosion Control:***

Erosion of soil and sedimentation of streams and water bodies shall be minimized using the following erosion practices:

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(h)1 | Exposed or disturbed areas due to stripping of vegetation, soil removal, and regrading shall be permanently stabilized within six months of occupancy of a structure. |
| ☒ | ☐ | ☐ | XV-H(h)2 | During construction, temporary vegetation and/or mulching shall be used to protect exposed area from erosion. Until a disturbed area is permanently stabilized, sediment in run-off water shall be trapped by using staked hay bales or sedimentation traps. |
| ☒ | ☐ | ☐ | XV-H(h)3 | Permanent erosion control and vegetative measures shall be in accordance with the erosion/sedimentation/vegetative practices recommended by the Soil Conservation Service. |
| ☒ | ☐ | ☐ | XV-H(h)4 | All slopes exceeding fifteen (15) percent resulting from site grading shall be both covered with four (4) inches of topsoil and planted with a vegetative cover sufficient to prevent erosion or to be stabilized by a retaining wall. |
| ☒ | ☐ | ☐ | XV-H(h)5 | Dust control shall be used during grading operations if the grading is to occur within two hundred (200) feet of an occupied residence or place of business. Dust control methods may consist of grading fine soils on calm days only or dampening the ground with water. |

***XV- H(i) Utilities:***

| *Yes* | *No* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(i)1 | Except for preexisting overhead connections, all electric, telephone, cable TV and other such utilities shall be underground from the roadway utilities. |
| ☒ | ☐ | ☐ | XV-H(i)2 | In order to minimize design and permitting conflicts, the applicant must demonstrate that the proposed development will be permitted to connect to the public sewer, water, and other service systems. If sewerage is to be treated on site, the application shall include, if completed, a copy of the plan submitted in accordance with the regulations of the Board of Health. |

**Site Plan Review Comments:**

1. The entire Stormwater Management System should be reviewed and revised. The use of a minimum Time of Concentration is not acceptable with the use of a computer software such as HydroCAD. As the applicant stated this program is SCS TR 20 based which offers no minimum time of concentration. Actual time of concentrations should be calculated for each subcatchment. Direct input of 6 minute times of concentration provides for lower peak flows and then for smaller BMPs to comply with stormwater regulations. Calculating actual times of concentration will provide larger peak flows and then require larger BMPs to actually control peak runoff.

   **Response: Due to the small subcatchment areas in the analysis, the Tc is unrealistically small when flow paths are entered. The design initially used 6 minute minimum based on our extensive experience in designing stormwater management systems. Assigning a six minute minimum to small subcatchment areas provides a more realistic value for the hydraulic flow path; introduces less error into the model with Tc at least twice dt; and is based on sound engineering judgement. It is incorrect to state that minimum Tc is not acceptable and imply that the 6 minute Tc was chosen to reduce the size of the Stormwater Management BMPs.**

   **However, in order to demonstrate that a flow path Tc has no appreciable effect on the peak rate of runoff for subcatchments of this size, the time of concentration for the subcatchments have been revised to reflect estimated flow characteristics based on the proposed drainage system and site grading. The revised calculations demonstrate that the initial design did not undersize the proposed drainage system as suggested.**

2. A structure should be proposed at any bend in the drainage line.

   **Response: Drain cleanouts have been proposed where proposed roof drains have a bend. All other drain lines have manholes at pipe junctures or bends.**

3. The area of the post development analysis does not match the pre-development area.

   **Response: The difference from the existing and proposed development areas was six (6) square feet, 0.005% of the watershed area. There was no effect on the runoff amount from a deminimus amount of area added to the proposed analysis. The proposed development total area has been revised to match the existing total area of 108,682 square feet.**

4. The groundwater elevation within the Underground Infiltration area is incorrect. The elevation of test pit 1 is 16.29, however the existing grade at the highest end of the infiltration system is 18.5. Test pit 1 had ESHWT at 26" and test pit 2 had an ESHWT at 21". Interpolating between the two test pits ESHWT would result in an ESHWT of 23". This should be taken from the highest elevation within the infiltration system. ESHWT within the infiltration system would be 16.59 which would require the bottom of the stone beneath the chambers to be at a minimum of 18.59. The system should be raised to ensure it has the required 2" separation to groundwater.

   **Response: The proposed stormwater infiltration system has been revised. The revised infiltration system specifies a different chamber with a shallower profile in order to reduce the overall height of the system and provide greater separation to estimated seasonal high groundwater. The highest existing surface elevation at the proposed system location is 16.6. The depth to estimated season high groundwater is 23 inches, resulting in an elevation of seasonal high groundwater of 14.7. The revised bottom of stone elevation is 16.8, providing a proposed separation to groundwater of 2.1 feet.**

   **Grading around the infiltration system has been revised to accommodate the changes. A retaining wall is proposed in order to meet the existing grade at the wetland 25 foot no disturb buffer.**

5. The separation distance between the rim and invert of the catch basins should be confirmed for constructability. The catch basins with a flat top should be specified.

   **Response: The catchbasin and manhole detail includes a flat top option. The concrete structure manufacturer will determine the structure configuration during construction and provide a construction submittal to be verified by the design engineer. A note has been added requiring the concrete structure manufacturer to verify the required top per item and plan.**

6. Drain manholes requiring a flat top should be specified.

   **Response: The catchbasin and manhole detail includes a flat top option. The concrete structure manufacturer will determine the structure configuration during construction and provide a construction submittal to be verified by the design engineer. A note has been added requiring the concrete structure manufacturer to verify the required top per item and plan.**

7. Catch basin frames and grates should be specified.

   **Response: The frame and grate/cover detail has been revised for specification of the frames, grates and covers.**

8. The bypass manholes should be reviewed for constructability. It may be difficult to construct a diversion wall in a 48" structure. The Bypass Structure detail should be revised to show the correct DMH and inverts.

   **Response: In our experience the bypass diversion walls can be constructed within the manholes as proposed. Depending on the contractor's method of constructing the weir, a larger diameter manhole may be used if necessary.**

9. An erosion control detail should be provided. **Refer to Detail Sheet C-8**

10. A construction entrance should be proposed.

    **Response: Refer to Drawing C-3 for construction entrance location**

11. Spot grades should be provided at the new entrance for approximately 75' to ensure the water is draining as designed.

    **Response: Spot grades have been added at the entrance to the site where the proposed new pavement shall meet the grade of the existing street.**

12. The outlet structure for Rain Garden 1 cannot be constructed as designed. A 4" orifice is proposed at elevation 15.8 which would make the top of the orifice at 16.13. The grate on top of the structure is proposed at 16.1. This orifice would be into the top of the structure and should be revised. The same is true for outlet structure 2. A 4" orifice is proposed at 18.3 and the grate on top of the structure is at 18.5. The top of this orifice would be above the top of the structure.

    **Response: The outlet control structures have been revised. The inverts and orifices have been adjusted to allow construction of the proposed structures.**

13. A riprap overflow is proposed on the abutting property. An easement should be provided or the riprap should be removed.

    **Response: Refer to Drawing C-5. No riprap swale is proposed. Flow to the culvert will be overland as currently exists at the site**

14. More information regarding the utilities connected to the existing building is required to ensure adequate cover will be provided. DPS should also review for compliance with City standards.

15. The modeling of the infiltration area should be explained. It appears some areas of stone may have been double-counted.

**Response: The proposed stormwater infiltration system has been revised to address the separation to groundwater in comment 4 above. The original design did not double count storage, but since the revised design is more symmetrical it may be easier to follow.**

If you have any questions or desire any additional information regarding this matter, please do not hesitate to contact me at 781-937-3045.

Very truly yours,

Cornerstone Construction Services, LLC

Richard Barthelmes, P.E.

attachments

cc: Port City Realty, LLC
Christiansen & Sergi, Inc.

**ATTACHMENT NO. 1**

**Compliance Checklist Comments**
**Site Plan Review Comments**

# CHRISTIANSEN & SERGI, INC.
PROFESSIONAL ENGINEERS AND LAND SURVEYORS
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**City of Newburyport Planning Board**
**Review for Compliance with Site Plan Review Regulations**

## Compliance Checklist

Review Date: 4/26/18

Plan Title: **Proposed Building Addition Site Plan**

Applicant: Port City Realty, LLC

Applicant's Engineer: Cornerstone

Plan Date: March 30, 2018

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*Key to check boxes: Com = complete Inc = incomplete N/A = not applicable Var = variance required*

***XV-E MATERIALS FOR REVIEW* 1**

| Com | Inc | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XVE Plan Sheets 24" x 36" |
| ☐ | ☒ | ☐ | XVE Scale of not less than 1"=40' or 1"=8' for elevations **Scale is 1"=20'** |
| ☐ | ☒ | ☐ | XVE Plans stamped by a registered architect, landscape architect, or professional engineer |

***XV-E (a) SUBMISSION REQUIREMENTS*:**

☒ ☐ ☐ XVE(a)1. *Location and boundaries:*
The location and boundaries of the lot, zoning district, adjacent streets or ways, applicable information from section VI, Dimensional Controls, the location and owners' names of all adjacent properties. Plans shall also show any deeds of easement, rights-of-ways, covenants and any other agreements affecting the use of the site.

☐ ☒ ☐ XVE(a)2 . *Structures:*

Existing and proposed structures, including dimensions, footprint, total gross floor area, number of stories, floor elevations, and building height(s). See section II, Definitions.

**No dimensions, elevations, number of stories, or gross floor areas provided for the existing building.**

☐ ☐ ☒ XVE(a)3 . *Signage:*

The location, dimensions, height, lighting, and other characteristics of all proposed signs. **No new sign proposed.**

| Com | Inc | N/A | Content: |
|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(a)4 *Landscaping* |

Proposed landscape features including the locations and a description of buffer areas, screening, fencing, and a planting plan. A registered landscape architect shall prepare a planting plan, unless the planning board deems a licensed plant nursery person appropriate

for small projects such as minor additions or alterations. **A Landscape Plan has been provided, however it was not stamped by a Register Landscape Architect.**

☐ ☒ ☐ XVE(a)5 *Traffic*

The plan shall show pedestrian, bicycle, and vehicular traffic flow patterns and show adequate access to and from the site and adequate circulation within the site. The planning board encourages accommodation of public transportation and/or private vanpooling arrangements. **Pedestrian and bicycle access is not provided from the street to the building except for riding within the drive.**

☐ ☒ ☐ XVE(a)6 *Parking*

The location of parking and loading areas, driveways, access and egress points, bicycle racks, and bus stops or drop-off areas. **No bike racks or drop-off areas have been provided.**

☐ ☒ ☐ XVE(a)7 *Public Access*

The location and description of proposed public access areas, including parks, conservation areas, gardens, bikeways, pathways or sidewalk areas. Riverfront sites shall include indications of compliance with state and federal regulations. **None Proposed**

☐ ☒ ☐ XVE(a)8 *Lighting*

Existing and proposed exterior lighting, including locations, lighting source, and fixture types. The planning board may require photometric analysis of proposed lighting

**No lighting was shown.**

☐ ☒ ☐ XVE(a)9 *Topography*

Existing and proposed topography of the site including contours (two foot intervals), the location of wetlands streams, water bodies, aquifers, aquifer recharge areas, drainage swales, areas subject to flooding, and unique natural land features, including all stonewalls, trees over eight (8) inches in caliper, and the general location of the tree line. **Proposed contours are shown at one foot intervals and existing contours are at two foot intervals. One or the other showed be used not both.**

☐ ☒ ☐ XVE(a)10 *Water and Waste Disposal, drainage and other utilities*

The locations and description of all existing and proposed septic systems, sanitary sewer water supply, storm drainage systems (including method and calculations for 10- and 100-year storm events), utilities, refuse and other waste disposal methods.

**See comment letter.**

XV-E (b) NARRATIVE SUBMITTALS – MAJOR PROJECTS:

| *Com* | *Inc* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(b)1 | *Surface and ground water pollution* |

A report on the impact of storm water runoff on adjacent and downstream water bodies, subsurface ground water, and water tables. **See comment letter**

☐ ☒ ☐ XVE(b)2 *Soils:*

A report on the potential erosion and sedimentation caused by the operation and maintenance of the proposed development and the mitigation efforts proposed. To this end,

high intensity soil mapping, i.e., test borings and analysis, may be required **. See comment letter**

☐ ☒ ☐ XVE(b)3 *Environmental and community impact analysis*

For projects with significant environmental impact to wetlands, floodplains, or other sensitive resources the board may request a report following the submission requirements of Section 5.6 of the Newburyport Subdivision Rules and Regulations, including a report on the relationship of the proposed development to the natural and man-made environment, and compatibility of the proposed development with adjacent or surrounding land uses and neighborhoods. This analysis shall be a guide to the planning board in its deliberations and will build into the Board's decision-making process consideration of the environment and community impacts of the proposed development. An EIR required through the MEPA process, which addresses the Planning Board's concerns, may be substituted in lieu of this report. **Not provided.**

☒ ☐ ☐ *XVE(b)4: Traffic*

☒ ☐ ☐ XVE(b)4 I The nearest and/or most impacted public roadway intersection.

☐ ☒ ☐ XVE(b)4 ii The estimated average daily traffic generation, including composition and peak hour levels.

☒ ☐ ☐ XVE(b)4 iii The directional flows resulting from the proposed development.

☐ ☒ ☐ XVE(b)4 iv Any proposed methods to mitigate the estimated traffic impact such as promoting the use of public transportation, or other appropriate means.

☐ ☒ ☐ XVE(b)4 v. The methodology and sources used to derive existing data and estimations.

☐ ☒ ☐ XVE(b)4 vi. The feasibility of traffic calming measures such as textured crosswalks, bike lanes, roundabouts, rumble strips, street trees, or bulb-outs.

☒ ☐ ☐ XVE(b)4 vii. A detailed traffic access and impact study may also be required for the project. At the applicant's expense, the planning board may engage a traffic consultant to review said report and make its recommendations to the planning board thirty (30) days before final action is required.

☒ ☐ ☐ XVE(b)5 *Architectual Style*

Plans and other drawings shall include architectural elevations of all sides of all new buildings and of those sides of existing buildings which are proposed to be altered in any way. A registered architect who shall sign the plan and place his/her seal upon it shall prepare the renderings or elevations. The drawings shall be prepared at a minimum scale of 1/8" = 1' and shall show the following:

☒ ☐ ☐ XVE(b)5 i. Exterior material, including trim, and colors.

☐ ☒ ☐ XVE(b)5 ii. Type, pitch, and material of roofs

| *Com* | *Inc* | *N/A* | *Content:* | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XVE(b)5 iii | Size, type, and spacing of windows, doors and other openings. |
| ☐ | ☐ | ☒ | XVE(b)5 iv. | Size, location, colors, and copy of signs affixed to or hanging from the building. Size of the sign was |
| ☒ | ☐ | ☐ | XVE(b)5v. | The relationship in massing, scale, and height to other existing structures in the immediate vicinity |
| ☒ | ☐ | ☐ | XVE(b)5vi. | Elevations or renderings of new construction, renovation or expansions (or model may be provided at the option of the applicant). |

☐ ☒ ☐ XVE(b)5vii. Cross-sections of the site and buildings.

☐ ☒ ☐ XVE(b)5viii. Product literature on proposed light fixtures

*XVE(b)6: OTHER PERMITS REQUIRED*

| Com | Inc | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XVE(b)6i. All completed or pending actions of the zoning board of appeals relative to the application, including an estimated schedule of application and approval |
| ☐ | ☒ | ☐ | XVE(b)6ii. A listing of state and federal permits, licenses, and approvals necessary, including Chapter 91. |

## XV-G. SITE PLAN REVIEW CRITERIA

***XV-G (a) Community Character: The proposed development:***

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(a)1 Minimizes obstruction of scenic views from publicly accessible locations; |
| ☒ | ☐ | ☐ | XV-G(a)2 Minimizes impacts to important natural or historical features; |
| ☒ | ☐ | ☐ | XV-G(a)3 Screens objectionable features such as large blank walls, open dumpster, loading or storage areas, from neighboring properties and roadways; |
| ☒ | ☐ | ☐ | XV-G(a)4 Is in harmony with the architectural style of the adjacent buildings and immediate neighborhood; |
| ☐ | ☐ | ☒ | XV-G(a)5 if located within the National Historic District, is consistent with the architectural style, scale, density, massing and setbacks in the district; |
| ☒ | ☐ | ☐ | XV-G(a)6 Promotes a design and architectural consistency regarding the architectural value and significance of the site, building or structure, the general design, arrangement and texture, materials and color of the features involved and the relation of each feature to similar features of building and structures in the immediate neighborhood and surrounding area; |
| ☒ | ☐ | ☐ | XV-G(a)7 Is appropriate in regards to the size and shape of the buildings or structures both in relation to the land area upon which the building or structure is situated and to the adjacent buildings and structures within the neighborhood. |

***XV-G (b) Traffic. parking and public access: The proposed development:***

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G (b)1 Minimizes vehicular traffic and safety impacts of the proposed development on adjacent highways or roads. |
| ☐ | ☒ | ☐ | XV-G(b)2 Maximizes the convenience and safety of vehicular, bicycle, and pedestrian movement within the neighborhood and site. **No access for bicycles and pedestrains other than the access drives.** |
| ☐ | ☒ | ☐ | XV-G(b)3 Minimizes adverse impacts on neighborhood on/off-street parking and includes incentives for the use of alternatives to single-occupant vehicles. **No incentives for the use of alternatives have been provided.** |

***XV-G(c) Health: The proposed development:***

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(c)1 Minimizes adverse air-quality impacts, noise, glare, and odors; |
| ☒ | ☐ | ☐ | XV-G(c)2 Provides for appropriate handling and disposal of hazardous materials and transmissions. |

***XV-G(d) Public services and utilities:*** ***The proposed development:***

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☐ | ☒ | ☐ | XV-G(d)1 Is served with adequate water supply, wastewater systems, and solid waste disposal systems; **See comment letter** |
| ☒ | ☐ | ☐ | XV-G(d)2 Is within the capacity of the city's infrastructure as defined by the water, sewer and DPW departments; |
| ☐ | ☒ | ☐ | XV-G(d)3 Includes measures to prevent pollution of surface or groundwater, minimizing erosion and sedimentation, as well as measures to prevent changes in groundwater levels, increased run-off, and potential for flooding; **See comment letter** |
| ☐ | ☒ | ☐ | XV-G(d)4 Demonstrates an effort to conserve energy and water. **No effort detailed.** |

***XV-G (e) Land use planning:*** ***The proposed development:***

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(e)1 Is consistent with the land-use goals of the city's master plan. |

***XV-G (f) Open space and environmental protection:*** ***The proposed development:***

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XV-G(f)1 Minimizes adverse impacts to open space usage and retention and is integrated into the natural landscape. Minimizes adverse environmental impacts to such features as wetlands, floodplains, and aquifer recharge areas and minimizes tree, vegetation, and soil removal, and grade changes; |
| ☒ | ☐ | ☒ | XV-G(f)2 Proposes a landscape design that favors native and drought-tolerant species and avoids invasive plants. |

***XV-H. DEVELOPMENT AND PERFORMANCE STANDARDS:***

***XV- H(a) Pedestrian and vehicular access and traffic impacts:*** Applicants must demonstrate that the project will minimize pedestrian and vehicular traffic and safety impacts on city roads. In the case of multi-tenant properties, these requirements are directed at the immediate vicinity of the proposed renovation, addition, expansion, or new building rather than the site as a whole.

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☐ | ☒ | ☐ | XV-H(a)1 One access driveway per lot shall be permitted as a matter of right, except, the planning board may, in certain circumstances, require additional driveways as part of the site plan approval process where the access is shared or the project has frontage on two separate streets. To the extent feasible, access to businesses shall be provided via one of the following:<br>i. Access via a common driveway serving adjacent lots or premises;<br>ii. Access via an existing side street;<br>iii. Access via a cul-de-sac or loop road shared by adjacent lots or premises. |
| ☐ | ☒ | ☐ | XV-H(a)2 All proposed curb cuts shall be limited to the minimum width for safe entering and exiting, and shall in no case exceed 24 feet in width provided however; the board may require a curb cut to be up to 30 feet in width for commercial or industrial truck traffic. The location of driveway openings in relation to traffic and to adjacent streets must provide for the |

convenience and safety of vehicular and pedestrian movement within the site. The number of curb cuts on state and local roads shall be minimized. **Greater than 30'.**

☒ ☐ ☐ XV-H(a)3 All proposed driveways shall be designed to afford pedestrians, bicyclists, and motorists exiting to public ways with safe sight distance. Improvements may be required on the public way for vehicular turning movements in or out of the site and safe pedestrian access to adjoining sidewalks, paths, walking trails or bikeways.

☐ ☒ ☐ XV-H(a)4 The ~~proposed development~~ development shall assure safe interior circulation by separating pedestrian and vehicular traffic within its site. **No separate access for pedestrians is provided to the street**.

☐ ☐ ☒ XV-H(a)5 All roadways and sidewalk construction within the site shall comply with Sections 6.8, 6.9 (except for all I districts), 6.10 and 6.11, of the Newburyport Subdivision Rules and Regulations.

| *Com* | *Inc* | *N/A* | *Content:* |
|---|---|---|---|
| ☐ | ☒ | ☐ | XV-H(a)6 Sidewalks, crosswalks, walkways, bike racks, or other pedestrian access may be required to allow access to adjacent properties and between individual businesses within a development. **No sidewalks to the street, crosswalks or bike racks proposed** |
| ☐ | ☐ | ☒ | XV-H(a)7 If the property abuts a public bikeway/right-of-way, an improved access route to the bikeway may be requested. |
| ☒ | ☐ | ☐ | XV-H(a)8 Unless a variance is granted by the ZBA pertaining to the requirements of Section VII, proposed projects or uses must comply with the parking and off-street loading requirements in Section VII. |
| ☒ | ☐ | ☐ | XV-H(a)9 Where feasible, parking areas shall be located to the side or behind buildings so as to provide an appropriate setting for the building within the context of the site and neighborhood and allow parking areas to be shared with adjacent businesses. The planning board may require alternative parking lot layouts. Except where infeasible or inappropriate, all parking lots shall be accessible by driveways to the parking lots of adjacent nonresidential uses and land zoned for nonresidential uses. |
| ☒ | ☐ | ☐ | XV-H(a)10 Except where physical constraints, site configuration, or safety considerations preclude strict compliance, no parking or loading shall be permitted within the required front yard setback. |
| ☐ | ☒ | ☐ | XV-H(a)11Traffic calming measures such as crosswalks, bike lanes, rumble strips, and landscaped islands may be required. **No crosswalks, bike lanes or rumble strips proposed.** |
| ☐ | ☐ | ☒ | XV-H(a)12 All off-site construction on state roadways shall comply with the Department of Massachusetts Highway Department (MHD) standards, specifications, or special conditions as applicable as well as requirements listed under CMR 521 as amended for the Massachusetts Architectural Access Board (MAAB) unless waived by MHD and or MAAB. |

***XV- H(b) Site plan and architectural design***

| *Yes* | *No* | *N/A* | *Content:* |
|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(b)1 Height |
| ☒ | ☐ | ☐ | XV-H(b)2 Bulk and general massing (footprint, shape, articulation or detail) |
| ☒ | ☐ | ☐ | XV-H(b)3 Major divisions or rhythms of the façade (height and width proportions, building lines, etc.) Where appropriate large continuous buildings shall be avoided and massing of buildings should be broken or staggered to reflect the historic scale of existing buildings and traditional development patterns of Newburyport. |

☐ ☒ ☐ XV-H(b)4 Rhythm of openings (i.e. # windows, spacing, window and doors relationships.) **No spacing provided.**

☐ ☒ ☐ XV-H(b)5 Roof treatments (slope, articulation surface). Rooftop mechanical equipments shall be screened from view by rook forms or other appropriate screening devices.

☒ ☐ ☐ XV-H(b)6 Materials, colors, and textures of building and signage. In general, natural materials such as stone, brick, wood siding, shingles, slate, etc. are preferred to industrial or artificial materials such as exposed concrete, anodized or galvanized metal, tinted glass, plastics vinyl, etc.

***XV-H(b)7 General Architectural Character***

| Yes | No | N/A | Content: | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(b)7i | Horizontal or vertical emphasis of building. |
| ☒ | ☐ | ☐ | XV-H(b)7ii | Scale (height and width proportions). |
| ☒ | ☐ | ☐ | XV-H(b)7iii | Stylistic features and themes. |
| ☒ | ☐ | ☐ | XV-H(b)7iv | Setbacks. |
| ☐ | ☐ | ☒ | XV-H(b)7v | All proposed structures within a local historic district shall require a certificate of appropriateness form the historical commission. |
| ☐ | ☐ | ☒ | XV-H(b)7vi | additional dimensional and setback requirements, etc. |

***XV- H(c) Lighting***

Protection of adjoining premises or open space areas against detrimental off-site glare or spillover light.

| Yes | No | N/A | Content: | |
|---|---|---|---|---|
| ☐ | ☒ | ☐ | XV-H(c)1 | The goal of exterior lighting shall be to make development safe and identify and accent key elements in the project's design. **Not provided** |
| ☐ | ☒ | ☐ | XV-H(c)2 | Lighting poles and structures should be appropriately scaled and styled for the project. Pedestrian areas should have poles ten (10) to twelve (12) feet high and parking areas should have poles eighteen (18) to twenty-two (22) feet high. The pole heights should determine the overall spacing of the poles and fixtures shall be of the cutoff luminaire type. Off-site illumination to adjacent properties shall not exceed 0.2-foot candles as measured at the property line. Lamp type should be metal halide to provide a natural uniform quality of light. Parking and pedestrian light fixtures should be compatible with the building lighting to provide for a contiguous appearance of the project. **Not provided.** |
| ☐ | ☒ | ☐ | XV-H(c)3 | If requested by the board, a registered engineer or a lighting consultant shall prepare a photometric analysis of site lighting. **Not provided**. |

***XV- H(d) Landscaping:***

| Yes | No | N/A | Content: | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(d)1 | Except for zoning districts where the setback requirements are less than 20 feet, a landscaped buffer strip at least twenty (20) feet wide, continuous except for approved driveways, shall be established adjacent to any public road to visually separate parking and other uses from the road. Unless waived by the board due to safety, pedestrian uses, or lot shape, the buffer strip shall be planted with grass, medium height shrubs, and shade trees having a minimum 3 inches in caliper planted at least every thirty (30) feet along the road frontage. At all street or driveway intersections, trees or shrubs shall be set back a sufficient distance from such intersections so that they do not present an obstruction to sightlines. |
| ☐ | ☐ | ☒ | XV-H(d)2 | Except for zoning districts with no side-yard setback requirements, a continuous landscaped buffer strip between business and industrial districts and any residential districts and/or property lines shall be provided for new development and maintained in perpetuity. In particular, circumstances where said buffer strip may be impractical to apply, given safety, land use, permitted setbacks, lot shape or historic preservation considerations, the planning board may vary the landscape buffer requirements. The landscape buffer strip shall be of a density to substantially screen the development in question from view, along the zoning district line in question. Plantings of various approved evergreen species are encouraged and shall be planted at a minimum height of six (6) feet. Fencing may be |

allowed in lieu or in conjunction with plantings. Design and height of said fencing shall be subject to the approval of the planning board..

| Com | Inc | N/A | Content: |
|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(d)3 Other than for existing retaining walls, new retaining walls shall be constructed to a maximum height of six(6) feet. If site conditions require elevation changes of greater than six (6) feet, retaining walls shall be terraced and landscaped. New retaining walls facing residential districts shall be solid fieldstone or fieldstone veneer or other similar material. Unless used within the industrial districts, vertical cast in place concrete or concrete blocks shall not be permitted. |
| ☐ | ☐ | ☒ | XV-H(d)4 Surface parking lots containing over 20 spaces shall have at least one shade tree per ten (10) parking spaces, such trees to be a minimum of 2 1/2 inches in diameter and located either in the parking area or within 10 feet of it. At least 5% of the interior of the parking area shall be maintained with landscaping, including trees, in landscape islands or plots of at least nine (9) feet in width with no more than 20 parking spaces between each island or plot. Trees shall be located to provide visual relief from sun and wind interruption within the parking area and assure safe patterns of internal pedestrian and vehicular traffic. Other traffic calming measures such as crosswalks, bike lanes, rumble-strips, and landscape islands may be required as necessary. |
| ☐ | ☒ | ☐ | XV-H(d)5 Exposed storage areas, machinery, service areas, truck loading areas, utility buildings and structures and other unsightly uses shall be screened from view from neighboring properties and streets using dense, hardy evergreen plantings, or earthen berms, or wall or tight fence complemented by evergreen plantings. **Not screened** |
| ☒ | ☐ | ☐ | XV-H(d)6 All landscaped areas shall be properly maintained. Shrubs or trees, which die within the first year, shall be replaced within one growing season as a condition of approval. The board strongly encourages the use of drought resistant native plant species. |

***XV- H(e) Storm water runoff :***

The site plan shows or includes adequate provisions for measures to prevent pollution of surface or groundwater, minimizing erosion and sedimentation, and measures to prevent changes in groundwater levels, increased run-off, and potential for flooding. The plan shall include: **See specific comments on stormwater management**

| Yes | No | N/A | Content: |
|---|---|---|---|
| ☐ | ☐ | ☐ | XV-H(e)1 A plan consistent with the Massachusetts Storm-Water Management Policy (SWMP), where the rate of surface water run-off from the site shall not be increased after construction. If needed to meet this requirement and maximize groundwater recharge, increased run-off from impervious surfaces shall be recharged on site by being diverted to vegetated surfaces for infiltration or through the use of subsurface infiltration systems, retention or detention ponds. Dry wells shall be used only where other methods are unfeasible and shall require oil, grease, and sediment traps to facilitate removal of contaminants. The plan shall also be consistent with the Phase III National Pollution Discharge Elimination System (NPDES) requirements as adopted by the City of Newburyport. |
| ☐ | ☐ | ☐ | XV-H(e)2 Neighboring properties shall not be adversely affected by excessive run-off. |
| ☐ | ☐ | ☐ | XV-H(e)3 A detailed stormwater management plan will also be required. |

XV- H(f) Water Quality:

| Yes | No | N/A | Content: | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(f) | Groundwater recharge shall be maximized and groundwater quality shall be protected. Various techniques may be required to maximize recharge, such as perforated drainpipes, reduction of paved areas, and reduction of building coverage. Installing grease traps, and/or gas/oil separators to improve water quality may also be required. Where the groundwater elevation is close to the surface extra site grading precautions may be taken to maintain the protective function of the overburden. |

***XV- H(g) Wetlands:***

| Yes | No | N/A | Content: | |
|---|---|---|---|---|
| ☐ | ☐ | ☒ | XV-H(g) | In order to minimize design and permitting conflicts, when wetland replacement or mitigation is required, the application shall include, if completed, a copy of the plan submitted in accordance with the regulations of the Newburyport Conservation Commission. |

***XV- H(h) Erosion Control:***

Erosion of soil and sedimentation of streams and water bodies shall be minimized using the following erosion practices:

| | | | | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(h)1 | Exposed or disturbed areas due to stripping of vegetation, soil removal, and regrading shall be permanently stabilized within six months of occupancy of a structure. |
| ☒ | ☐ | ☐ | XV-H(h)2 | During construction, temporary vegetation and/or mulching shall be used to protect exposed area from erosion. Until a disturbed area is permanently stabilized, sediment in run-off water shall be trapped by using staked hay bales or sedimentation traps. |
| ☒ | ☐ | ☐ | XV-H(h)3 | Permanent erosion control and vegetative measures shall be in accordance with the erosion/sedimentation/vegetative practices recommended by the Soil Conservation Service. |
| ☒ | ☐ | ☐ | XV-H(h)4 | All slopes exceeding fifteen (15) percent resulting from site grading shall be both covered with four (4) inches of topsoil and planted with a vegetative cover sufficient to prevent erosion or to be stabilized by a retaining wall. |
| ☒ | ☐ | ☐ | XV-H(h)5 | Dust control shall be used during grading operations if the grading is to occur within two hundred (200) feet of an occupied residence or place of business. Dust control methods may consist of grading fine soils on calm days only or dampening the ground with water. |

***XV- H(i) Utilities:***

| | | | | |
|---|---|---|---|---|
| ☒ | ☐ | ☐ | XV-H(i)1 | Except for preexisting overhead connections, all electric, telephone, cable TV and other such utilities shall be underground from the roadway utilities. |
| ☒ | ☐ | ☐ | XV-H(i)2 | In order to minimize design and permitting conflicts, the applicant must demonstrate that the proposed development will be permitted to connect to the public sewer, water, and other service systems. If sewerage is to be treated on site, the application shall include, if completed, a copy of the plan submitted in accordance with the regulations of the Board of Health. |

CHRISTIANSEN & SERGI, INC.
PROFESSIONAL ENGINEERS AND LAND SURVEYORS
160 SUMMER STREET, HAVERHILL, MA 01830

**City of Newburyport Planning Board**
**Site Plan Review**

| | |
|---|---|
| Review Date: | 4/26/18 |
| Plan Title: | Proposed Building Addition Site Plan |
| Applicant: | Port City Realty, LLC |
| Applicant's Engineer: | Cornerstone |
| Plan Date: | March 30, 2018 |

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The submitted plan set was reviewed for compliance with the City of Newburyport Site Plan Review. The applicant has submitted the following plans and documents for Christiansen & Sergi, Inc. (CSI) to review:

1. Plans entitled Proposed Building Addition; Sheets C1 – C8, dated 3/30/2018
2. Application for Site Plan Review, dated 3/30/2018.
3. Stormwater Analysis, last revised 3/30/2018.
4. Architectural Plans, Sheets A101 - A102, dated 4/2/2018.
5. Landscape Plan, Sheet L1, dated 3/30/18

A compliance checklist comparing the plan's content to the City of Newburyport requirements for a site plan is attached. While there are many areas in which the plan is non-compliant the Board should consider which of those required items are necessary to be added to the plan and which are not needed

We have listed below those non-compliant issues we consider to be of most Importance as well as engineering design issues that need to be addresses so that the project will be built and function as intended.

1. The entire Stormwater Management System should be reviewed and revised. The use of a minimum Time of Concentration is not acceptable with the use of a computer software such as HydroCAD. As the applicant stated this program is SCS TR 20 based which offers no minimum time of concentration. Actual time of concentrations should be calculated for each subcatchment. Direct input of 6 minute times of concentration provides for lower peak flows and then for smaller BMPs to comply with stormwater

regulations. Calculating actual times of concentration will provide larger peak flows and then require larger BMPs to actually control peak runoff.

2. A structure should be proposed at any bend in the drainage line.

3. The area of the post development analysis does not match the pre-development area.

4. The groundwater elevation within the Underground Infiltration area is incorrect. The elevation of test pit 1 is 16.29, however the existing grade at the highest end of the infiltration system is 18.5. Test pit 1 had ESHWT at 26" and test pit 2 had an ESHWT at 21". Interpolating between the two test pits ESHWT would result in an ESHWT of 23". This should be taken from the highest elevation within the infiltration system. ESHWT within the infiltration system would be 16.59 which would require the bottom of the stone beneath the chambers to be at a minimum of 18.59. The system should be raised to ensure it has the required 2" separation to groundwater.

5. The separation distance between the rim and invert of the catch basins should be confirmed for constructability. The catch basins with a flat top should be specified.

6. Drain manholes requiring a flat top should be specified.

7. Catch basin frames and grates should be specified.

8. The bypass manholes should be reviewed for constructability. It may be difficult to construct a diversion wall in a 48" structure. The Bypass Structure detail should be revised to show the correct DMH and inverts.

9. An erosion control detail should be provided.

10. A construction entrance should be proposed.

11. Spot grades should be provided at the new entrance for approximately 75' to ensure the water is draining as designed.

12. The outlet structure for Rain Garden 1 cannot be constructed as designed. A 4" orifice is proposed at elevation 15.8 which would make the top of the orifice at 16.13. The grate on top of the structure is proposed at 16.1. This orifice would be into the top of the structure and should be revised. The same is true for outlet structure 2. A 4" orifice is proposed at 18.3 and the grate on top of the structure is at 18.5. The top of this orifice would be above the top of the structure.

13. A riprap overflow is proposed on the abutting property. An easement should be provided or the riprap should be removed.

14. More information regarding the utilities connected to the existing building is required to ensure adequate cover will be provided. DPS should also review for compliance with City standards.

15. The modeling of the infiltration area should be explained. It appears some areas of stone may have been double-counted.

The Applicant should submit revised plans and a written response to these comments at their earliest convenience. The Applicant may request a digital copy of this review to expedite their response. Should the Applicant have any questions or comments regarding this review, the Applicant should correspond through the Planning Board, or may contact Christiansen & Sergi, Inc. at the discretion of the City of Newburyport Planning Board.

Regards,

Christiansen & Sergi, Inc.

**ATTACHMENT NO. 2**

**Revised Stormwater Analysis and Calculations Summary**

# Revised Stormwater Calculations Summary

The Stormwater Management System has been revised in order to address comments in the Christensen & Sergi, Inc. letter dated April 26, 2018. The changes are detailed in a response letter from Cornerstone dated May 18, 2018 that describes the revisions to each comments individually. To ease the review of the revised stormwater management system, the following summary tables have been updated from the original Stormwater Analysis and Calculations Report.

The following changes to the Proposed Conditions Analysis were made:

- Change the Time of Concentration (Tc) from 6 minutes to flow path Tc;
- The infiltration system design was revised to increase the separation to estimated season high groundwater;
- Outlet control structures were revised to address constructability concerns.

The updated Peak Rate of Runoff and Peak Rate Flow Summary tables are below.

The Existing Conditions Analysis was not revised, but the Existing Peak Rate of Runoff summary table is included below for reference.

**Existing Peak Rate of Runoff (cfs)**

| Storm Event | Design Point #1 | Design Point #2 | Design Point #3 |
|---|---|---|---|
| 2 year 24 hour | 0.63 | 1.24 | 0.55 |
| 10-year 24 hour | 1.11 | 3.13 | 1.19 |
| 25-year 24 hour | 1.45 | 4.60 | 1.66 |
| 50-year 24 hour | 1.85 | 6.43 | 2.23 |
| 100-year 24 hour | 2.21 | 8.17 | 2.76 |

**Time of Concentration Summary**

| | Time of concentration (min.) | | Net change in Peak Rate of Runoff (cfs) | | | | |
|---|---|---|---|---|---|---|---|
| Subcatchment | Previous | Revised | 2 year | 10 year | 25 year | 50 year | 100 year |
| SC 100 | 6.0 | 3.9 | 0.05 | 0.12 | 0.16 | 0.20 | 0.25 |
| SC 101 | 6.0 | 2.7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SC 102 | 6.0 | 2.6 | 0.04 | 0.06 | 0.07 | 0.09 | 0.10 |
| SC 200 | 6.0 | 1.8 | 0.02 | 0.02 | 0.03 | 0.04 | 0.05 |
| SC 201 | 6.0 | 2.6 | 0.01 | 0.03 | 0.03 | 0.04 | 0.04 |
| SC202 | 6.0 | 1.3 | 0.02 | 0.02 | 0.03 | 0.03 | 0.04 |
| SC203 | 6.0 | 3.6 | 0.03 | 0.05 | 0.05 | 0.08 | 0.09 |
| SC 204 | 6.0 | 1.1 | 0.05 | 0.06 | 0.09 | 0.10 | 0.12 |
| SC 205 | 6.0 | 1.1 | 0.04 | 0.05 | 0.06 | 0.08 | 0.08 |
| SC206 | 6.0 | 2.0 | 0.04 | 0.06 | 0.08 | 0.09 | 0.10 |
| SC 207 | 6.0 | 1.2 | 0.02 | 0.03 | 0.05 | 0.05 | 0.06 |
| SC 208 | 6.0 | 1.8 | 0.03 | 0.05 | 0.05 | 0.07 | 0.09 |
| SC 209 | 6.0 | 1.5 | 0.02 | 0.05 | 0.06 | 0.08 | 0.09 |
| SC 210 | 6.0 | 10.6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SC 300 | 6.0 | 5.8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

As demonstrated in the above table, revising the time of concentration to flow paths has no appreciable effect on the peak rate of runoff from each subcatchment. In reality, stormwater runoff calculations and the computer modeling software is not accurate enough specify the differences in flow rate as small as shown. Assigning a six minute minimum to small subcatchment areas provides a more realistic value for the hydraulic flow path; introduces less error into the model with Tc less than twice dt; and is based on sound engineering judgement. It is incorrect to state that minimum Tc is not acceptable and imply that the 6 minute Tc was chosen to reduce the size of the Stormwater Management BMPs.

The proposed condition peak flow analysis the three Design Points is summarized below.

**Proposed Peak Rate of Runoff (cfs) Comparison**

| Storm Event | Design Point #1 (previous) | Design Point #1 (revised) | Design Point #2 (previous) | Design Point #2 (revised) | Design Point #3 (previous) | Design Point #3 (revised) |
|---|---|---|---|---|---|---|
| 2 year 24 hour | 0.21 | 0.26 | 1.16 | 1.08 | 0.05 | 0.05 |
| 10-year 24 hour | 0.59 | 0.66 | 3.08 | 2.72 | 0.11 | 0.11 |
| 25-year 24 hour | 0.82 | 1.00 | 4.48 | 3.91 | 0.15 | 0.15 |
| 50-year 24 hour | 1.19 | 1.34 | 6.26 | 5.35 | 0.21 | 0.21 |
| 100-year 24 hour | 1.92 | 1.58 | 7.85 | 8.04 | 0.26 | 0.26 |

Summary of the net change in peak rate of runoff from pre to post conditions are provided below.

**Design Point #1 Peak Flow Comparison**

| Storm Event | Existing Conditions Peak Rate of Runoff (cfs) | Revised Proposed Conditions Peak Rate of Runoff (cfs) | Net difference in Peak Rate of Runoff (cfs) |
|---|---|---|---|
| 2-year 24 hour | 0.63 | 0.26 | -0.37 |
| 10-year 24 hour | 1.11 | 0.66 | -0.45 |
| 25-year 24 hour | 1.45 | 1.00 | -0.45 |
| 50-year 24 hour | 1.85 | 1.34 | -0.51 |
| 100- year 24 hour | 2.21 | 1.58 | -0.63 |

**Design Point #2 Peak Flow Comparison**

| Storm Event | Existing Conditions Peak Rate of Runoff (cfs) | Revised Proposed Conditions Peak Rate of Runoff (cfs) | Net difference in Peak Rate of Runoff (cfs) |
|---|---|---|---|
| 2-year 24 hour | 1.24 | 1.08 | -0.16 |
| 10-year 24 hour | 3.13 | 2.72 | -0.41 |
| 25-year 24 hour | 4.60 | 3.91 | -0.69 |
| 50-year 24 hour | 6.43 | 5.35 | -1.08 |
| 100- year 24 hour | 8.17 | 8.04 | -0.13 |

**Design Point #3 Peak Flow Comparison**

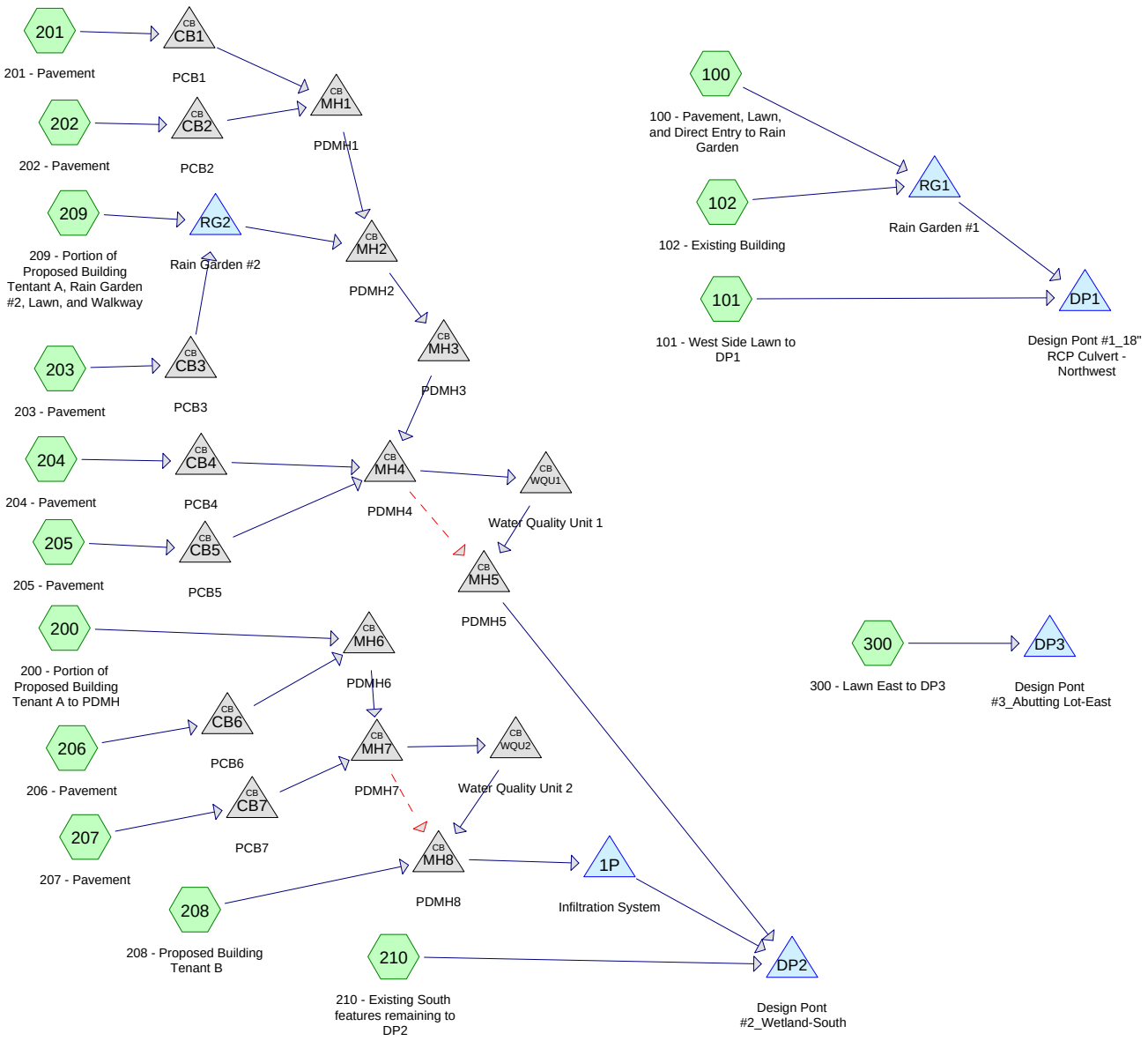
| Storm Event | Existing Conditions Peak Rate of Runoff (cfs) | Revised Proposed Conditions Peak Rate of Runoff (cfs) | Net difference in Peak Rate of Runoff (cfs) |
|---|---|---|---|
| 2-year 24 hour | 0.55 | 0.05 | -0.50 |
| 10-year 24 hour | 1.19 | 0.11 | -1.08 |
| 25-year 24 hour | 1.66 | 0.15 | -1.51 |
| 50-year 24 hour | 2.23 | 0.21 | -2.02 |
| 100- year 24 hour | 2.76 | 0.26 | -2.50 |

The revised HyroCAD Stormwater Calculations are attached for reference.

**ATTACHMENT NO. 3**

**Revised Proposed Conditions Analysis**

**Provided on Electronic Copy**




**Routing Diagram for PROPOSED 12-22-17 rev 5-14-18**
Prepared by Cornerstone, Printed 5/15/2018

## Area Listing (all nodes)

| Area (sq-ft) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 2,078 | 79 | 50-75% Grass cover, Fair, HSG C (209) |
| 7,219 | 74 | >75% Grass cover, Good, HSG C (100, 101, 201, 203, 300) |
| 35,498 | 65 | Brush, Good, HSG C (210) |
| 9,437 | 65 | Brush, Good, HSG C, Wetland Brush (210) |
| 33,796 | 98 | Paved parking, HSG C (100, 201, 202, 203, 204, 205, 206, 207) |
| 876 | 65 | Rain Garden Surface Area (209) |
| 6,173 | 65 | Rain Garden surface area (100) |
| 4,287 | 98 | Roofs, HSG C (208) |
| 5,175 | 98 | Roofs, HSG C, Existing Building (102) |
| 2,107 | 98 | Roofs, HSG C, Half Prop. Building A (200) |
| 84 | 98 | Unconnected pavement, HSG C (209) |
| 1,952 | 98 | Unconnected roofs, HSG C (209) |
| **108,682** | **80** | **TOTAL AREA** |

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 100: 100 - Pavement, Lawn,** Runoff Area=20,037 sf 45.35% Impervious Runoff Depth=1.46"
Flow Length=165' Tc=3.9 min CN=82 Runoff=0.82 cfs 2,435 cf

**Subcatchment 101: 101 - West Side Lawn to** Runoff Area=271 sf 0.00% Impervious Runoff Depth=0.97"
Flow Length=178' Tc=2.7 min CN=74 Runoff=0.01 cfs 22 cf

**Subcatchment 102: 102 - Existing Building** Runoff Area=5,175 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=165' Tc=2.6 min CN=98 Runoff=0.39 cfs 1,237 cf

**Subcatchment 200: 200 - Portion of** Runoff Area=2,107 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=157' Tc=1.8 min CN=98 Runoff=0.16 cfs 504 cf

**Subcatchment 201: 201 - Pavement** Runoff Area=2,187 sf 95.93% Impervious Runoff Depth=2.76"
Flow Length=91' Tc=2.6 min CN=97 Runoff=0.16 cfs 503 cf

**Subcatchment 202: 202 - Pavement** Runoff Area=1,651 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=90' Slope=0.0133 '/' Tc=1.3 min CN=98 Runoff=0.13 cfs 395 cf

**Subcatchment 203: 203 - Pavement** Runoff Area=5,013 sf 96.69% Impervious Runoff Depth=2.76"
Flow Length=100' Tc=3.6 min CN=97 Runoff=0.36 cfs 1,152 cf

**Subcatchment 204: 204 - Pavement** Runoff Area=4,813 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=122' Tc=1.1 min CN=98 Runoff=0.37 cfs 1,150 cf

**Subcatchment 205: 205 - Pavement** Runoff Area=3,480 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=107' Tc=1.1 min CN=98 Runoff=0.27 cfs 832 cf

**Subcatchment 206: 206 - Pavement** Runoff Area=5,141 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=125' Slope=0.0120 '/' Tc=2.0 min CN=98 Runoff=0.39 cfs 1,229 cf

**Subcatchment 207: 207 - Pavement** Runoff Area=2,680 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=108' Slope=0.0220 '/' Tc=1.2 min CN=98 Runoff=0.20 cfs 640 cf

**Subcatchment 208: 208 - Proposed** Runoff Area=4,287 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=145' Tc=1.8 min CN=98 Runoff=0.32 cfs 1,025 cf

**Subcatchment 209: 209 - Portion of** Runoff Area=4,990 sf 40.80% Impervious Runoff Depth=1.60"
Flow Length=108' Tc=1.5 min CN=84 Runoff=0.23 cfs 665 cf

**Subcatchment 210: 210 - Existing South** Runoff Area=44,935 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=210' Tc=10.6 min CN=65 Runoff=0.42 cfs 2,069 cf

**Subcatchment 300: 300 - Lawn East to DP3** Runoff Area=1,915 sf 0.00% Impervious Runoff Depth=0.97"
Flow Length=40' Slope=0.0300 '/' Tc=5.8 min CN=74 Runoff=0.05 cfs 155 cf

**Pond 1P: Infiltration System** Peak Elev=17.69' Storage=616 cf Inflow=1.06 cfs 3,397 cf
Discarded=0.26 cfs 3,404 cf Primary=0.00 cfs 0 cf Outflow=0.26 cfs 3,404 cf

**Pond CB1: PCB1** Peak Elev=16.82' Inflow=0.16 cfs 503 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.16 cfs 503 cf

**Pond CB2: PCB2** Peak Elev=16.79' Inflow=0.13 cfs 395 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.13 cfs 395 cf

**Pond CB3: PCB3** Peak Elev=18.37' Inflow=0.36 cfs 1,152 cf
12.0" Round Culvert n=0.013 L=64.0' S=0.0078 '/' Outflow=0.36 cfs 1,152 cf

**Pond CB4: PCB4** Peak Elev=15.44' Inflow=0.37 cfs 1,150 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0085 '/' Outflow=0.37 cfs 1,150 cf

**Pond CB5: PCB5** Peak Elev=15.12' Inflow=0.27 cfs 832 cf
12.0" Round Culvert n=0.013 L=93.0' S=0.0054 '/' Outflow=0.27 cfs 832 cf

**Pond CB6: PCB6** Peak Elev=20.27' Inflow=0.39 cfs 1,229 cf
12.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.39 cfs 1,229 cf

**Pond CB7: PCB7** Peak Elev=19.23' Inflow=0.20 cfs 640 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0091 '/' Outflow=0.20 cfs 640 cf

**Pond DP1: Design Pont #1_18" RCP Culvert - Northwest** Inflow=0.26 cfs 2,959 cf
Primary=0.26 cfs 2,959 cf

**Pond DP2: Design Pont #2_Wetland-South** Inflow=1.08 cfs 6,076 cf
Primary=1.08 cfs 6,076 cf

**Pond DP3: Design Pont #3_Abutting Lot-East** Inflow=0.05 cfs 155 cf
Primary=0.05 cfs 155 cf

**Pond MH1: PDMH1** Peak Elev=16.60' Inflow=0.28 cfs 897 cf
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=0.28 cfs 897 cf

**Pond MH2: PDMH2** Peak Elev=16.07' Inflow=0.41 cfs 2,025 cf
12.0" Round Culvert n=0.013 L=115.0' S=0.0052 '/' Outflow=0.41 cfs 2,025 cf

**Pond MH3: PDMH3** Peak Elev=15.38' Inflow=0.41 cfs 2,025 cf
12.0" Round Culvert n=0.013 L=138.0' S=0.0051 '/' Outflow=0.41 cfs 2,025 cf

**Pond MH4: PDMH4** Peak Elev=14.74' Inflow=0.92 cfs 4,007 cf
Primary=0.79 cfs 3,915 cf Secondary=0.12 cfs 93 cf Outflow=0.92 cfs 4,007 cf

**Pond MH5: PDMH5** Peak Elev=14.12' Inflow=0.92 cfs 4,007 cf
15.0" Round Culvert n=0.013 L=23.0' S=0.0087 '/' Outflow=0.92 cfs 4,007 cf

**Pond MH6: PDMH6** Peak Elev=19.84' Inflow=0.54 cfs 1,732 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=0.54 cfs 1,732 cf

**Pond MH7: PDMH7** Peak Elev=19.18' Inflow=0.74 cfs 2,373 cf
Primary=0.63 cfs 2,318 cf Secondary=0.11 cfs 54 cf Outflow=0.74 cfs 2,373 cf

**Pond MH8: PDMH8** Peak Elev=18.75' Inflow=1.06 cfs 3,397 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=1.06 cfs 3,397 cf

**Pond RG1: Rain Garden #1** Peak Elev=15.66' Storage=1,730 cf Inflow=1.20 cfs 3,671 cf
Outflow=0.26 cfs 2,937 cf

**Pond RG2: Rain Garden #2** Peak Elev=18.25' Storage=813 cf Inflow=0.59 cfs 1,817 cf
Outflow=0.28 cfs 1,128 cf

**Pond WQU1: Water Quality Unit 1** Peak Elev=14.34' Inflow=0.79 cfs 3,915 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=0.79 cfs 3,915 cf

**Pond WQU2: Water Quality Unit 2** Peak Elev=18.86' Inflow=0.63 cfs 2,318 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=0.63 cfs 2,318 cf

**Total Runoff Area = 108,682 sf Runoff Volume = 14,011 cf Average Runoff Depth = 1.55"**
**56.39% Pervious = 61,281 sf 43.61% Impervious = 47,401 sf**

## Summary for Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden

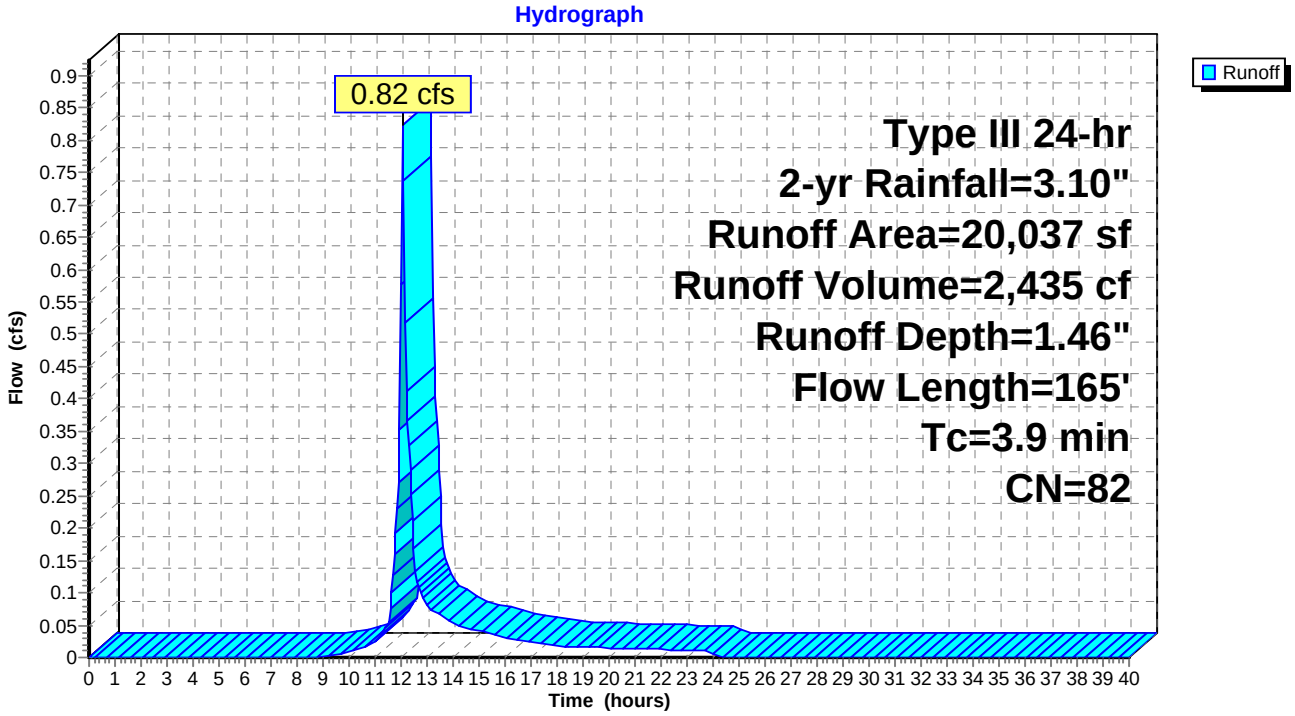
Runoff = 0.82 cfs @ 12.06 hrs, Volume= 2,435 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 4,778 | 74 | >75% Grass cover, Good, HSG C |
| * | 6,173 | 65 | Rain Garden surface area |
| | 9,086 | 98 | Paved parking, HSG C |
| | 20,037 | 82 | Weighted Average |
| | 10,951 | | 54.65% Pervious Area |
| | 9,086 | | 45.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 83 | 0.0180 | 1.27 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.8 | 17 | 0.0410 | 0.16 | | **Sheet Flow, Stone rip rap to RG** Grass: Short n= 0.150 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 3.9 | 165 | Total | | | |

## Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden



## Summary for Subcatchment 101: 101 - West Side Lawn to DP1

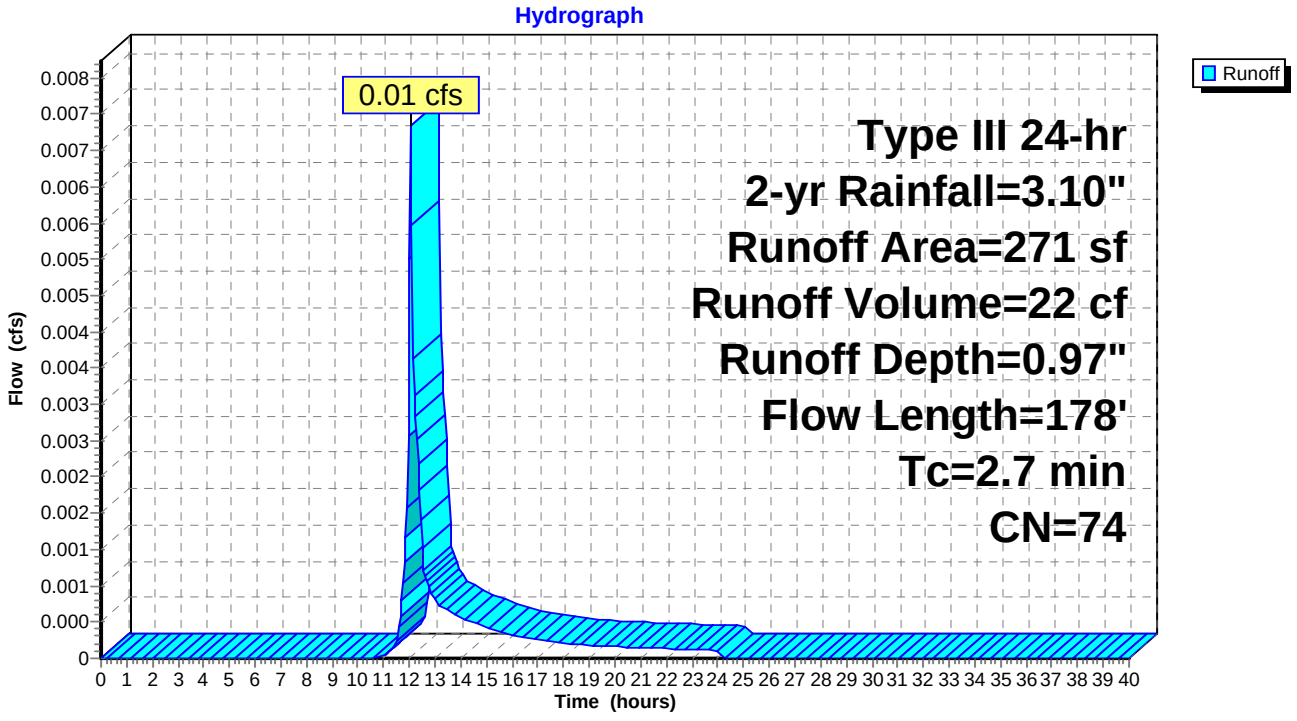
Runoff = 0.01 cfs @ 12.05 hrs, Volume= 22 cf, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 271 | 74 | >75% Grass cover, Good, HSG C |
| 271 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.4 | 100 | 0.0150 | 1.23 | | **Sheet Flow, Grass** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.3 | 78 | 0.0220 | 1.04 | | **Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps |
| 2.7 | 178 | Total | | | |

## Subcatchment 101: 101 - West Side Lawn to DP1



## Summary for Subcatchment 102: 102 - Existing Building

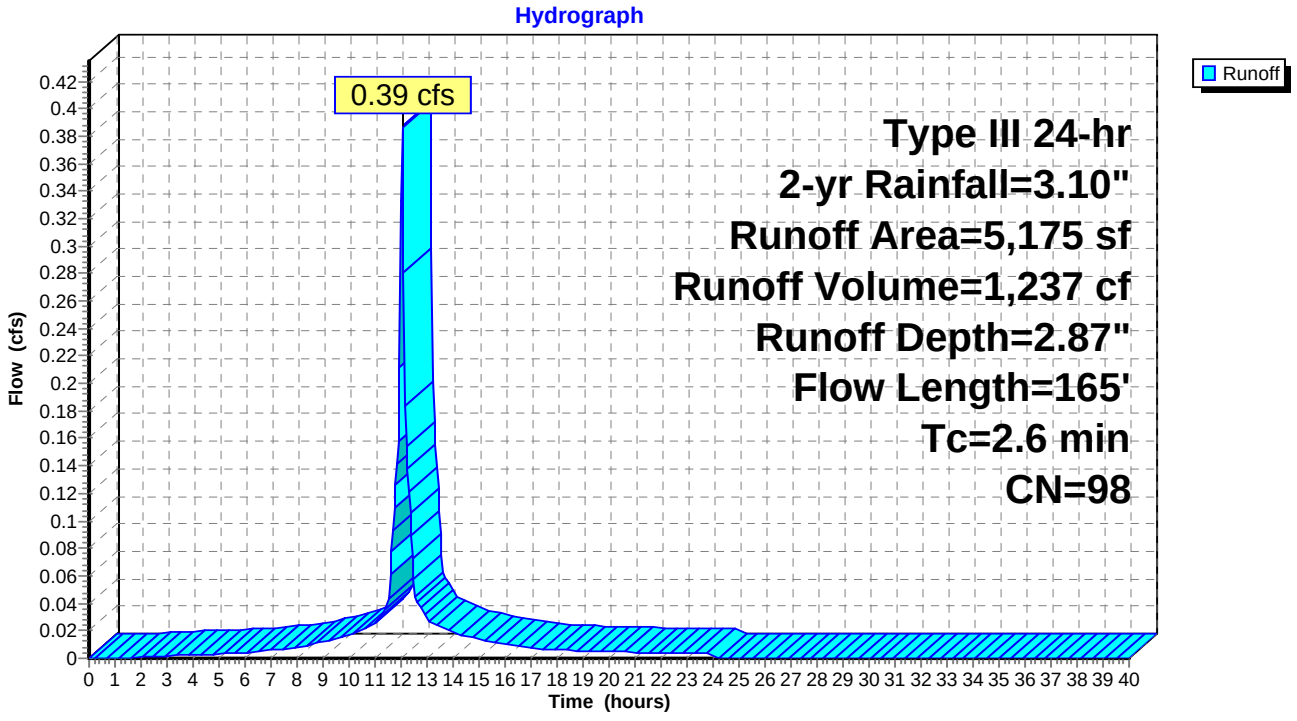
Runoff = 0.39 cfs @ 12.04 hrs, Volume= 1,237 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,175 | 98 | Roofs, HSG C, Existing Building |
| | 5,175 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.6 | 100 | 0.0100 | 1.05 | | **Sheet Flow, Estimated roof drain to rain garden** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 2.6 | 165 | Total | | | |

## Subcatchment 102: 102 - Existing Building



## Summary for Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH

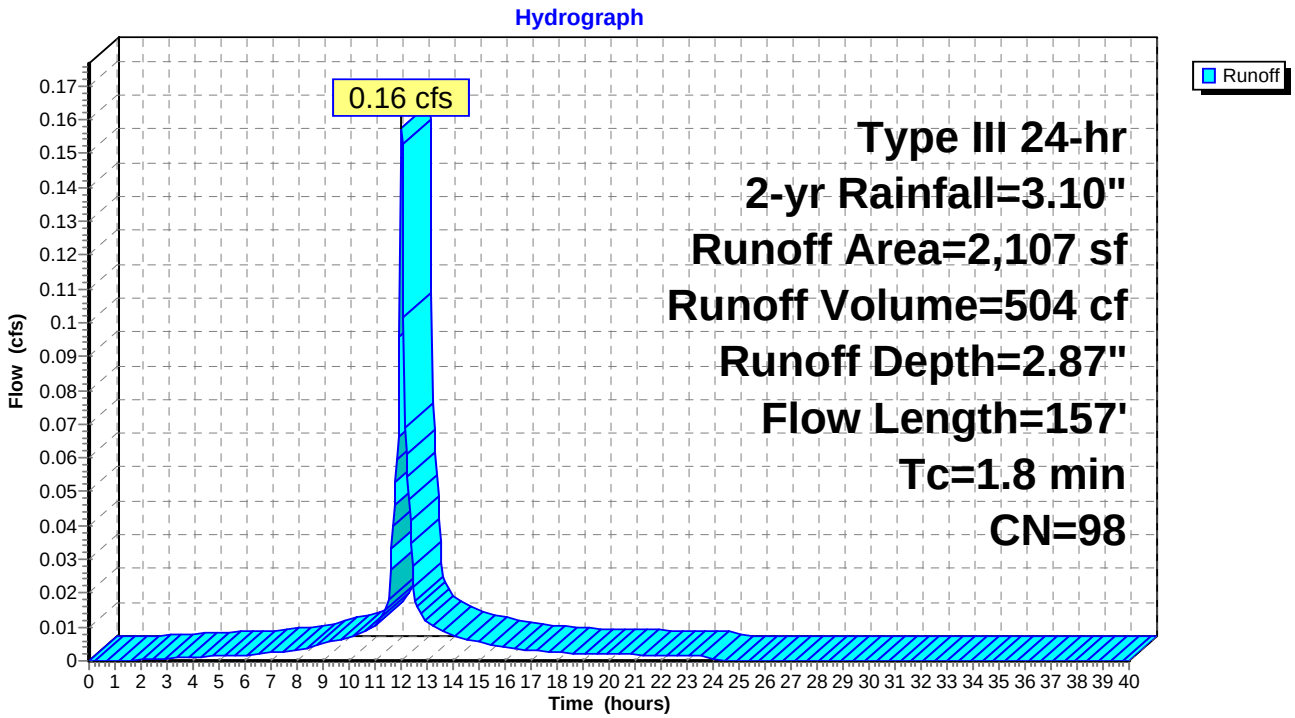
Runoff = 0.16 cfs @ 12.03 hrs, Volume= 504 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 2,107 | 98 | Roofs, HSG C, Half Prop. Building A |
| | 2,107 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 50 | 0.0050 | 0.69 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.6 | 107 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to PDMH - Estimated**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 157 | Total | | | |

### Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH



## Summary for Subcatchment 201: 201 - Pavement

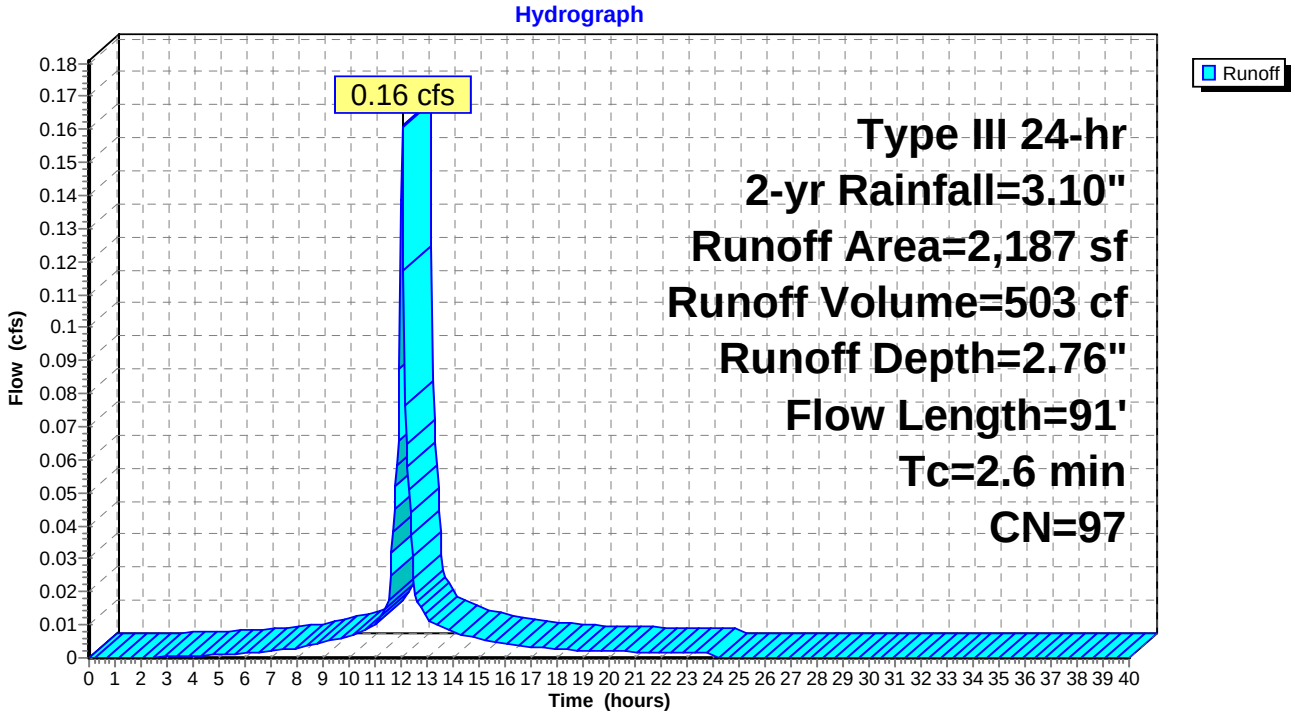
Runoff = 0.16 cfs @ 12.04 hrs, Volume= 503 cf, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 2,098 | 98 | Paved parking, HSG C |
| 89 | 74 | >75% Grass cover, Good, HSG C |
| 2,187 | 97 | Weighted Average |
| 89 | | 4.07% Pervious Area |
| 2,098 | | 95.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 6 | 0.0200 | 0.07 | | **Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.22" |
| 1.1 | 85 | 0.0170 | 1.25 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.6 | 91 | Total | | | |

## Subcatchment 201: 201 - Pavement



## Summary for Subcatchment 202: 202 - Pavement

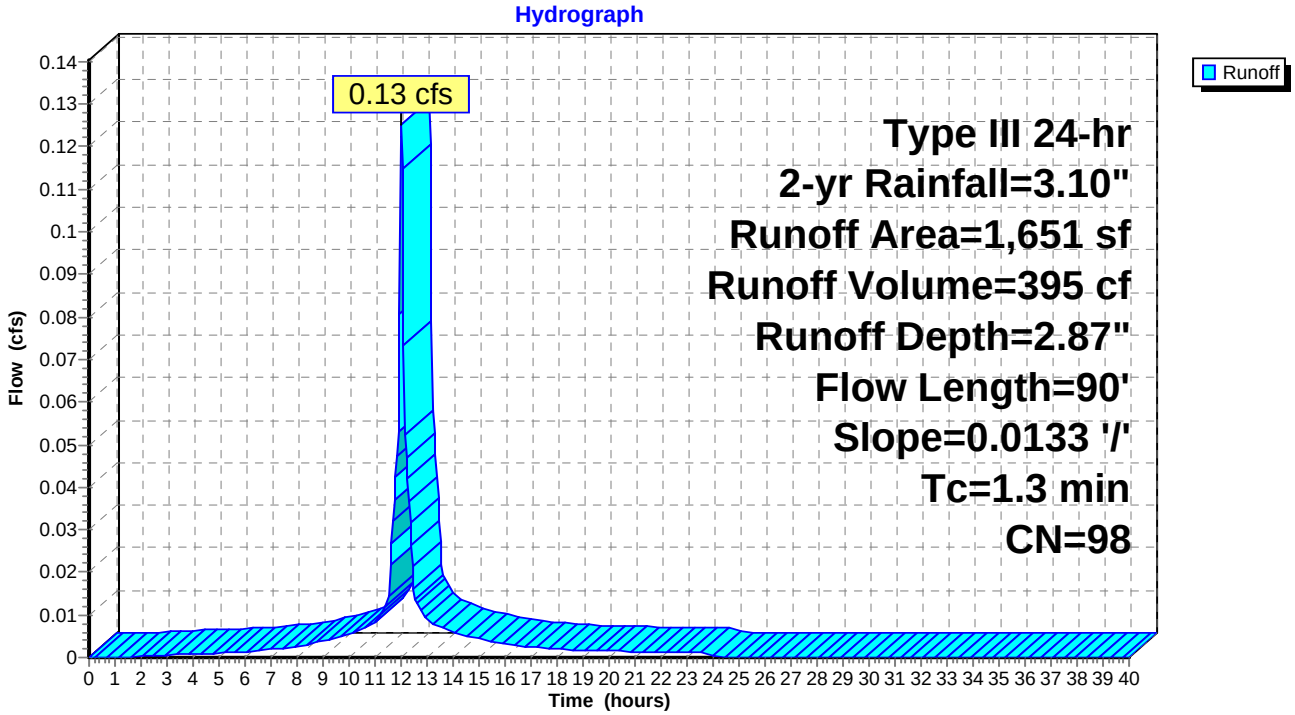
Runoff = 0.13 cfs @ 12.02 hrs, Volume= 395 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 1,651 | 98 | Paved parking, HSG C |
| 1,651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 90 | 0.0133 | 1.15 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |

## Subcatchment 202: 202 - Pavement



## Summary for Subcatchment 203: 203 - Pavement

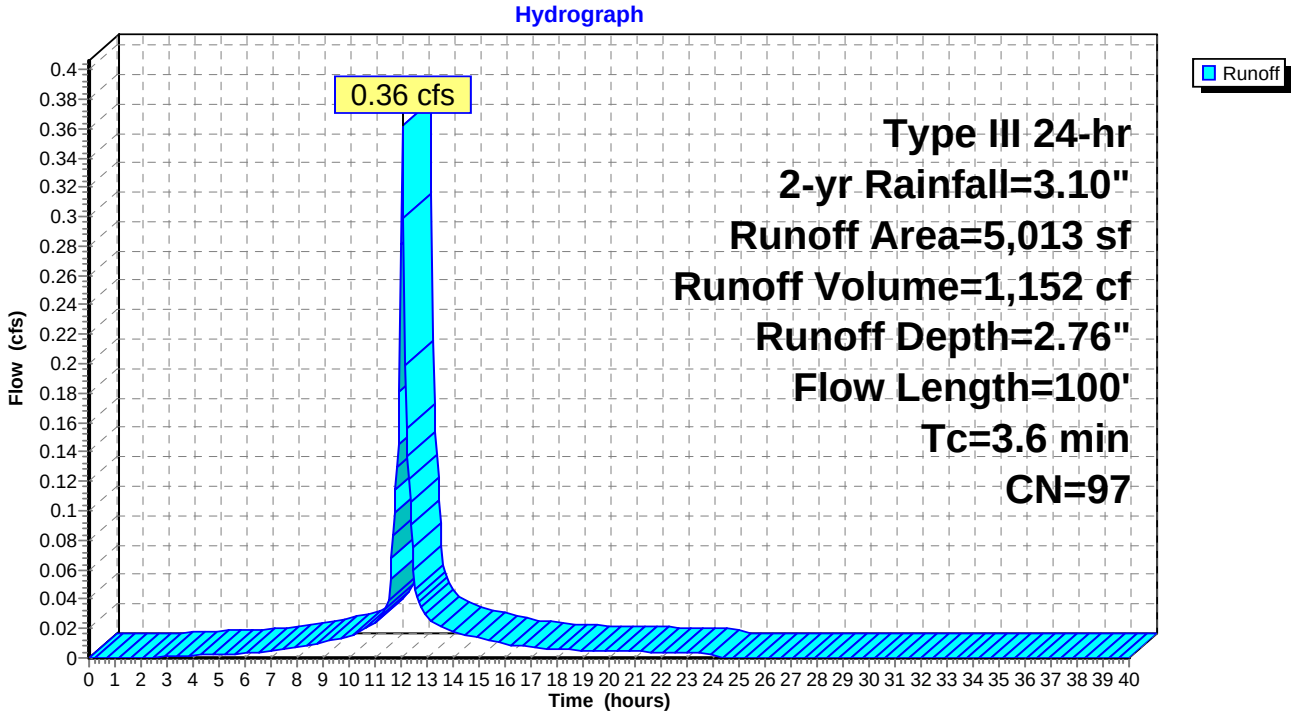
Runoff = 0.36 cfs @ 12.05 hrs, Volume= 1,152 cf, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 4,847 | 98 | Paved parking, HSG C |
| 166 | 74 | >75% Grass cover, Good, HSG C |
| 5,013 | 97 | Weighted Average |
| 166 | | 3.31% Pervious Area |
| 4,847 | | 96.69% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 2.6 | 12 | 0.0200 | 0.08 | | **Sheet Flow, Grass to Sidewalk** Grass: Dense n= 0.240 P2= 3.22" |
| 0.1 | 6 | 0.0150 | 0.70 | | **Sheet Flow, Sidewalk** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.9 | 82 | 0.0260 | 1.47 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 3.6 | 100 | Total | | | |

## Subcatchment 203: 203 - Pavement



## Summary for Subcatchment 204: 204 - Pavement

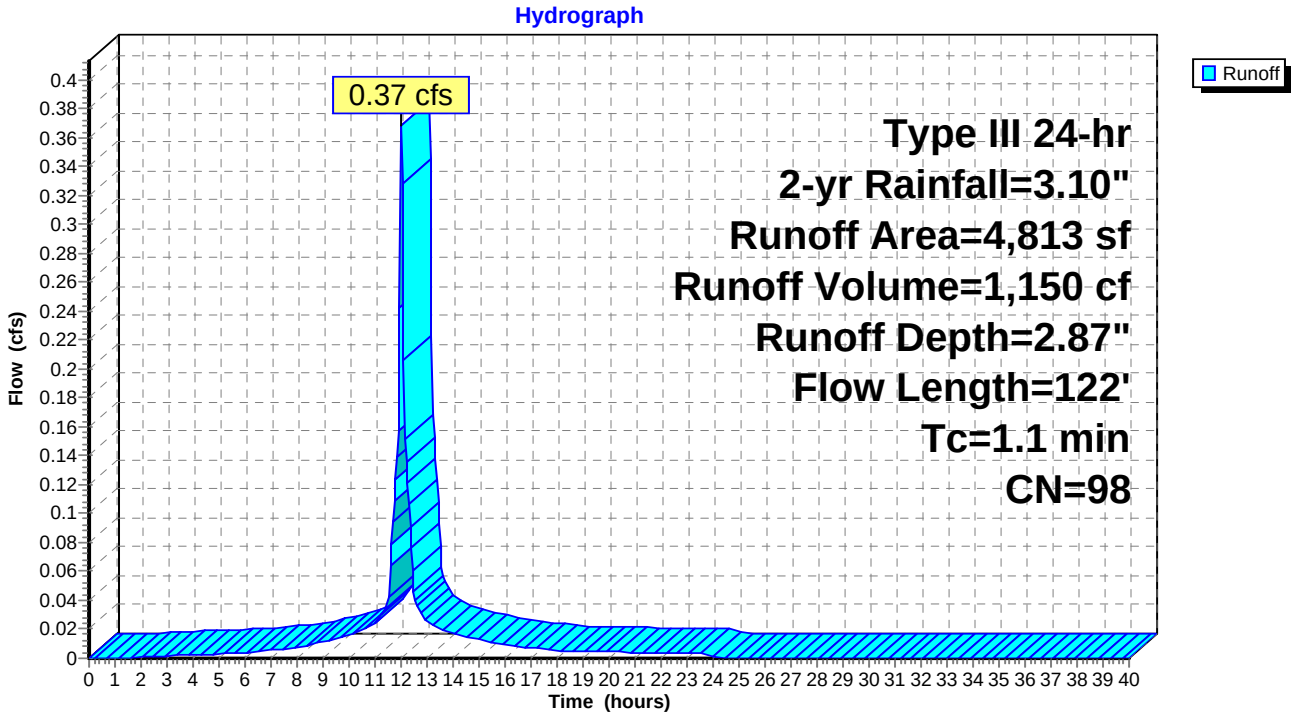
Runoff = 0.37 cfs @ 12.01 hrs, Volume= 1,150 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 4,813 | 98 | Paved parking, HSG C |
| 4,813 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.0 | 100 | 0.0300 | 1.62 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.1 | 22 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 122 | Total | | | |

## Subcatchment 204: 204 - Pavement



## Summary for Subcatchment 205: 205 - Pavement

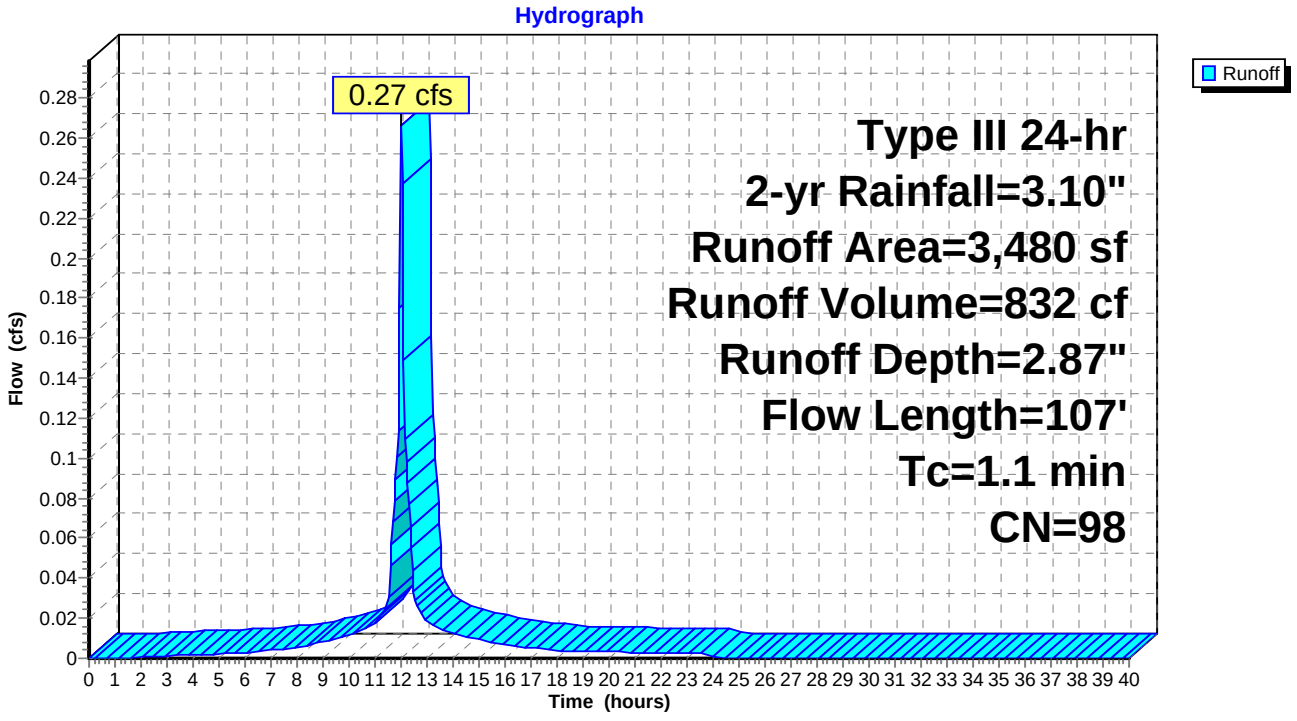
Runoff = 0.27 cfs @ 12.01 hrs, Volume= 832 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 3,480 | 98 | Paved parking, HSG C |
| 3,480 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 100 | 0.0270 | 1.56 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 7 | 0.0280 | 3.40 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 107 | Total | | | |

## Subcatchment 205: 205 - Pavement



## Summary for Subcatchment 206: 206 - Pavement

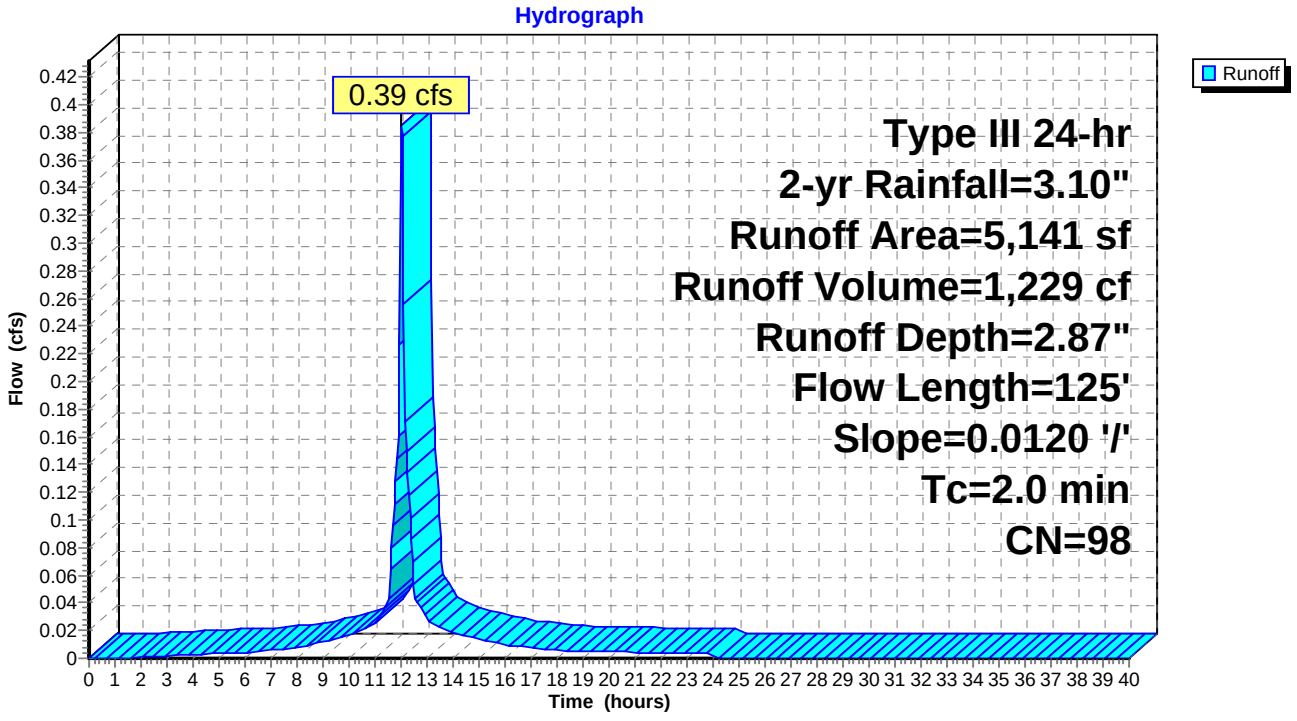
Runoff = 0.39 cfs @ 12.03 hrs, Volume= 1,229 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 5,141 | 98 | Paved parking, HSG C |
| 5,141 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 100 | 0.0120 | 1.12 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 25 | 0.0120 | 0.85 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.0 | 125 | Total | | | |

## Subcatchment 206: 206 - Pavement



## Summary for Subcatchment 207: 207 - Pavement

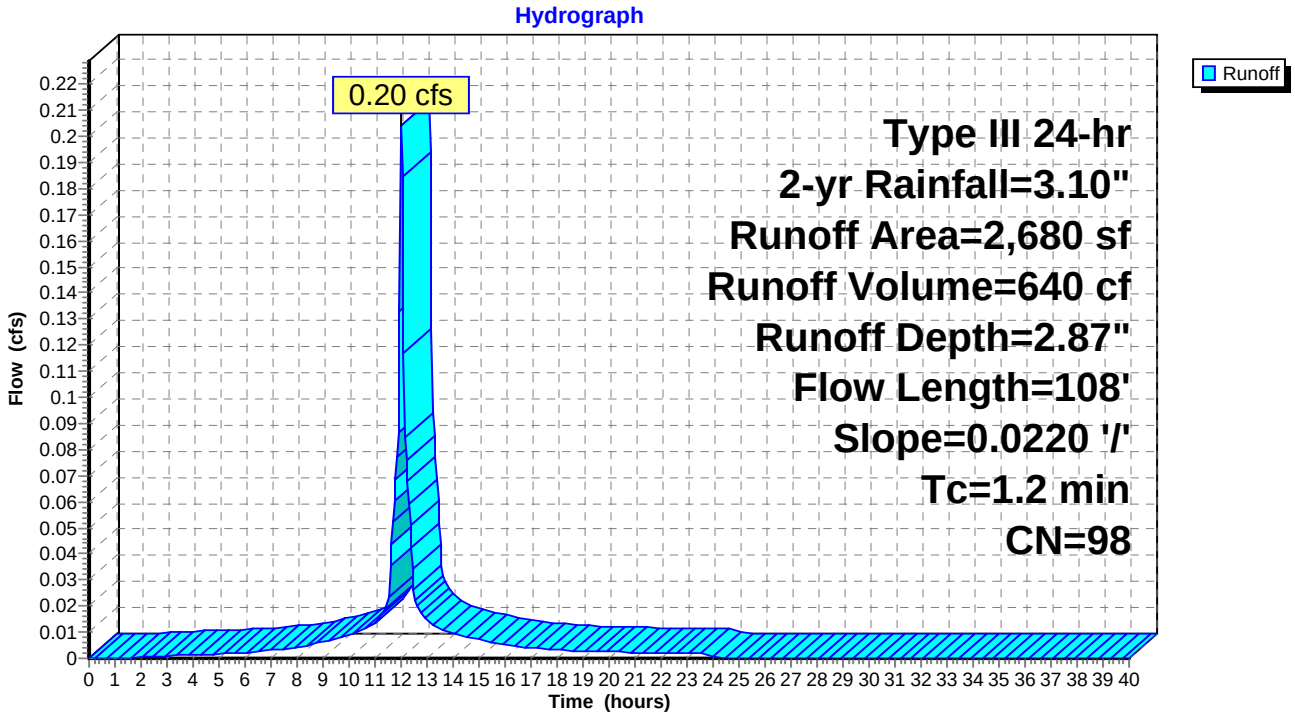
Runoff = 0.20 cfs @ 12.02 hrs, Volume= 640 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 2,680 | 98 | Paved parking, HSG C |
| 2,680 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 100 | 0.0220 | 1.43 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 8 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.2 | 108 | Total | | | |

## Subcatchment 207: 207 - Pavement



## Summary for Subcatchment 208: 208 - Proposed Building Tenant B

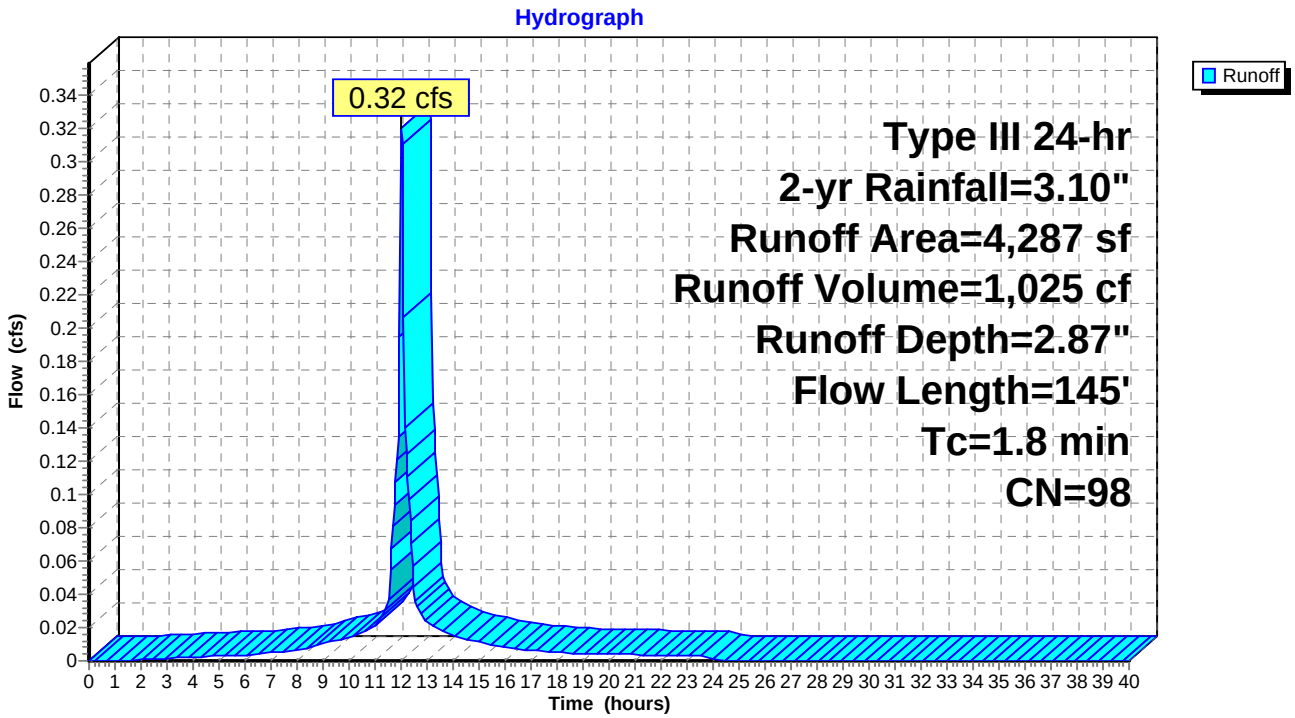
Runoff = 0.32 cfs @ 12.03 hrs, Volume= 1,025 cf, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 4,287 | 98 | Roofs, HSG C |
| 4,287 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 55 | 0.0050 | 0.70 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 90 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Estimated Roof Drain to PDMH**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 145 | Total | | | |

## Subcatchment 208: 208 - Proposed Building Tenant B



## mary for Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and W

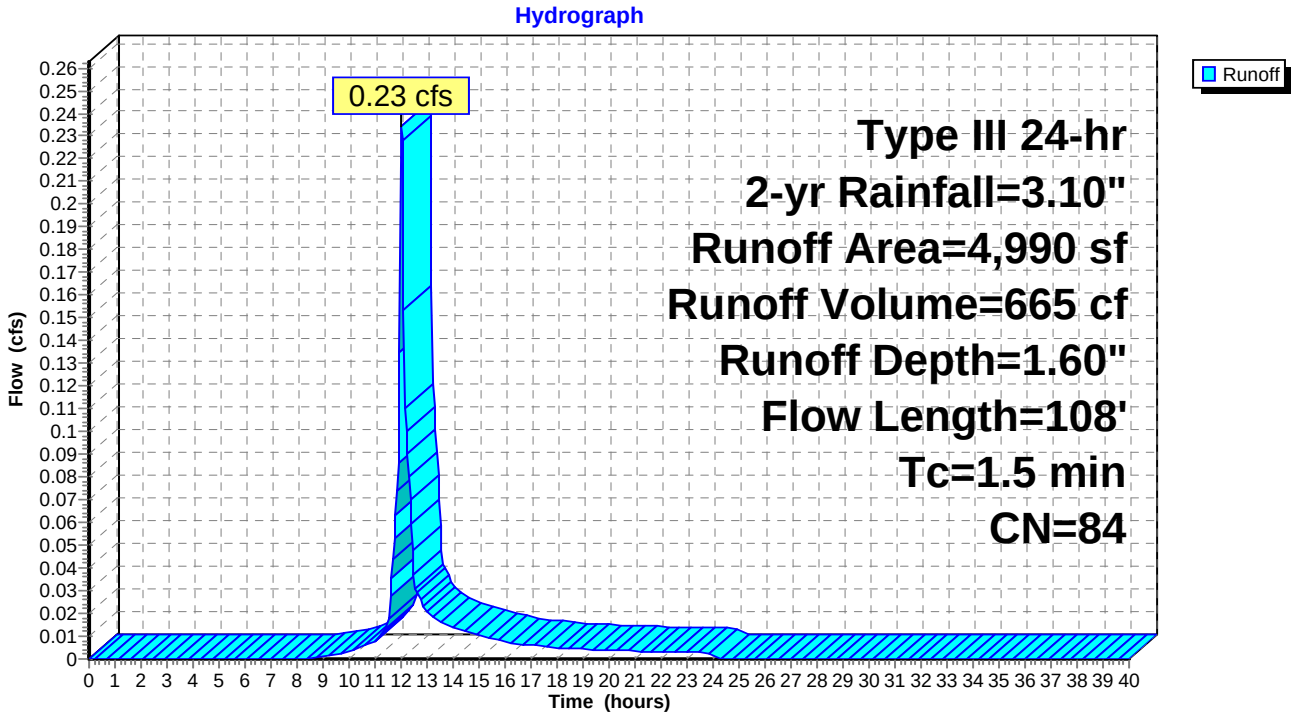
Runoff = 0.23 cfs @ 12.03 hrs, Volume= 665 cf, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 876 | 65 | Rain Garden Surface Area |
| | 2,078 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 84 | 98 | Unconnected pavement, HSG C |
| | 1,952 | 98 | Unconnected roofs, HSG C |
| | 4,990 | 84 | Weighted Average |
| | 2,954 | | 59.20% Pervious Area |
| | 2,036 | | 40.80% Impervious Area |
| | 2,036 | | 100.00% Unconnected |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 43 | 0.0050 | 0.67 | | **Sheet Flow, Flat Roof to Drain** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.4 | 65 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to Rain garden** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior |
| 1.5 | 108 | Total | | | |

## Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and Walkwa



## Summary for Subcatchment 210: 210 - Existing South features remaining to DP2

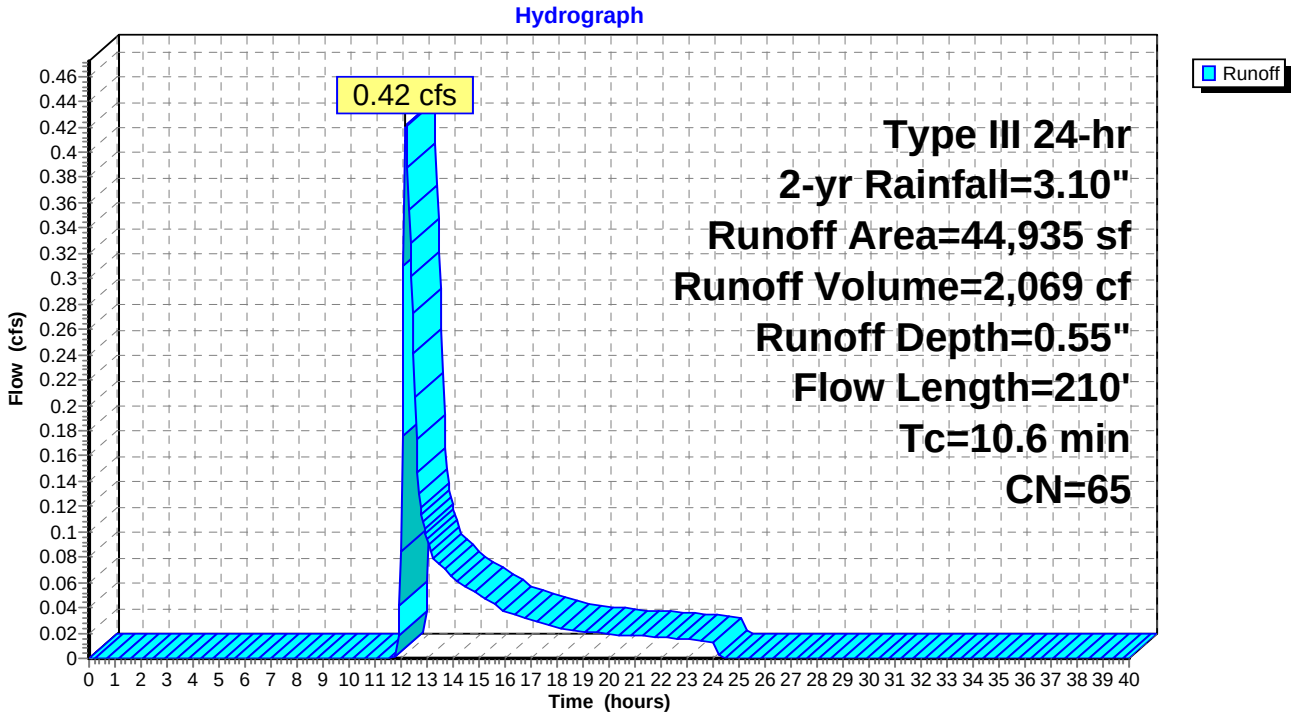
Runoff = 0.42 cfs @ 12.19 hrs, Volume= 2,069 cf, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 35,498 | 65 | Brush, Good, HSG C |
| * | 9,437 | 65 | Brush, Good, HSG C, Wetland Brush |
| | 44,935 | 65 | Weighted Average |
| | 44,935 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0600 | 0.18 | | **Sheet Flow,** Grass: Dense n= 0.240 P2= 3.22" |
| 1.4 | 110 | 0.0360 | 1.33 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 10.6 | 210 | Total | | | |

## Subcatchment 210: 210 - Existing South features remaining to DP2



## Summary for Subcatchment 300: 300 - Lawn East to DP3

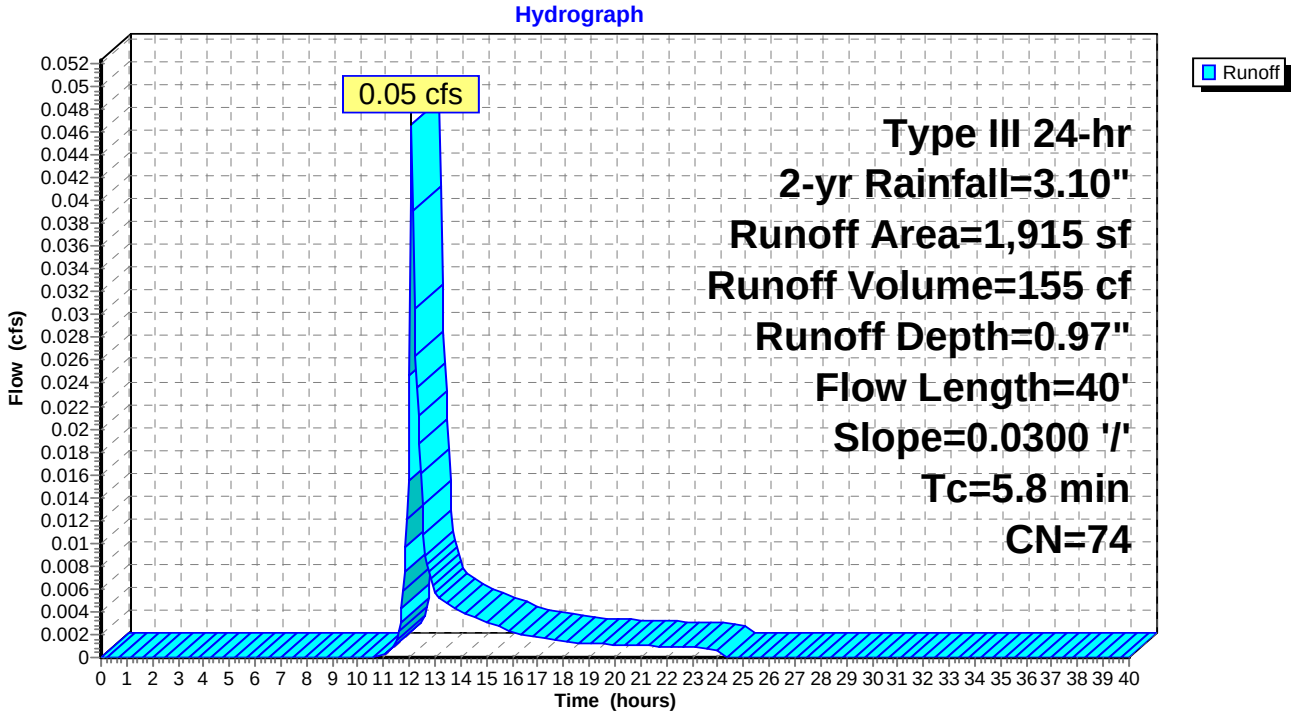
Runoff = 0.05 cfs @ 12.10 hrs, Volume= 155 cf, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.10"

| Area (sf) | CN | Description |
|---|---|---|
| 1,915 | 74 | >75% Grass cover, Good, HSG C |
| 1,915 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.8 | 40 | 0.0300 | 0.11 | | **Sheet Flow, Overland Flow**<br>Grass: Dense n= 0.240 P2= 3.22" |

## Subcatchment 300: 300 - Lawn East to DP3



## Summary for Pond 1P: Infiltration System

Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 1.06 cfs @ 12.03 hrs, Volume= 3,397 cf
Outflow = 0.26 cfs @ 11.80 hrs, Volume= 3,404 cf, Atten= 76%, Lag= 0.0 min
Discarded = 0.26 cfs @ 11.80 hrs, Volume= 3,404 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 17.69' @ 12.37 hrs Surf.Area= 1,342 sf Storage= 616 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 10.7 min ( 763.9 - 753.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 16.80' | 961 cf | **Stone field surrounding chambers (Irregular)** Listed below<br>3,623 cf Overall - 1,222 cf Embedded = 2,401 cf x 40.0% Voids |
| #2 | 17.30' | 1,222 cf | **Cultec R180 Chambers, 56 units** Listed below Inside #1 |
| | | 2,183 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 16.80 | 1,342 | 175.5 | 0 | 0 | 1,342 |
| 19.50 | 1,342 | 175.5 | 3,623 | 3,623 | 1,816 |

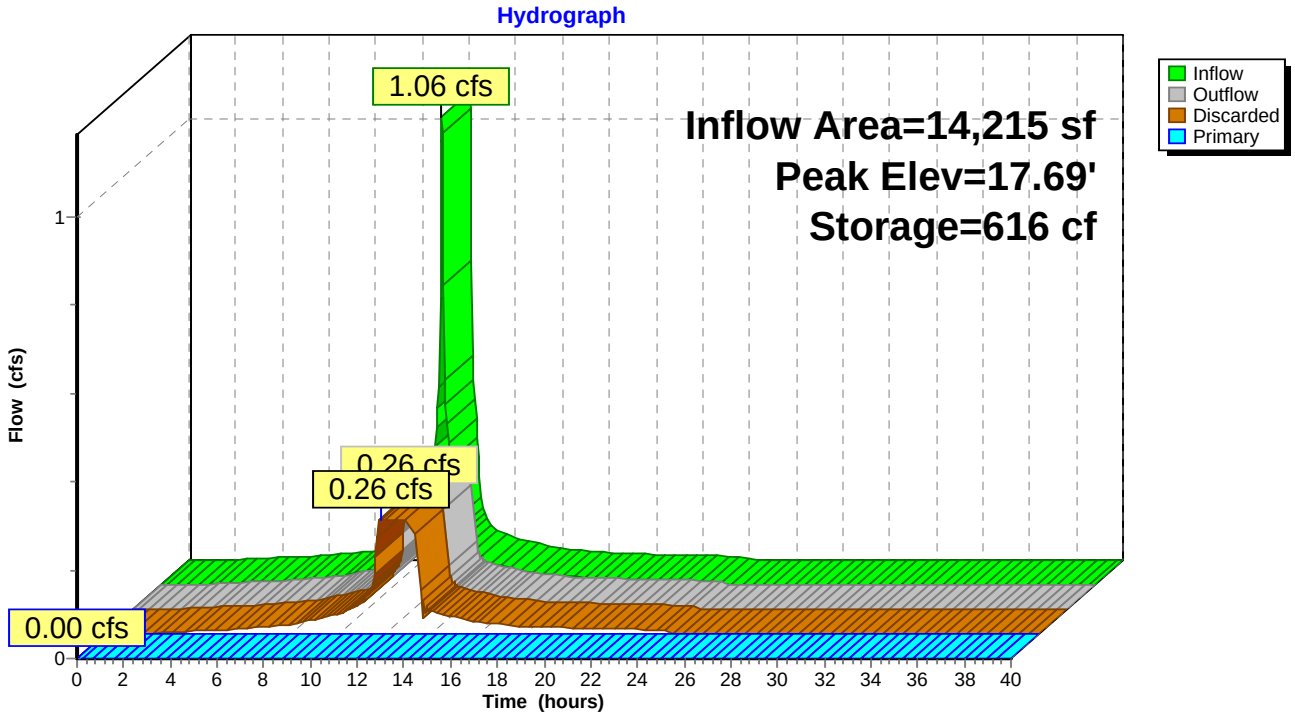
| Elevation (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|
| 17.30 | 0 | 0 |
| 18.10 | 460 | 460 |
| 18.70 | 522 | 982 |
| 19.00 | 240 | 1,222 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 16.80' | **8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01' |
| #2 | Device 3 | 19.00' | **4.0' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Primary | 16.80' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.80' / 16.50' S= 0.0143 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Discarded OutFlow** Max=0.26 cfs @ 11.80 hrs HW=16.85' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=16.80' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** ( Controls 0.00 cfs)
└**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: Infiltration System



## Summary for Pond CB1: PCB1

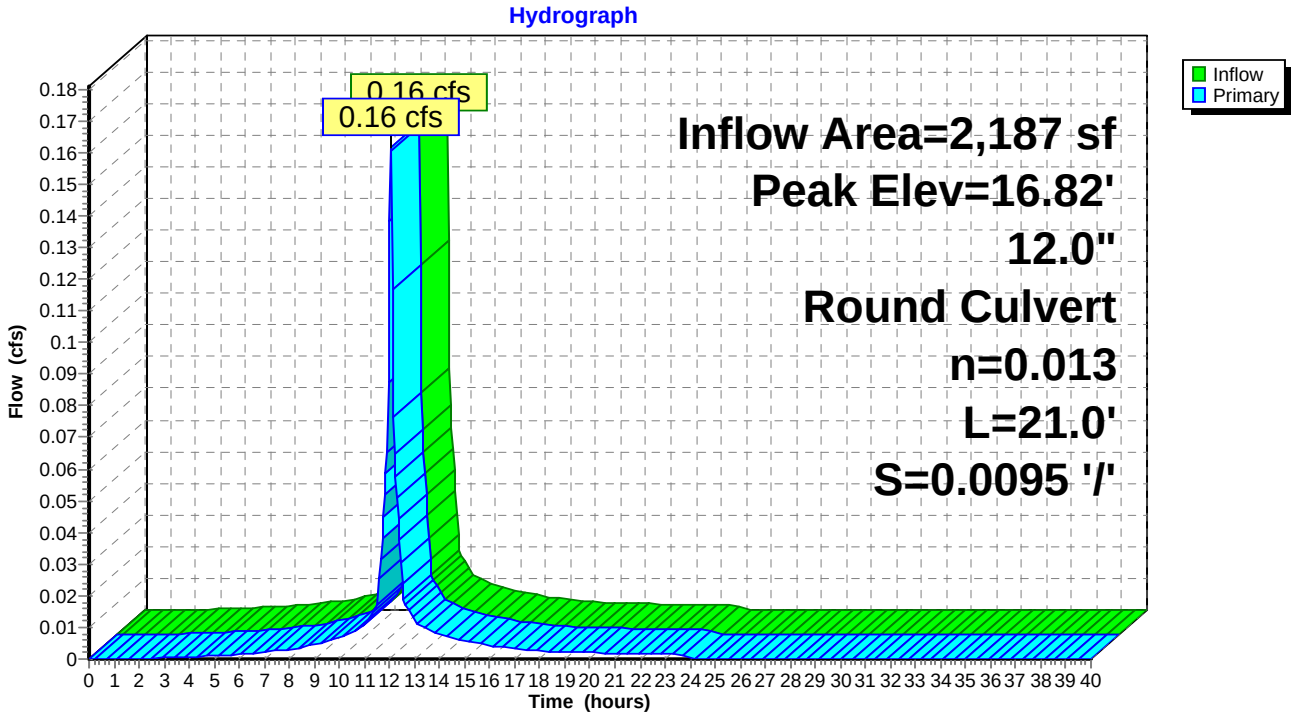
Inflow Area = 2,187 sf, 95.93% Impervious, Inflow Depth = 2.76" for 2-yr event
Inflow = 0.16 cfs @ 12.04 hrs, Volume= 503 cf
Outflow = 0.16 cfs @ 12.04 hrs, Volume= 503 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.16 cfs @ 12.04 hrs, Volume= 503 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.82' @ 12.04 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.15 cfs @ 12.04 hrs HW=16.82' TW=16.59' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.15 cfs @ 1.86 fps)

## Pond CB1: PCB1



## Summary for Pond CB2: PCB2

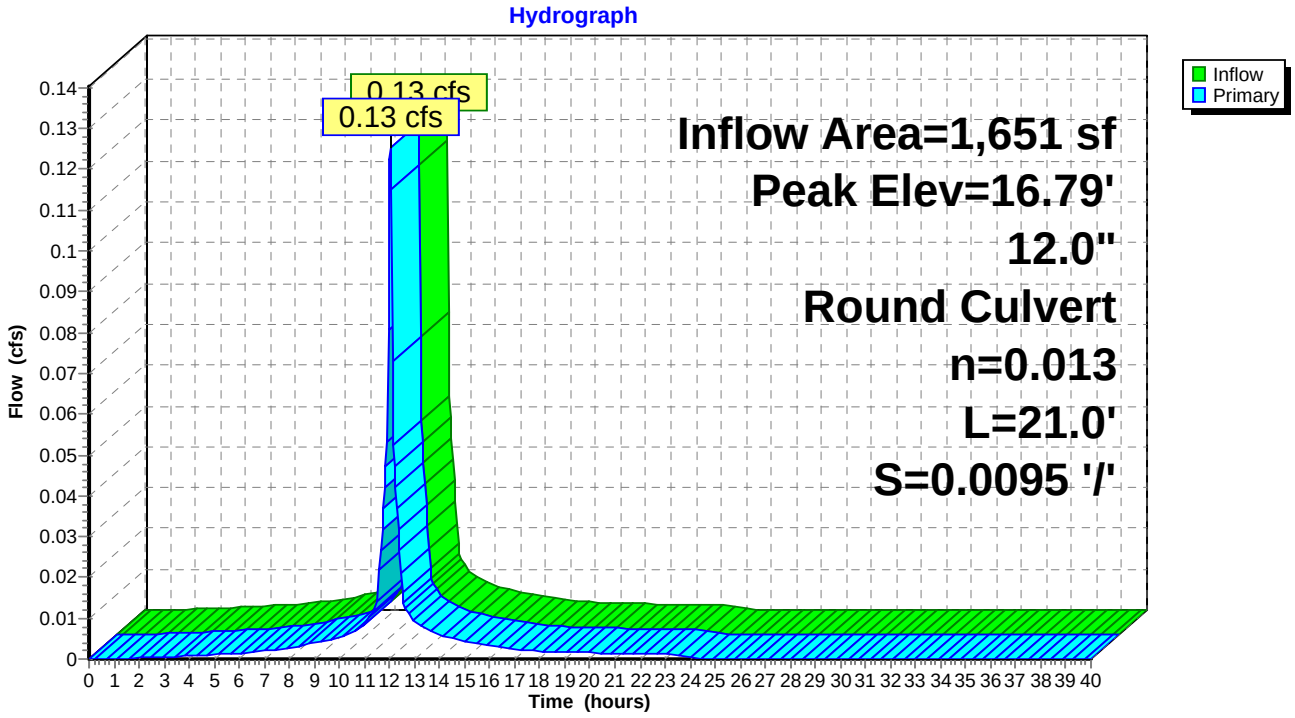
Inflow Area = 1,651 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 0.13 cfs @ 12.02 hrs, Volume= 395 cf
Outflow = 0.13 cfs @ 12.02 hrs, Volume= 395 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.13 cfs @ 12.02 hrs, Volume= 395 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.79' @ 12.02 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.12 cfs @ 12.02 hrs HW=16.79' TW=16.59' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.12 cfs @ 1.69 fps)

## Pond CB2: PCB2



## Summary for Pond CB3: PCB3

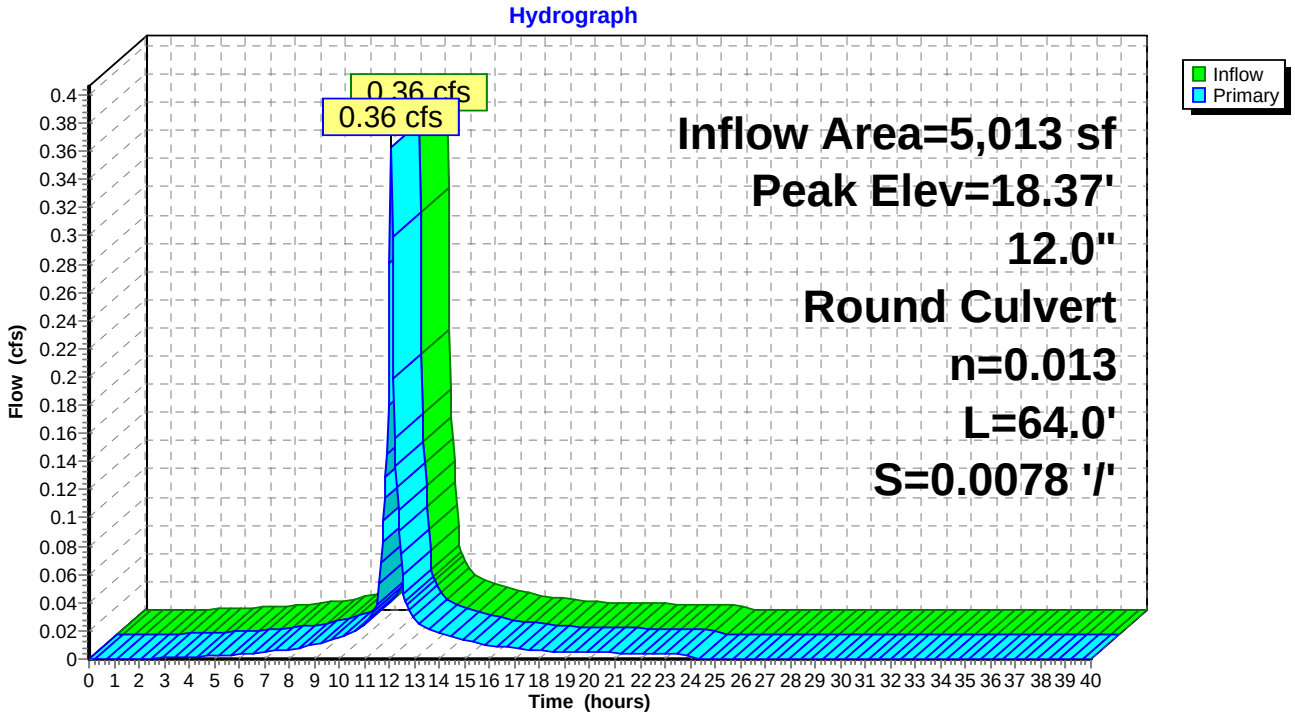
Inflow Area = 5,013 sf, 96.69% Impervious, Inflow Depth = 2.76" for 2-yr event
Inflow = 0.36 cfs @ 12.05 hrs, Volume= 1,152 cf
Outflow = 0.36 cfs @ 12.05 hrs, Volume= 1,152 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.05 hrs, Volume= 1,152 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.37' @ 12.08 hrs
Flood Elev= 20.70'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.00' | **12.0" Round Culvert**<br>L= 64.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.00' / 17.50' S= 0.0078 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.29 cfs @ 12.05 hrs HW=18.37' TW=18.14' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.29 cfs @ 1.64 fps)

## Pond CB3: PCB3



## Summary for Pond CB4: PCB4

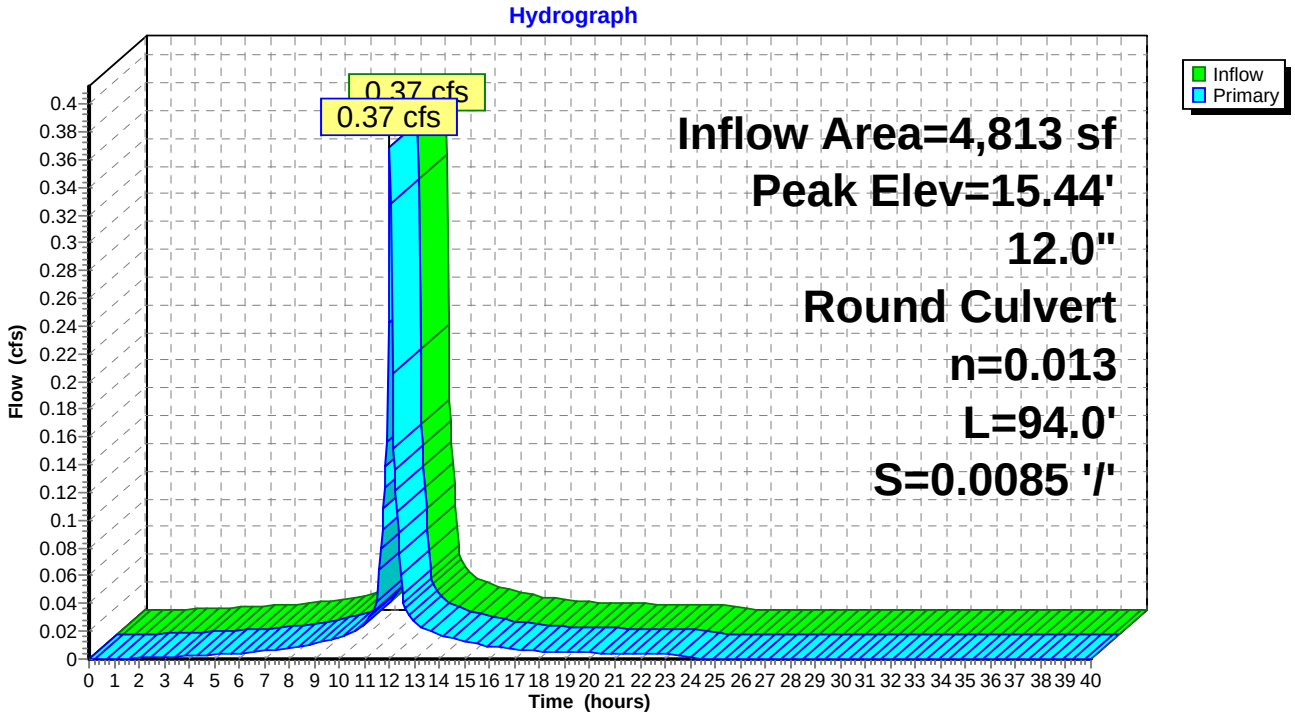
Inflow Area = 4,813 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 0.37 cfs @ 12.01 hrs, Volume= 1,150 cf
Outflow = 0.37 cfs @ 12.01 hrs, Volume= 1,150 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.01 hrs, Volume= 1,150 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.44' @ 12.01 hrs
Flood Elev= 17.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.10' | **12.0" Round Culvert**<br>L= 94.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.10' / 14.30' S= 0.0085 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.35 cfs @ 12.01 hrs HW=15.43' TW=14.73' (Dynamic Tailwater)
**1=Culvert** (Inlet Controls 0.35 cfs @ 1.55 fps)

## Pond CB4: PCB4



## Summary for Pond CB5: PCB5

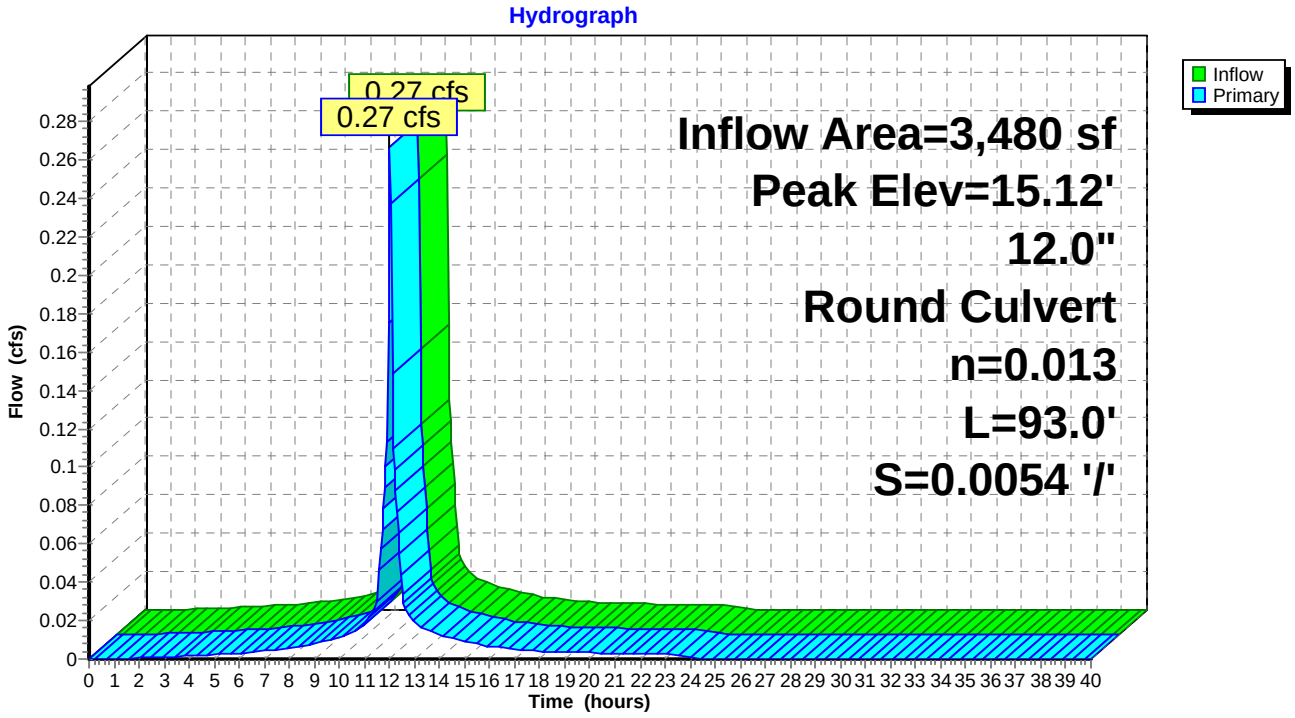
Inflow Area = 3,480 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 0.27 cfs @ 12.01 hrs, Volume= 832 cf
Outflow = 0.27 cfs @ 12.01 hrs, Volume= 832 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 12.01 hrs, Volume= 832 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.12' @ 12.03 hrs
Flood Elev= 17.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.80' | **12.0" Round Culvert**<br>L= 93.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.80' / 14.30' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.24 cfs @ 12.01 hrs HW=15.11' TW=14.73' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.24 cfs @ 1.71 fps)

### Pond CB5: PCB5



## Summary for Pond CB6: PCB6

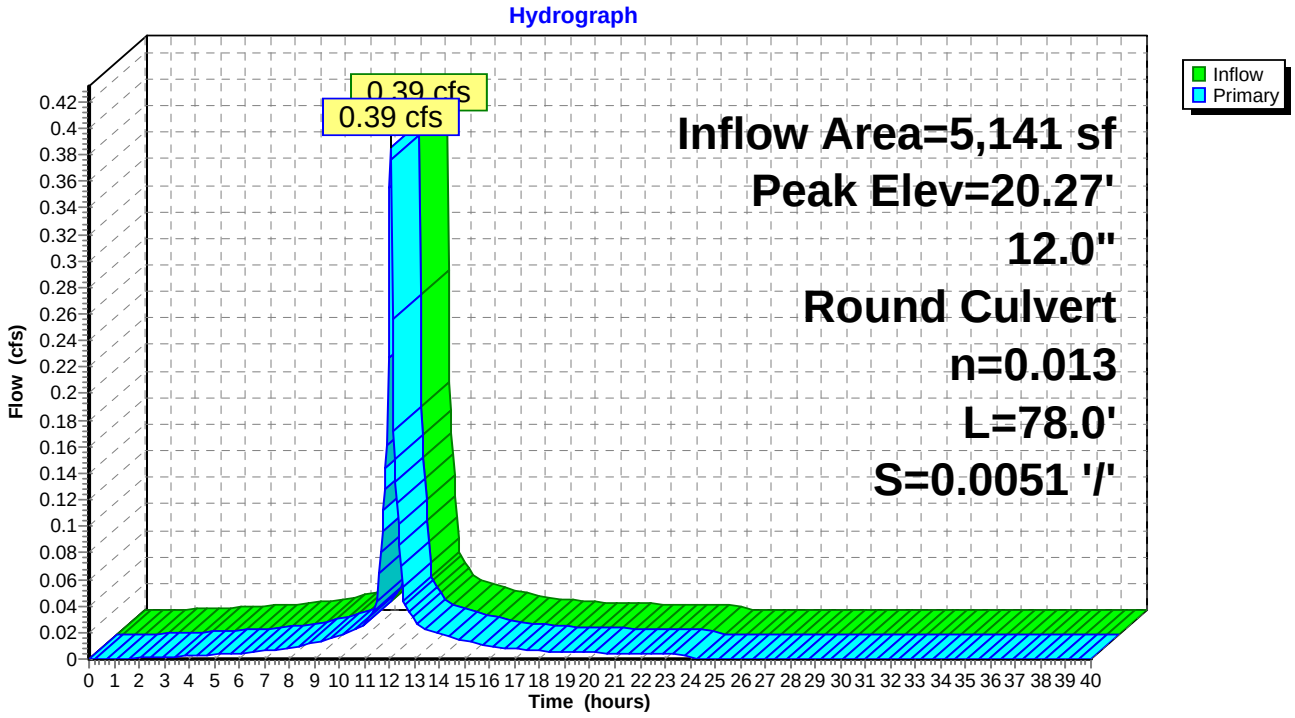
Inflow Area = 5,141 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 0.39 cfs @ 12.03 hrs, Volume= 1,229 cf
Outflow = 0.39 cfs @ 12.03 hrs, Volume= 1,229 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.03 hrs, Volume= 1,229 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.27' @ 12.04 hrs
Flood Elev= 22.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.90' | **12.0" Round Culvert**<br>L= 78.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.90' / 19.50' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.36 cfs @ 12.03 hrs HW=20.26' TW=19.83' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.36 cfs @ 2.08 fps)

## Pond CB6: PCB6



## Summary for Pond CB7: PCB7

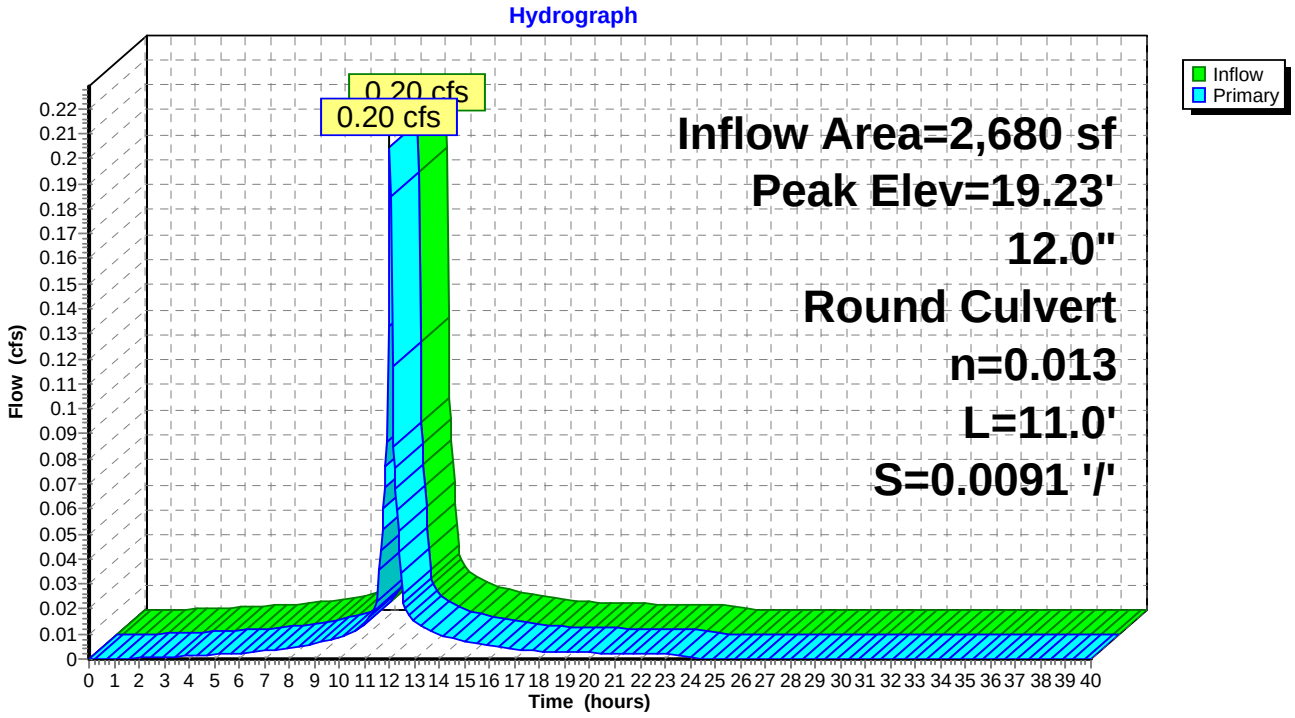
Inflow Area = 2,680 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 0.20 cfs @ 12.02 hrs, Volume= 640 cf
Outflow = 0.20 cfs @ 12.02 hrs, Volume= 640 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.20 cfs @ 12.02 hrs, Volume= 640 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.23' @ 12.06 hrs
Flood Elev= 21.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.90' | **12.0" Round Culvert**<br>L= 11.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.90' / 18.80' S= 0.0091 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.12 cfs @ 12.02 hrs HW=19.20' TW=19.17' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.12 cfs @ 0.89 fps)

## Pond CB7: PCB7

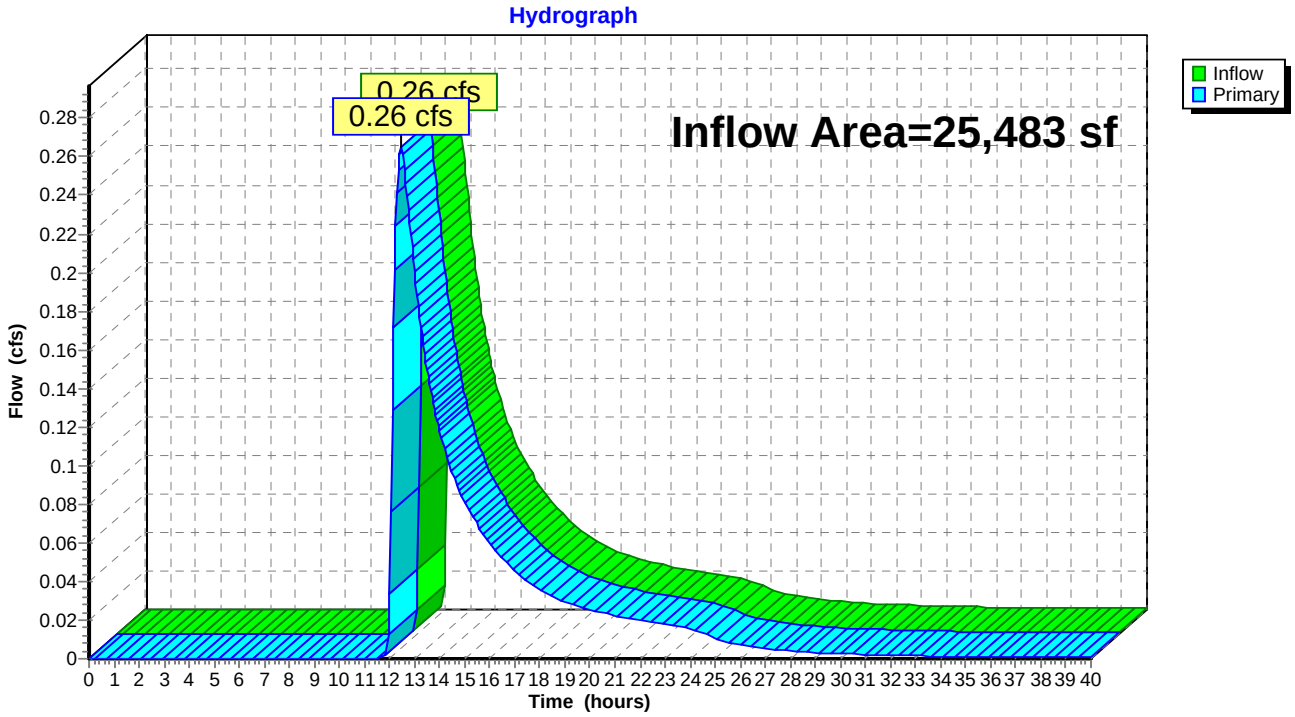


## Summary for Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

Inflow Area = 25,483 sf, 55.96% Impervious, Inflow Depth > 1.39" for 2-yr event
Inflow = 0.26 cfs @ 12.46 hrs, Volume= 2,959 cf
Primary = 0.26 cfs @ 12.46 hrs, Volume= 2,959 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

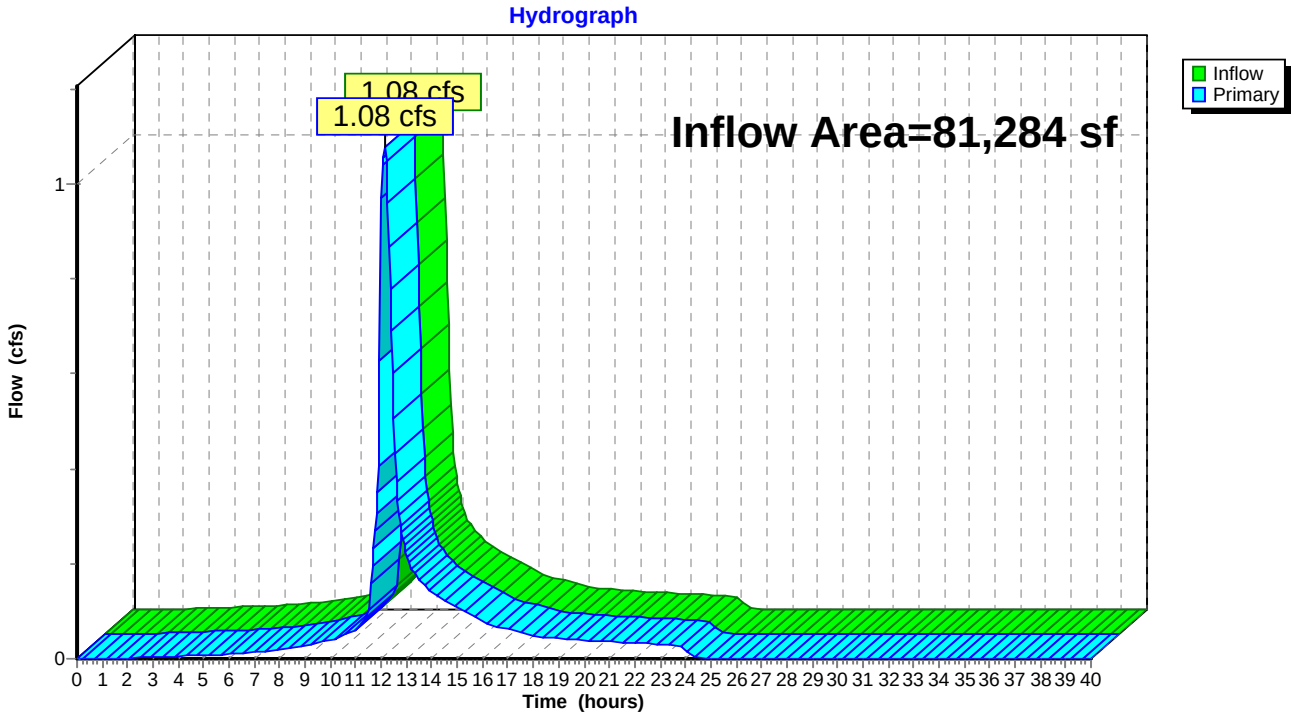


## Summary for Pond DP2: Design Pont #2_Wetland-South

Inflow Area = 81,284 sf, 40.77% Impervious, Inflow Depth = 0.90" for 2-yr event
Inflow = 1.08 cfs @ 12.15 hrs, Volume= 6,076 cf
Primary = 1.08 cfs @ 12.15 hrs, Volume= 6,076 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP2: Design Pont #2_Wetland-South

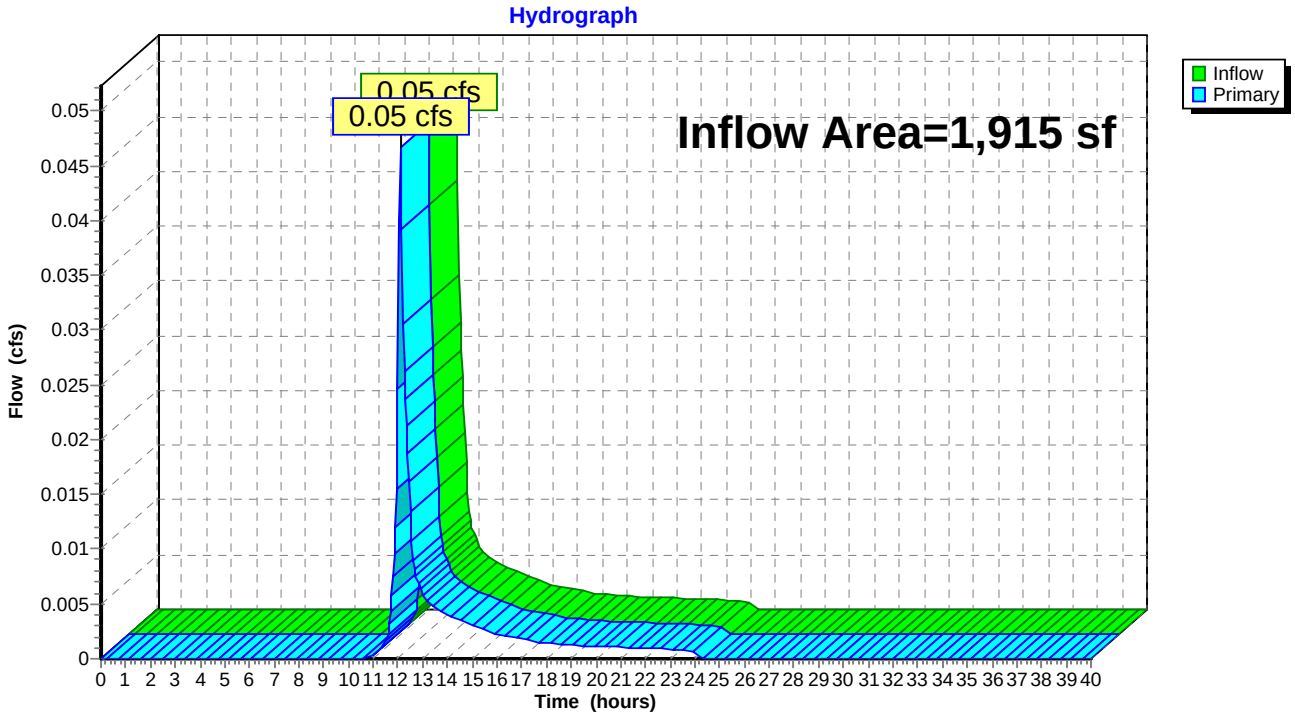


## Summary for Pond DP3: Design Pont #3_Abutting Lot-East

Inflow Area = 1,915 sf, 0.00% Impervious, Inflow Depth = 0.97" for 2-yr event
Inflow = 0.05 cfs @ 12.10 hrs, Volume= 155 cf
Primary = 0.05 cfs @ 12.10 hrs, Volume= 155 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP3: Design Pont #3_Abutting Lot-East



## Summary for Pond MH1: PDMH1

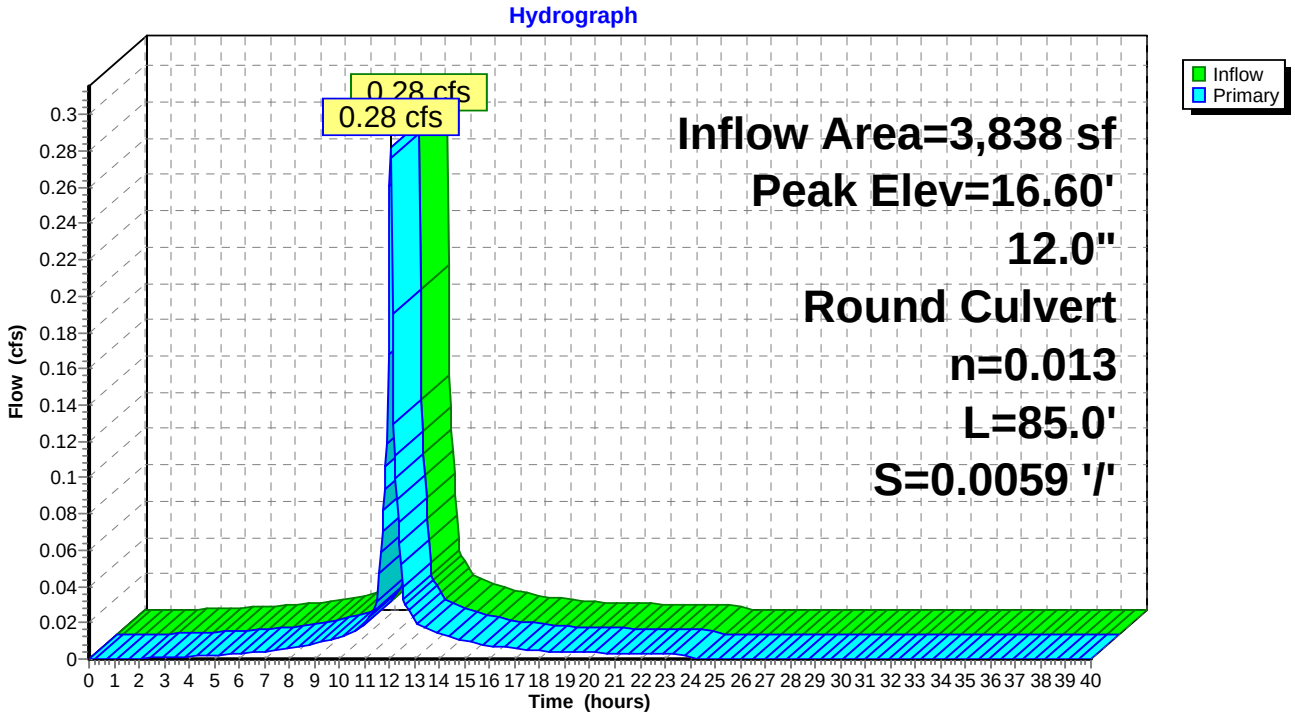
Inflow Area = 3,838 sf, 97.68% Impervious, Inflow Depth = 2.80" for 2-yr event
Inflow = 0.28 cfs @ 12.03 hrs, Volume= 897 cf
Outflow = 0.28 cfs @ 12.03 hrs, Volume= 897 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.03 hrs, Volume= 897 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.60' @ 12.03 hrs
Flood Elev= 20.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.30' | **12.0" Round Culvert**<br>L= 85.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.30' / 15.80' S= 0.0059 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.27 cfs @ 12.03 hrs HW=16.59' TW=16.01' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 0.27 cfs @ 2.12 fps)

## Pond MH1: PDMH1



## Summary for Pond MH2: PDMH2

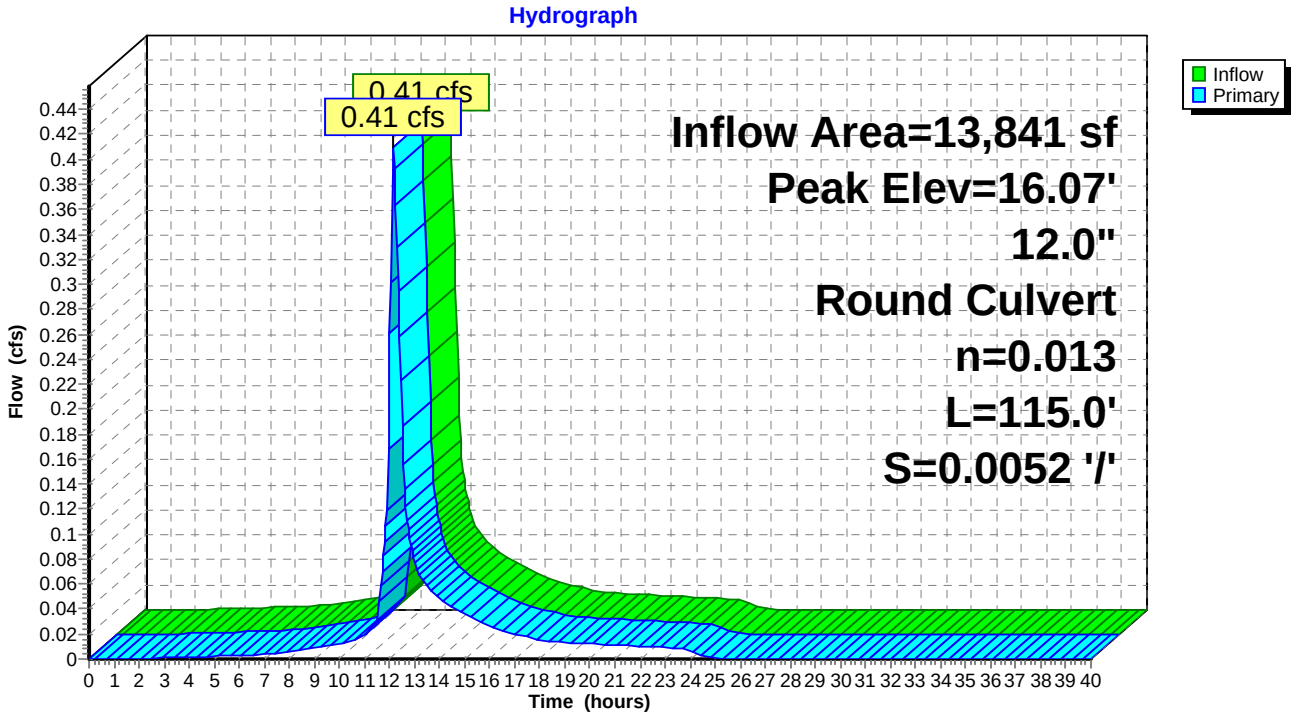
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 1.76" for 2-yr event
Inflow = 0.41 cfs @ 12.15 hrs, Volume= 2,025 cf
Outflow = 0.41 cfs @ 12.15 hrs, Volume= 2,025 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.15 hrs, Volume= 2,025 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.07' @ 12.15 hrs
Flood Elev= 21.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.70' | **12.0" Round Culvert**<br>L= 115.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.70' / 15.10' S= 0.0052 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.41 cfs @ 12.15 hrs HW=16.07' TW=15.38' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.41 cfs @ 2.29 fps)

## Pond MH2: PDMH2



## Summary for Pond MH3: PDMH3

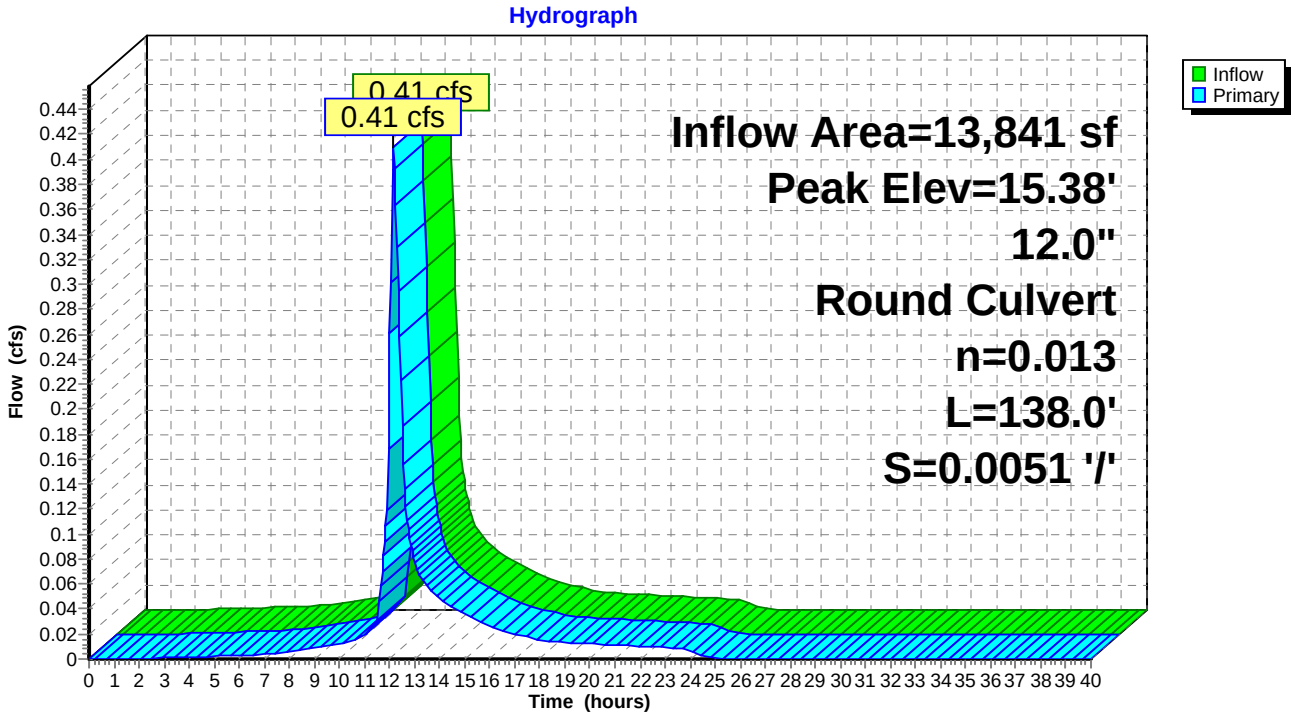
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 1.76" for 2-yr event
Inflow = 0.41 cfs @ 12.15 hrs, Volume= 2,025 cf
Outflow = 0.41 cfs @ 12.15 hrs, Volume= 2,025 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.15 hrs, Volume= 2,025 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.38' @ 12.14 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.00' | **12.0" Round Culvert**<br>L= 138.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.00' / 14.30' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.42 cfs @ 12.15 hrs HW=15.38' TW=14.66' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.42 cfs @ 2.22 fps)

## Pond MH3: PDMH3



## Summary for Pond MH4: PDMH4

Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 2.17" for 2-yr event
Inflow = 0.92 cfs @ 12.02 hrs, Volume= 4,007 cf
Outflow = 0.92 cfs @ 12.02 hrs, Volume= 4,007 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.02 hrs, Volume= 3,915 cf
Secondary = 0.12 cfs @ 12.02 hrs, Volume= 93 cf

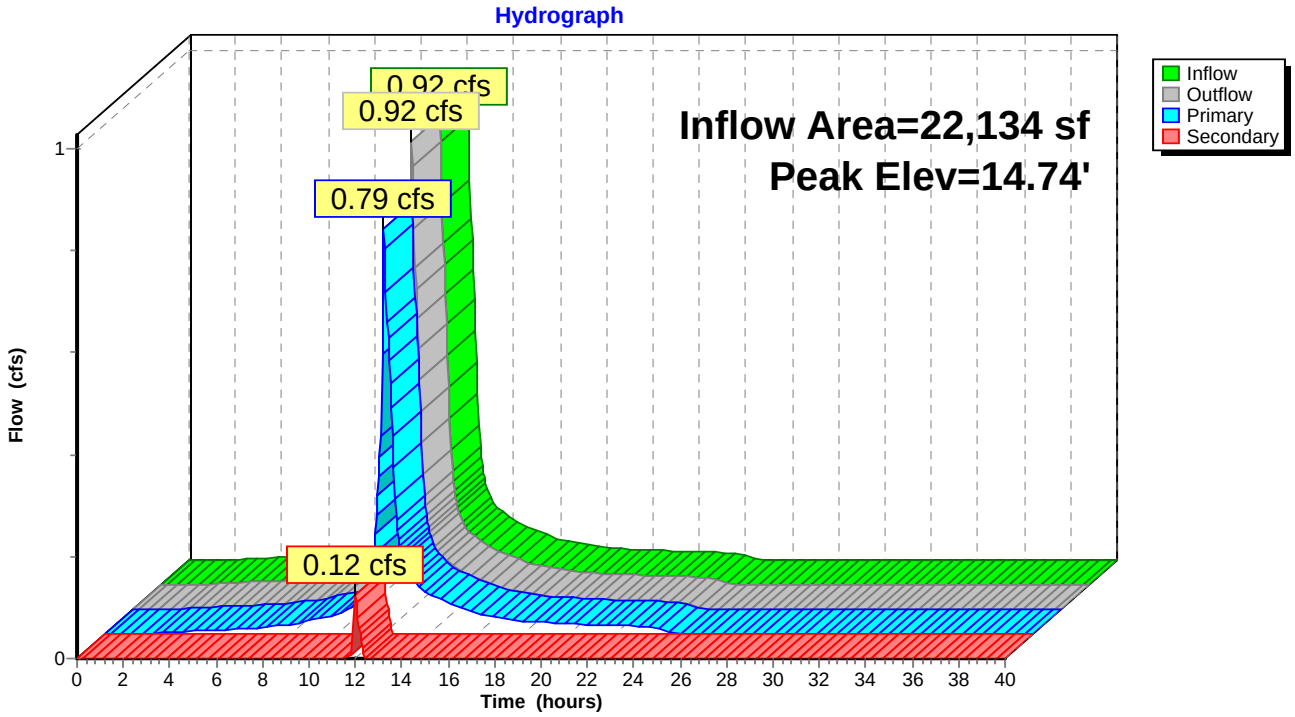
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.74' @ 12.02 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.20' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 14.10' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 14.20' | **12.0" Round Culvert**<br>L= 8.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 13.70' S= 0.0625 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 14.55' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=0.76 cfs @ 12.02 hrs HW=14.73' TW=14.34' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.76 cfs @ 2.64 fps)

**Secondary OutFlow** Max=0.11 cfs @ 12.02 hrs HW=14.73' TW=14.11' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.11 cfs of 0.82 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 1.38 fps)

## Pond MH4: PDMH4



## Summary for Pond MH5: PDMH5

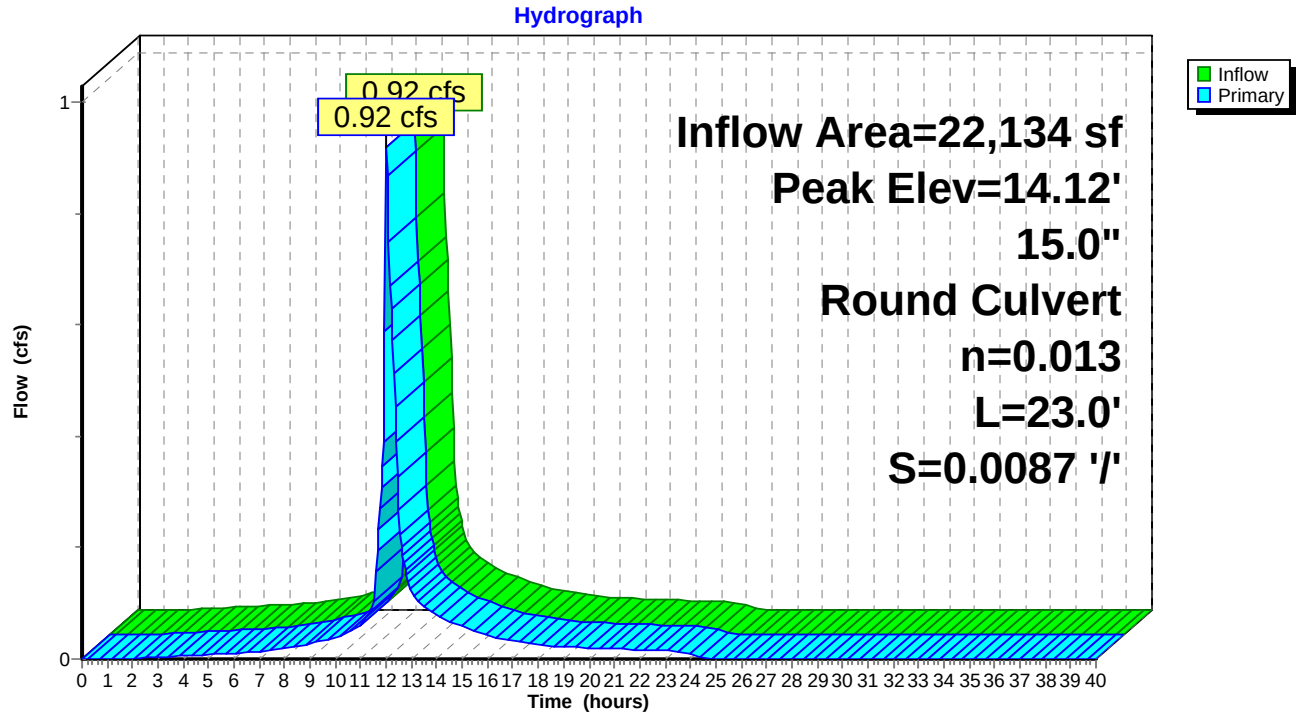
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 2.17" for 2-yr event
Inflow = 0.92 cfs @ 12.02 hrs, Volume= 4,007 cf
Outflow = 0.92 cfs @ 12.02 hrs, Volume= 4,007 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.92 cfs @ 12.02 hrs, Volume= 4,007 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.12' @ 12.02 hrs
Flood Elev= 21.40'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.60' | **15.0" Round Culvert**<br>L= 23.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.60' / 13.40' S= 0.0087 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=0.88 cfs @ 12.02 hrs HW=14.11' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.88 cfs @ 2.76 fps)

### Pond MH5: PDMH5



## Summary for Pond MH6: PDMH6

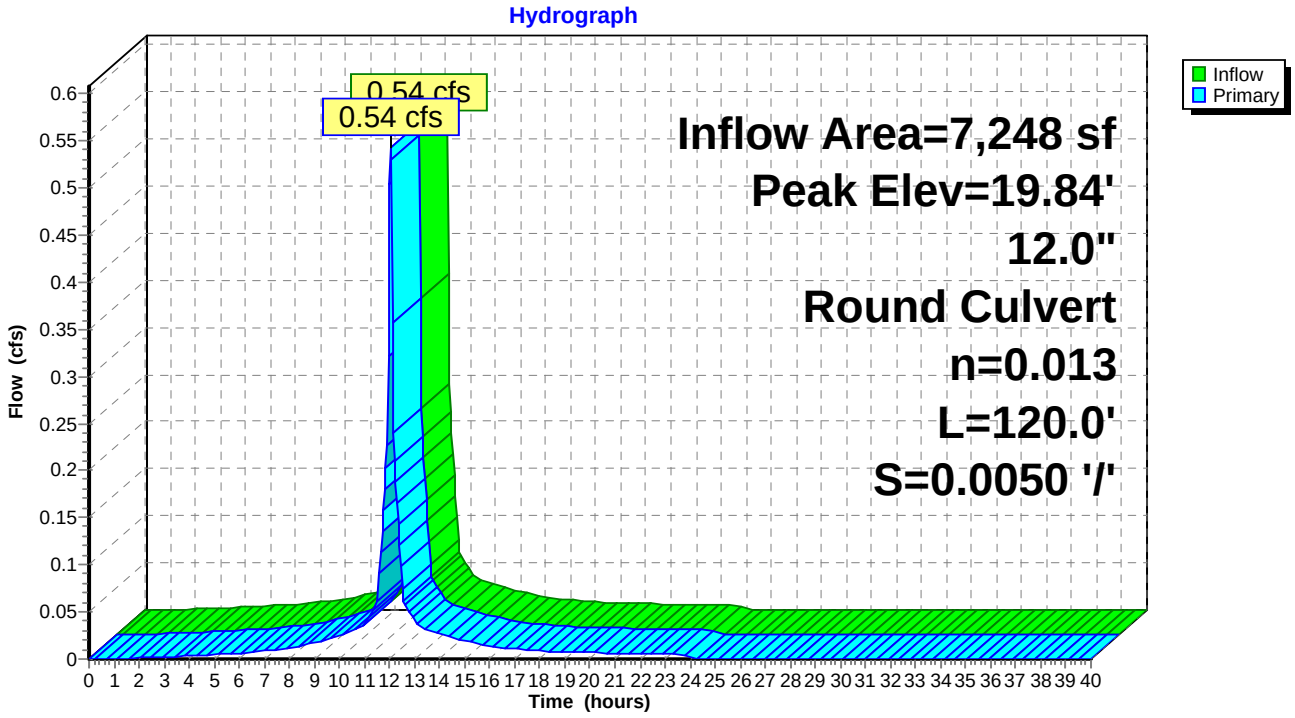
Inflow Area = 7,248 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 0.54 cfs @ 12.03 hrs, Volume= 1,732 cf
Outflow = 0.54 cfs @ 12.03 hrs, Volume= 1,732 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.54 cfs @ 12.03 hrs, Volume= 1,732 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.84' @ 12.04 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.40' | **12.0" Round Culvert**<br>L= 120.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.40' / 18.80' S= 0.0050 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.51 cfs @ 12.03 hrs HW=19.83' TW=19.17' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.51 cfs @ 2.35 fps)

## Pond MH6: PDMH6



## Summary for Pond MH7: PDMH7

Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 0.74 cfs @ 12.03 hrs, Volume= 2,373 cf
Outflow = 0.74 cfs @ 12.03 hrs, Volume= 2,373 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.03 hrs, Volume= 2,318 cf
Secondary = 0.11 cfs @ 12.03 hrs, Volume= 54 cf

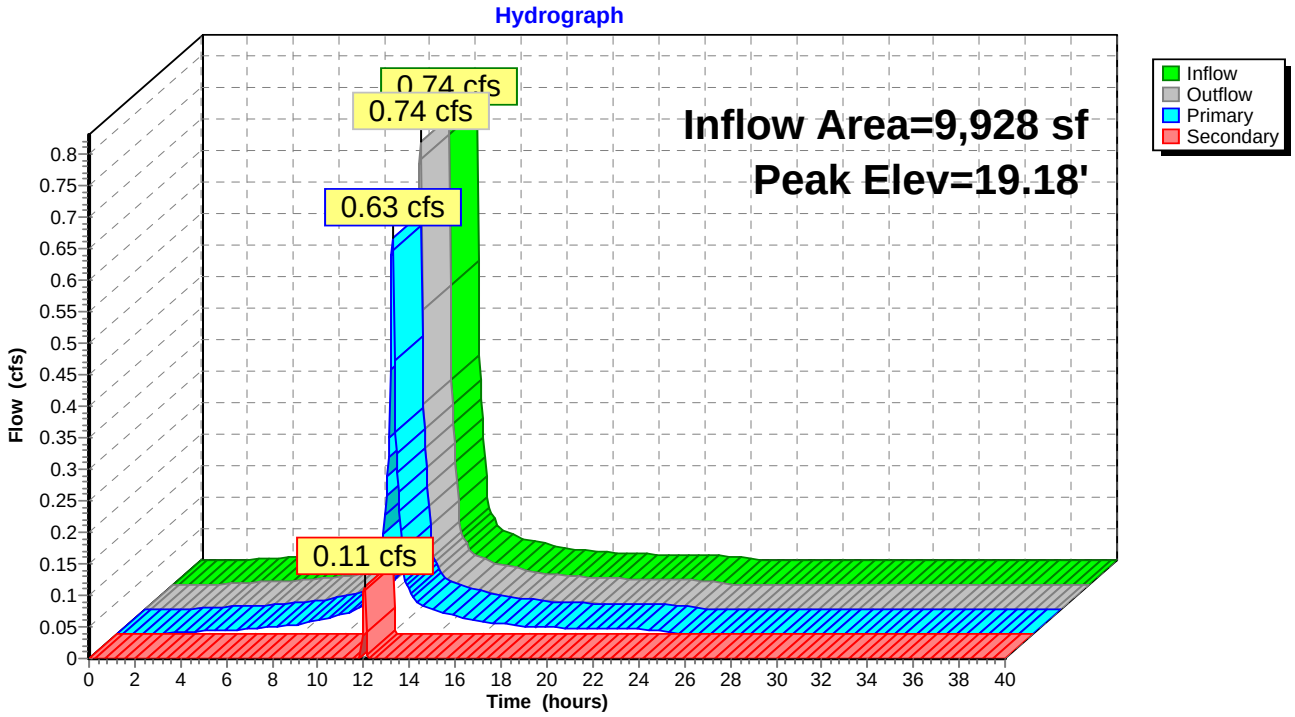
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.18' @ 12.03 hrs
Flood Elev= 21.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.60' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.20' S= 0.0500 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 19.00' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=0.60 cfs @ 12.03 hrs HW=19.17' TW=18.82' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.60 cfs @ 2.45 fps)

**Secondary OutFlow** Max=0.11 cfs @ 12.03 hrs HW=19.17' TW=18.73' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.11 cfs of 0.67 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 1.34 fps)

## Pond MH7: PDMH7



## Summary for Pond MH8: PDMH8

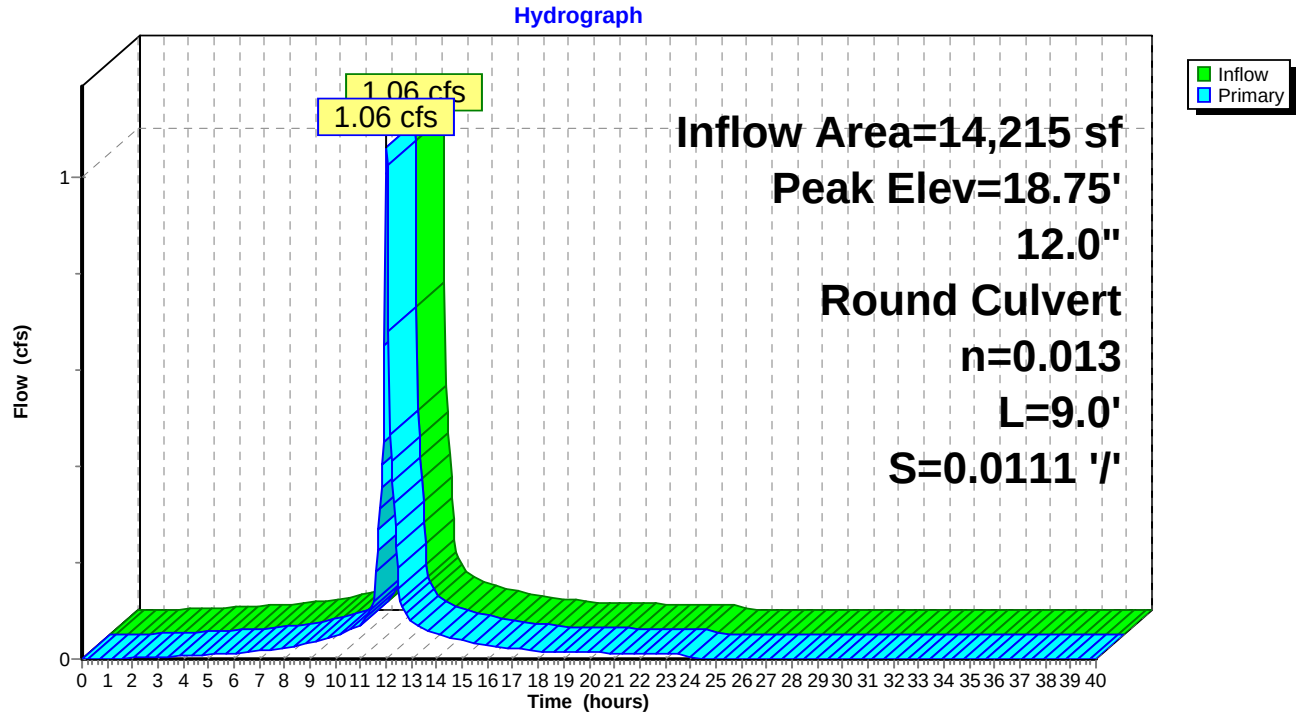
Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 2.87" for 2-yr event
Inflow = 1.06 cfs @ 12.03 hrs, Volume= 3,397 cf
Outflow = 1.06 cfs @ 12.03 hrs, Volume= 3,397 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.03 hrs, Volume= 3,397 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.75' @ 12.03 hrs
Flood Elev= 22.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.10' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.10' / 18.00' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.02 cfs @ 12.03 hrs HW=18.73' TW=17.34' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 1.02 cfs @ 2.76 fps)

### Pond MH8: PDMH8



## Summary for Pond RG1: Rain Garden #1

Inflow Area = 25,212 sf, 56.56% Impervious, Inflow Depth = 1.75" for 2-yr event
Inflow = 1.20 cfs @ 12.06 hrs, Volume= 3,671 cf
Outflow = 0.26 cfs @ 12.47 hrs, Volume= 2,937 cf, Atten= 78%, Lag= 24.8 min
Primary = 0.26 cfs @ 12.47 hrs, Volume= 2,937 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.66' @ 12.47 hrs Surf.Area= 5,286 sf Storage= 1,730 cf
Flood Elev= 16.70' Surf.Area= 6,703 sf Storage= 6,272 cf

Plug-Flow detention time= 232.0 min calculated for 2,934 cf (80% of inflow)
Center-of-Mass det. time= 154.6 min ( 962.8 - 808.3 )

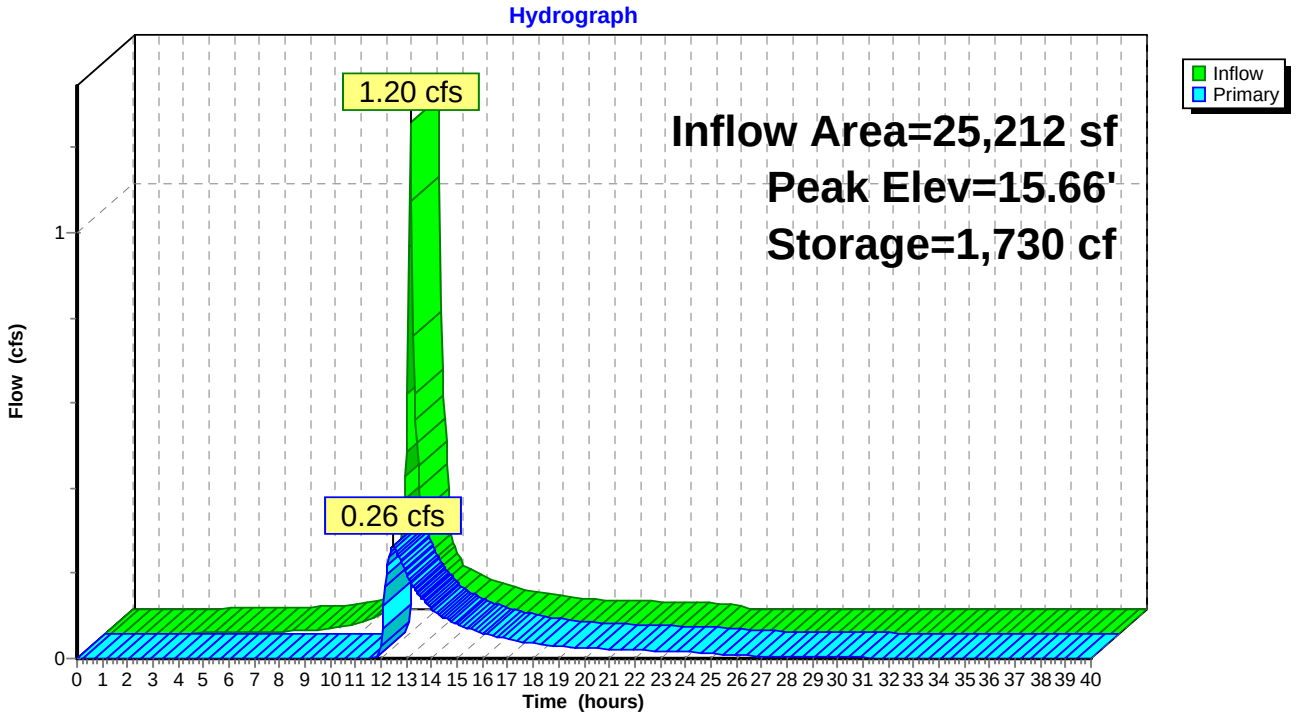
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 15.30' | 6,272 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 15.30 | 4,439 | 288.0 | 0 | 0 | 4,439 |
| 16.00 | 6,173 | 327.0 | 3,698 | 3,698 | 6,360 |
| 16.30 | 6,569 | 334.0 | 1,911 | 5,609 | 6,741 |
| 16.40 | 6,703 | 337.0 | 664 | 6,272 | 6,905 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.35' | **8.0" Round Culvert X 2.00**<br>L= 65.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 15.35' / 15.00' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf |
| #2 | Device 1 | 15.45' | **4.0" Vert. Orifice/Grate X 3.00** C= 0.600 |
| #3 | Device 1 | 15.80' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 16.35' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.26 cfs @ 12.47 hrs HW=15.66' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Passes 0.26 cfs of 0.43 cfs potential flow)
- **2=Orifice/Grate** (Orifice Controls 0.26 cfs @ 1.55 fps)
- **3=Orifice/Grate** ( Controls 0.00 cfs)
- **4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG1: Rain Garden #1



## Summary for Pond RG2: Rain Garden #2

Inflow Area = 10,003 sf, 68.81% Impervious, Inflow Depth = 2.18" for 2-yr event
Inflow = 0.59 cfs @ 12.04 hrs, Volume= 1,817 cf
Outflow = 0.28 cfs @ 12.18 hrs, Volume= 1,128 cf, Atten= 52%, Lag= 8.0 min
Primary = 0.28 cfs @ 12.18 hrs, Volume= 1,128 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.25' @ 12.18 hrs Surf.Area= 847 sf Storage= 813 cf
Flood Elev= 19.00' Surf.Area= 1,118 sf Storage= 1,546 cf

Plug-Flow detention time= 204.0 min calculated for 1,128 cf (62% of inflow)
Center-of-Mass det. time= 98.3 min ( 885.7 - 787.4 )

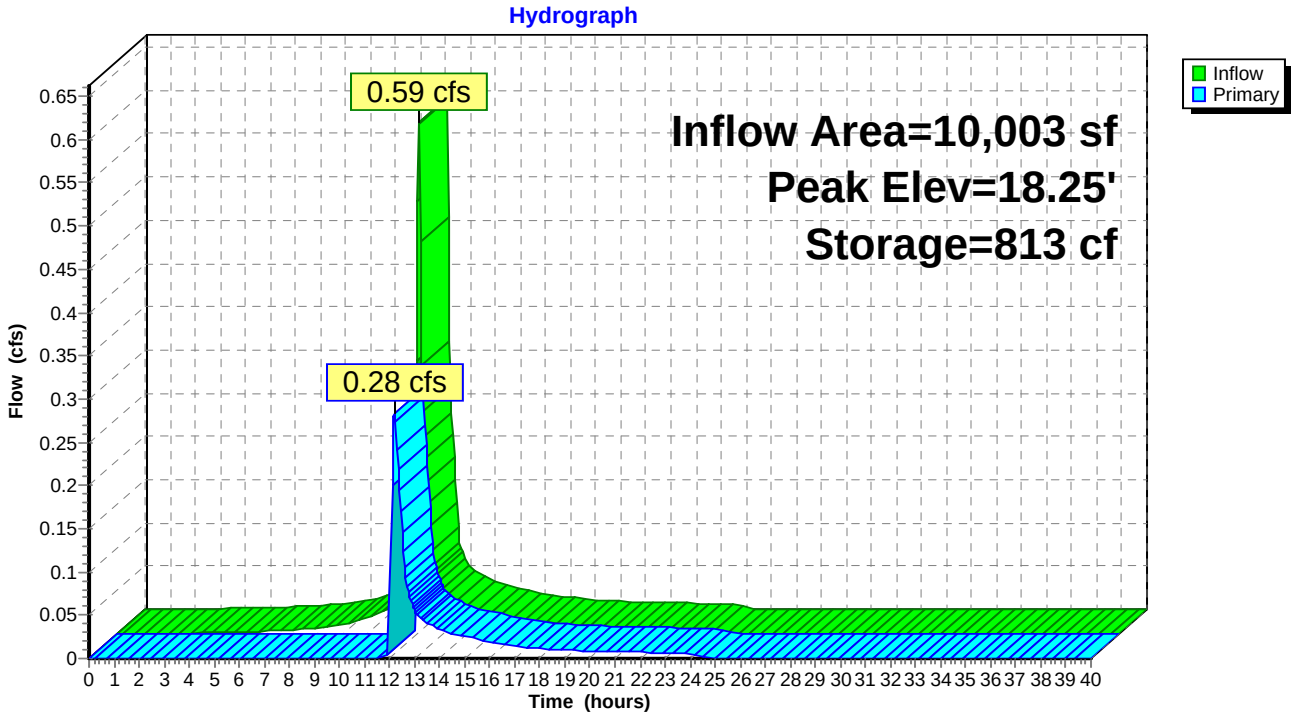
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 17.00' | 2,934 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 17.00 | 468 | 89.0 | 0 | 0 | 468 |
| 18.00 | 765 | 108.0 | 610 | 610 | 782 |
| 19.00 | 1,118 | 127.0 | 936 | 1,546 | 1,156 |
| 20.00 | 1,676 | 152.0 | 1,388 | 2,934 | 1,728 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.50' | **12.0" Round Culvert X 2.00**<br>L= 53.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 16.50' / 15.80' S= 0.0132 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 18.10' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 18.40' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 19.20' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.28 cfs @ 12.18 hrs HW=18.25' TW=16.07' (Dynamic Tailwater)
**1=Culvert** (Passes 0.28 cfs of 7.46 cfs potential flow)
- **2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 1.25 fps)
- **3=Orifice/Grate** ( Controls 0.00 cfs)
- **4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG2: Rain Garden #2



## Summary for Pond WQU1: Water Quality Unit 1

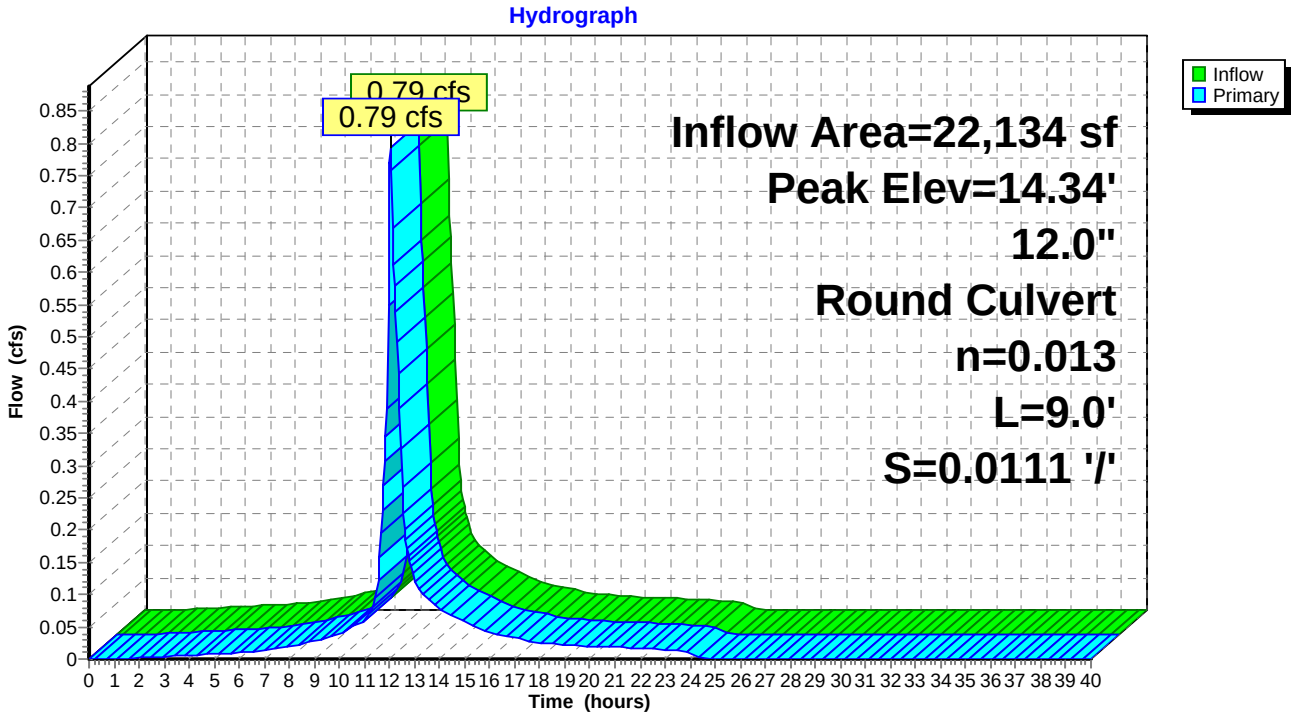
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 2.12" for 2-yr event
Inflow = 0.79 cfs @ 12.02 hrs, Volume= 3,915 cf
Outflow = 0.79 cfs @ 12.02 hrs, Volume= 3,915 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.02 hrs, Volume= 3,915 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.34' @ 12.03 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.80' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.80' / 13.70' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.76 cfs @ 12.02 hrs HW=14.34' TW=14.11' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.76 cfs @ 2.56 fps)

## Pond WQU1: Water Quality Unit 1



## Summary for Pond WQU2: Water Quality Unit 2

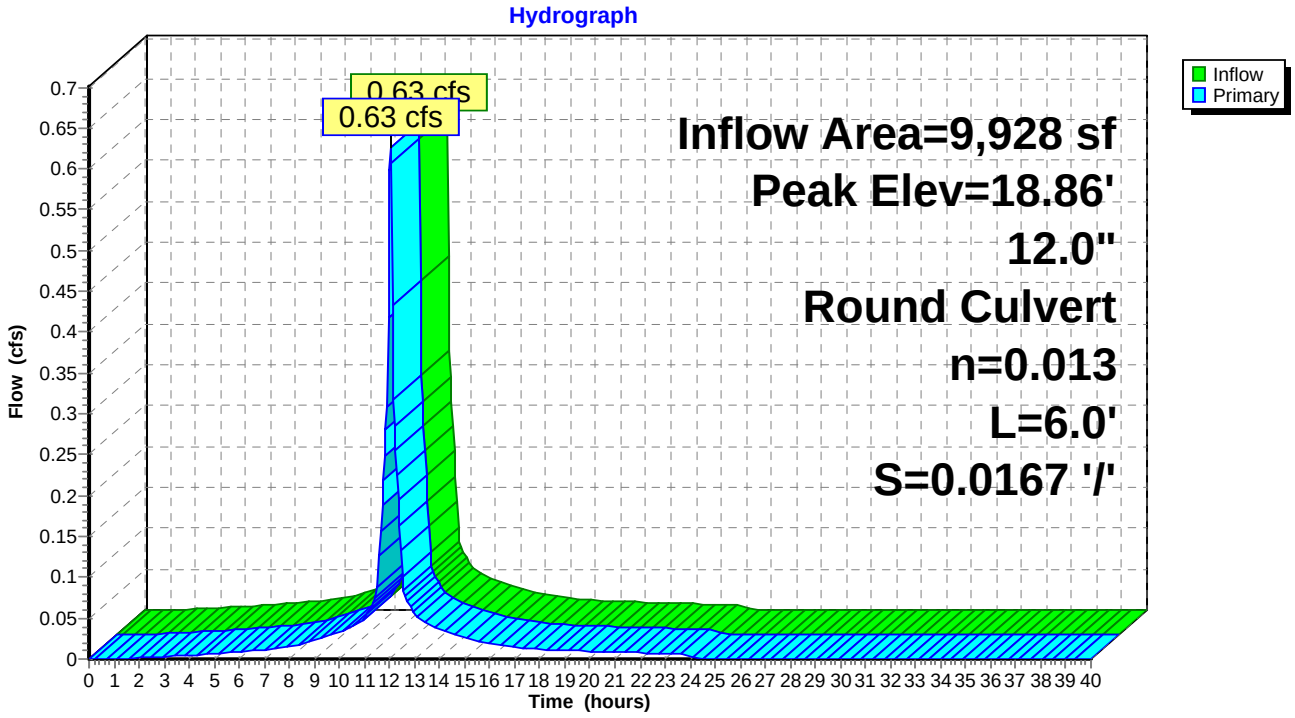
Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 2.80" for 2-yr event
Inflow = 0.63 cfs @ 12.03 hrs, Volume= 2,318 cf
Outflow = 0.63 cfs @ 12.03 hrs, Volume= 2,318 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.03 hrs, Volume= 2,318 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.86' @ 12.06 hrs
Flood Elev= 22.30'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.30' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.30' / 18.20' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.46 cfs @ 12.03 hrs HW=18.82' TW=18.73' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.46 cfs @ 1.60 fps)

## Pond WQU2: Water Quality Unit 2



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 100: 100 - Pavement, Lawn,** Runoff Area=20,037 sf 45.35% Impervious Runoff Depth=2.81"
Flow Length=165' Tc=3.9 min CN=82 Runoff=1.60 cfs 4,696 cf

**Subcatchment 101: 101 - West Side Lawn to** Runoff Area=271 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=178' Tc=2.7 min CN=74 Runoff=0.02 cfs 48 cf

**Subcatchment 102: 102 - Existing Building** Runoff Area=5,175 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=165' Tc=2.6 min CN=98 Runoff=0.59 cfs 1,925 cf

**Subcatchment 200: 200 - Portion of** Runoff Area=2,107 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=157' Tc=1.8 min CN=98 Runoff=0.24 cfs 784 cf

**Subcatchment 201: 201 - Pavement** Runoff Area=2,187 sf 95.93% Impervious Runoff Depth=4.35"
Flow Length=91' Tc=2.6 min CN=97 Runoff=0.25 cfs 792 cf

**Subcatchment 202: 202 - Pavement** Runoff Area=1,651 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=90' Slope=0.0133 '/' Tc=1.3 min CN=98 Runoff=0.19 cfs 614 cf

**Subcatchment 203: 203 - Pavement** Runoff Area=5,013 sf 96.69% Impervious Runoff Depth=4.35"
Flow Length=100' Tc=3.6 min CN=97 Runoff=0.56 cfs 1,816 cf

**Subcatchment 204: 204 - Pavement** Runoff Area=4,813 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=122' Tc=1.1 min CN=98 Runoff=0.56 cfs 1,790 cf

**Subcatchment 205: 205 - Pavement** Runoff Area=3,480 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=107' Tc=1.1 min CN=98 Runoff=0.41 cfs 1,294 cf

**Subcatchment 206: 206 - Pavement** Runoff Area=5,141 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=125' Slope=0.0120 '/' Tc=2.0 min CN=98 Runoff=0.59 cfs 1,912 cf

**Subcatchment 207: 207 - Pavement** Runoff Area=2,680 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=108' Slope=0.0220 '/' Tc=1.2 min CN=98 Runoff=0.31 cfs 997 cf

**Subcatchment 208: 208 - Proposed** Runoff Area=4,287 sf 100.00% Impervious Runoff Depth=4.46"
Flow Length=145' Tc=1.8 min CN=98 Runoff=0.49 cfs 1,595 cf

**Subcatchment 209: 209 - Portion of** Runoff Area=4,990 sf 40.80% Impervious Runoff Depth=3.00"
Flow Length=108' Tc=1.5 min CN=84 Runoff=0.44 cfs 1,246 cf

**Subcatchment 210: 210 - Existing South** Runoff Area=44,935 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=210' Tc=10.6 min CN=65 Runoff=1.40 cfs 5,457 cf

**Subcatchment 300: 300 - Lawn East to DP3** Runoff Area=1,915 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=40' Slope=0.0300 '/' Tc=5.8 min CN=74 Runoff=0.11 cfs 339 cf

**Pond 1P: Infiltration System** Peak Elev=18.43' Storage=1,324 cf Inflow=1.62 cfs 5,288 cf
Discarded=0.26 cfs 5,288 cf Primary=0.00 cfs 0 cf Outflow=0.26 cfs 5,288 cf

**Pond CB1: PCB1** Peak Elev=16.89' Inflow=0.25 cfs 792 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.25 cfs 792 cf

**Pond CB2: PCB2** Peak Elev=16.85' Inflow=0.19 cfs 614 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.19 cfs 614 cf

**Pond CB3: PCB3** Peak Elev=18.56' Inflow=0.56 cfs 1,816 cf
12.0" Round Culvert n=0.013 L=64.0' S=0.0078 '/' Outflow=0.56 cfs 1,816 cf

**Pond CB4: PCB4** Peak Elev=15.53' Inflow=0.56 cfs 1,790 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0085 '/' Outflow=0.56 cfs 1,790 cf

**Pond CB5: PCB5** Peak Elev=15.24' Inflow=0.41 cfs 1,294 cf
12.0" Round Culvert n=0.013 L=93.0' S=0.0054 '/' Outflow=0.41 cfs 1,294 cf

**Pond CB6: PCB6** Peak Elev=20.37' Inflow=0.59 cfs 1,912 cf
12.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.59 cfs 1,912 cf

**Pond CB7: PCB7** Peak Elev=19.34' Inflow=0.31 cfs 997 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0091 '/' Outflow=0.31 cfs 997 cf

**Pond DP1: Design Pont #1_18" RCP Culvert - Northwest** Inflow=0.66 cfs 5,933 cf
Primary=0.66 cfs 5,933 cf

**Pond DP2: Design Pont #2_Wetland-South** Inflow=2.72 cfs 12,323 cf
Primary=2.72 cfs 12,323 cf

**Pond DP3: Design Pont #3_Abutting Lot-East** Inflow=0.11 cfs 339 cf
Primary=0.11 cfs 339 cf

**Pond MH1: PDMH1** Peak Elev=16.70' Inflow=0.43 cfs 1,407 cf
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=0.43 cfs 1,407 cf

**Pond MH2: PDMH2** Peak Elev=16.33' Inflow=1.02 cfs 3,781 cf
12.0" Round Culvert n=0.013 L=115.0' S=0.0052 '/' Outflow=1.02 cfs 3,781 cf

**Pond MH3: PDMH3** Peak Elev=15.66' Inflow=1.02 cfs 3,781 cf
12.0" Round Culvert n=0.013 L=138.0' S=0.0051 '/' Outflow=1.02 cfs 3,781 cf

**Pond MH4: PDMH4** Peak Elev=15.00' Inflow=1.90 cfs 6,866 cf
Primary=1.51 cfs 6,424 cf Secondary=0.40 cfs 442 cf Outflow=1.90 cfs 6,866 cf

**Pond MH5: PDMH5** Peak Elev=14.41' Inflow=1.90 cfs 6,866 cf
15.0" Round Culvert n=0.013 L=23.0' S=0.0087 '/' Outflow=1.90 cfs 6,866 cf

**Pond MH6: PDMH6** Peak Elev=19.96' Inflow=0.83 cfs 2,696 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=0.83 cfs 2,696 cf

**Pond MH7: PDMH7** Peak Elev=19.29' Inflow=1.13 cfs 3,693 cf
Primary=0.91 cfs 3,528 cf Secondary=0.23 cfs 165 cf Outflow=1.13 cfs 3,693 cf

**Pond MH8: PDMH8** Peak Elev=18.95' Inflow=1.62 cfs 5,288 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=1.62 cfs 5,288 cf

**Pond RG1: Rain Garden #1** Peak Elev=15.85' Storage=2,777 cf Inflow=2.18 cfs 6,621 cf
Outflow=0.65 cfs 5,885 cf

**Pond RG2: Rain Garden #2** Peak Elev=18.46' Storage=999 cf Inflow=0.98 cfs 3,063 cf
Outflow=0.71 cfs 2,374 cf

**Pond WQU1: Water Quality Unit 1** Peak Elev=14.67' Inflow=1.51 cfs 6,424 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=1.51 cfs 6,424 cf

**Pond WQU2: Water Quality Unit 2** Peak Elev=19.06' Inflow=0.91 cfs 3,528 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=0.91 cfs 3,528 cf

**Total Runoff Area = 108,682 sf Runoff Volume = 25,307 cf Average Runoff Depth = 2.79"**
**56.39% Pervious = 61,281 sf 43.61% Impervious = 47,401 sf**

## Summary for Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden

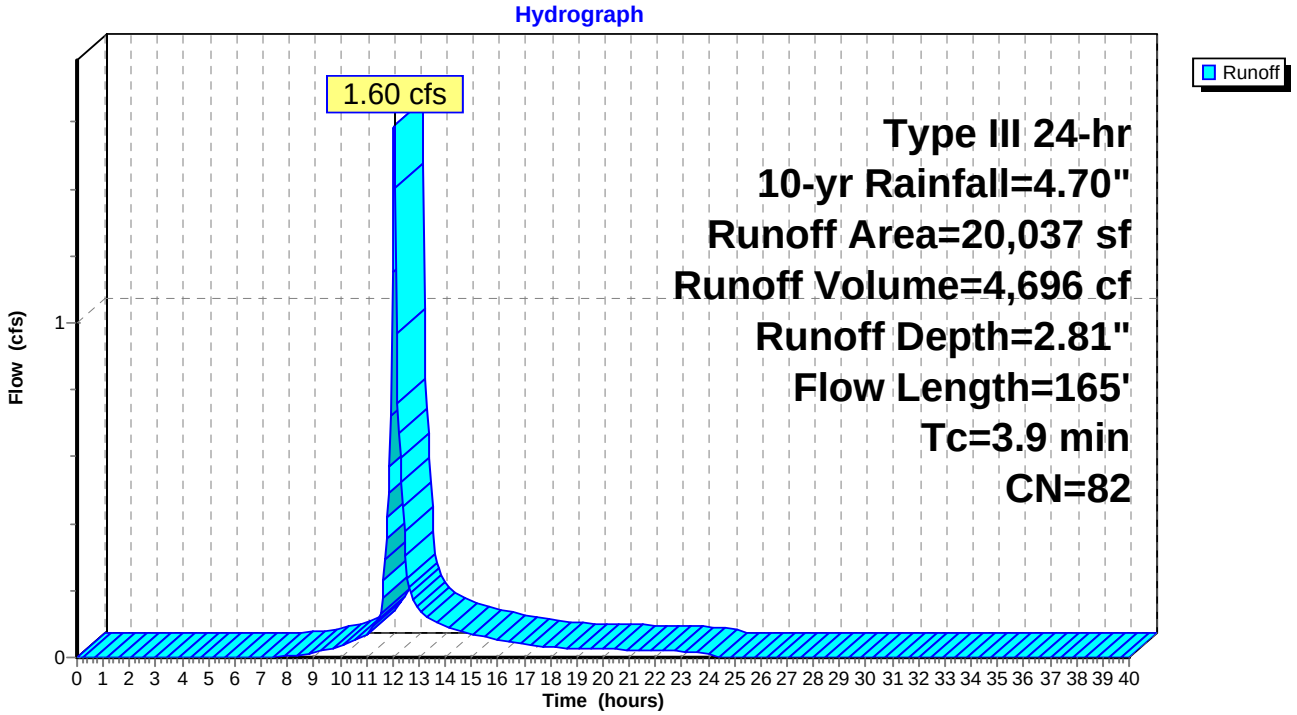
Runoff = 1.60 cfs @ 12.06 hrs, Volume= 4,696 cf, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 4,778 | 74 | >75% Grass cover, Good, HSG C |
| * | 6,173 | 65 | Rain Garden surface area |
| | 9,086 | 98 | Paved parking, HSG C |
| | 20,037 | 82 | Weighted Average |
| | 10,951 | | 54.65% Pervious Area |
| | 9,086 | | 45.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 83 | 0.0180 | 1.27 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.8 | 17 | 0.0410 | 0.16 | | **Sheet Flow, Stone rip rap to RG** Grass: Short n= 0.150 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 3.9 | 165 | Total | | | |

## Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden



## Summary for Subcatchment 101: 101 - West Side Lawn to DP1

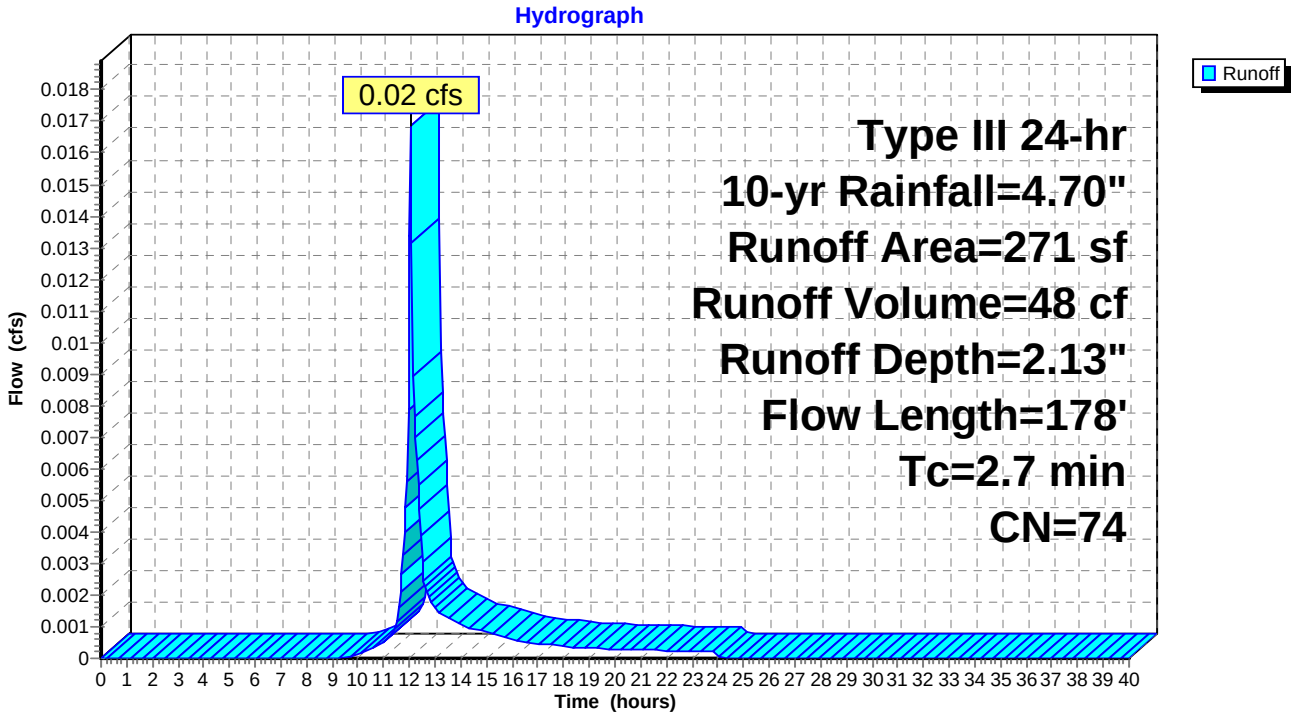
Runoff = 0.02 cfs @ 12.05 hrs, Volume= 48 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 271 | 74 | >75% Grass cover, Good, HSG C |
| 271 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.4 | 100 | 0.0150 | 1.23 | | **Sheet Flow, Grass** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.3 | 78 | 0.0220 | 1.04 | | **Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps |
| 2.7 | 178 | Total | | | |

## Subcatchment 101: 101 - West Side Lawn to DP1



## Summary for Subcatchment 102: 102 - Existing Building

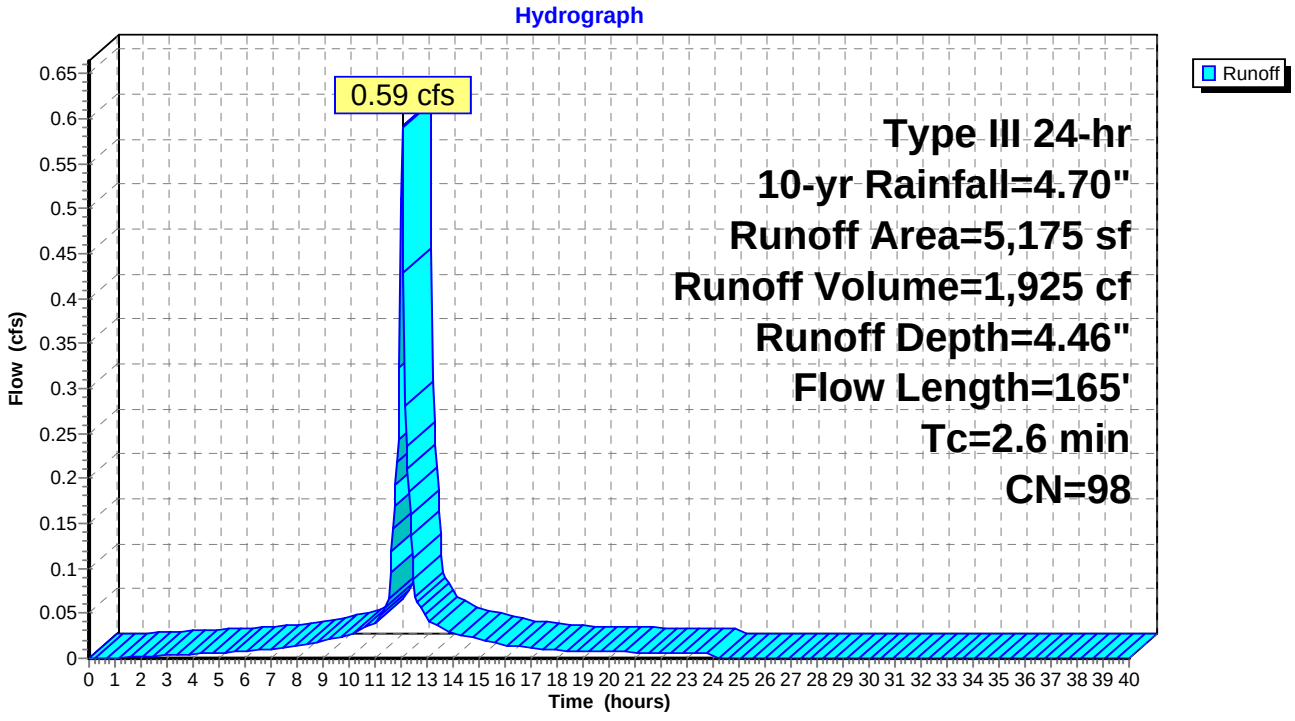
Runoff = 0.59 cfs @ 12.04 hrs, Volume= 1,925 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,175 | 98 | Roofs, HSG C, Existing Building |
| | 5,175 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.6 | 100 | 0.0100 | 1.05 | | **Sheet Flow, Estimated roof drain to rain garden** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 2.6 | 165 | Total | | | |

## Subcatchment 102: 102 - Existing Building



## Summary for Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH

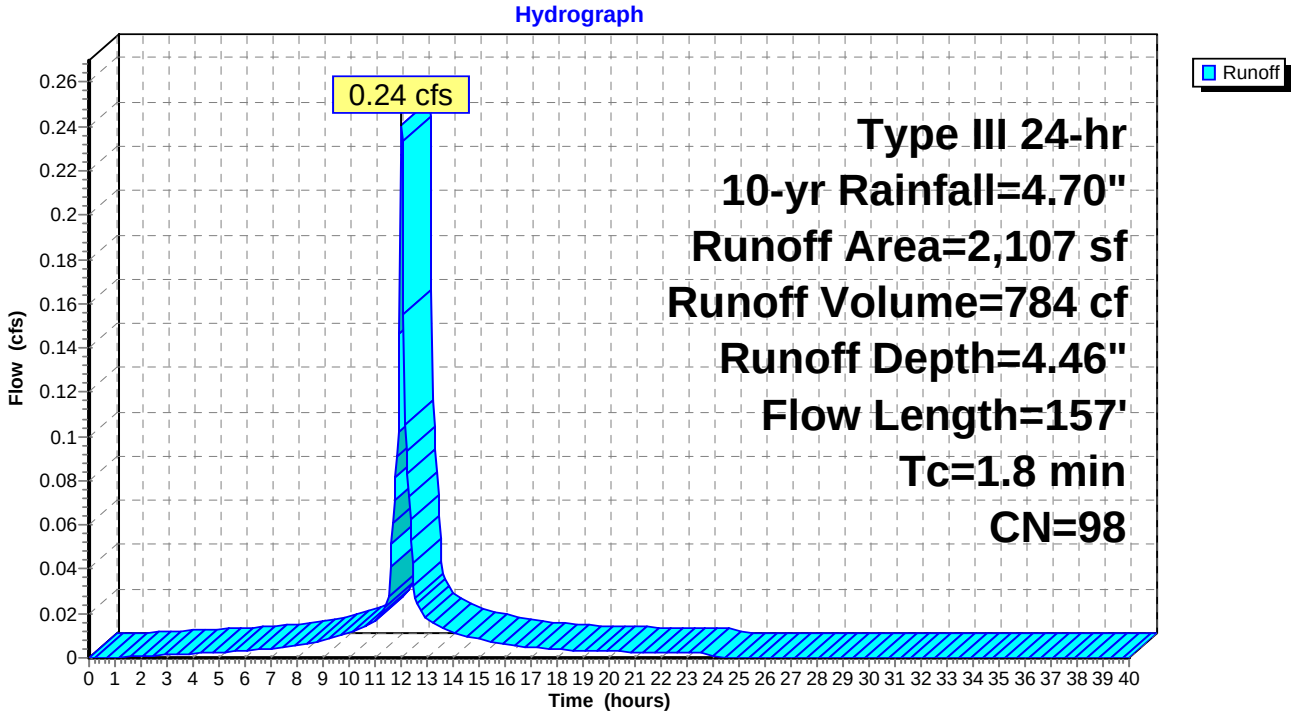
Runoff = 0.24 cfs @ 12.03 hrs, Volume= 784 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 2,107 | 98 | Roofs, HSG C, Half Prop. Building A |
| | 2,107 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 50 | 0.0050 | 0.69 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.6 | 107 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to PDMH - Estimated**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 157 | Total | | | |

### Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH



## Summary for Subcatchment 201: 201 - Pavement

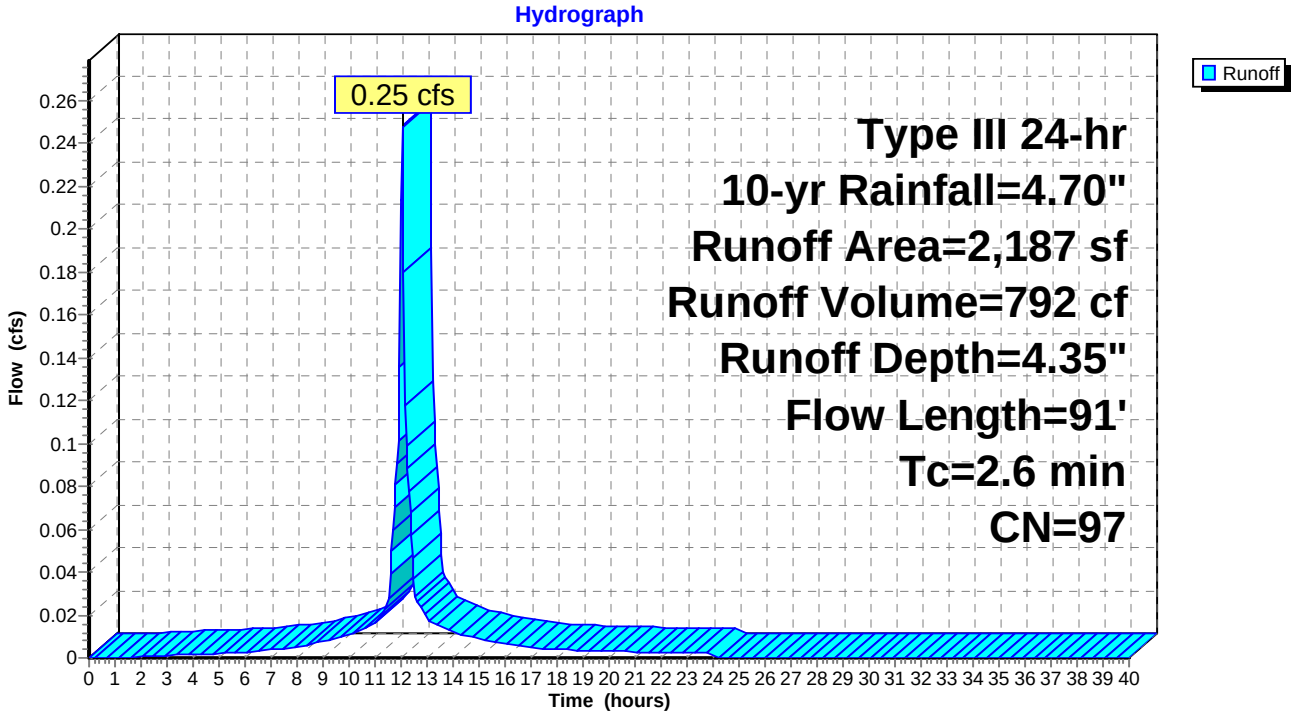
Runoff = 0.25 cfs @ 12.04 hrs, Volume= 792 cf, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 2,098 | 98 | Paved parking, HSG C |
| 89 | 74 | >75% Grass cover, Good, HSG C |
| 2,187 | 97 | Weighted Average |
| 89 | | 4.07% Pervious Area |
| 2,098 | | 95.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 6 | 0.0200 | 0.07 | | **Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.22" |
| 1.1 | 85 | 0.0170 | 1.25 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.6 | 91 | Total | | | |

## Subcatchment 201: 201 - Pavement



## Summary for Subcatchment 202: 202 - Pavement

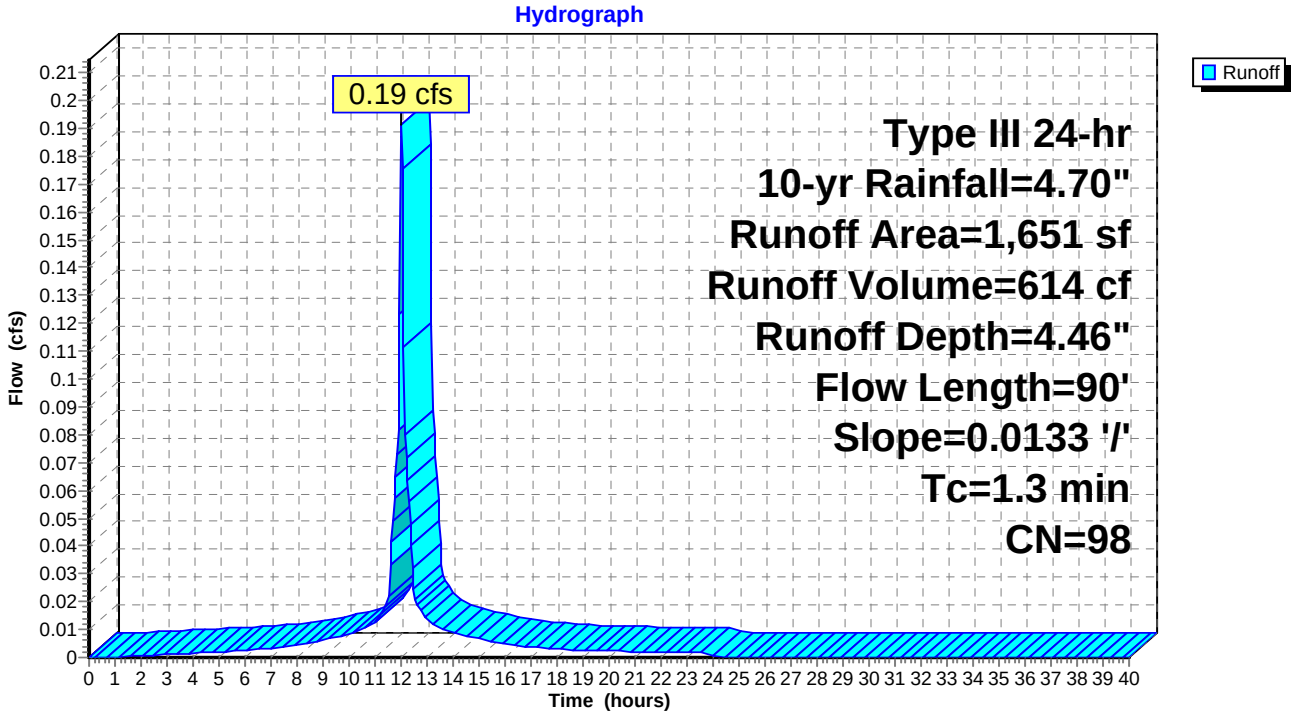
Runoff = 0.19 cfs @ 12.02 hrs, Volume= 614 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 1,651 | 98 | Paved parking, HSG C |
| 1,651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 90 | 0.0133 | 1.15 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |

## Subcatchment 202: 202 - Pavement



## Summary for Subcatchment 203: 203 - Pavement

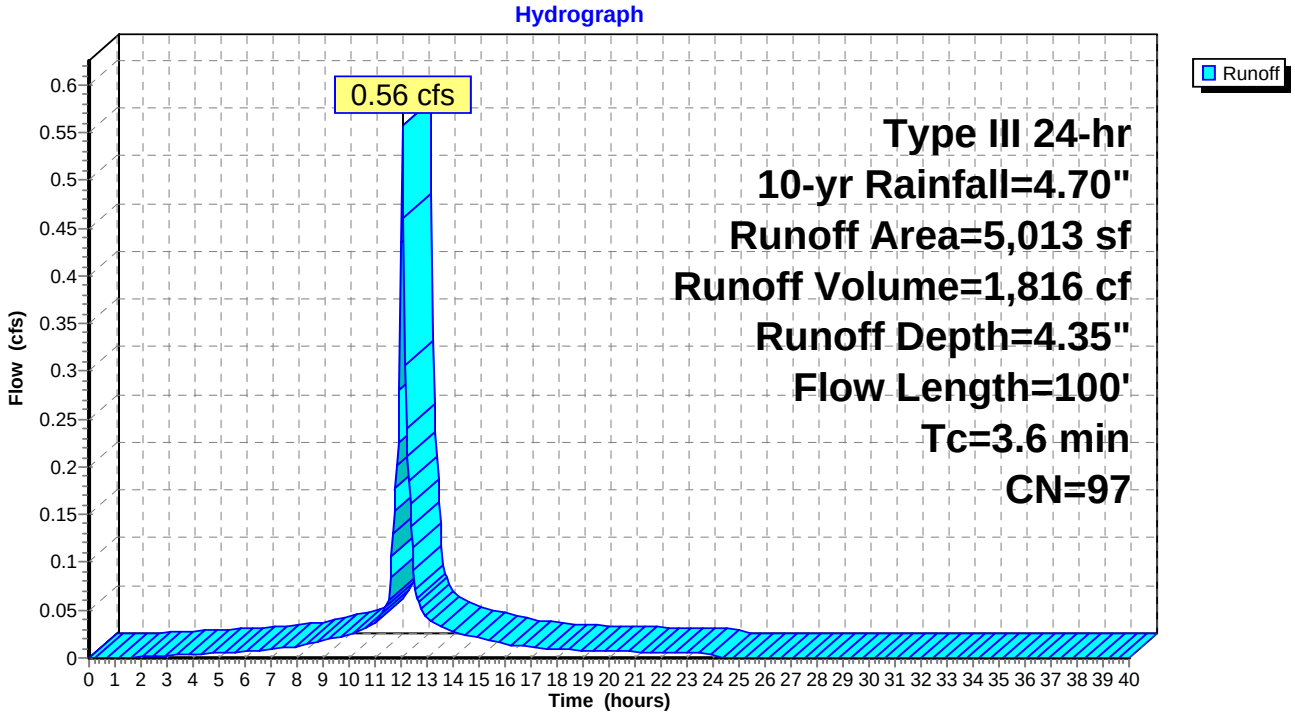
Runoff = 0.56 cfs @ 12.05 hrs, Volume= 1,816 cf, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 4,847 | 98 | Paved parking, HSG C |
| 166 | 74 | >75% Grass cover, Good, HSG C |
| 5,013 | 97 | Weighted Average |
| 166 | | 3.31% Pervious Area |
| 4,847 | | 96.69% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 2.6 | 12 | 0.0200 | 0.08 | | **Sheet Flow, Grass to Sidewalk** Grass: Dense n= 0.240 P2= 3.22" |
| 0.1 | 6 | 0.0150 | 0.70 | | **Sheet Flow, Sidewalk** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.9 | 82 | 0.0260 | 1.47 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 3.6 | 100 | Total | | | |

## Subcatchment 203: 203 - Pavement



## Summary for Subcatchment 204: 204 - Pavement

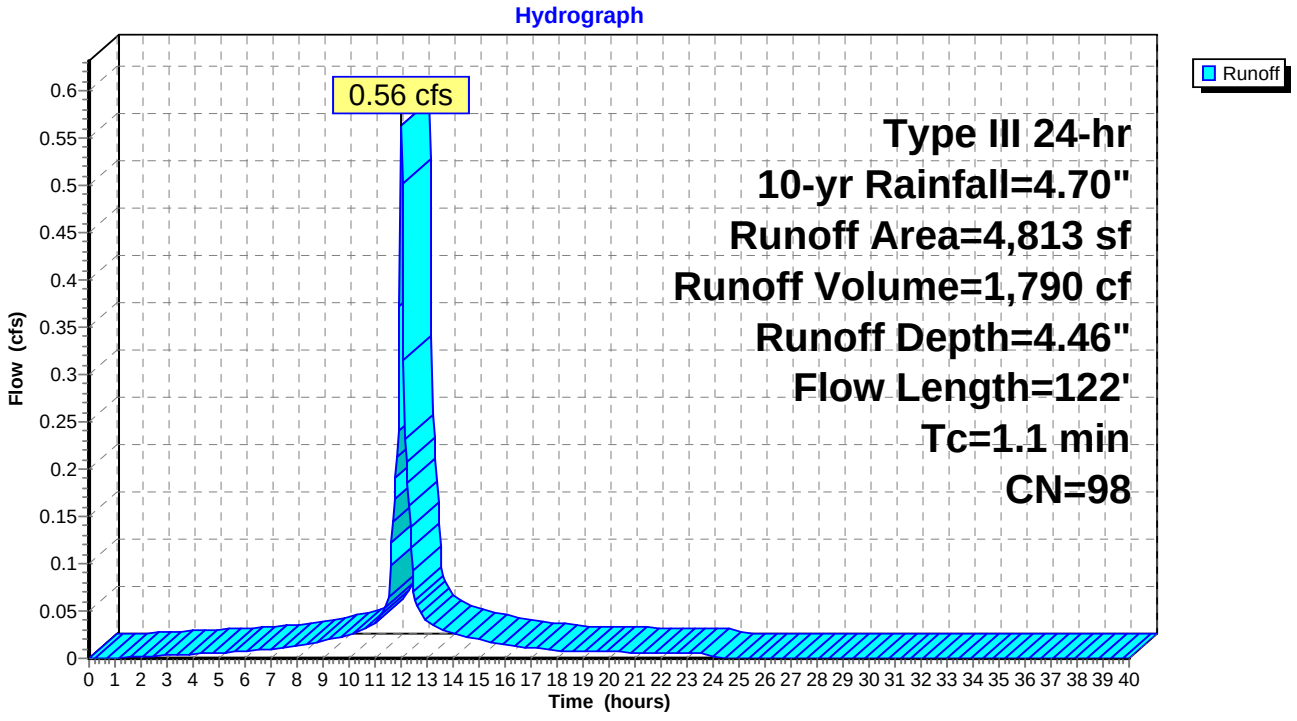
Runoff = 0.56 cfs @ 12.01 hrs, Volume= 1,790 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 4,813 | 98 | Paved parking, HSG C |
| 4,813 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.0 | 100 | 0.0300 | 1.62 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.1 | 22 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 122 | Total | | | |

## Subcatchment 204: 204 - Pavement



## Summary for Subcatchment 205: 205 - Pavement

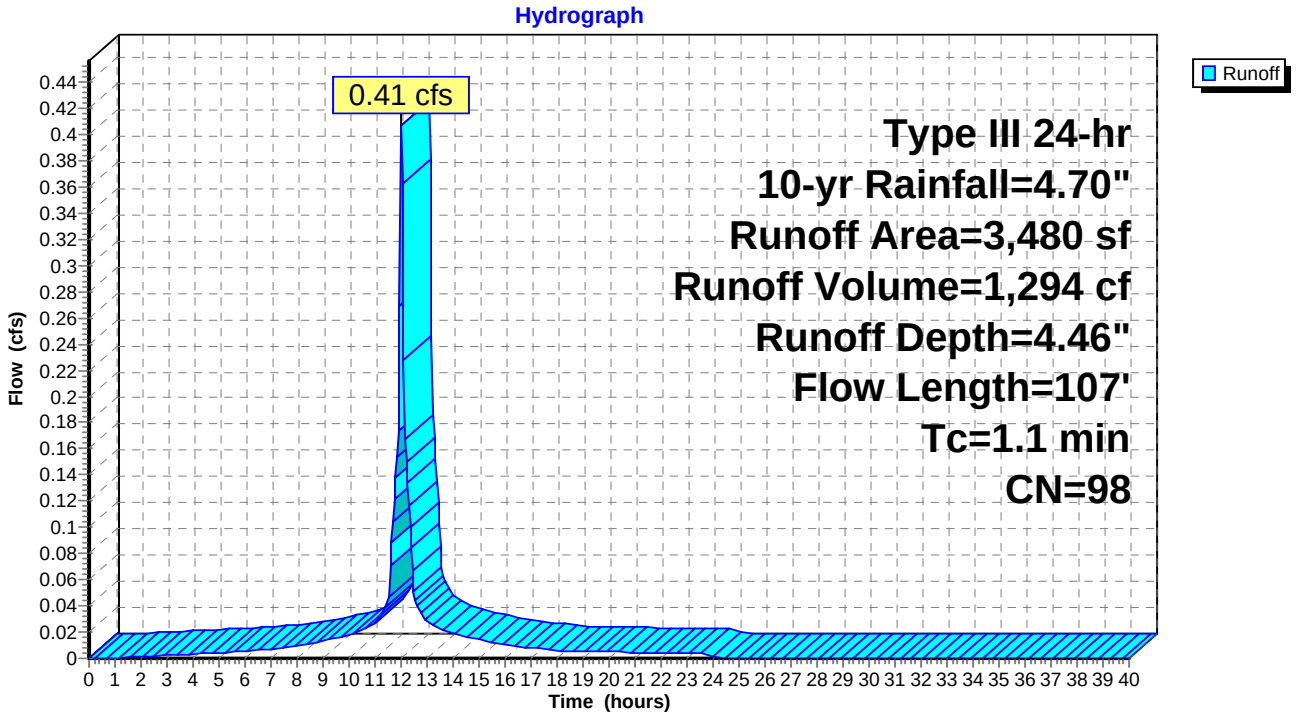
Runoff = 0.41 cfs @ 12.01 hrs, Volume= 1,294 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 3,480 | 98 | Paved parking, HSG C |
| 3,480 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 100 | 0.0270 | 1.56 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 7 | 0.0280 | 3.40 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 107 | Total | | | |

## Subcatchment 205: 205 - Pavement



## Summary for Subcatchment 206: 206 - Pavement

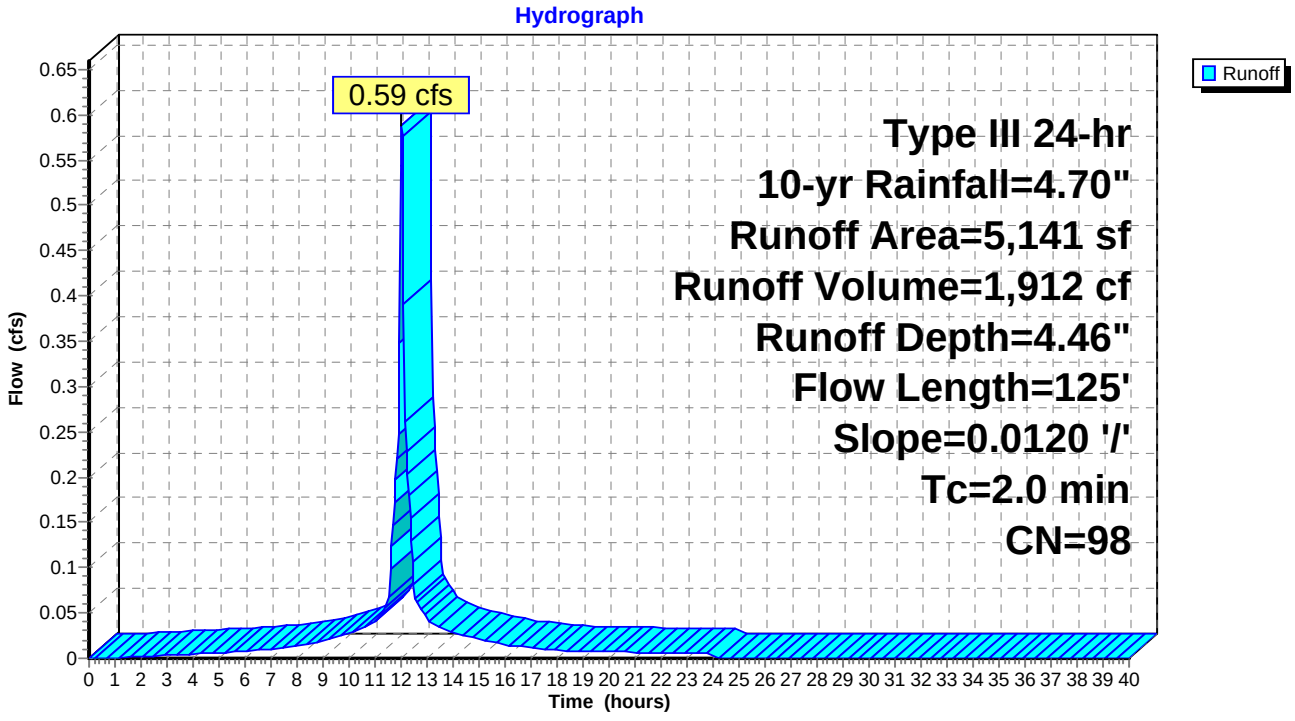
Runoff = 0.59 cfs @ 12.03 hrs, Volume= 1,912 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 5,141 | 98 | Paved parking, HSG C |
| 5,141 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 100 | 0.0120 | 1.12 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 25 | 0.0120 | 0.85 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.0 | 125 | Total | | | |

## Subcatchment 206: 206 - Pavement



## Summary for Subcatchment 207: 207 - Pavement

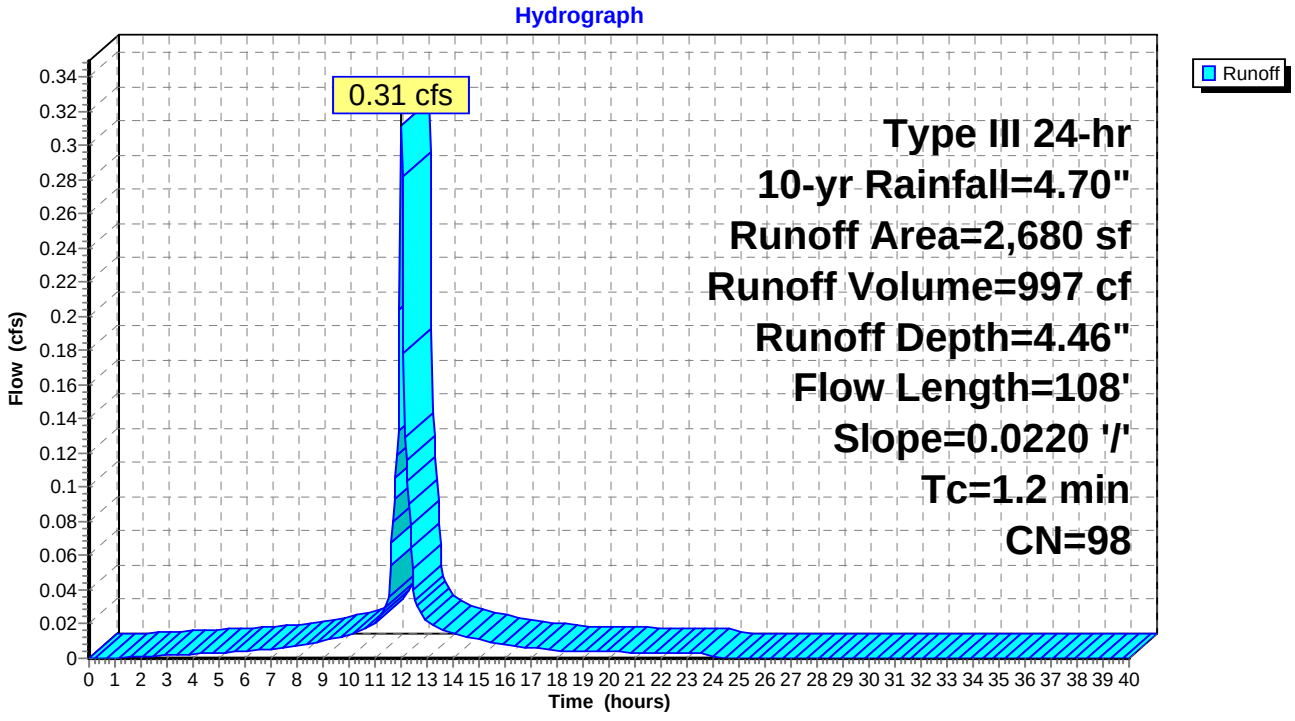
Runoff = 0.31 cfs @ 12.02 hrs, Volume= 997 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 2,680 | 98 | Paved parking, HSG C |
| 2,680 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 100 | 0.0220 | 1.43 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 8 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.2 | 108 | Total | | | |

## Subcatchment 207: 207 - Pavement



## Summary for Subcatchment 208: 208 - Proposed Building Tenant B

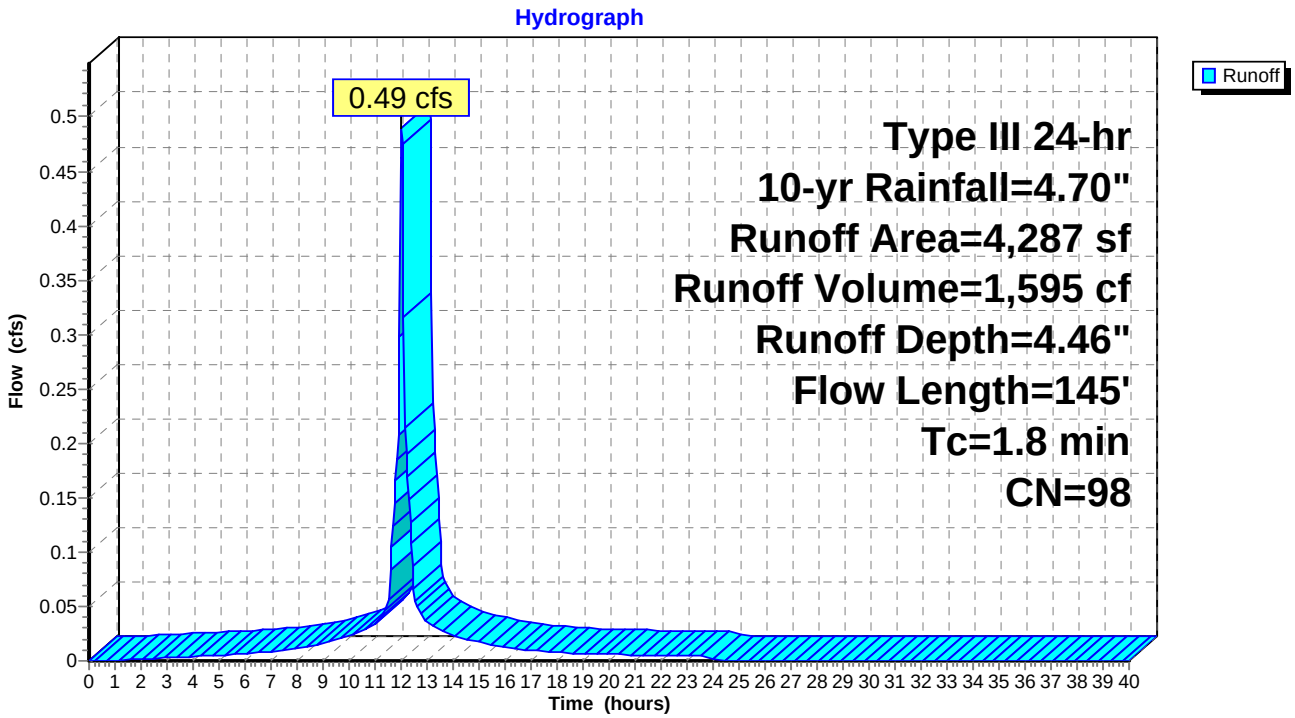
Runoff = 0.49 cfs @ 12.03 hrs, Volume= 1,595 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 4,287 | 98 | Roofs, HSG C |
| 4,287 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 55 | 0.0050 | 0.70 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 90 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Estimated Roof Drain to PDMH**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 145 | Total | | | |

## Subcatchment 208: 208 - Proposed Building Tenant B



## mary for Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and W

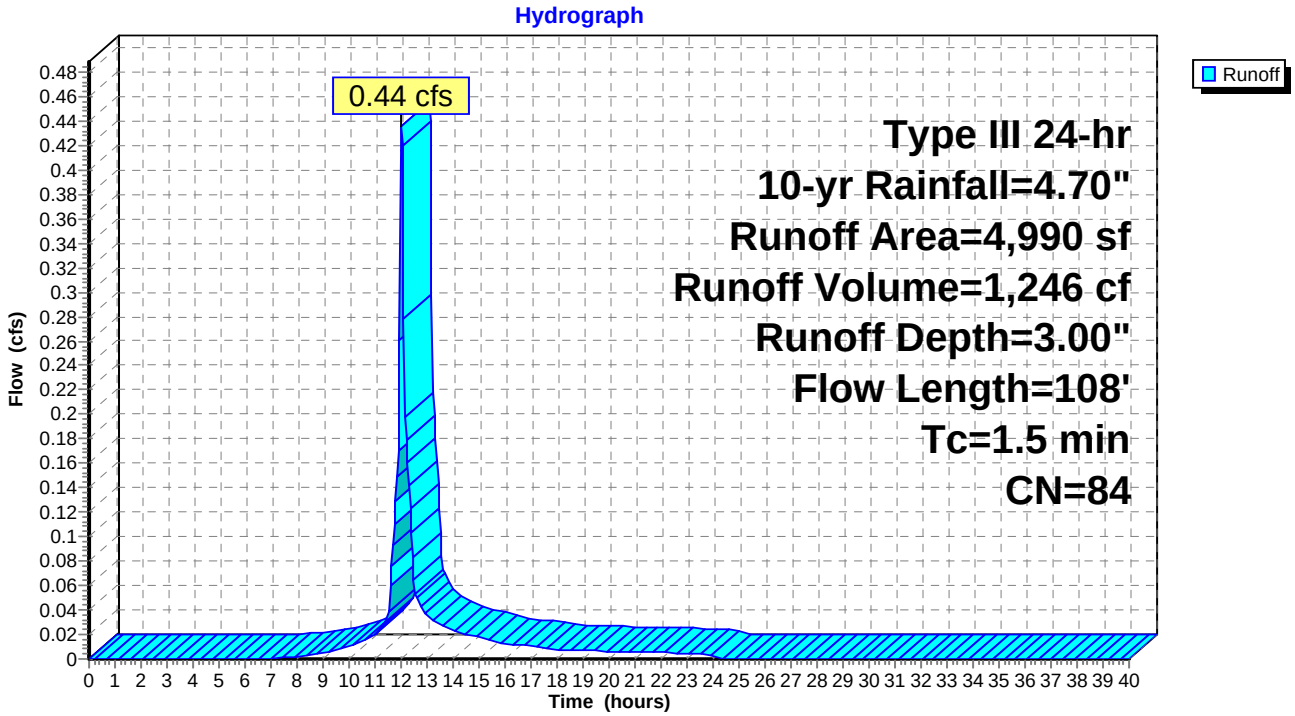
Runoff = 0.44 cfs @ 12.03 hrs, Volume= 1,246 cf, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 876 | 65 | Rain Garden Surface Area |
| | 2,078 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 84 | 98 | Unconnected pavement, HSG C |
| | 1,952 | 98 | Unconnected roofs, HSG C |
| | 4,990 | 84 | Weighted Average |
| | 2,954 | | 59.20% Pervious Area |
| | 2,036 | | 40.80% Impervious Area |
| | 2,036 | | 100.00% Unconnected |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 43 | 0.0050 | 0.67 | | **Sheet Flow, Flat Roof to Drain** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.4 | 65 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to Rain garden** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior |
| 1.5 | 108 | Total | | | |

## Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and Walkwa



## Summary for Subcatchment 210: 210 - Existing South features remaining to DP2

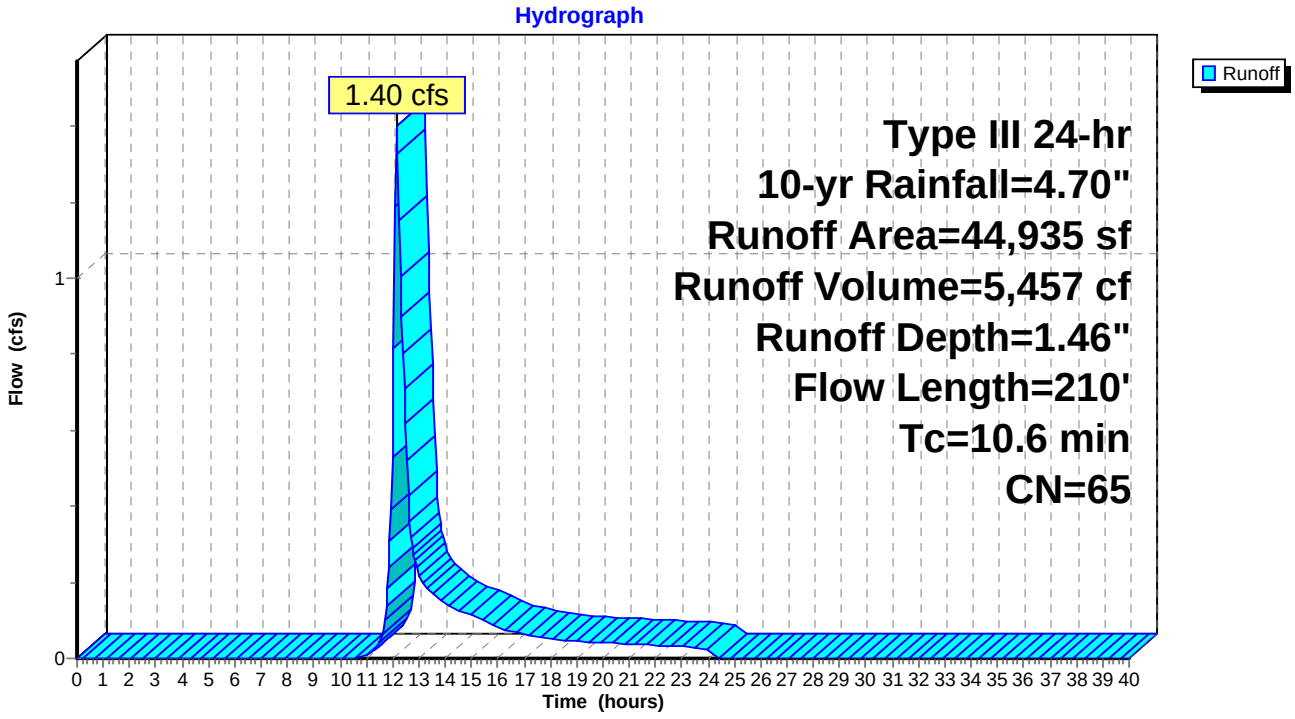
Runoff = 1.40 cfs @ 12.16 hrs, Volume= 5,457 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 35,498 | 65 | Brush, Good, HSG C |
| * | 9,437 | 65 | Brush, Good, HSG C, Wetland Brush |
| | 44,935 | 65 | Weighted Average |
| | 44,935 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0600 | 0.18 | | **Sheet Flow,** Grass: Dense n= 0.240 P2= 3.22" |
| 1.4 | 110 | 0.0360 | 1.33 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 10.6 | 210 | Total | | | |

## Subcatchment 210: 210 - Existing South features remaining to DP2



## Summary for Subcatchment 300: 300 - Lawn East to DP3

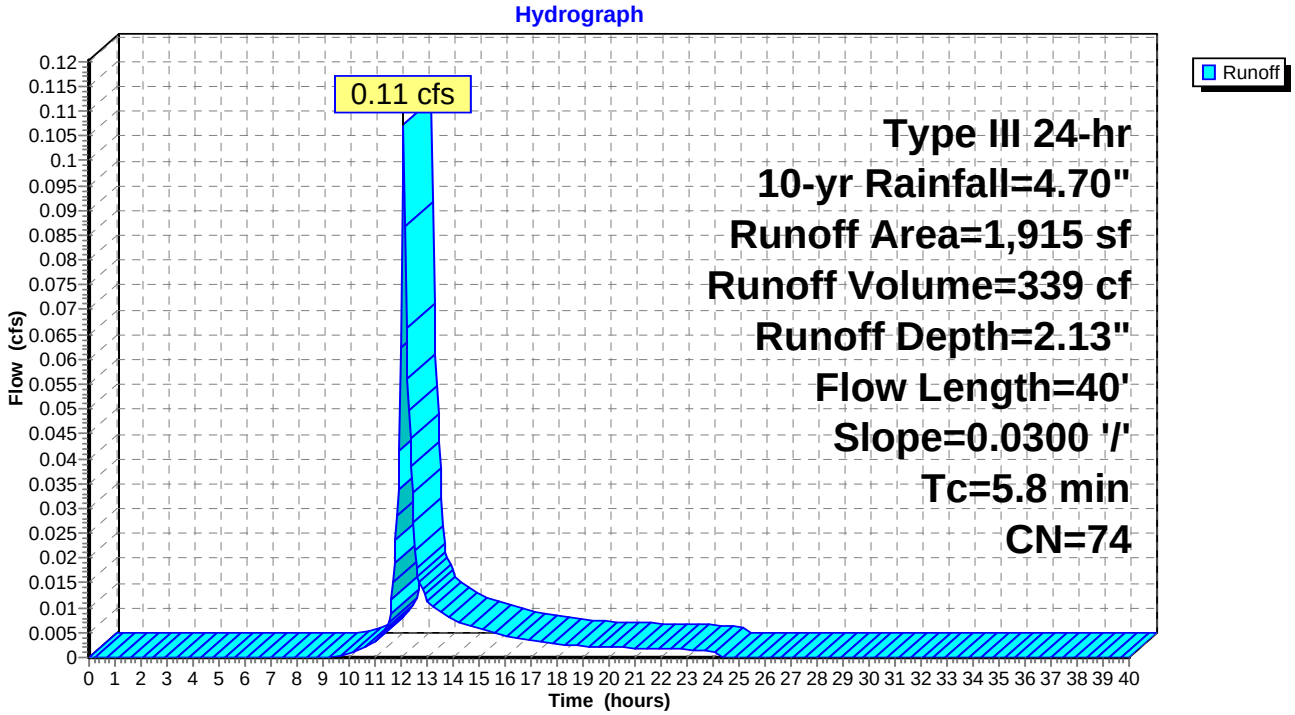
Runoff = 0.11 cfs @ 12.09 hrs, Volume= 339 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

| Area (sf) | CN | Description |
|---|---|---|
| 1,915 | 74 | >75% Grass cover, Good, HSG C |
| 1,915 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.8 | 40 | 0.0300 | 0.11 | | **Sheet Flow, Overland Flow**<br>Grass: Dense n= 0.240 P2= 3.22" |

## Subcatchment 300: 300 - Lawn East to DP3



## Summary for Pond 1P: Infiltration System

Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 1.62 cfs @ 12.03 hrs, Volume= 5,288 cf
Outflow = 0.26 cfs @ 11.65 hrs, Volume= 5,288 cf, Atten= 84%, Lag= 0.0 min
Discarded = 0.26 cfs @ 11.65 hrs, Volume= 5,288 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.43' @ 12.47 hrs Surf.Area= 1,342 sf Storage= 1,324 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 26.7 min ( 771.8 - 745.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 16.80' | 961 cf | **Stone field surrounding chambers (Irregular)** Listed below<br>3,623 cf Overall - 1,222 cf Embedded = 2,401 cf x 40.0% Voids |
| #2 | 17.30' | 1,222 cf | **Cultec R180 Chambers, 56 units** Listed below Inside #1 |
| | | 2,183 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 16.80 | 1,342 | 175.5 | 0 | 0 | 1,342 |
| 19.50 | 1,342 | 175.5 | 3,623 | 3,623 | 1,816 |

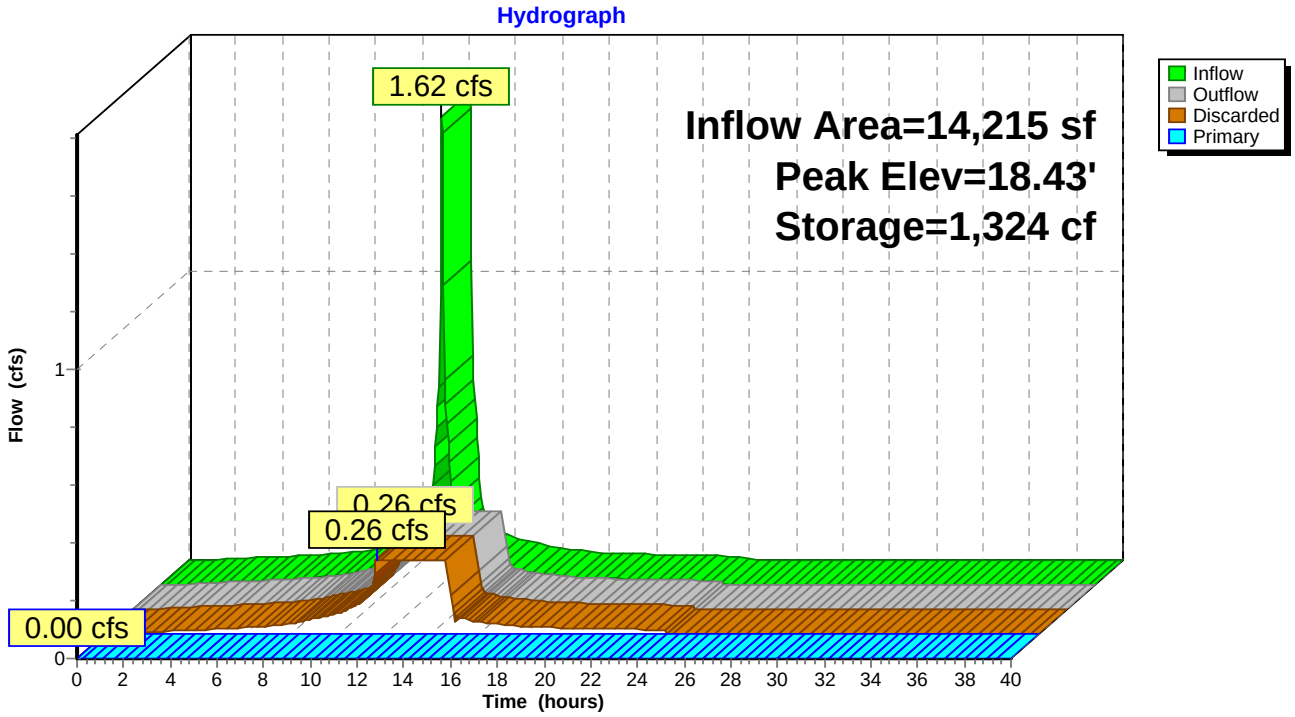
| Elevation (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|
| 17.30 | 0 | 0 |
| 18.10 | 460 | 460 |
| 18.70 | 522 | 982 |
| 19.00 | 240 | 1,222 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 16.80' | **8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01' |
| #2 | Device 3 | 19.00' | **4.0' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Primary | 16.80' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.80' / 16.50' S= 0.0143 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Discarded OutFlow** Max=0.26 cfs @ 11.65 hrs HW=16.83' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=16.80' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** ( Controls 0.00 cfs)
└**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: Infiltration System



## Summary for Pond CB1: PCB1

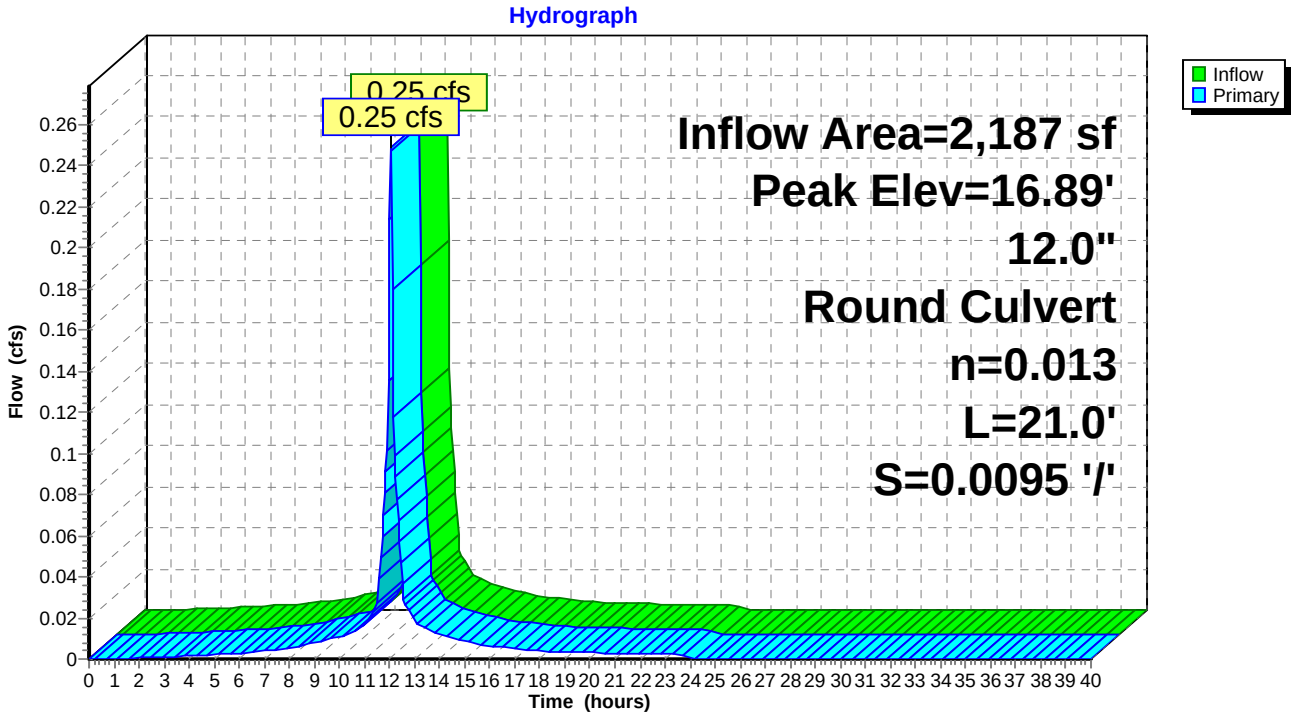
Inflow Area = 2,187 sf, 95.93% Impervious, Inflow Depth = 4.35" for 10-yr event
Inflow = 0.25 cfs @ 12.04 hrs, Volume= 792 cf
Outflow = 0.25 cfs @ 12.04 hrs, Volume= 792 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.04 hrs, Volume= 792 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.89' @ 12.05 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.22 cfs @ 12.04 hrs HW=16.88' TW=16.70' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.22 cfs @ 1.84 fps)

### Pond CB1: PCB1



## Summary for Pond CB2: PCB2

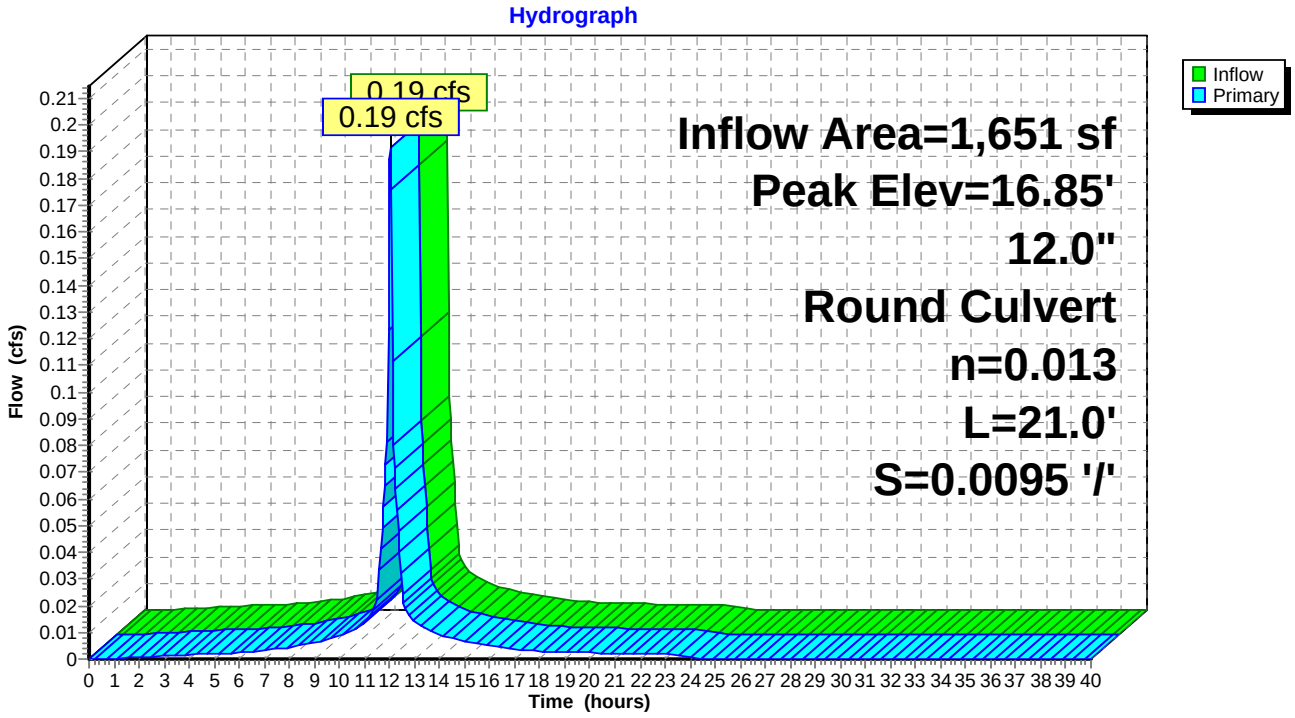
Inflow Area = 1,651 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 0.19 cfs @ 12.02 hrs, Volume= 614 cf
Outflow = 0.19 cfs @ 12.02 hrs, Volume= 614 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.02 hrs, Volume= 614 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.85' @ 12.04 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.16 cfs @ 12.02 hrs HW=16.84' TW=16.68' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.16 cfs @ 1.62 fps)

## Pond CB2: PCB2



## Summary for Pond CB3: PCB3

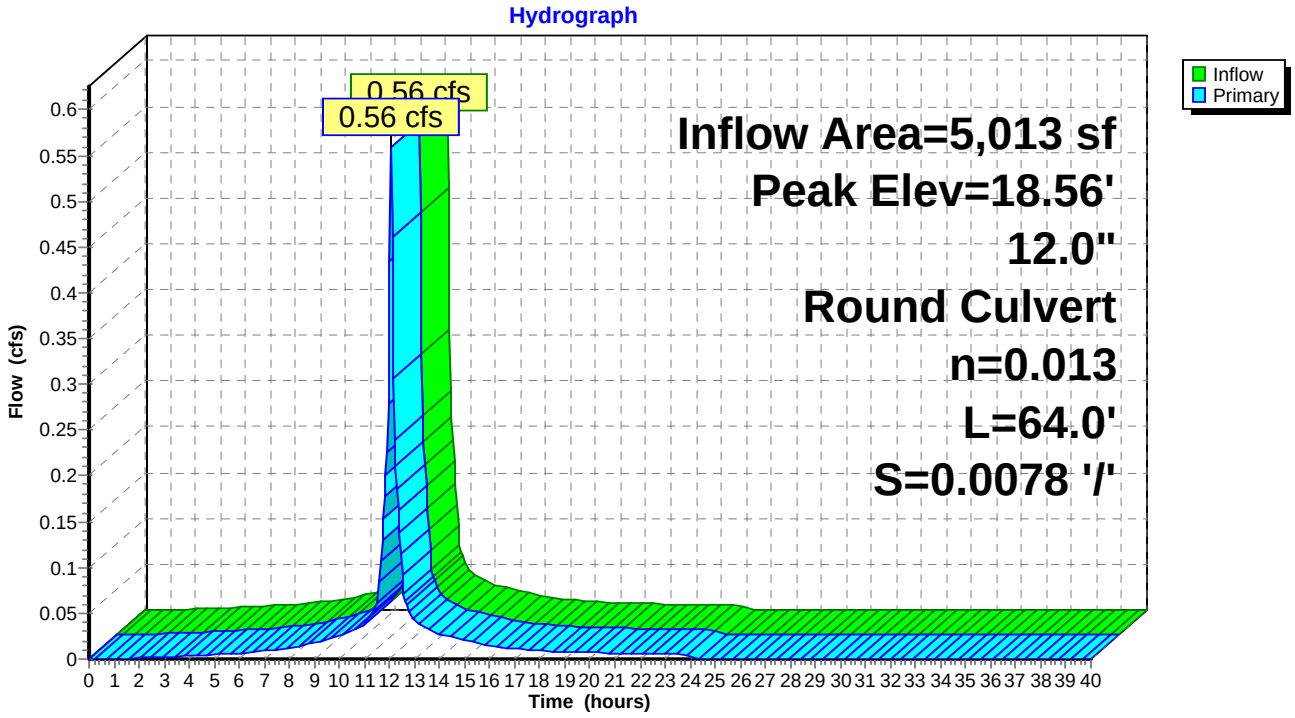
Inflow Area = 5,013 sf, 96.69% Impervious, Inflow Depth = 4.35" for 10-yr event
Inflow = 0.56 cfs @ 12.05 hrs, Volume= 1,816 cf
Outflow = 0.56 cfs @ 12.05 hrs, Volume= 1,816 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.05 hrs, Volume= 1,816 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.56' @ 12.08 hrs
Flood Elev= 20.70'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.00' | **12.0" Round Culvert**<br>L= 64.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.00' / 17.50' S= 0.0078 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.44 cfs @ 12.05 hrs HW=18.56' TW=18.42' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.44 cfs @ 1.43 fps)

## Pond CB3: PCB3



## Summary for Pond CB4: PCB4

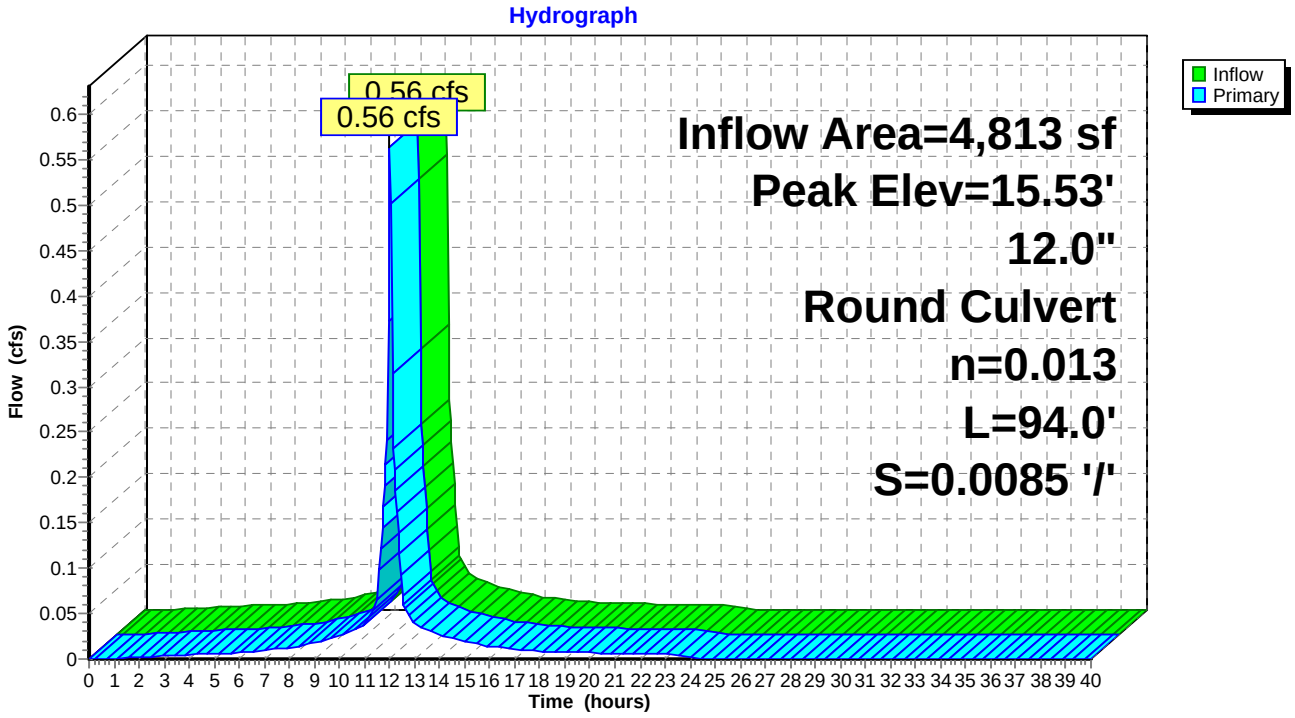
Inflow Area = 4,813 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 0.56 cfs @ 12.01 hrs, Volume= 1,790 cf
Outflow = 0.56 cfs @ 12.01 hrs, Volume= 1,790 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.01 hrs, Volume= 1,790 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.53' @ 12.03 hrs
Flood Elev= 17.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.10' | **12.0" Round Culvert**<br>L= 94.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.10' / 14.30' S= 0.0085 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.50 cfs @ 12.01 hrs HW=15.52' TW=14.98' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.50 cfs @ 2.32 fps)

## Pond CB4: PCB4



## Summary for Pond CB5: PCB5

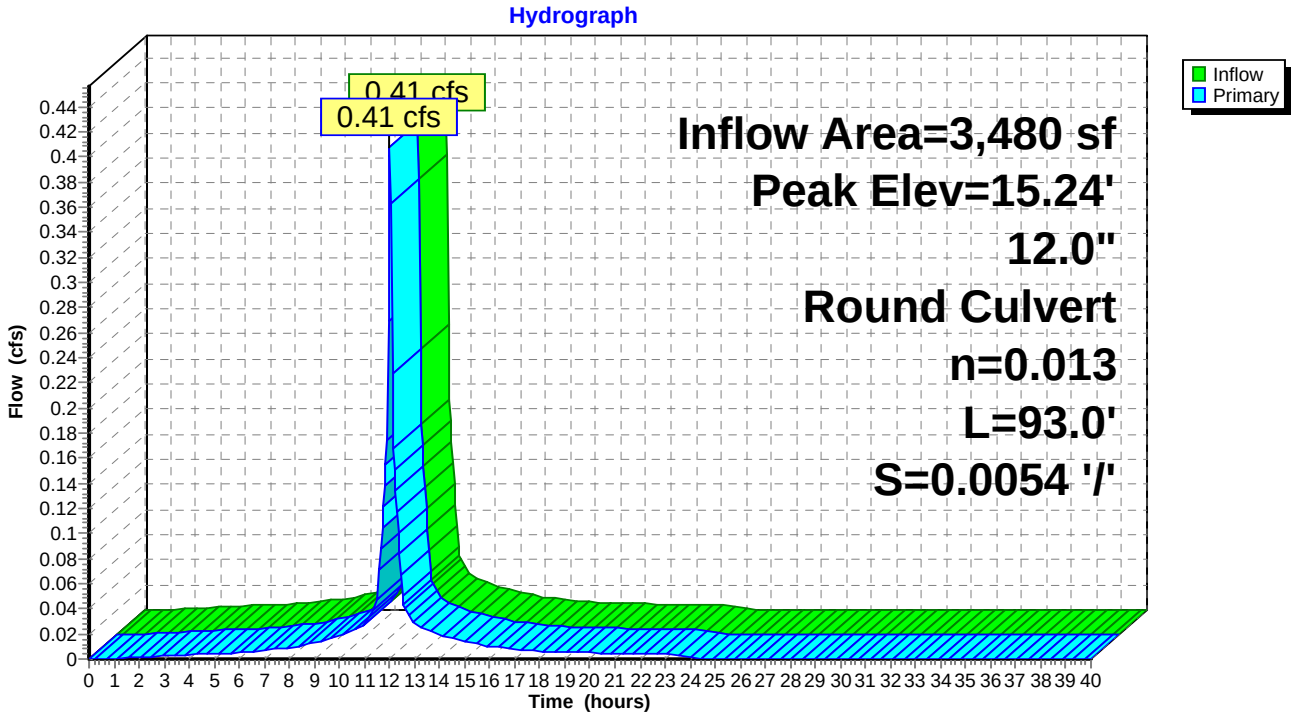
Inflow Area = 3,480 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 0.41 cfs @ 12.01 hrs, Volume= 1,294 cf
Outflow = 0.41 cfs @ 12.01 hrs, Volume= 1,294 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.41 cfs @ 12.01 hrs, Volume= 1,294 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.24' @ 12.04 hrs
Flood Elev= 17.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.80' | **12.0" Round Culvert**<br>L= 93.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.80' / 14.30' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.33 cfs @ 12.01 hrs HW=15.22' TW=14.98' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.33 cfs @ 1.54 fps)

## Pond CB5: PCB5



## Summary for Pond CB6: PCB6

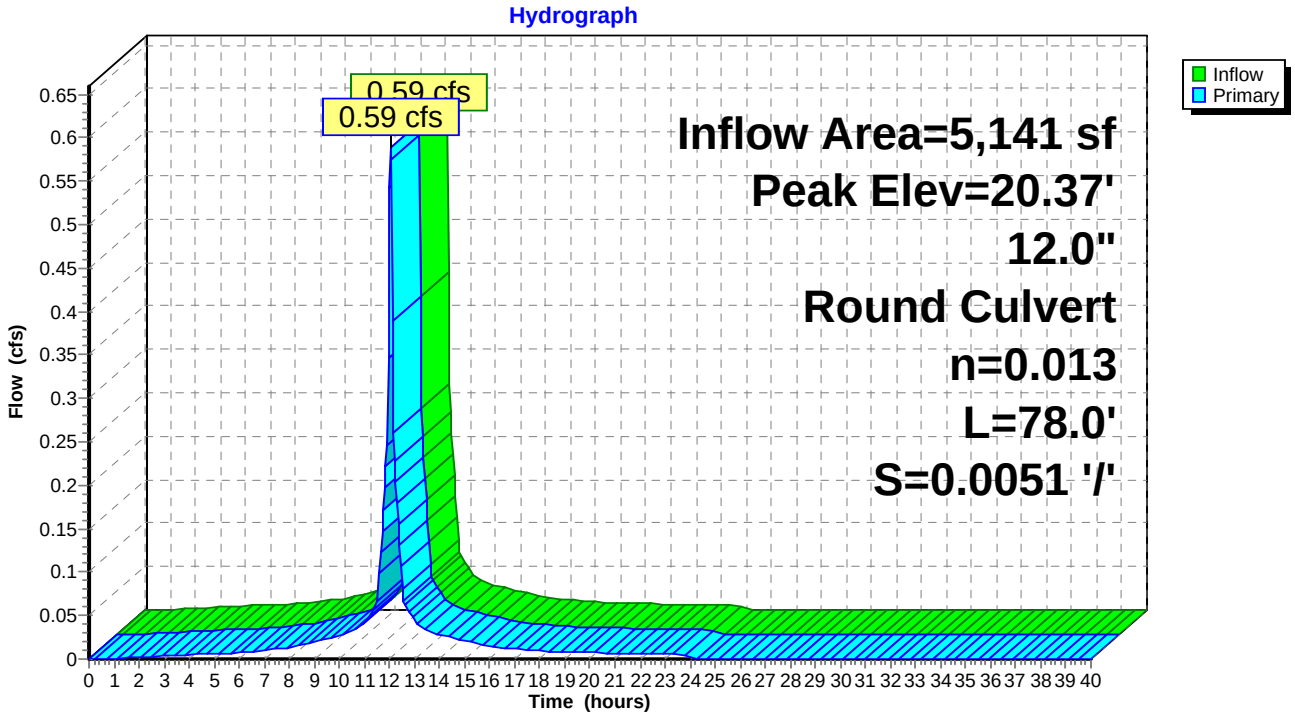
Inflow Area = 5,141 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 0.59 cfs @ 12.03 hrs, Volume= 1,912 cf
Outflow = 0.59 cfs @ 12.03 hrs, Volume= 1,912 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.59 cfs @ 12.03 hrs, Volume= 1,912 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.37' @ 12.04 hrs
Flood Elev= 22.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.90' | **12.0" Round Culvert**<br>L= 78.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.90' / 19.50' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.53 cfs @ 12.03 hrs HW=20.36' TW=19.94' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.53 cfs @ 2.22 fps)

## Pond CB6: PCB6



## Summary for Pond CB7: PCB7

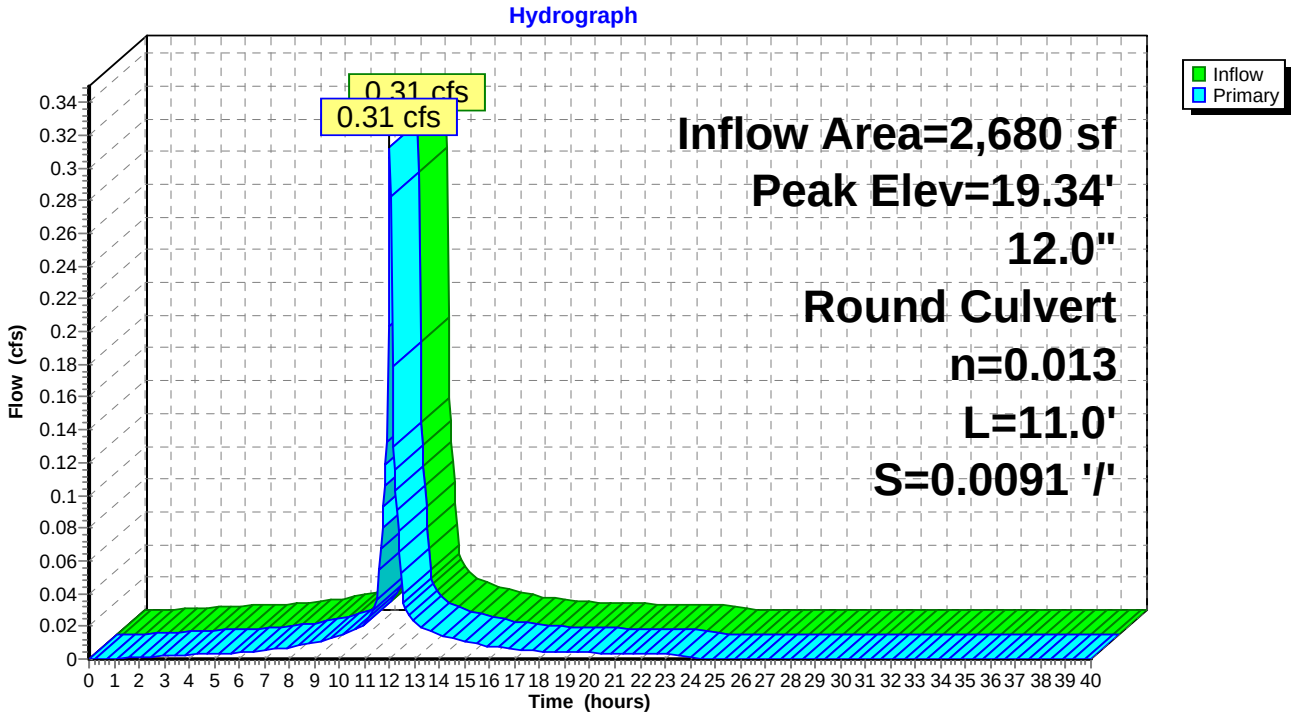
Inflow Area = 2,680 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 0.31 cfs @ 12.02 hrs, Volume= 997 cf
Outflow = 0.31 cfs @ 12.02 hrs, Volume= 997 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.31 cfs @ 12.02 hrs, Volume= 997 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.34' @ 12.06 hrs
Flood Elev= 21.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.90' | **12.0" Round Culvert**<br>L= 11.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.90' / 18.80' S= 0.0091 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.12 cfs @ 12.02 hrs HW=19.30' TW=19.28' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.12 cfs @ 0.64 fps)

## Pond CB7: PCB7

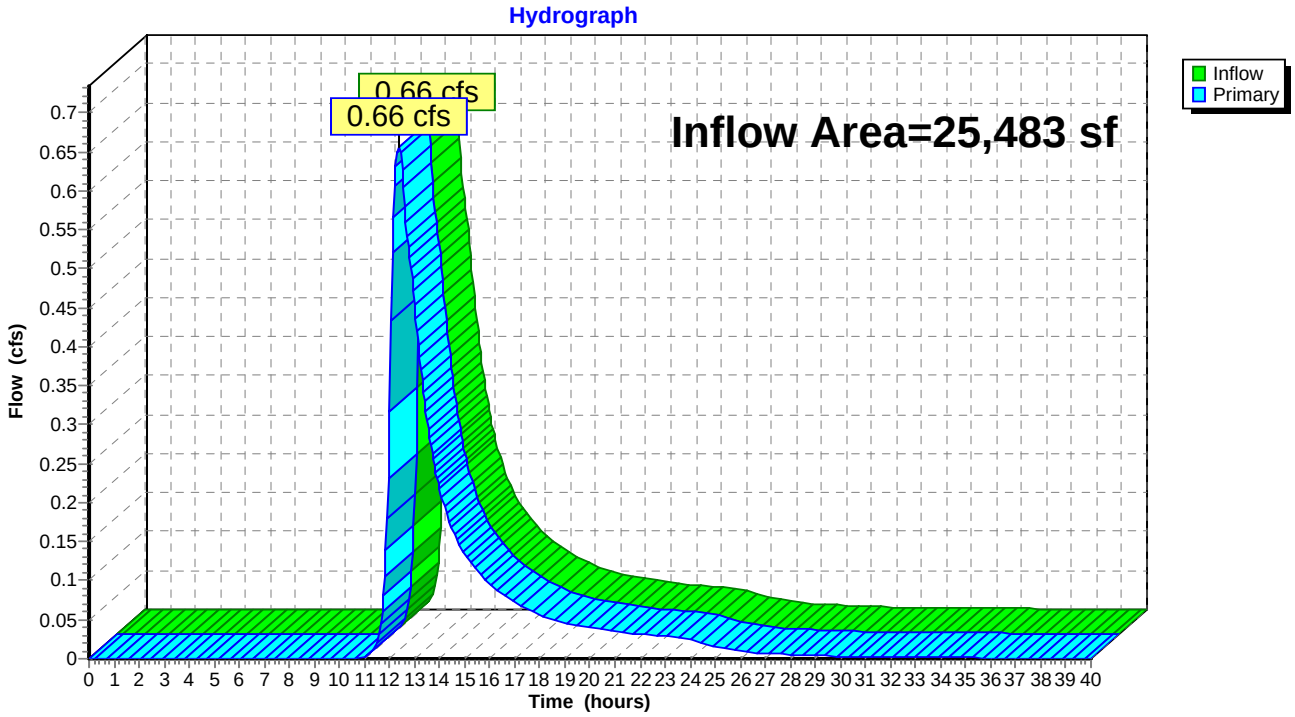


## Summary for Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

Inflow Area = 25,483 sf, 55.96% Impervious, Inflow Depth > 2.79" for 10-yr event
Inflow = 0.66 cfs @ 12.37 hrs, Volume= 5,933 cf
Primary = 0.66 cfs @ 12.37 hrs, Volume= 5,933 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

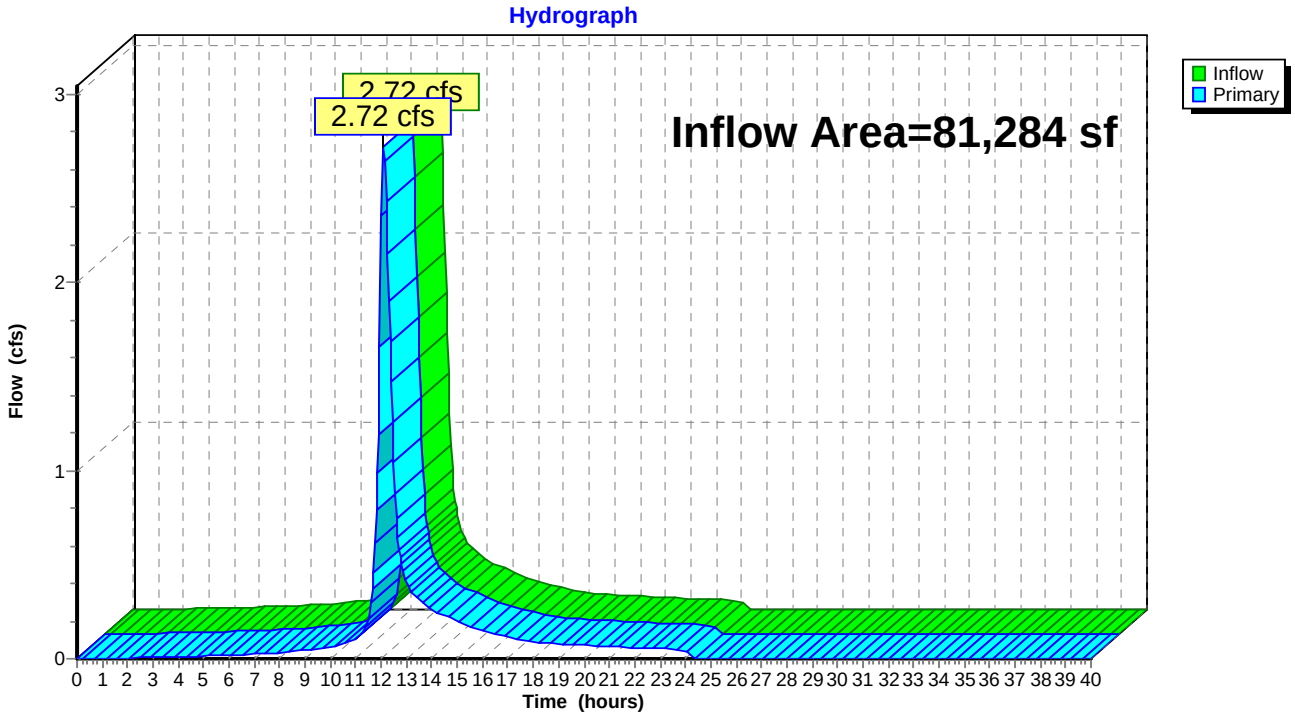


## Summary for Pond DP2: Design Pont #2_Wetland-South

Inflow Area = 81,284 sf, 40.77% Impervious, Inflow Depth = 1.82" for 10-yr event
Inflow = 2.72 cfs @ 12.09 hrs, Volume= 12,323 cf
Primary = 2.72 cfs @ 12.09 hrs, Volume= 12,323 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP2: Design Pont #2_Wetland-South

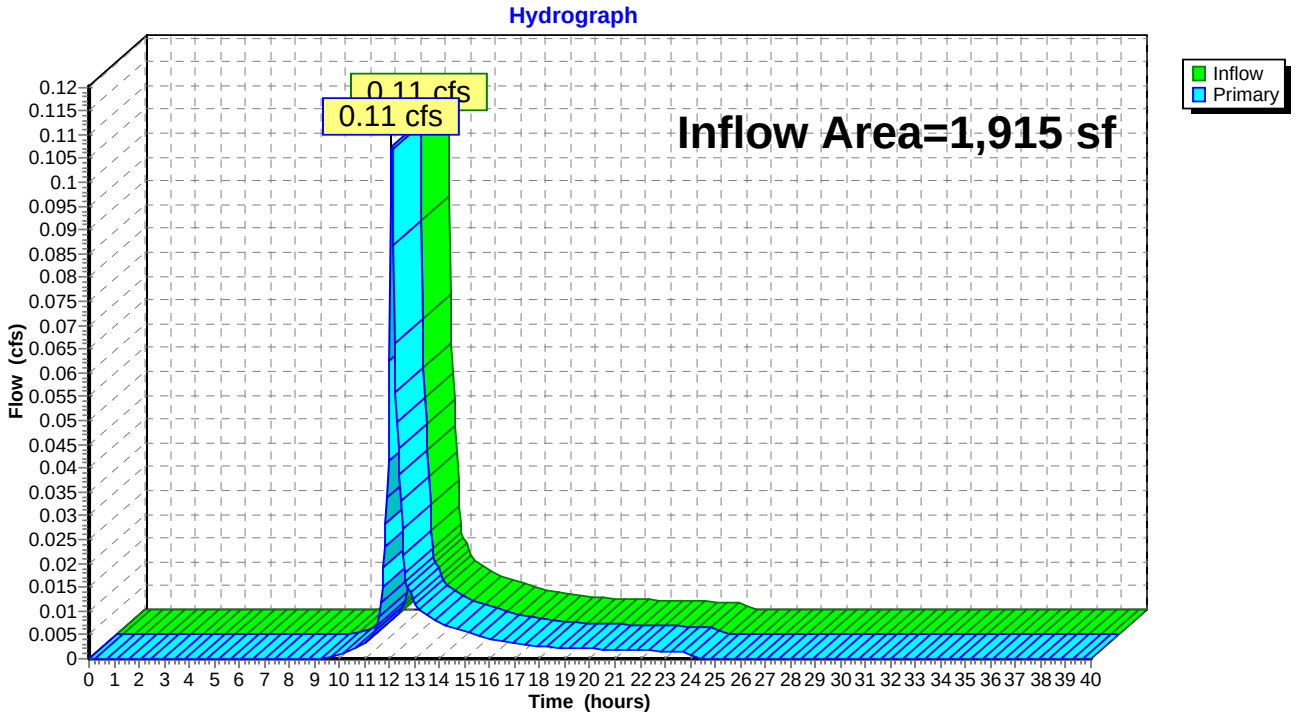


## Summary for Pond DP3: Design Pont #3_Abutting Lot-East

Inflow Area = 1,915 sf, 0.00% Impervious, Inflow Depth = 2.13" for 10-yr event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 339 cf
Primary = 0.11 cfs @ 12.09 hrs, Volume= 339 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP3: Design Pont #3_Abutting Lot-East



## Summary for Pond MH1: PDMH1

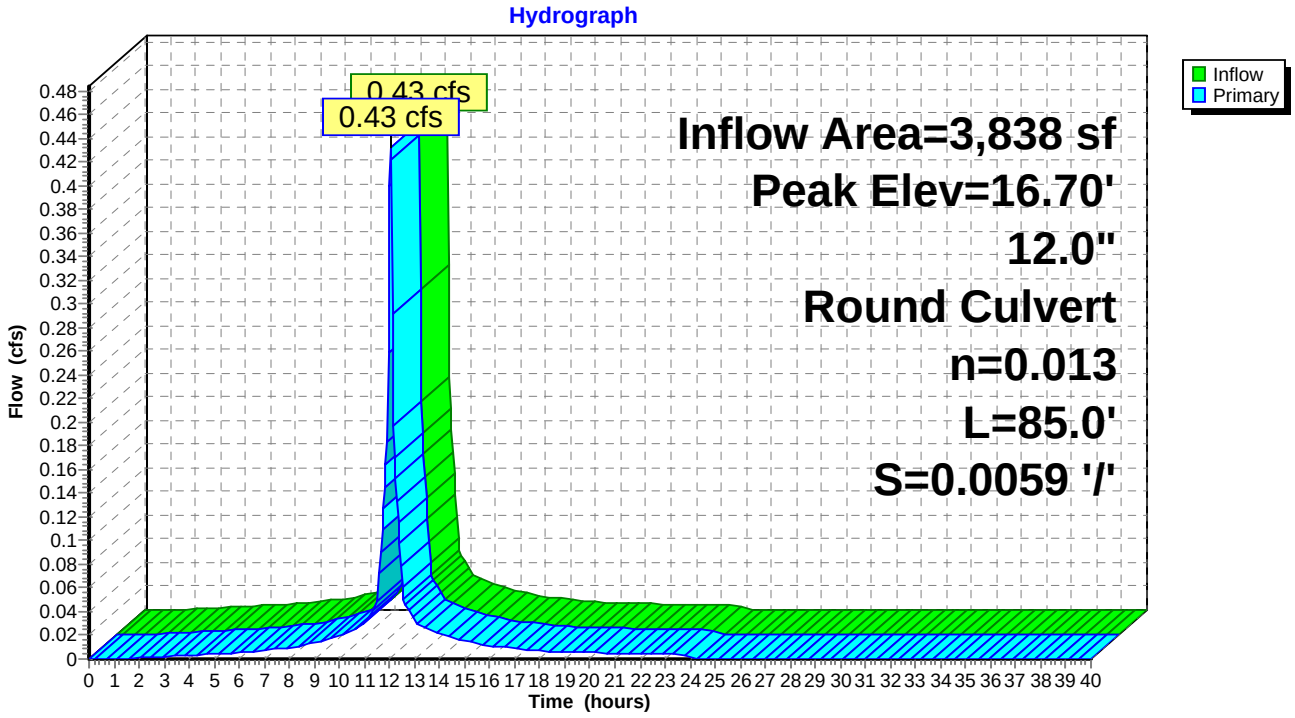
Inflow Area = 3,838 sf, 97.68% Impervious, Inflow Depth = 4.40" for 10-yr event
Inflow = 0.43 cfs @ 12.03 hrs, Volume= 1,407 cf
Outflow = 0.43 cfs @ 12.03 hrs, Volume= 1,407 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.03 hrs, Volume= 1,407 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.70' @ 12.04 hrs
Flood Elev= 20.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.30' | **12.0" Round Culvert**<br>L= 85.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.30' / 15.80' S= 0.0059 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.38 cfs @ 12.03 hrs HW=16.69' TW=16.30' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.38 cfs @ 1.99 fps)

### Pond MH1: PDMH1



## Summary for Pond MH2: PDMH2

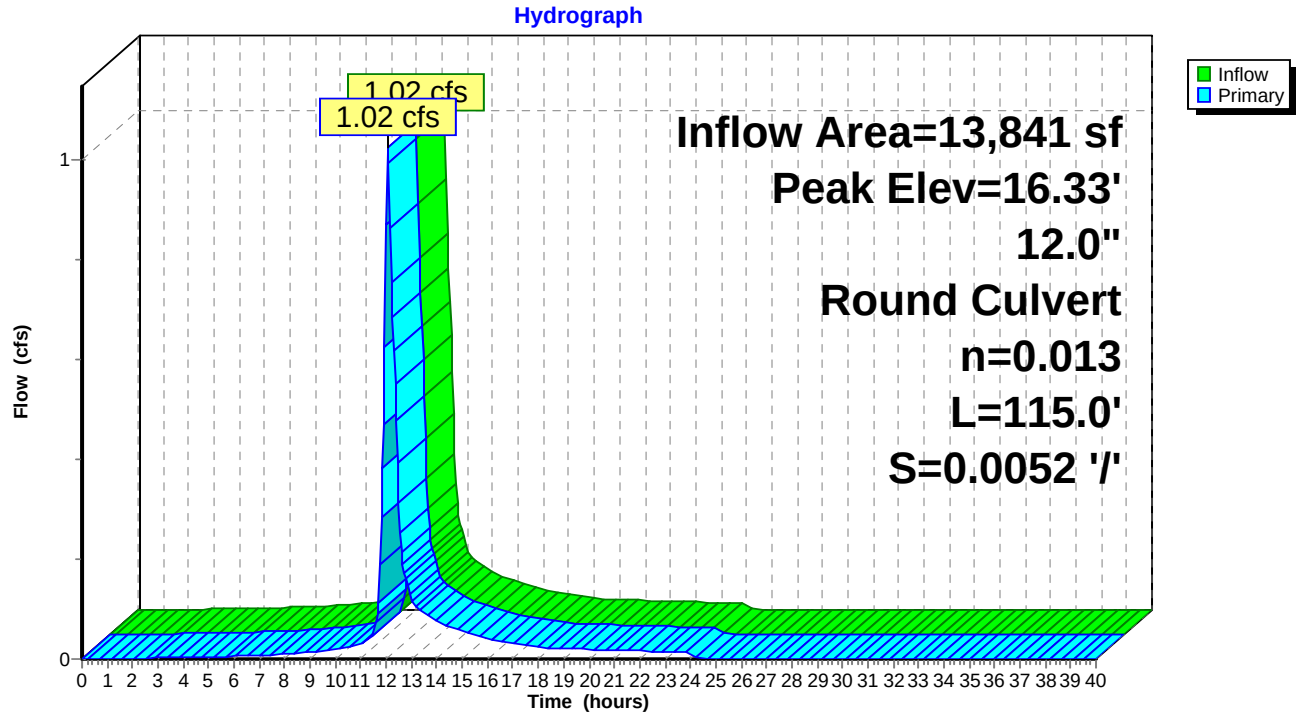
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 3.28" for 10-yr event
Inflow = 1.02 cfs @ 12.07 hrs, Volume= 3,781 cf
Outflow = 1.02 cfs @ 12.07 hrs, Volume= 3,781 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.02 cfs @ 12.07 hrs, Volume= 3,781 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.33' @ 12.08 hrs
Flood Elev= 21.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.70' | **12.0" Round Culvert**<br>L= 115.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.70' / 15.10' S= 0.0052 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.97 cfs @ 12.07 hrs HW=16.32' TW=15.65' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.97 cfs @ 2.73 fps)

### Pond MH2: PDMH2



## Summary for Pond MH3: PDMH3

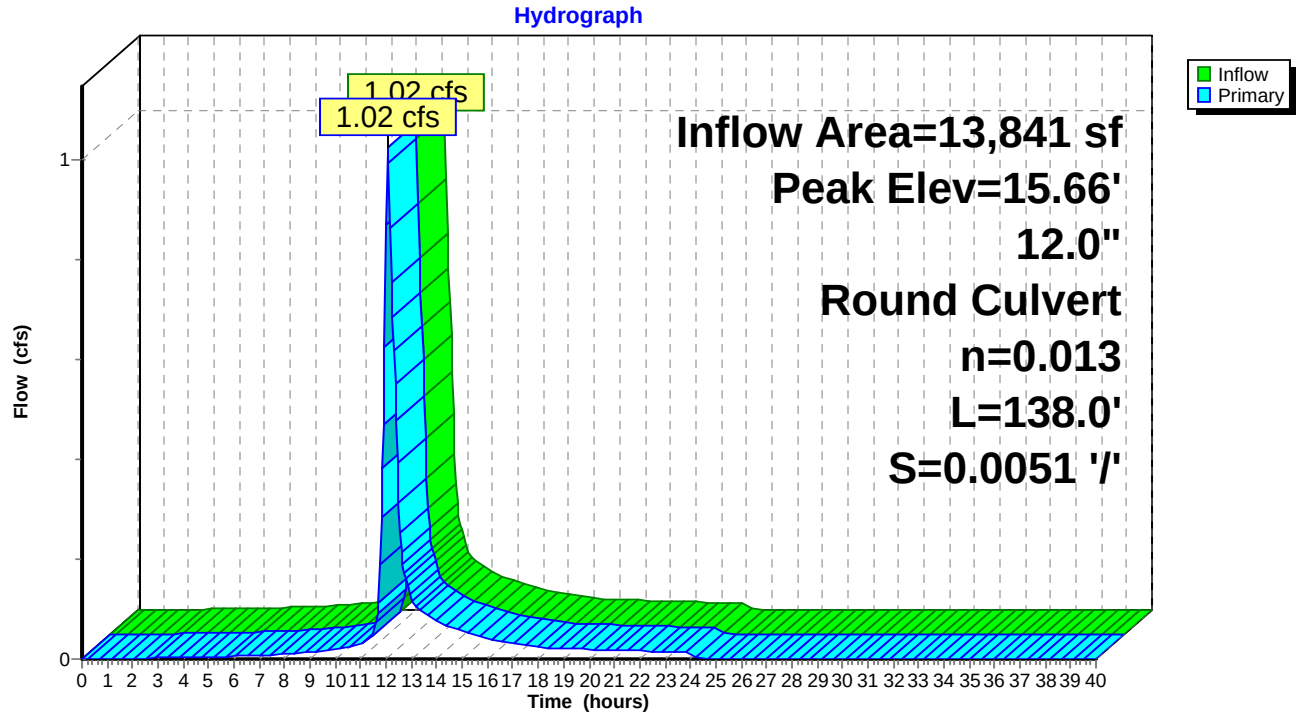
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 3.28" for 10-yr event
Inflow = 1.02 cfs @ 12.07 hrs, Volume= 3,781 cf
Outflow = 1.02 cfs @ 12.07 hrs, Volume= 3,781 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.02 cfs @ 12.07 hrs, Volume= 3,781 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.66' @ 12.07 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.00' | **12.0" Round Culvert**<br>L= 138.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.00' / 14.30' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.02 cfs @ 12.07 hrs HW=15.65' TW=14.97' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 1.02 cfs @ 2.64 fps)

### Pond MH3: PDMH3



## Summary for Pond MH4: PDMH4

Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 3.72" for 10-yr event
Inflow = 1.90 cfs @ 12.03 hrs, Volume= 6,866 cf
Outflow = 1.90 cfs @ 12.03 hrs, Volume= 6,866 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.51 cfs @ 12.03 hrs, Volume= 6,424 cf
Secondary = 0.40 cfs @ 12.03 hrs, Volume= 442 cf

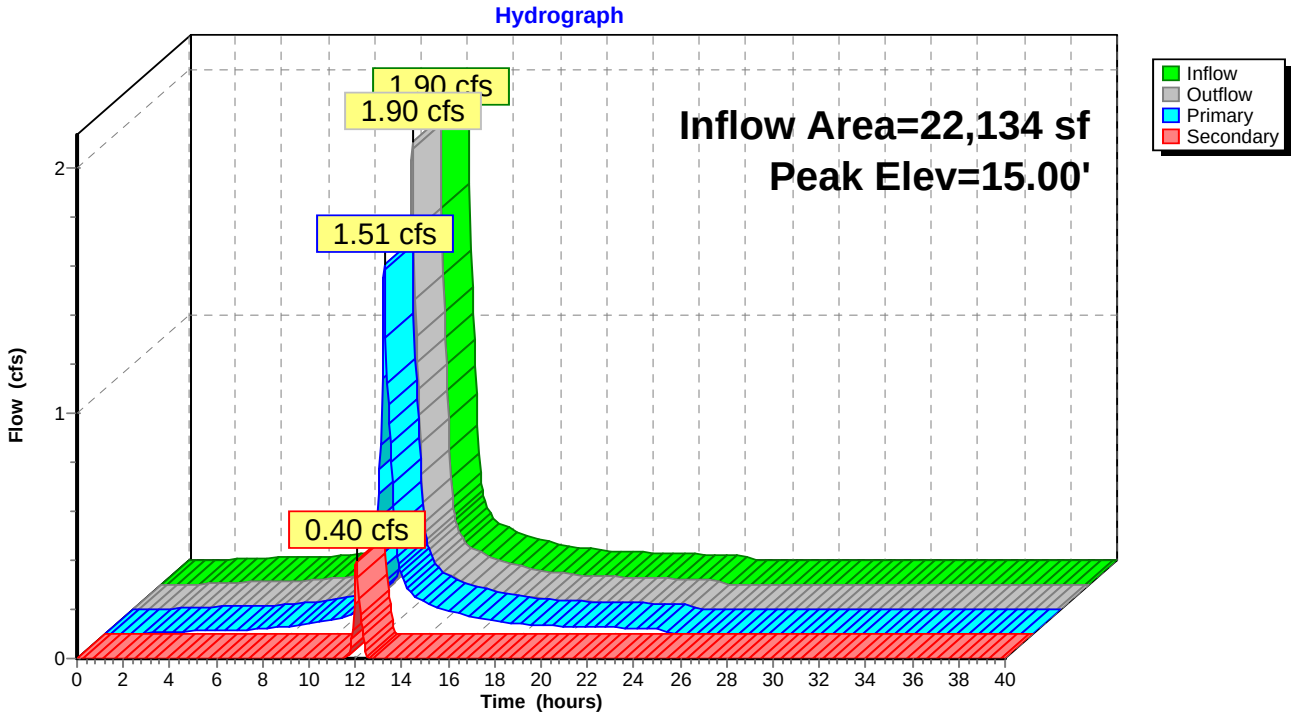
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.00' @ 12.03 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.20' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 14.10' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 14.20' | **12.0" Round Culvert**<br>L= 8.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 13.70' S= 0.0625 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 14.55' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=1.47 cfs @ 12.03 hrs HW=14.99' TW=14.64' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.47 cfs @ 3.04 fps)

**Secondary OutFlow** Max=0.39 cfs @ 12.03 hrs HW=14.99' TW=14.39' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.39 cfs of 1.58 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.39 cfs @ 2.16 fps)

## Pond MH4: PDMH4



## Summary for Pond MH5: PDMH5

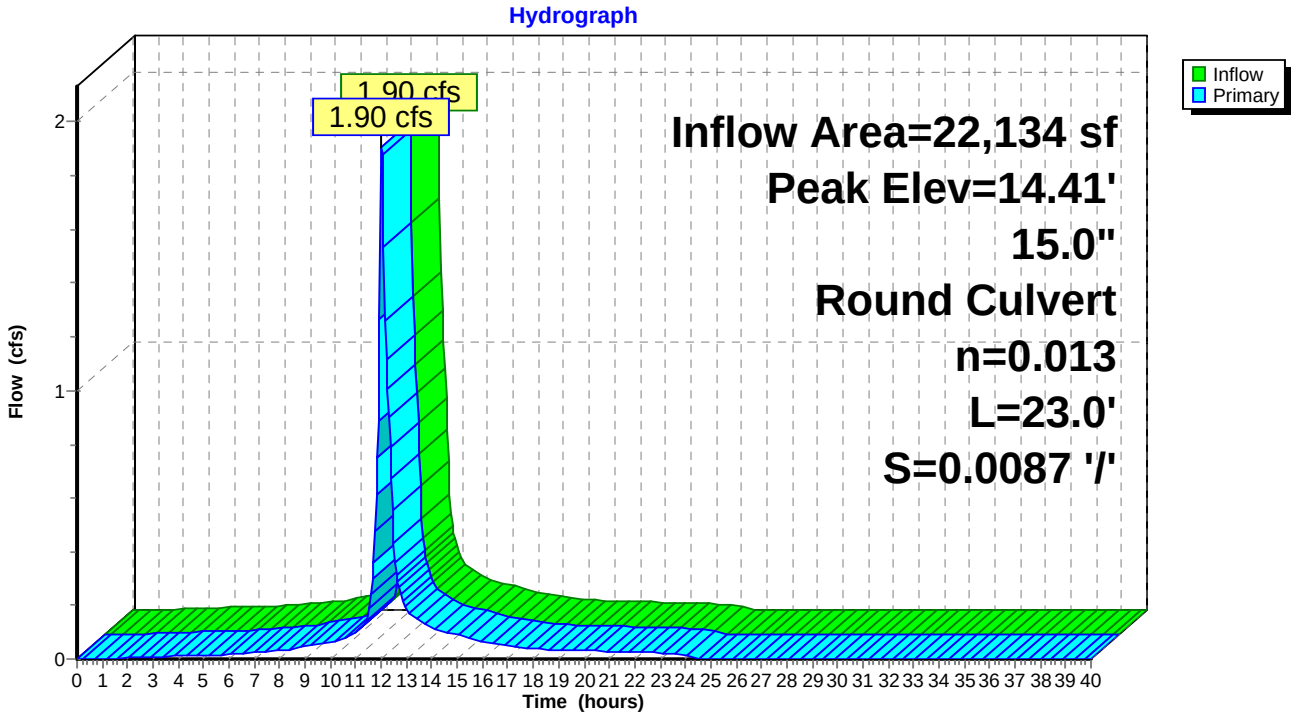
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 3.72" for 10-yr event
Inflow = 1.90 cfs @ 12.03 hrs, Volume= 6,866 cf
Outflow = 1.90 cfs @ 12.03 hrs, Volume= 6,866 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.90 cfs @ 12.03 hrs, Volume= 6,866 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.41' @ 12.03 hrs
Flood Elev= 21.40'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.60' | **15.0" Round Culvert**<br>L= 23.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.60' / 13.40' S= 0.0087 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=1.86 cfs @ 12.03 hrs HW=14.39' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.86 cfs @ 3.23 fps)

### Pond MH5: PDMH5



## Summary for Pond MH6: PDMH6

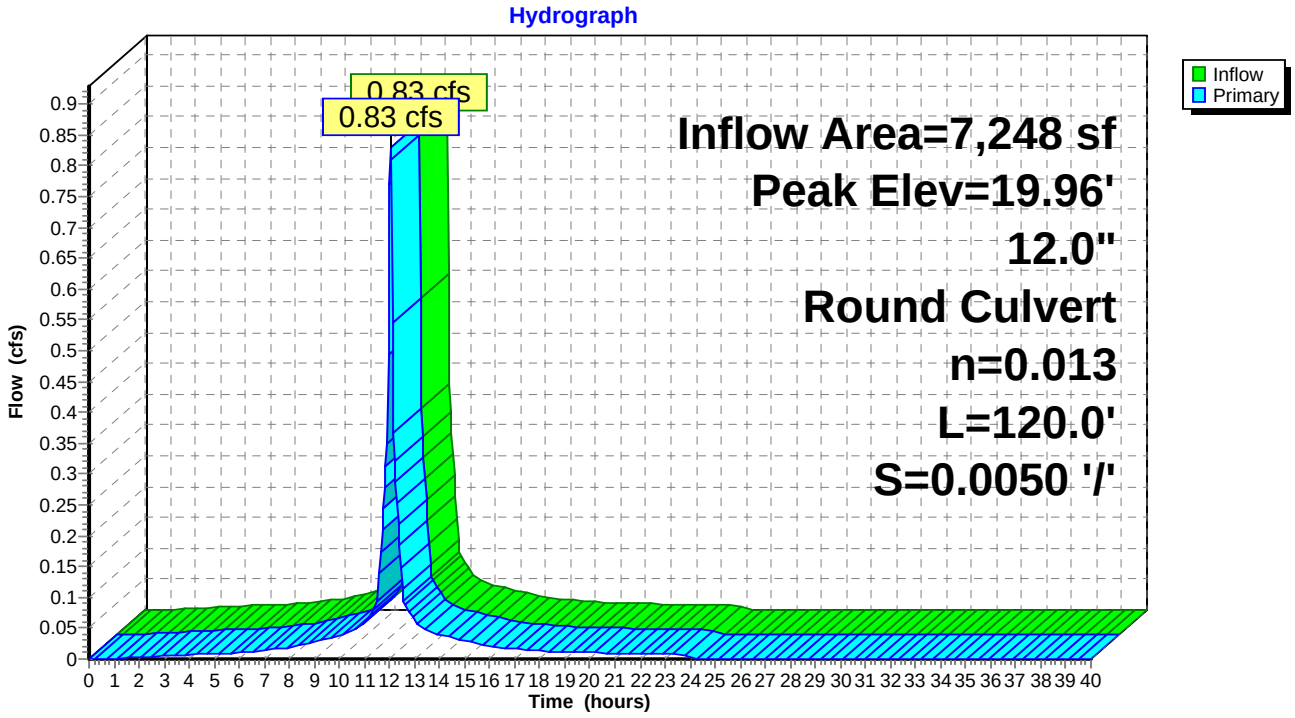
Inflow Area = 7,248 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 0.83 cfs @ 12.03 hrs, Volume= 2,696 cf
Outflow = 0.83 cfs @ 12.03 hrs, Volume= 2,696 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.03 hrs, Volume= 2,696 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.96' @ 12.04 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.40' | **12.0" Round Culvert**<br>L= 120.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.40' / 18.80' S= 0.0050 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.78 cfs @ 12.03 hrs HW=19.94' TW=19.28' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.78 cfs @ 2.57 fps)

## Pond MH6: PDMH6



## Summary for Pond MH7: PDMH7

Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 1.13 cfs @ 12.03 hrs, Volume= 3,693 cf
Outflow = 1.13 cfs @ 12.03 hrs, Volume= 3,693 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.03 hrs, Volume= 3,528 cf
Secondary = 0.23 cfs @ 12.03 hrs, Volume= 165 cf

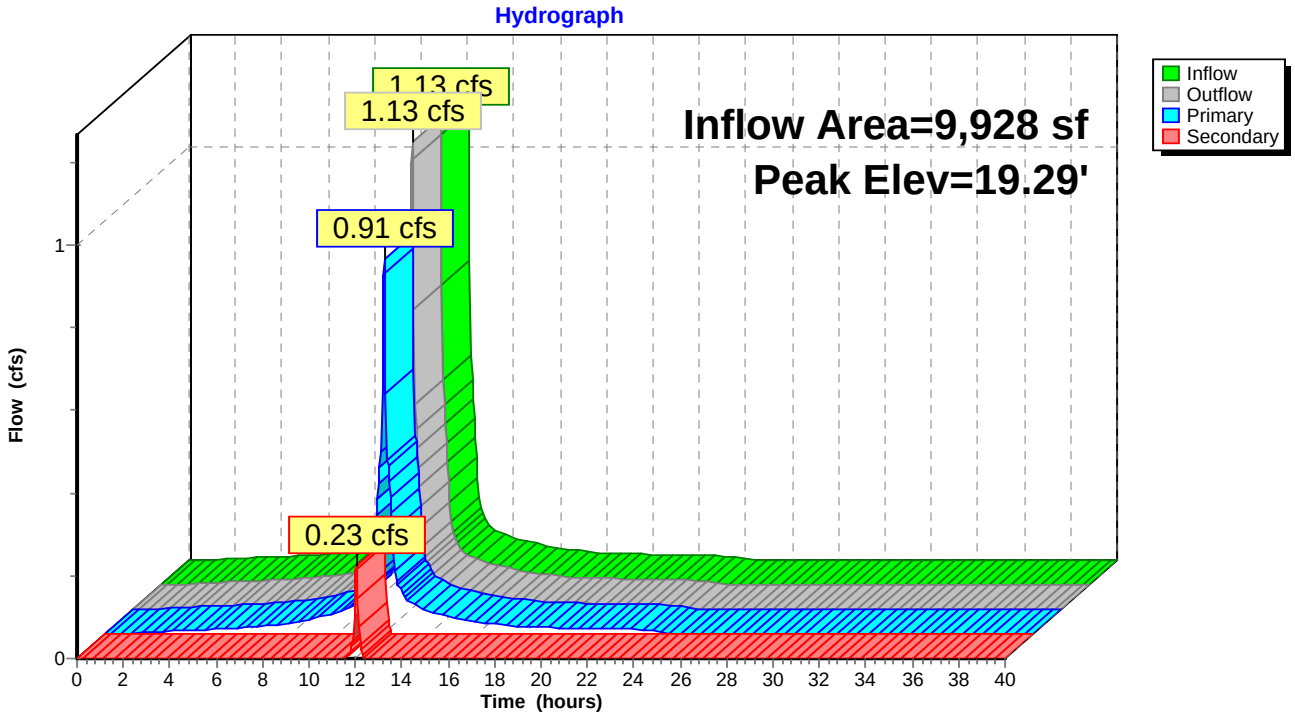
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.29' @ 12.03 hrs
Flood Elev= 21.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.60' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.20' S= 0.0500 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 19.00' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=0.87 cfs @ 12.03 hrs HW=19.28' TW=18.99' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.87 cfs @ 2.65 fps)

**Secondary OutFlow** Max=0.22 cfs @ 12.03 hrs HW=19.28' TW=18.93' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.22 cfs of 0.97 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 1.73 fps)

## Pond MH7: PDMH7



## Summary for Pond MH8: PDMH8

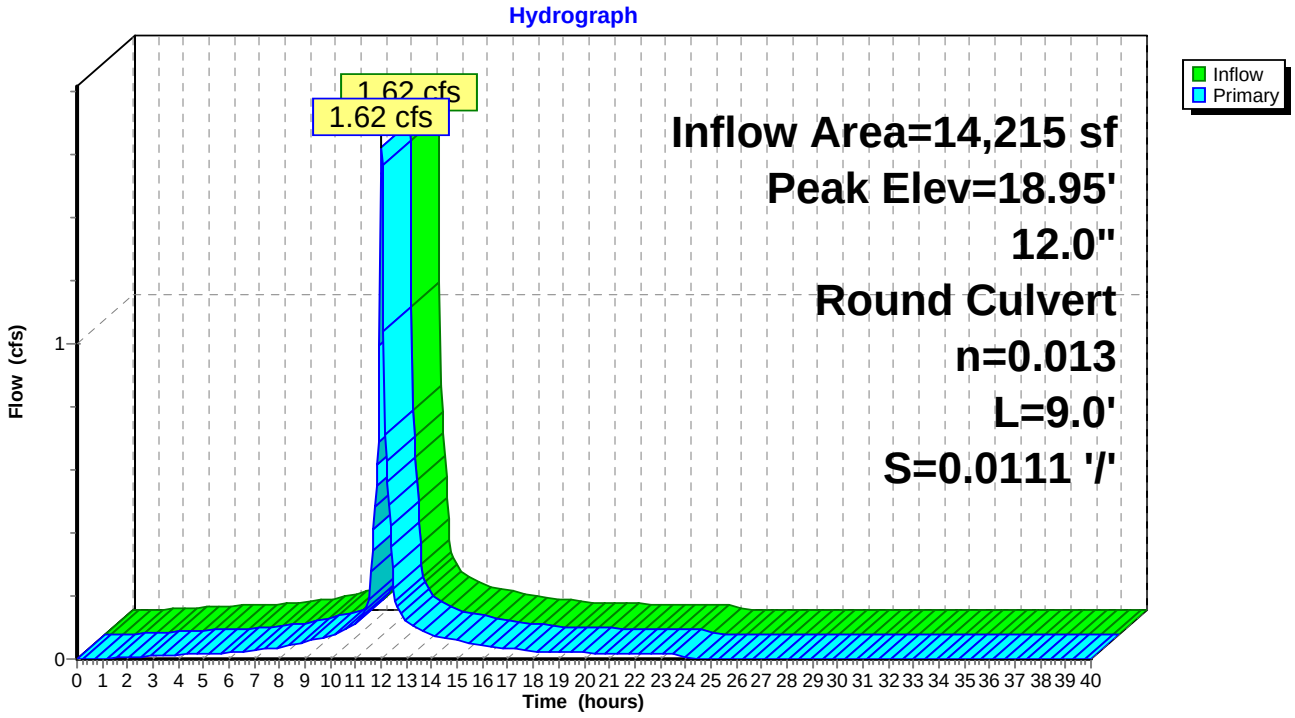
Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 4.46" for 10-yr event
Inflow = 1.62 cfs @ 12.03 hrs, Volume= 5,288 cf
Outflow = 1.62 cfs @ 12.03 hrs, Volume= 5,288 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.03 hrs, Volume= 5,288 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.95' @ 12.03 hrs
Flood Elev= 22.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.10' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.10' / 18.00' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.55 cfs @ 12.03 hrs HW=18.93' TW=17.75' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 1.55 cfs @ 3.04 fps)

### Pond MH8: PDMH8



## Summary for Pond RG1: Rain Garden #1

Inflow Area = 25,212 sf, 56.56% Impervious, Inflow Depth = 3.15" for 10-yr event
Inflow = 2.18 cfs @ 12.05 hrs, Volume= 6,621 cf
Outflow = 0.65 cfs @ 12.37 hrs, Volume= 5,885 cf, Atten= 70%, Lag= 18.9 min
Primary = 0.65 cfs @ 12.37 hrs, Volume= 5,885 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.85' @ 12.37 hrs Surf.Area= 5,766 sf Storage= 2,777 cf
Flood Elev= 16.70' Surf.Area= 6,703 sf Storage= 6,272 cf

Plug-Flow detention time= 167.0 min calculated for 5,885 cf (89% of inflow)
Center-of-Mass det. time= 114.1 min ( 910.4 - 796.3 )

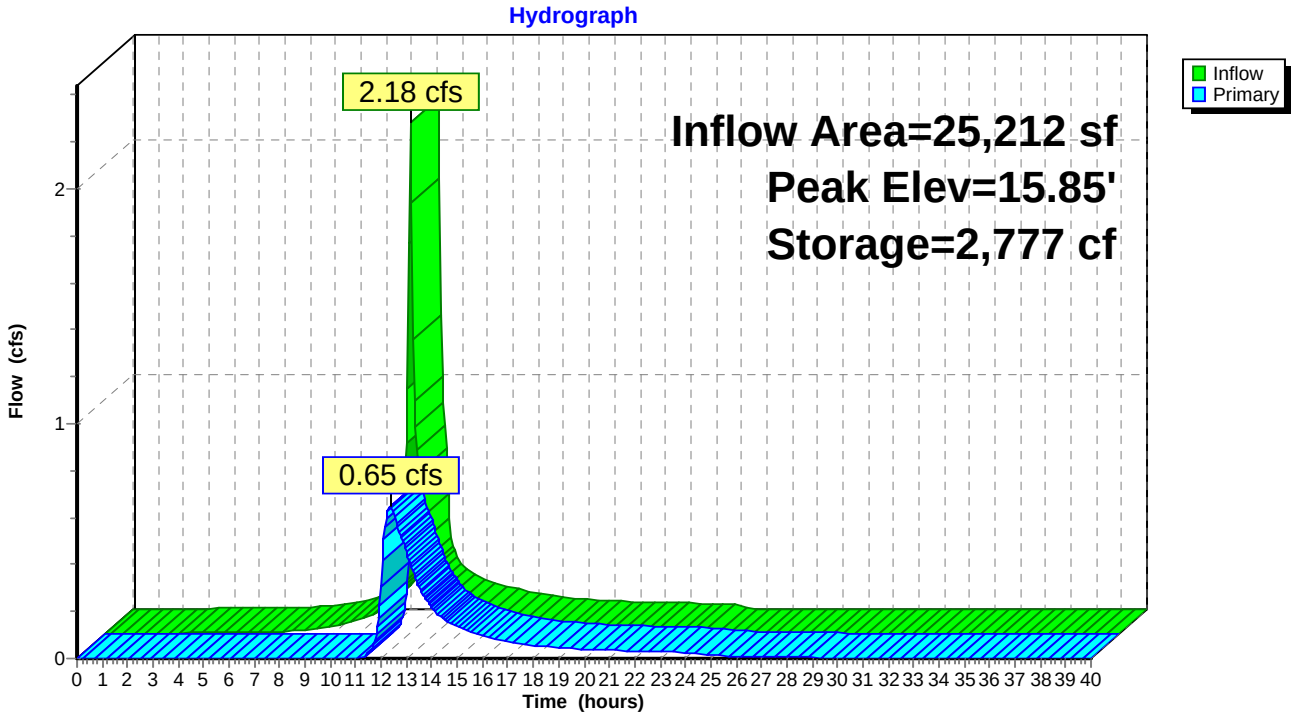
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 15.30' | 6,272 cf | **Custom Stage Data (Irregular)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 15.30 | 4,439 | 288.0 | 0 | 0 | 4,439 |
| 16.00 | 6,173 | 327.0 | 3,698 | 3,698 | 6,360 |
| 16.30 | 6,569 | 334.0 | 1,911 | 5,609 | 6,741 |
| 16.40 | 6,703 | 337.0 | 664 | 6,272 | 6,905 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.35' | **8.0" Round Culvert X 2.00**<br>L= 65.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 15.35' / 15.00' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf |
| #2 | Device 1 | 15.45' | **4.0" Vert. Orifice/Grate X 3.00** C= 0.600 |
| #3 | Device 1 | 15.80' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 16.35' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.65 cfs @ 12.37 hrs HW=15.85' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.65 cfs of 1.00 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.60 cfs @ 2.30 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.05 cfs @ 0.68 fps)
  └**4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG1: Rain Garden #1



## Summary for Pond RG2: Rain Garden #2

Inflow Area = 10,003 sf, 68.81% Impervious, Inflow Depth = 3.67" for 10-yr event
Inflow = 0.98 cfs @ 12.04 hrs, Volume= 3,063 cf
Outflow = 0.71 cfs @ 12.11 hrs, Volume= 2,374 cf, Atten= 28%, Lag= 4.2 min
Primary = 0.71 cfs @ 12.11 hrs, Volume= 2,374 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.46' @ 12.11 hrs Surf.Area= 920 sf Storage= 999 cf
Flood Elev= 19.00' Surf.Area= 1,118 sf Storage= 1,546 cf

Plug-Flow detention time= 148.7 min calculated for 2,371 cf (77% of inflow)
Center-of-Mass det. time= 67.7 min ( 844.5 - 776.8 )

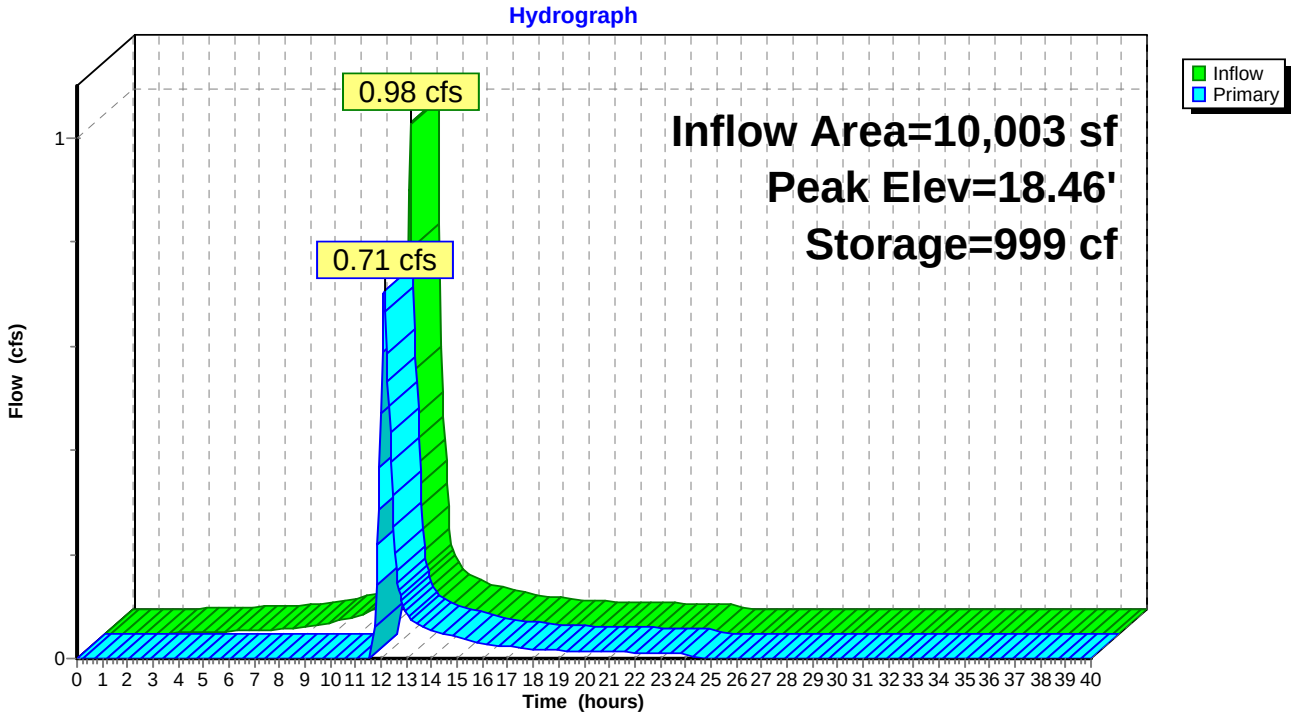
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 17.00' | 2,934 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 17.00 | 468 | 89.0 | 0 | 0 | 468 |
| 18.00 | 765 | 108.0 | 610 | 610 | 782 |
| 19.00 | 1,118 | 127.0 | 936 | 1,546 | 1,156 |
| 20.00 | 1,676 | 152.0 | 1,388 | 2,934 | 1,728 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.50' | **12.0" Round Culvert X 2.00**<br>L= 53.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 16.50' / 15.80' S= 0.0132 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 18.10' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 18.40' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 19.20' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.69 cfs @ 12.11 hrs HW=18.46' TW=16.31' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.69 cfs of 8.05 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.63 cfs @ 2.51 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 0.76 fps)
  - **4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG2: Rain Garden #2



## Summary for Pond WQU1: Water Quality Unit 1

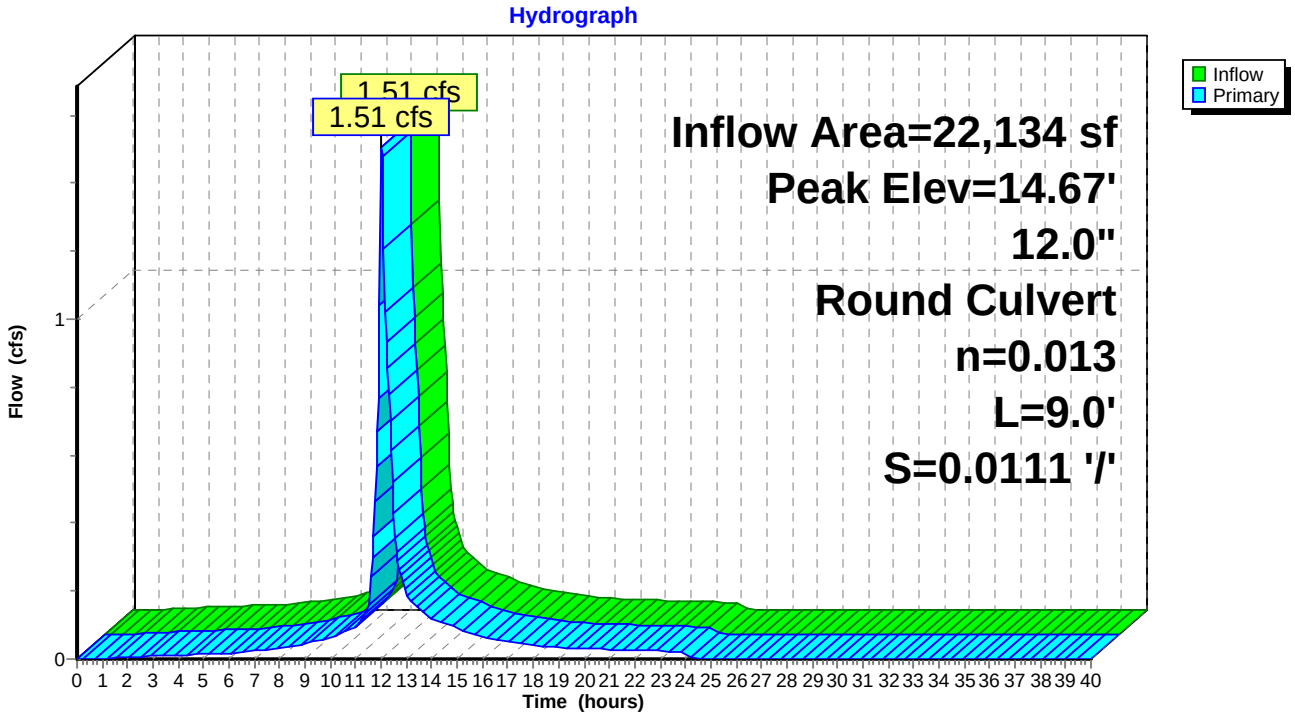
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 3.48" for 10-yr event
Inflow = 1.51 cfs @ 12.03 hrs, Volume= 6,424 cf
Outflow = 1.51 cfs @ 12.03 hrs, Volume= 6,424 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.51 cfs @ 12.03 hrs, Volume= 6,424 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.67' @ 12.05 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.80' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.80' / 13.70' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.33 cfs @ 12.03 hrs HW=14.64' TW=14.39' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.33 cfs @ 1.89 fps)

## Pond WQU1: Water Quality Unit 1



## Summary for Pond WQU2: Water Quality Unit 2

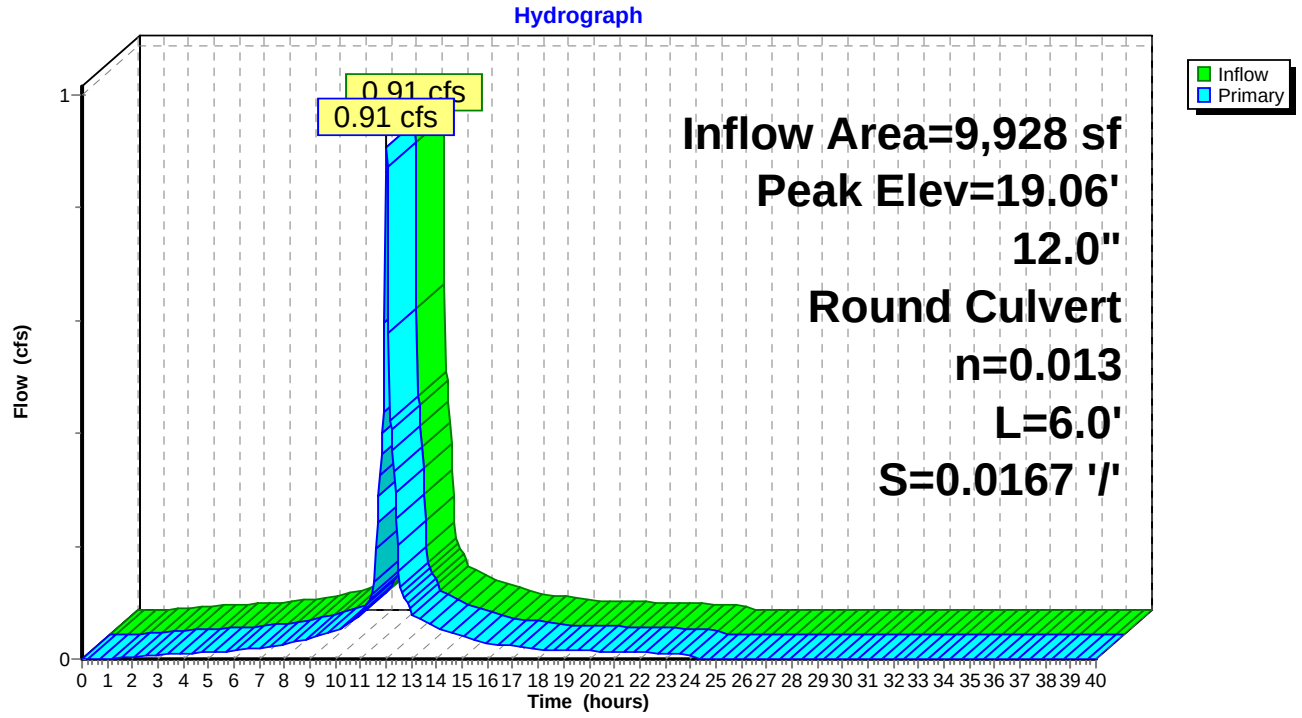
Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 4.26" for 10-yr event
Inflow = 0.91 cfs @ 12.03 hrs, Volume= 3,528 cf
Outflow = 0.91 cfs @ 12.03 hrs, Volume= 3,528 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.03 hrs, Volume= 3,528 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.06' @ 12.06 hrs
Flood Elev= 22.30'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.30' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.30' / 18.20' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.56 cfs @ 12.03 hrs HW=18.99' TW=18.93' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.56 cfs @ 0.97 fps)

## Pond WQU2: Water Quality Unit 2



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 100: 100 - Pavement, Lawn,** Runoff Area=20,037 sf 45.35% Impervious Runoff Depth=3.80"
Flow Length=165' Tc=3.9 min CN=82 Runoff=2.15 cfs 6,351 cf

**Subcatchment 101: 101 - West Side Lawn to** Runoff Area=271 sf 0.00% Impervious Runoff Depth=3.02"
Flow Length=178' Tc=2.7 min CN=74 Runoff=0.02 cfs 68 cf

**Subcatchment 102: 102 - Existing Building** Runoff Area=5,175 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=165' Tc=2.6 min CN=98 Runoff=0.73 cfs 2,399 cf

**Subcatchment 200: 200 - Portion of** Runoff Area=2,107 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=157' Tc=1.8 min CN=98 Runoff=0.30 cfs 977 cf

**Subcatchment 201: 201 - Pavement** Runoff Area=2,187 sf 95.93% Impervious Runoff Depth=5.44"
Flow Length=91' Tc=2.6 min CN=97 Runoff=0.31 cfs 992 cf

**Subcatchment 202: 202 - Pavement** Runoff Area=1,651 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=90' Slope=0.0133 '/' Tc=1.3 min CN=98 Runoff=0.24 cfs 765 cf

**Subcatchment 203: 203 - Pavement** Runoff Area=5,013 sf 96.69% Impervious Runoff Depth=5.44"
Flow Length=100' Tc=3.6 min CN=97 Runoff=0.69 cfs 2,275 cf

**Subcatchment 204: 204 - Pavement** Runoff Area=4,813 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=122' Tc=1.1 min CN=98 Runoff=0.70 cfs 2,231 cf

**Subcatchment 205: 205 - Pavement** Runoff Area=3,480 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=107' Tc=1.1 min CN=98 Runoff=0.50 cfs 1,613 cf

**Subcatchment 206: 206 - Pavement** Runoff Area=5,141 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=125' Slope=0.0120 '/' Tc=2.0 min CN=98 Runoff=0.73 cfs 2,383 cf

**Subcatchment 207: 207 - Pavement** Runoff Area=2,680 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=108' Slope=0.0220 '/' Tc=1.2 min CN=98 Runoff=0.39 cfs 1,242 cf

**Subcatchment 208: 208 - Proposed** Runoff Area=4,287 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=145' Tc=1.8 min CN=98 Runoff=0.61 cfs 1,987 cf

**Subcatchment 209: 209 - Portion of** Runoff Area=4,990 sf 40.80% Impervious Runoff Depth=4.01"
Flow Length=108' Tc=1.5 min CN=84 Runoff=0.58 cfs 1,667 cf

**Subcatchment 210: 210 - Existing South** Runoff Area=44,935 sf 0.00% Impervious Runoff Depth=2.21"
Flow Length=210' Tc=10.6 min CN=65 Runoff=2.20 cfs 8,264 cf

**Subcatchment 300: 300 - Lawn East to DP3** Runoff Area=1,915 sf 0.00% Impervious Runoff Depth=3.02"
Flow Length=40' Slope=0.0300 '/' Tc=5.8 min CN=74 Runoff=0.15 cfs 482 cf

**Pond 1P: Infiltration System** Peak Elev=18.93' Storage=1,840 cf Inflow=2.01 cfs 6,589 cf
Discarded=0.26 cfs 6,592 cf Primary=0.00 cfs 0 cf Outflow=0.26 cfs 6,592 cf

**Pond CB1: PCB1** Peak Elev=16.93' Inflow=0.31 cfs 992 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.31 cfs 992 cf

**Pond CB2: PCB2** Peak Elev=16.89' Inflow=0.24 cfs 765 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.24 cfs 765 cf

**Pond CB3: PCB3** Peak Elev=18.65' Inflow=0.69 cfs 2,275 cf
12.0" Round Culvert n=0.013 L=64.0' S=0.0078 '/' Outflow=0.69 cfs 2,275 cf

**Pond CB4: PCB4** Peak Elev=15.60' Inflow=0.70 cfs 2,231 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0085 '/' Outflow=0.70 cfs 2,231 cf

**Pond CB5: PCB5** Peak Elev=15.31' Inflow=0.50 cfs 1,613 cf
12.0" Round Culvert n=0.013 L=93.0' S=0.0054 '/' Outflow=0.50 cfs 1,613 cf

**Pond CB6: PCB6** Peak Elev=20.44' Inflow=0.73 cfs 2,383 cf
12.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.73 cfs 2,383 cf

**Pond CB7: PCB7** Peak Elev=19.41' Inflow=0.39 cfs 1,242 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0091 '/' Outflow=0.39 cfs 1,242 cf

**Pond DP1: Design Pont #1_18" RCP Culvert - Northwest** Inflow=1.00 cfs 8,081 cf
Primary=1.00 cfs 8,081 cf

**Pond DP2: Design Pont #2_Wetland-South** Inflow=3.91 cfs 17,119 cf
Primary=3.91 cfs 17,119 cf

**Pond DP3: Design Pont #3_Abutting Lot-East** Inflow=0.15 cfs 482 cf
Primary=0.15 cfs 482 cf

**Pond MH1: PDMH1** Peak Elev=16.76' Inflow=0.54 cfs 1,758 cf
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=0.54 cfs 1,758 cf

**Pond MH2: PDMH2** Peak Elev=16.46' Inflow=1.38 cfs 5,011 cf
12.0" Round Culvert n=0.013 L=115.0' S=0.0052 '/' Outflow=1.38 cfs 5,011 cf

**Pond MH3: PDMH3** Peak Elev=15.80' Inflow=1.38 cfs 5,011 cf
12.0" Round Culvert n=0.013 L=138.0' S=0.0051 '/' Outflow=1.38 cfs 5,011 cf

**Pond MH4: PDMH4** Peak Elev=15.15' Inflow=2.44 cfs 8,855 cf
Primary=1.90 cfs 8,143 cf Secondary=0.58 cfs 712 cf Outflow=2.44 cfs 8,855 cf

**Pond MH5: PDMH5** Peak Elev=14.54' Inflow=2.44 cfs 8,855 cf
15.0" Round Culvert n=0.013 L=23.0' S=0.0087 '/' Outflow=2.44 cfs 8,855 cf

**Pond MH6: PDMH6** Peak Elev=20.03' Inflow=1.03 cfs 3,360 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=1.03 cfs 3,360 cf

**Pond MH7: PDMH7** Peak Elev=19.36' Inflow=1.40 cfs 4,602 cf
Primary=1.10 cfs 4,335 cf Secondary=0.30 cfs 267 cf Outflow=1.40 cfs 4,602 cf

**Pond MH8: PDMH8** Peak Elev=19.08' Inflow=2.01 cfs 6,589 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=2.01 cfs 6,589 cf

**Pond RG1: Rain Garden #1** Peak Elev=15.95' Storage=3,374 cf Inflow=2.87 cfs 8,750 cf
Outflow=1.00 cfs 8,013 cf

**Pond RG2: Rain Garden #2** Peak Elev=18.54' Storage=1,071 cf Inflow=1.25 cfs 3,942 cf
Outflow=0.97 cfs 3,253 cf

**Pond WQU1: Water Quality Unit 1** Peak Elev=14.89' Inflow=1.90 cfs 8,143 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=1.90 cfs 8,143 cf

**Pond WQU2: Water Quality Unit 2** Peak Elev=19.19' Inflow=1.10 cfs 4,335 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=1.10 cfs 4,335 cf

**Total Runoff Area = 108,682 sf Runoff Volume = 33,696 cf Average Runoff Depth = 3.72"**
**56.39% Pervious = 61,281 sf 43.61% Impervious = 47,401 sf**

## Summary for Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden

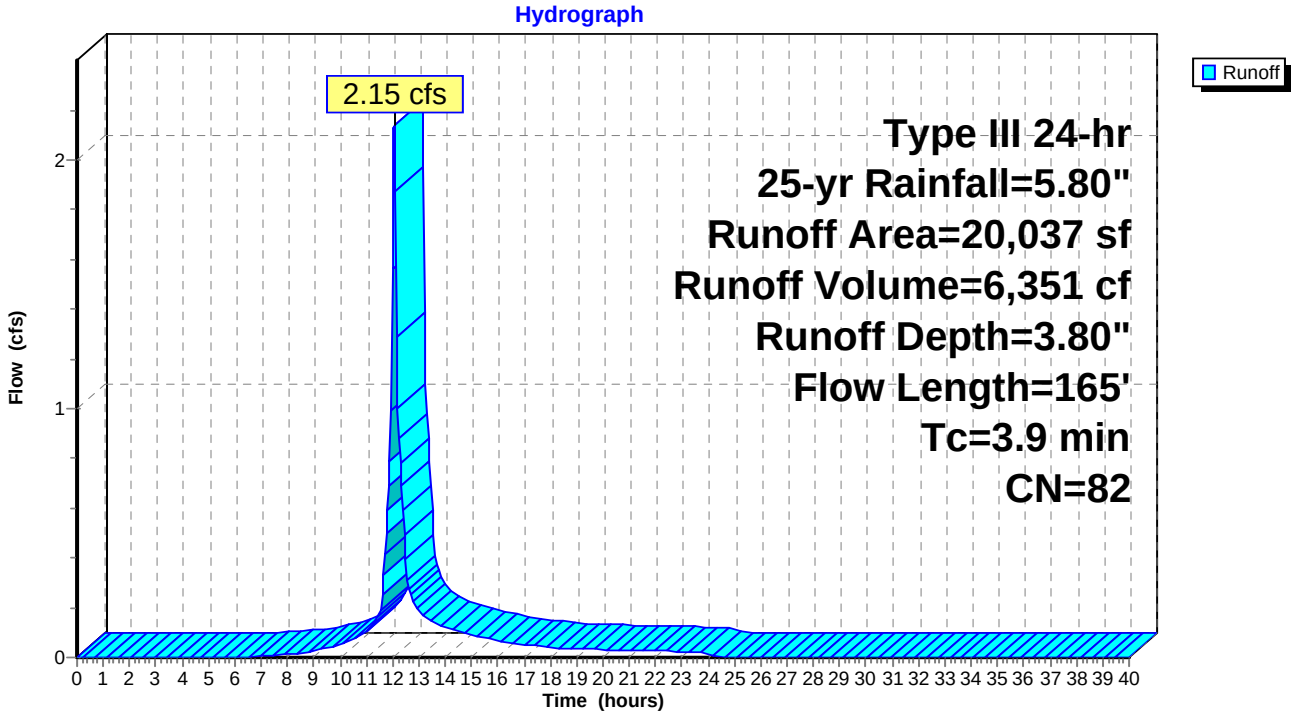
Runoff = 2.15 cfs @ 12.06 hrs, Volume= 6,351 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 4,778 | 74 | >75% Grass cover, Good, HSG C |
| * | 6,173 | 65 | Rain Garden surface area |
| | 9,086 | 98 | Paved parking, HSG C |
| | 20,037 | 82 | Weighted Average |
| | 10,951 | | 54.65% Pervious Area |
| | 9,086 | | 45.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 83 | 0.0180 | 1.27 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.8 | 17 | 0.0410 | 0.16 | | **Sheet Flow, Stone rip rap to RG** Grass: Short n= 0.150 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 3.9 | 165 | Total | | | |

## Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden



## Summary for Subcatchment 101: 101 - West Side Lawn to DP1

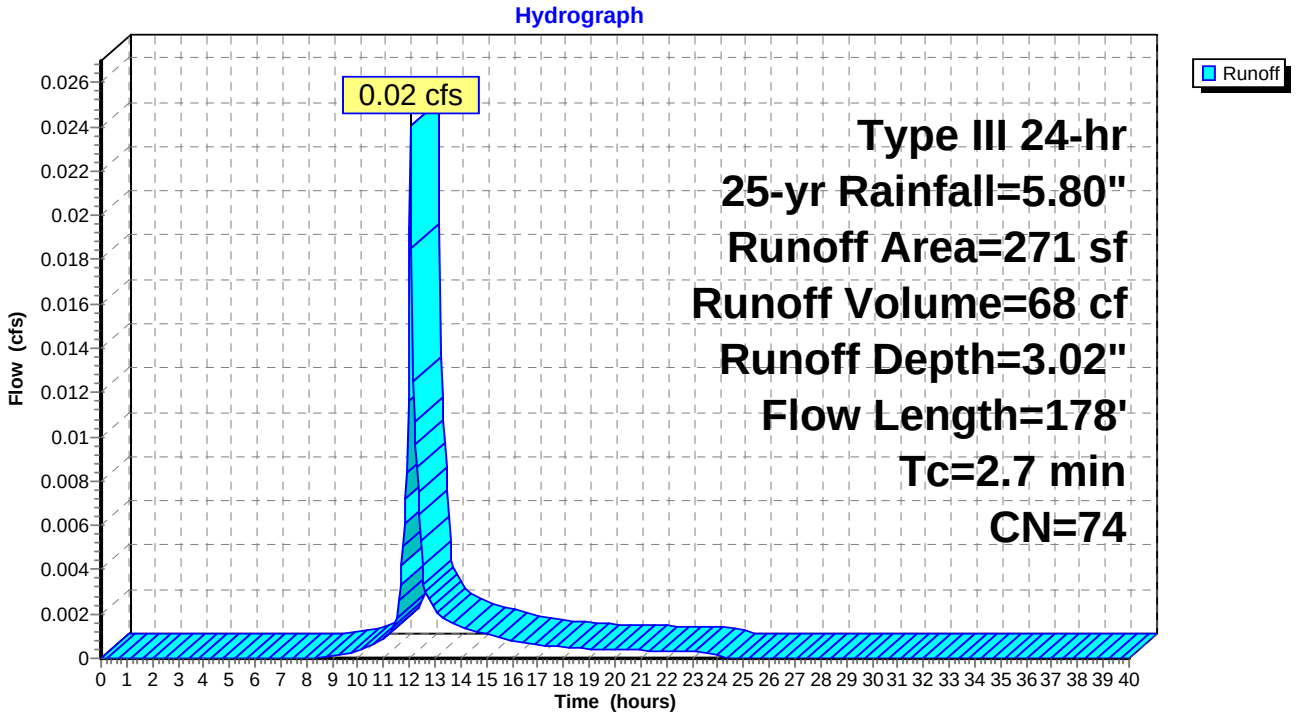
Runoff = 0.02 cfs @ 12.05 hrs, Volume= 68 cf, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 271 | 74 | >75% Grass cover, Good, HSG C |
| 271 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.4 | 100 | 0.0150 | 1.23 | | **Sheet Flow, Grass** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.3 | 78 | 0.0220 | 1.04 | | **Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps |
| 2.7 | 178 | Total | | | |

## Subcatchment 101: 101 - West Side Lawn to DP1



## Summary for Subcatchment 102: 102 - Existing Building

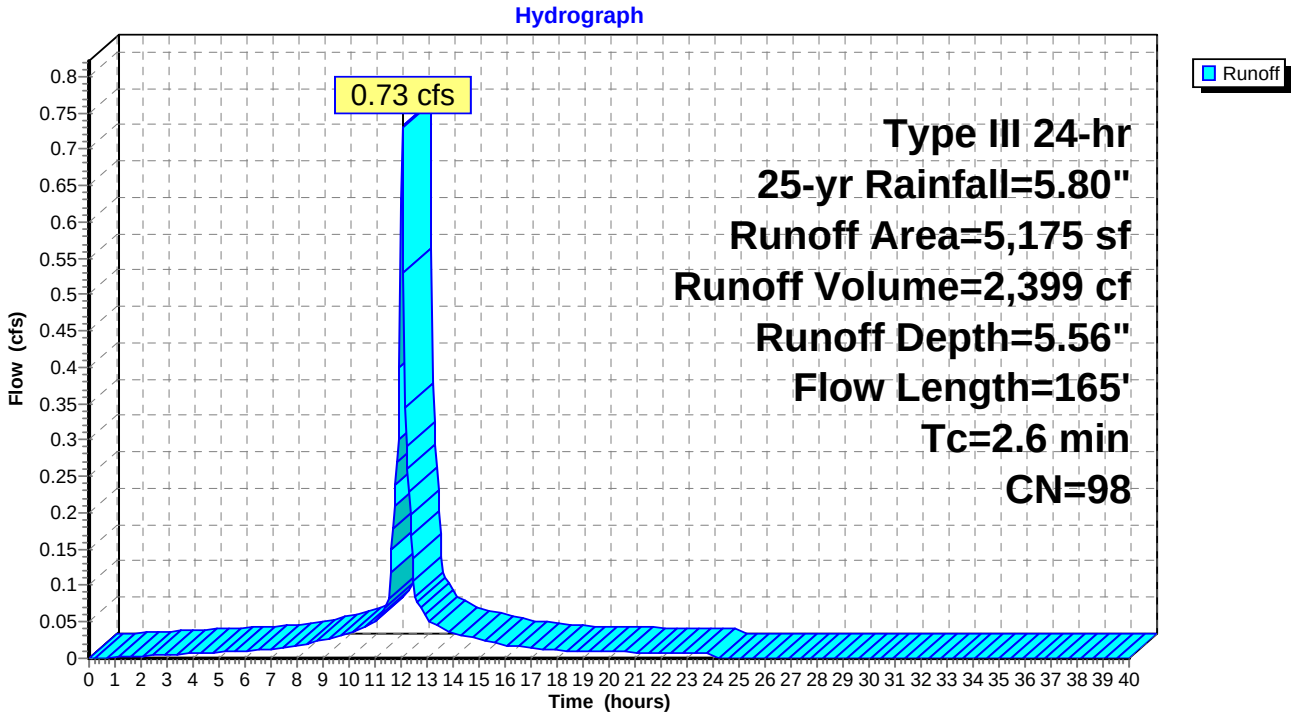
Runoff = 0.73 cfs @ 12.04 hrs, Volume= 2,399 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,175 | 98 | Roofs, HSG C, Existing Building |
| | 5,175 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.6 | 100 | 0.0100 | 1.05 | | **Sheet Flow, Estimated roof drain to rain garden** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 2.6 | 165 | Total | | | |

## Subcatchment 102: 102 - Existing Building



## Summary for Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH

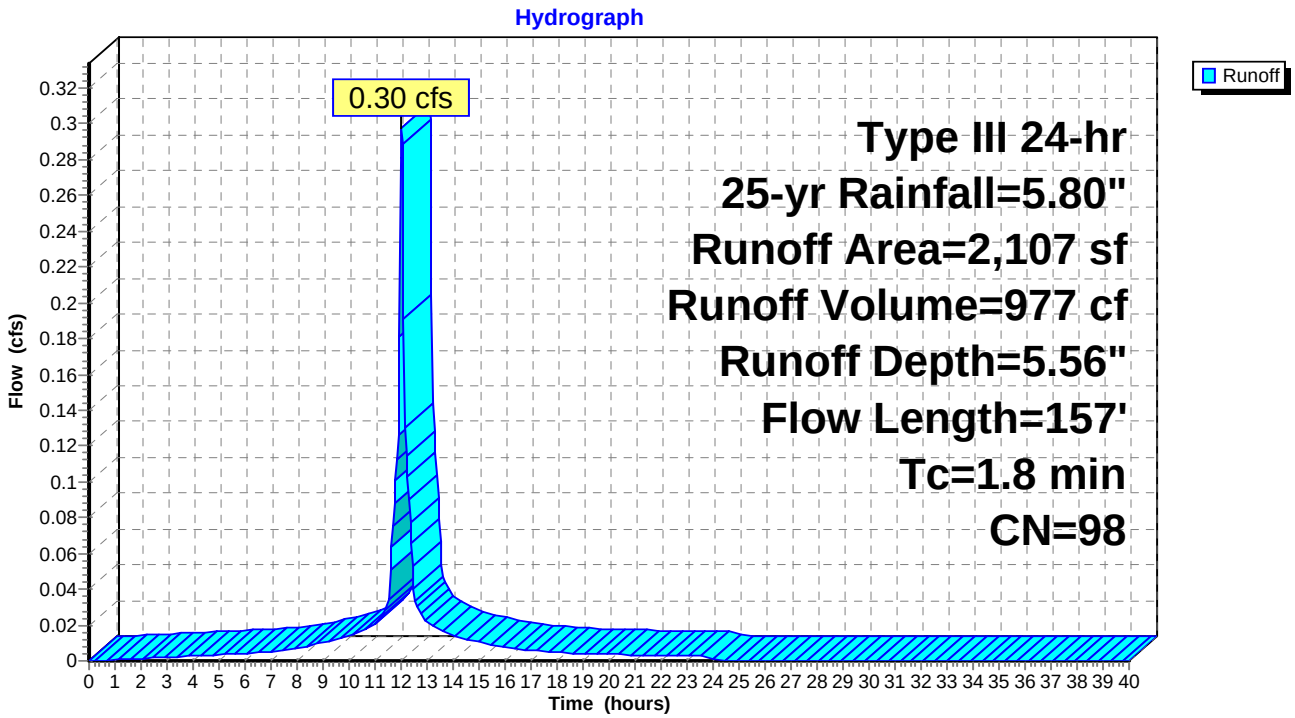
Runoff = 0.30 cfs @ 12.03 hrs, Volume= 977 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 2,107 | 98 | Roofs, HSG C, Half Prop. Building A |
| | 2,107 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 50 | 0.0050 | 0.69 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.6 | 107 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to PDMH - Estimated**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 157 | Total | | | |

### Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH



## Summary for Subcatchment 201: 201 - Pavement

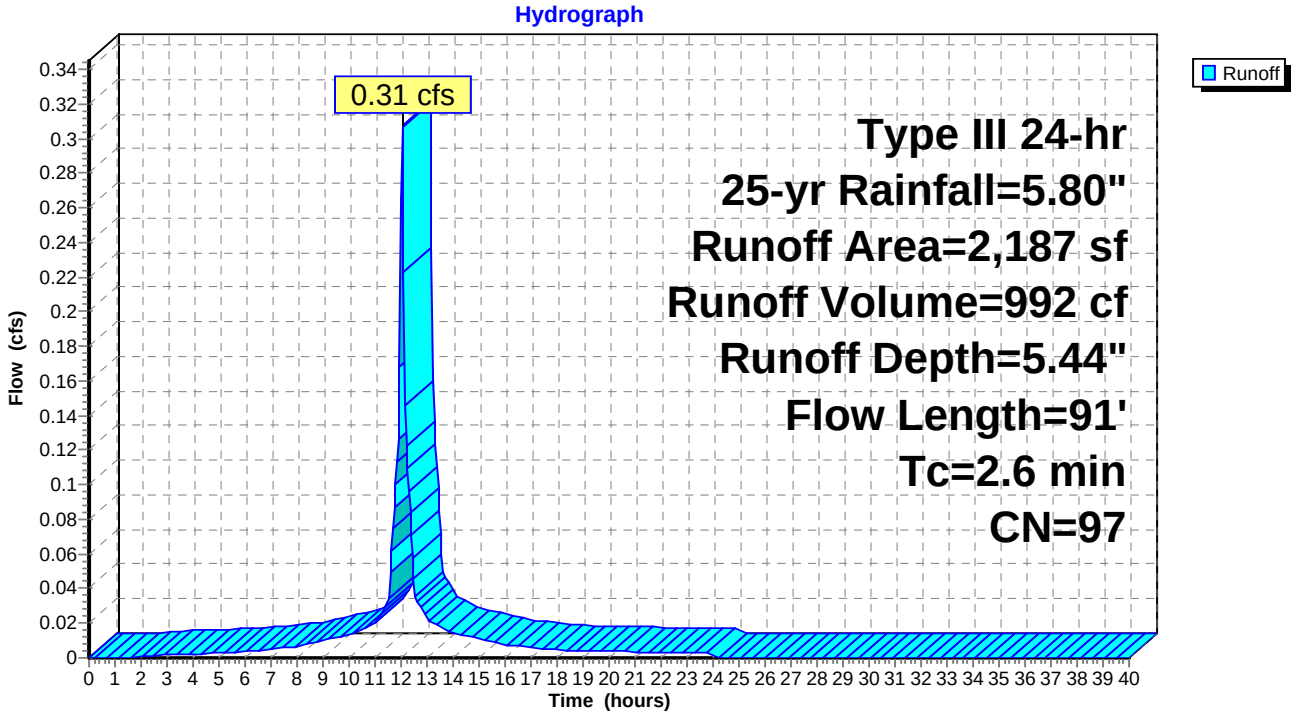
Runoff = 0.31 cfs @ 12.04 hrs, Volume= 992 cf, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 2,098 | 98 | Paved parking, HSG C |
| 89 | 74 | >75% Grass cover, Good, HSG C |
| 2,187 | 97 | Weighted Average |
| 89 | | 4.07% Pervious Area |
| 2,098 | | 95.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 6 | 0.0200 | 0.07 | | **Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.22" |
| 1.1 | 85 | 0.0170 | 1.25 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.6 | 91 | Total | | | |

## Subcatchment 201: 201 - Pavement



## Summary for Subcatchment 202: 202 - Pavement

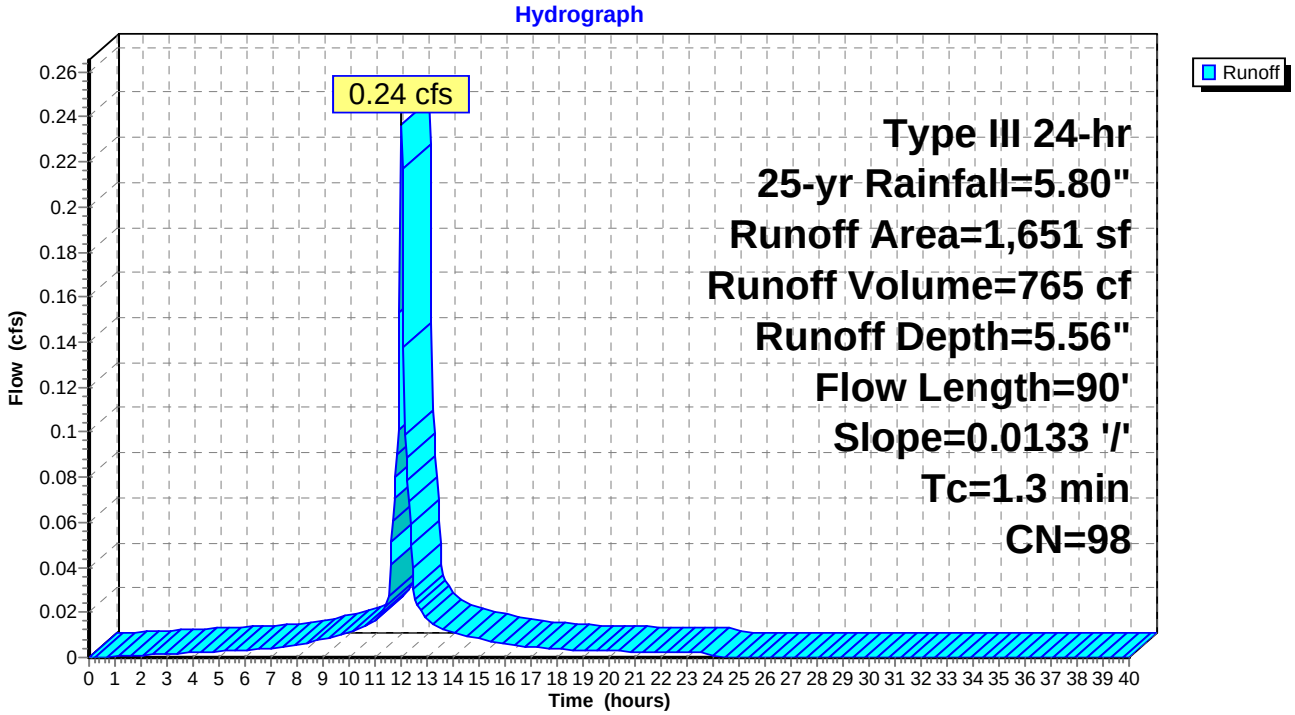
Runoff = 0.24 cfs @ 12.02 hrs, Volume= 765 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 1,651 | 98 | Paved parking, HSG C |
| 1,651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 90 | 0.0133 | 1.15 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |

## Subcatchment 202: 202 - Pavement



## Summary for Subcatchment 203: 203 - Pavement

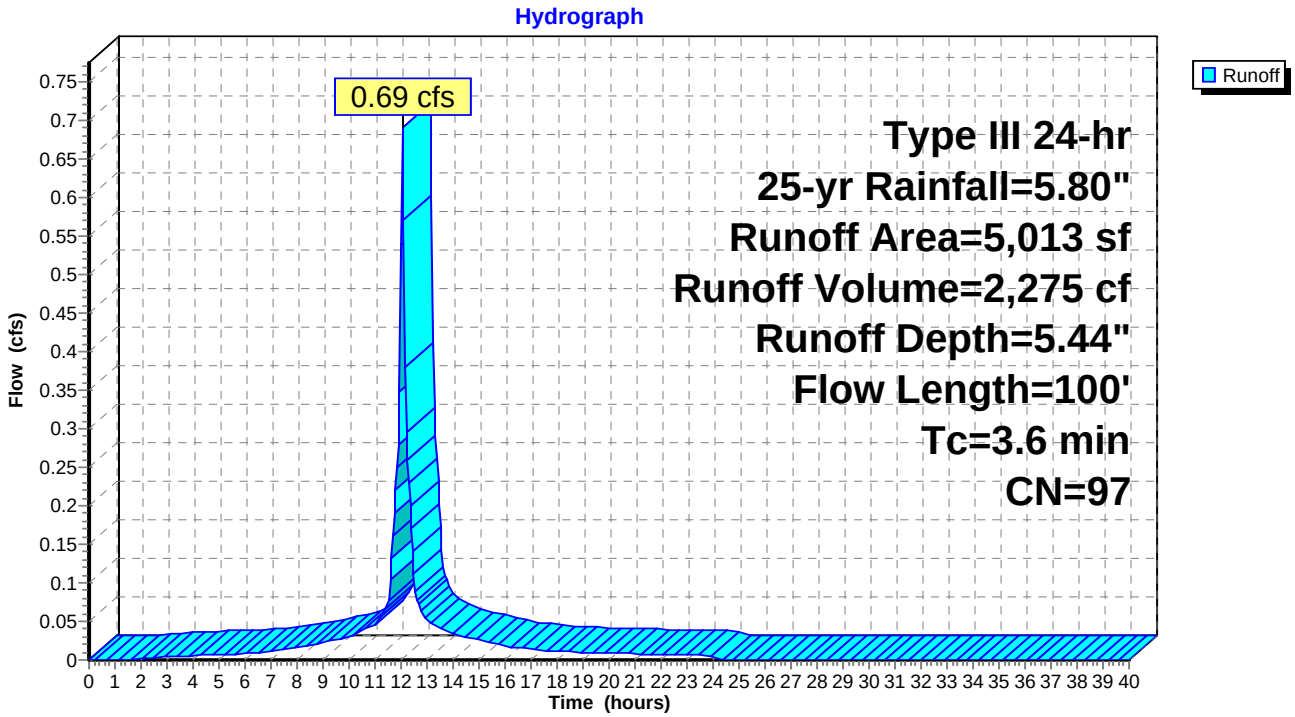
Runoff = 0.69 cfs @ 12.05 hrs, Volume= 2,275 cf, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 4,847 | 98 | Paved parking, HSG C |
| 166 | 74 | >75% Grass cover, Good, HSG C |
| 5,013 | 97 | Weighted Average |
| 166 | | 3.31% Pervious Area |
| 4,847 | | 96.69% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 2.6 | 12 | 0.0200 | 0.08 | | **Sheet Flow, Grass to Sidewalk** Grass: Dense n= 0.240 P2= 3.22" |
| 0.1 | 6 | 0.0150 | 0.70 | | **Sheet Flow, Sidewalk** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.9 | 82 | 0.0260 | 1.47 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 3.6 | 100 | Total | | | |

## Subcatchment 203: 203 - Pavement



## Summary for Subcatchment 204: 204 - Pavement

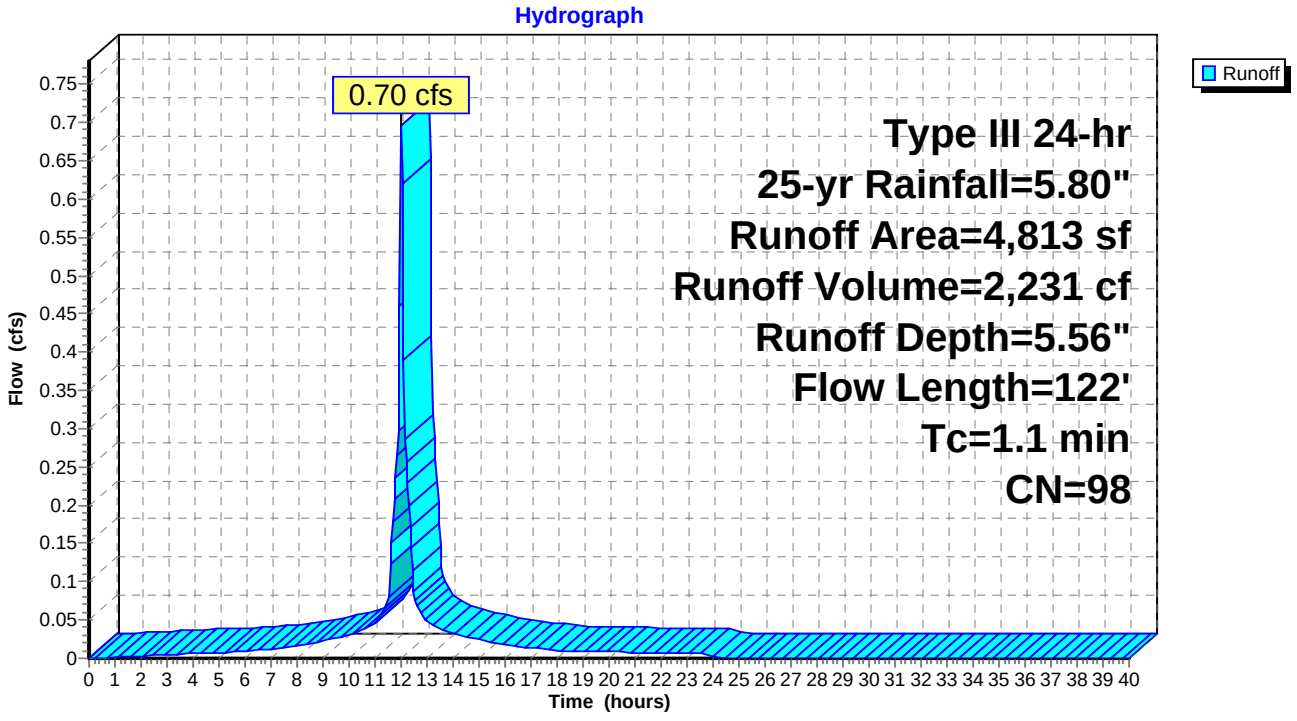
Runoff = 0.70 cfs @ 12.01 hrs, Volume= 2,231 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 4,813 | 98 | Paved parking, HSG C |
| 4,813 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.0 | 100 | 0.0300 | 1.62 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.1 | 22 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 122 | Total | | | |

## Subcatchment 204: 204 - Pavement



## Summary for Subcatchment 205: 205 - Pavement

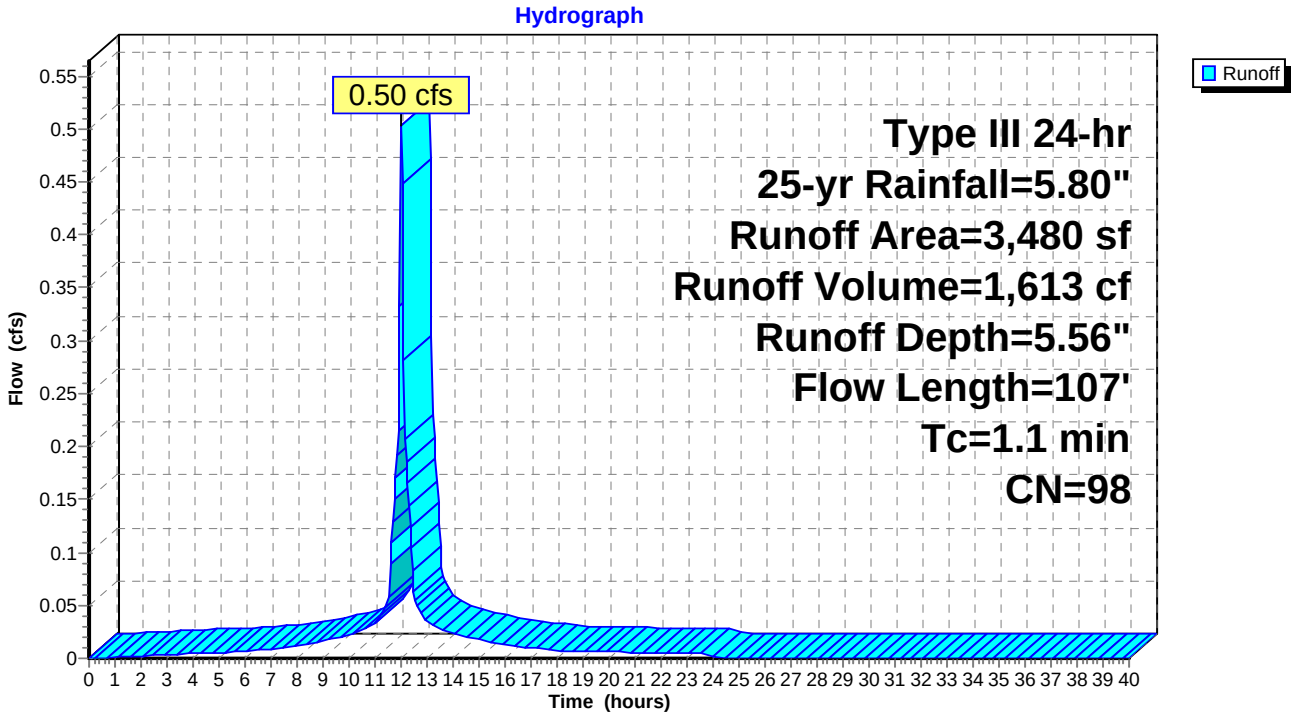
Runoff = 0.50 cfs @ 12.01 hrs, Volume= 1,613 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 3,480 | 98 | Paved parking, HSG C |
| 3,480 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 100 | 0.0270 | 1.56 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 7 | 0.0280 | 3.40 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 107 | Total | | | |

## Subcatchment 205: 205 - Pavement



## Summary for Subcatchment 206: 206 - Pavement

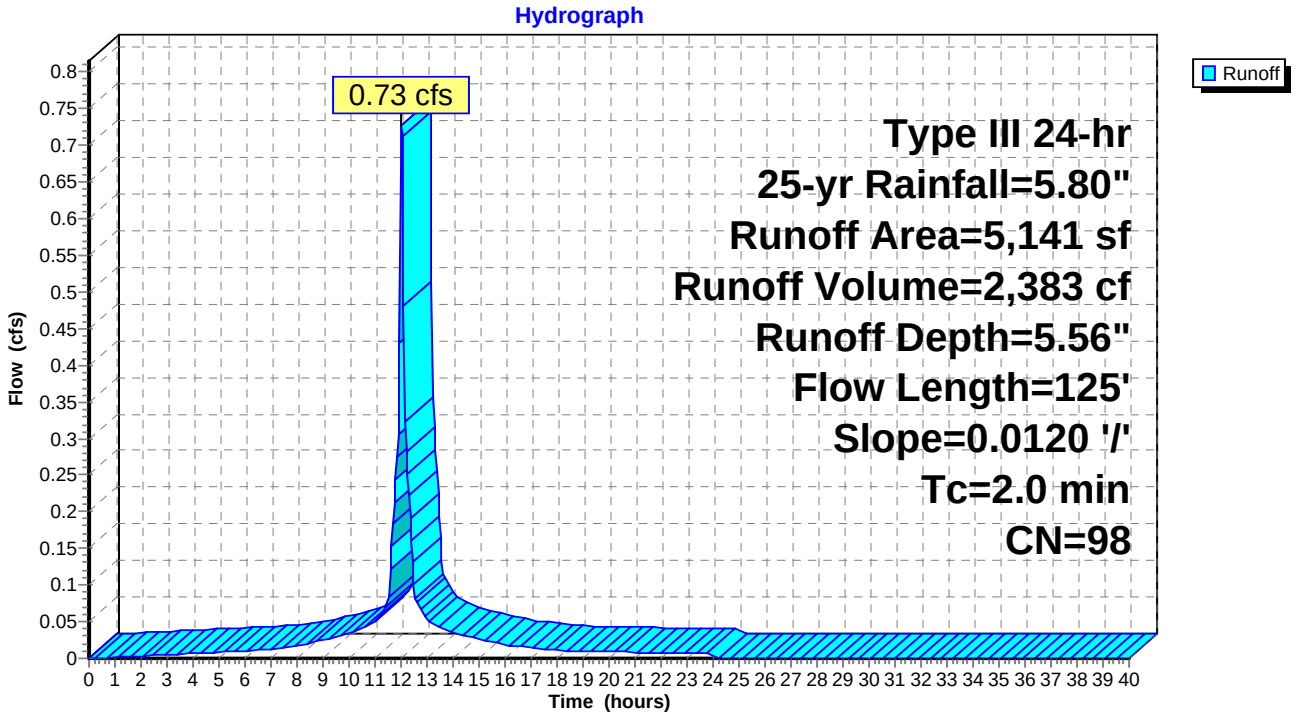
Runoff = 0.73 cfs @ 12.03 hrs, Volume= 2,383 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 5,141 | 98 | Paved parking, HSG C |
| 5,141 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 100 | 0.0120 | 1.12 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 25 | 0.0120 | 0.85 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.0 | 125 | Total | | | |

## Subcatchment 206: 206 - Pavement



## Summary for Subcatchment 207: 207 - Pavement

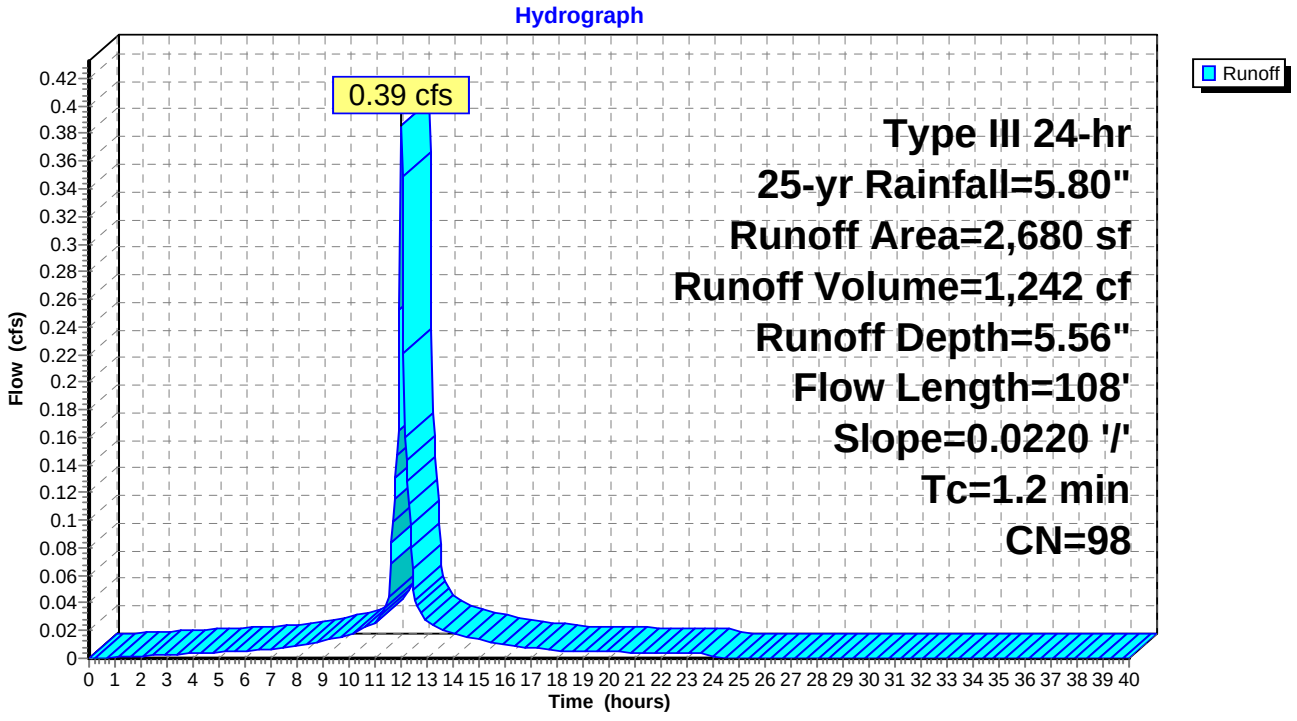
Runoff = 0.39 cfs @ 12.02 hrs, Volume= 1,242 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 2,680 | 98 | Paved parking, HSG C |
| 2,680 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 100 | 0.0220 | 1.43 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 8 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.2 | 108 | Total | | | |

## Subcatchment 207: 207 - Pavement



## Summary for Subcatchment 208: 208 - Proposed Building Tenant B

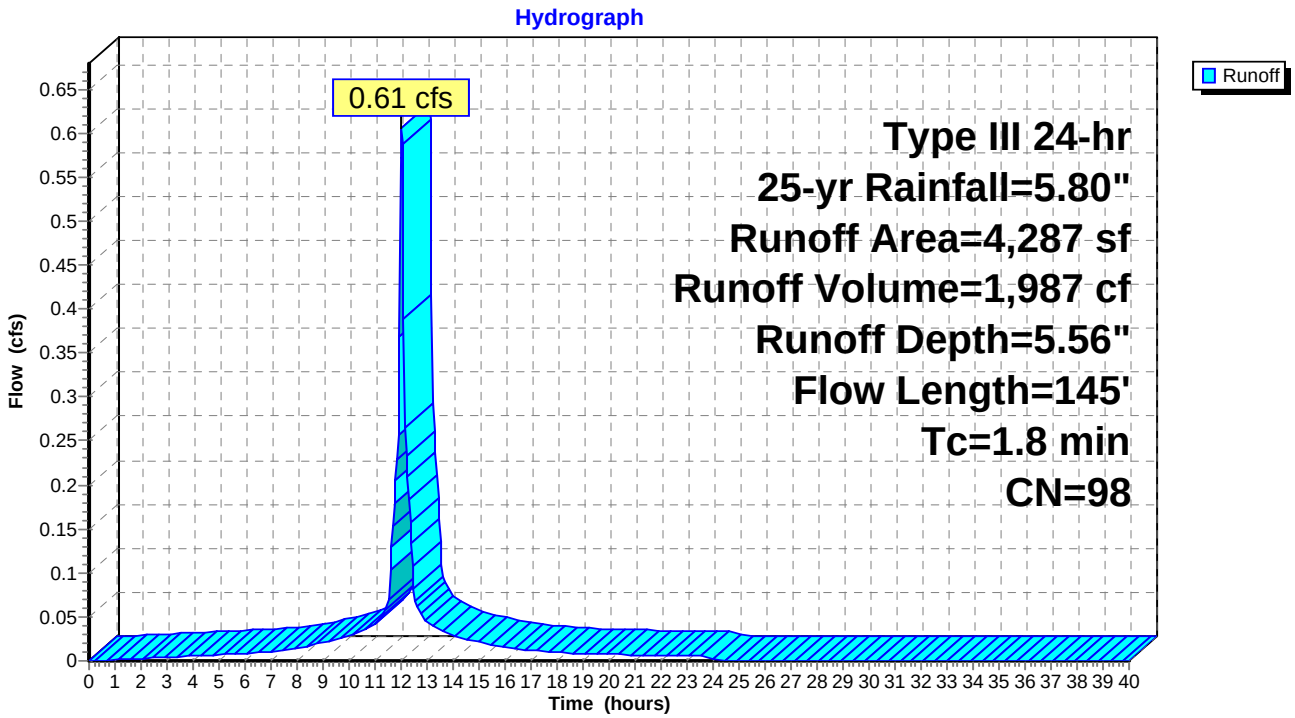
Runoff = 0.61 cfs @ 12.03 hrs, Volume= 1,987 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 4,287 | 98 | Roofs, HSG C |
| 4,287 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 55 | 0.0050 | 0.70 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 90 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Estimated Roof Drain to PDMH**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 145 | Total | | | |

## Subcatchment 208: 208 - Proposed Building Tenant B



## mary for Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and W

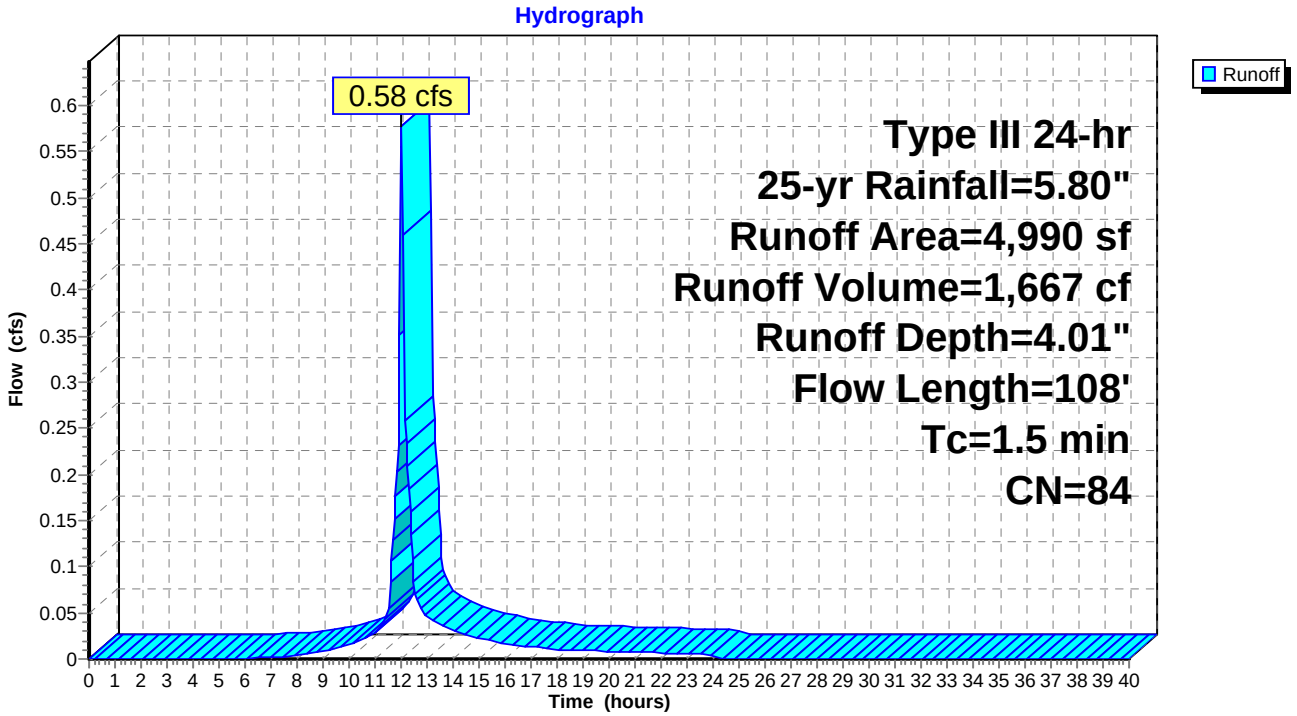
Runoff = 0.58 cfs @ 12.03 hrs, Volume= 1,667 cf, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 876 | 65 | Rain Garden Surface Area |
| | 2,078 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 84 | 98 | Unconnected pavement, HSG C |
| | 1,952 | 98 | Unconnected roofs, HSG C |
| | 4,990 | 84 | Weighted Average |
| | 2,954 | | 59.20% Pervious Area |
| | 2,036 | | 40.80% Impervious Area |
| | 2,036 | | 100.00% Unconnected |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 43 | 0.0050 | 0.67 | | **Sheet Flow, Flat Roof to Drain** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.4 | 65 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to Rain garden** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior |
| 1.5 | 108 | Total | | | |

## Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and Walkwa



## Summary for Subcatchment 210: 210 - Existing South features remaining to DP2

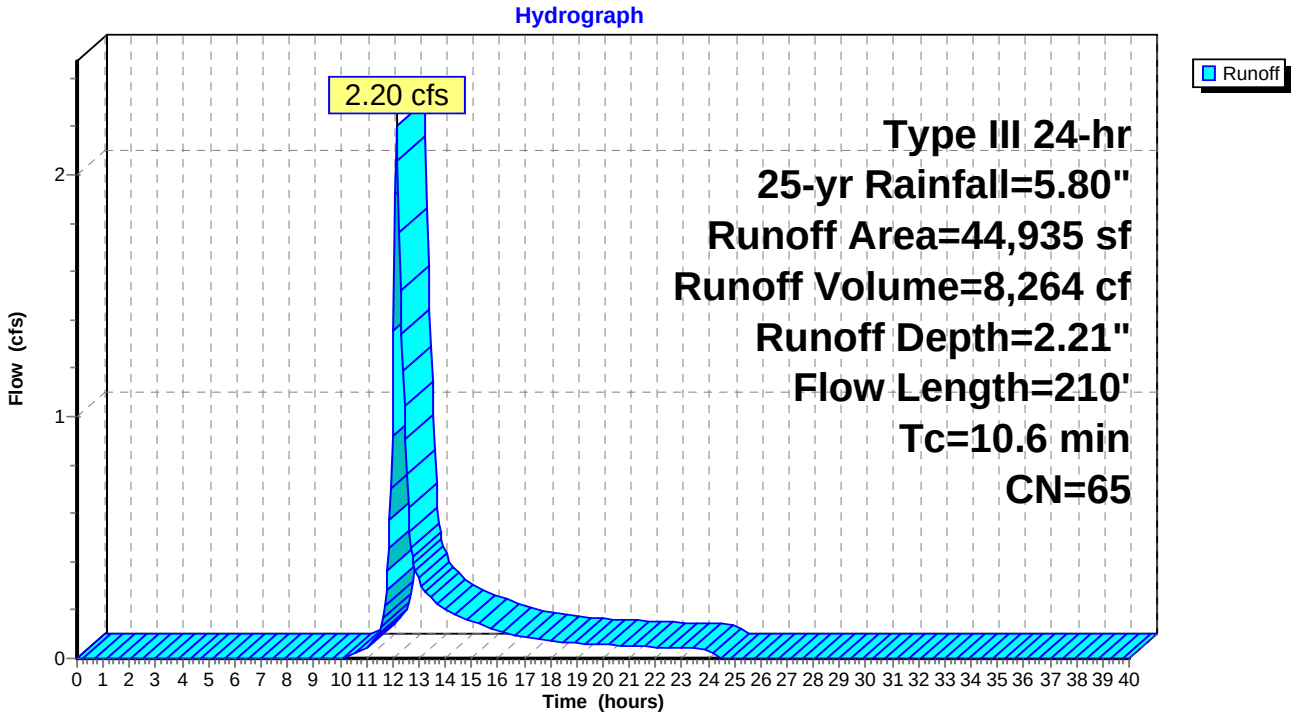
Runoff = 2.20 cfs @ 12.16 hrs, Volume= 8,264 cf, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 35,498 | 65 | Brush, Good, HSG C |
| * | 9,437 | 65 | Brush, Good, HSG C, Wetland Brush |
| | 44,935 | 65 | Weighted Average |
| | 44,935 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0600 | 0.18 | | **Sheet Flow,** Grass: Dense n= 0.240 P2= 3.22" |
| 1.4 | 110 | 0.0360 | 1.33 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 10.6 | 210 | Total | | | |

## Subcatchment 210: 210 - Existing South features remaining to DP2



## Summary for Subcatchment 300: 300 - Lawn East to DP3

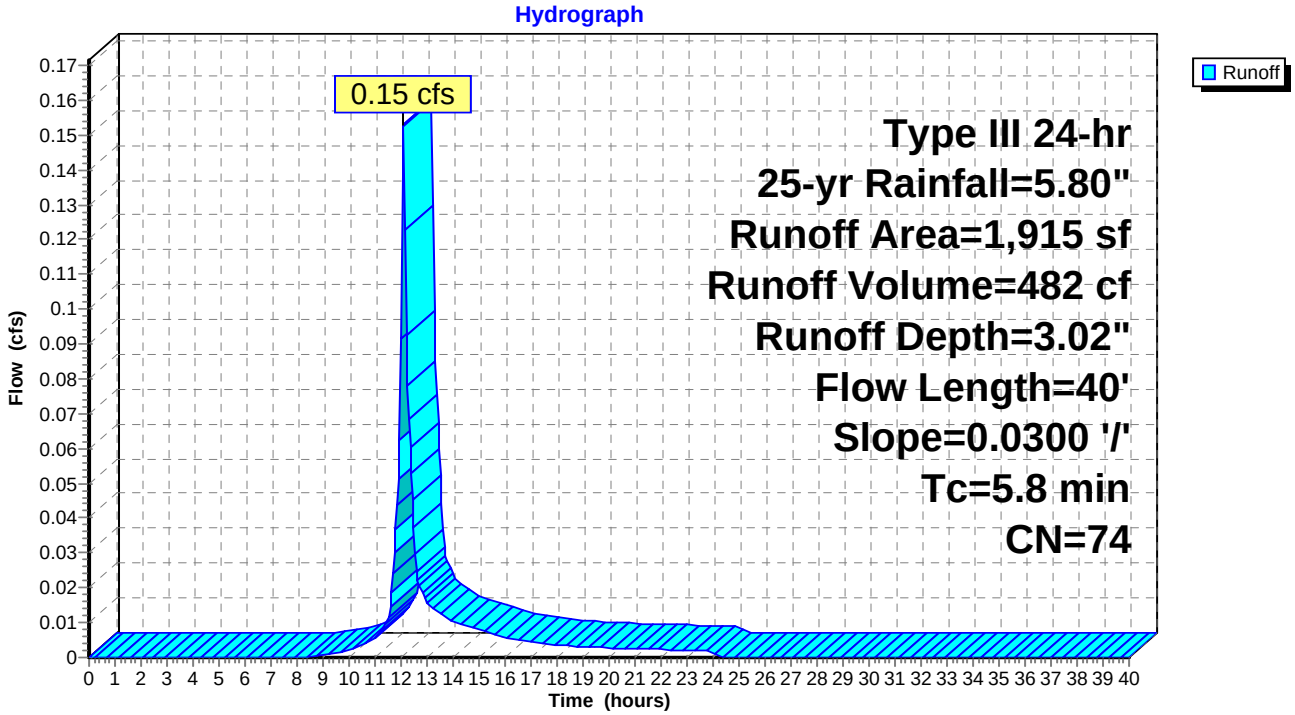
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 482 cf, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.80"

| Area (sf) | CN | Description |
|---|---|---|
| 1,915 | 74 | >75% Grass cover, Good, HSG C |
| 1,915 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.8 | 40 | 0.0300 | 0.11 | | **Sheet Flow, Overland Flow**<br>Grass: Dense n= 0.240 P2= 3.22" |

## Subcatchment 300: 300 - Lawn East to DP3



## Summary for Pond 1P: Infiltration System

Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 2.01 cfs @ 12.03 hrs, Volume= 6,589 cf
Outflow = 0.26 cfs @ 11.65 hrs, Volume= 6,592 cf, Atten= 87%, Lag= 0.0 min
Discarded = 0.26 cfs @ 11.65 hrs, Volume= 6,592 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.93' @ 12.52 hrs Surf.Area= 1,342 sf Storage= 1,840 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 40.4 min ( 782.1 - 741.7 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 16.80' | 961 cf | **Stone field surrounding chambers (Irregular)** Listed below<br>3,623 cf Overall - 1,222 cf Embedded = 2,401 cf x 40.0% Voids |
| #2 | 17.30' | 1,222 cf | **Cultec R180 Chambers, 56 units** Listed below Inside #1 |
| | | 2,183 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 16.80 | 1,342 | 175.5 | 0 | 0 | 1,342 |
| 19.50 | 1,342 | 175.5 | 3,623 | 3,623 | 1,816 |

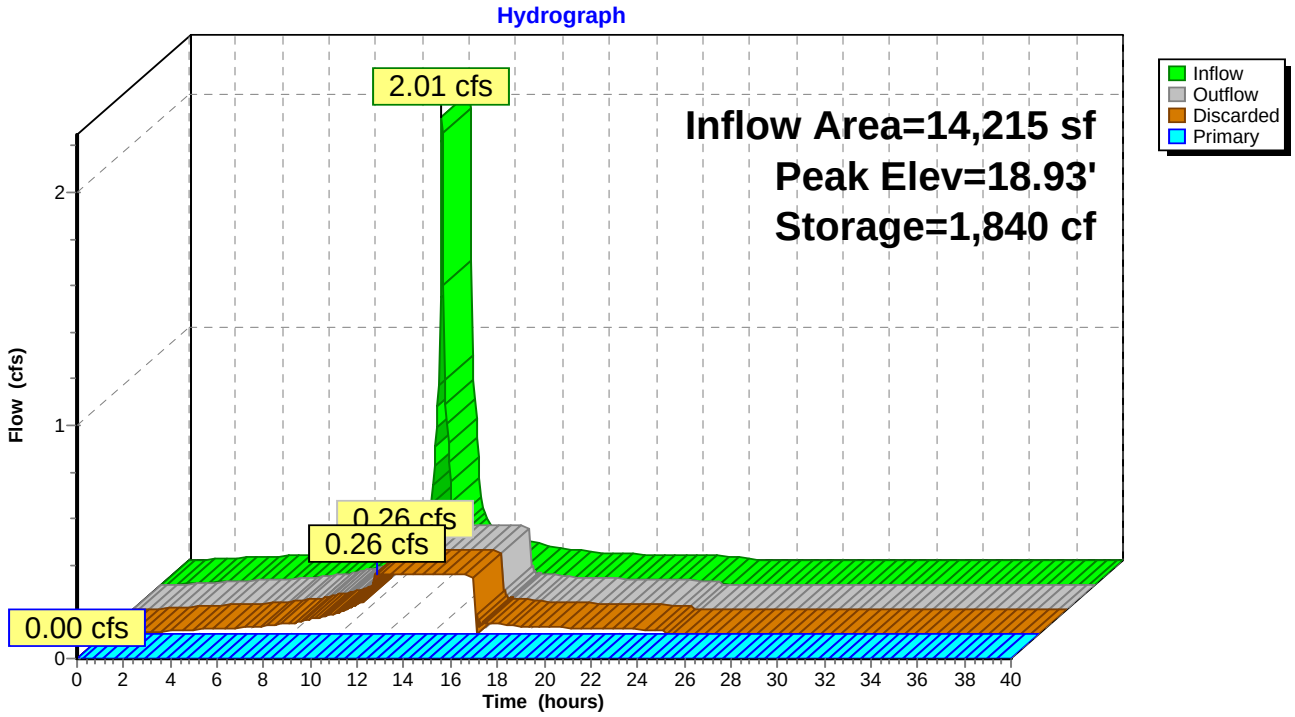
| Elevation (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|
| 17.30 | 0 | 0 |
| 18.10 | 460 | 460 |
| 18.70 | 522 | 982 |
| 19.00 | 240 | 1,222 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 16.80' | **8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01' |
| #2 | Device 3 | 19.00' | **4.0' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Primary | 16.80' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.80' / 16.50' S= 0.0143 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Discarded OutFlow** Max=0.26 cfs @ 11.65 hrs HW=16.87' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=16.80' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** ( Controls 0.00 cfs)
└**2=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: Infiltration System



## Summary for Pond CB1: PCB1

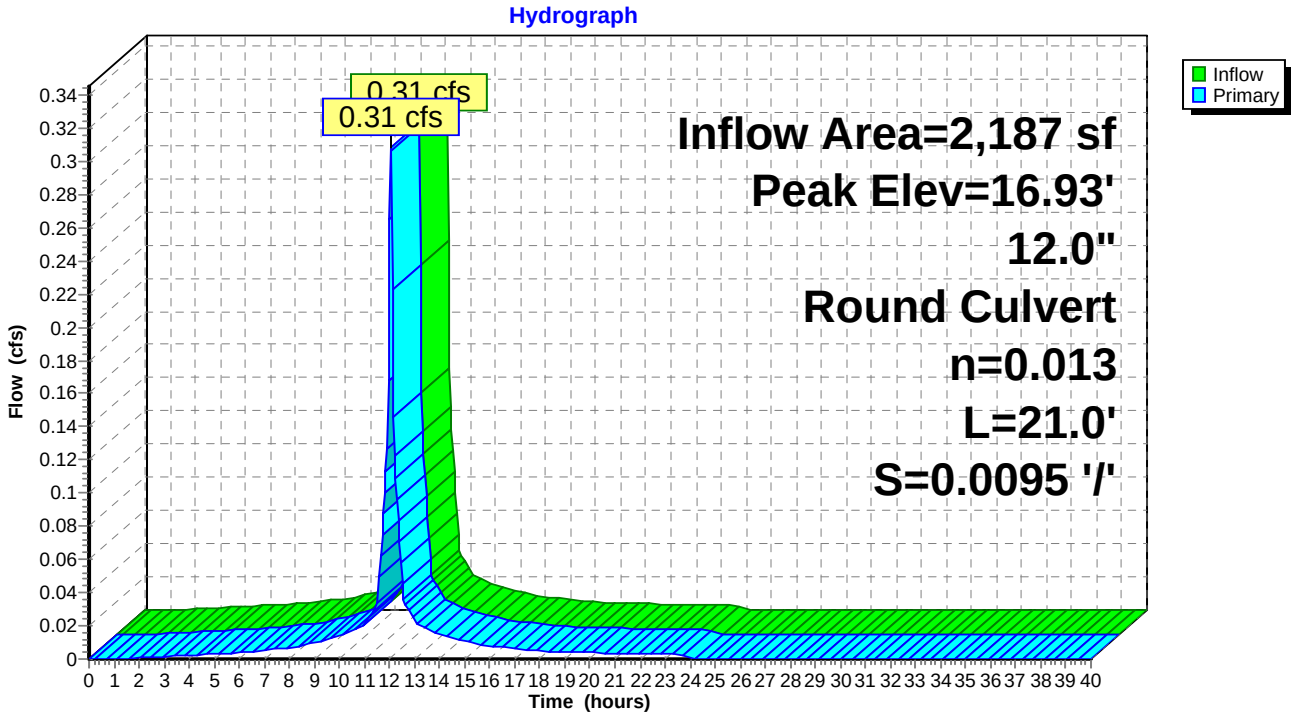
Inflow Area = 2,187 sf, 95.93% Impervious, Inflow Depth = 5.44" for 25-yr event
Inflow = 0.31 cfs @ 12.04 hrs, Volume= 992 cf
Outflow = 0.31 cfs @ 12.04 hrs, Volume= 992 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.31 cfs @ 12.04 hrs, Volume= 992 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.93' @ 12.06 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.27 cfs @ 12.04 hrs HW=16.92' TW=16.75' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.27 cfs @ 1.83 fps)

## Pond CB1: PCB1



## Summary for Pond CB2: PCB2

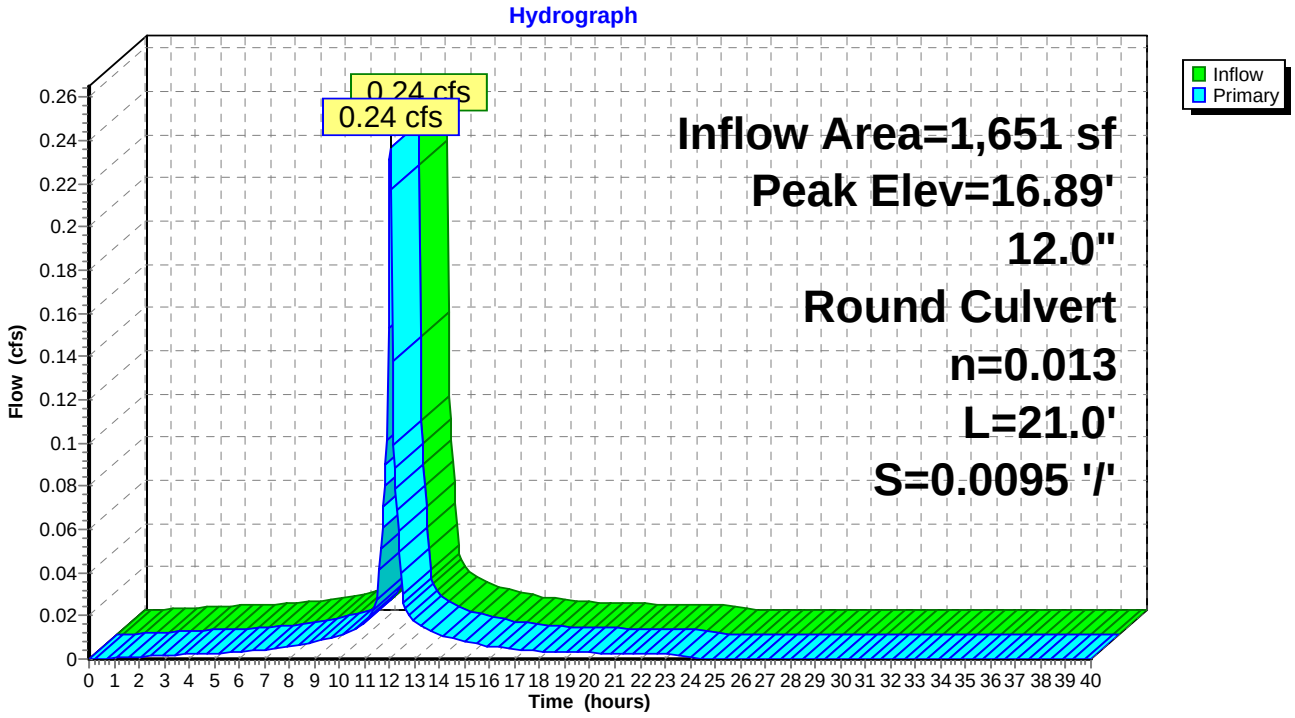
Inflow Area = 1,651 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 0.24 cfs @ 12.02 hrs, Volume= 765 cf
Outflow = 0.24 cfs @ 12.02 hrs, Volume= 765 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.02 hrs, Volume= 765 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.89' @ 12.04 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.19 cfs @ 12.02 hrs HW=16.88' TW=16.74' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.19 cfs @ 1.59 fps)

## Pond CB2: PCB2



## Summary for Pond CB3: PCB3

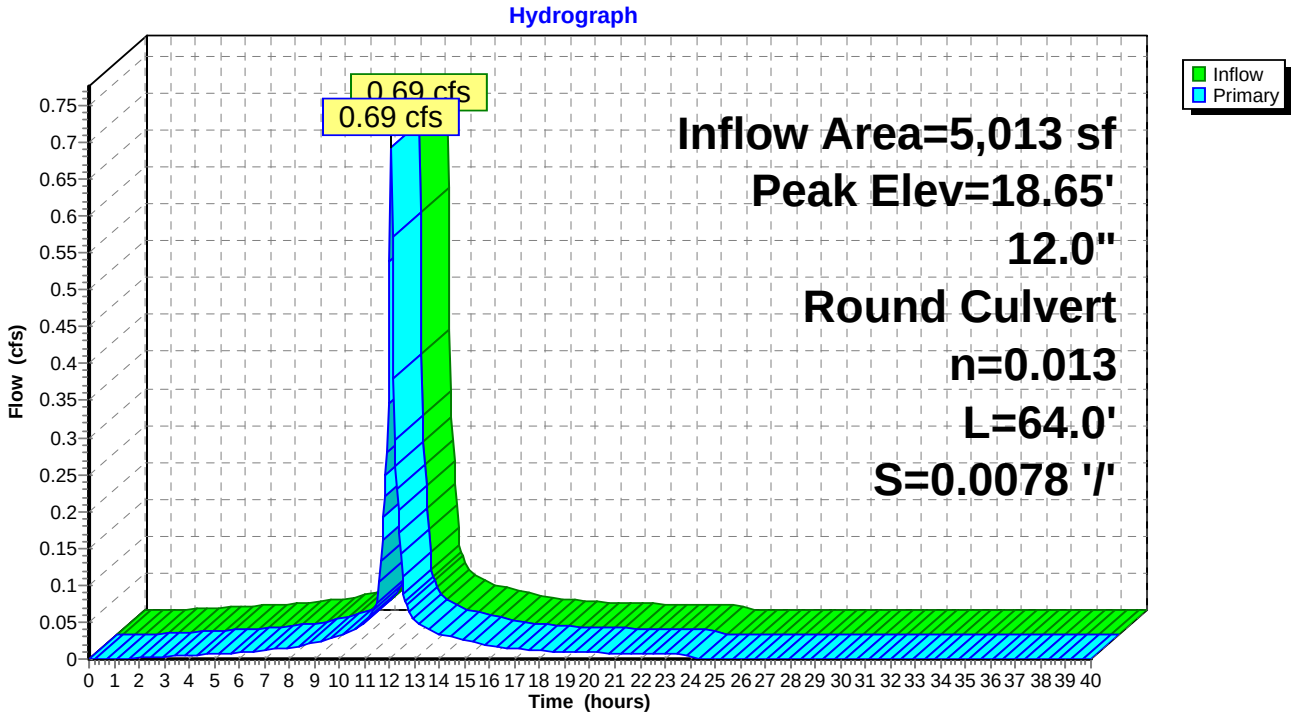
Inflow Area = 5,013 sf, 96.69% Impervious, Inflow Depth = 5.44" for 25-yr event
Inflow = 0.69 cfs @ 12.05 hrs, Volume= 2,275 cf
Outflow = 0.69 cfs @ 12.05 hrs, Volume= 2,275 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 12.05 hrs, Volume= 2,275 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.65' @ 12.09 hrs
Flood Elev= 20.70'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.00' | **12.0" Round Culvert**<br>L= 64.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.00' / 17.50' S= 0.0078 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.53 cfs @ 12.05 hrs HW=18.63' TW=18.50' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.53 cfs @ 1.44 fps)

## Pond CB3: PCB3



## Summary for Pond CB4: PCB4

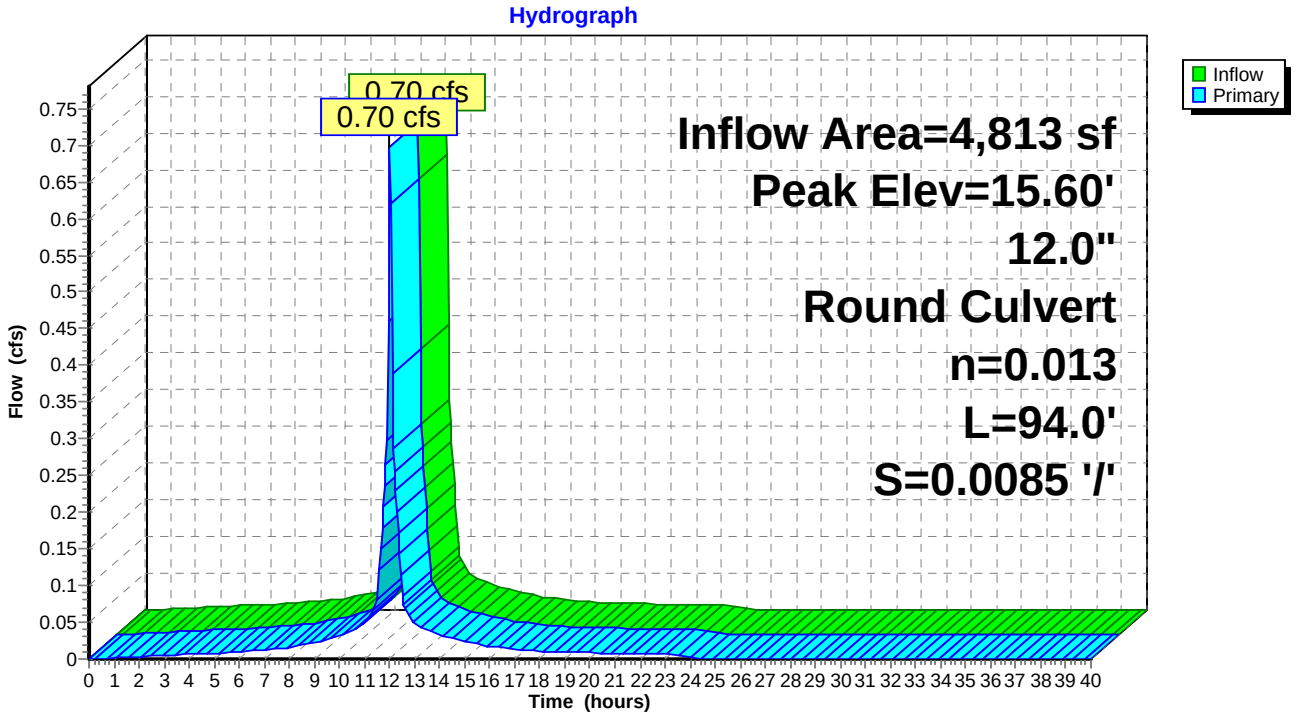
Inflow Area = 4,813 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 0.70 cfs @ 12.01 hrs, Volume= 2,231 cf
Outflow = 0.70 cfs @ 12.01 hrs, Volume= 2,231 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.01 hrs, Volume= 2,231 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.60' @ 12.03 hrs
Flood Elev= 17.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.10' | **12.0" Round Culvert**<br>L= 94.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.10' / 14.30' S= 0.0085 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.59 cfs @ 12.01 hrs HW=15.58' TW=15.10' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.59 cfs @ 2.31 fps)

## Pond CB4: PCB4



## Summary for Pond CB5: PCB5

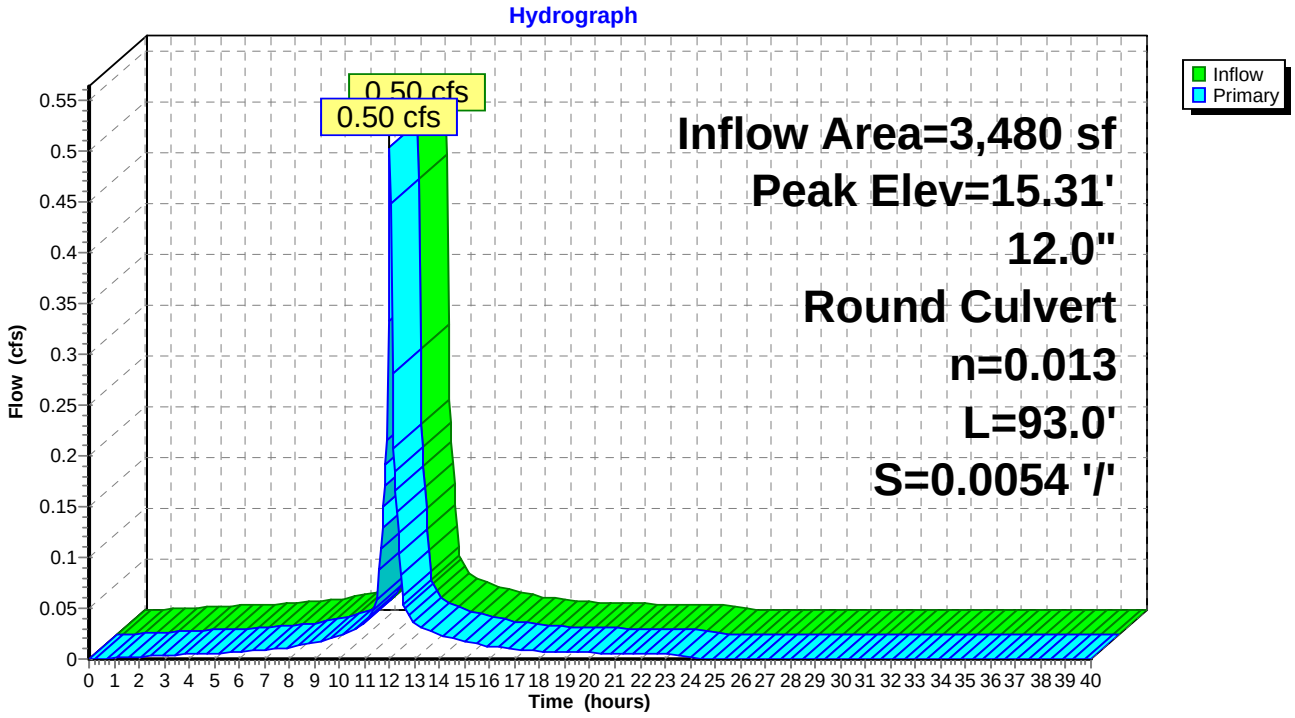
Inflow Area = 3,480 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 0.50 cfs @ 12.01 hrs, Volume= 1,613 cf
Outflow = 0.50 cfs @ 12.01 hrs, Volume= 1,613 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.01 hrs, Volume= 1,613 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.31' @ 12.05 hrs
Flood Elev= 17.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.80' | **12.0" Round Culvert**<br>L= 93.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.80' / 14.30' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.37 cfs @ 12.01 hrs HW=15.29' TW=15.10' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.37 cfs @ 1.45 fps)

## Pond CB5: PCB5



## Summary for Pond CB6: PCB6

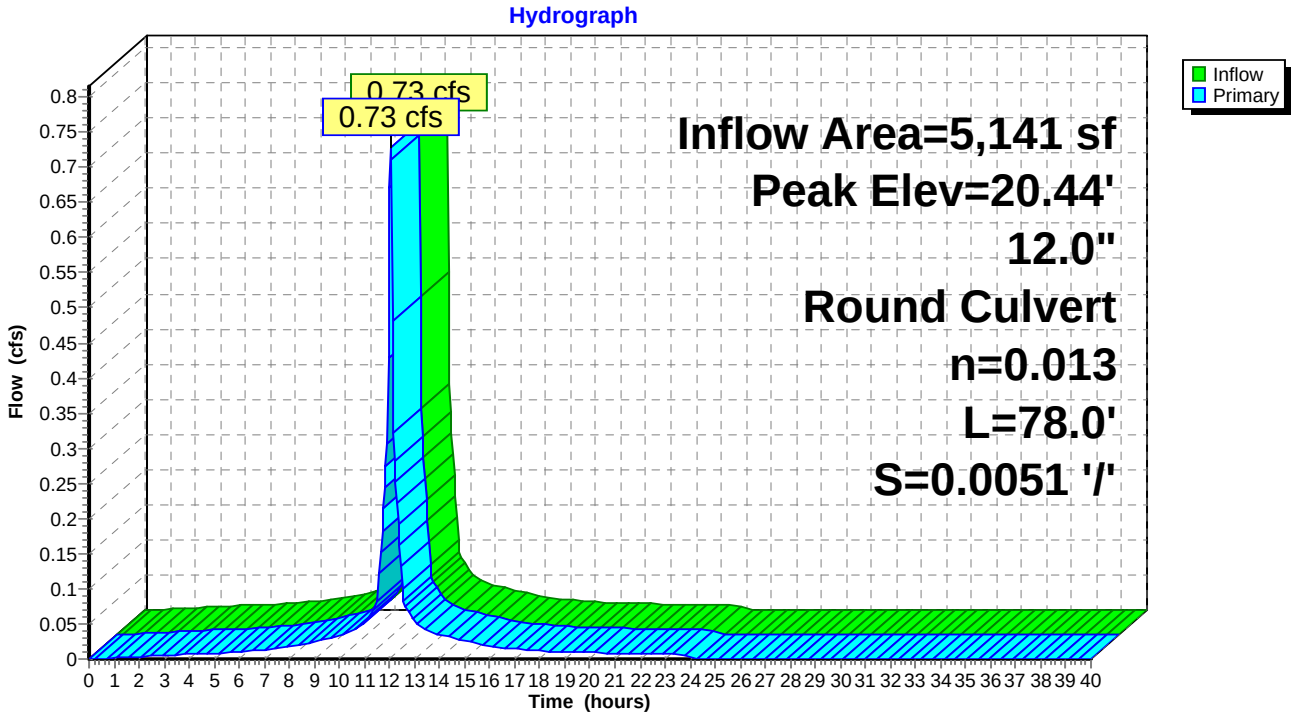
Inflow Area = 5,141 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 0.73 cfs @ 12.03 hrs, Volume= 2,383 cf
Outflow = 0.73 cfs @ 12.03 hrs, Volume= 2,383 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.03 hrs, Volume= 2,383 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.44' @ 12.04 hrs
Flood Elev= 22.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.90' | **12.0" Round Culvert**<br>L= 78.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.90' / 19.50' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.65 cfs @ 12.03 hrs HW=20.42' TW=20.02' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.65 cfs @ 2.28 fps)

## Pond CB6: PCB6



## Summary for Pond CB7: PCB7

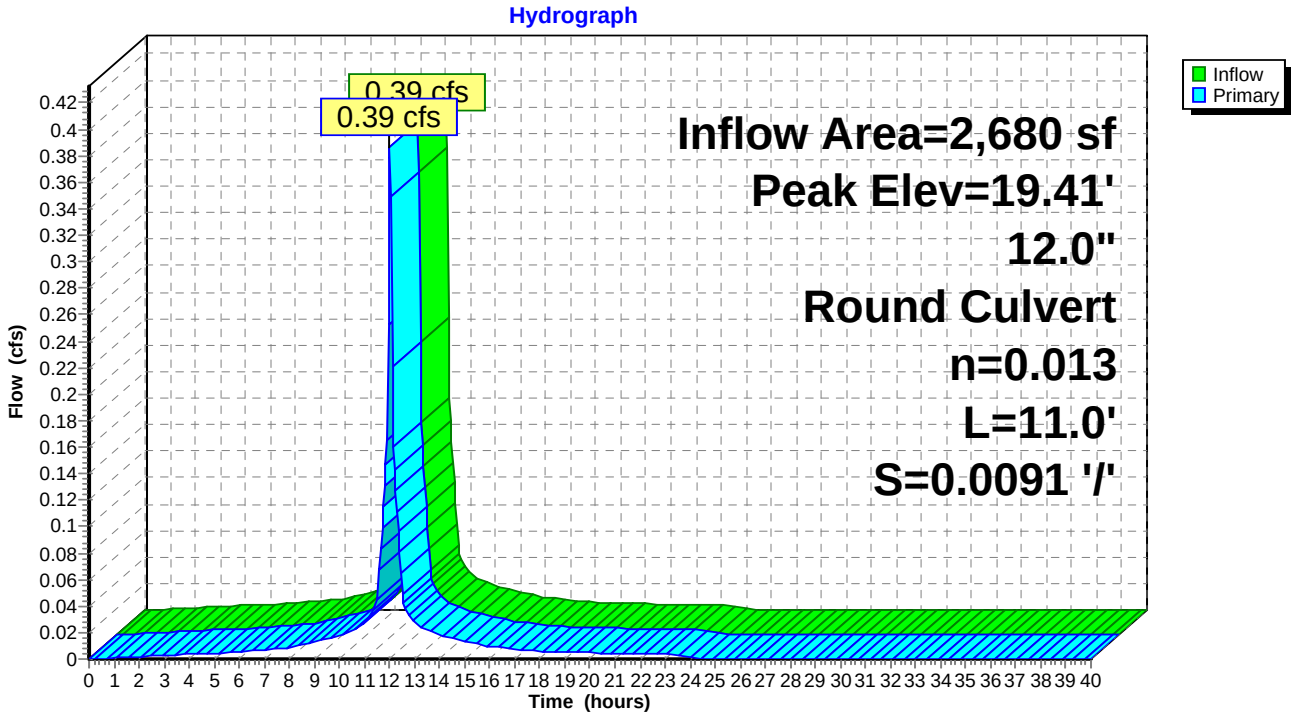
Inflow Area = 2,680 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 0.39 cfs @ 12.02 hrs, Volume= 1,242 cf
Outflow = 0.39 cfs @ 12.02 hrs, Volume= 1,242 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.02 hrs, Volume= 1,242 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.41' @ 12.06 hrs
Flood Elev= 21.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.90' | **12.0" Round Culvert**<br>L= 11.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.90' / 18.80' S= 0.0091 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.08 cfs @ 12.02 hrs HW=19.35' TW=19.35' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.08 cfs @ 0.33 fps)

## Pond CB7: PCB7

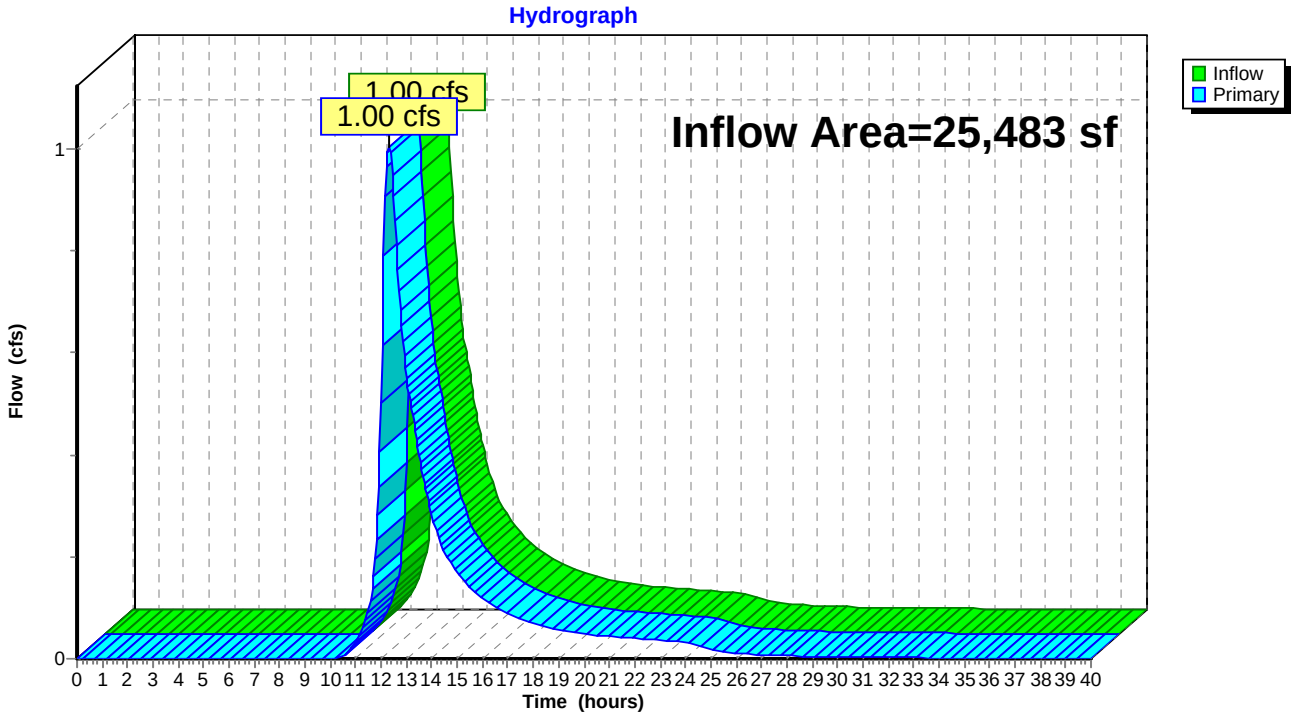


## Summary for Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

Inflow Area = 25,483 sf, 55.96% Impervious, Inflow Depth > 3.81" for 25-yr event
Inflow = 1.00 cfs @ 12.31 hrs, Volume= 8,081 cf
Primary = 1.00 cfs @ 12.31 hrs, Volume= 8,081 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

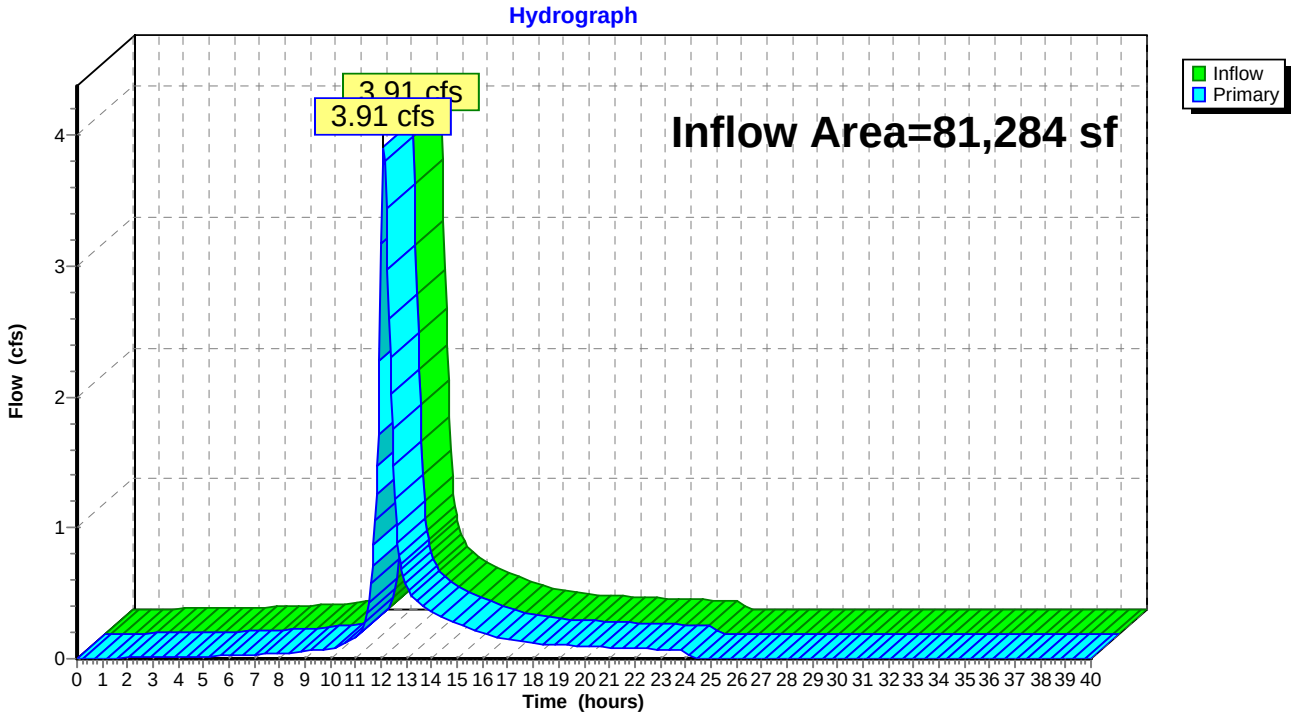


## Summary for Pond DP2: Design Pont #2_Wetland-South

Inflow Area = 81,284 sf, 40.77% Impervious, Inflow Depth = 2.53" for 25-yr event
Inflow = 3.91 cfs @ 12.10 hrs, Volume= 17,119 cf
Primary = 3.91 cfs @ 12.10 hrs, Volume= 17,119 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP2: Design Pont #2_Wetland-South

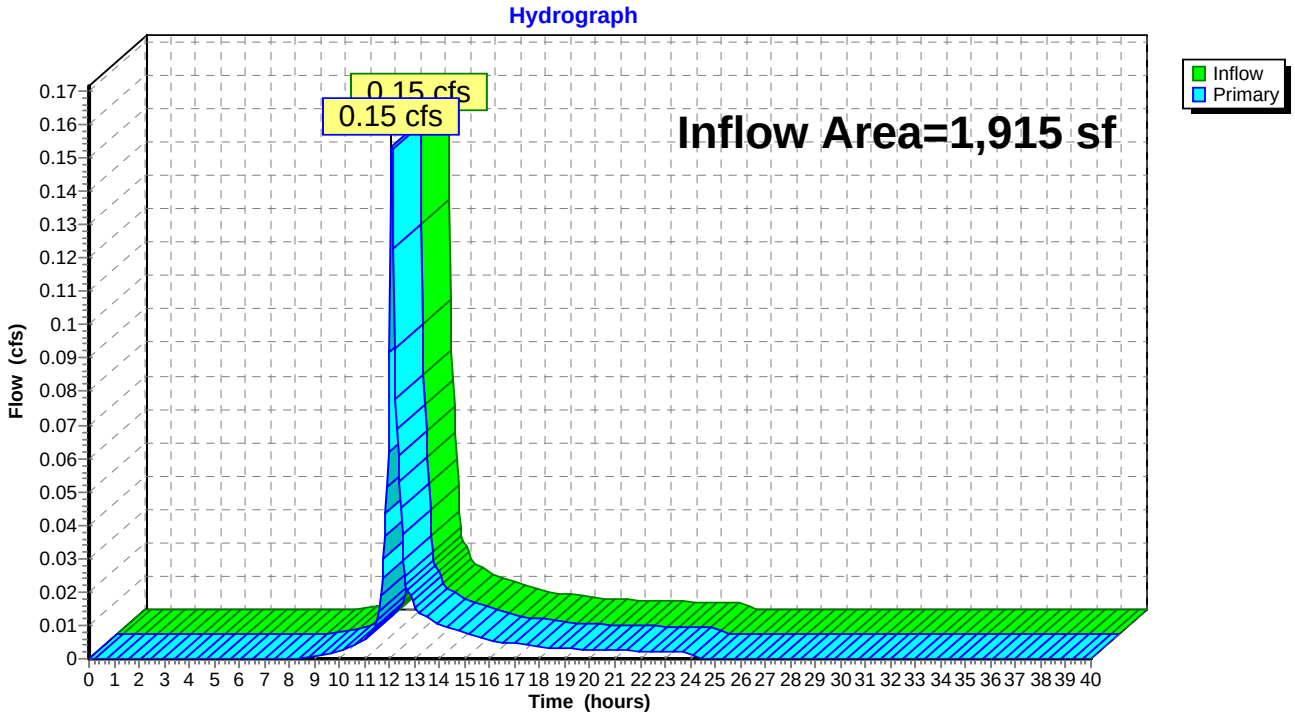


## Summary for Pond DP3: Design Pont #3_Abutting Lot-East

Inflow Area = 1,915 sf, 0.00% Impervious, Inflow Depth = 3.02" for 25-yr event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 482 cf
Primary = 0.15 cfs @ 12.09 hrs, Volume= 482 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP3: Design Pont #3_Abutting Lot-East



## Summary for Pond MH1: PDMH1

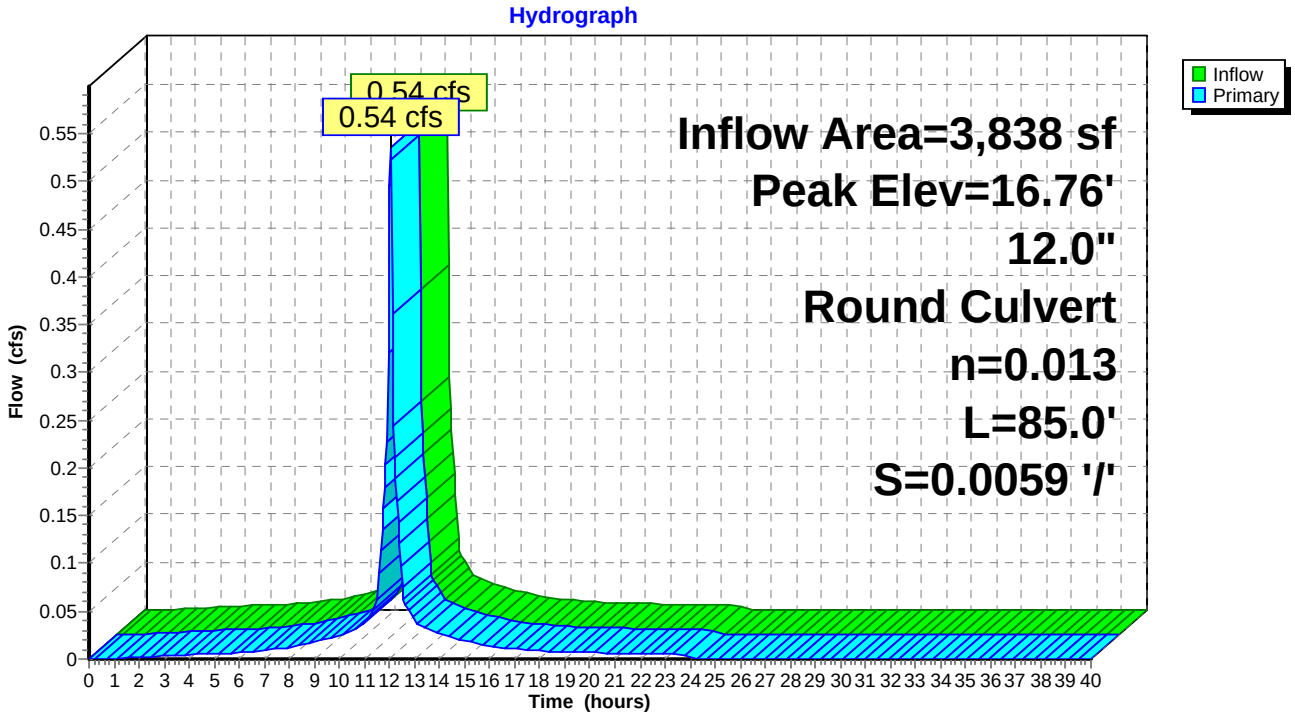
Inflow Area = 3,838 sf, 97.68% Impervious, Inflow Depth = 5.50" for 25-yr event
Inflow = 0.54 cfs @ 12.03 hrs, Volume= 1,758 cf
Outflow = 0.54 cfs @ 12.03 hrs, Volume= 1,758 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.54 cfs @ 12.03 hrs, Volume= 1,758 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.76' @ 12.05 hrs
Flood Elev= 20.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.30' | **12.0" Round Culvert**<br>L= 85.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.30' / 15.80' S= 0.0059 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.45 cfs @ 12.03 hrs HW=16.75' TW=16.40' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.45 cfs @ 1.97 fps)

### Pond MH1: PDMH1



## Summary for Pond MH2: PDMH2

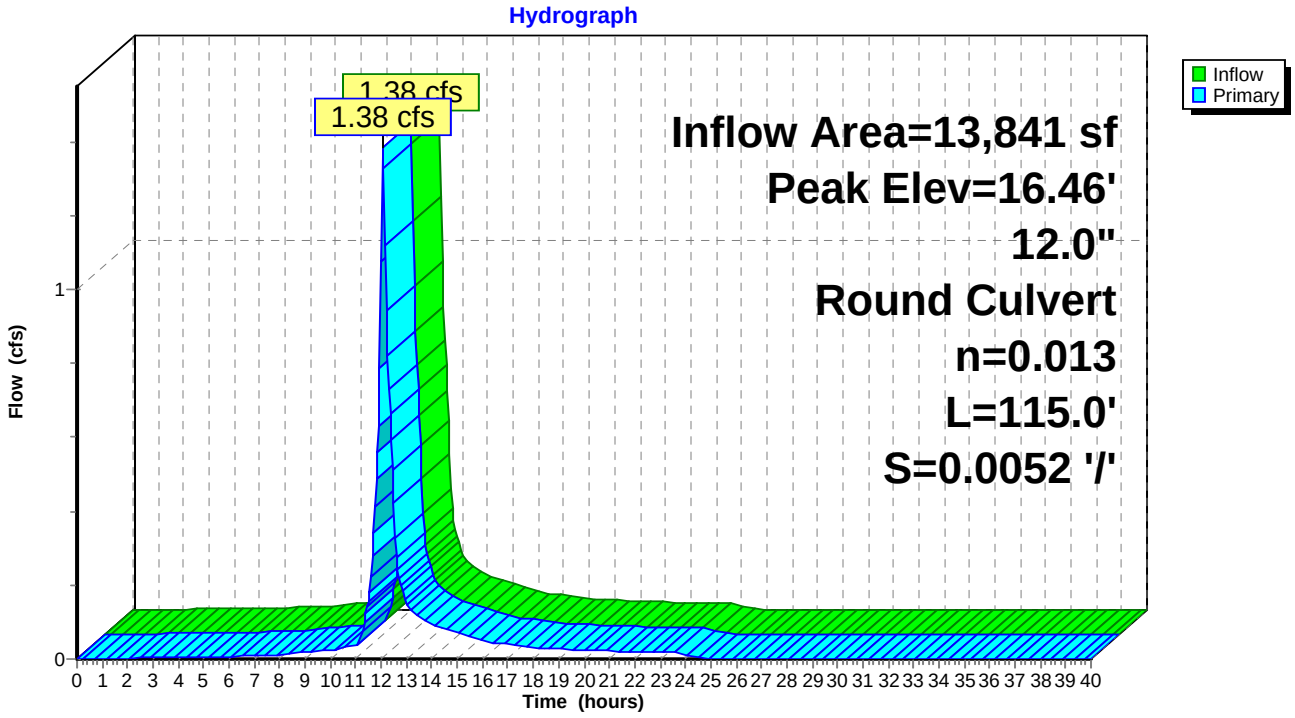
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 4.34" for 25-yr event
Inflow = 1.38 cfs @ 12.07 hrs, Volume= 5,011 cf
Outflow = 1.38 cfs @ 12.07 hrs, Volume= 5,011 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.07 hrs, Volume= 5,011 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.46' @ 12.09 hrs
Flood Elev= 21.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.70' | **12.0" Round Culvert**<br>L= 115.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.70' / 15.10' S= 0.0052 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.27 cfs @ 12.07 hrs HW=16.44' TW=15.79' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.27 cfs @ 2.84 fps)

### Pond MH2: PDMH2



## Summary for Pond MH3: PDMH3

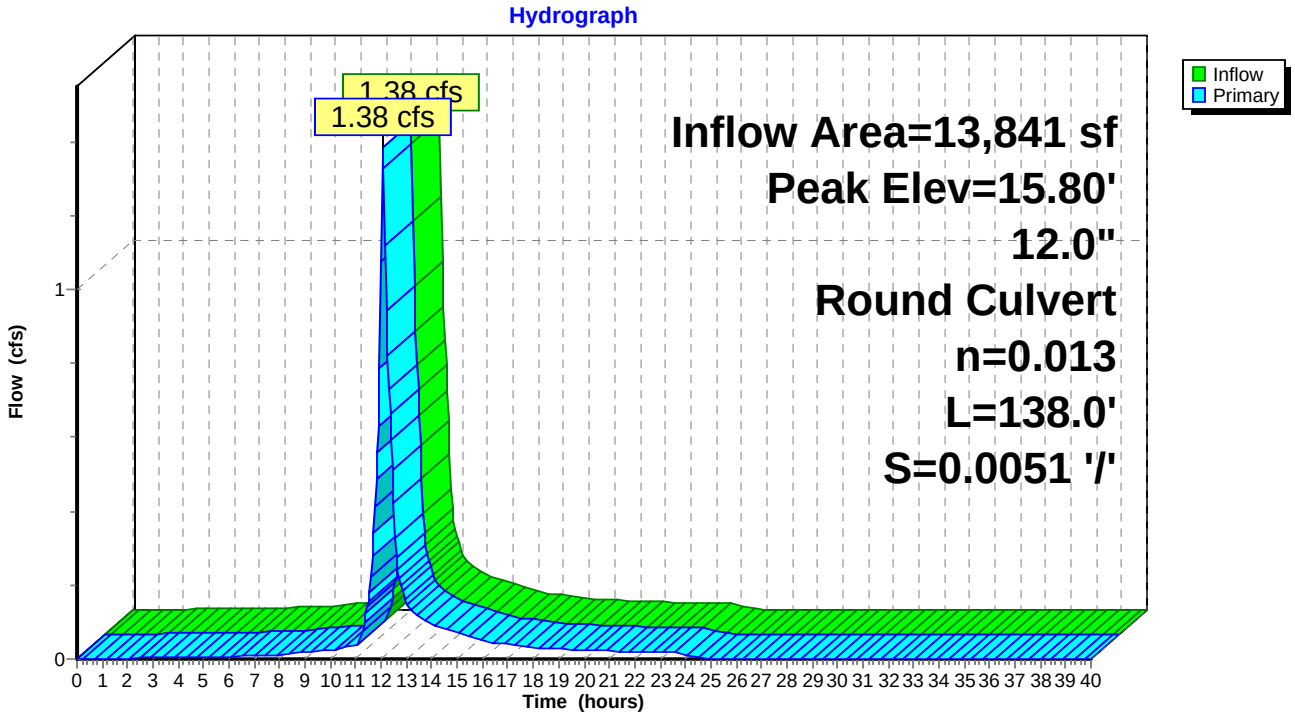
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 4.34" for 25-yr event
Inflow = 1.38 cfs @ 12.07 hrs, Volume= 5,011 cf
Outflow = 1.38 cfs @ 12.07 hrs, Volume= 5,011 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.07 hrs, Volume= 5,011 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.80' @ 12.08 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.00' | **12.0" Round Culvert**<br>L= 138.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.00' / 14.30' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.32 cfs @ 12.07 hrs HW=15.79' TW=15.13' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.32 cfs @ 2.73 fps)

### Pond MH3: PDMH3



## Summary for Pond MH4: PDMH4

Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 4.80" for 25-yr event
Inflow = 2.44 cfs @ 12.04 hrs, Volume= 8,855 cf
Outflow = 2.44 cfs @ 12.04 hrs, Volume= 8,855 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.90 cfs @ 12.04 hrs, Volume= 8,143 cf
Secondary = 0.58 cfs @ 12.08 hrs, Volume= 712 cf

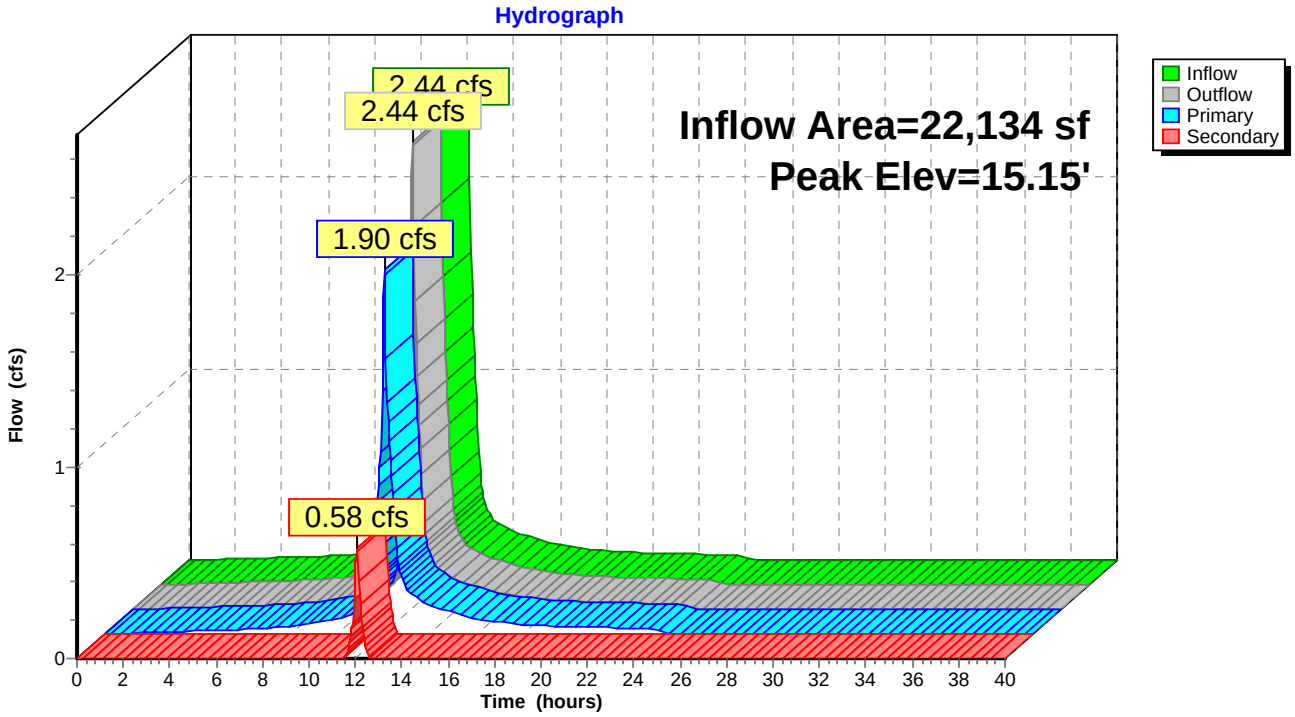
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.15' @ 12.08 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.20' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 14.10' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 14.20' | **12.0" Round Culvert**<br>L= 8.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 13.70' S= 0.0625 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 14.55' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=1.51 cfs @ 12.04 hrs HW=15.11' TW=14.84' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.51 cfs @ 2.00 fps)

**Secondary OutFlow** Max=0.56 cfs @ 12.08 hrs HW=15.13' TW=14.48' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.56 cfs of 1.97 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.56 cfs @ 2.49 fps)

## Pond MH4: PDMH4



## Summary for Pond MH5: PDMH5

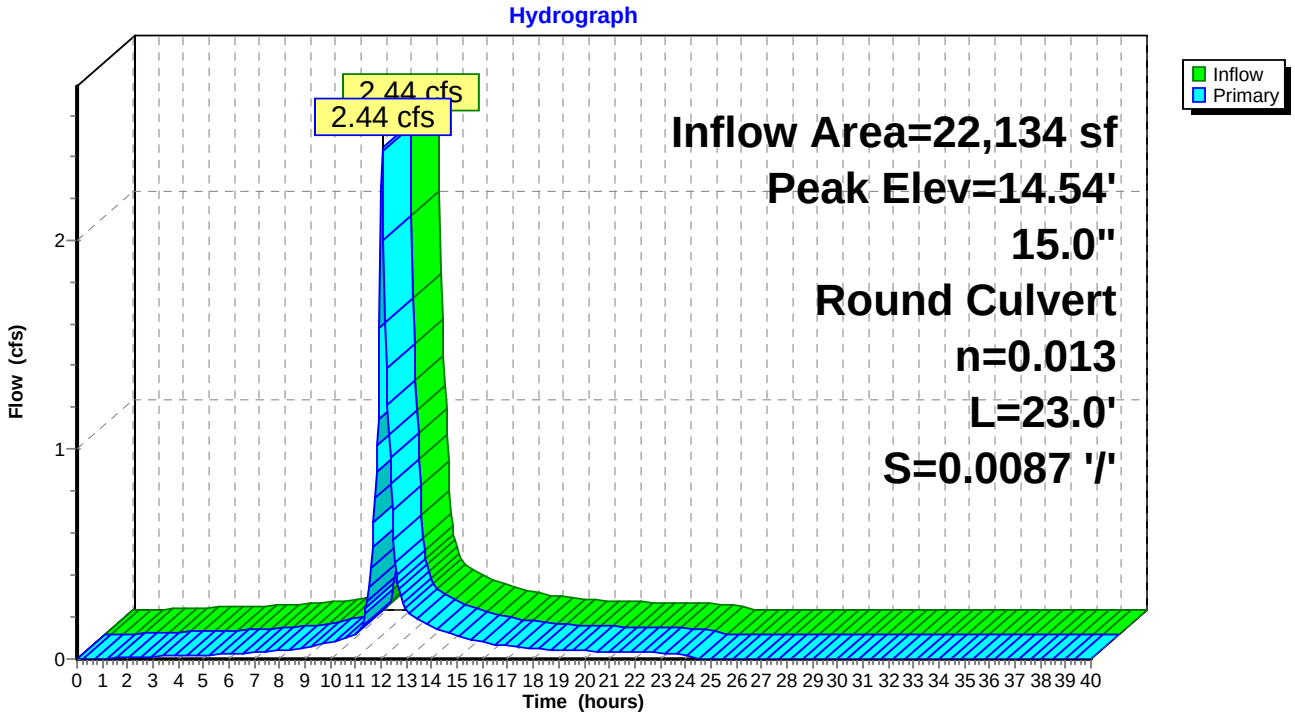
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 4.80" for 25-yr event
Inflow = 2.44 cfs @ 12.04 hrs, Volume= 8,855 cf
Outflow = 2.44 cfs @ 12.04 hrs, Volume= 8,855 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.44 cfs @ 12.04 hrs, Volume= 8,855 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.54' @ 12.04 hrs
Flood Elev= 21.40'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.60' | **15.0" Round Culvert**<br>L= 23.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.60' / 13.40' S= 0.0087 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=2.39 cfs @ 12.04 hrs HW=14.53' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 2.39 cfs @ 3.41 fps)

### Pond MH5: PDMH5



## Summary for Pond MH6: PDMH6

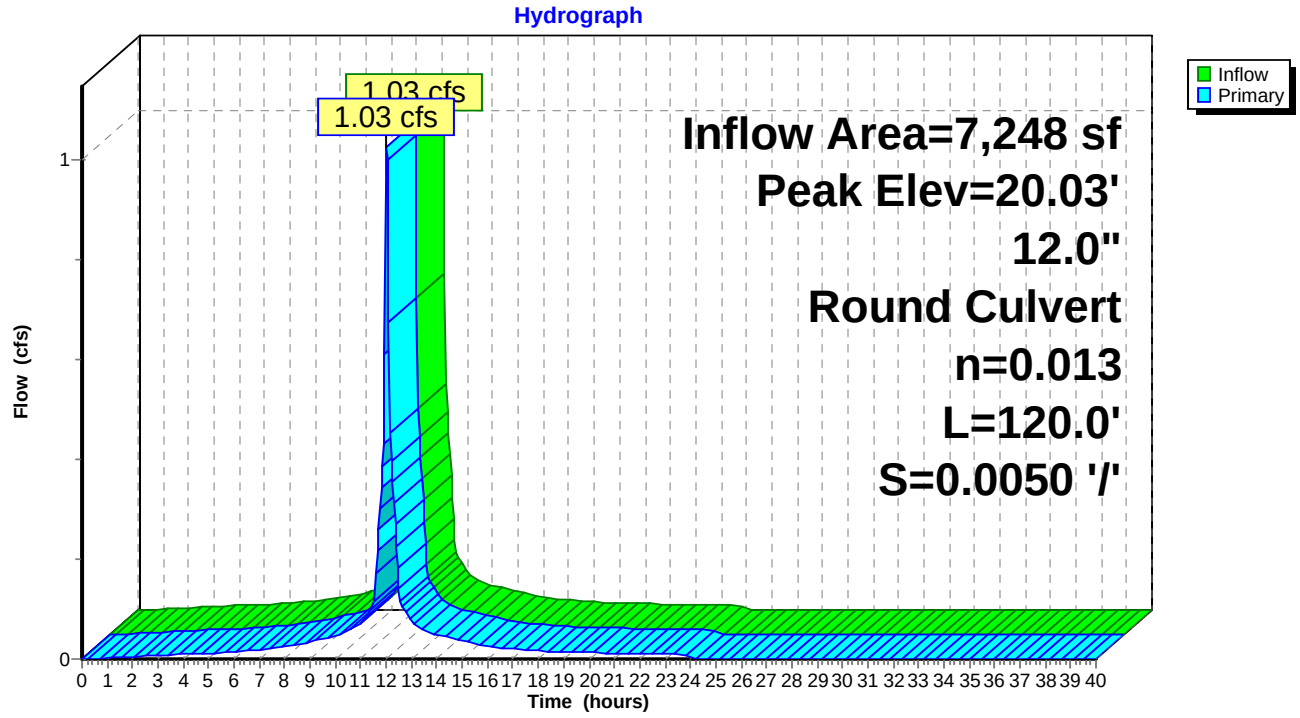
Inflow Area = 7,248 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 1.03 cfs @ 12.03 hrs, Volume= 3,360 cf
Outflow = 1.03 cfs @ 12.03 hrs, Volume= 3,360 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 12.03 hrs, Volume= 3,360 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.03' @ 12.04 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.40' | **12.0" Round Culvert**<br>L= 120.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.40' / 18.80' S= 0.0050 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.95 cfs @ 12.03 hrs HW=20.02' TW=19.35' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.95 cfs @ 2.69 fps)

### Pond MH6: PDMH6



## Summary for Pond MH7: PDMH7

Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 1.40 cfs @ 12.03 hrs, Volume= 4,602 cf
Outflow = 1.40 cfs @ 12.03 hrs, Volume= 4,602 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.10 cfs @ 12.03 hrs, Volume= 4,335 cf
Secondary = 0.30 cfs @ 12.03 hrs, Volume= 267 cf

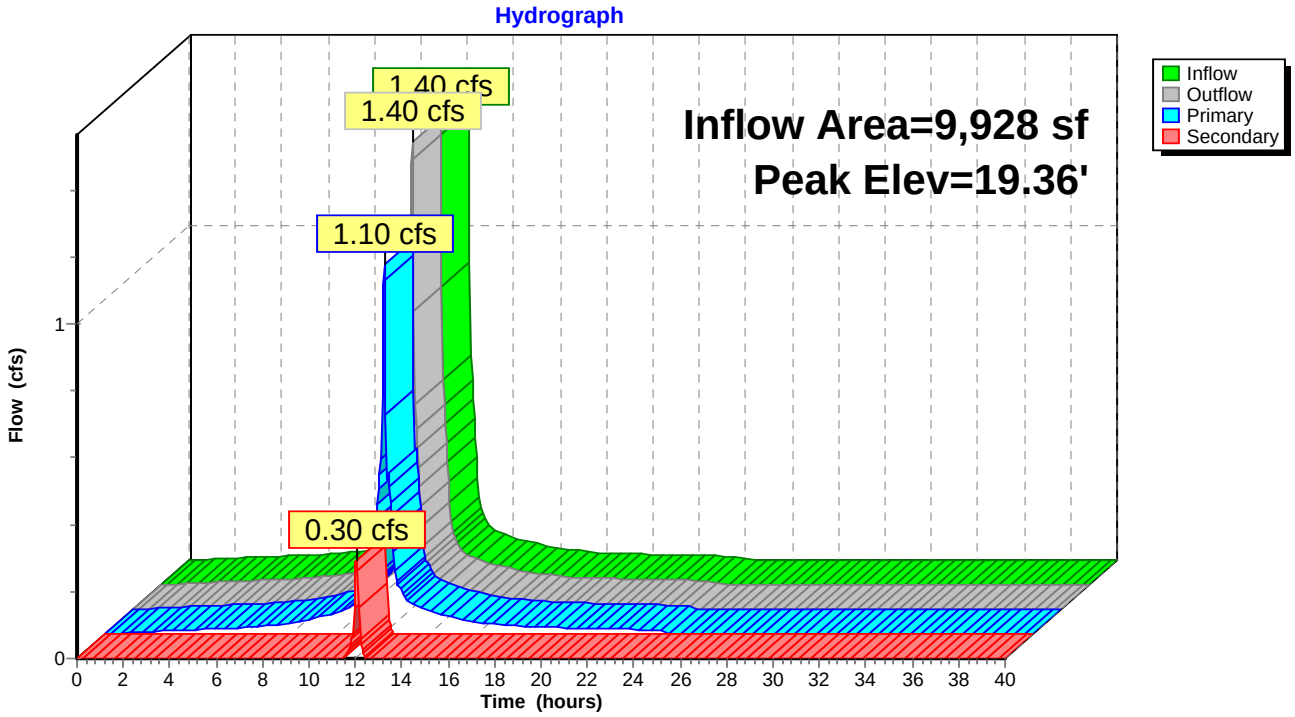
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.36' @ 12.03 hrs
Flood Elev= 21.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.60' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.20' S= 0.0500 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 19.00' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=1.01 cfs @ 12.03 hrs HW=19.35' TW=19.11' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.01 cfs @ 2.64 fps)

**Secondary OutFlow** Max=0.29 cfs @ 12.03 hrs HW=19.35' TW=19.05' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.29 cfs of 1.12 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.29 cfs @ 1.89 fps)

## Pond MH7: PDMH7



## Summary for Pond MH8: PDMH8

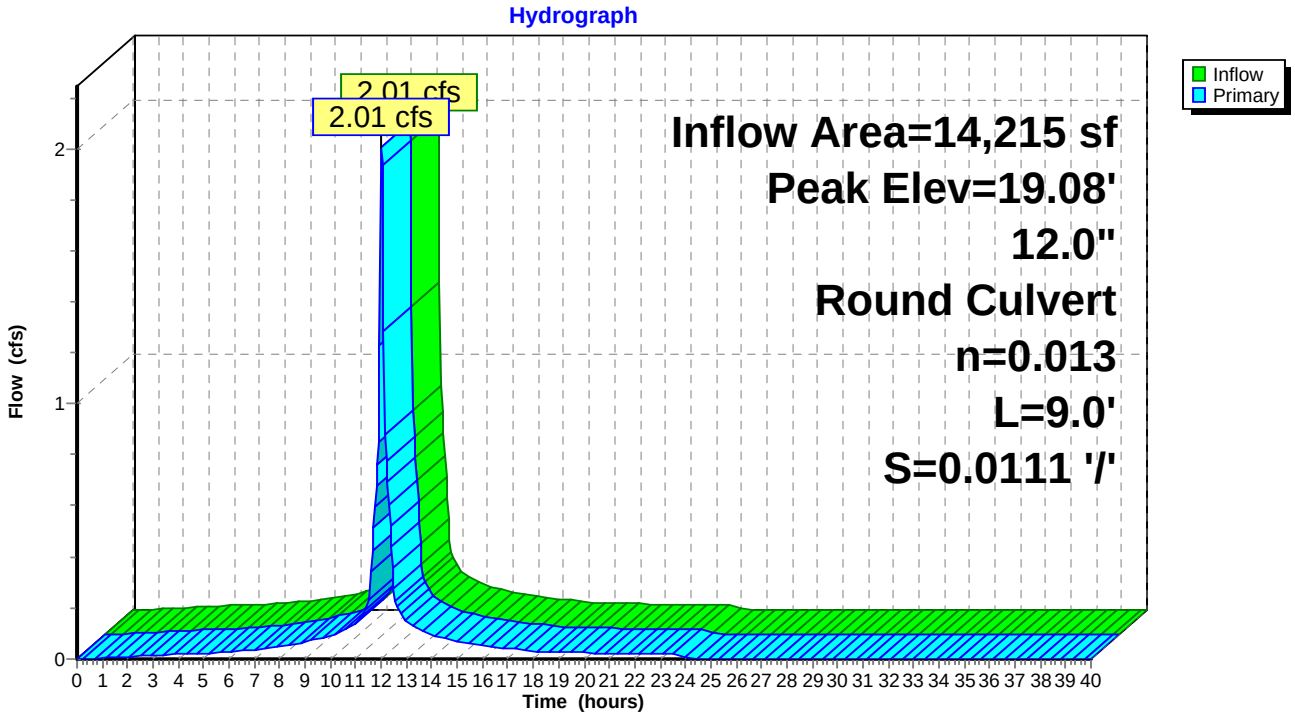
Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 5.56" for 25-yr event
Inflow = 2.01 cfs @ 12.03 hrs, Volume= 6,589 cf
Outflow = 2.01 cfs @ 12.03 hrs, Volume= 6,589 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.01 cfs @ 12.03 hrs, Volume= 6,589 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.08' @ 12.03 hrs
Flood Elev= 22.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.10' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.10' / 18.00' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.92 cfs @ 12.03 hrs HW=19.05' TW=18.03' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 1.92 cfs @ 3.20 fps)

### Pond MH8: PDMH8



## Summary for Pond RG1: Rain Garden #1

Inflow Area = 25,212 sf, 56.56% Impervious, Inflow Depth = 4.16" for 25-yr event
Inflow = 2.87 cfs @ 12.05 hrs, Volume= 8,750 cf
Outflow = 1.00 cfs @ 12.31 hrs, Volume= 8,013 cf, Atten= 65%, Lag= 15.3 min
Primary = 1.00 cfs @ 12.31 hrs, Volume= 8,013 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.95' @ 12.31 hrs Surf.Area= 6,032 sf Storage= 3,374 cf
Flood Elev= 16.70' Surf.Area= 6,703 sf Storage= 6,272 cf

Plug-Flow detention time= 142.8 min calculated for 8,003 cf (91% of inflow)
Center-of-Mass det. time= 101.1 min ( 891.4 - 790.3 )

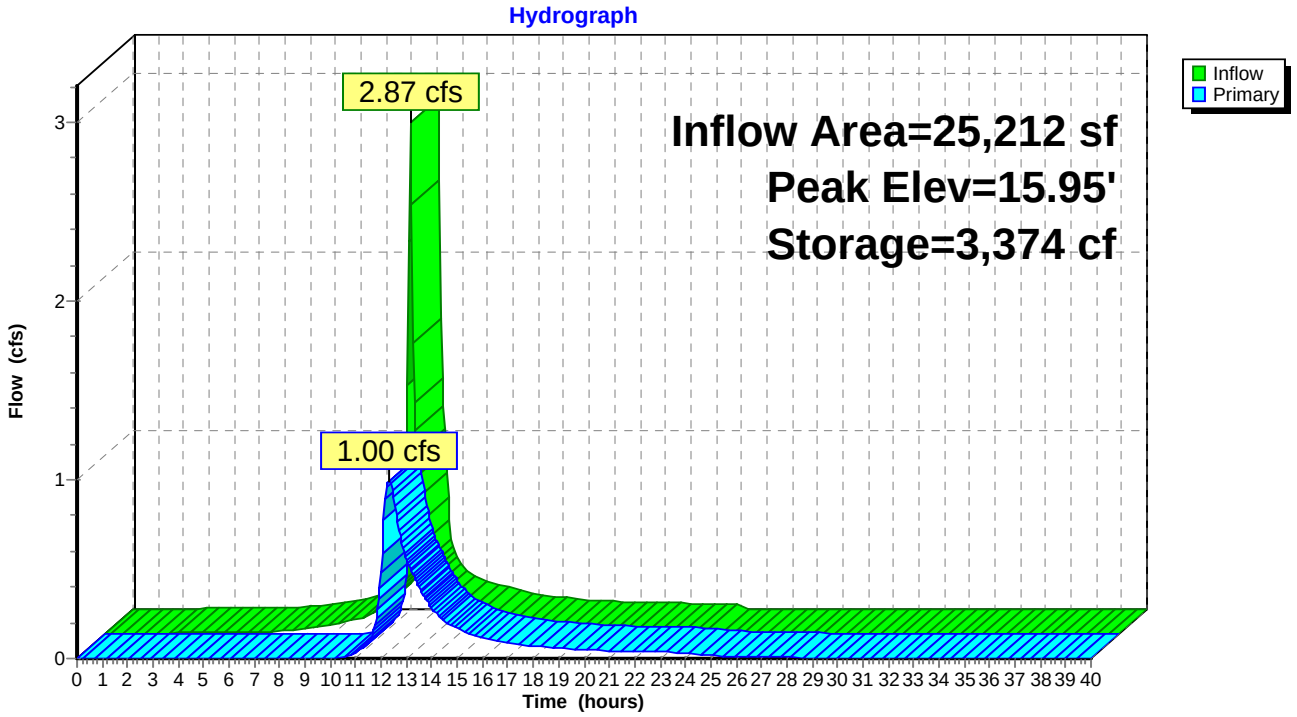
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 15.30' | 6,272 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 15.30 | 4,439 | 288.0 | 0 | 0 | 4,439 |
| 16.00 | 6,173 | 327.0 | 3,698 | 3,698 | 6,360 |
| 16.30 | 6,569 | 334.0 | 1,911 | 5,609 | 6,741 |
| 16.40 | 6,703 | 337.0 | 664 | 6,272 | 6,905 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.35' | **8.0" Round Culvert X 2.00**<br>L= 65.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 15.35' / 15.00' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf |
| #2 | Device 1 | 15.45' | **4.0" Vert. Orifice/Grate X 3.00** C= 0.600 |
| #3 | Device 1 | 15.80' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 16.35' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.99 cfs @ 12.31 hrs HW=15.95' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.99 cfs of 1.32 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.72 cfs @ 2.77 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.27 cfs @ 1.23 fps)
  └**4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG1: Rain Garden #1



## Summary for Pond RG2: Rain Garden #2

Inflow Area = 10,003 sf, 68.81% Impervious, Inflow Depth = 4.73" for 25-yr event
Inflow = 1.25 cfs @ 12.04 hrs, Volume= 3,942 cf
Outflow = 0.97 cfs @ 12.10 hrs, Volume= 3,253 cf, Atten= 23%, Lag= 3.8 min
Primary = 0.97 cfs @ 12.10 hrs, Volume= 3,253 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.54' @ 12.10 hrs Surf.Area= 947 sf Storage= 1,071 cf
Flood Elev= 19.00' Surf.Area= 1,118 sf Storage= 1,546 cf

Plug-Flow detention time= 130.1 min calculated for 3,249 cf (82% of inflow)
Center-of-Mass det. time= 60.1 min ( 831.8 - 771.7 )

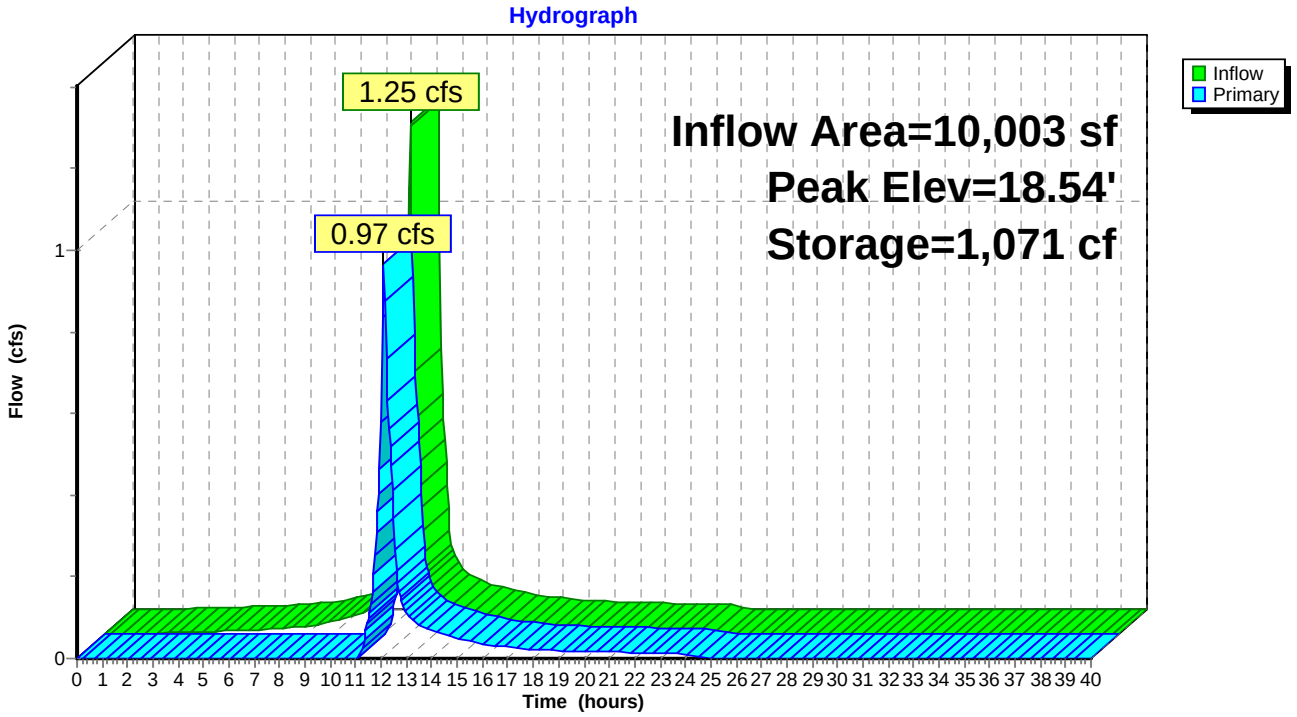
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 17.00' | 2,934 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 17.00 | 468 | 89.0 | 0 | 0 | 468 |
| 18.00 | 765 | 108.0 | 610 | 610 | 782 |
| 19.00 | 1,118 | 127.0 | 936 | 1,546 | 1,156 |
| 20.00 | 1,676 | 152.0 | 1,388 | 2,934 | 1,728 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.50' | **12.0" Round Culvert X 2.00**<br>L= 53.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 16.50' / 15.80' S= 0.0132 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 18.10' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 18.40' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 19.20' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=0.96 cfs @ 12.10 hrs HW=18.54' TW=16.45' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.96 cfs of 8.27 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.71 cfs @ 2.86 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.24 cfs @ 1.19 fps)
  └─**4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG2: Rain Garden #2



## Summary for Pond WQU1: Water Quality Unit 1

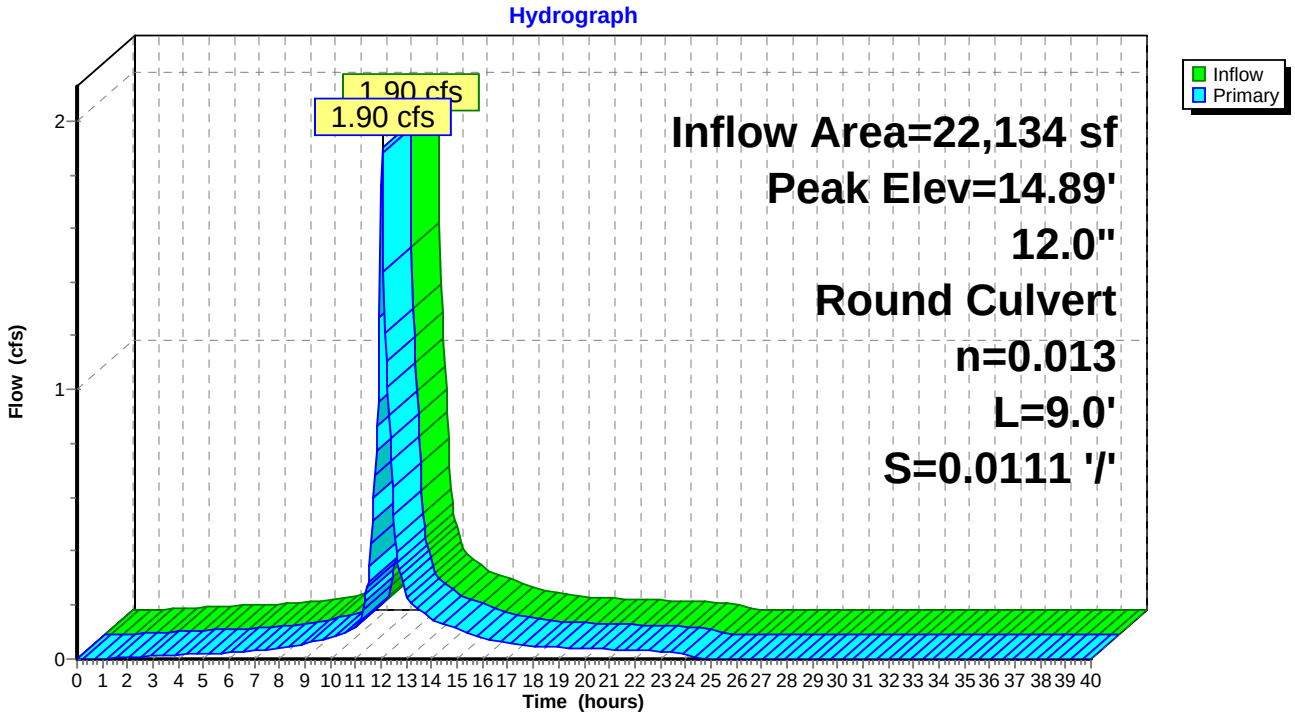
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 4.41" for 25-yr event
Inflow = 1.90 cfs @ 12.04 hrs, Volume= 8,143 cf
Outflow = 1.90 cfs @ 12.04 hrs, Volume= 8,143 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.90 cfs @ 12.04 hrs, Volume= 8,143 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.89' @ 12.06 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.80' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.80' / 13.70' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.67 cfs @ 12.04 hrs HW=14.84' TW=14.52' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.67 cfs @ 2.12 fps)

### Pond WQU1: Water Quality Unit 1



## Summary for Pond WQU2: Water Quality Unit 2

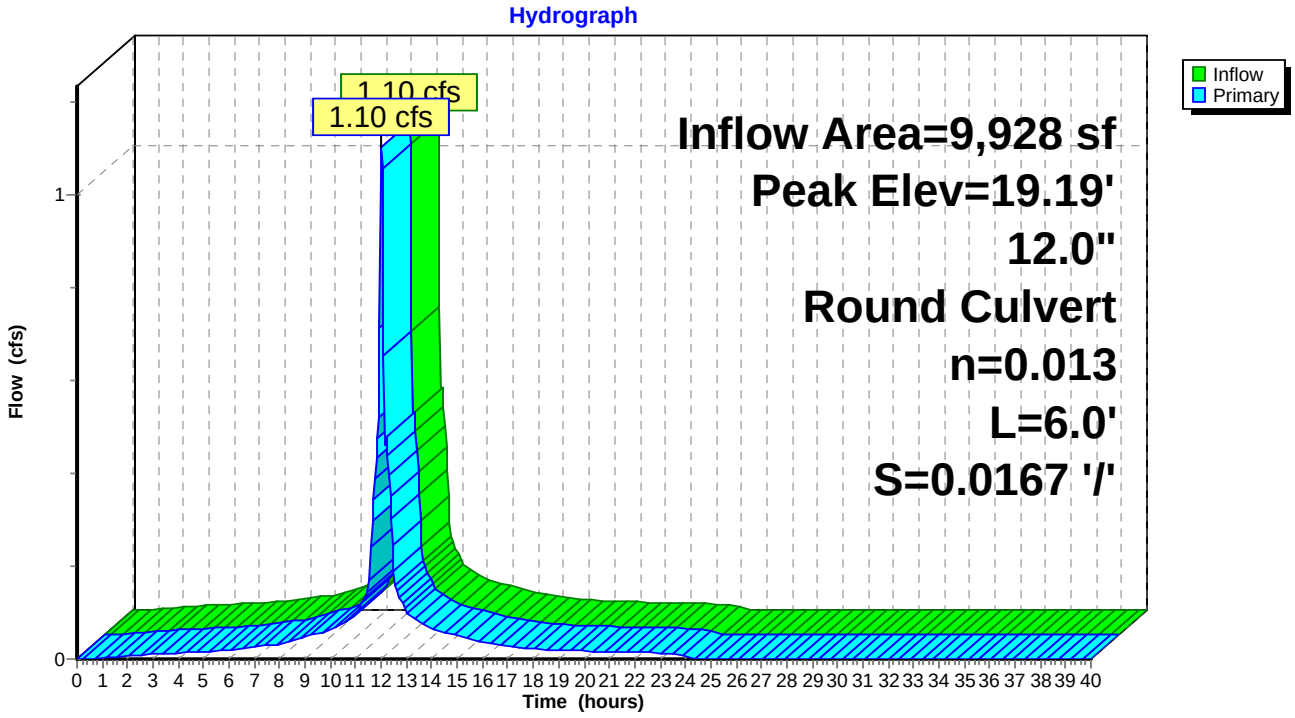
Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 5.24" for 25-yr event
Inflow = 1.10 cfs @ 12.03 hrs, Volume= 4,335 cf
Outflow = 1.10 cfs @ 12.03 hrs, Volume= 4,335 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.10 cfs @ 12.03 hrs, Volume= 4,335 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.19' @ 12.06 hrs
Flood Elev= 22.30'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.30' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.30' / 18.20' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.63 cfs @ 12.03 hrs HW=19.11' TW=19.05' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.63 cfs @ 0.92 fps)

## Pond WQU2: Water Quality Unit 2



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 100: 100 - Pavement, Lawn,** Runoff Area=20,037 sf 45.35% Impervious Runoff Depth=5.01"
Flow Length=165' Tc=3.9 min CN=82 Runoff=2.80 cfs 8,365 cf

**Subcatchment 101: 101 - West Side Lawn to** Runoff Area=271 sf 0.00% Impervious Runoff Depth=4.13"
Flow Length=178' Tc=2.7 min CN=74 Runoff=0.03 cfs 93 cf

**Subcatchment 102: 102 - Existing Building** Runoff Area=5,175 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=165' Tc=2.6 min CN=98 Runoff=0.90 cfs 2,959 cf

**Subcatchment 200: 200 - Portion of** Runoff Area=2,107 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=157' Tc=1.8 min CN=98 Runoff=0.37 cfs 1,205 cf

**Subcatchment 201: 201 - Pavement** Runoff Area=2,187 sf 95.93% Impervious Runoff Depth=6.74"
Flow Length=91' Tc=2.6 min CN=97 Runoff=0.38 cfs 1,229 cf

**Subcatchment 202: 202 - Pavement** Runoff Area=1,651 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=90' Slope=0.0133 '/' Tc=1.3 min CN=98 Runoff=0.29 cfs 944 cf

**Subcatchment 203: 203 - Pavement** Runoff Area=5,013 sf 96.69% Impervious Runoff Depth=6.74"
Flow Length=100' Tc=3.6 min CN=97 Runoff=0.85 cfs 2,816 cf

**Subcatchment 204: 204 - Pavement** Runoff Area=4,813 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=122' Tc=1.1 min CN=98 Runoff=0.85 cfs 2,752 cf

**Subcatchment 205: 205 - Pavement** Runoff Area=3,480 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=107' Tc=1.1 min CN=98 Runoff=0.62 cfs 1,990 cf

**Subcatchment 206: 206 - Pavement** Runoff Area=5,141 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=125' Slope=0.0120 '/' Tc=2.0 min CN=98 Runoff=0.89 cfs 2,939 cf

**Subcatchment 207: 207 - Pavement** Runoff Area=2,680 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=108' Slope=0.0220 '/' Tc=1.2 min CN=98 Runoff=0.47 cfs 1,532 cf

**Subcatchment 208: 208 - Proposed** Runoff Area=4,287 sf 100.00% Impervious Runoff Depth=6.86"
Flow Length=145' Tc=1.8 min CN=98 Runoff=0.74 cfs 2,451 cf

**Subcatchment 209: 209 - Portion of** Runoff Area=4,990 sf 40.80% Impervious Runoff Depth=5.23"
Flow Length=108' Tc=1.5 min CN=84 Runoff=0.75 cfs 2,177 cf

**Subcatchment 210: 210 - Existing South** Runoff Area=44,935 sf 0.00% Impervious Runoff Depth=3.18"
Flow Length=210' Tc=10.6 min CN=65 Runoff=3.24 cfs 11,908 cf

**Subcatchment 300: 300 - Lawn East to DP3** Runoff Area=1,915 sf 0.00% Impervious Runoff Depth=4.13"
Flow Length=40' Slope=0.0300 '/' Tc=5.8 min CN=74 Runoff=0.21 cfs 659 cf

**Pond 1P: Infiltration System** Peak Elev=19.15' Storage=1,994 cf Inflow=2.46 cfs 8,127 cf
Discarded=0.26 cfs 7,574 cf Primary=0.65 cfs 553 cf Outflow=0.90 cfs 8,128 cf

**Pond CB1: PCB1** Peak Elev=16.98' Inflow=0.38 cfs 1,229 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.38 cfs 1,229 cf

**Pond CB2: PCB2** Peak Elev=16.93' Inflow=0.29 cfs 944 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.29 cfs 944 cf

**Pond CB3: PCB3** Peak Elev=18.73' Inflow=0.85 cfs 2,816 cf
12.0" Round Culvert n=0.013 L=64.0' S=0.0078 '/' Outflow=0.85 cfs 2,816 cf

**Pond CB4: PCB4** Peak Elev=15.68' Inflow=0.85 cfs 2,752 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0085 '/' Outflow=0.85 cfs 2,752 cf

**Pond CB5: PCB5** Peak Elev=15.53' Inflow=0.62 cfs 1,990 cf
12.0" Round Culvert n=0.013 L=93.0' S=0.0054 '/' Outflow=0.62 cfs 1,990 cf

**Pond CB6: PCB6** Peak Elev=20.51' Inflow=0.89 cfs 2,939 cf
12.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.89 cfs 2,939 cf

**Pond CB7: PCB7** Peak Elev=19.50' Inflow=0.47 cfs 1,532 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0091 '/' Outflow=0.47 cfs 1,532 cf

**Pond DP1: Design Pont #1_18" RCP Culvert - Northwest** Inflow=1.34 cfs 10,680 cf
Primary=1.34 cfs 10,680 cf

**Pond DP2: Design Pont #2_Wetland-South** Inflow=5.35 cfs 23,680 cf
Primary=5.35 cfs 23,680 cf

**Pond DP3: Design Pont #3_Abutting Lot-East** Inflow=0.21 cfs 659 cf
Primary=0.21 cfs 659 cf

**Pond MH1: PDMH1** Peak Elev=16.83' Inflow=0.66 cfs 2,173 cf
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=0.66 cfs 2,173 cf

**Pond MH2: PDMH2** Peak Elev=16.61' Inflow=1.80 cfs 6,477 cf
12.0" Round Culvert n=0.013 L=115.0' S=0.0052 '/' Outflow=1.80 cfs 6,477 cf

**Pond MH3: PDMH3** Peak Elev=16.02' Inflow=1.80 cfs 6,477 cf
12.0" Round Culvert n=0.013 L=138.0' S=0.0051 '/' Outflow=1.80 cfs 6,477 cf

**Pond MH4: PDMH4** Peak Elev=15.50' Inflow=3.11 cfs 11,219 cf
Primary=2.25 cfs 10,131 cf Secondary=0.93 cfs 1,087 cf Outflow=3.11 cfs 11,219 cf

**Pond MH5: PDMH5** Peak Elev=14.70' Inflow=3.11 cfs 11,219 cf
15.0" Round Culvert n=0.013 L=23.0' S=0.0087 '/' Outflow=3.11 cfs 11,219 cf

**Pond MH6: PDMH6** Peak Elev=20.12' Inflow=1.26 cfs 4,144 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=1.26 cfs 4,144 cf

**Pond MH7: PDMH7** Peak Elev=19.49' Inflow=1.72 cfs 5,676 cf
Primary=1.37 cfs 5,158 cf Secondary=0.38 cfs 518 cf Outflow=1.72 cfs 5,676 cf

**Pond MH8: PDMH8** Peak Elev=19.26' Inflow=2.46 cfs 8,127 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=2.46 cfs 8,127 cf

**Pond RG1: Rain Garden #1** Peak Elev=16.06' Storage=4,050 cf Inflow=3.68 cfs 11,324 cf
Outflow=1.33 cfs 10,587 cf

**Pond RG2: Rain Garden #2** Peak Elev=18.62' Storage=1,149 cf Inflow=1.57 cfs 4,993 cf
Outflow=1.23 cfs 4,305 cf

**Pond WQU1: Water Quality Unit 1** Peak Elev=15.17' Inflow=2.25 cfs 10,131 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=2.25 cfs 10,131 cf

**Pond WQU2: Water Quality Unit 2** Peak Elev=19.41' Inflow=1.37 cfs 5,158 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=1.37 cfs 5,158 cf

**Total Runoff Area = 108,682 sf Runoff Volume = 44,019 cf Average Runoff Depth = 4.86"**
**56.39% Pervious = 61,281 sf 43.61% Impervious = 47,401 sf**

## Summary for Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden

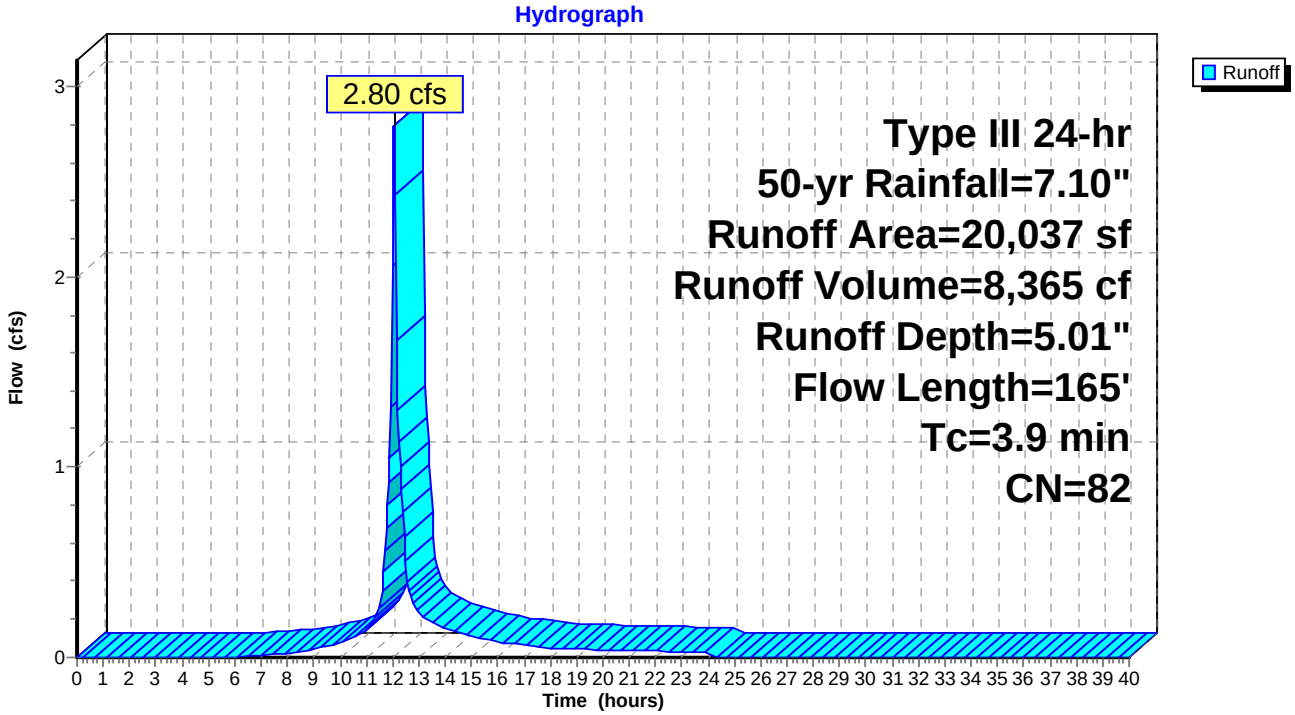
Runoff = 2.80 cfs @ 12.06 hrs, Volume= 8,365 cf, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 4,778 | 74 | >75% Grass cover, Good, HSG C |
| * | 6,173 | 65 | Rain Garden surface area |
| | 9,086 | 98 | Paved parking, HSG C |
| | 20,037 | 82 | Weighted Average |
| | 10,951 | | 54.65% Pervious Area |
| | 9,086 | | 45.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 83 | 0.0180 | 1.27 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.8 | 17 | 0.0410 | 0.16 | | **Sheet Flow, Stone rip rap to RG** Grass: Short n= 0.150 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 3.9 | 165 | Total | | | |

## Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden



## Summary for Subcatchment 101: 101 - West Side Lawn to DP1

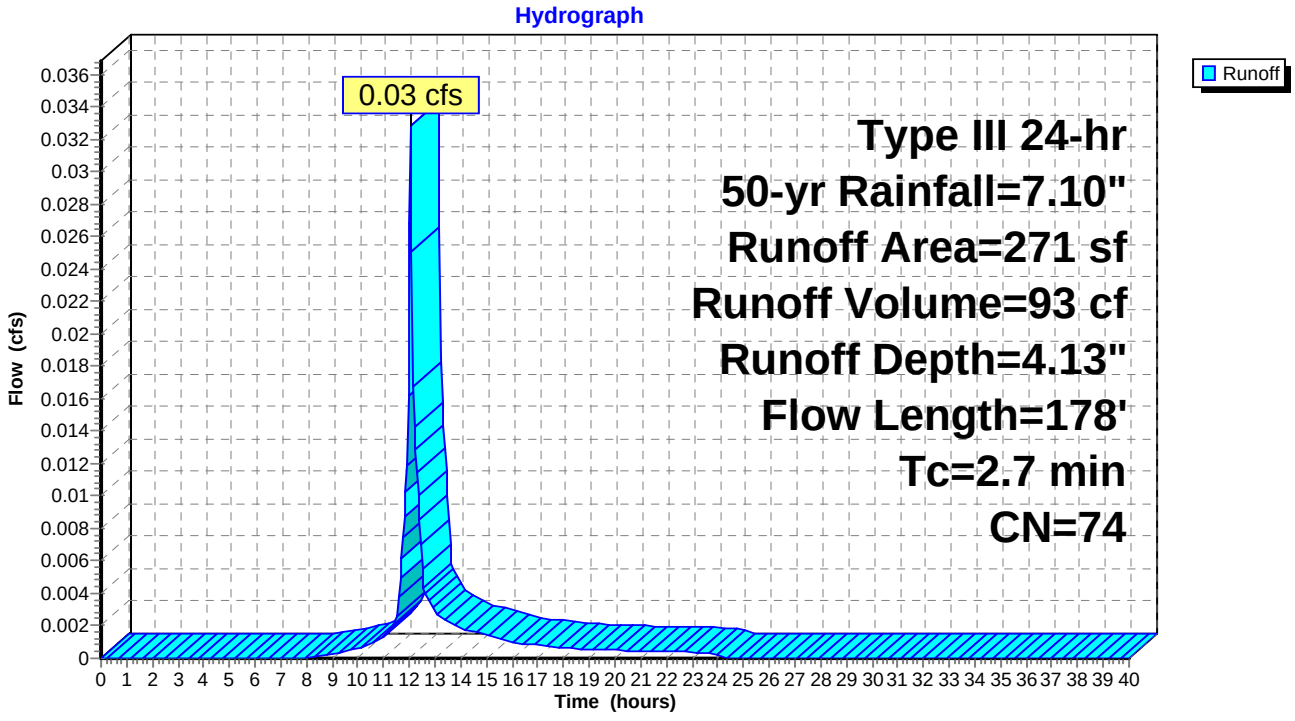
Runoff = 0.03 cfs @ 12.05 hrs, Volume= 93 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 271 | 74 | >75% Grass cover, Good, HSG C |
| 271 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.4 | 100 | 0.0150 | 1.23 | | **Sheet Flow, Grass** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.3 | 78 | 0.0220 | 1.04 | | **Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps |
| 2.7 | 178 | Total | | | |

## Subcatchment 101: 101 - West Side Lawn to DP1



## Summary for Subcatchment 102: 102 - Existing Building

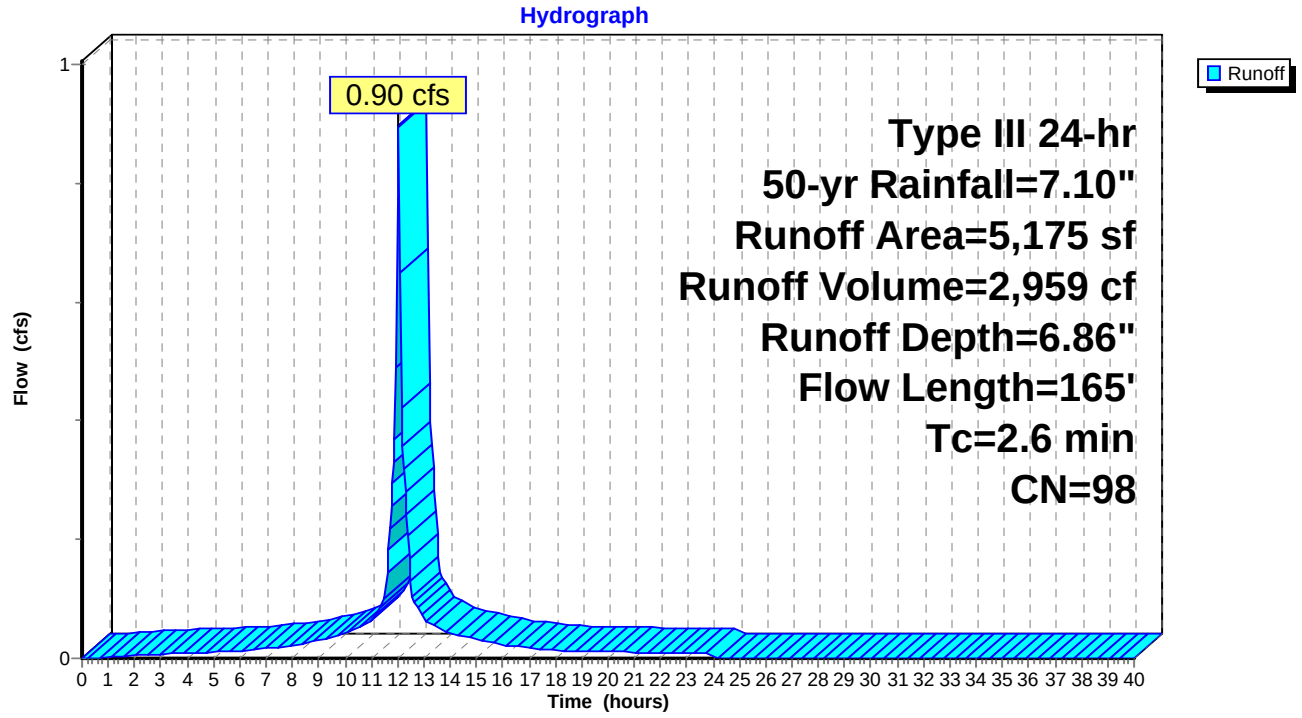
Runoff = 0.90 cfs @ 12.04 hrs, Volume= 2,959 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,175 | 98 | Roofs, HSG C, Existing Building |
| | 5,175 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.6 | 100 | 0.0100 | 1.05 | | **Sheet Flow, Estimated roof drain to rain garden** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 2.6 | 165 | Total | | | |

## Subcatchment 102: 102 - Existing Building



## Summary for Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH

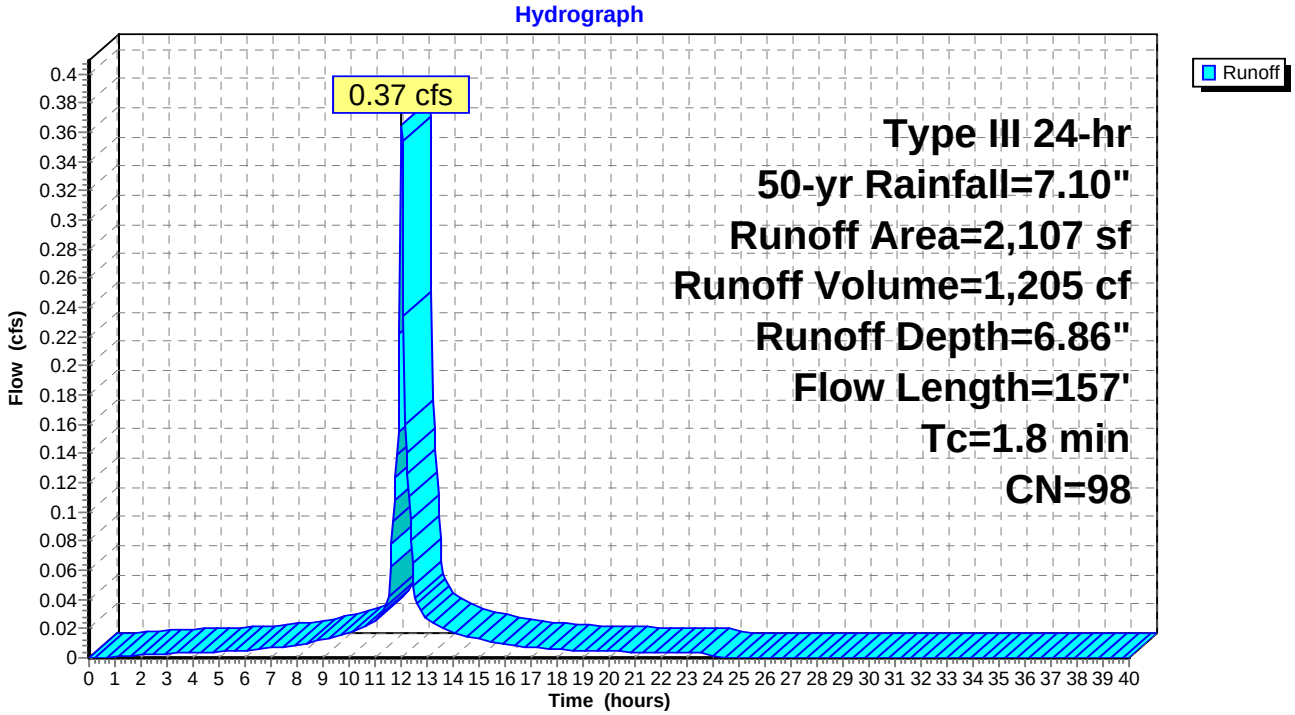
Runoff = 0.37 cfs @ 12.03 hrs, Volume= 1,205 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 2,107 | 98 | Roofs, HSG C, Half Prop. Building A |
| | 2,107 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 50 | 0.0050 | 0.69 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.6 | 107 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to PDMH - Estimated**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 157 | Total | | | |

### Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH



## Summary for Subcatchment 201: 201 - Pavement

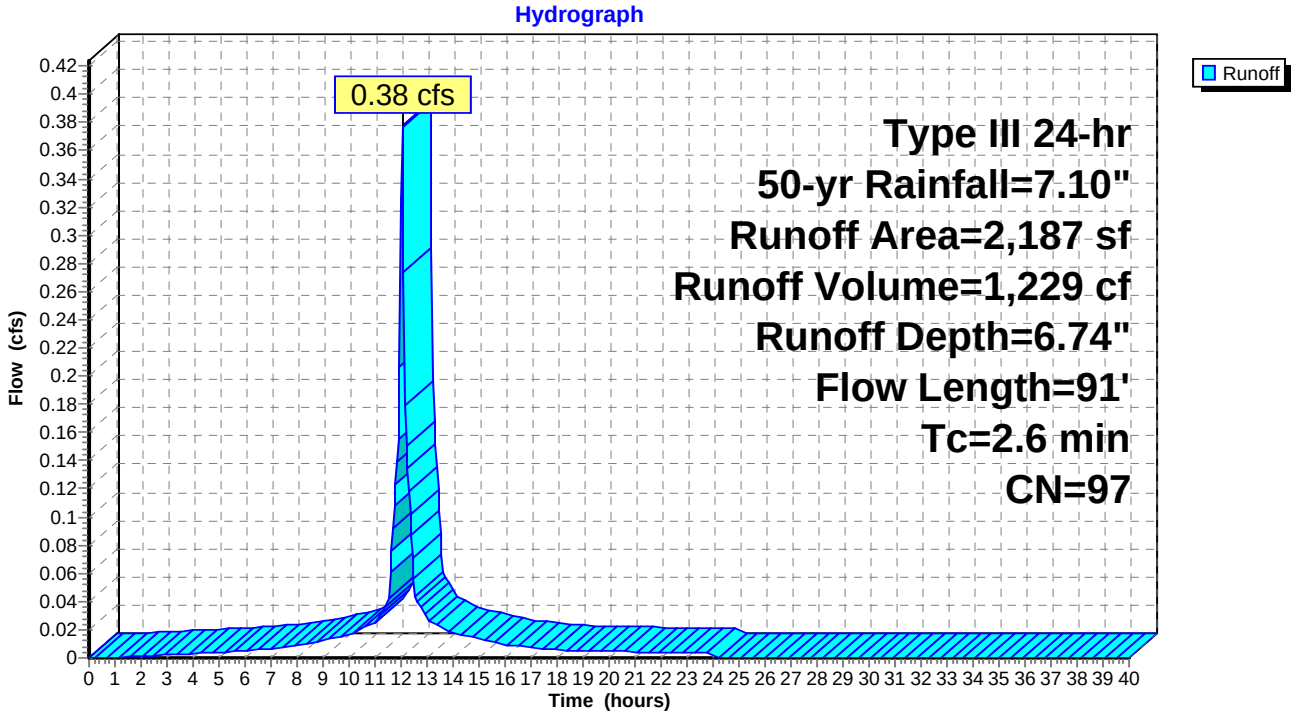
Runoff = 0.38 cfs @ 12.04 hrs, Volume= 1,229 cf, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 2,098 | 98 | Paved parking, HSG C |
| 89 | 74 | >75% Grass cover, Good, HSG C |
| 2,187 | 97 | Weighted Average |
| 89 | | 4.07% Pervious Area |
| 2,098 | | 95.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 6 | 0.0200 | 0.07 | | **Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.22" |
| 1.1 | 85 | 0.0170 | 1.25 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.6 | 91 | Total | | | |

## Subcatchment 201: 201 - Pavement



## Summary for Subcatchment 202: 202 - Pavement

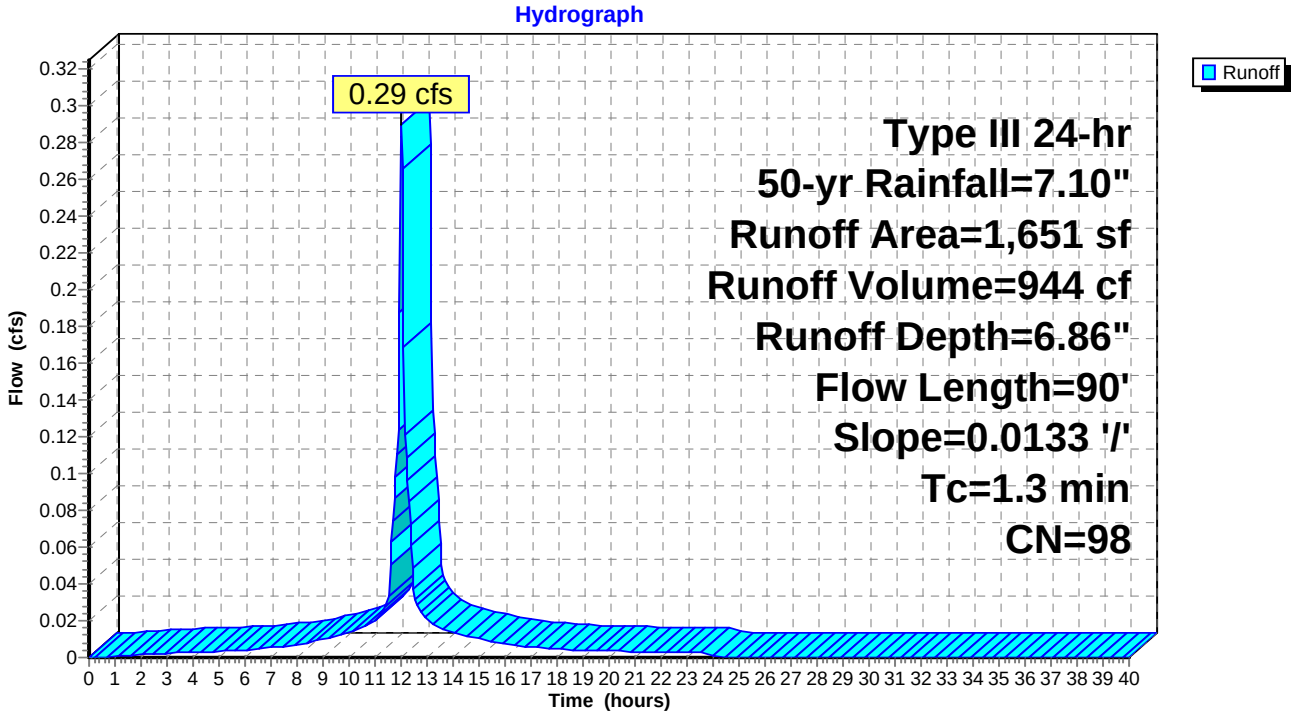
Runoff = 0.29 cfs @ 12.02 hrs, Volume= 944 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 1,651 | 98 | Paved parking, HSG C |
| 1,651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 90 | 0.0133 | 1.15 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |

## Subcatchment 202: 202 - Pavement



## Summary for Subcatchment 203: 203 - Pavement

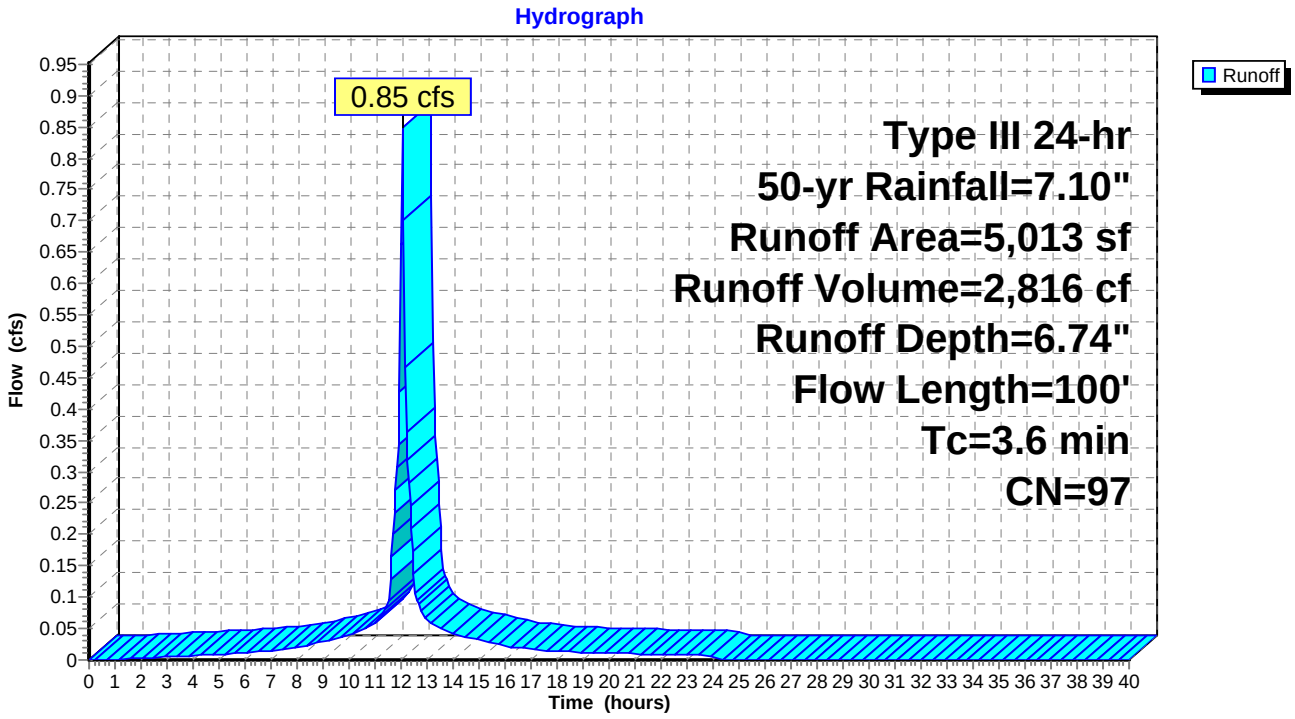
Runoff = 0.85 cfs @ 12.05 hrs, Volume= 2,816 cf, Depth= 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 4,847 | 98 | Paved parking, HSG C |
| 166 | 74 | >75% Grass cover, Good, HSG C |
| 5,013 | 97 | Weighted Average |
| 166 | | 3.31% Pervious Area |
| 4,847 | | 96.69% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 2.6 | 12 | 0.0200 | 0.08 | | **Sheet Flow, Grass to Sidewalk** Grass: Dense n= 0.240 P2= 3.22" |
| 0.1 | 6 | 0.0150 | 0.70 | | **Sheet Flow, Sidewalk** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.9 | 82 | 0.0260 | 1.47 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 3.6 | 100 | Total | | | |

## Subcatchment 203: 203 - Pavement



## Summary for Subcatchment 204: 204 - Pavement

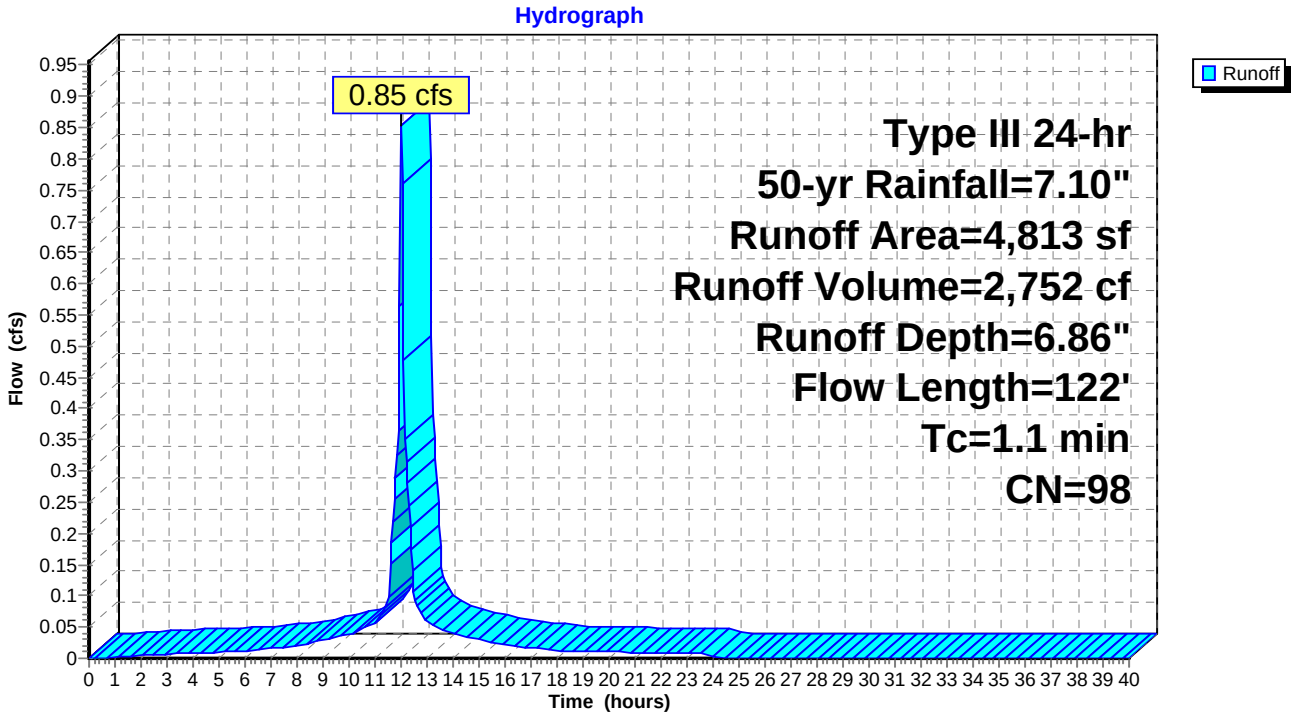
Runoff = 0.85 cfs @ 12.01 hrs, Volume= 2,752 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 4,813 | 98 | Paved parking, HSG C |
| 4,813 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.0 | 100 | 0.0300 | 1.62 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.1 | 22 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 122 | Total | | | |

## Subcatchment 204: 204 - Pavement



## Summary for Subcatchment 205: 205 - Pavement

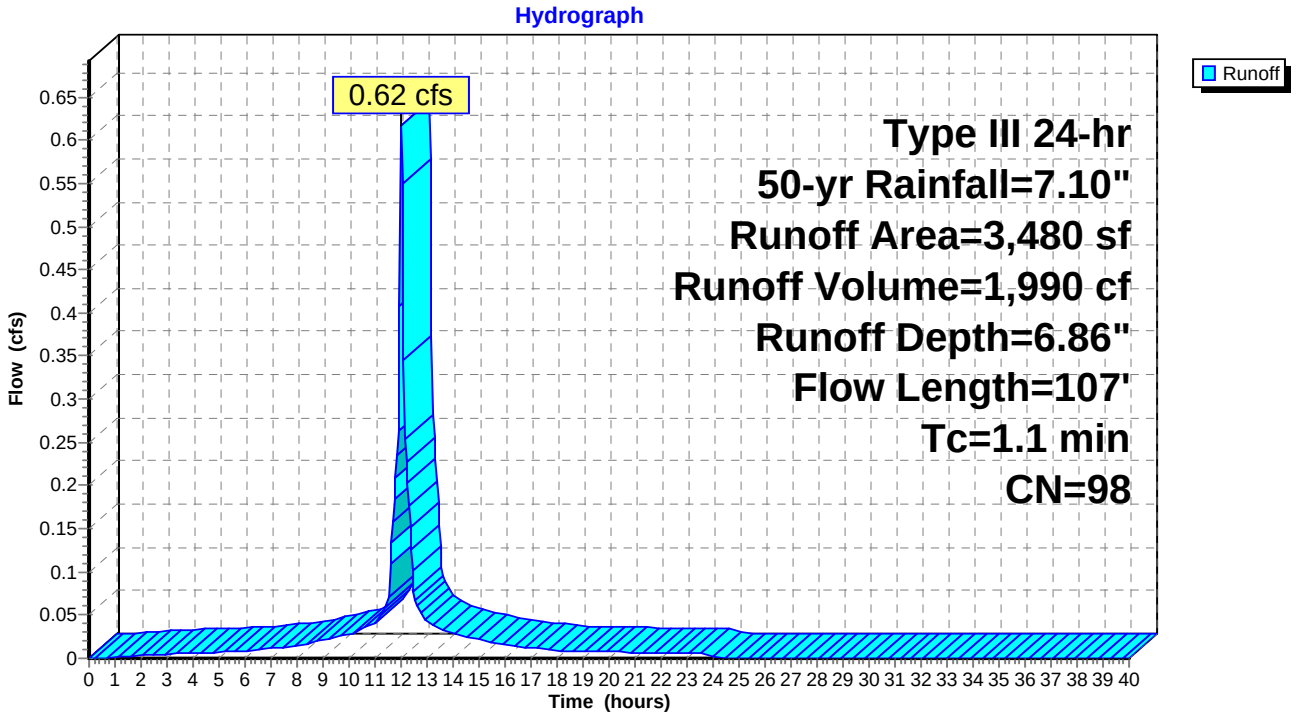
Runoff = 0.62 cfs @ 12.01 hrs, Volume= 1,990 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 3,480 | 98 | Paved parking, HSG C |
| 3,480 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 100 | 0.0270 | 1.56 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 7 | 0.0280 | 3.40 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 107 | Total | | | |

## Subcatchment 205: 205 - Pavement



## Summary for Subcatchment 206: 206 - Pavement

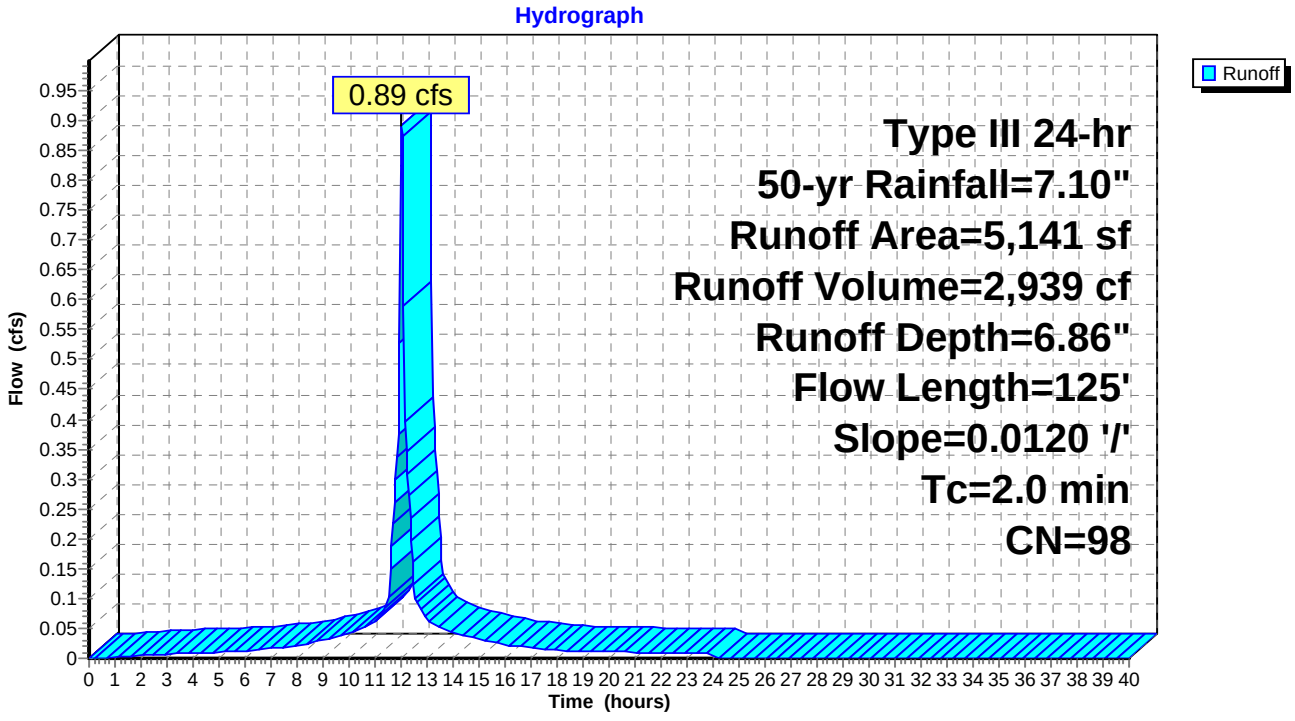
Runoff = 0.89 cfs @ 12.03 hrs, Volume= 2,939 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 5,141 | 98 | Paved parking, HSG C |
| 5,141 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 100 | 0.0120 | 1.12 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 25 | 0.0120 | 0.85 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.0 | 125 | Total | | | |

## Subcatchment 206: 206 - Pavement



## Summary for Subcatchment 207: 207 - Pavement

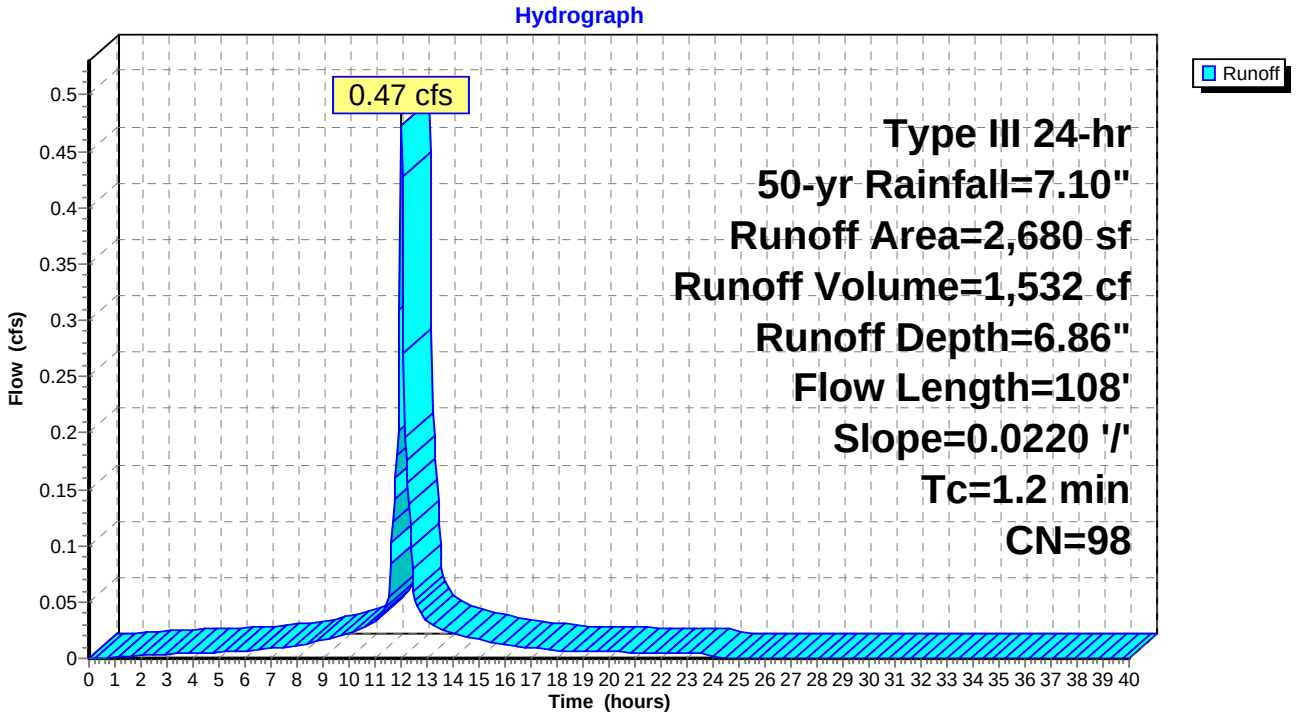
Runoff = 0.47 cfs @ 12.02 hrs, Volume= 1,532 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 2,680 | 98 | Paved parking, HSG C |
| 2,680 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 100 | 0.0220 | 1.43 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 8 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.2 | 108 | Total | | | |

## Subcatchment 207: 207 - Pavement



## Summary for Subcatchment 208: 208 - Proposed Building Tenant B

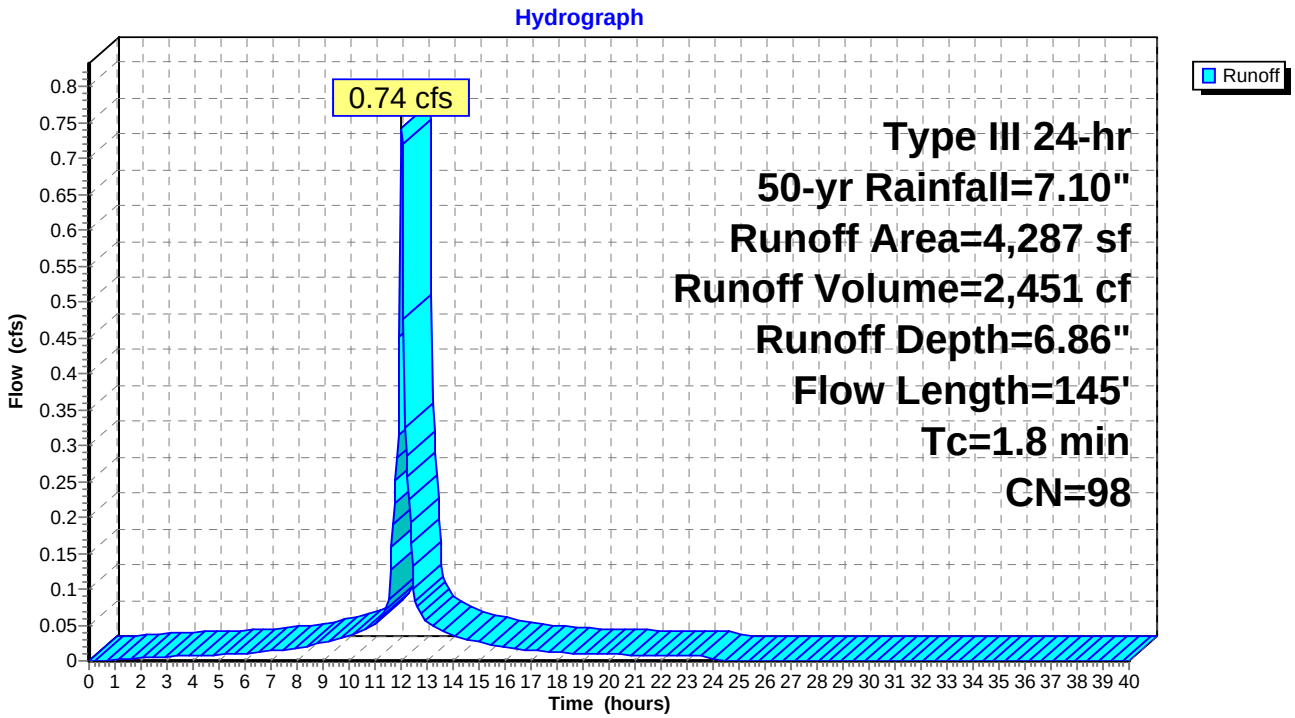
Runoff = 0.74 cfs @ 12.03 hrs, Volume= 2,451 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 4,287 | 98 | Roofs, HSG C |
| 4,287 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 55 | 0.0050 | 0.70 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 90 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Estimated Roof Drain to PDMH**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 145 | Total | | | |

## Subcatchment 208: 208 - Proposed Building Tenant B



## mary for Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and W

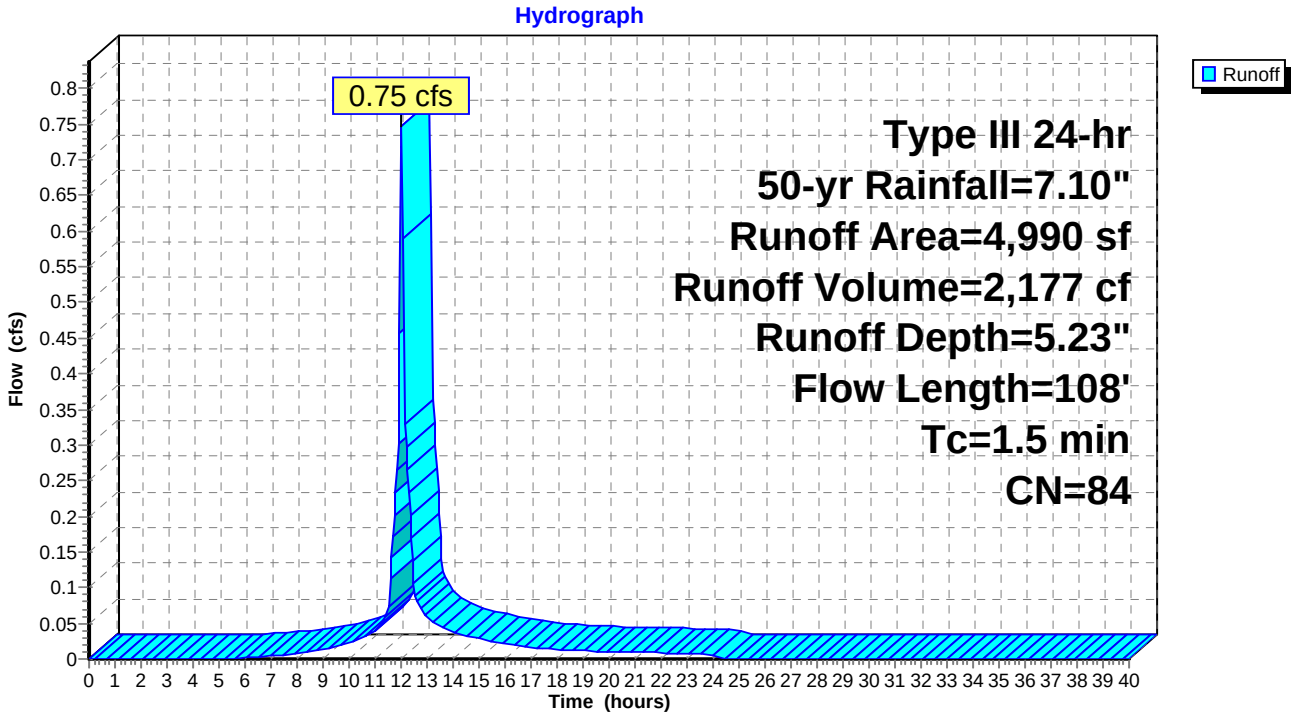
Runoff = 0.75 cfs @ 12.02 hrs, Volume= 2,177 cf, Depth= 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 876 | 65 | Rain Garden Surface Area |
| | 2,078 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 84 | 98 | Unconnected pavement, HSG C |
| | 1,952 | 98 | Unconnected roofs, HSG C |
| | 4,990 | 84 | Weighted Average |
| | 2,954 | | 59.20% Pervious Area |
| | 2,036 | | 40.80% Impervious Area |
| | 2,036 | | 100.00% Unconnected |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 43 | 0.0050 | 0.67 | | **Sheet Flow, Flat Roof to Drain** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.4 | 65 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to Rain garden** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior |
| 1.5 | 108 | Total | | | |

## Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and Walkwa



## Summary for Subcatchment 210: 210 - Existing South features remaining to DP2

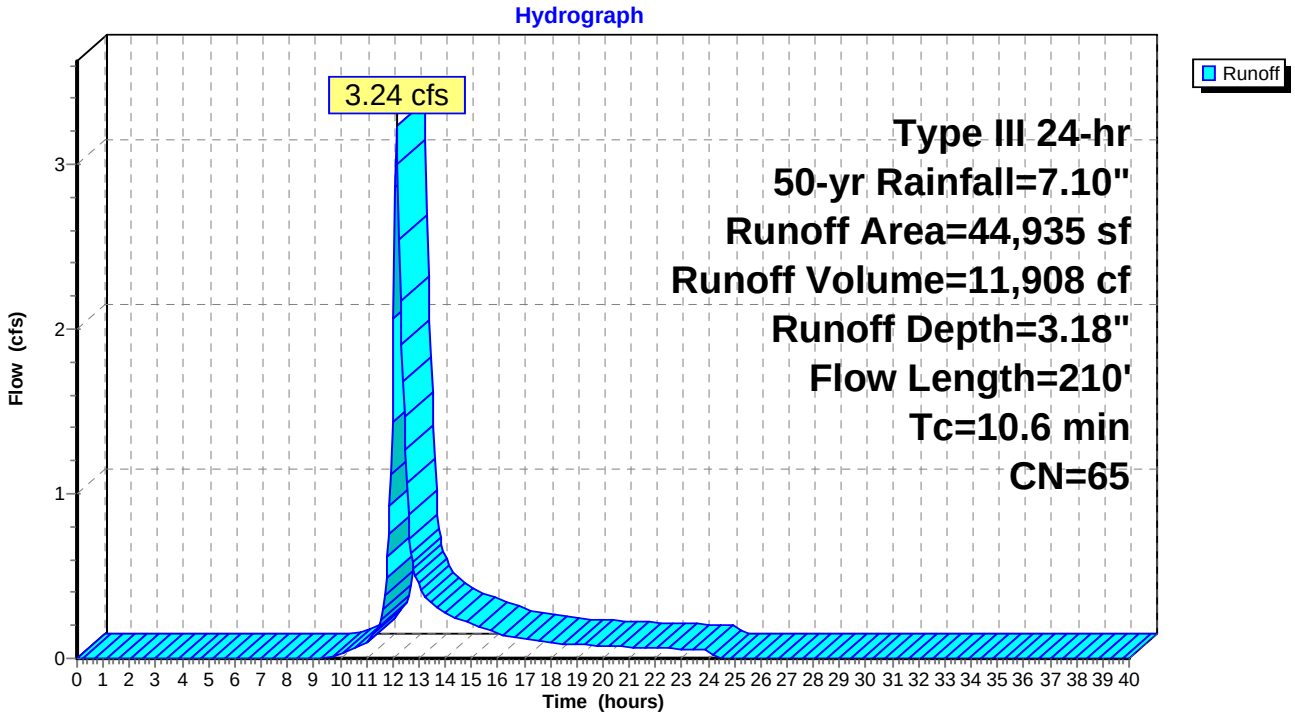
Runoff = 3.24 cfs @ 12.16 hrs, Volume= 11,908 cf, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 35,498 | 65 | Brush, Good, HSG C |
| * | 9,437 | 65 | Brush, Good, HSG C, Wetland Brush |
| | 44,935 | 65 | Weighted Average |
| | 44,935 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0600 | 0.18 | | **Sheet Flow,** Grass: Dense n= 0.240 P2= 3.22" |
| 1.4 | 110 | 0.0360 | 1.33 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 10.6 | 210 | Total | | | |

## Subcatchment 210: 210 - Existing South features remaining to DP2



## Summary for Subcatchment 300: 300 - Lawn East to DP3

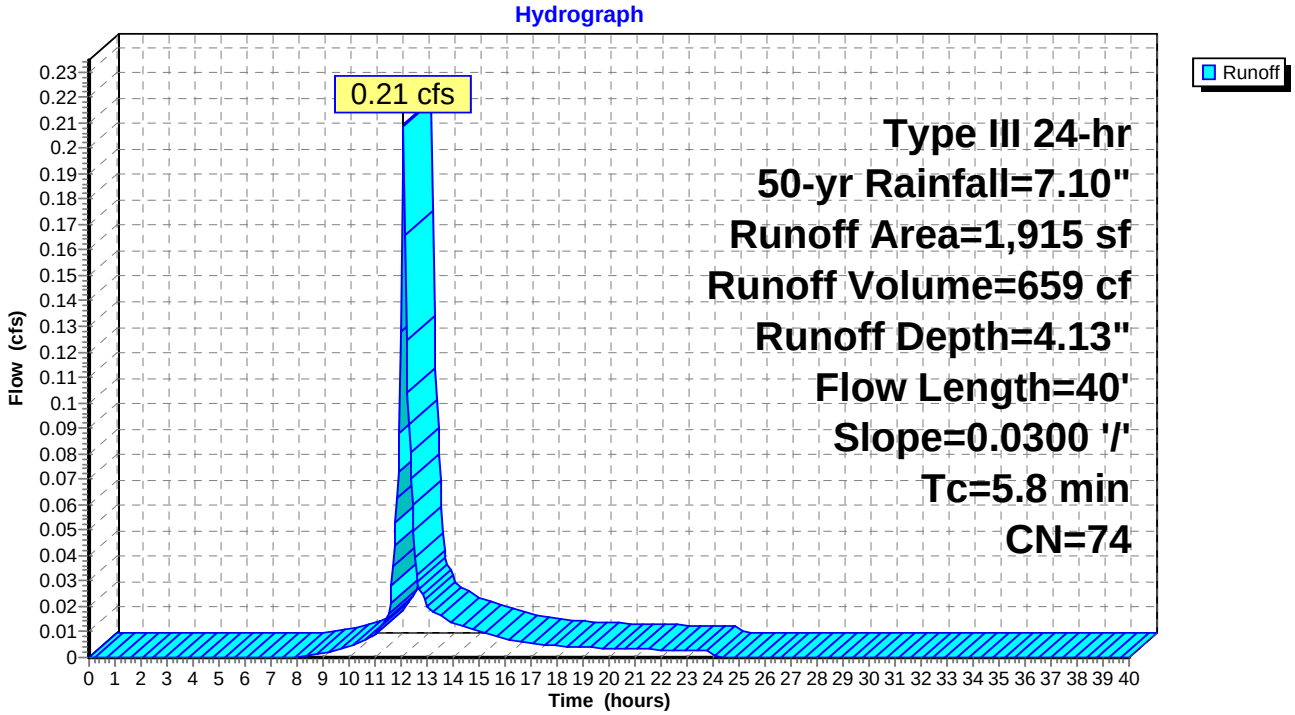
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 659 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=7.10"

| Area (sf) | CN | Description |
|---|---|---|
| 1,915 | 74 | >75% Grass cover, Good, HSG C |
| 1,915 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.8 | 40 | 0.0300 | 0.11 | | **Sheet Flow, Overland Flow**<br>Grass: Dense n= 0.240 P2= 3.22" |

## Subcatchment 300: 300 - Lawn East to DP3



## Summary for Pond 1P: Infiltration System

Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 2.46 cfs @ 12.03 hrs, Volume= 8,127 cf
Outflow = 0.90 cfs @ 12.24 hrs, Volume= 8,128 cf, Atten= 63%, Lag= 12.5 min
Discarded = 0.26 cfs @ 11.60 hrs, Volume= 7,574 cf
Primary = 0.65 cfs @ 12.24 hrs, Volume= 553 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.15' @ 12.24 hrs Surf.Area= 1,342 sf Storage= 1,994 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 40.8 min ( 779.7 - 738.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 16.80' | 961 cf | **Stone field surrounding chambers (Irregular)** Listed below<br>3,623 cf Overall - 1,222 cf Embedded = 2,401 cf x 40.0% Voids |
| #2 | 17.30' | 1,222 cf | **Cultec R180 Chambers, 56 units** Listed below Inside #1 |
| | | 2,183 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 16.80 | 1,342 | 175.5 | 0 | 0 | 1,342 |
| 19.50 | 1,342 | 175.5 | 3,623 | 3,623 | 1,816 |

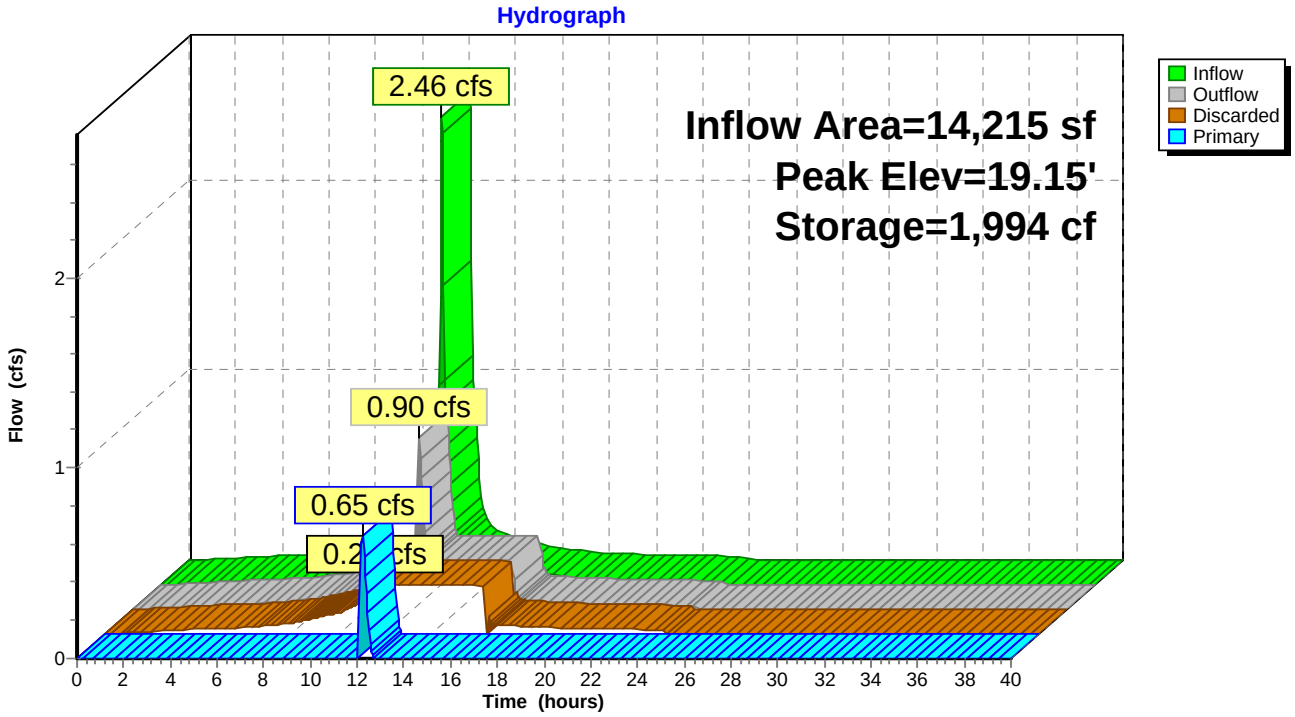
| Elevation (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|
| 17.30 | 0 | 0 |
| 18.10 | 460 | 460 |
| 18.70 | 522 | 982 |
| 19.00 | 240 | 1,222 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 16.80' | **8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01' |
| #2 | Device 3 | 19.00' | **4.0' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Primary | 16.80' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.80' / 16.50' S= 0.0143 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Discarded OutFlow** Max=0.26 cfs @ 11.60 hrs HW=16.87' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

**Primary OutFlow** Max=0.63 cfs @ 12.24 hrs HW=19.15' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.63 cfs of 4.06 cfs potential flow)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.63 cfs @ 1.07 fps)

## Pond 1P: Infiltration System



## Summary for Pond CB1: PCB1

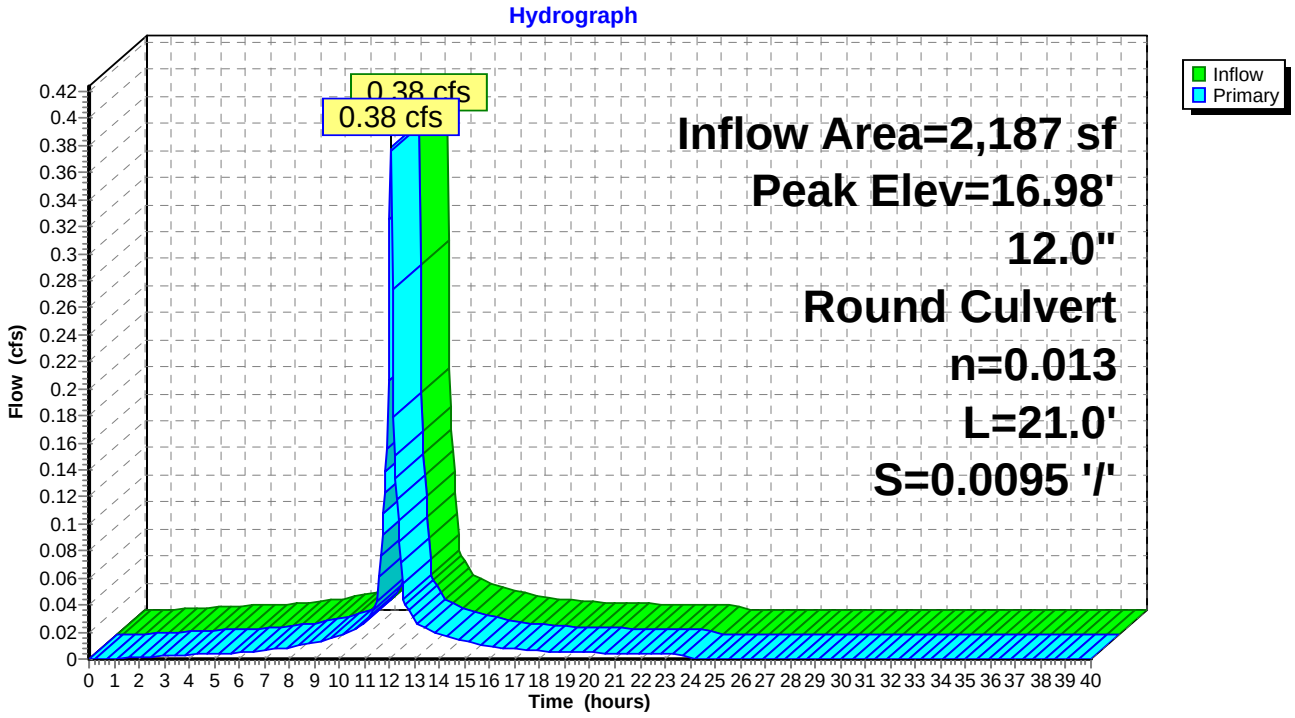
Inflow Area = 2,187 sf, 95.93% Impervious, Inflow Depth = 6.74" for 50-yr event
Inflow = 0.38 cfs @ 12.04 hrs, Volume= 1,229 cf
Outflow = 0.38 cfs @ 12.04 hrs, Volume= 1,229 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.04 hrs, Volume= 1,229 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.98' @ 12.06 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.31 cfs @ 12.04 hrs HW=16.97' TW=16.82' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.31 cfs @ 1.75 fps)

## Pond CB1: PCB1



## Summary for Pond CB2: PCB2

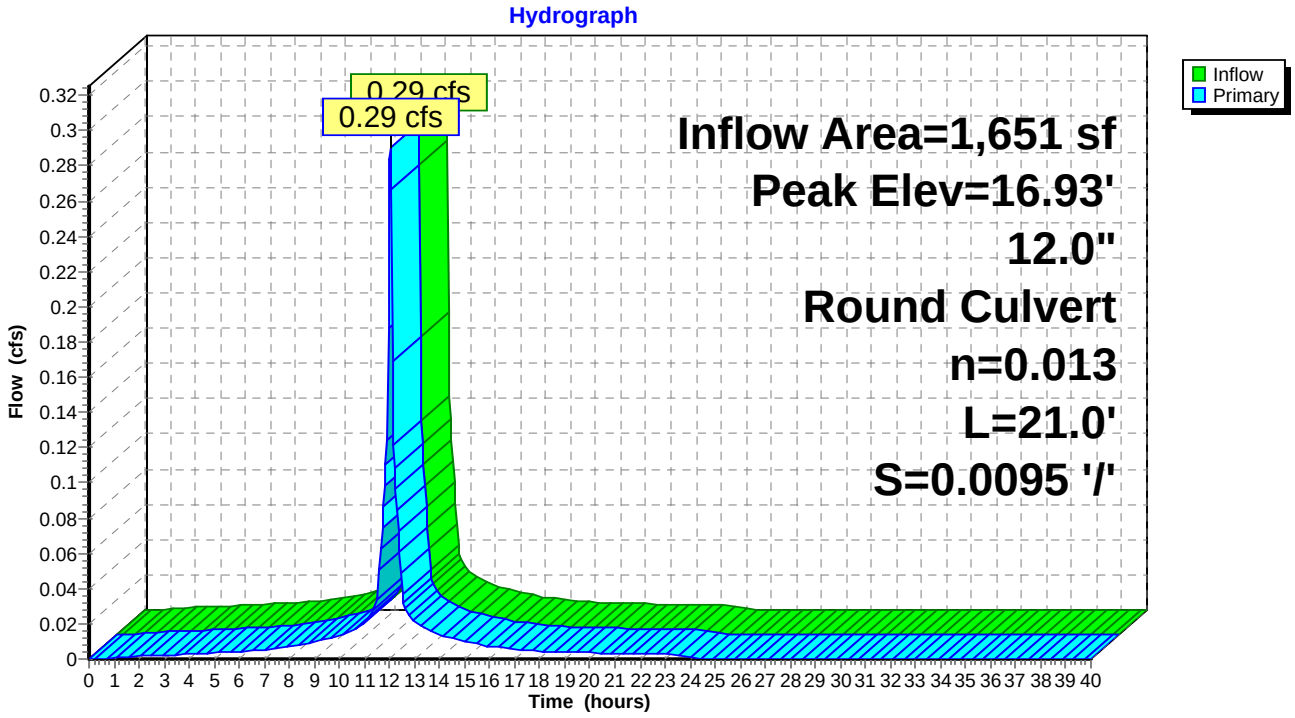
Inflow Area = 1,651 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 0.29 cfs @ 12.02 hrs, Volume= 944 cf
Outflow = 0.29 cfs @ 12.02 hrs, Volume= 944 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.02 hrs, Volume= 944 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.93' @ 12.05 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.21 cfs @ 12.02 hrs HW=16.92' TW=16.80' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.21 cfs @ 1.51 fps)

## Pond CB2: PCB2



## Summary for Pond CB3: PCB3

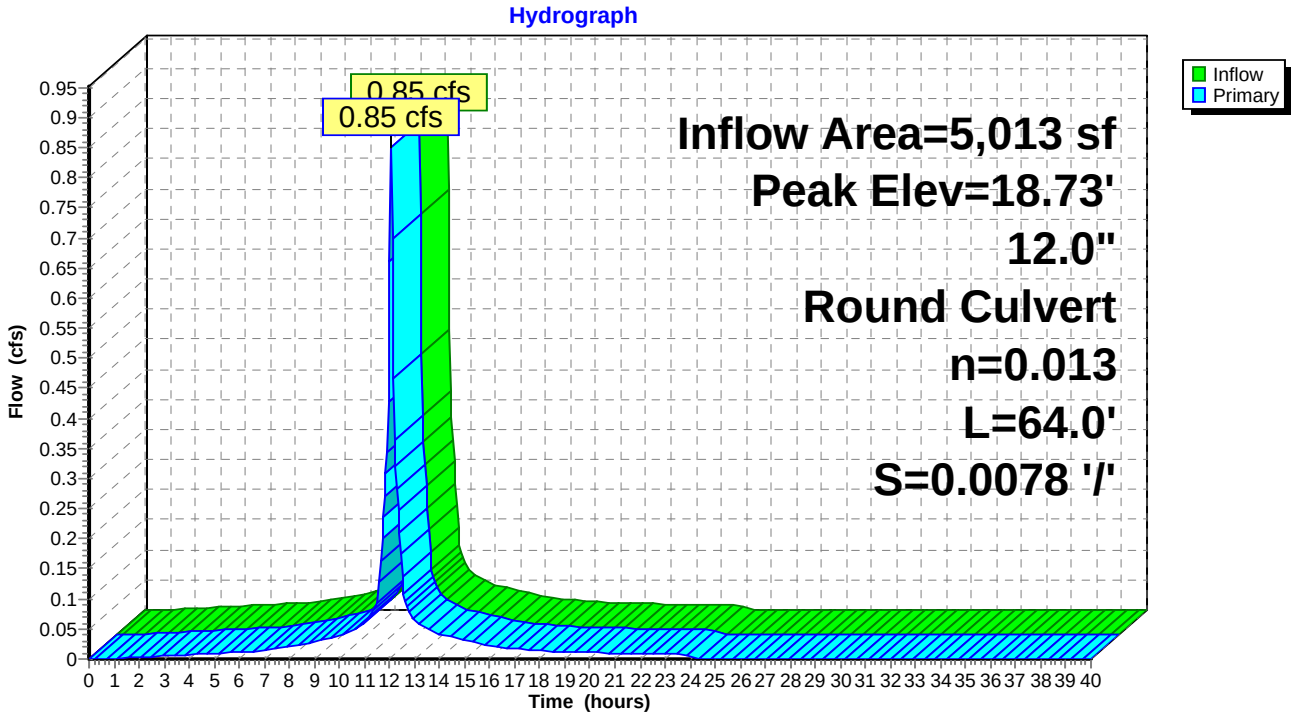
Inflow Area = 5,013 sf, 96.69% Impervious, Inflow Depth = 6.74" for 50-yr event
Inflow = 0.85 cfs @ 12.05 hrs, Volume= 2,816 cf
Outflow = 0.85 cfs @ 12.05 hrs, Volume= 2,816 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.05 hrs, Volume= 2,816 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.73' @ 12.09 hrs
Flood Elev= 20.70'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.00' | **12.0" Round Culvert**<br>L= 64.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.00' / 17.50' S= 0.0078 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.64 cfs @ 12.05 hrs HW=18.72' TW=18.59' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.64 cfs @ 1.49 fps)

## Pond CB3: PCB3



## Summary for Pond CB4: PCB4

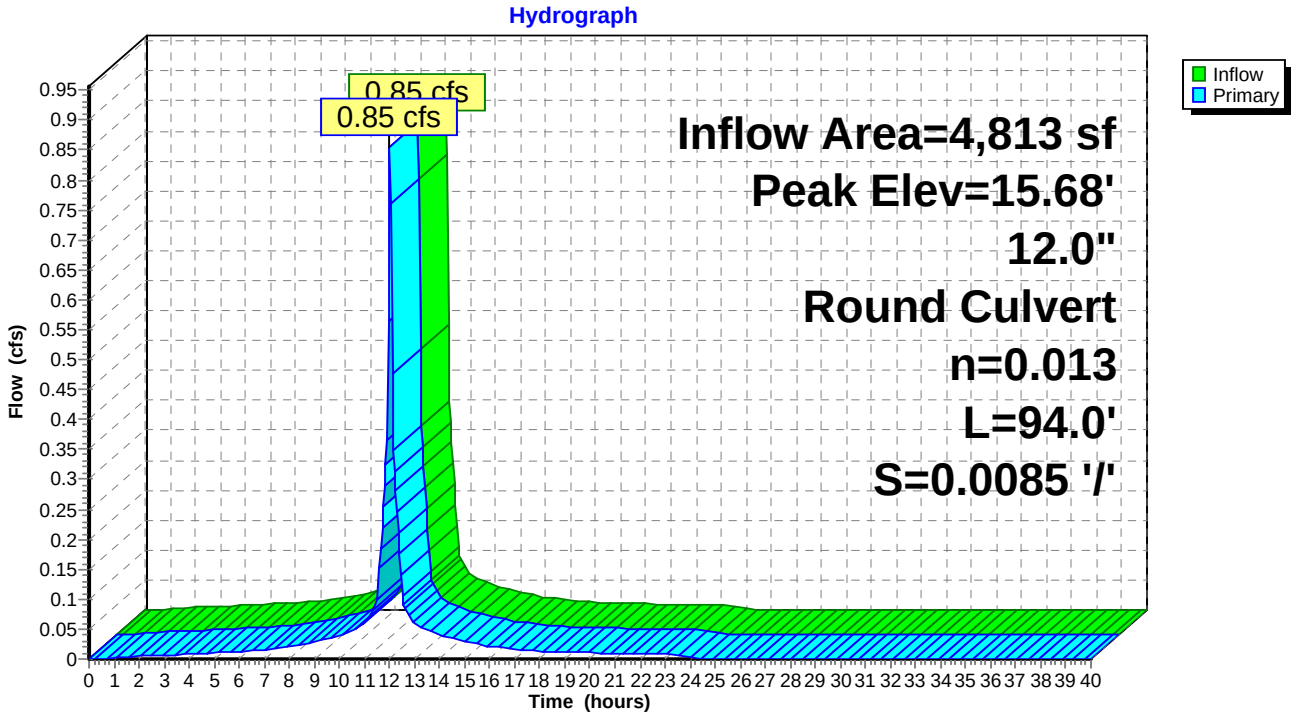
Inflow Area = 4,813 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 0.85 cfs @ 12.01 hrs, Volume= 2,752 cf
Outflow = 0.85 cfs @ 12.01 hrs, Volume= 2,752 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.01 hrs, Volume= 2,752 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.68' @ 12.06 hrs
Flood Elev= 17.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.10' | **12.0" Round Culvert**<br>L= 94.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.10' / 14.30' S= 0.0085 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.64 cfs @ 12.01 hrs HW=15.66' TW=15.30' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.64 cfs @ 2.06 fps)

## Pond CB4: PCB4



## Summary for Pond CB5: PCB5

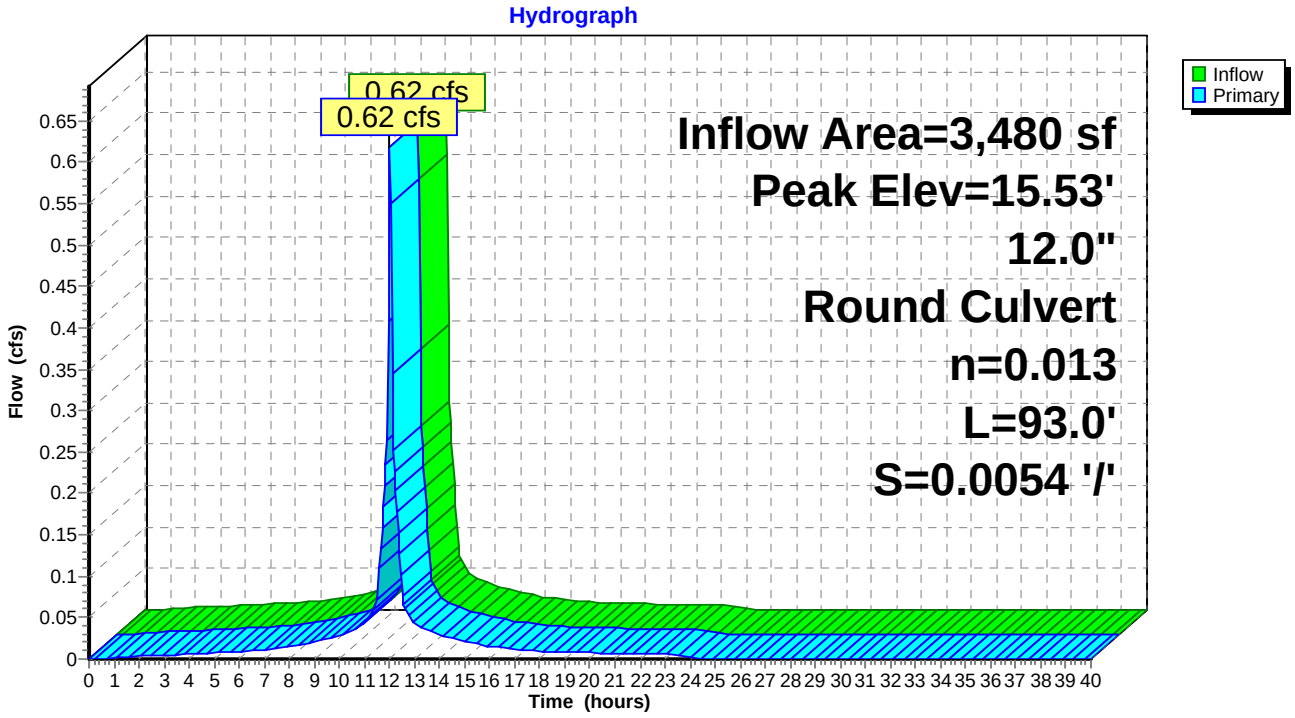
Inflow Area = 3,480 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 0.62 cfs @ 12.01 hrs, Volume= 1,990 cf
Outflow = 0.62 cfs @ 12.01 hrs, Volume= 1,990 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.62 cfs @ 12.01 hrs, Volume= 1,990 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.53' @ 12.11 hrs
Flood Elev= 17.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.80' | **12.0" Round Culvert**<br>L= 93.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.80' / 14.30' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.28 cfs @ 12.01 hrs HW=15.36' TW=15.30' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.28 cfs @ 0.89 fps)

## Pond CB5: PCB5



## Summary for Pond CB6: PCB6

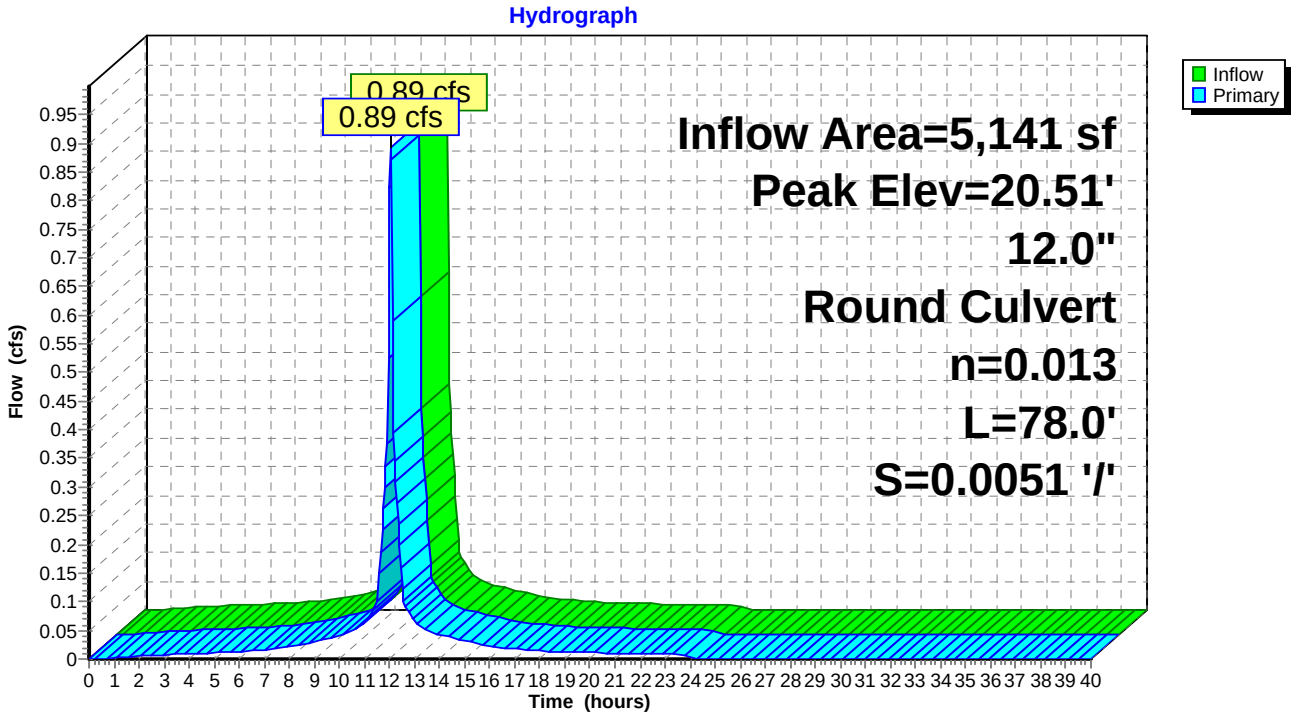
Inflow Area = 5,141 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 0.89 cfs @ 12.03 hrs, Volume= 2,939 cf
Outflow = 0.89 cfs @ 12.03 hrs, Volume= 2,939 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.89 cfs @ 12.03 hrs, Volume= 2,939 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.51' @ 12.05 hrs
Flood Elev= 22.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.90' | **12.0" Round Culvert**<br>L= 78.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.90' / 19.50' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.78 cfs @ 12.03 hrs HW=20.49' TW=20.10' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.78 cfs @ 2.33 fps)

## Pond CB6: PCB6



## Summary for Pond CB7: PCB7

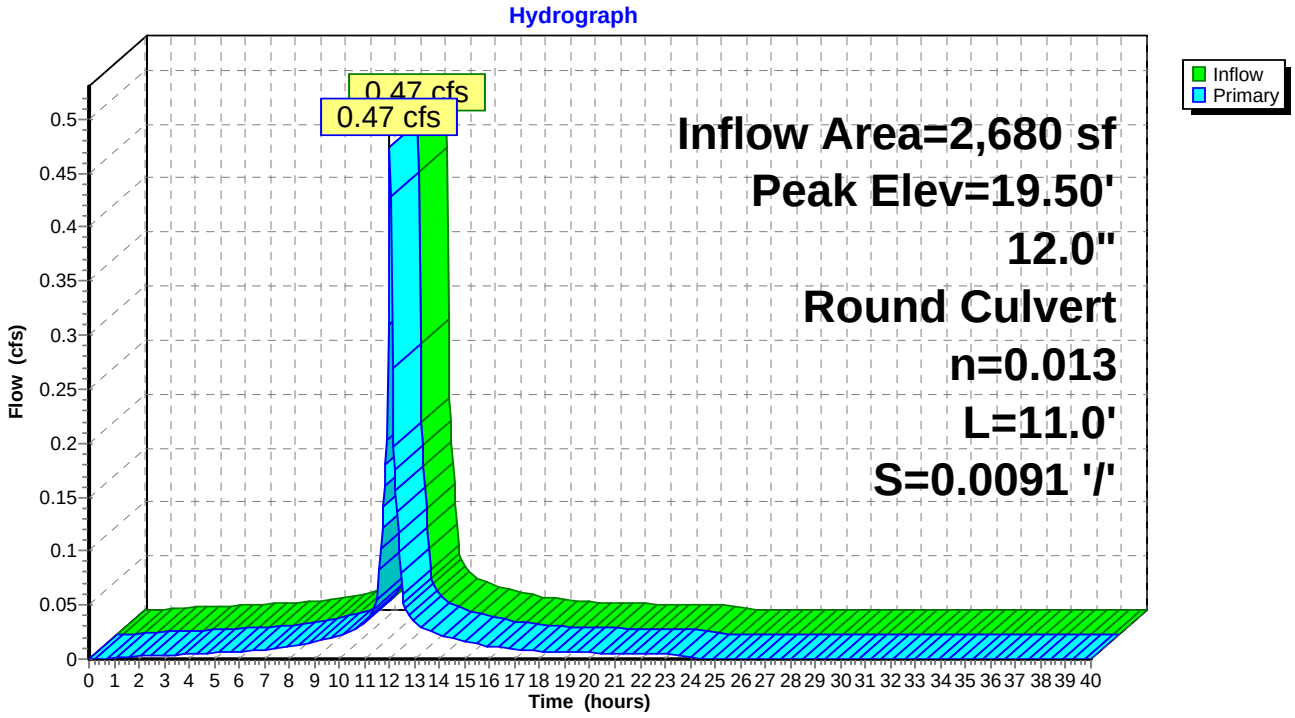
Inflow Area = 2,680 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 0.47 cfs @ 12.02 hrs, Volume= 1,532 cf
Outflow = 0.47 cfs @ 12.02 hrs, Volume= 1,532 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.47 cfs @ 12.02 hrs, Volume= 1,532 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.50' @ 12.15 hrs
Flood Elev= 21.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.90' | **12.0" Round Culvert**<br>L= 11.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.90' / 18.80' S= 0.0091 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.00 cfs @ 12.02 hrs HW=19.42' TW=19.43' (Dynamic Tailwater)
**1=Culvert** ( Controls 0.00 cfs)

## Pond CB7: PCB7

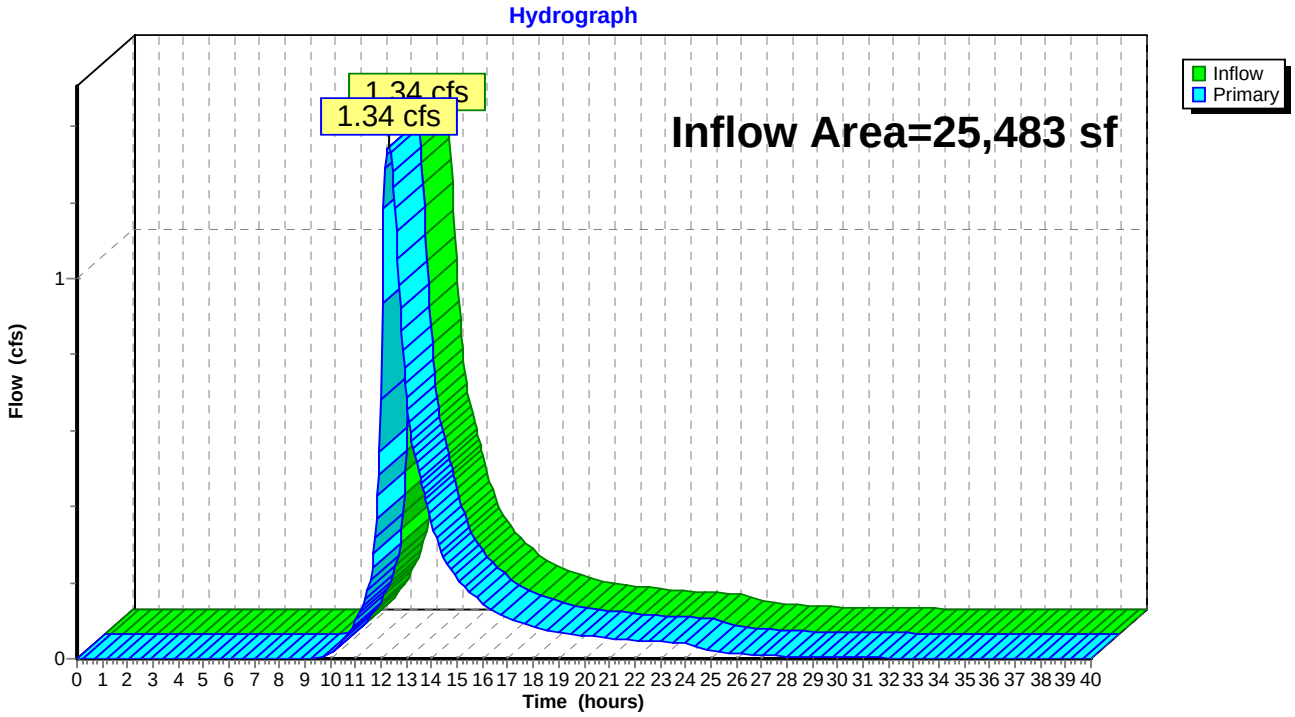


## Summary for Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

Inflow Area = 25,483 sf, 55.96% Impervious, Inflow Depth > 5.03" for 50-yr event
Inflow = 1.34 cfs @ 12.28 hrs, Volume= 10,680 cf
Primary = 1.34 cfs @ 12.28 hrs, Volume= 10,680 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

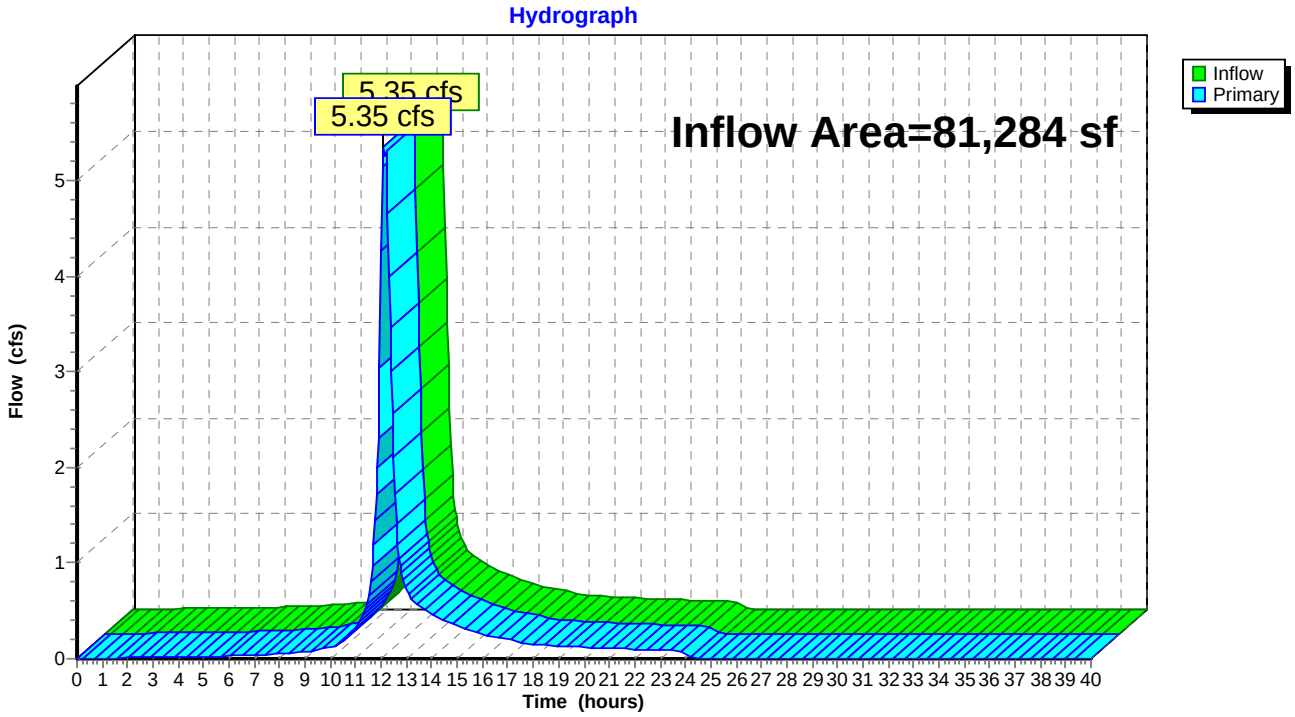


## Summary for Pond DP2: Design Pont #2_Wetland-South

Inflow Area = 81,284 sf, 40.77% Impervious, Inflow Depth = 3.50" for 50-yr event
Inflow = 5.35 cfs @ 12.10 hrs, Volume= 23,680 cf
Primary = 5.35 cfs @ 12.10 hrs, Volume= 23,680 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP2: Design Pont #2_Wetland-South

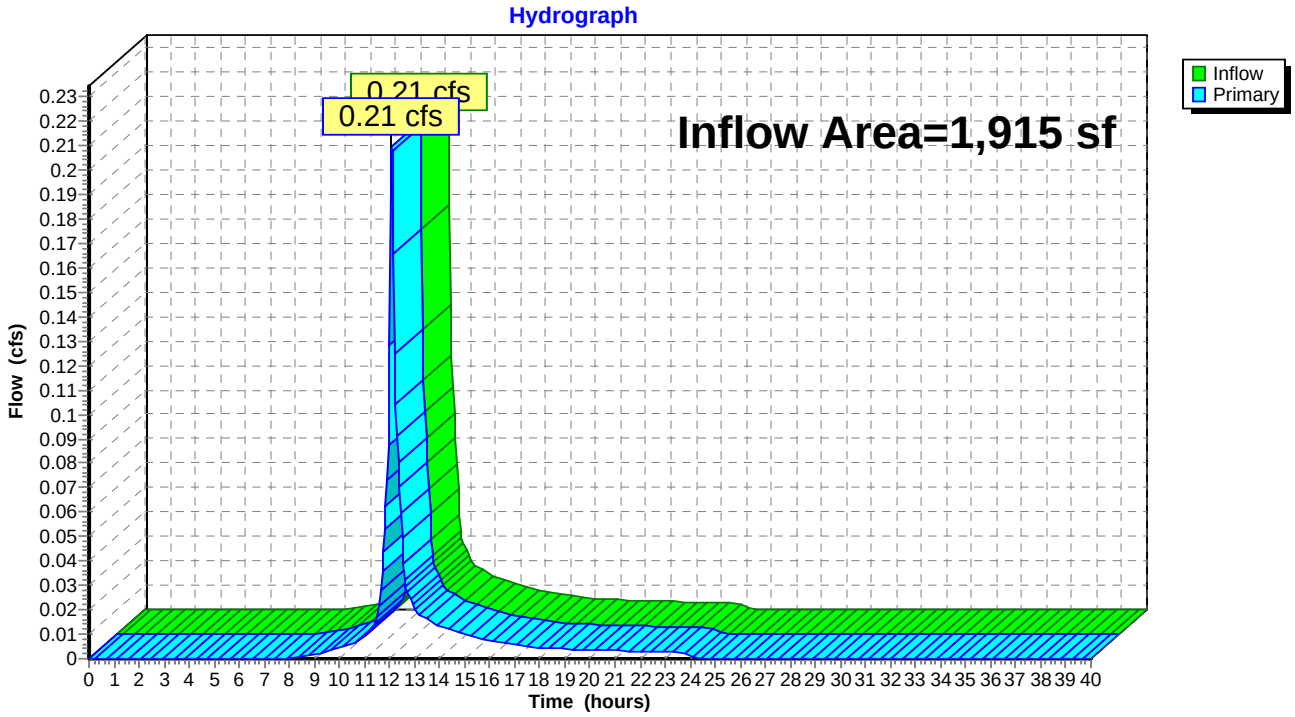


## Summary for Pond DP3: Design Pont #3_Abutting Lot-East

Inflow Area = 1,915 sf, 0.00% Impervious, Inflow Depth = 4.13" for 50-yr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 659 cf
Primary = 0.21 cfs @ 12.09 hrs, Volume= 659 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP3: Design Pont #3_Abutting Lot-East



## Summary for Pond MH1: PDMH1

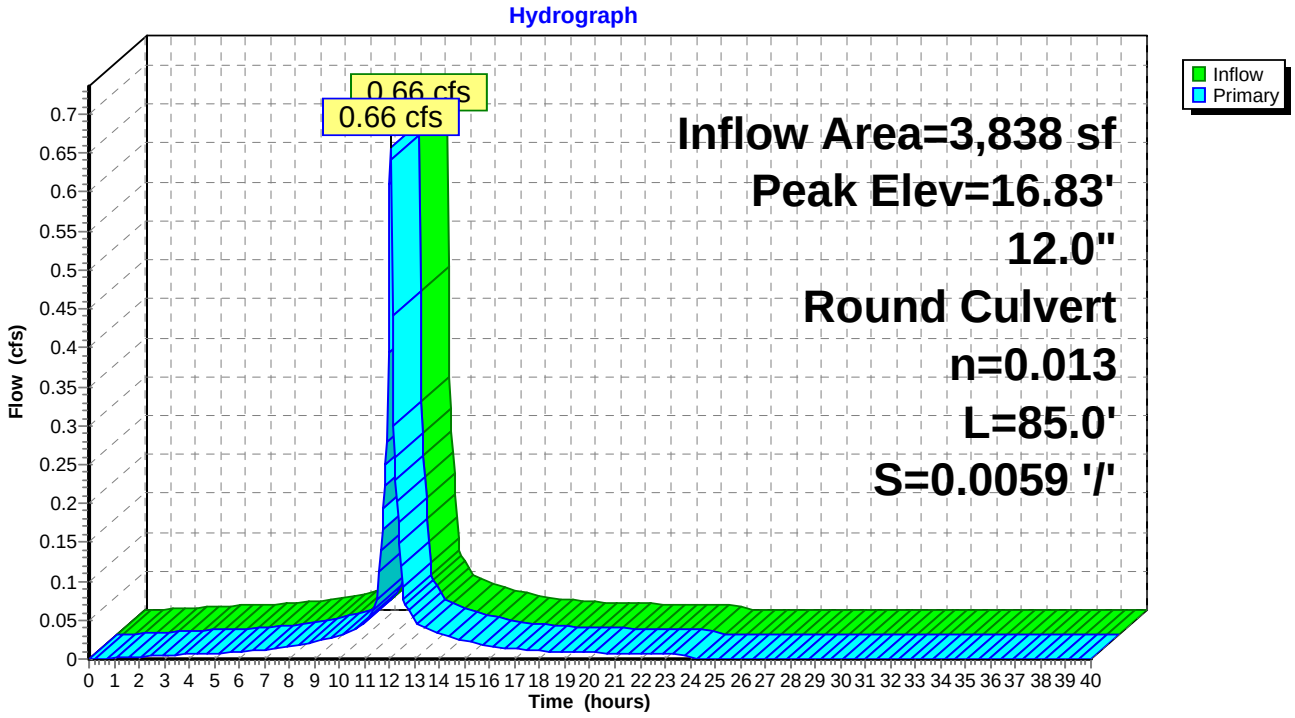
Inflow Area = 3,838 sf, 97.68% Impervious, Inflow Depth = 6.79" for 50-yr event
Inflow = 0.66 cfs @ 12.03 hrs, Volume= 2,173 cf
Outflow = 0.66 cfs @ 12.03 hrs, Volume= 2,173 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.66 cfs @ 12.03 hrs, Volume= 2,173 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.83' @ 12.06 hrs
Flood Elev= 20.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.30' | **12.0" Round Culvert**<br>L= 85.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.30' / 15.80' S= 0.0059 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.52 cfs @ 12.03 hrs HW=16.81' TW=16.53' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.52 cfs @ 1.86 fps)

### Pond MH1: PDMH1



## Summary for Pond MH2: PDMH2

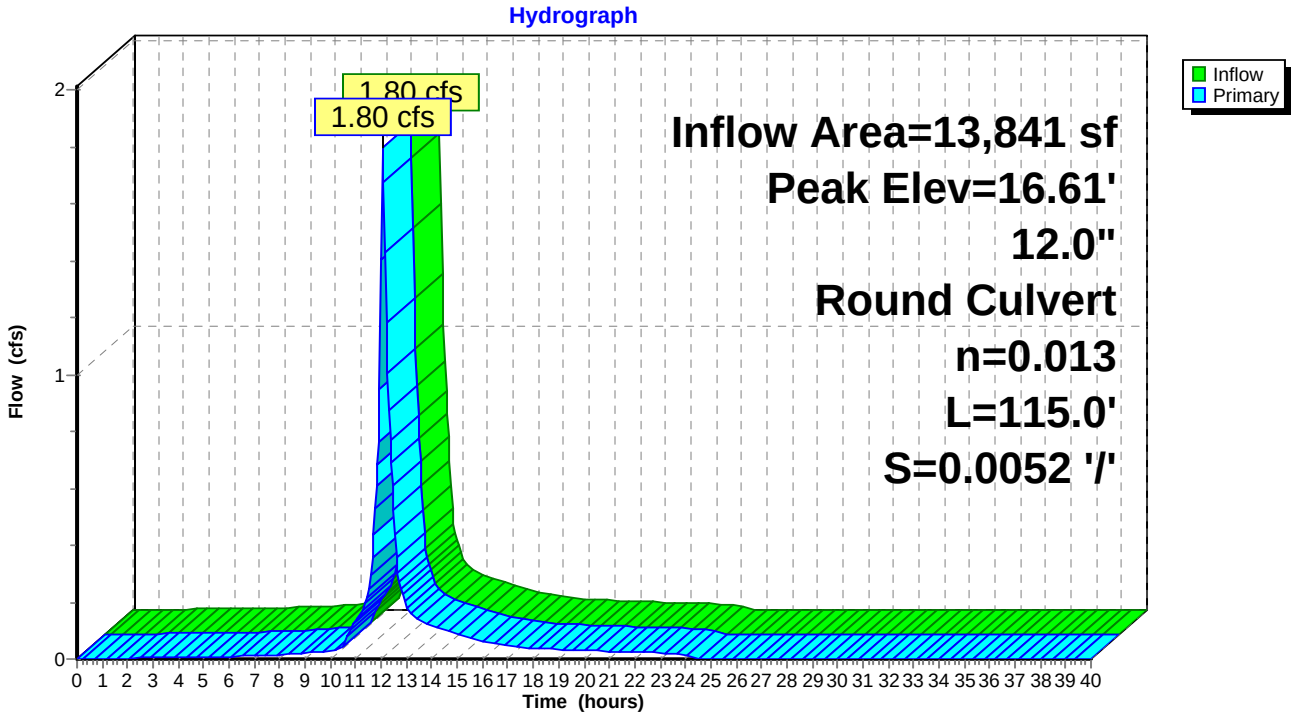
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 5.62" for 50-yr event
Inflow = 1.80 cfs @ 12.06 hrs, Volume= 6,477 cf
Outflow = 1.80 cfs @ 12.06 hrs, Volume= 6,477 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.80 cfs @ 12.06 hrs, Volume= 6,477 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.61' @ 12.09 hrs
Flood Elev= 21.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.70' | **12.0" Round Culvert**<br>L= 115.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.70' / 15.10' S= 0.0052 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.57 cfs @ 12.06 hrs HW=16.58' TW=15.97' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 1.57 cfs @ 2.85 fps)

### Pond MH2: PDMH2



## Summary for Pond MH3: PDMH3

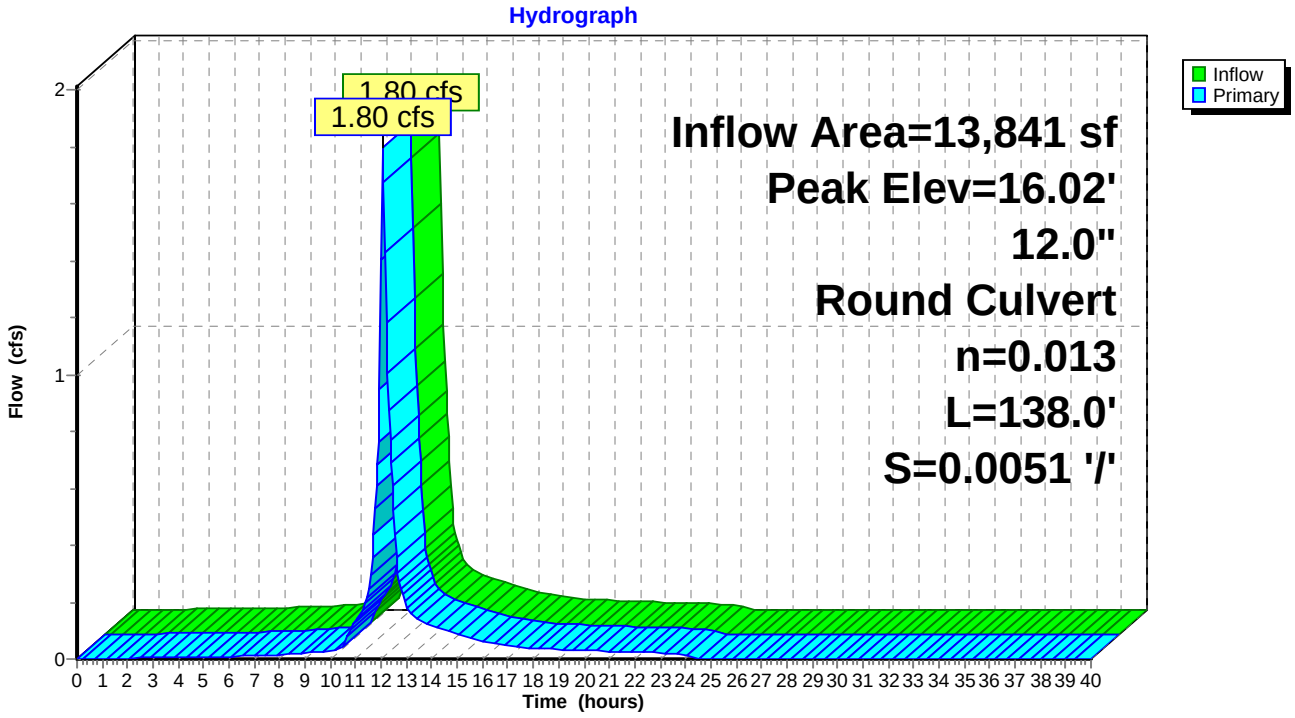
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 5.62" for 50-yr event
Inflow = 1.80 cfs @ 12.06 hrs, Volume= 6,477 cf
Outflow = 1.80 cfs @ 12.06 hrs, Volume= 6,477 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.80 cfs @ 12.06 hrs, Volume= 6,477 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.02' @ 12.10 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.00' | **12.0" Round Culvert**<br>L= 138.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.00' / 14.30' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.52 cfs @ 12.06 hrs HW=15.97' TW=15.47' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.52 cfs @ 2.47 fps)

### Pond MH3: PDMH3



## Summary for Pond MH4: PDMH4

Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 6.08" for 50-yr event
Inflow = 3.11 cfs @ 12.04 hrs, Volume= 11,219 cf
Outflow = 3.11 cfs @ 12.04 hrs, Volume= 11,219 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.25 cfs @ 12.03 hrs, Volume= 10,131 cf
Secondary = 0.93 cfs @ 12.07 hrs, Volume= 1,087 cf

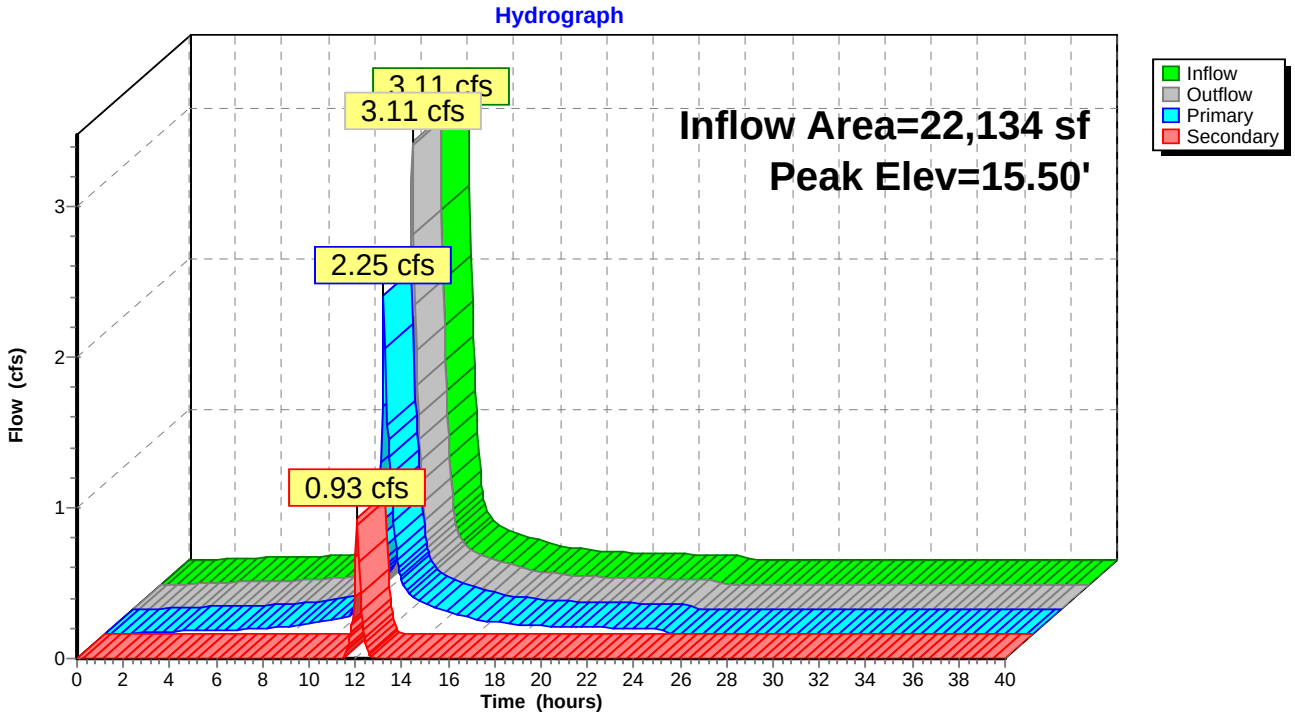
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.50' @ 12.07 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.20' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 14.10' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 14.20' | **12.0" Round Culvert**<br>L= 8.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 13.70' S= 0.0625 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 14.55' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=1.63 cfs @ 12.03 hrs HW=15.35' TW=15.06' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.63 cfs @ 2.07 fps)

**Secondary OutFlow** Max=0.90 cfs @ 12.07 hrs HW=15.47' TW=14.64' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.90 cfs of 2.62 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 3.10 fps)

## Pond MH4: PDMH4



## Summary for Pond MH5: PDMH5

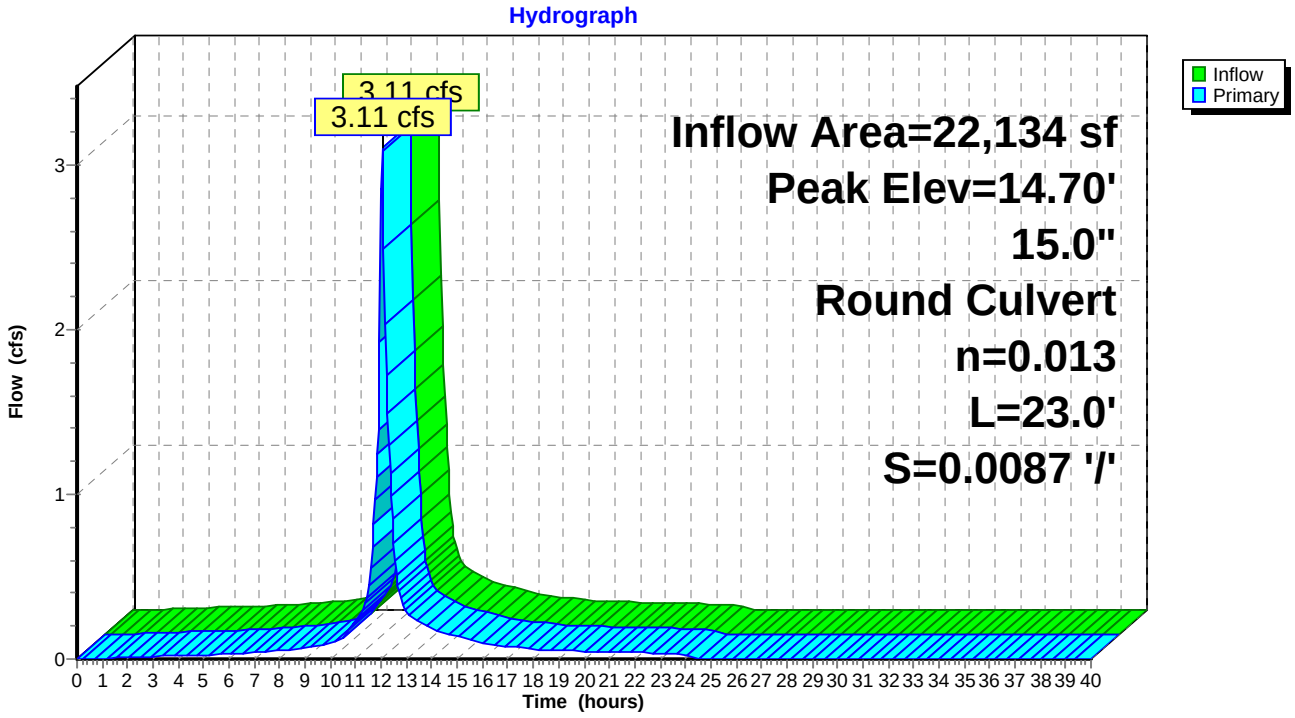
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 6.08" for 50-yr event
Inflow = 3.11 cfs @ 12.04 hrs, Volume= 11,219 cf
Outflow = 3.11 cfs @ 12.04 hrs, Volume= 11,219 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.11 cfs @ 12.04 hrs, Volume= 11,219 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.70' @ 12.04 hrs
Flood Elev= 21.40'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.60' | **15.0" Round Culvert**<br>L= 23.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.60' / 13.40' S= 0.0087 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=3.04 cfs @ 12.04 hrs HW=14.68' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.04 cfs @ 3.60 fps)

### Pond MH5: PDMH5



## Summary for Pond MH6: PDMH6

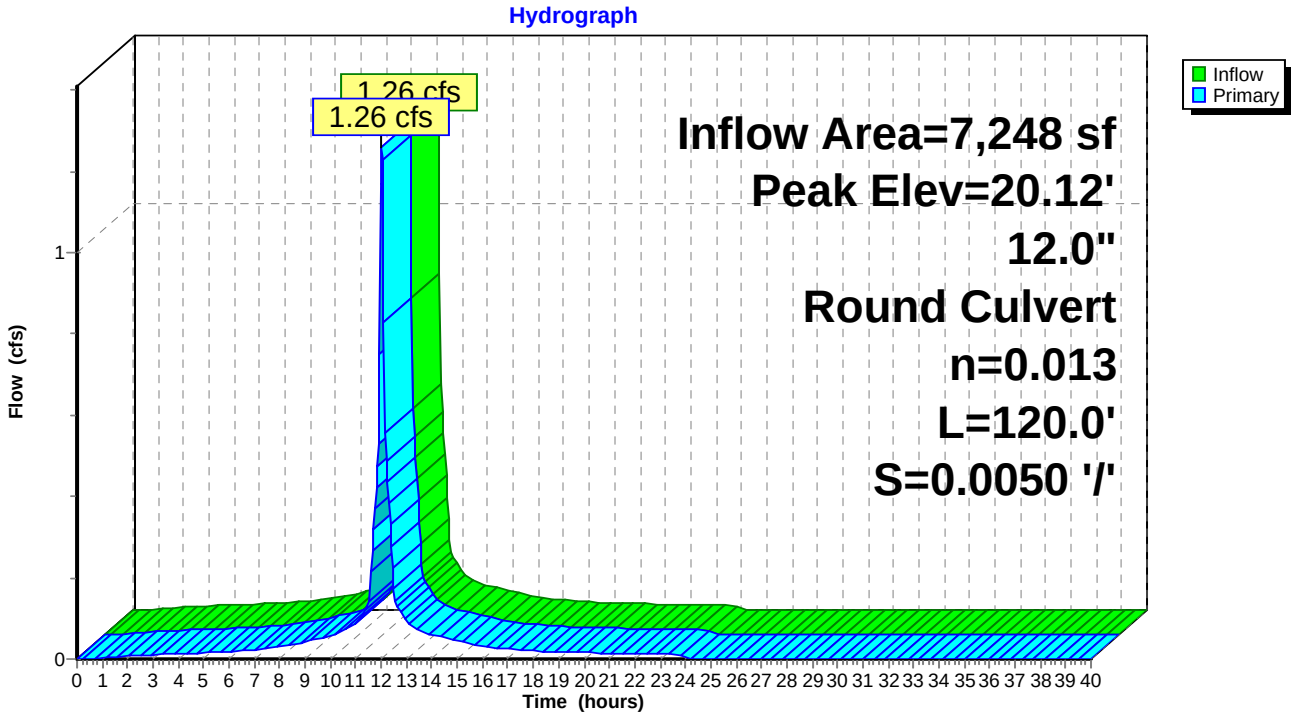
Inflow Area = 7,248 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 1.26 cfs @ 12.03 hrs, Volume= 4,144 cf
Outflow = 1.26 cfs @ 12.03 hrs, Volume= 4,144 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.26 cfs @ 12.03 hrs, Volume= 4,144 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.12' @ 12.04 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.40' | **12.0" Round Culvert**<br>L= 120.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.40' / 18.80' S= 0.0050 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.16 cfs @ 12.03 hrs HW=20.10' TW=19.44' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 1.16 cfs @ 2.78 fps)

### Pond MH6: PDMH6



## Summary for Pond MH7: PDMH7

Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 1.72 cfs @ 12.03 hrs, Volume= 5,676 cf
Outflow = 1.72 cfs @ 12.03 hrs, Volume= 5,676 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.03 hrs, Volume= 5,158 cf
Secondary = 0.38 cfs @ 12.10 hrs, Volume= 518 cf

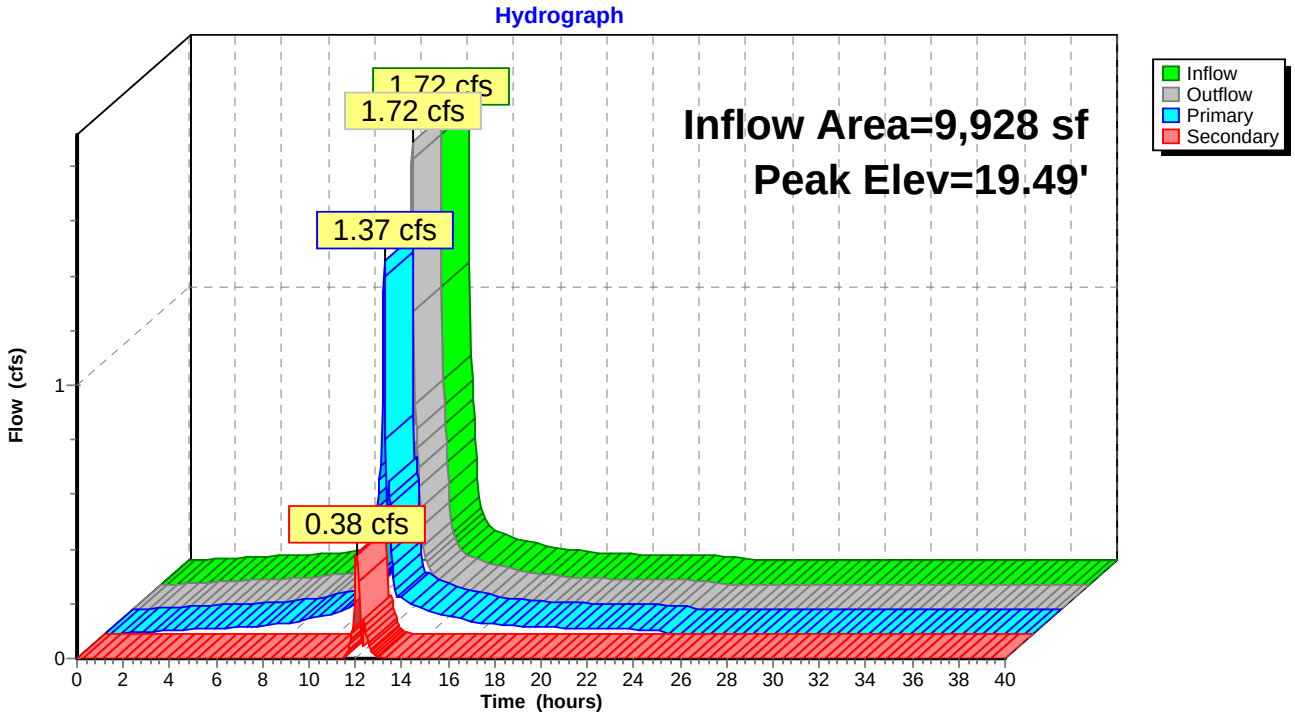
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.49' @ 12.09 hrs
Flood Elev= 21.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.60' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.20' S= 0.0500 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 19.00' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=0.90 cfs @ 12.03 hrs HW=19.44' TW=19.29' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.90 cfs @ 1.45 fps)

**Secondary OutFlow** Max=0.44 cfs @ 12.10 hrs HW=19.48' TW=18.93' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.44 cfs of 1.57 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.44 cfs @ 2.27 fps)

## Pond MH7: PDMH7



## Summary for Pond MH8: PDMH8

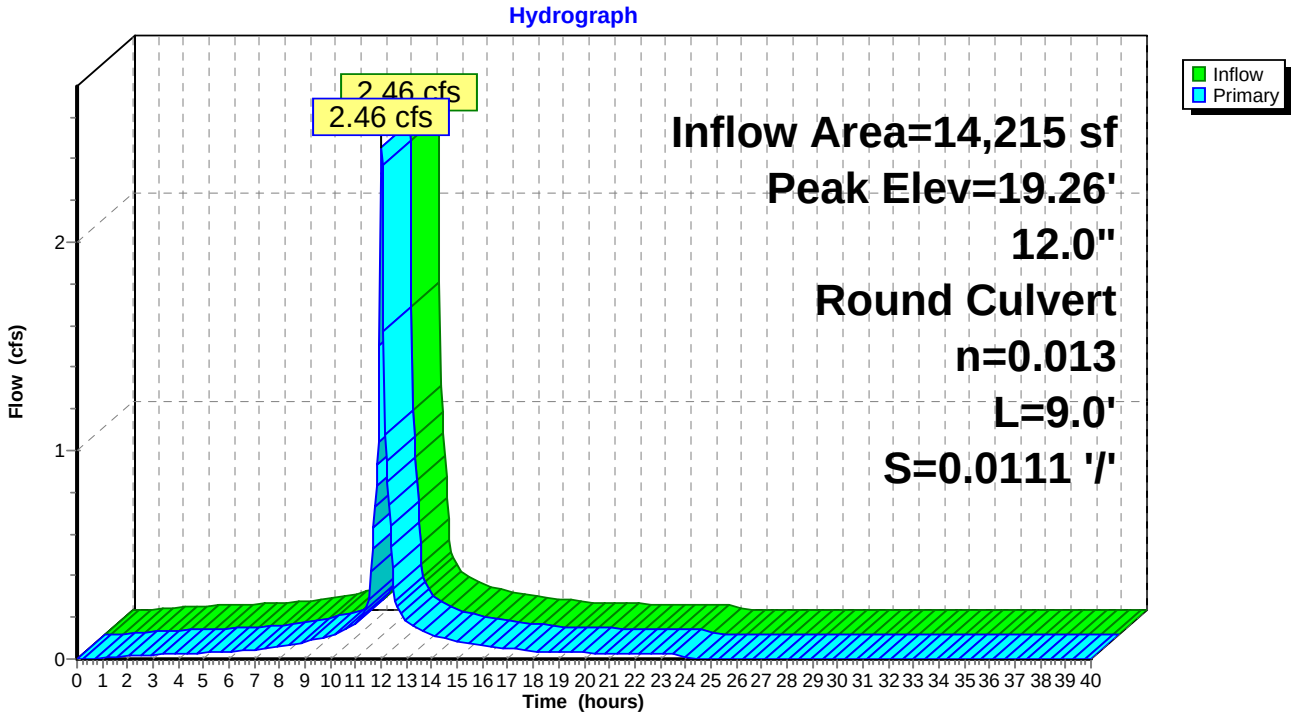
Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 6.86" for 50-yr event
Inflow = 2.46 cfs @ 12.03 hrs, Volume= 8,127 cf
Outflow = 2.46 cfs @ 12.03 hrs, Volume= 8,127 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.46 cfs @ 12.03 hrs, Volume= 8,127 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.26' @ 12.03 hrs
Flood Elev= 22.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.10' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.10' / 18.00' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.35 cfs @ 12.03 hrs HW=19.22' TW=18.35' (Dynamic Tailwater)
**1=Culvert** (Inlet Controls 2.35 cfs @ 3.00 fps)

### Pond MH8: PDMH8



## Summary for Pond RG1: Rain Garden #1

Inflow Area = 25,212 sf, 56.56% Impervious, Inflow Depth = 5.39" for 50-yr event
Inflow = 3.68 cfs @ 12.05 hrs, Volume= 11,324 cf
Outflow = 1.33 cfs @ 12.29 hrs, Volume= 10,587 cf, Atten= 64%, Lag= 14.0 min
Primary = 1.33 cfs @ 12.29 hrs, Volume= 10,587 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.06' @ 12.29 hrs Surf.Area= 6,247 sf Storage= 4,050 cf
Flood Elev= 16.70' Surf.Area= 6,703 sf Storage= 6,272 cf

Plug-Flow detention time= 124.9 min calculated for 10,573 cf (93% of inflow)
Center-of-Mass det. time= 91.1 min ( 875.7 - 784.6 )

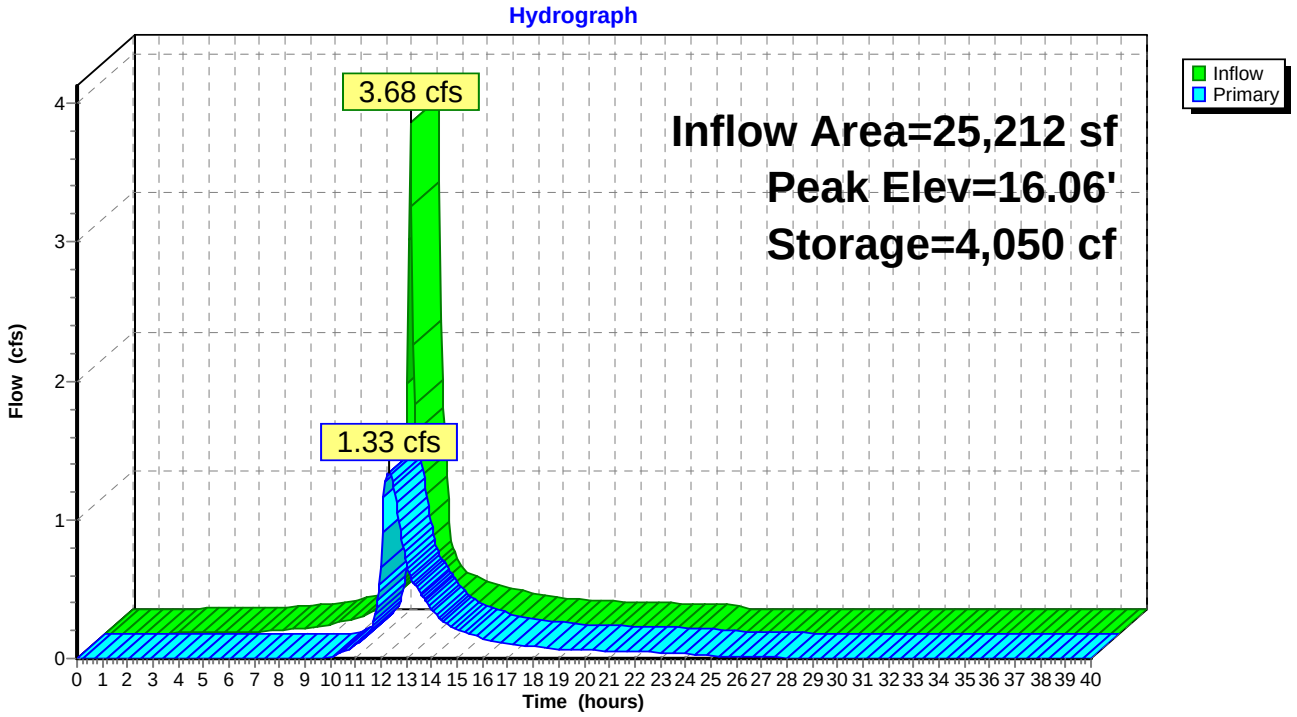
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 15.30' | 6,272 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 15.30 | 4,439 | 288.0 | 0 | 0 | 4,439 |
| 16.00 | 6,173 | 327.0 | 3,698 | 3,698 | 6,360 |
| 16.30 | 6,569 | 334.0 | 1,911 | 5,609 | 6,741 |
| 16.40 | 6,703 | 337.0 | 664 | 6,272 | 6,905 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.35' | **8.0" Round Culvert X 2.00**<br>L= 65.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 15.35' / 15.00' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf |
| #2 | Device 1 | 15.45' | **4.0" Vert. Orifice/Grate X 3.00** C= 0.600 |
| #3 | Device 1 | 15.80' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 16.35' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=1.33 cfs @ 12.29 hrs HW=16.06' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.33 cfs of 1.65 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.84 cfs @ 3.19 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.50 cfs @ 1.98 fps)
  - **4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG1: Rain Garden #1



## Summary for Pond RG2: Rain Garden #2

Inflow Area = 10,003 sf, 68.81% Impervious, Inflow Depth = 5.99" for 50-yr event
Inflow = 1.57 cfs @ 12.04 hrs, Volume= 4,993 cf
Outflow = 1.23 cfs @ 12.10 hrs, Volume= 4,305 cf, Atten= 22%, Lag= 3.5 min
Primary = 1.23 cfs @ 12.10 hrs, Volume= 4,305 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.62' @ 12.10 hrs Surf.Area= 976 sf Storage= 1,149 cf
Flood Elev= 19.00' Surf.Area= 1,118 sf Storage= 1,546 cf

Plug-Flow detention time= 115.6 min calculated for 4,305 cf (86% of inflow)
Center-of-Mass det. time= 54.0 min ( 821.1 - 767.0 )

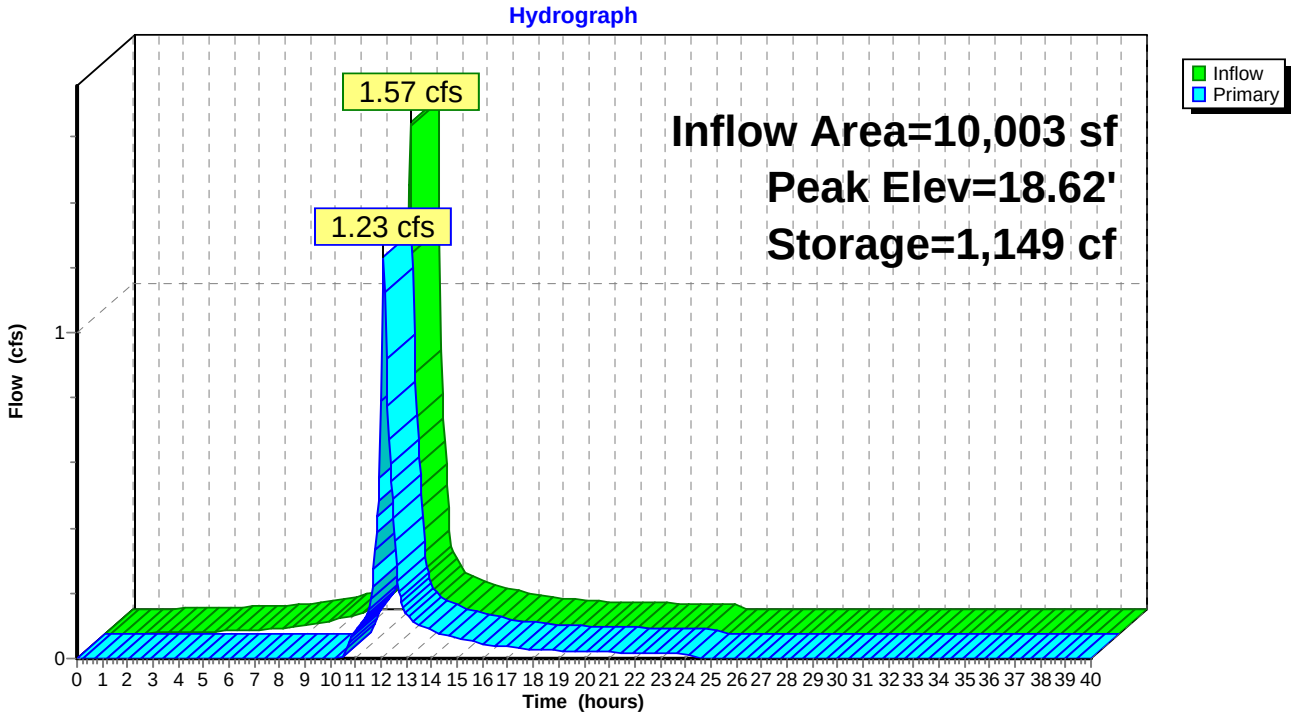
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 17.00' | 2,934 cf | **Custom Stage Data (Irregular)**Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 17.00 | 468 | 89.0 | 0 | 0 | 468 |
| 18.00 | 765 | 108.0 | 610 | 610 | 782 |
| 19.00 | 1,118 | 127.0 | 936 | 1,546 | 1,156 |
| 20.00 | 1,676 | 152.0 | 1,388 | 2,934 | 1,728 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.50' | **12.0" Round Culvert X 2.00**<br>L= 53.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 16.50' / 15.80' S= 0.0132 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 18.10' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 18.40' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 19.20' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=1.23 cfs @ 12.10 hrs HW=18.62' TW=16.60' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.23 cfs of 8.49 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.79 cfs @ 3.17 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.44 cfs @ 1.74 fps)
  └**4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG2: Rain Garden #2



## Summary for Pond WQU1: Water Quality Unit 1

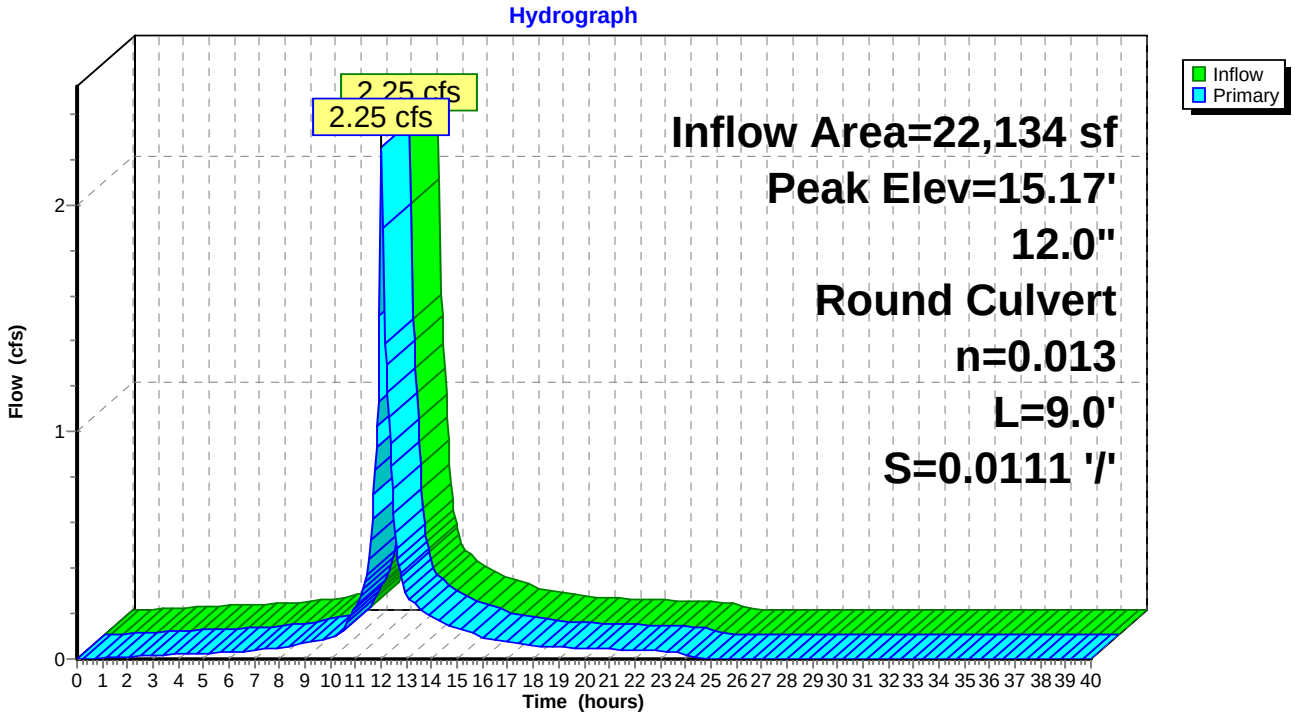
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 5.49" for 50-yr event
Inflow = 2.25 cfs @ 12.03 hrs, Volume= 10,131 cf
Outflow = 2.25 cfs @ 12.03 hrs, Volume= 10,131 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.25 cfs @ 12.03 hrs, Volume= 10,131 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.17' @ 12.05 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.80' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.80' / 13.70' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.87 cfs @ 12.03 hrs HW=15.06' TW=14.67' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.87 cfs @ 2.38 fps)

## Pond WQU1: Water Quality Unit 1



## Summary for Pond WQU2: Water Quality Unit 2

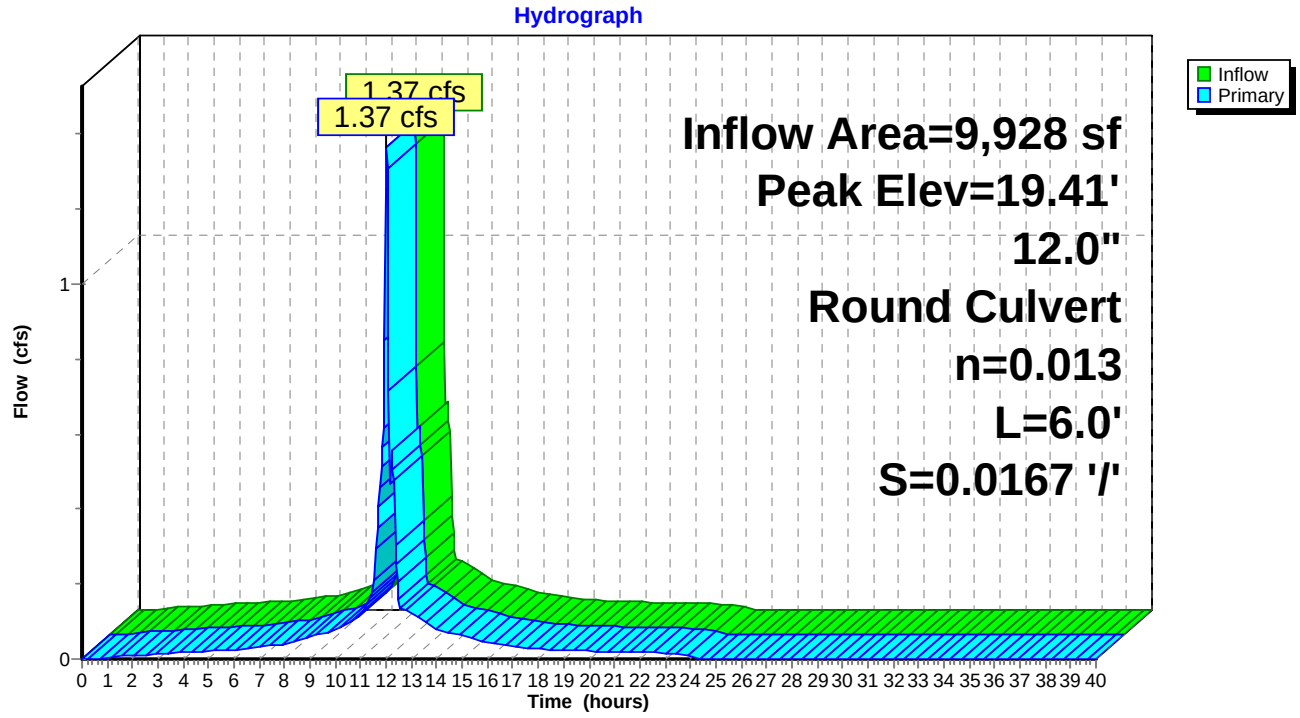
Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 6.23" for 50-yr event
Inflow = 1.37 cfs @ 12.03 hrs, Volume= 5,158 cf
Outflow = 1.37 cfs @ 12.03 hrs, Volume= 5,158 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.03 hrs, Volume= 5,158 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.41' @ 12.06 hrs
Flood Elev= 22.30'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.30' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.30' / 18.20' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.78 cfs @ 12.03 hrs HW=19.29' TW=19.22' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.78 cfs @ 1.00 fps)

## Pond WQU2: Water Quality Unit 2



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 100: 100 - Pavement, Lawn,** Runoff Area=20,037 sf 45.35% Impervious Runoff Depth=6.15"
Flow Length=165' Tc=3.9 min CN=82 Runoff=3.41 cfs 10,261 cf

**Subcatchment 101: 101 - West Side Lawn to** Runoff Area=271 sf 0.00% Impervious Runoff Depth=5.19"
Flow Length=178' Tc=2.7 min CN=74 Runoff=0.04 cfs 117 cf

**Subcatchment 102: 102 - Existing Building** Runoff Area=5,175 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=165' Tc=2.6 min CN=98 Runoff=1.05 cfs 3,476 cf

**Subcatchment 200: 200 - Portion of** Runoff Area=2,107 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=157' Tc=1.8 min CN=98 Runoff=0.43 cfs 1,415 cf

**Subcatchment 201: 201 - Pavement** Runoff Area=2,187 sf 95.93% Impervious Runoff Depth=7.94"
Flow Length=91' Tc=2.6 min CN=97 Runoff=0.44 cfs 1,447 cf

**Subcatchment 202: 202 - Pavement** Runoff Area=1,651 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=90' Slope=0.0133 '/' Tc=1.3 min CN=98 Runoff=0.34 cfs 1,109 cf

**Subcatchment 203: 203 - Pavement** Runoff Area=5,013 sf 96.69% Impervious Runoff Depth=7.94"
Flow Length=100' Tc=3.6 min CN=97 Runoff=1.00 cfs 3,317 cf

**Subcatchment 204: 204 - Pavement** Runoff Area=4,813 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=122' Tc=1.1 min CN=98 Runoff=1.00 cfs 3,233 cf

**Subcatchment 205: 205 - Pavement** Runoff Area=3,480 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=107' Tc=1.1 min CN=98 Runoff=0.72 cfs 2,337 cf

**Subcatchment 206: 206 - Pavement** Runoff Area=5,141 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=125' Slope=0.0120 '/' Tc=2.0 min CN=98 Runoff=1.04 cfs 3,453 cf

**Subcatchment 207: 207 - Pavement** Runoff Area=2,680 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=108' Slope=0.0220 '/' Tc=1.2 min CN=98 Runoff=0.55 cfs 1,800 cf

**Subcatchment 208: 208 - Proposed** Runoff Area=4,287 sf 100.00% Impervious Runoff Depth=8.06"
Flow Length=145' Tc=1.8 min CN=98 Runoff=0.87 cfs 2,879 cf

**Subcatchment 209: 209 - Portion of** Runoff Area=4,990 sf 40.80% Impervious Runoff Depth=6.38"
Flow Length=108' Tc=1.5 min CN=84 Runoff=0.90 cfs 2,655 cf

**Subcatchment 210: 210 - Existing South** Runoff Area=44,935 sf 0.00% Impervious Runoff Depth=4.14"
Flow Length=210' Tc=10.6 min CN=65 Runoff=4.24 cfs 15,496 cf

**Subcatchment 300: 300 - Lawn East to DP3** Runoff Area=1,915 sf 0.00% Impervious Runoff Depth=5.19"
Flow Length=40' Slope=0.0300 '/' Tc=5.8 min CN=74 Runoff=0.26 cfs 829 cf

**Pond 1P: Infiltration System** Peak Elev=19.24' Storage=2,043 cf Inflow=2.88 cfs 9,548 cf
Discarded=0.26 cfs 8,360 cf Primary=1.33 cfs 1,188 cf Outflow=1.59 cfs 9,548 cf

**Pond CB1: PCB1** Peak Elev=17.03' Inflow=0.44 cfs 1,447 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.44 cfs 1,447 cf

**Pond CB2: PCB2** Peak Elev=16.98' Inflow=0.34 cfs 1,109 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0095 '/' Outflow=0.34 cfs 1,109 cf

**Pond CB3: PCB3** Peak Elev=18.81' Inflow=1.00 cfs 3,317 cf
12.0" Round Culvert n=0.013 L=64.0' S=0.0078 '/' Outflow=1.00 cfs 3,317 cf

**Pond CB4: PCB4** Peak Elev=15.95' Inflow=1.00 cfs 3,233 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0085 '/' Outflow=1.00 cfs 3,233 cf

**Pond CB5: PCB5** Peak Elev=15.91' Inflow=0.72 cfs 2,337 cf
12.0" Round Culvert n=0.013 L=93.0' S=0.0054 '/' Outflow=0.72 cfs 2,337 cf

**Pond CB6: PCB6** Peak Elev=20.58' Inflow=1.04 cfs 3,453 cf
12.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=1.04 cfs 3,453 cf

**Pond CB7: PCB7** Peak Elev=19.77' Inflow=0.55 cfs 1,800 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0091 '/' Outflow=0.55 cfs 1,800 cf

**Pond DP1: Design Pont #1_18" RCP Culvert - Northwest** Inflow=1.58 cfs 13,116 cf
Primary=1.58 cfs 13,116 cf

**Pond DP2: Design Pont #2_Wetland-South** Inflow=8.04 cfs 30,092 cf
Primary=8.04 cfs 30,092 cf

**Pond DP3: Design Pont #3_Abutting Lot-East** Inflow=0.26 cfs 829 cf
Primary=0.26 cfs 829 cf

**Pond MH1: PDMH1** Peak Elev=16.92' Inflow=0.77 cfs 2,556 cf
12.0" Round Culvert n=0.013 L=85.0' S=0.0059 '/' Outflow=0.77 cfs 2,556 cf

**Pond MH2: PDMH2** Peak Elev=16.87' Inflow=2.09 cfs 7,839 cf
12.0" Round Culvert n=0.013 L=115.0' S=0.0052 '/' Outflow=2.09 cfs 7,839 cf

**Pond MH3: PDMH3** Peak Elev=16.47' Inflow=2.09 cfs 7,839 cf
12.0" Round Culvert n=0.013 L=138.0' S=0.0051 '/' Outflow=2.09 cfs 7,839 cf

**Pond MH4: PDMH4** Peak Elev=15.90' Inflow=3.65 cfs 13,409 cf
Primary=2.59 cfs 11,947 cf Secondary=1.22 cfs 1,462 cf Outflow=3.65 cfs 13,409 cf

**Pond MH5: PDMH5** Peak Elev=14.83' Inflow=3.65 cfs 13,409 cf
15.0" Round Culvert n=0.013 L=23.0' S=0.0087 '/' Outflow=3.65 cfs 13,409 cf

**Pond MH6: PDMH6** Peak Elev=20.20' Inflow=1.47 cfs 4,868 cf
12.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=1.47 cfs 4,868 cf

**Pond MH7: PDMH7** Peak Elev=19.77' Inflow=2.01 cfs 6,668 cf
Primary=1.65 cfs 5,924 cf Secondary=0.60 cfs 744 cf Outflow=2.01 cfs 6,668 cf

**Pond MH8: PDMH8** Peak Elev=19.48' Inflow=2.88 cfs 9,548 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=2.88 cfs 9,548 cf

**Pond RG1: Rain Garden #1** Peak Elev=16.16' Storage=4,714 cf Inflow=4.44 cfs 13,737 cf
Outflow=1.56 cfs 12,999 cf

**Pond RG2: Rain Garden #2** Peak Elev=18.70' Storage=1,231 cf Inflow=1.87 cfs 5,971 cf
Outflow=1.43 cfs 5,283 cf

**Pond WQU1: Water Quality Unit 1** Peak Elev=15.42' Inflow=2.59 cfs 11,947 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0111 '/' Outflow=2.59 cfs 11,947 cf

**Pond WQU2: Water Quality Unit 2** Peak Elev=19.73' Inflow=1.65 cfs 5,924 cf
12.0" Round Culvert n=0.013 L=6.0' S=0.0167 '/' Outflow=1.65 cfs 5,924 cf

**Total Runoff Area = 108,682 sf Runoff Volume = 53,824 cf Average Runoff Depth = 5.94"**
**56.39% Pervious = 61,281 sf 43.61% Impervious = 47,401 sf**

## Summary for Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden

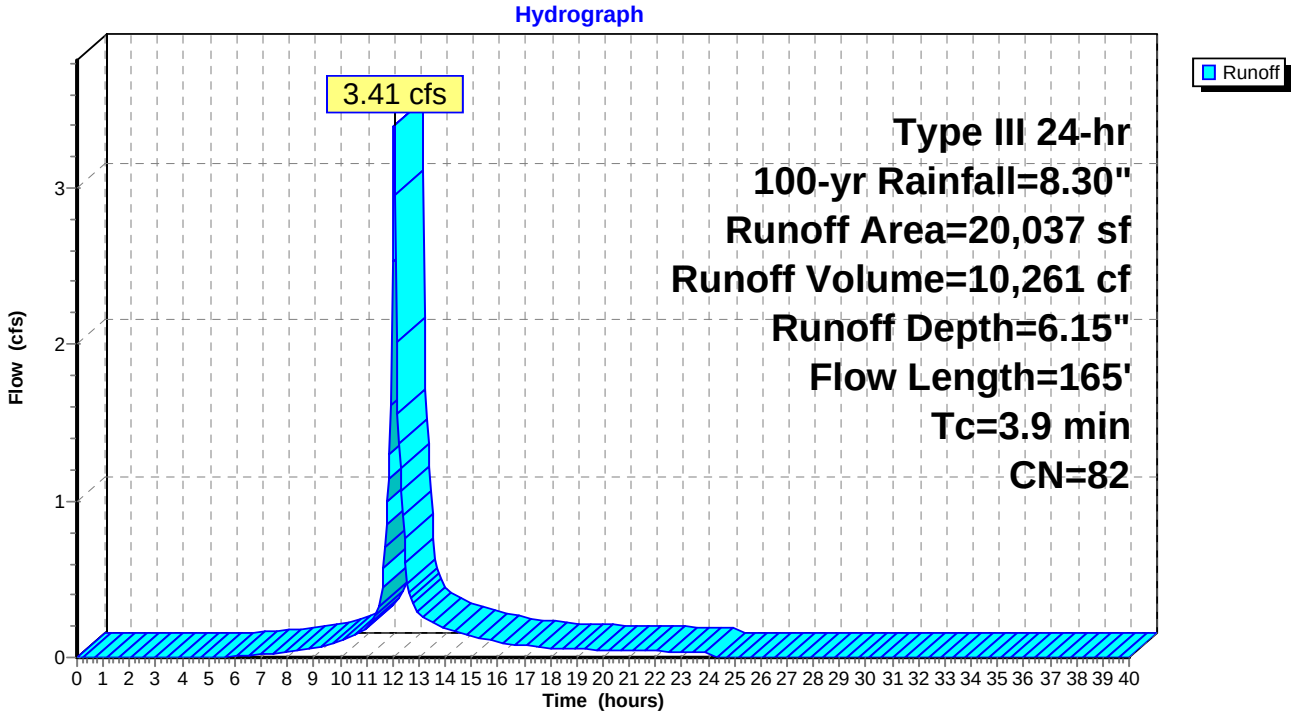
Runoff = 3.41 cfs @ 12.06 hrs, Volume= 10,261 cf, Depth= 6.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 4,778 | 74 | >75% Grass cover, Good, HSG C |
| * | 6,173 | 65 | Rain Garden surface area |
| | 9,086 | 98 | Paved parking, HSG C |
| | 20,037 | 82 | Weighted Average |
| | 10,951 | | 54.65% Pervious Area |
| | 9,086 | | 45.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 83 | 0.0180 | 1.27 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.8 | 17 | 0.0410 | 0.16 | | **Sheet Flow, Stone rip rap to RG** Grass: Short n= 0.150 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 3.9 | 165 | Total | | | |

## Subcatchment 100: 100 - Pavement, Lawn, and Direct Entry to Rain Garden



## Summary for Subcatchment 101: 101 - West Side Lawn to DP1

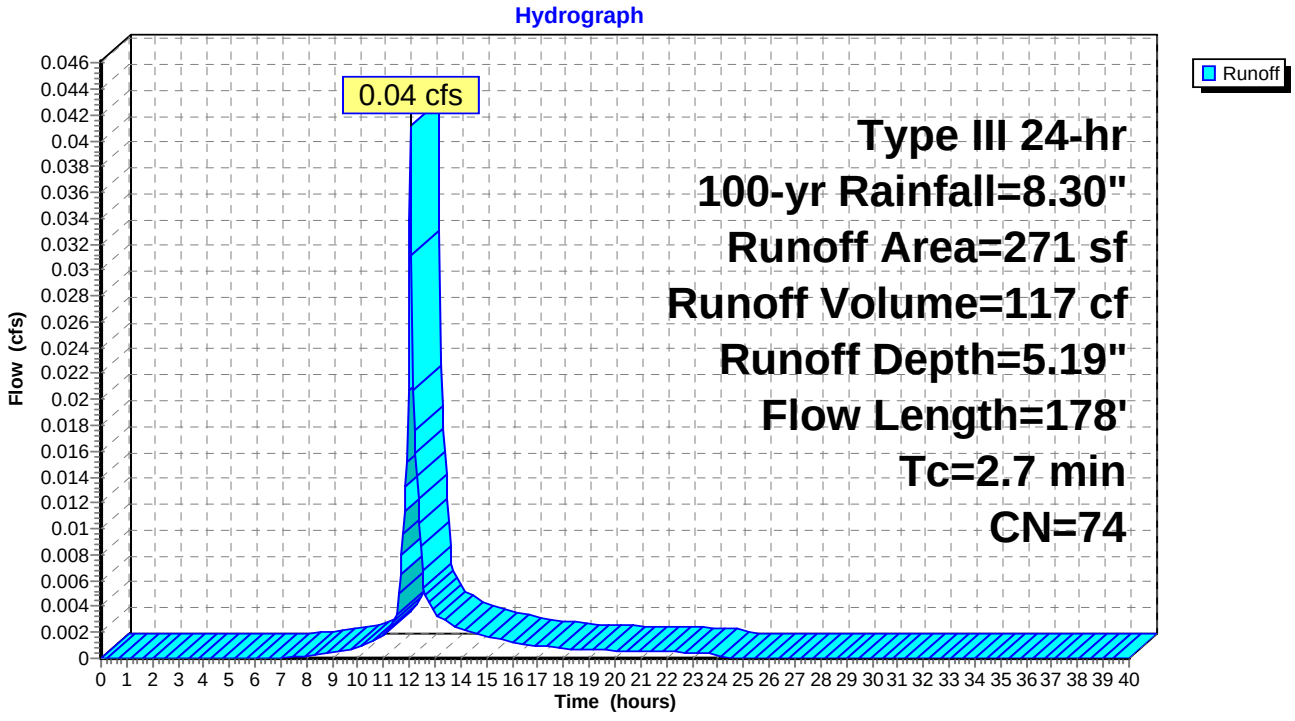
Runoff = 0.04 cfs @ 12.05 hrs, Volume= 117 cf, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 271 | 74 | >75% Grass cover, Good, HSG C |
| 271 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.4 | 100 | 0.0150 | 1.23 | | **Sheet Flow, Grass** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.3 | 78 | 0.0220 | 1.04 | | **Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps |
| 2.7 | 178 | Total | | | |

## Subcatchment 101: 101 - West Side Lawn to DP1



## Summary for Subcatchment 102: 102 - Existing Building

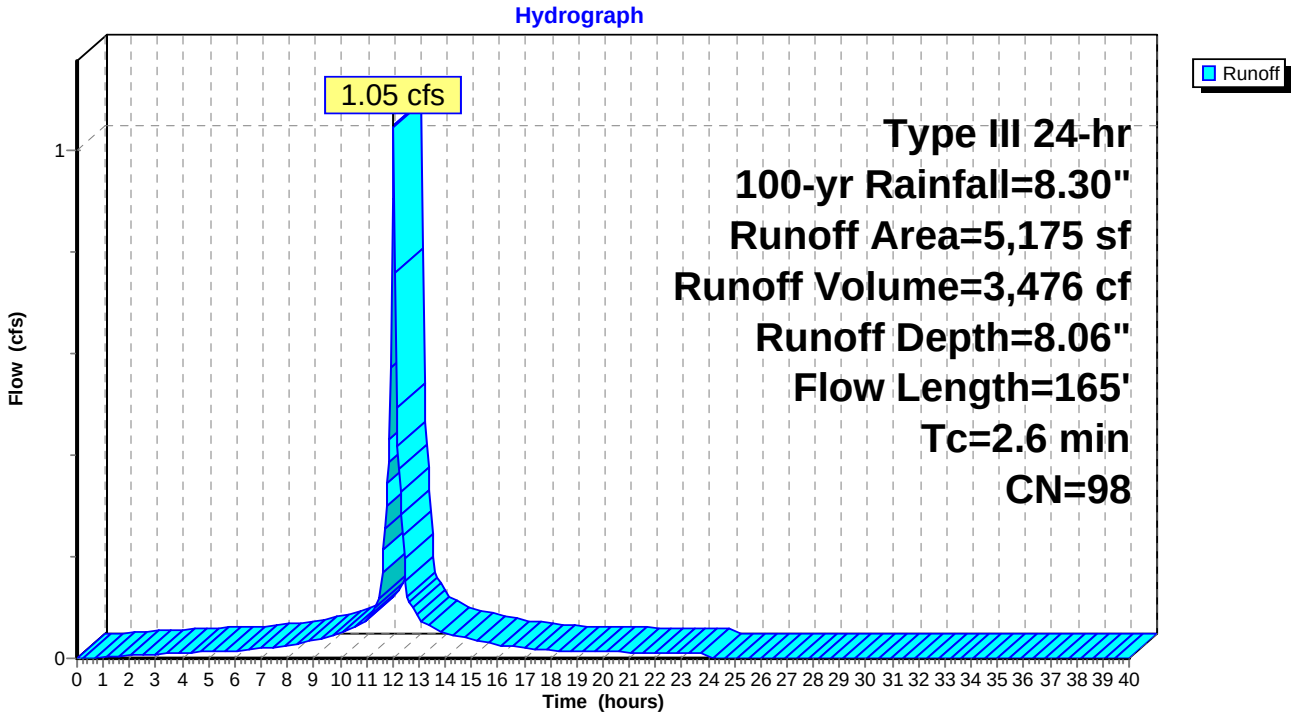
Runoff = 1.05 cfs @ 12.04 hrs, Volume= 3,476 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,175 | 98 | Roofs, HSG C, Existing Building |
| | 5,175 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.6 | 100 | 0.0100 | 1.05 | | **Sheet Flow, Estimated roof drain to rain garden** Smooth surfaces n= 0.011 P2= 3.22" |
| 1.0 | 65 | 0.0260 | 1.13 | | **Shallow Concentrated Flow, Grass to DP1** Short Grass Pasture Kv= 7.0 fps |
| 2.6 | 165 | Total | | | |

## Subcatchment 102: 102 - Existing Building



## Summary for Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH

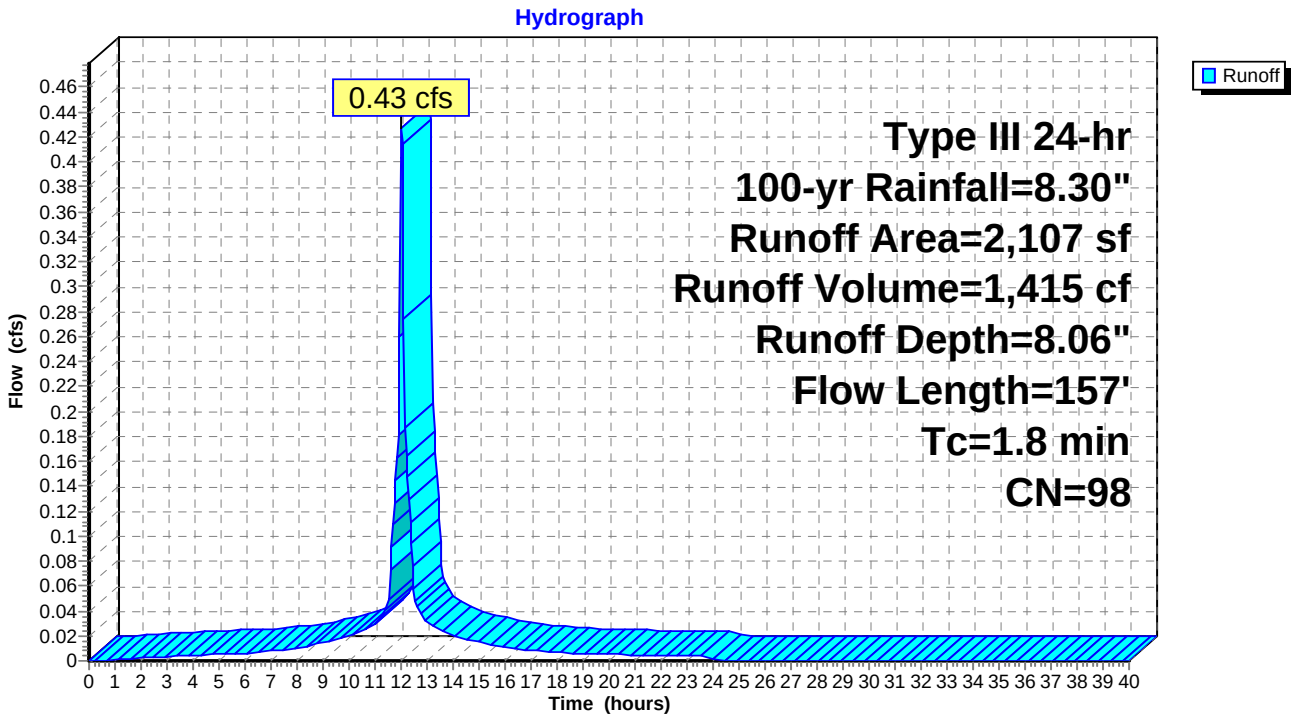
Runoff = 0.43 cfs @ 12.03 hrs, Volume= 1,415 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 2,107 | 98 | Roofs, HSG C, Half Prop. Building A |
| | 2,107 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 50 | 0.0050 | 0.69 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.6 | 107 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to PDMH - Estimated**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 157 | Total | | | |

### Subcatchment 200: 200 - Portion of Proposed Building Tenant A to PDMH



## Summary for Subcatchment 201: 201 - Pavement

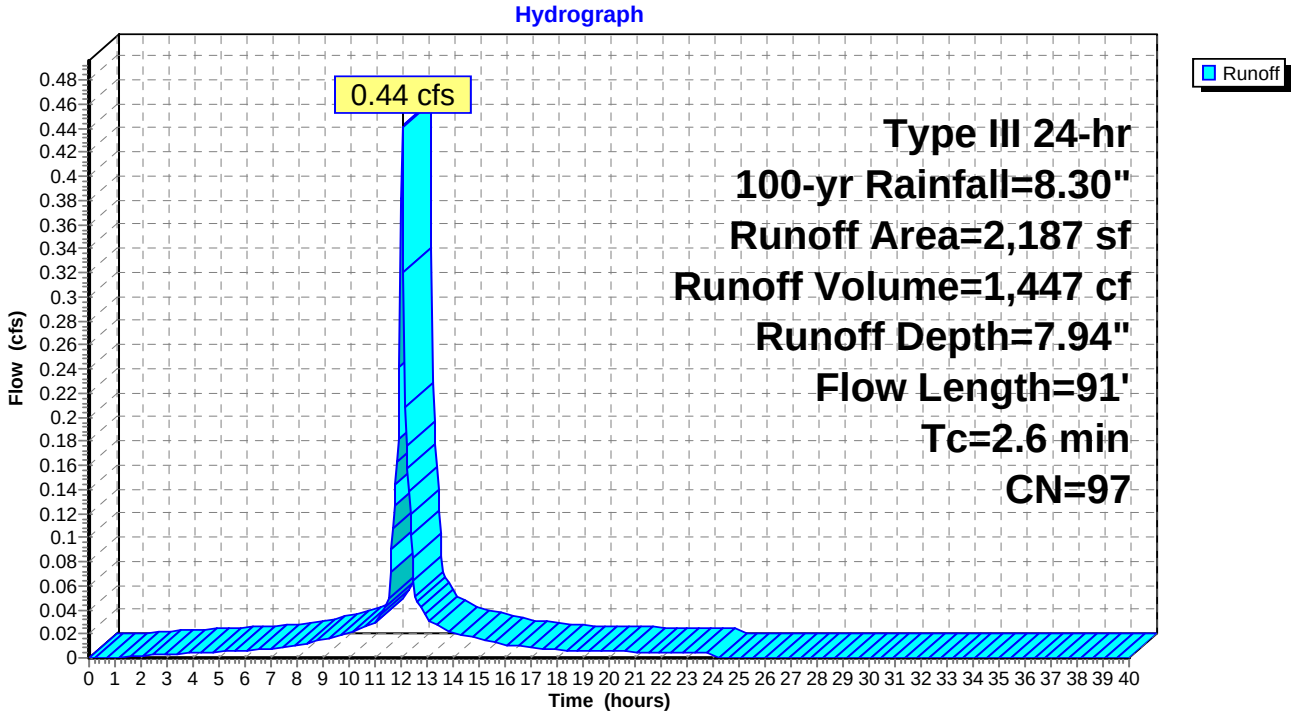
Runoff = 0.44 cfs @ 12.04 hrs, Volume= 1,447 cf, Depth= 7.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 2,098 | 98 | Paved parking, HSG C |
| 89 | 74 | >75% Grass cover, Good, HSG C |
| 2,187 | 97 | Weighted Average |
| 89 | | 4.07% Pervious Area |
| 2,098 | | 95.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 6 | 0.0200 | 0.07 | | **Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.22" |
| 1.1 | 85 | 0.0170 | 1.25 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.6 | 91 | Total | | | |

## Subcatchment 201: 201 - Pavement



## Summary for Subcatchment 202: 202 - Pavement

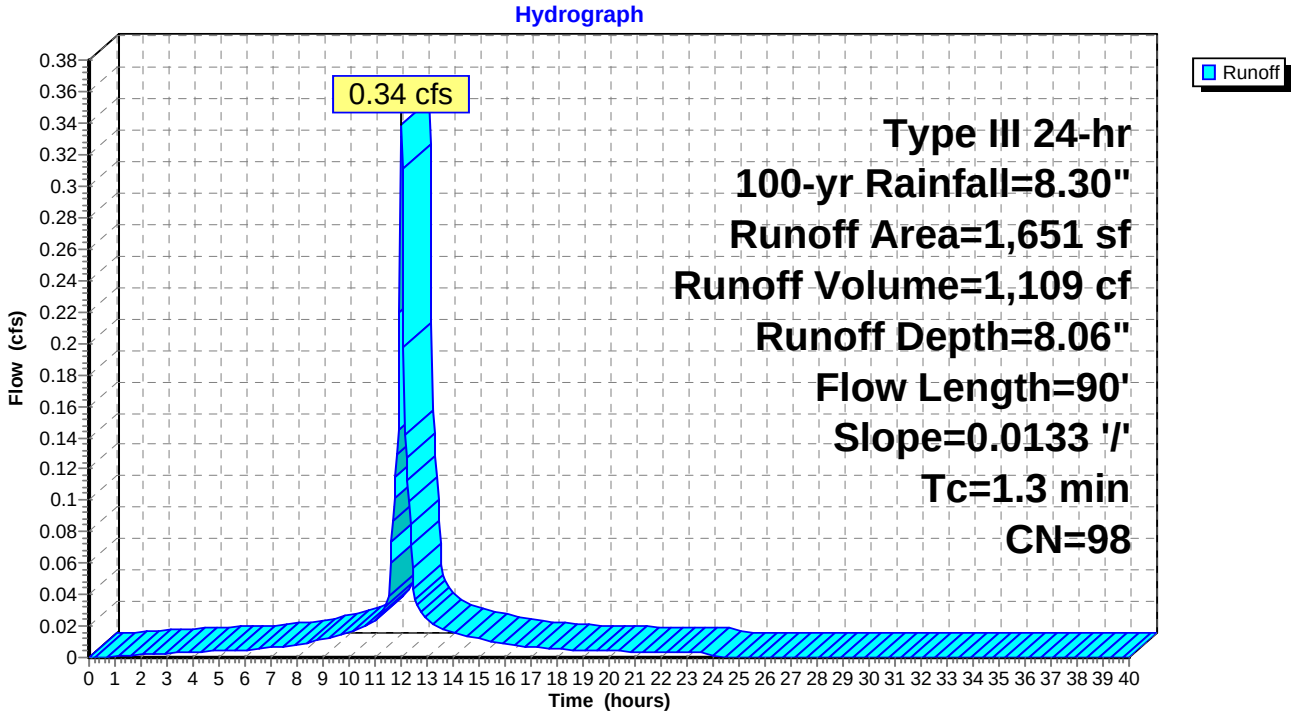
Runoff = 0.34 cfs @ 12.02 hrs, Volume= 1,109 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 1,651 | 98 | Paved parking, HSG C |
| 1,651 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 90 | 0.0133 | 1.15 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |

## Subcatchment 202: 202 - Pavement



## Summary for Subcatchment 203: 203 - Pavement

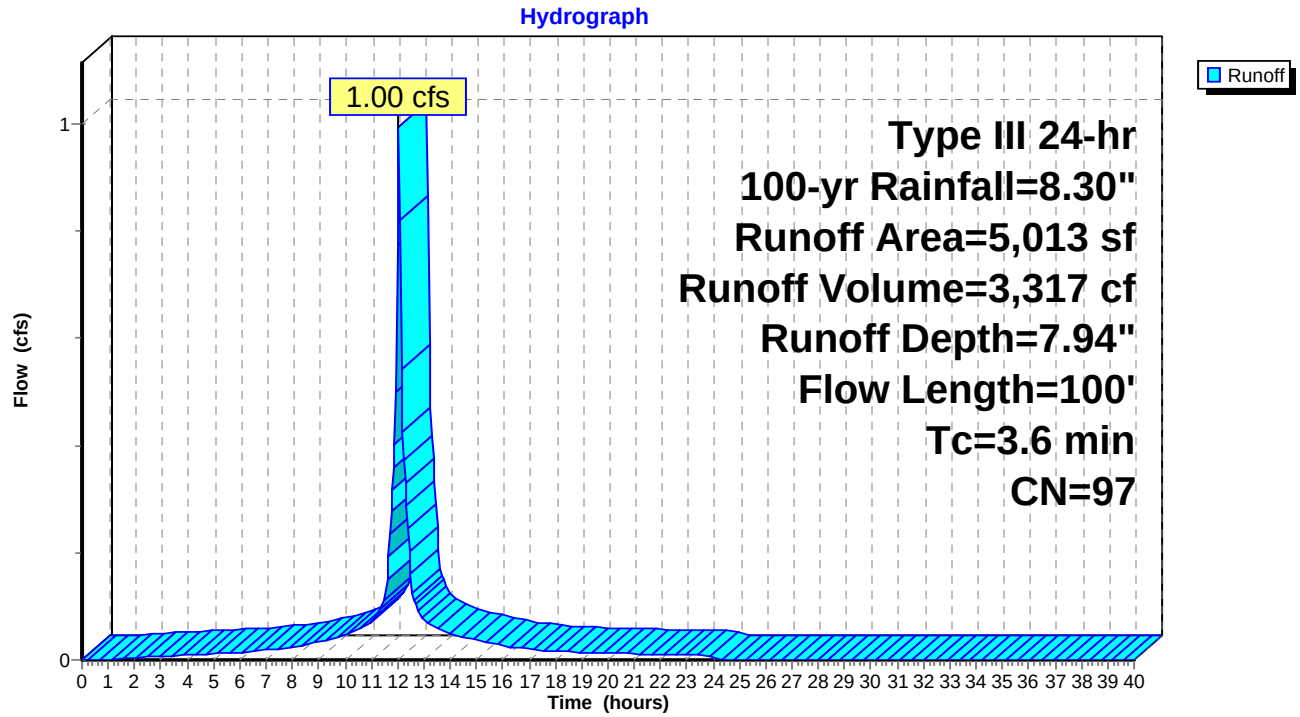
Runoff = 1.00 cfs @ 12.05 hrs, Volume= 3,317 cf, Depth= 7.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 4,847 | 98 | Paved parking, HSG C |
| 166 | 74 | >75% Grass cover, Good, HSG C |
| 5,013 | 97 | Weighted Average |
| 166 | | 3.31% Pervious Area |
| 4,847 | | 96.69% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 2.6 | 12 | 0.0200 | 0.08 | | **Sheet Flow, Grass to Sidewalk** Grass: Dense n= 0.240 P2= 3.22" |
| 0.1 | 6 | 0.0150 | 0.70 | | **Sheet Flow, Sidewalk** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.9 | 82 | 0.0260 | 1.47 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 3.6 | 100 | Total | | | |

## Subcatchment 203: 203 - Pavement



## Summary for Subcatchment 204: 204 - Pavement

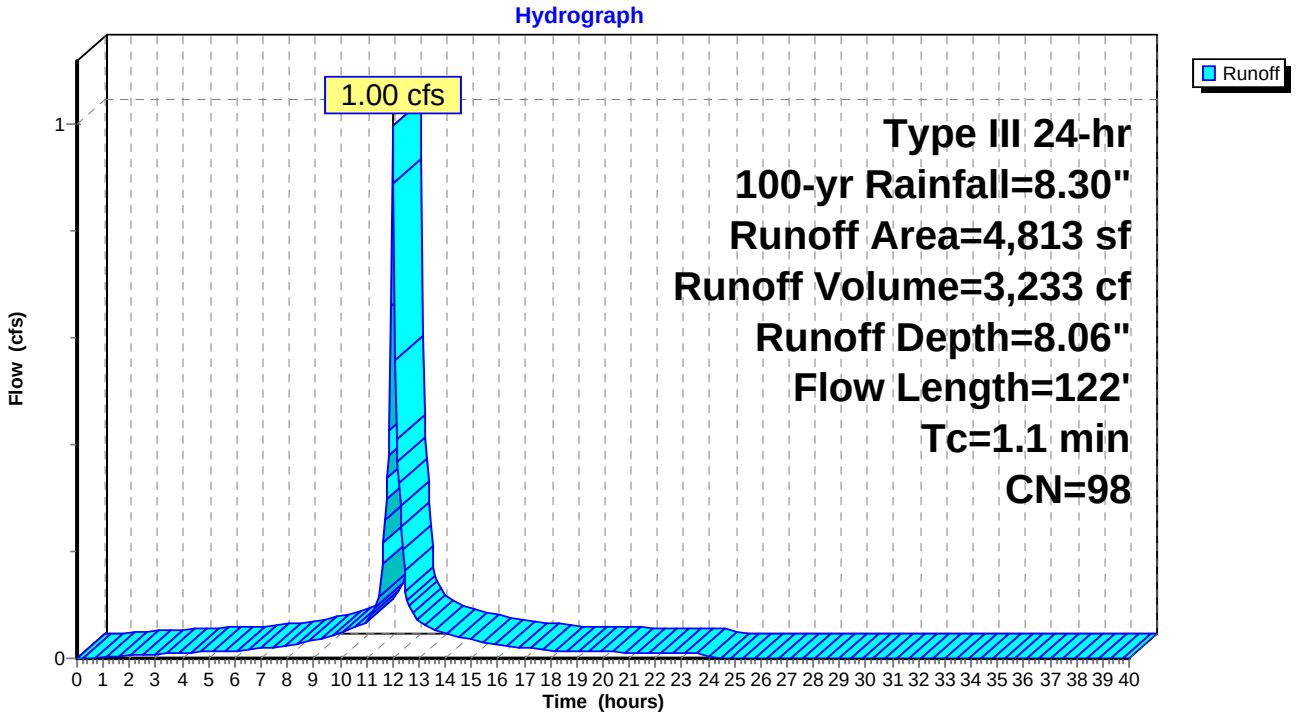
Runoff = 1.00 cfs @ 12.01 hrs, Volume= 3,233 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 4,813 | 98 | Paved parking, HSG C |
| 4,813 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.0 | 100 | 0.0300 | 1.62 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.1 | 22 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 122 | Total | | | |

## Subcatchment 204: 204 - Pavement



## Summary for Subcatchment 205: 205 - Pavement

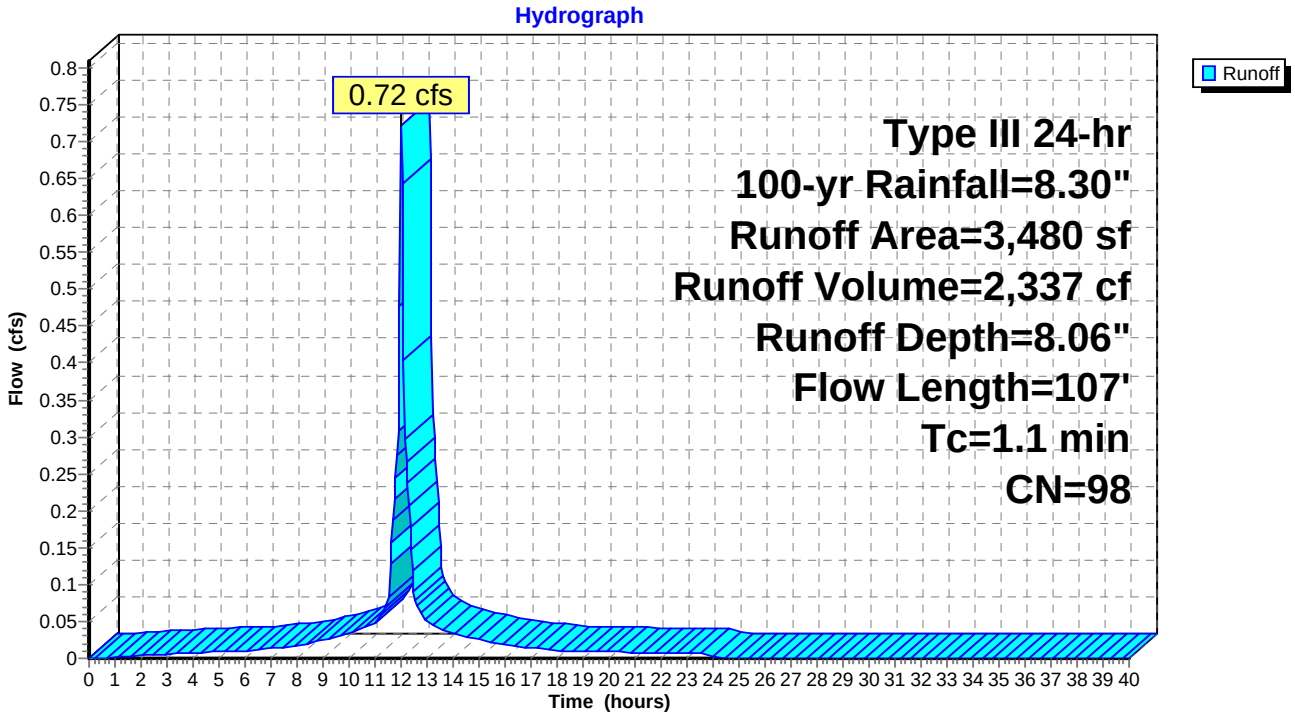
Runoff = 0.72 cfs @ 12.01 hrs, Volume= 2,337 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 3,480 | 98 | Paved parking, HSG C |
| 3,480 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 100 | 0.0270 | 1.56 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 7 | 0.0280 | 3.40 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.1 | 107 | Total | | | |

## Subcatchment 205: 205 - Pavement



## Summary for Subcatchment 206: 206 - Pavement

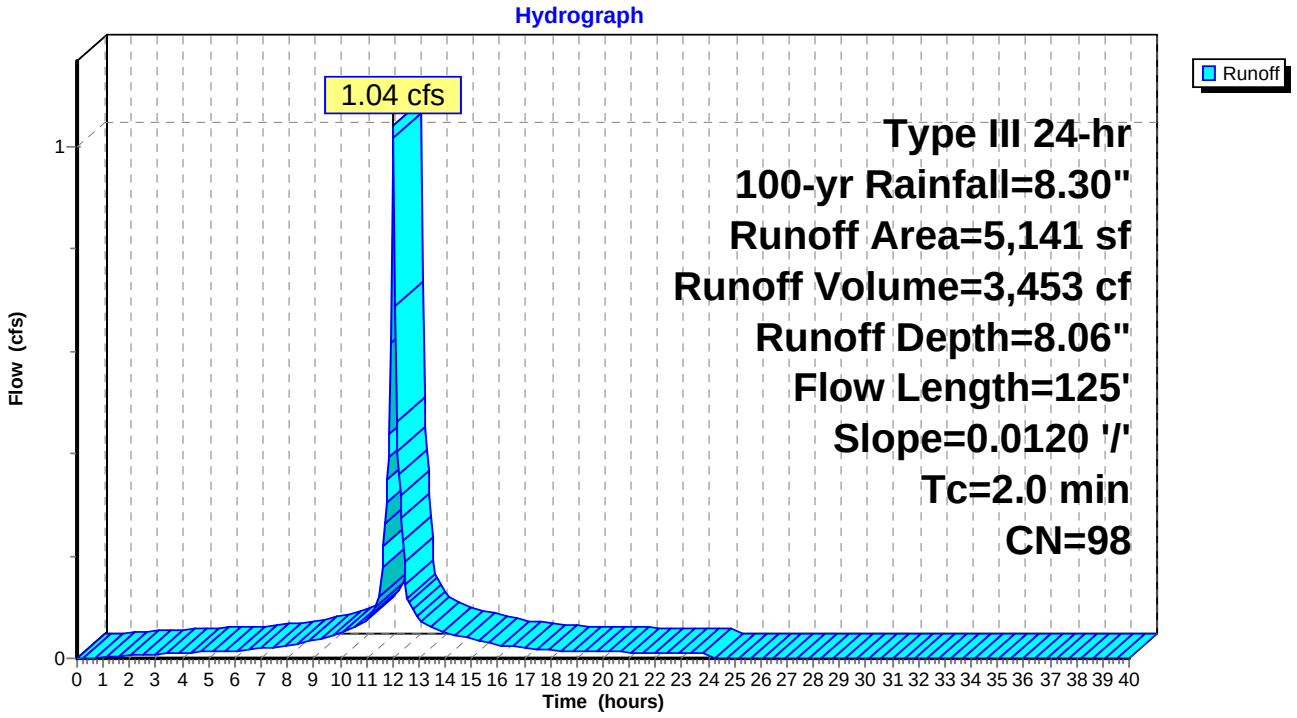
Runoff = 1.04 cfs @ 12.03 hrs, Volume= 3,453 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 5,141 | 98 | Paved parking, HSG C |
| 5,141 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.5 | 100 | 0.0120 | 1.12 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 25 | 0.0120 | 0.85 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 2.0 | 125 | Total | | | |

## Subcatchment 206: 206 - Pavement



## Summary for Subcatchment 207: 207 - Pavement

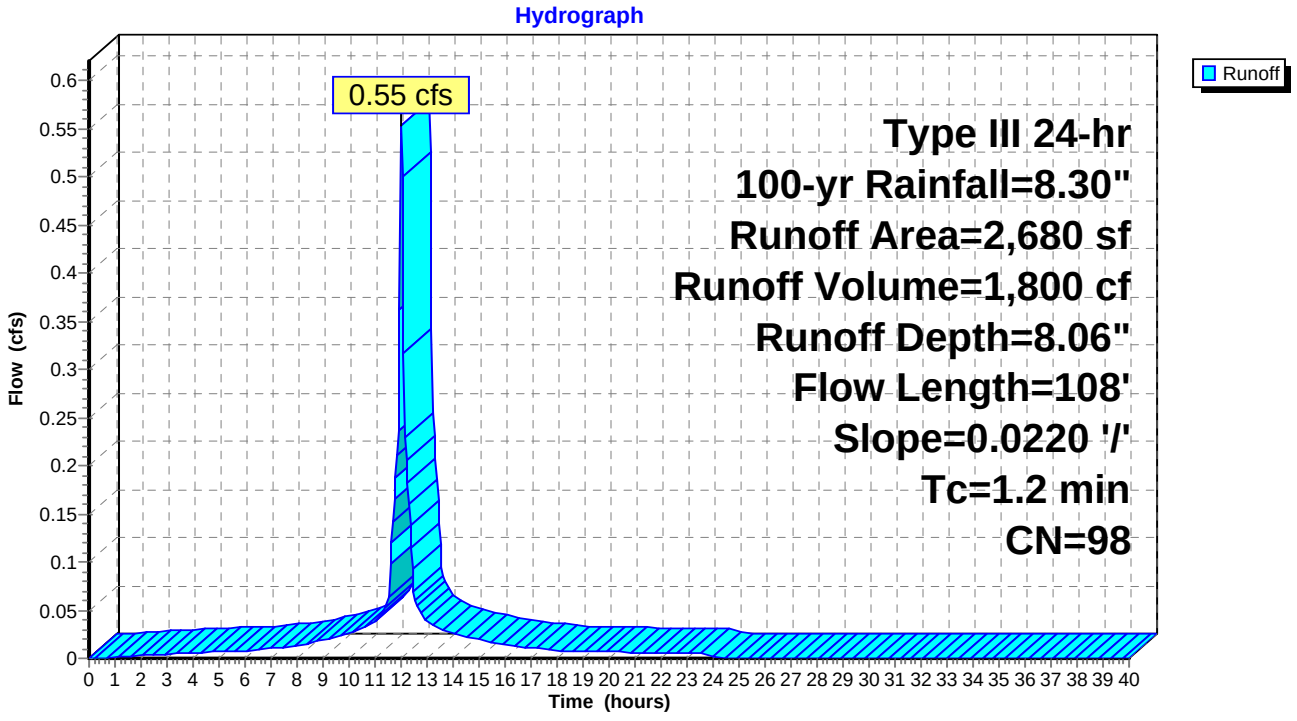
Runoff = 0.55 cfs @ 12.02 hrs, Volume= 1,800 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 2,680 | 98 | Paved parking, HSG C |
| 2,680 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.2 | 100 | 0.0220 | 1.43 | | **Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.0 | 8 | 0.0220 | 3.01 | | **Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps |
| 1.2 | 108 | Total | | | |

## Subcatchment 207: 207 - Pavement



## Summary for Subcatchment 208: 208 - Proposed Building Tenant B

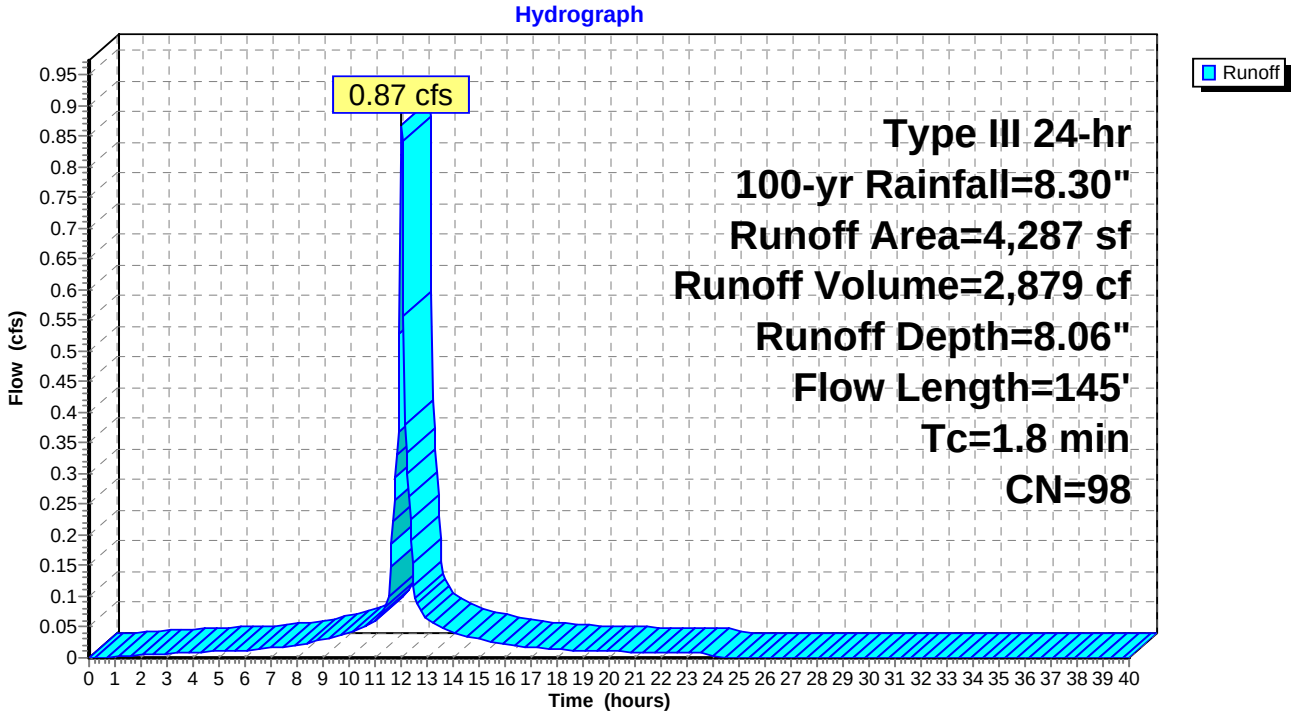
Runoff = 0.87 cfs @ 12.03 hrs, Volume= 2,879 cf, Depth= 8.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 4,287 | 98 | Roofs, HSG C |
| 4,287 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.3 | 55 | 0.0050 | 0.70 | | **Sheet Flow, Flat Roof to Drain**<br>Smooth surfaces n= 0.011 P2= 3.22" |
| 0.5 | 90 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Estimated Roof Drain to PDMH**<br>6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13'<br>n= 0.013 Corrugated PE, smooth interior |
| 1.8 | 145 | Total | | | |

## Subcatchment 208: 208 - Proposed Building Tenant B



## mary for Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and W

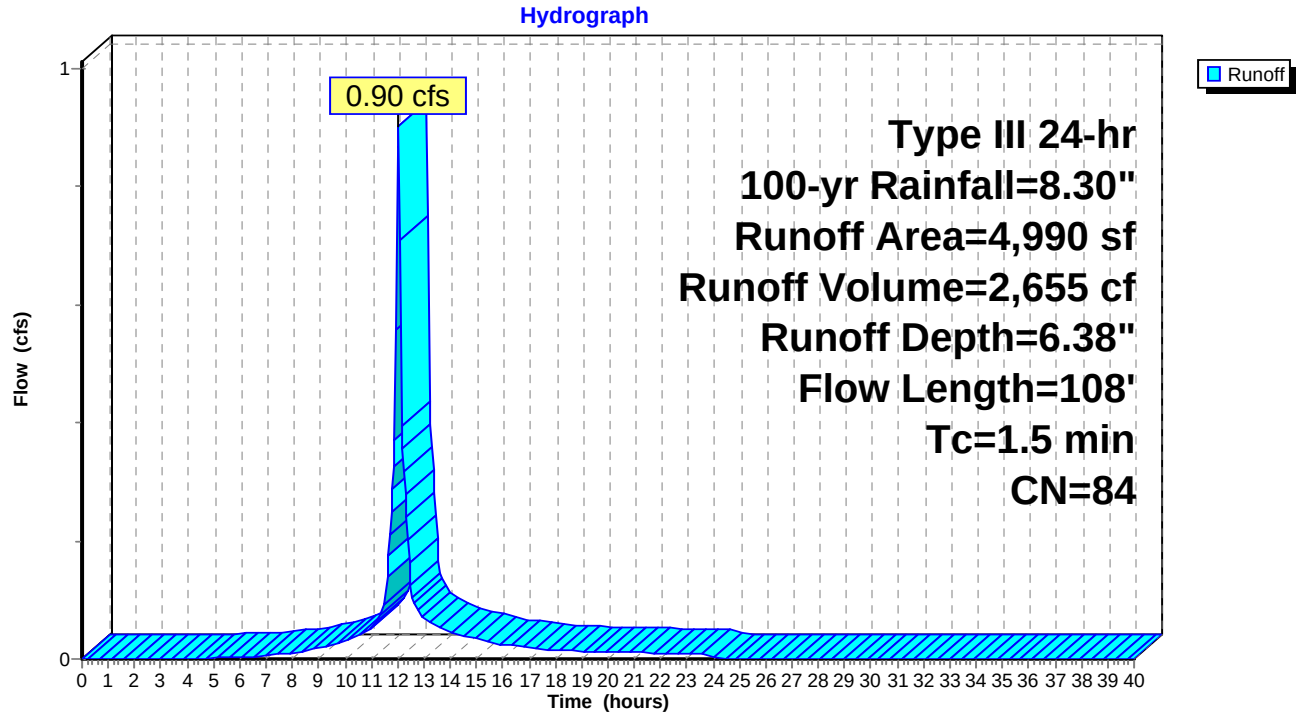
Runoff = 0.90 cfs @ 12.02 hrs, Volume= 2,655 cf, Depth= 6.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 876 | 65 | Rain Garden Surface Area |
| | 2,078 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 84 | 98 | Unconnected pavement, HSG C |
| | 1,952 | 98 | Unconnected roofs, HSG C |
| | 4,990 | 84 | Weighted Average |
| | 2,954 | | 59.20% Pervious Area |
| | 2,036 | | 40.80% Impervious Area |
| | 2,036 | | 100.00% Unconnected |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 1.1 | 43 | 0.0050 | 0.67 | | **Sheet Flow, Flat Roof to Drain** Smooth surfaces n= 0.011 P2= 3.22" |
| 0.4 | 65 | 0.0100 | 2.86 | 0.56 | **Pipe Channel, Roof Drain to Rain garden** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013 Corrugated PE, smooth interior |
| 1.5 | 108 | Total | | | |

## Subcatchment 209: 209 - Portion of Proposed Building Tentant A, Rain Garden #2, Lawn, and Walkwa



## Summary for Subcatchment 210: 210 - Existing South features remaining to DP2

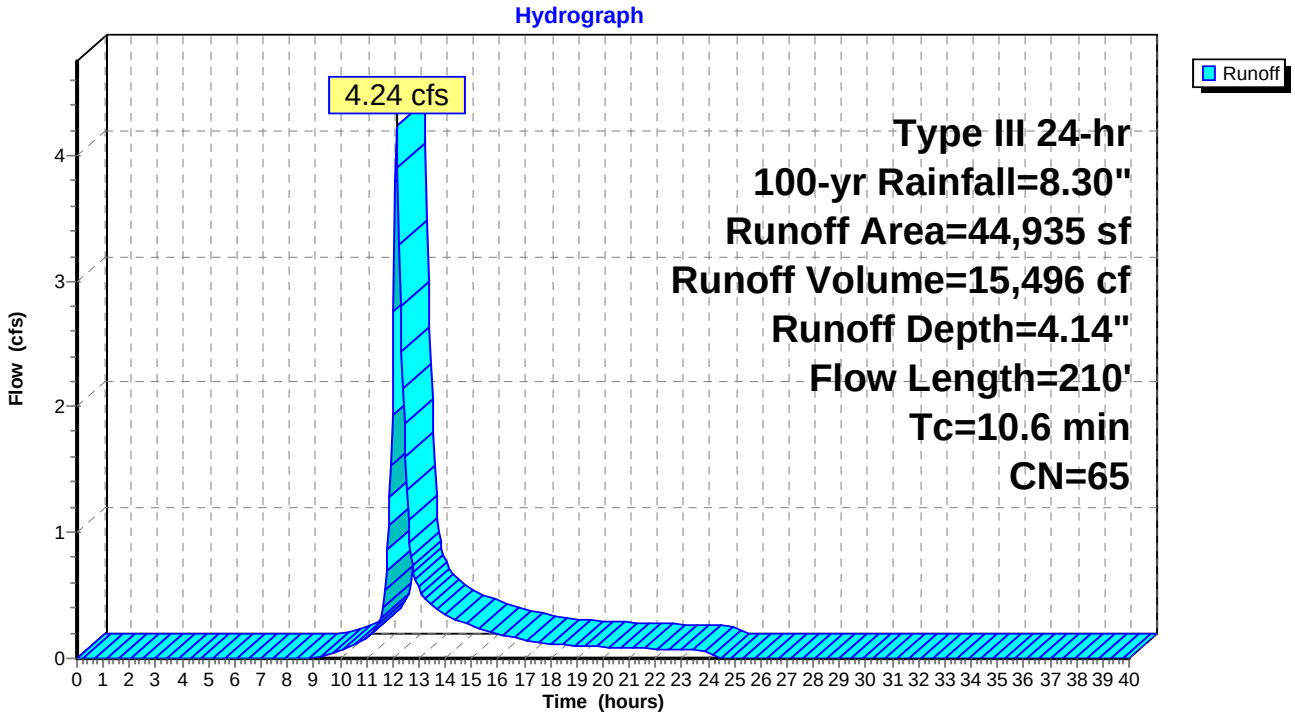
Runoff = 4.24 cfs @ 12.15 hrs, Volume= 15,496 cf, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 35,498 | 65 | Brush, Good, HSG C |
| * | 9,437 | 65 | Brush, Good, HSG C, Wetland Brush |
| | 44,935 | 65 | Weighted Average |
| | 44,935 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0600 | 0.18 | | **Sheet Flow,** Grass: Dense n= 0.240 P2= 3.22" |
| 1.4 | 110 | 0.0360 | 1.33 | | **Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps |
| 10.6 | 210 | Total | | | |

## Subcatchment 210: 210 - Existing South features remaining to DP2



## Summary for Subcatchment 300: 300 - Lawn East to DP3

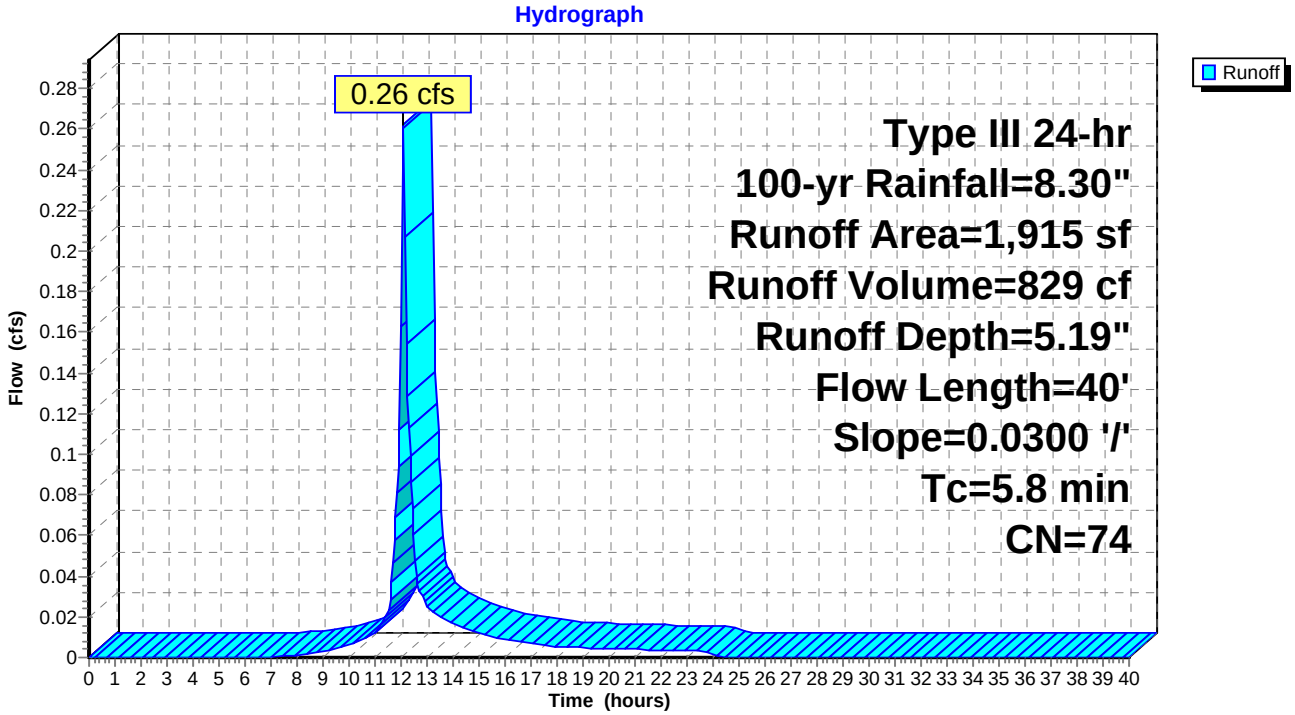
Runoff = 0.26 cfs @ 12.09 hrs, Volume= 829 cf, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.30"

| Area (sf) | CN | Description |
|---|---|---|
| 1,915 | 74 | >75% Grass cover, Good, HSG C |
| 1,915 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.8 | 40 | 0.0300 | 0.11 | | **Sheet Flow, Overland Flow**<br>Grass: Dense n= 0.240 P2= 3.22" |

## Subcatchment 300: 300 - Lawn East to DP3



## Summary for Pond 1P: Infiltration System

Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 2.88 cfs @ 12.03 hrs, Volume= 9,548 cf
Outflow = 1.59 cfs @ 12.14 hrs, Volume= 9,548 cf, Atten= 45%, Lag= 6.8 min
Discarded = 0.26 cfs @ 11.45 hrs, Volume= 8,360 cf
Primary = 1.33 cfs @ 12.14 hrs, Volume= 1,188 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.24' @ 12.14 hrs Surf.Area= 1,342 sf Storage= 2,043 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 39.1 min ( 775.9 - 736.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 16.80' | 961 cf | **Stone field surrounding chambers (Irregular)** Listed below<br>3,623 cf Overall - 1,222 cf Embedded = 2,401 cf x 40.0% Voids |
| #2 | 17.30' | 1,222 cf | **Cultec R180 Chambers, 56 units** Listed below Inside #1 |
| | | 2,183 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 16.80 | 1,342 | 175.5 | 0 | 0 | 1,342 |
| 19.50 | 1,342 | 175.5 | 3,623 | 3,623 | 1,816 |

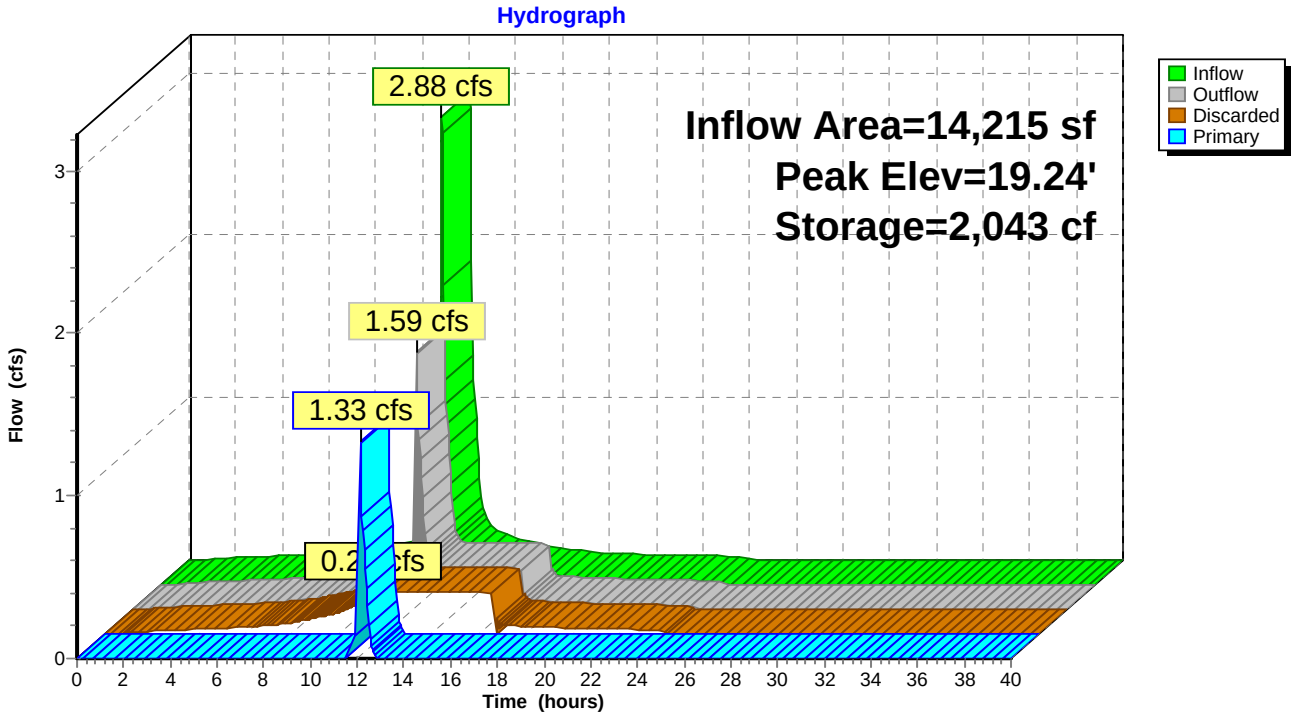
| Elevation (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|
| 17.30 | 0 | 0 |
| 18.10 | 460 | 460 |
| 18.70 | 522 | 982 |
| 19.00 | 240 | 1,222 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Discarded | 16.80' | **8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01' |
| #2 | Device 3 | 19.00' | **4.0' long x 0.5' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00<br>Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Primary | 16.80' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.80' / 16.50' S= 0.0143 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Discarded OutFlow** Max=0.26 cfs @ 11.45 hrs HW=16.84' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

**Primary OutFlow** Max=1.28 cfs @ 12.14 hrs HW=19.23' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 1.28 cfs of 4.15 cfs potential flow)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.28 cfs @ 1.37 fps)

## Pond 1P: Infiltration System



## Summary for Pond CB1: PCB1

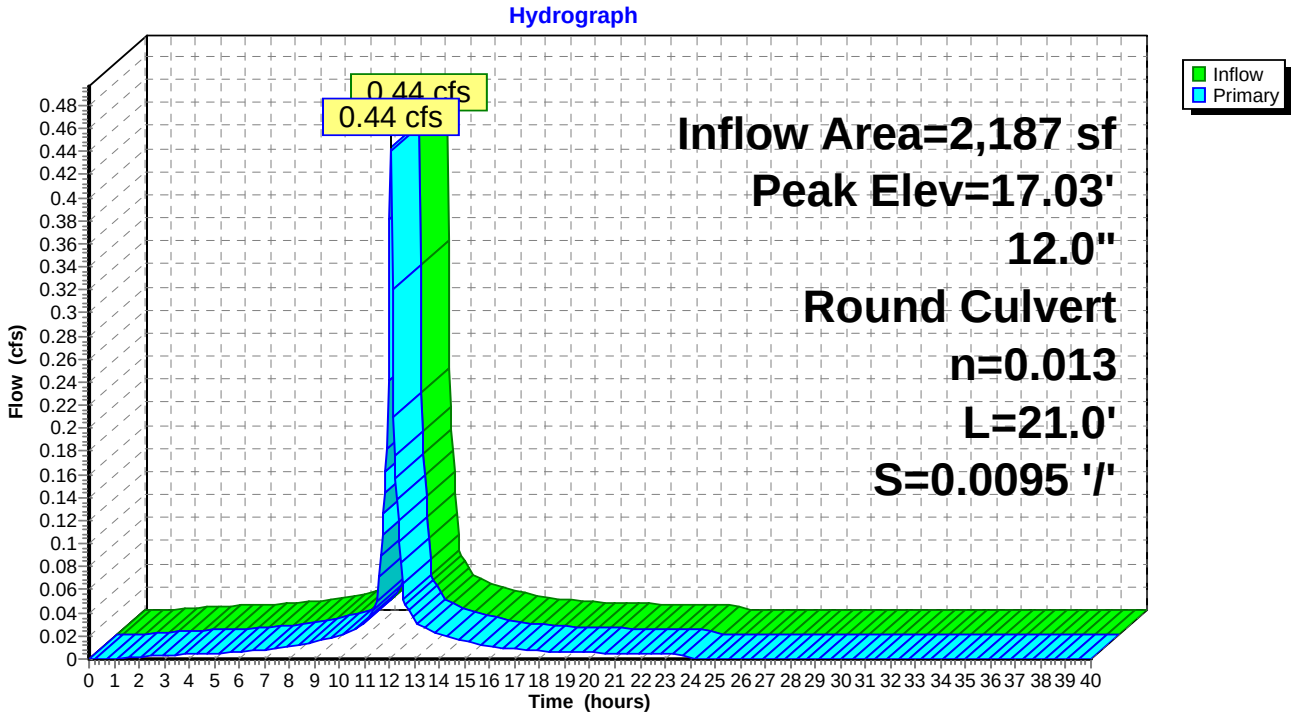
Inflow Area = 2,187 sf, 95.93% Impervious, Inflow Depth = 7.94" for 100-yr event
Inflow = 0.44 cfs @ 12.04 hrs, Volume= 1,447 cf
Outflow = 0.44 cfs @ 12.04 hrs, Volume= 1,447 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.04 hrs, Volume= 1,447 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 17.03' @ 12.07 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.34 cfs @ 12.04 hrs HW=17.01' TW=16.89' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.34 cfs @ 1.62 fps)

## Pond CB1: PCB1



## Summary for Pond CB2: PCB2

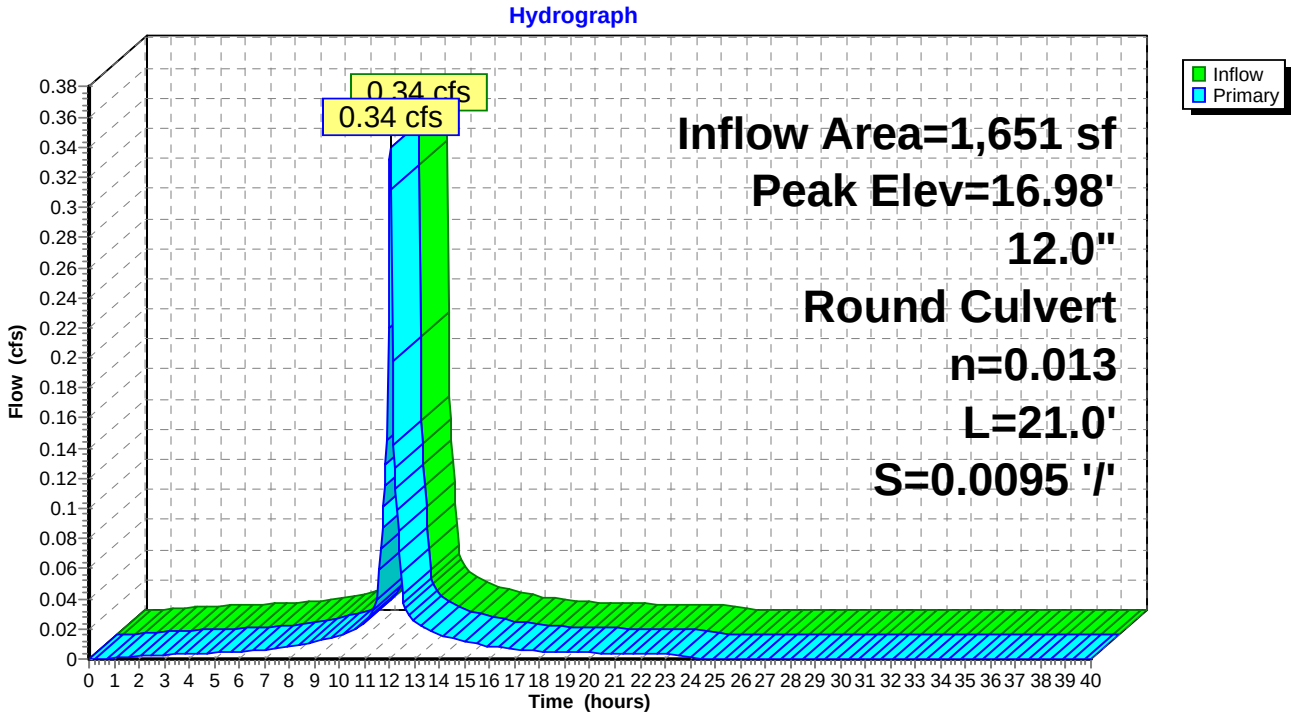
Inflow Area = 1,651 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 0.34 cfs @ 12.02 hrs, Volume= 1,109 cf
Outflow = 0.34 cfs @ 12.02 hrs, Volume= 1,109 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.34 cfs @ 12.02 hrs, Volume= 1,109 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.98' @ 12.06 hrs
Flood Elev= 19.50'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.60' | **12.0" Round Culvert**<br>L= 21.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.60' / 16.40' S= 0.0095 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.23 cfs @ 12.02 hrs HW=16.95' TW=16.86' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.23 cfs @ 1.38 fps)

## Pond CB2: PCB2



## Summary for Pond CB3: PCB3

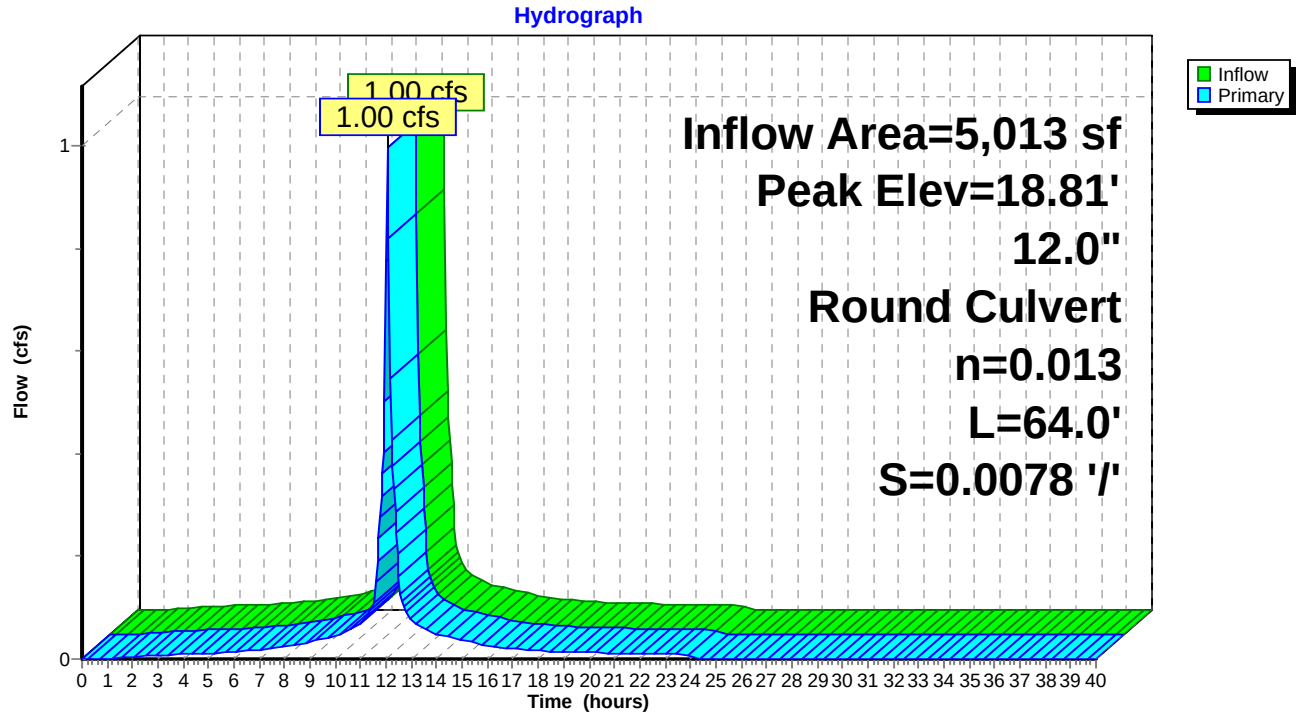
Inflow Area = 5,013 sf, 96.69% Impervious, Inflow Depth = 7.94" for 100-yr event
Inflow = 1.00 cfs @ 12.05 hrs, Volume= 3,317 cf
Outflow = 1.00 cfs @ 12.05 hrs, Volume= 3,317 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.00 cfs @ 12.05 hrs, Volume= 3,317 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.81' @ 12.09 hrs
Flood Elev= 20.70'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.00' | **12.0" Round Culvert**<br>L= 64.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.00' / 17.50' S= 0.0078 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.74 cfs @ 12.05 hrs HW=18.79' TW=18.66' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.74 cfs @ 1.52 fps)

## Pond CB3: PCB3



## Summary for Pond CB4: PCB4

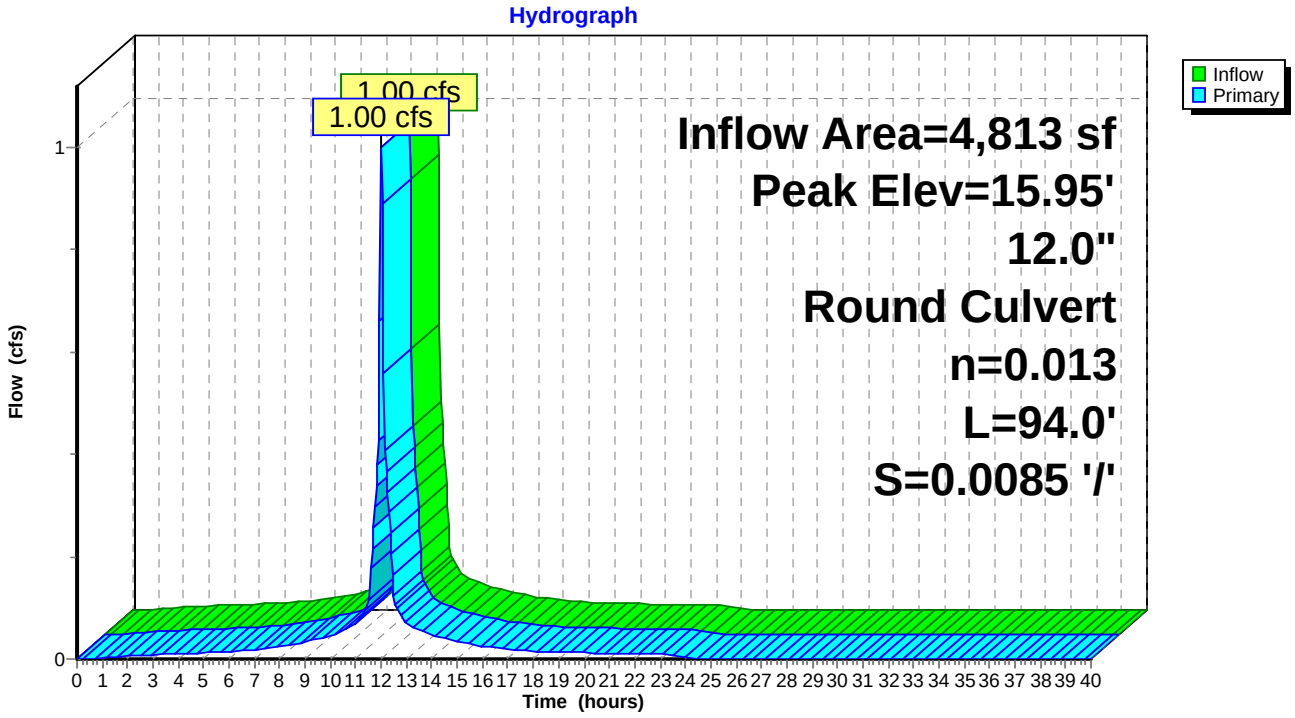
Inflow Area = 4,813 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 1.00 cfs @ 12.01 hrs, Volume= 3,233 cf
Outflow = 1.00 cfs @ 12.01 hrs, Volume= 3,233 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.00 cfs @ 12.01 hrs, Volume= 3,233 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.95' @ 12.11 hrs
Flood Elev= 17.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.10' | **12.0" Round Culvert**<br>L= 94.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.10' / 14.30' S= 0.0085 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.55 cfs @ 12.01 hrs HW=15.73' TW=15.56' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.55 cfs @ 1.50 fps)

### Pond CB4: PCB4



## Summary for Pond CB5: PCB5

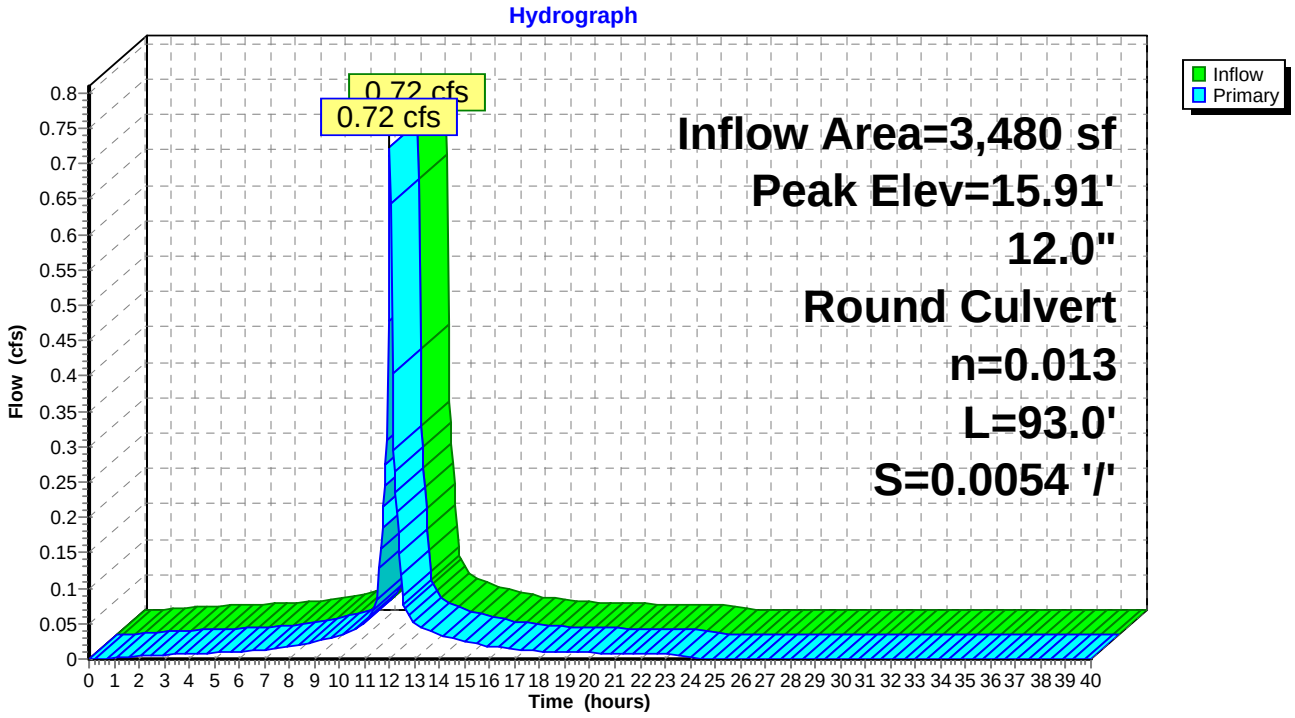
Inflow Area = 3,480 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 0.72 cfs @ 12.01 hrs, Volume= 2,337 cf
Outflow = 0.72 cfs @ 12.01 hrs, Volume= 2,337 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.72 cfs @ 12.01 hrs, Volume= 2,337 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.91' @ 12.11 hrs
Flood Elev= 17.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.80' | **12.0" Round Culvert**<br>L= 93.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.80' / 14.30' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.00 cfs @ 12.01 hrs HW=15.46' TW=15.56' (Dynamic Tailwater)
└**1=Culvert** ( Controls 0.00 cfs)

## Pond CB5: PCB5



## Summary for Pond CB6: PCB6

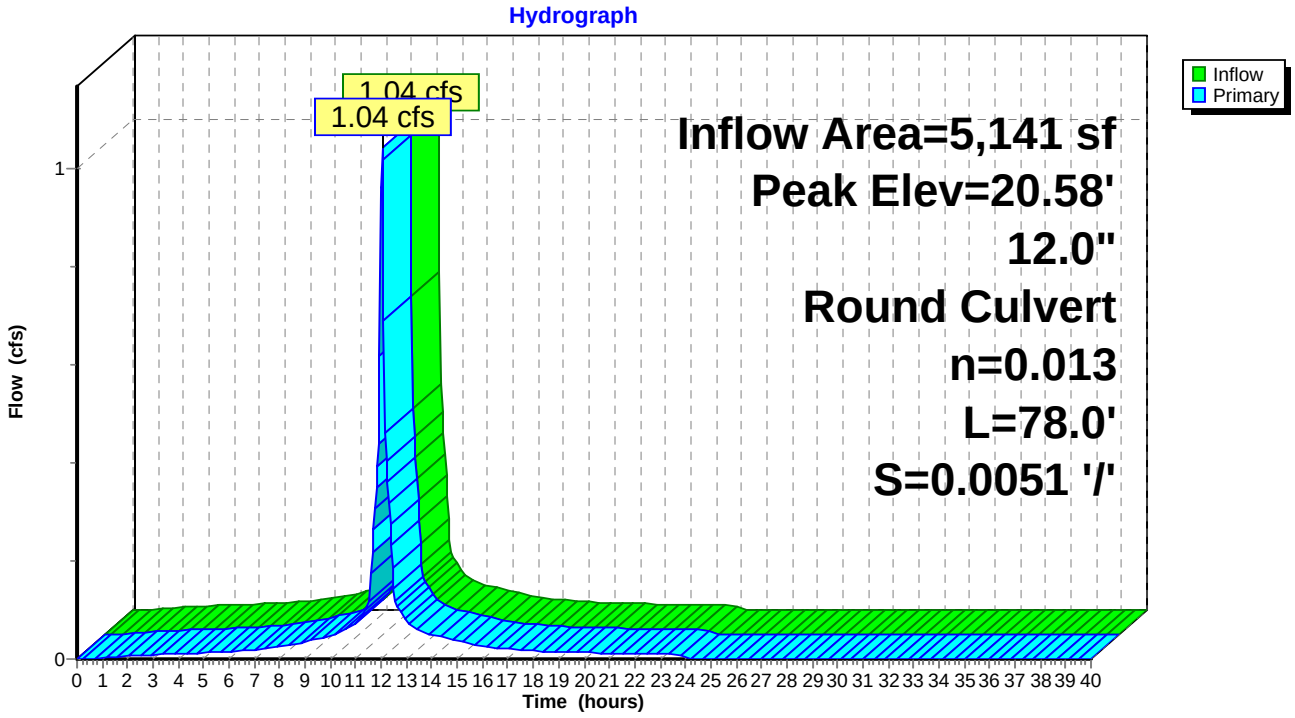
Inflow Area = 5,141 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 1.04 cfs @ 12.03 hrs, Volume= 3,453 cf
Outflow = 1.04 cfs @ 12.03 hrs, Volume= 3,453 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.03 hrs, Volume= 3,453 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.58' @ 12.05 hrs
Flood Elev= 22.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.90' | **12.0" Round Culvert**<br>L= 78.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.90' / 19.50' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.90 cfs @ 12.03 hrs HW=20.55' TW=20.17' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.90 cfs @ 2.35 fps)

## Pond CB6: PCB6



## Summary for Pond CB7: PCB7

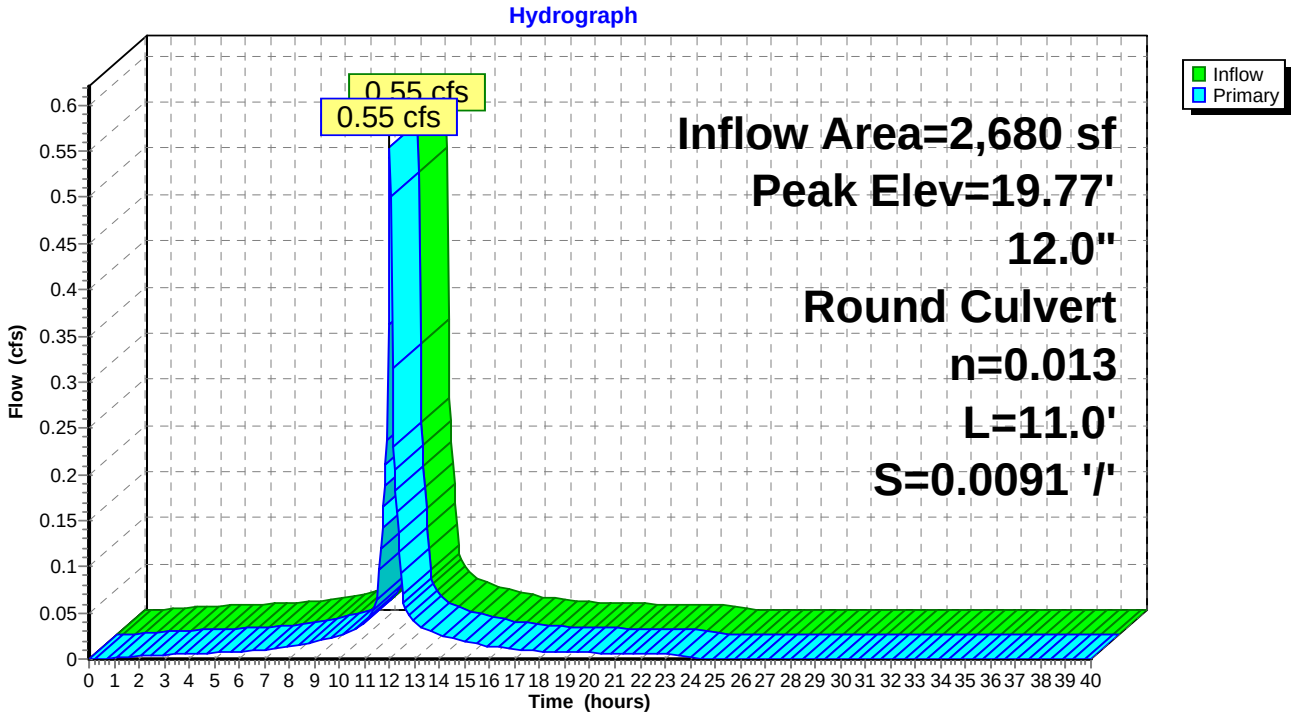
Inflow Area = 2,680 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 0.55 cfs @ 12.02 hrs, Volume= 1,800 cf
Outflow = 0.55 cfs @ 12.02 hrs, Volume= 1,800 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.55 cfs @ 12.02 hrs, Volume= 1,800 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.77' @ 12.15 hrs
Flood Elev= 21.60'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.90' | **12.0" Round Culvert**<br>L= 11.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.90' / 18.80' S= 0.0091 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.00 cfs @ 12.02 hrs HW=19.48' TW=19.52' (Dynamic Tailwater)
↑**1=Culvert** ( Controls 0.00 cfs)

## Pond CB7: PCB7

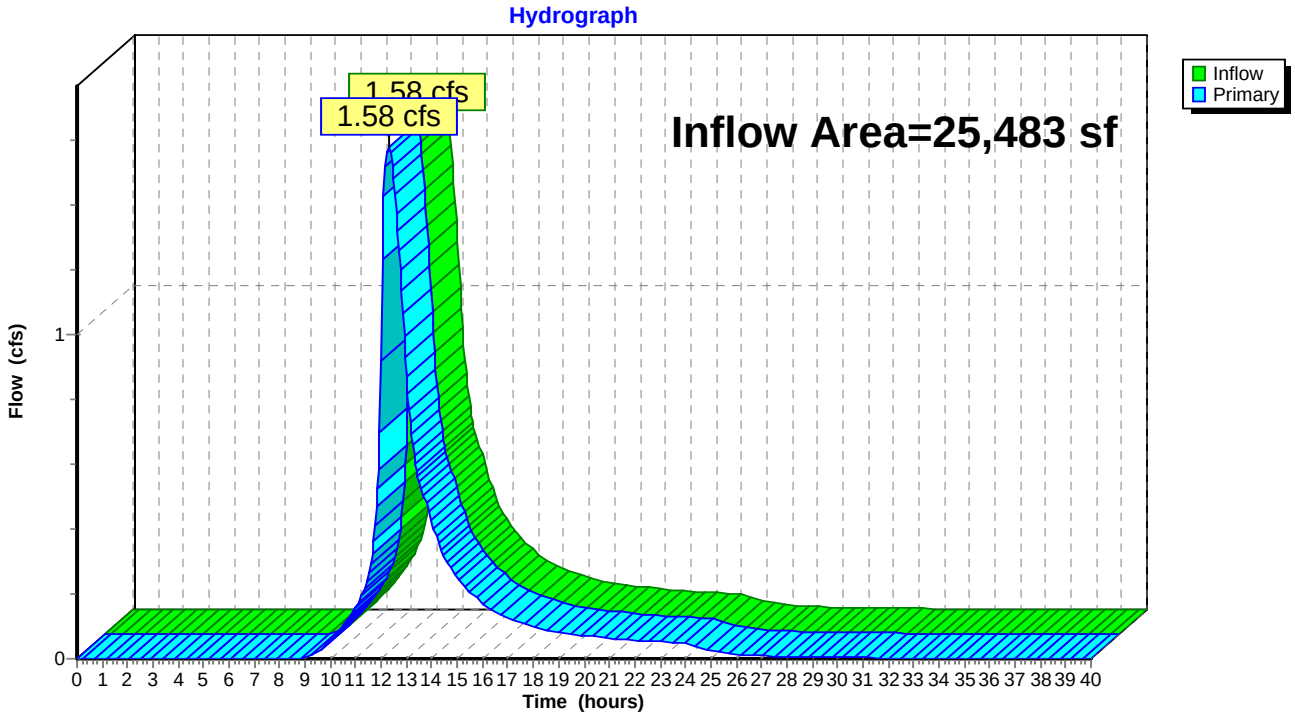


## Summary for Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

Inflow Area = 25,483 sf, 55.96% Impervious, Inflow Depth > 6.18" for 100-yr event
Inflow = 1.58 cfs @ 12.29 hrs, Volume= 13,116 cf
Primary = 1.58 cfs @ 12.29 hrs, Volume= 13,116 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

### Pond DP1: Design Pont #1_18" RCP Culvert - Northwest

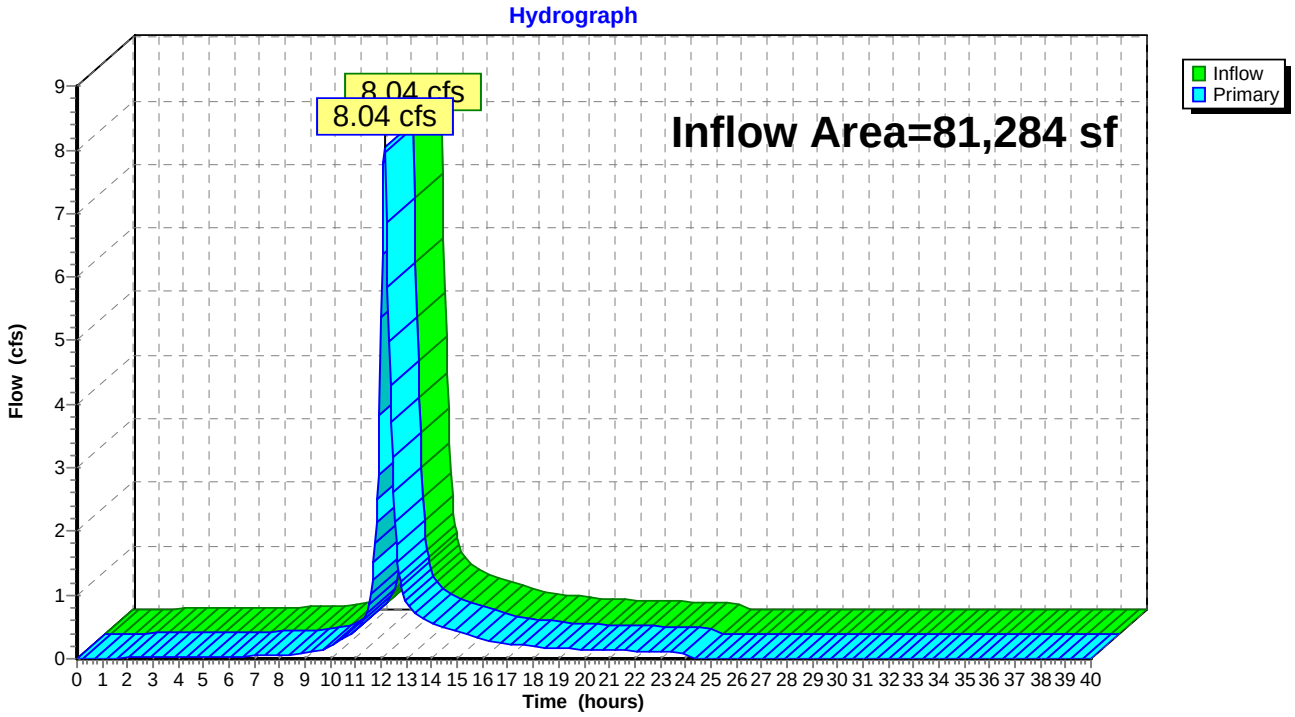


## Summary for Pond DP2: Design Pont #2_Wetland-South

Inflow Area = 81,284 sf, 40.77% Impervious, Inflow Depth = 4.44" for 100-yr event
Inflow = 8.04 cfs @ 12.13 hrs, Volume= 30,092 cf
Primary = 8.04 cfs @ 12.13 hrs, Volume= 30,092 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP2: Design Pont #2_Wetland-South

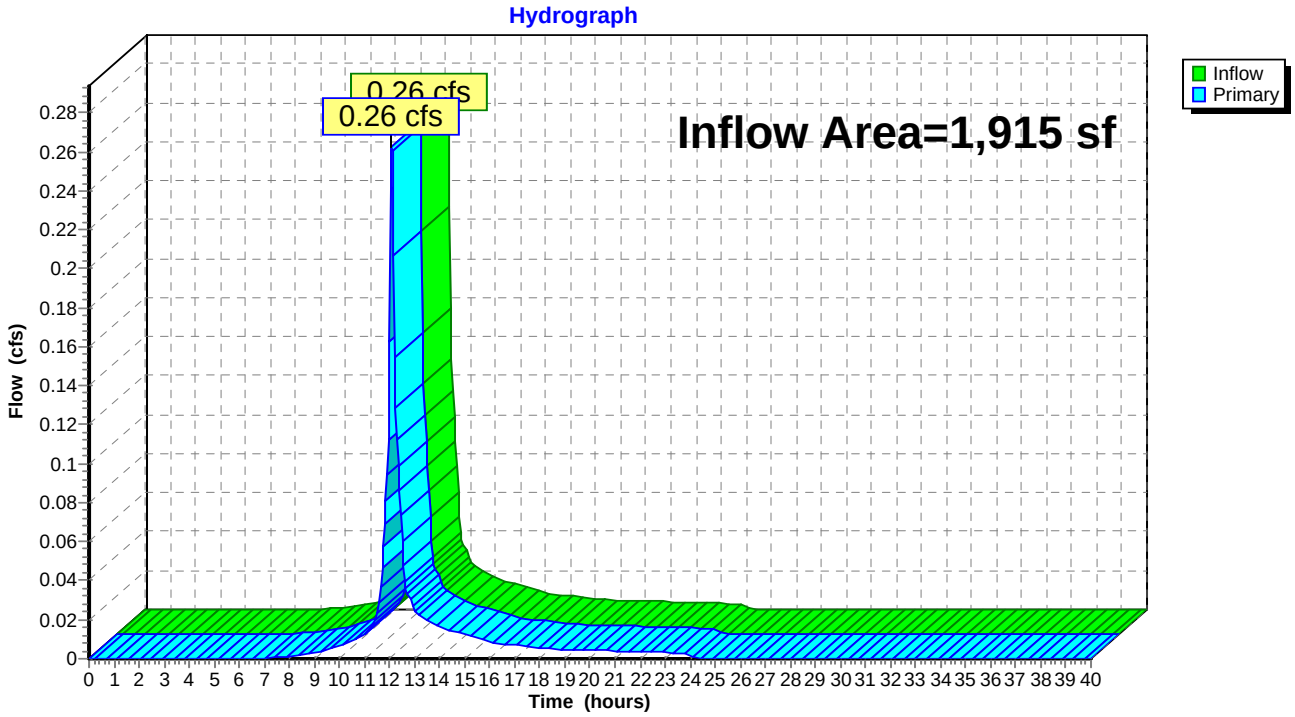


## Summary for Pond DP3: Design Pont #3_Abutting Lot-East

Inflow Area = 1,915 sf, 0.00% Impervious, Inflow Depth = 5.19" for 100-yr event
Inflow = 0.26 cfs @ 12.09 hrs, Volume= 829 cf
Primary = 0.26 cfs @ 12.09 hrs, Volume= 829 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

## Pond DP3: Design Pont #3_Abutting Lot-East



## Summary for Pond MH1: PDMH1

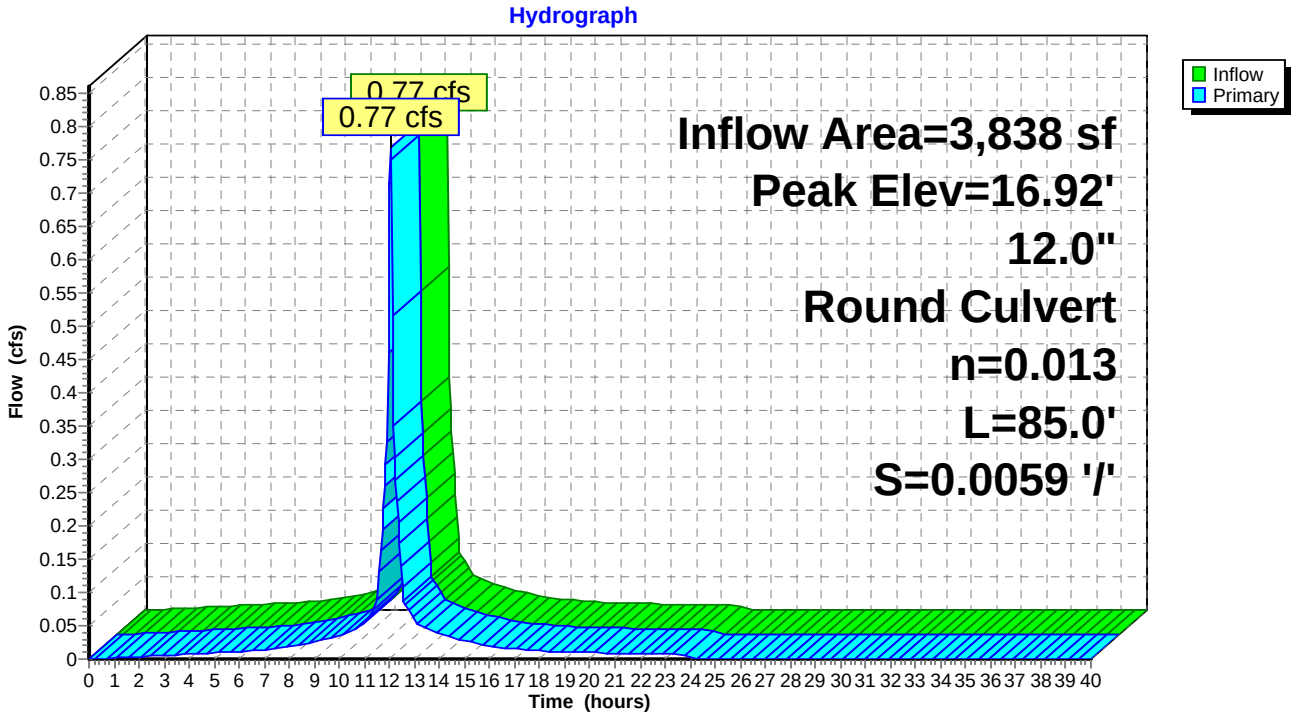
Inflow Area = 3,838 sf, 97.68% Impervious, Inflow Depth = 7.99" for 100-yr event
Inflow = 0.77 cfs @ 12.03 hrs, Volume= 2,556 cf
Outflow = 0.77 cfs @ 12.03 hrs, Volume= 2,556 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.77 cfs @ 12.03 hrs, Volume= 2,556 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.92' @ 12.19 hrs
Flood Elev= 20.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.30' | **12.0" Round Culvert**<br>L= 85.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 16.30' / 15.80' S= 0.0059 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.57 cfs @ 12.03 hrs HW=16.88' TW=16.64' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 0.57 cfs @ 1.75 fps)

## Pond MH1: PDMH1



## Summary for Pond MH2: PDMH2

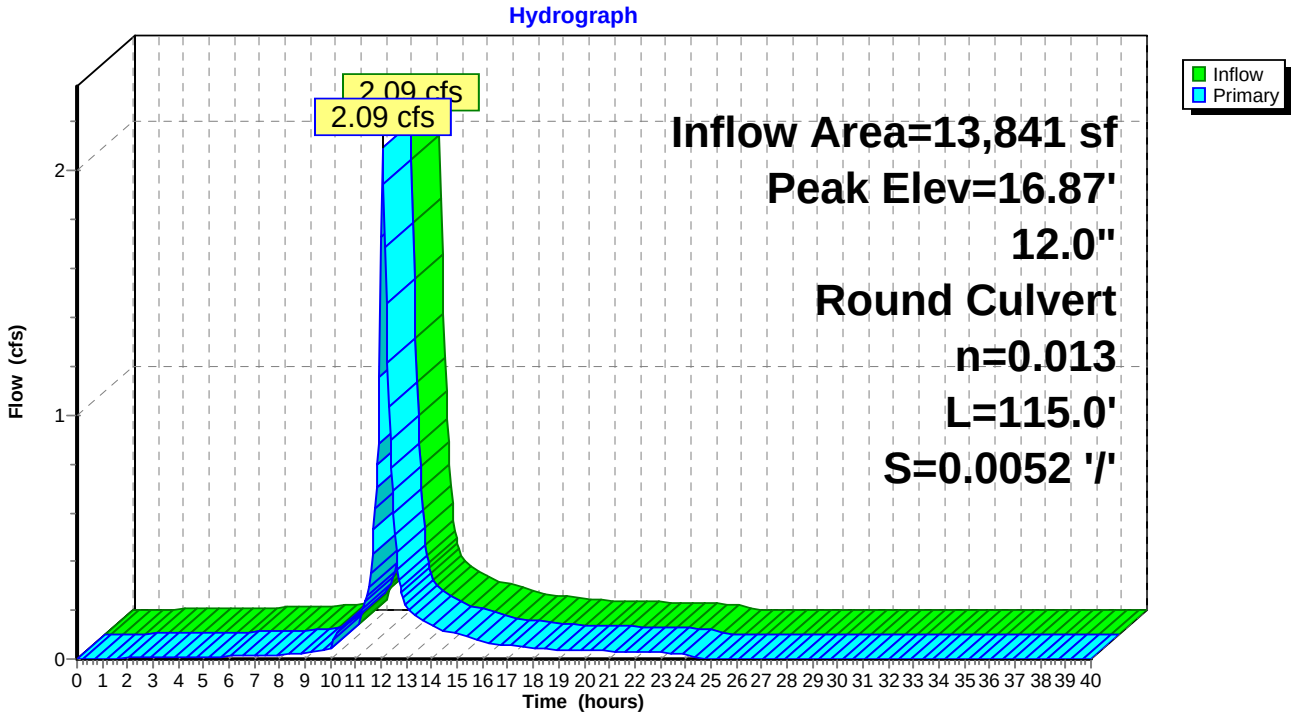
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 6.80" for 100-yr event
Inflow = 2.09 cfs @ 12.06 hrs, Volume= 7,839 cf
Outflow = 2.09 cfs @ 12.06 hrs, Volume= 7,839 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.09 cfs @ 12.06 hrs, Volume= 7,839 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.87' @ 12.14 hrs
Flood Elev= 21.20'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.70' | **12.0" Round Culvert**<br>L= 115.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.70' / 15.10' S= 0.0052 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.67 cfs @ 12.06 hrs HW=16.71' TW=16.21' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.67 cfs @ 2.62 fps)

### Pond MH2: PDMH2



## Summary for Pond MH3: PDMH3

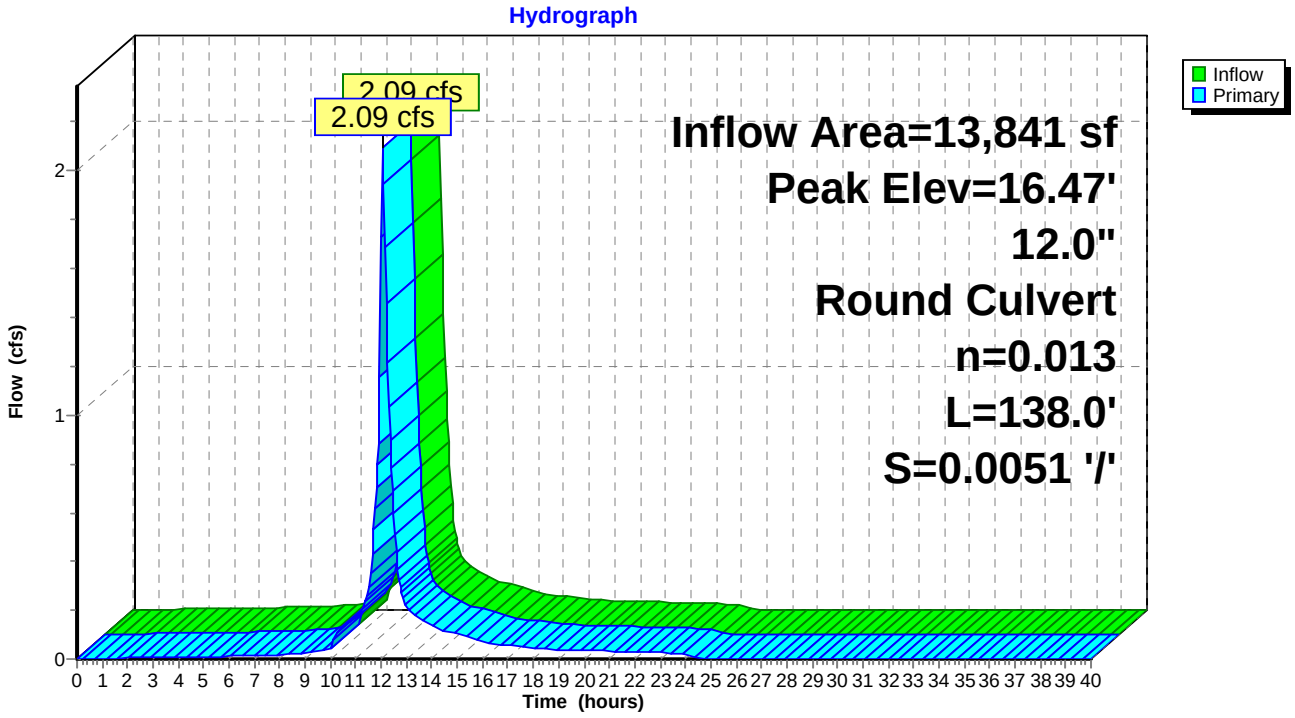
Inflow Area = 13,841 sf, 76.82% Impervious, Inflow Depth = 6.80" for 100-yr event
Inflow = 2.09 cfs @ 12.06 hrs, Volume= 7,839 cf
Outflow = 2.09 cfs @ 12.06 hrs, Volume= 7,839 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.09 cfs @ 12.06 hrs, Volume= 7,839 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.47' @ 12.10 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.00' | **12.0" Round Culvert**<br>L= 138.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 15.00' / 14.30' S= 0.0051 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.54 cfs @ 12.06 hrs HW=16.21' TW=15.86' (Dynamic Tailwater)
**1=Culvert** (Outlet Controls 1.54 cfs @ 2.06 fps)

### Pond MH3: PDMH3



## Summary for Pond MH4: PDMH4

Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 7.27" for 100-yr event
Inflow = 3.65 cfs @ 12.04 hrs, Volume= 13,409 cf
Outflow = 3.65 cfs @ 12.04 hrs, Volume= 13,409 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.59 cfs @ 12.02 hrs, Volume= 11,947 cf
Secondary = 1.22 cfs @ 12.06 hrs, Volume= 1,462 cf

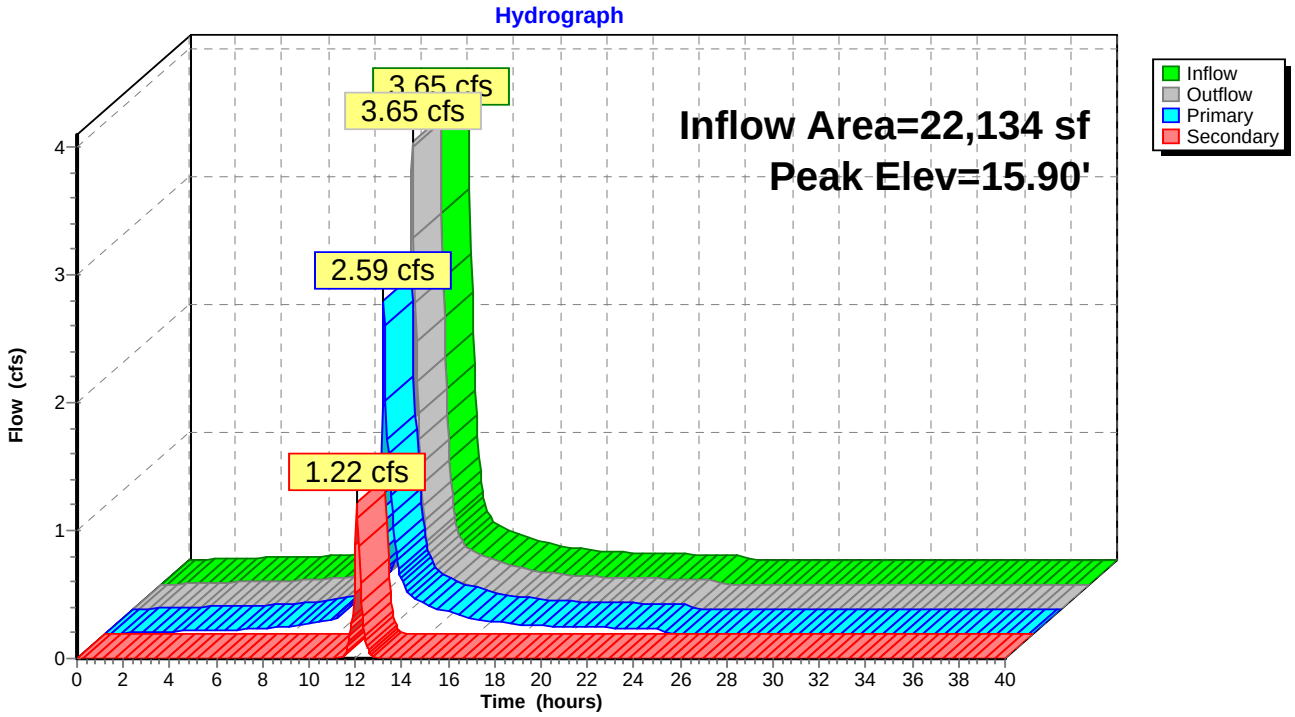
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.90' @ 12.07 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 14.20' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 14.10' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 14.20' | **12.0" Round Culvert**<br>L= 8.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 14.20' / 13.70' S= 0.0625 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 14.55' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=1.62 cfs @ 12.02 hrs HW=15.59' TW=15.30' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.62 cfs @ 2.07 fps)

**Secondary OutFlow** Max=1.18 cfs @ 12.06 hrs HW=15.86' TW=14.78' (Dynamic Tailwater)
└─**2=Culvert** (Passes 1.18 cfs of 3.09 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.18 cfs @ 3.63 fps)

## Pond MH4: PDMH4



## Summary for Pond MH5: PDMH5

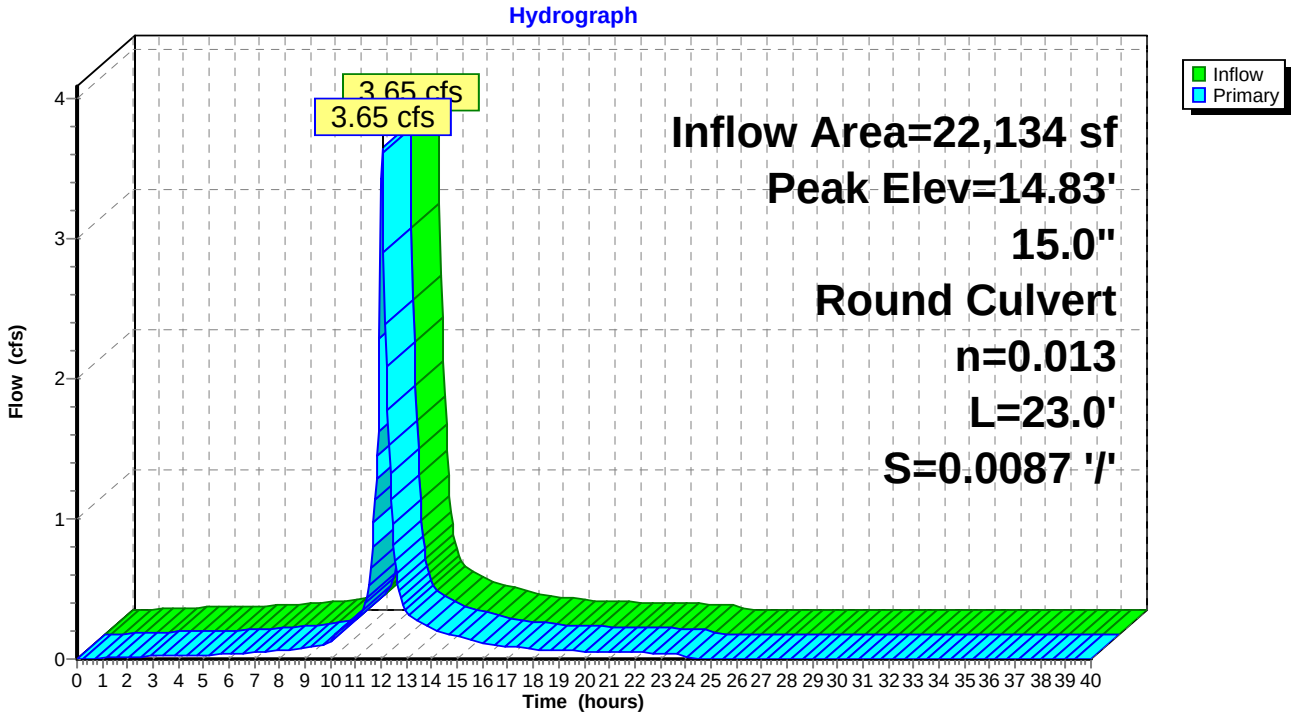
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 7.27" for 100-yr event
Inflow = 3.65 cfs @ 12.04 hrs, Volume= 13,409 cf
Outflow = 3.65 cfs @ 12.04 hrs, Volume= 13,409 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.65 cfs @ 12.04 hrs, Volume= 13,409 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 14.83' @ 12.04 hrs
Flood Elev= 21.40'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.60' | **15.0" Round Culvert**<br>L= 23.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.60' / 13.40' S= 0.0087 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=3.56 cfs @ 12.04 hrs HW=14.81' TW=0.00' (Dynamic Tailwater)
**1=Culvert** (Barrel Controls 3.56 cfs @ 3.73 fps)

### Pond MH5: PDMH5



## Summary for Pond MH6: PDMH6

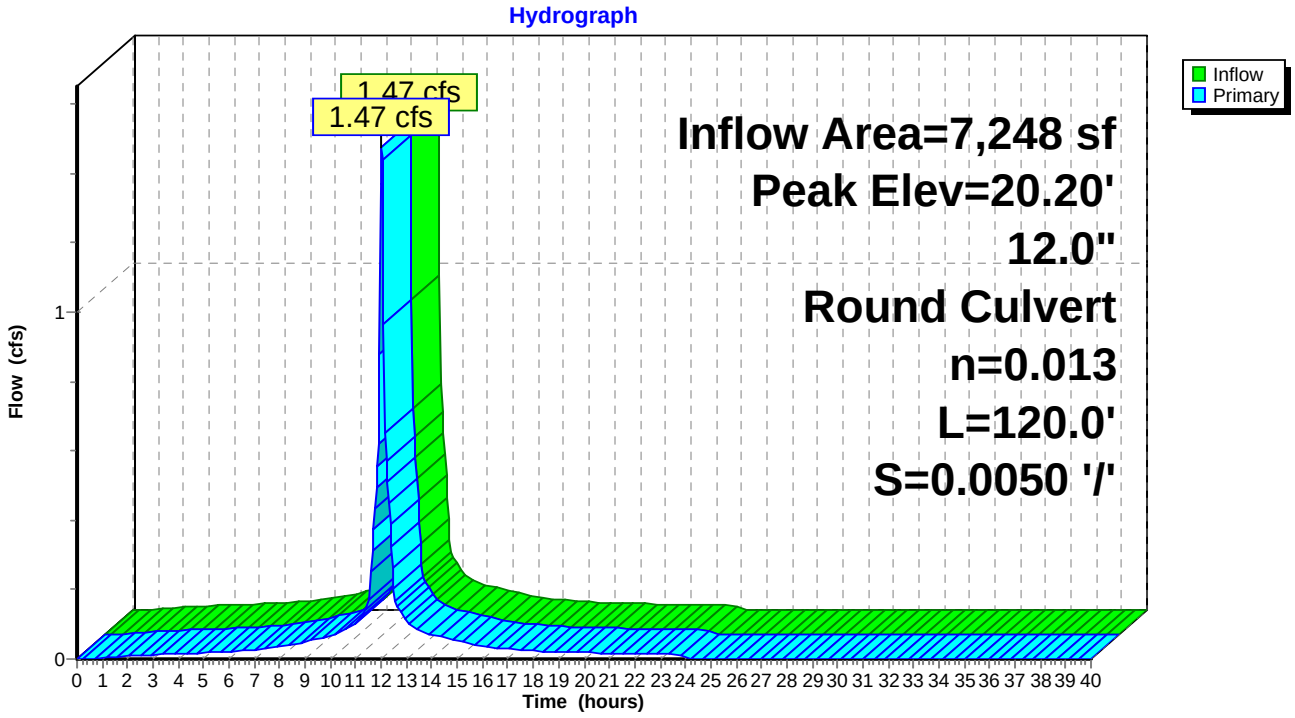
Inflow Area = 7,248 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 1.47 cfs @ 12.03 hrs, Volume= 4,868 cf
Outflow = 1.47 cfs @ 12.03 hrs, Volume= 4,868 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.47 cfs @ 12.03 hrs, Volume= 4,868 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 20.20' @ 12.04 hrs
Flood Elev= 23.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 19.40' | **12.0" Round Culvert**<br>L= 120.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 19.40' / 18.80' S= 0.0050 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.31 cfs @ 12.03 hrs HW=20.17' TW=19.54' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.31 cfs @ 2.78 fps)

### Pond MH6: PDMH6



## Summary for Pond MH7: PDMH7

Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 2.01 cfs @ 12.03 hrs, Volume= 6,668 cf
Outflow = 2.01 cfs @ 12.03 hrs, Volume= 6,668 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.65 cfs @ 12.03 hrs, Volume= 5,924 cf
Secondary = 0.60 cfs @ 12.11 hrs, Volume= 744 cf

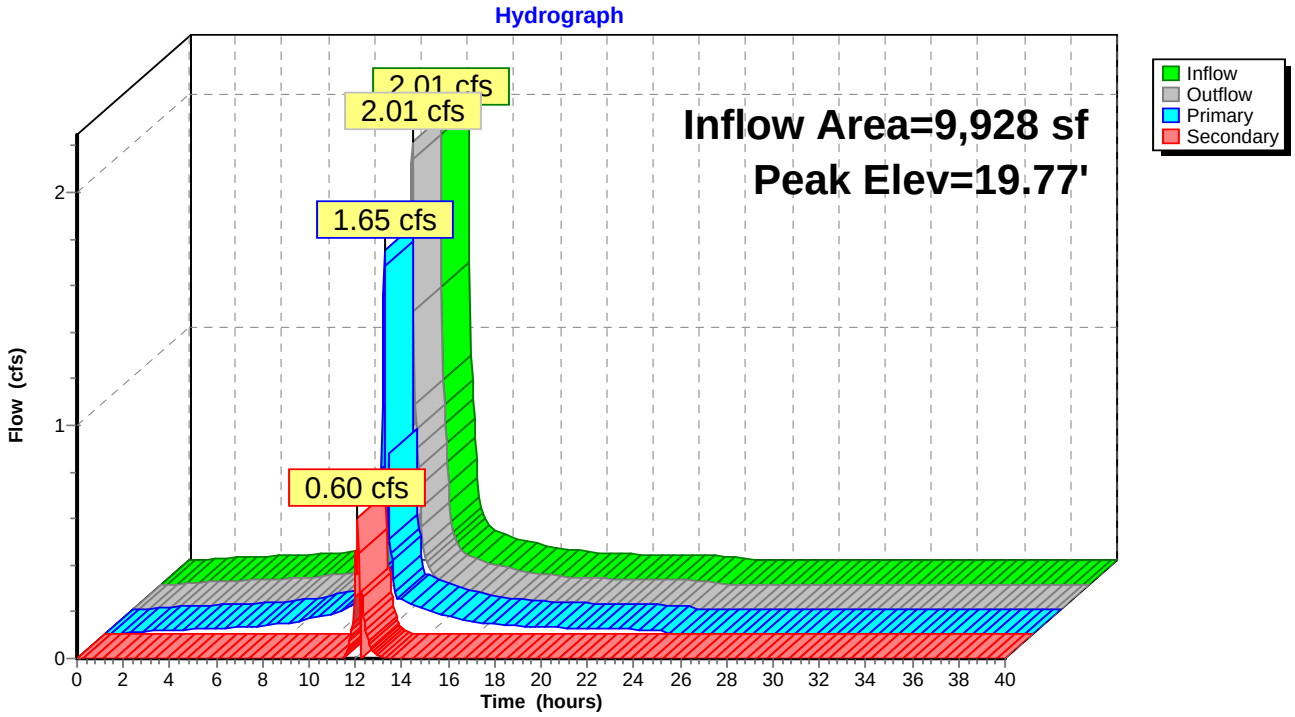
Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.77' @ 12.10 hrs
Flood Elev= 21.80'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.60' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Secondary | 18.70' | **12.0" Round Culvert**<br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.70' / 18.20' S= 0.0500 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #3 | Device 2 | 19.00' | **0.5' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |

**Primary OutFlow** Max=0.20 cfs @ 12.03 hrs HW=19.54' TW=19.54' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.20 cfs @ 0.28 fps)

**Secondary OutFlow** Max=0.67 cfs @ 12.11 hrs HW=19.74' TW=19.25' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.67 cfs of 2.09 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.67 cfs @ 2.59 fps)

## Pond MH7: PDMH7



## Summary for Pond MH8: PDMH8

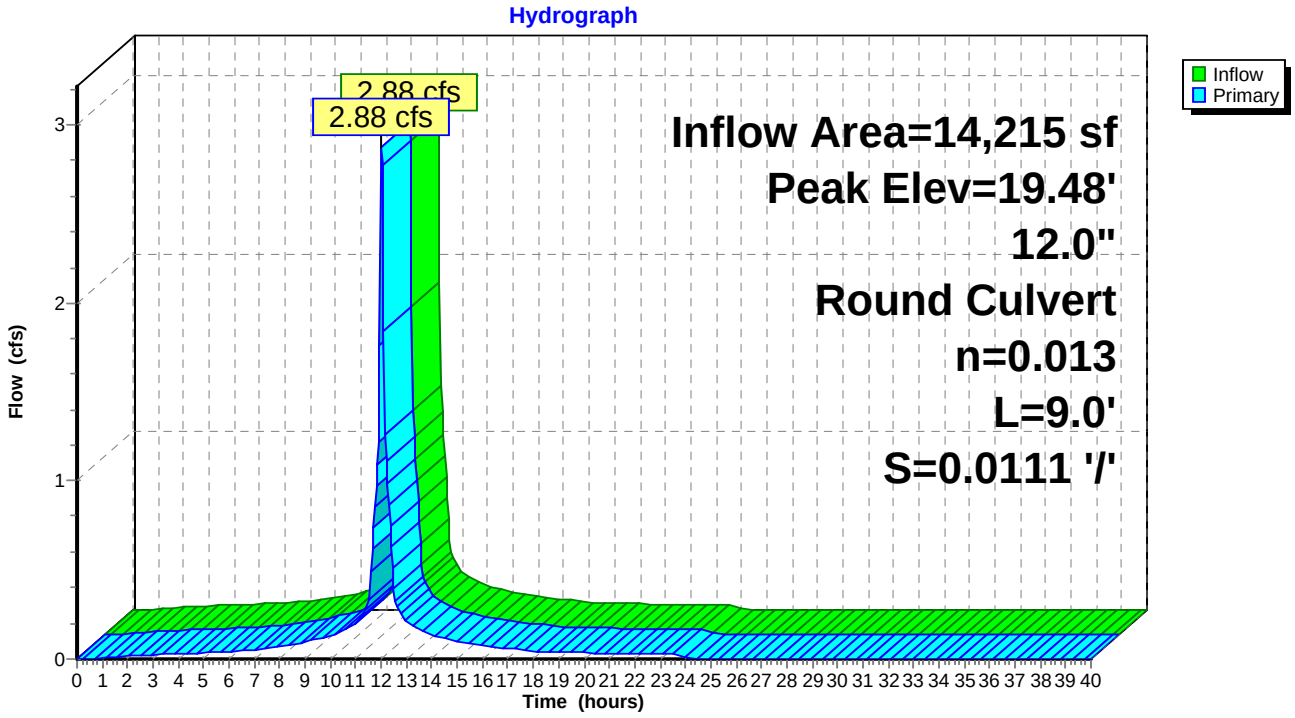
Inflow Area = 14,215 sf,100.00% Impervious, Inflow Depth = 8.06" for 100-yr event
Inflow = 2.88 cfs @ 12.03 hrs, Volume= 9,548 cf
Outflow = 2.88 cfs @ 12.03 hrs, Volume= 9,548 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.88 cfs @ 12.03 hrs, Volume= 9,548 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.48' @ 12.03 hrs
Flood Elev= 22.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.10' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.10' / 18.00' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.67 cfs @ 12.03 hrs HW=19.45' TW=18.65' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 2.67 cfs @ 3.40 fps)

### Pond MH8: PDMH8



## Summary for Pond RG1: Rain Garden #1

Inflow Area = 25,212 sf, 56.56% Impervious, Inflow Depth = 6.54" for 100-yr event
Inflow = 4.44 cfs @ 12.05 hrs, Volume= 13,737 cf
Outflow = 1.56 cfs @ 12.29 hrs, Volume= 12,999 cf, Atten= 65%, Lag= 14.4 min
Primary = 1.56 cfs @ 12.29 hrs, Volume= 12,999 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 16.16' @ 12.29 hrs Surf.Area= 6,385 sf Storage= 4,714 cf
Flood Elev= 16.70' Surf.Area= 6,703 sf Storage= 6,272 cf

Plug-Flow detention time= 115.0 min calculated for 12,999 cf (95% of inflow)
Center-of-Mass det. time= 85.1 min ( 865.4 - 780.4 )

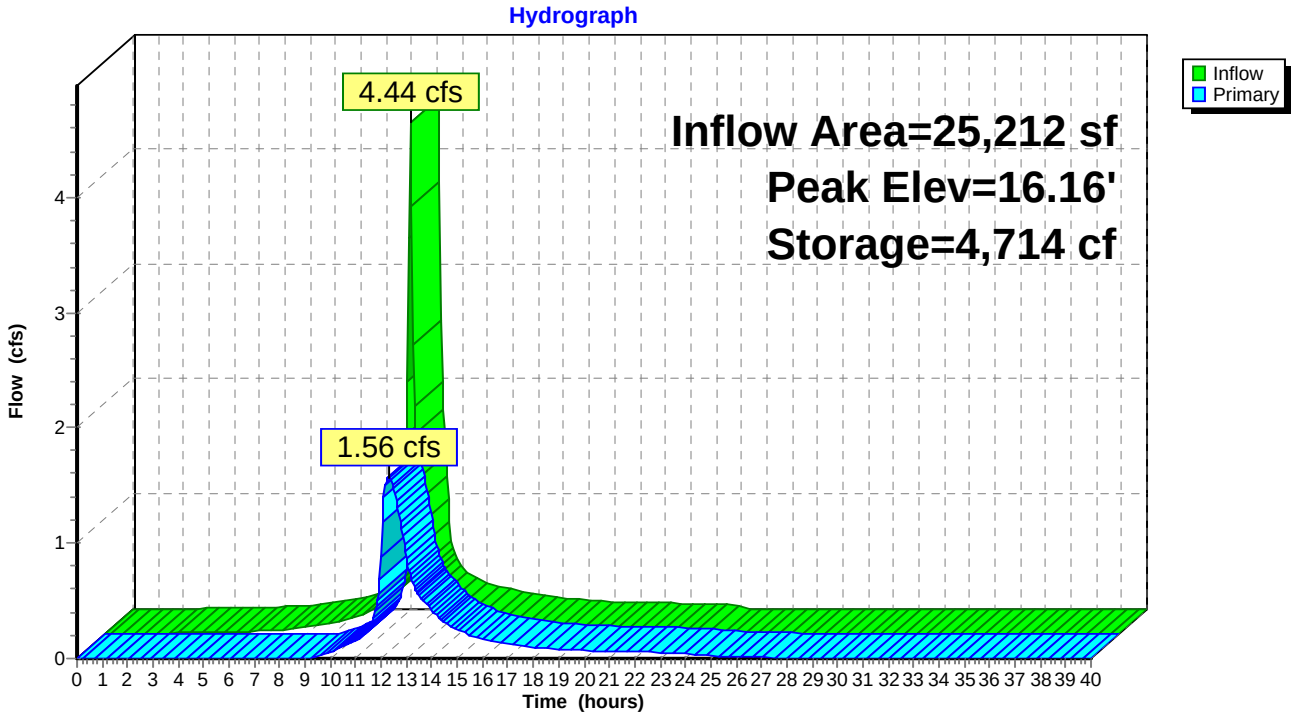
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 15.30' | 6,272 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 15.30 | 4,439 | 288.0 | 0 | 0 | 4,439 |
| 16.00 | 6,173 | 327.0 | 3,698 | 3,698 | 6,360 |
| 16.30 | 6,569 | 334.0 | 1,911 | 5,609 | 6,741 |
| 16.40 | 6,703 | 337.0 | 664 | 6,272 | 6,905 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 15.35' | **8.0" Round Culvert X 2.00**<br>L= 65.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 15.35' / 15.00' S= 0.0054 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf |
| #2 | Device 1 | 15.45' | **4.0" Vert. Orifice/Grate X 3.00** C= 0.600 |
| #3 | Device 1 | 15.80' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 16.35' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=1.56 cfs @ 12.29 hrs HW=16.16' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.56 cfs of 1.88 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.93 cfs @ 3.55 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.63 cfs @ 2.53 fps)
  └**4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG1: Rain Garden #1



## Summary for Pond RG2: Rain Garden #2

Inflow Area = 10,003 sf, 68.81% Impervious, Inflow Depth = 7.16" for 100-yr event
Inflow = 1.87 cfs @ 12.04 hrs, Volume= 5,971 cf
Outflow = 1.43 cfs @ 12.10 hrs, Volume= 5,283 cf, Atten= 24%, Lag= 3.6 min
Primary = 1.43 cfs @ 12.10 hrs, Volume= 5,283 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 18.70' @ 12.10 hrs Surf.Area= 1,006 sf Storage= 1,231 cf
Flood Elev= 19.00' Surf.Area= 1,118 sf Storage= 1,546 cf

Plug-Flow detention time= 103.6 min calculated for 5,276 cf (88% of inflow)
Center-of-Mass det. time= 49.8 min ( 813.3 - 763.6 )

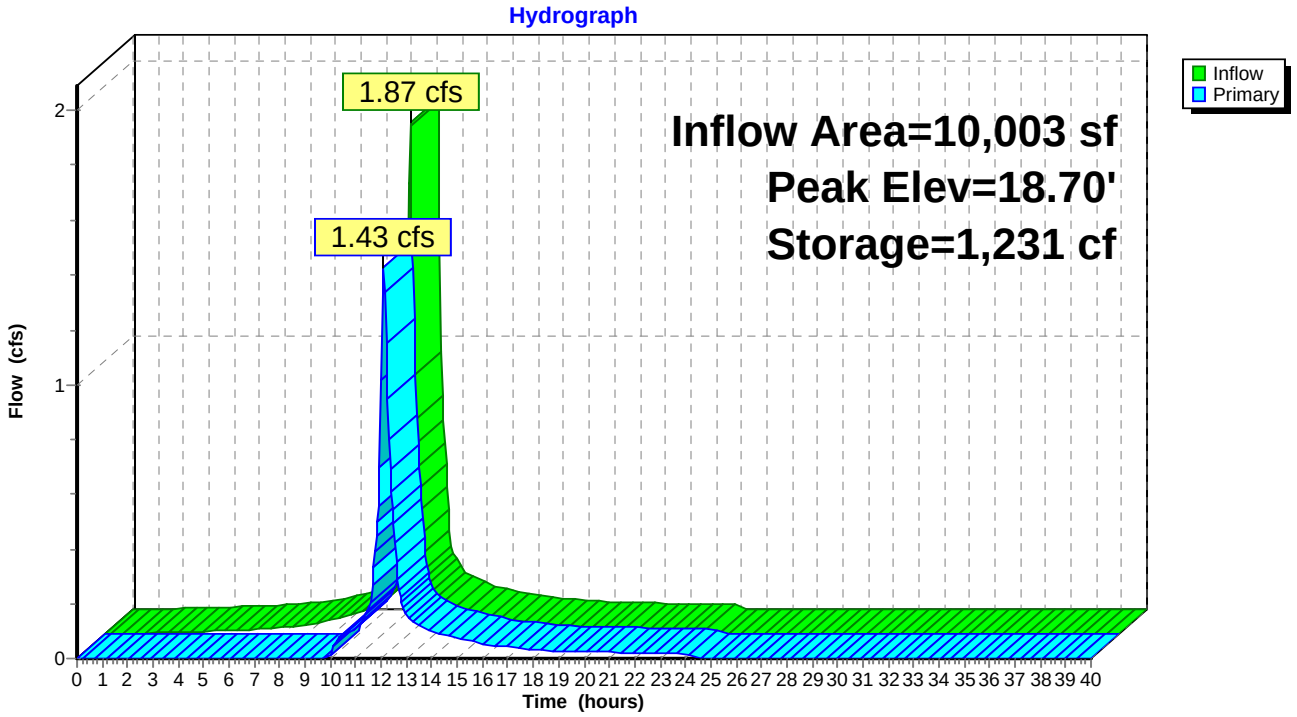
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 17.00' | 2,934 cf | **Custom Stage Data (Irregular)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---|---|---|---|---|---|
| 17.00 | 468 | 89.0 | 0 | 0 | 468 |
| 18.00 | 765 | 108.0 | 610 | 610 | 782 |
| 19.00 | 1,118 | 127.0 | 936 | 1,546 | 1,156 |
| 20.00 | 1,676 | 152.0 | 1,388 | 2,934 | 1,728 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 16.50' | **12.0" Round Culvert X 2.00**<br>L= 53.0' CPP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 16.50' / 15.80' S= 0.0132 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 18.10' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 18.40' | **18.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 19.20' | **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |

**Primary OutFlow** Max=1.42 cfs @ 12.10 hrs HW=18.70' TW=16.76' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.42 cfs of 8.71 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.87 cfs @ 3.46 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.56 cfs @ 2.24 fps)
  └**4=Orifice/Grate** ( Controls 0.00 cfs)

## Pond RG2: Rain Garden #2



## Summary for Pond WQU1: Water Quality Unit 1

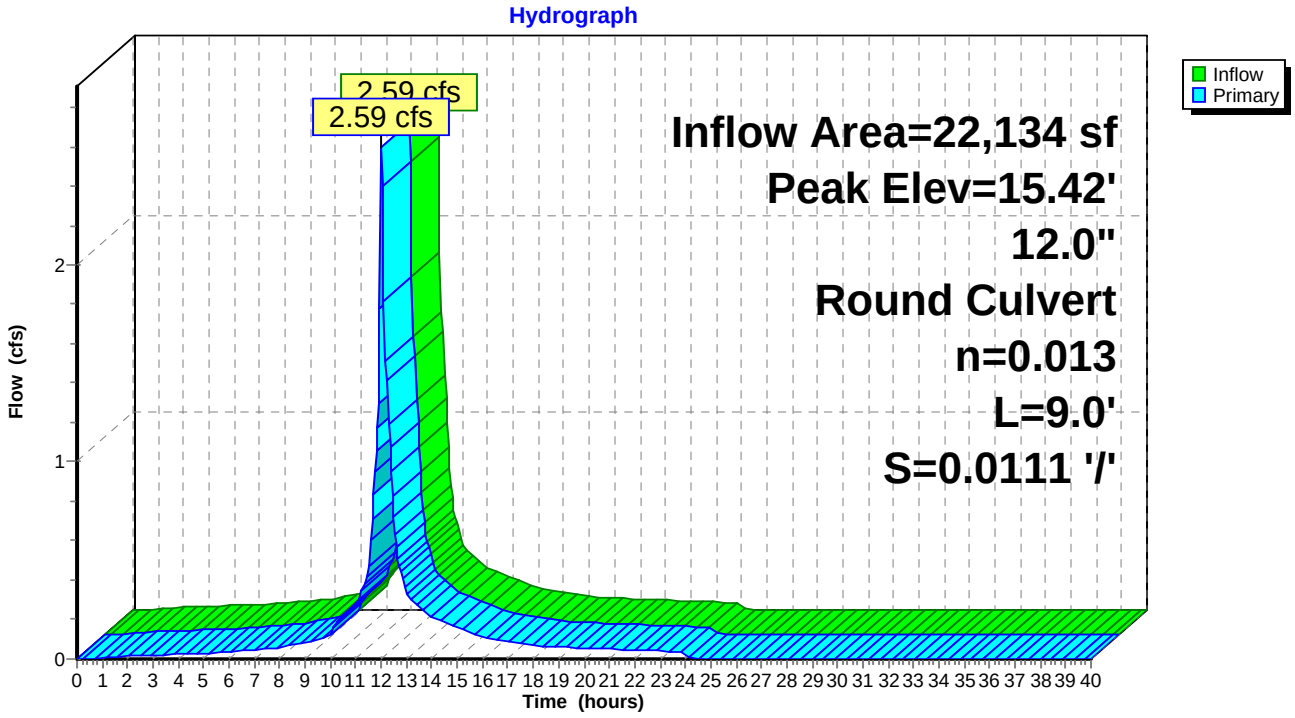
Inflow Area = 22,134 sf, 85.50% Impervious, Inflow Depth = 6.48" for 100-yr event
Inflow = 2.59 cfs @ 12.02 hrs, Volume= 11,947 cf
Outflow = 2.59 cfs @ 12.02 hrs, Volume= 11,947 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.59 cfs @ 12.02 hrs, Volume= 11,947 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 15.42' @ 12.05 hrs
Flood Elev= 21.00'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 13.80' | **12.0" Round Culvert**<br>L= 9.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 13.80' / 13.70' S= 0.0111 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.12 cfs @ 12.02 hrs HW=15.30' TW=14.79' (Dynamic Tailwater)
**1=Culvert** (Inlet Controls 2.12 cfs @ 2.70 fps)

### Pond WQU1: Water Quality Unit 1



## Summary for Pond WQU2: Water Quality Unit 2

Inflow Area = 9,928 sf,100.00% Impervious, Inflow Depth = 7.16" for 100-yr event
Inflow = 1.65 cfs @ 12.03 hrs, Volume= 5,924 cf
Outflow = 1.65 cfs @ 12.03 hrs, Volume= 5,924 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.65 cfs @ 12.03 hrs, Volume= 5,924 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 19.73' @ 12.06 hrs
Flood Elev= 22.30'

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 18.30' | **12.0" Round Culvert**<br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 18.30' / 18.20' S= 0.0167 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.87 cfs @ 12.03 hrs HW=19.54' TW=19.45' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.87 cfs @ 1.10 fps)

## Pond WQU2: Water Quality Unit 2