

9/14/22

To Warner Planning Board

we hereby request to continue the hearing for Catch Housing - Map 35 Lot 4-3 to September 28, 2026. and extend the period to issue a decision.

Benjamin C Osgood Jr agent

Ben Coy

Catch Housing, Lot 3 Warner NH

From bosgood@rangereng.com <bosgood@rangereng.com>

Date Wed 9/23/2026 2:04 PM

To Karen Coyne <kcoyne@warnernh.gov>; Landuse Secretary <landuse@warnernh.gov>

Cc 'George Holt' <gholt@aries-eng.com>; 'Thomas Furtado' <tfurtado@catchhousing.org>; 'Alexandria Panagiotakos' <apanagiotakos@catchhousing.org>

 2 attachments (9 MB)

2026-09-23 Ranger Responses to Comments Catch Housing.pdf; 2026-09-23 cLOT 3 WARNER CATCH HOUSING PLAN SET.pdf;

External (bosgood@rangereng.com)

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Good Afternoon,

Attached are revised plans for Lot 3 Warner – Catch Housing. These plans include additional revisions to the drainage system that were required when completing the drainage report.

Also attached is a revised response letter, items 11 and 24 changed from the original.

I will be sending the drainage report in a different email and will have hard copies delivered tomorrow.

Ben

Benjamin C. Osgood, Jr., PE
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September 14, 2026
Revised September 23, 2026

Karen Coyne
Town of Warner
Planning Board Chair
5 East Main St
PO Box 265
Warner NH 03278

Re: Site Plan Review Comments
Proposed CATCH 34-Unit Multi-Family Development
Tax Map 35, Lot 4-3
9 Route 103 West Warner, New Hampshire

Dear Chairwoman Coyne,

This letter is our draft response to the comments from the town's peer review engineer and to comments received from the Warner River local Advisory Committee. The majority of the comments are final but a few may change as the drainage calculations and AOT requirements are addressed. Additional information will be submitted for review after the meeting tonight so the plans that we present tonight will be for the purpose of providing updates to the board.

General Comments

1. Warner Geographic Information System (GIS) data indicate the site is located in the Commercial (C-1) Zoning District and the Intervale Overlay District (IOD). Article IX of Warner Zoning Ordinance indicate 25-foot side and back yard setbacks and a 40-foot building setback along the property frontage. The proposed development meets the C-1 dimensional and impervious surfaces requirements.

No response required

2. Article IX of Warner Zoning Ordinance (ZO) limits the maximum gross floor area to 40,000 square feet for an individual building on a lot. Details on the gross square-footage of the proposed apartment building were not found on the Site Plans reviewed by Aries. The Planning Board should confirm that the proposed gross floor area does not exceed the allowable area.

The square footage has been listed on CS1001 as 39,200 square feet

3. The Site Plans are stamped by a Professional Engineer (PE), licensed in the State of Massachusetts. Engineering studies and designs conducted in the State of New Hampshire are required to be performed by a Professional Engineer licensed in the State of New Hampshire.

Our NH stamp will be put on the plan

4. Sheets 4 and 5 show buildings on Lot 4-2 as “proposed”, while we understand this building has been constructed. The planning board should confirm with the Applicant that the Site Plans depicts “as-built” features on Lot 4-2.

The features shown are as built features, the proposed building note has been revised.

5. According to ZO Article IV, Section I, Height Regulations: No structure shall exceed 35 feet in height except 45 feet in height is allowed in the C-1 and B-1 Districts. "Height" is defined as the vertical distance between the average finished grade within 5 feet of the building and the highest point of the building.

The building height has been added to the zoning table on sheet CS1001

6. An Exterior Elevation Plan depicts a “Typical” elevation of 46’-8” for the southern face of the proposed building and a “Typical” elevation of 37’-0” for the northern face of the proposed building. Based on an average of these values (41’-10”), the proposed building height complies with the Warner ZO.

No response required

Site Access

7. The proposed site access to the 34-unit multi-family development is directly from Route 103 (West Main Street) on an existing access grade via a 24-foot-wide single access driveway. The proposed driveway is located directly across Route 103 from the intersecting North Road. A traffic study should be conducted to provide recommendations for the proposed expansion of this intersection, particularly due to the location of the proposed intersection directly across from North Road. An NHDOT driveway permit approval will be required.

A driveway permit application has been filed

8. The access road grade is proposed to be 8.2%, which is compliant with the Warner Driveway Regulations, dated January 22, 2018.

No response required

9. A 20-foot-wide gravel fire access road is shown to extend approximately half the length of the proposed building located between the building and the sloping land north of the building adjacent to the Route 103 ROW. Aries recommends that the fire access road be extended around the entire perimeter of the site building to the southeastern parking area to provide access to all portions of the site building during a life-safety or fire event. The current Site Plans show no effective exterior access to the eastern and northern portion of the building.

Site grades make it impossible to have a road around the building. The road has been extended to provide more coverage and a sidewalk added around the building for access. The access requirements for NFPA have been met.

10. Snow management for this gravel fire access road also needs to be addressed, so that snow storage is not located at the end of the access road, which would further limit access to the northern and eastern portion of the building.

Snow will be plowed to the uphill side during storms. If snow accumulates to block the access it will be removed to one of the other snow storage areas

11. The Vehicle Turning Plan - Ladder Truck - CS2701 shows turning moments for paved parking areas but does not show turn radii for 40-foot "Pumper Fire Truck" on to the gravel fire lane located on the northwestern side of the site building.
The turning plan has been revised to show the pumper truck going down the fire lane. An additional turning plan has been added that shows a tower truck as requested by the planning board on September 14, 2026
12. Construction details for the proposed gravel access road should be provided to demonstrate that the proposed gravel road is suitable for access by heavy fire department vehicles.
A detail for the gravel road has been added to the plans
13. Aries strongly encourages the Planning Board to consult with the Warner Fire Chief regarding the utility and design of the proposed fire access road.
The Warner Fire Chief has commented on the plans.

Parking

14. The proposed Site Plan requires a waiver from the Section XIX - Access, Parking, Loading and Pedestrian Safety Standards, to permit 1.53 parking spaces per unit where 2.5 parking spaces per unit are required. Aries notes that recent legislation (RSA 674:16, VII) limits how many residential parking spaces a municipality can require and states that a local legislative body, "shall not require more than one residential parking space per unit." Based on this recently adopted legislation, the proposed waiver request meets current NH residential parking space requirements.
No response required

Retaining Walls

15. The Grading and Drainage Plan (Sheet 6) indicates a retaining wall in the northeast corner of the proposed development with an approximate top of wall elevation of 450 feet, and an apparent base elevation at 440 feet, which suggests a significant vertical wall height of approximately 10 feet. A second 10-foot-high retaining wall is proposed to be constructed to the west of the site access road. Available plan details (Detail 9;
Sheet 9) depict a maximum wall height of 3 feet. Aries recommended that retaining walls greater than three feet in height be designed and constructed under the supervision of a Professional Engineer (structural) who is licensed in the State of New Hampshire.
A revised wall detail has been added for a 10' wall with a note that a structural engineer must stamp the wall design prior to being issued a building permit
 16. Existing retaining walls appear to be shown on the Site Plans located along the western and southern limit of the site "Buildable Area" generally adjacent to delineated wetlands. The retaining walls are located outside of delineated wetland and flood zone. The top elevations of the existing retaining walls should be shown on the Site Plans.
Top of wall elevations have been added to the plan on CS1501
 17. In the retaining wall design detail on Sheet 9, Aries recommends installing a 6-inch
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perforated underdrain in the crushed stone backfill behind the base of the wall that drains to daylight.

The underdrain has been added to the detail and the grading and drainage plan.

Flood Zone and Wetlands

18. The Site Plans cover page includes note for protection of Wood Turtles, listed as State Species of Special Concern. The Site Plans appear to provide notice of the presence of protected species to contractors. Aries recommends that a project monitor be retained to confirm compliance with the plan specification during the proposed construction work.

The project will comply with any monitoring requirements imposed by AOT.

19. The Site Plans shows a "Buildable Area" equal to 2.6 acres of a total 13.8 acres. The Buildable Area outside of New Hampshire Shoreland Protection Zone.

No response required

20. The "Buildable Area" has identified wetlands and is in the AE Flood Zone along the western and southern "Buildable Area" margins.

No response required

21. The Federal Emergency Management Agency (FEMA) Zone AE 100-year base flood elevation (BFE) depicted on Ranger's Site Plans is 421 feet. This is consistent with the most recent (2010) flood mapping for the Warner River.

The flood zone is changing, the building and parking lots are still well above the base flood elevation which is now 422.7.

22. The Site Plans do not indicate whether the proposed 3-story site building has a basement. Consistent with New Hampshire Floodplain Management Program regulations, lowest floor (including basement) should be located at or above the base flood elevation consistent with New Hampshire Floodplain Management Program regulations to limits back flow of stormwater through anticipated building footing drains.

The building does not have a basement. The first floor elevation is 432.0 and the new base flood is 422.7

23. Wetland impacts are not depicted on the Site Plans. However, Aries notes that construction of the proposed water and sewer lines are proposed to cross wetlands and a drainage channel/stream located in the northwestern portion of the site.

The proposed water and sewer lines are proposed to be installed by directional boring.

24. Plan approval will be subject to approval of a NHDES Wetlands Permit and Alteration of Terrain (AoT) permit.

The project is subject to AOT, however, we confirmed with NHDES Wetland Bureau that if we do not disturb wetlands we do not need to go to NHDES wetland bureau. Disturbance would include organic matter below the brook, however the directional boring will be 5' below the brook bed which is lower than organic matter extends in that location.

Stormwater Management

25. Stormwater from the site building and paved areas appears to be contained in a closed system by curbing that directs stormwater flow to a Stormwater Pond (stormwater system). Stormwater flows should be attenuated by the proposed stormwater system, and off-site flow rates should be less than or equal the pre-development flows. A hydraulic model and drainage report, which are necessary to size the depicted stormwater system, were not provided for review. A final design of the proposed stormwater system that limits stormwater flows to pre-existing conditions or less should be a condition of Site Plan approval.

No response required

26. The elevations of Seasonal High Groundwater (ESHGW) should be identified in the site test pit logs to clarify separation of the stormwater infiltration from the Stormwater Pond or other infiltration practices proposed.

The ESHGW has been added to the plan along with the older test pits 7 to 9

27. A drainage report that describes the proposed stormwater systems' capacity to manage stormwater was not provided for review.

A drainage report is being submitted

28. Drainage infrastructure is depicted on the Grading and Drainage Plan - CS1501. Drainage appears to be directed from impervious surface toward the proposed catch basins, which is then directed to a stormwater pond.

Correct, all flow from paved surfaces flows to the detention pond. The roof drains to a buried storage structure which has been added under the parking lot.

29. Existing drainage across Route 103 onto the site property is proposed to be redirected to the west of the proposed access road in a new 18-inch culvert in the NHDOT right-of-way (ROW). NHDOT approval will be required.

Noted, A driveway access permit application has been filed.

30. As the owner/applicant is to be responsible for maintenance of all drainage structures in the project, Aries recommend that the Applicant prepare a stormwater management plan that outlines the maintenance requirements and inspection schedule for the proposed stormwater systems. The inspection reports should be maintained at the site by the owner/applicant and available upon request for review by the Town.

A stormwater management plan with inspection requirements has been provided

31. Outlet Control Structure (OCS) detail on Sheet 11 shows finish grade at the top of the practice, which doesn't match the detail provided on Sheet 12. The detail is labeled "OCS-2". The "OCS" in the Stormwater Pond is labeled "OCS" with an invert out elevation of 419.5' and a grate elevation of 421'. Please clarify finish grade.

The OCS has been eliminated and replaced with an outlet weir.

32. Stormwater treatment practices do not appear to treat parking lot stormwater runoff prior to discharging to the stormwater pond. Aries recommends installing a hydrodynamic separator in the storm drain system prior to discharge to the stormwater pond to collect sediment, oil trash and other debris. The specified OCS

in the pond does not appear to provide stormwater treatment. Stormwater treatment is recommended to protect the receiving wetlands, surface water and groundwater located downstream of the stormwater pond.

Stormwater treatment is provided by infiltration in the detention pond. The pond captures enough stormwater to provide the required treatment.

33. A catch basin and drainpipe are depicted in the northeastern property corner. The proposed development plan does not address managing stormwater from this catch basin located in the ROW and discharging into the proposed site development area.

Inspection of the culvert revealed that it has not had any flow for a very long time. A small swale has been added to direct any flow that may come from the culvert down the slope.

34. An Overhead Electric line is depicted in the Site Plans in the area of the proposed Stormwater Pond. Please confirm that the electrical utility easement ("no width specified") allows for construction beneath the overhead electric line.

A copy of the easement has been provided, the easement only specifies that the line can be installed and does not prohibit the use of the property below.

35. Detail 1 on Page 12 of 21 depicts an emergency spillway from the stormwater pond at an elevation of 422 feet protected with riprap. The Grading and Drainage Plan - CS1501 does not show an emergency spillway or riprap protection. Please provide a detailed plan depicting an emergency spillway with outfall location and downstream channel protection.

The OCS has been eliminated and replaced with an outlet weir. The weir with the associated spillway have been shown on the plan view and details.

36. Erosion control notes reference Massachusetts Stormwater Policy. Please reference the NH Stormwater Manual, dated February 2025.

The note has been revised.

37. Pre- and post-development drainage plans (Sheets 20 and 21 of 21, respectively) do not account for stormwater migrating from upslope areas onto the property that will require management in the proposed stormwater practices and conveyances. Upslope areas may include the Route 103 and North Road ROWs, as well as upslope areas to the north potential extending up to Kearsarge Mountain Road.

Additional upslope area has been added to the drainage area plan

38. The Grading and Drainage Plan - CS1501 depicts catch basins on the northern side of Route 103 to the east of North Road that have undefined drainage routing.

The exact location of the outfall pipes for those catch basins can't be determined.

39. If cross culverts are present that discharge to the site property, management of this stormwater will need to be addressed in the site stormwater infrastructure.

If a cross culvert is present it does not flow onto this property, it will flow in the pipe that runs west under our driveway. This culvert is proposed to be replaced but does not accept water from this project.

40. As such, the proposed stormwater infrastructure is anticipated to be undersized. A drainage report and hydraulic modeling report were not available for review.

A drainage report will be provided and will show that the proposed stormwater

infrastructure is adequate.

41. The Grading and Drainage Plan depicts 4-foot-wide trench drains with 8-inch drain age pipe located along the proposed building's drip edge and well as roof drains. The routing of these stormwater conveyances is undefined and not shown on the Site Plans.

The roof drains have been added to the plans. They connect to catch basins that are part of the stormwater system.

42. Detail #5 shows a 2" Vertical Orifice -with an elevation of 96.50, which does not match other plan elevations.

This detail has been revised

43. Detail #1 - Cross Section Detention Pond 2 (Open Basin) appears to represent the Stormwater Pond in the Grading and Drainage Plan - CS1501. Please clarify pond numbering.

Pond 1 is the new buried structure under the parking lot. Pond 2 is the open pond.

Lighting

44. The Site Plans includes a lighting plan (Sheet 14) that depicts the locations of lighting poles along the margins of the parking areas. However, the plan does not indicate the type of fixture to be installed, nor does the plan depict the impact of lighting at the proposed development on abutting properties. Aries recommends requiring "dark sky" outdoor lighting that is designed to direct light to the ground. Submittal of additional light details and specification should be a condition of the Site Plan approval. Consideration should be given to requiring full shielding and a maximum color temperature of 3,000K (to limit blue light).

A lighting plan has been submitted. An additional copy is attached.

45. The lighting plans should also include exterior lighting fixtures that are proposed to be installed on the exterior of the site building, including entrance lighting and walkway lighting.

Those lighting fixtures have been included on the plan

46. Warner Site Plan Regulations require the following:

- a. The location and type of any outdoor lighting luminaries, including the height of the luminaries, and base design;
- b. The luminaries' manufacturer's specification data, including lumen output and photometric data showing cutoff angles;
- c. The type of lamp such as metal halide, high pressure sodium, LED, compact fluorescent, etc; and
- d. A photometric plan showing the intensity of illumination at ground level, expressed in foot candles, and documenting that the cut-off point for each fixture shall not spill on to any street or abutting lot using the proposed luminaries.

The information required is on the attached lighting plan and project plans

47. The provided Site Plans do not adequately describe the proposed exterior lighting.

Additional details regarding fixtures, etc. have been added to the plans.

Snow Storage

48. Three areas for snow storage are shown on Sheet 5 and include two areas that are depicted to drain to pavement and/or the Stormwater Pond. The third proposed snow storage area is located at the eastern end of the lower parking lot adjacent to a proposed dumpster enclosure. Stormwater drainage from this snow storage area and dumpster enclosure appears to be proposed to drain directly into the adjacent wetlands area without treatment. Aries recommends that runoff from melting snow and the dumpster enclosure be directed to the site closed drainage system so that road-salt-contaminated snow melt water and stormwater runoff can be captured and treated by the proposed stormwater system.

Grading in the area has been revised with the installation of additional walls to direct stormwater from the dumpster and snow storage area to the stormwater system.

Utilities

49. Proposed utilities include an 8-inch water main and a 1 1/4-inch sewer force main that connect to existing municipal water and sewer systems. Approval from the Warner Village Water District for these connections will be required.

The meeting minutes for the July 22, Warner Village Water District are attached. The minutes state that they expressed their strong support.

50. The proposed water and sewer piping will connect to existing stubs on the adjacent property. Aries recommends that a utility easement be provided to allow access to the utility lines across the adjacent property or properties should repairs be needed.
Utility easements will be created.

51. A wetlands permit will be required from the NHDES for the installation of the proposed utility lines across a mapped wetland area located in the northwestern portion of the site property.

As stated previously, the utility lines will be installed by directional drilling and will not disturb the wetlands.

52. The Site Plans do not indicate the location of an electrical service connection to the site building.

An electrical connection location has been added to the plan

The following comments are responding to the Warner River Local Advisory Committee comments:

The site is located adjacent to the flood plain of the Warner River and the 100-yr flood elevation mapped by the FEMA will encroach on the site along its western and southern boundaries.

This project is located partially in the Fema flood zone, however the construction does not infringe on the velocity zone.

-The site is on the edge of the sand and gravel aquifer that occurs along the river and is located within the Warner Ground Water Protection Overlay District and within the mapped wellhead protection area for the Warner Village District wells.

Warner Village District wells are downgradient from the proposed project and draw their water from the aquifer and via induced infiltration from the Warner River. The wells are approximately 38 feet deep, are completed in the sand and gravel aquifer, and are within 60 feet of the Warner River. The wells are approximately half a mile (as the crow flies) down-river from the subject property.

-Due to the local topography and geomorphology surface runoff and groundwater runoff from the site will ultimately travel to the Warner River and to wetlands and aquifer along the river.

The project is within the Warner Ground Water Protection Overlay District. The proposed use is an allowed use .

In addition to these general observations regarding the site location and its proximity to sensitive downgradient receptors noted above we offer the following:

-The Site Plan indicates that wood turtles potentially live within the project vicinity. WRLAC recommends that a study be completed before the site is disturbed to document habitat conditions and occurrence of wood turtles or other endangered species.

A study has been done and submitted to the planning board.

-The applicant should take steps to ensure that any site landscaping won't introduce or spread any invasive species. The extent of the proposed project suggests that the entirety of the buildable area will need to be completely clear-cut. The existing topsoil over the entirety of the site will be stripped, in addition to whatever new grading is proposed.

The landscaping plan does not include any invasive species

-There are a multitude of site drainage structures proposed, including catch basins, granite curbs, retaining walls, fence footings, concrete pads, drainage trenches, drainage manholes, hydrants, subsurface pumps, etc. In addition to the proposed site grading, all of these subsurface components will require the disturbance of a large volume of existing earth, and extending below ground quite deep. Where is ledge here, and what sort of jackhammering, drilling, blasting, etc. might be required?

Test pits that have been performed on this site did not indicate the presence of bedrock .

-The Site Plan indicates that buildable area is 2.6 acres of the lot's total 13.8 acres. The remaining 11.2 acres are in the Conservation Easement. Based upon our review, the buildable area as indicated on the plans includes all the property setbacks as well as

portions of wetlands, which are unbuildable. If you deduct the area of the setbacks and the mapped wetland areas, we estimate that the actual buildable area is reduced to approximately 1.5 acres.

The buildable area was determined at the time the lot was created and includes the area in the setback because other accessory items such as driveways and parking areas can be constructed in those areas.

-WRLAC suggests that a careful review of the Conservation Easement for the area downgradient of the site be completed. The proposed project will impact the Conservation Easement area, not only in terms of the final conditions (stormwater runoff, impervious surfaces, removed trees, regrading, etc.) but also resulting from the construction itself (grading, top-soil removal, retaining wall construction, etc.). Furthermore, there is a "Shoreline Protection Zone" shown as a 250' offset from the river, which falls within the middle of the Conservation Easement. Are there any downslope impacts from the project that could impact this zone?

There will be no proposed construction within the conservation easement area.

-The Site Plan only shows topographical contours within the Buildable Area. The Site Plan should also show topographic contours within the area to the south, including the Conservation

easement leading down to the river. The contours would allow identification of likely paths of runoff from the site.

The area in the conservation easement is not required to show topography.

-There is an existing retaining wall surrounding the wetland in the south portion of the Buildable Area that also encompasses the south side of proposed Stormwater Pond. The Site Plan seems to indicate that this existing retaining wall will remain in place. How might this be possible considering the extent of the regrading, new subgrade drainage installation, and construction of the pond? How will the storm pond construction effect the stability of the retaining wall?

The retaining wall will not be disturbed around the pond. In two locations a new retaining wall will be built behind the existing wall.

-There is a new retaining wall proposed along the west side of the project site, which runs along the length of the wetland area on that side. The construction of this new retaining wall will certainly impact/disturb the wetland area there. How will these impacts be mitigated?

The retaining wall is being built on the upland area adjacent to the wetland. The closest point of retaining wall construction is 6' from the edge of the wetland. The retaining wall will be built from the upland side of the wall and only needs to disturb 2' in front of the wall.

-A large area of snow storage is proposed adjacent to the wetland along the southern edge of the site and another along the north edge of the Stormwater Pond. The melting snow from these snow storage areas will leach directly to the wetland or into the pond. How will possible impacts (salt, automobile runoff) be mitigated?

Grading has been revised so that the snow storage areas drain towards the stormwater system. The stormwater pond is designed to provide treatment of snow melt runoff.

-There is a dumpster enclosure proposed at the end of the parking lot located in the vicinity of the south wetland. How will leaching of waste materials into ground or surface water be controlled near this location?

The dumpster area is built with a concrete slab and a curb around three sides. Any runoff from the dumpster area will enter the stormwater system. The dumpsters are emptied multiple times per week and the area is cleaned on a regular basis to prevent the migration of waste from the area.

-There is a small area in the SE corner designated as a Playground Area. What is the character/surface material of this playground? What provisions will be made to prevent children from playing around/outside the designated area, thinking about trampling natural adjacent areas, litter mitigation, etc.?

The area is a proposed future playground area and would be constructed with a bark mulch play surface. There is a fence proposed between the developed area of the site and the adjacent conservation easement area.

-The Utility Plan (sheet 7) shows the sewer force main and water supply lines will connection to existing stubs at the NW corner of the property at the northern tip of the wetland there. Both of these connections will be crossing a retaining wall and wetland. How will possible impacts be mitigated?

The lines will be installed under the wetland with direction boring so there will be no impact to the wetland

-The section detail of the Stormwater Pond on sheet 12 identifies it as "Pond 2 (Open Basin)". If this is Pond 2, where is Pond 1? The section detail shows the pond, the Outlet Control Structure (OCS), and an embankment (raised structure) on the downslope side of the pond. It's unclear where the embankment falls within the pond footprint. The plan view on the various site plans doesn't seem to show this embankment. The section detail doesn't show the existing retaining wall, or how the new pond embankments will relate to the existing retaining wall.

Additional details and an additional subsurface storage system will be added to the plans. All drainage plans will be reviewed and approved by the AOT Bureau.

-

Please provide results of infiltration test studies done for the proposed stormwater pond and the estimated seasonal high groundwater levels beneath the pond. Is the pond designed to provide any treatment of upgradient runoff (salt/sand/ice melt, vehicular fluids, etc.) that ultimately enters the pond?

Test pits and infiltration rates have been added to the plan. The pond is designed to provide pollution attenuation as outlined in the New Hampshire Stormwater Manual.

-What keeps animals, children, birds out of the pond?

There is a fence around the pond to prevent human access. Animals and birds will be able to access the pond, however, pond is a deceiving term,. The pond is a dry pond that will capture and infiltrate storm water, it will not be wet except for a short period after a rainfall.

-Please provide information regarding lighting for this project, either for landscape lighting or exterior lighting mounted on the building itself including specifications/quantities/locations, bulb type, lumens, color temperature, direction, hours of illumination, etc.

The lighting design information has been provided to the planning board and will be added to the plan

- The engineer's stamp on the plans shows a Massachusetts license. Is the engineer licensed in the State of New Hampshire?

The New Hampshire stamp has been added to the plan

-There are no architectural plans in this submission. What sort of foundation will the building require, is there a basement, what are proposed footing depths, mechanical requirements for HVAC- equipment locations, generator, etc.? What sort of noise might be expected from building equipment?

The building will have a standard concrete foundations set on shallow spread footings. Cover depth will be 4 feet and the ground floor level and the back half of the 1st floor level will be slab on grade. Each unit will have its own mechanical equipment.

-An "ecological impact study" had been referenced in some of the public hearings. Has such a study has been completed, and what are its findings?

The study was conducted by West Environmental and has been submitted to the planning board.

The following is in response to a letter from the Warner Conservation Commission dated September 2, 2026.

The plan presented by Ranger Engineering indicates there are areas adjacent to the easement that show fencing and sections of a concrete retaining wall. The WCC asks that the proposed four foot high chain link fence be extended along the entire border to delineate and separate the CATCH project area from the RAW conservation easement. With your approval, the WCC will provide and post medallions on the fence to identify the boundary of the conservation easement. A sign posted on the fencing will explain to residents and the public the importance of conservation easements for the protection of the wetland habitat and wildlife that live in and around the river.

There will be a fence along the top of the retaining walls that form the border between the upland and wetland areas. We have no problem with extending the fence to the west boundary of the property and installing 2 or 3 small medallions identifying the easement area.

We also ask that you leave as many of the large trees as possible that grow along the boundary with Dunkins. Saving the large trees will provide natural cooling, screening, wildlife habitat and an attractive entry into Warner Village.

The majority of those trees will remain. A few may need to be removed to install the retaining wall and driveway.

I will be at your meeting tonight to discuss this matter.

Thank You

A handwritten signature in blue ink that reads "Ben CO-J". The signature is stylized with a large, looped "C" and a trailing "J".

Benjamin C. Osgood Jr PE
President

SITE PLAN

LOT 3 - 9 ROUTE 103 WEST

ASSESSOR'S MAP 35 LOT 4-3

WARNER, NH 03278

DATE: MAY 12, 2026

REV: SEPTEMBER 23, 2026

PREPARED FOR:

CATCH NEIGHBOURHOOD HOUSING

105 LONDON RD, UNIT #1

CONCORD, NH 03301

INDEX OF DRAWINGS

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5.	CS1001	LAYOUT AND MATERIALS PLAN
6.	CS1501	GRADING AND DRAINAGE PLAN
7.	CS1701	UTILITY PLAN
8.	CS2701	VEHICLE TURNING PLAN - PUMPER TRUCK
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20.	CS8502	EROSION AND SEDIMENT CONTROL DETAILS
21.	CS9201	PRE - DEVELOPMENT DRAINAGE PLAN
22.	CS9301	POST - DEVELOPMENT DRAINAGE PLAN

NOTE:

- APPROVAL OF THIS PLAN REQUIRES A SPECIAL EXCEPTION BE GRANTED BY THE ZONING BOARD.

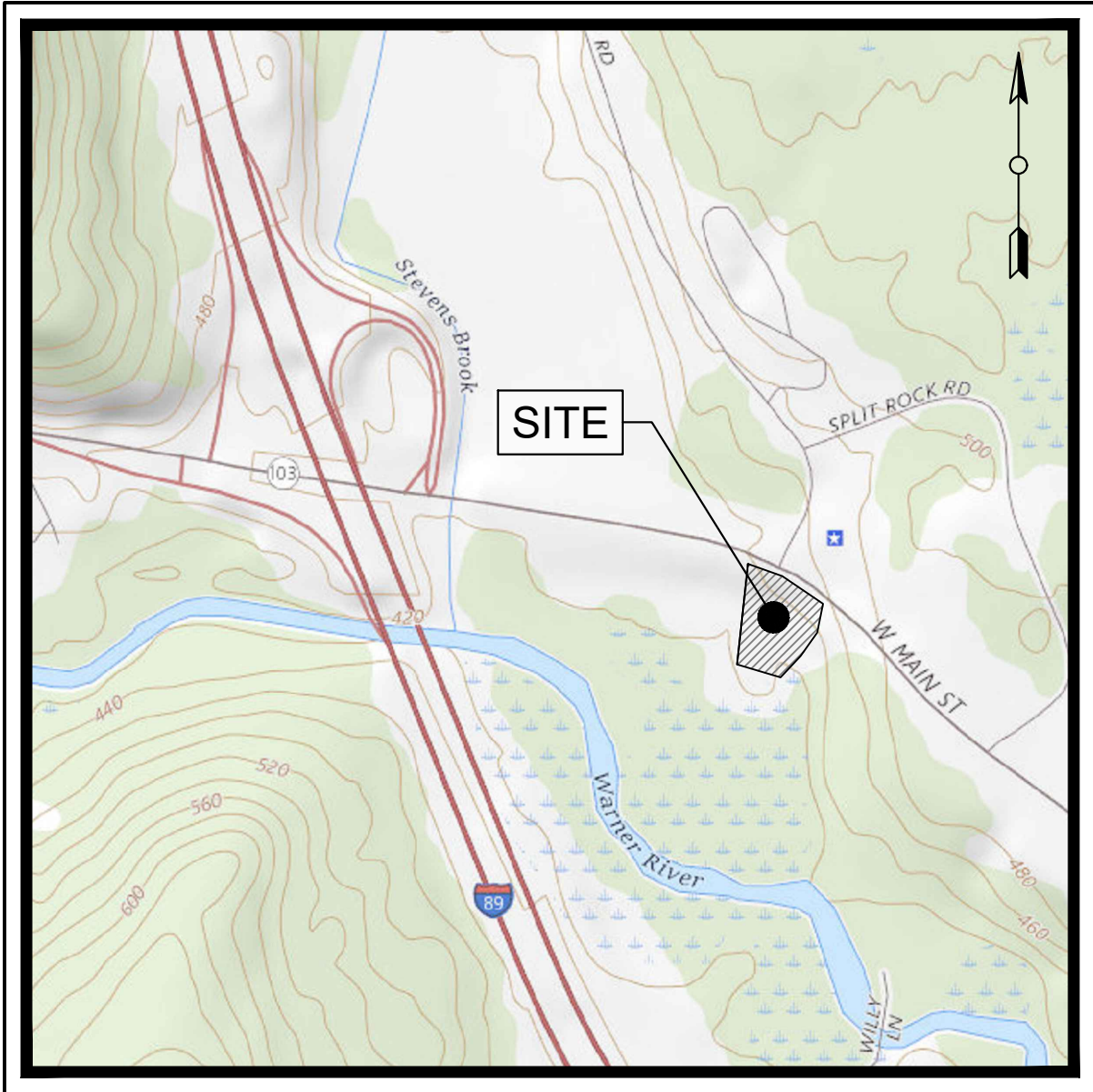
NEW HAMPSHIRE FISH AND GAME AOT PERMIT CONDITIONS RELATED TO THREATENED AND ENDANGERED SPECIES:

- THERE IS A POTENTIAL FOR WOOD TURTLES (STATE SPECIES OF SPECIAL CONCERN) TO BE WITHIN THE PROJECT VICINITY. OBSERVATIONS OF THESE SPECIES SHALL BE REPORTED IMMEDIATELY, PARTICULARLY DURING NESTING SEASON (MID-MAY THROUGH THE END OF JUNE) TO NHFG TO MELISSA DOPERALSKI (CELL/TEXT) 603-479-1129 OR JOSH MEGYESY AT 978-578-0802. SITE OPERATORS SHALL BE PROVIDED THE IDENTIFICATION FLYER AND NHFG CONTACT INFORMATION. SEE PLAN SHEET 6 (CS1001) FOR SPECIES IDENTIFICATION INFORMATION.
- TO AVOID IMPACTS TO RARE TURTLES, SOIL DISTURBANCE SHALL BEGIN AFTER OCTOBER 1 OR PRIOR TO MAY 15 TO AVOID DISTURBING POTENTIAL NESTING TURTLES, HATCHLINGS, OR ADULT FEMALES.
- A SILT FENCE SHALL BE INSTALLED AROUND THE PROJECT AREA FOOTPRINT PRIOR TO MAY 15 TO EXCLUDE FEMALE WOOD TURTLES WHO MAY BE ATTRACTED TO OPEN DISTURBED SOILS THAT WOULD RESULT FROM PROJECT ACTIVITIES. ALL TURTLE SPECIES NESTS ARE PROTECTED BY NEW HAMPSHIRE LAW. SEE PLAN SHEET 15 (CS8001) FOR MORE DETAILS.
- ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV EMAIL SUBJECT LINE: NH819-4037,ROUTE 103 WEST COMMERCIAL DEVELOPMENT,WILDLIFE SPECIES OBSERVATION. PHOTOGRAPHS SHALL BE PROVIDED FOR VERIFICATION AS FEASIBLE.
- THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.
- ALL MANUFACTURED EROSION AND SEDIMENT CONTROL PRODUCTS, UTILIZED FOR, BUT NOT LIMITED TO, SLOPE PROTECTION, RUNOFF DIVERSION, SLOPE INTERRUPTION, PERIMETER CONTROL, AND INLET PROTECTION, CHECK DAMS, SEDIMENT TRAPS, AND SILT FENCE INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.04, SHALL NOT CONTAIN WELDED PLASTIC, PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH. SEE PLAN SHEETS 15, 16, 17 (CS8001, CS8002, CS8501).



LOCUS MAP

1"= 350'



USGS MAP

N.T.S.

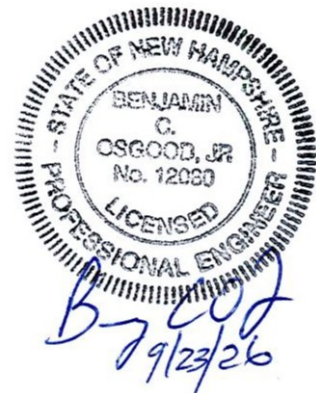
PREPARED BY:

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130 Main Street, Suite 202
Salem, NH 03079
Tel: 978-208-1762
www.rangereng.com

PROPERTY OWNER:
COMET, LLC
84 RANGE ROAD
WINDHAM, NH 03087



9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	
DATE	NO.	REVISIONS	BY

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
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COVER SHEET
CS0001



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CONSTRUCTION NOTES:

1. CONSTRUCTION
- A. TOPSOIL:
EXISTING TOPSOIL AND SUBSOIL SHALL BE REMOVED FROM ROADWAY AND BUILDING AREAS AND STOCKPILED.
- B. TREES AND STUMPS:
TREES AND STUMPS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN AN APPROVED MANNER. STUMPS SHALL NOT BE BURIED ON SITE.
2. MATERIALS
- A. BITUMINOUS CONCRETE PAVEMENT:
- PARKING AREAS:
SURFACE COURSE: 1-1/2 INCHES CLASS I BITUMINOUS CONCRETE PAVEMENT, TYPE I-1
WEARING COURSE
BINDER COURSE: 2-1/2 INCHES CLASS I BITUMINOUS CONCRETE PAVEMENT, TYPE I-1
BINDER COURSE
GRAVEL BASE COURSE: 4 INCHES COMPACTED DENSE GRADED CRUSHED STONE FOR SUB-BASE (NH 300.304)
8 INCHES COMPACTED SUB-BASE
- B. LANDSCAPE AREAS:
DISTURBED AREAS NOT COVERED BY STRUCTURES OR PAVEMENT AND NOT OTHERWISE SPECIFIED ON THE LANDSCAPE PLAN SHALL RECEIVE 6 INCHES OF TOPSOIL. THESE AREAS ARE TO BE SEEDED AND WATERED UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. LANDSCAPE AREAS ADJACENT TO THE BUILDING SHALL BE FINISHED WITH 3" OF 1-1/2" RIVER ROCK.
- C. TRAFFIC CONTROLS:
ALL SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.)
- D. ADA CONFORMANCE:
ALL HANDICAPPED ACCESSIBLE RAMPS AND SIDEWALKS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) AND THE STATE OF NEW HAMPSHIRE'S ADA REASONABLE ACCOMMODATION POLICY, WHICHEVER IS, WHICHEVER IS MORE RESTRICTIVE.
4. UTILITIES
- A. EXISTING UTILITIES:
THE LOCATION AND ELEVATIONS OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON THE SURVEY NOTED ABOVE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND PRIOR TO ORDERING STRUCTURES.
- B. PRIVATE UTILITIES:
THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE OR ELECTRIC). FINAL DESIGN AND LOCATIONS AT THE BUILDING WILL BE PROVIDED BY THE ARCHITECT. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE UTILITY CONNECTIONS WITH THE RESPECTIVE UTILITY COMPANIES PRIOR TO ANY UTILITY CONSTRUCTION OR DEMOLITION.
- C. STORM DRAINAGE:
STORM DRAIN PIPING SHALL BE HIGH DENSITY POLYETHYLENE PIPE (HDPE) WITH CORRUGATED EXTERIOR, SMOOTH LINED (n=0.013) WITH SOIL TIGHT JOINTS UNLESS OTHERWISE NOTED ON THE GRADING & DRAINAGE PLAN.
- D. PROPOSED STRUCTURES:
RIM ELEVATIONS OF PROPOSED DRAINAGE MANHOLES AND ASSOCIATED STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS. ARE TO BE SET FLUSH AND CONSISTENT WITH THE GRADING PLAN. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, GAS GATES AND OTHER UTILITIES TO FINISH GRADE WITHIN LIMITS OF WORK.

AS-BUILT NOTES:

1. PROJECT REQUIRED TO BE CERTIFIED BY A QUALIFIED ENGINEER TO CONFIRM THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS OR THAT DEVIATIONS WERE MADE WHICH DID NOT REQUIRE AN AMENDED OR NEW PERMIT.

ABBREVIATIONS

BIT	BITUMINOUS	OCS	OUTLET CONTROL STRUCTURE
CB	CATCH BASIN	OE	OVERHEAD ELECTRIC
CONC	CONCRETE	PC	POINT OF CURVATURE
DH	DRILL HOLE	PCC	PRECAST CONCRETE CURB
DMH	DRAIN MANHOLE	PERF	PERFORATED
ELEV	ELEVATION	PRC	POINT OF REVERSE CURVE-CURVE
ESHGW	ESTIMATED SEASONAL HIGH GROUND WATER	PROP	PROPOSED
EXIST	EXISTING	PT	POINT OF TANGENT
FND	FOUNDATION	PVC	POLYVINYL CHLORIDE PIPE
FES	FLARED END SECTION	RCP	REINFORCED CONCRETE PIPE
GF	GARAGE FLOOR	SMH	SEWER MANHOLE
HDPE	HIGH DENSITY POLYETHYLENE PIPE	STR	STRUCTURE
HYD	HYDRANT	TYP	TYPICAL
INV	INVERT ELEVATION	VGC	VERTICAL GRANITE CURB
IP	IRON PIPE	CCB	CAPE COD BERM
IR	IRON ROD		
MAX	MAXIMUM		
MIN	MINIMUM		
NTS	NOT TO SCALE		

LEGEND		
EXISTING		PROPOSED
	BUILDING	
	PROPERTY LINE	
	RIGHT-OF-WAY LINE	
	ADJACENT PROPERTY LINE	
	SETBACK LINE	
	EASEMENT LINE	
	WOOD FENCE	
	CONCRETE	
	RIP RAP	
	BIT. CONC. PAVEMENT	
	SIGN	
	BOLLARD	
	SPOT ELEVATION	
	CONTOUR	
	WATER LINE DOMESTIC	
	SANITARY SEWER	
	STORM SEWER	
	OVERHEAD ELECTRIC	
	UNDERGROUND GAS	
	UTILITY POLE	
	SANITARY MANHOLE	
	SANITARY SEWER CLEANOUT	
	STORM DRAIN MANHOLE	
	STORM DRAIN INLET	
	STORM DRAIN FLARED END SECTION	
	STORM DRAIN CLEANOUT	
	FIRE HYDRANT	
	WATER VALVE	
	TREE LINE	
	CONIFEROUS TREE	
	DECIDUOUS TREE	
	CONSTRUCTION ENTRANCE	
	SILT SACK	
	EROSION CONTROL	
	HANDICAP MARKING	
	DETECTABLE WARNING STRIP	
	STONE BOUND	
	GUARD RAIL	

9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	
DATE	NO.	REVISIONS	BY

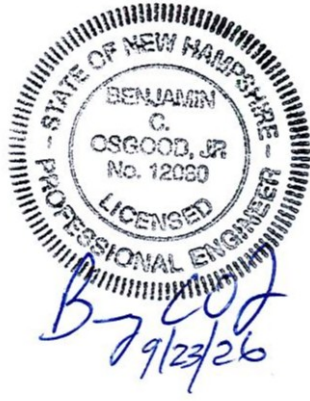
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
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NOTES AND LEGEND
CS0002



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FLOOD ZONE INFORMATION

SUBJECT PARCEL IS LOCATED IN ZONES AE & X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY-PANEL NUMBER 33013C287E WHICH BEARS AN EFFECTIVE DATE OF APRIL 19, 2010. FEMA FLOOD ELEVATION WAS DETERMINED BY FIELD SURVEY PERFORMED BY RANGER ENGINEERING GROUP. FLOODWAY LINE WAS TRACED FROM THE ABOVE REFERENCED FEMA MAP.

SURVEY NOTES

1. THE LOCUS IS SHOWN ON TOWN OF WARNER ASSESSOR'S MAP 35 LOT 4-3, LOCATED IN ZONING DISTRICT C1 COMMERCIAL AND THE INTERVALE OVERLAY DISTRICT, AND IS KNOWN AS 9 ROUTE 103 WEST.
2. DEED REFERENCE: BOOK 3579 PAGE 98, MERRIMACK COUNTY REGISTRY OF DEEDS.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE.
4. THE BASIS OF BEARING FOR THIS PLAN IS THE NORTH AMERICAN DATUM OF 1983 AS SHOWN ON PLAN #16243, MERRIMACK COUNTY REGISTRY OF DEEDS.
5. WETLANDS DELINEATED BY J. P. HAYES III CWS #18 IN ACCORDANCE WITH NEW HAMPSHIRE WETLANDS BUREAU REQUIREMENTS AND THE US ARMY CORPS OF ENGINEERS 1987 WETLAND DELINEATION MANUAL.
6. NHDOT DRIVEWAY ACCESS PERMIT # 05-463-0034, DATED 9/9/2021.

REFERENCE DEEDS:

1. BOOK 3579 PAGE 98 MERRIMACK COUNTY REGISTRY OF DEEDS

REFERENCE PLANS:

1. PLAN 16243
2. PLAN 11670
3. PLAN 7757
4. PLAN 307
5. STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS PLANS OF PROPOSED FEDERAL AID PROJECT I-89-I(57)119 N.H. PROJECT NO. P-7407-C INTERSTATE ROUTE I-89 SHEETS 76, 77, 80, & 81 ON FILE AT THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

EASEMENTS AND ENCUMBRANCES:

EXISTING CONSERVATION EASEMENT
BOOK 2547 PAGE 1295
PLAN 16243

TRANSMISSION LINE EASEMENT
BOOK 434 PG 528
NO WIDTH SPECIFIED

EXISTING INGRESS/EGRESS EASEMENT
BOOK 1842 PAGE 1520
PLAN 16243

9/23/2026	2	DRAINAGE CALCS	
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PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

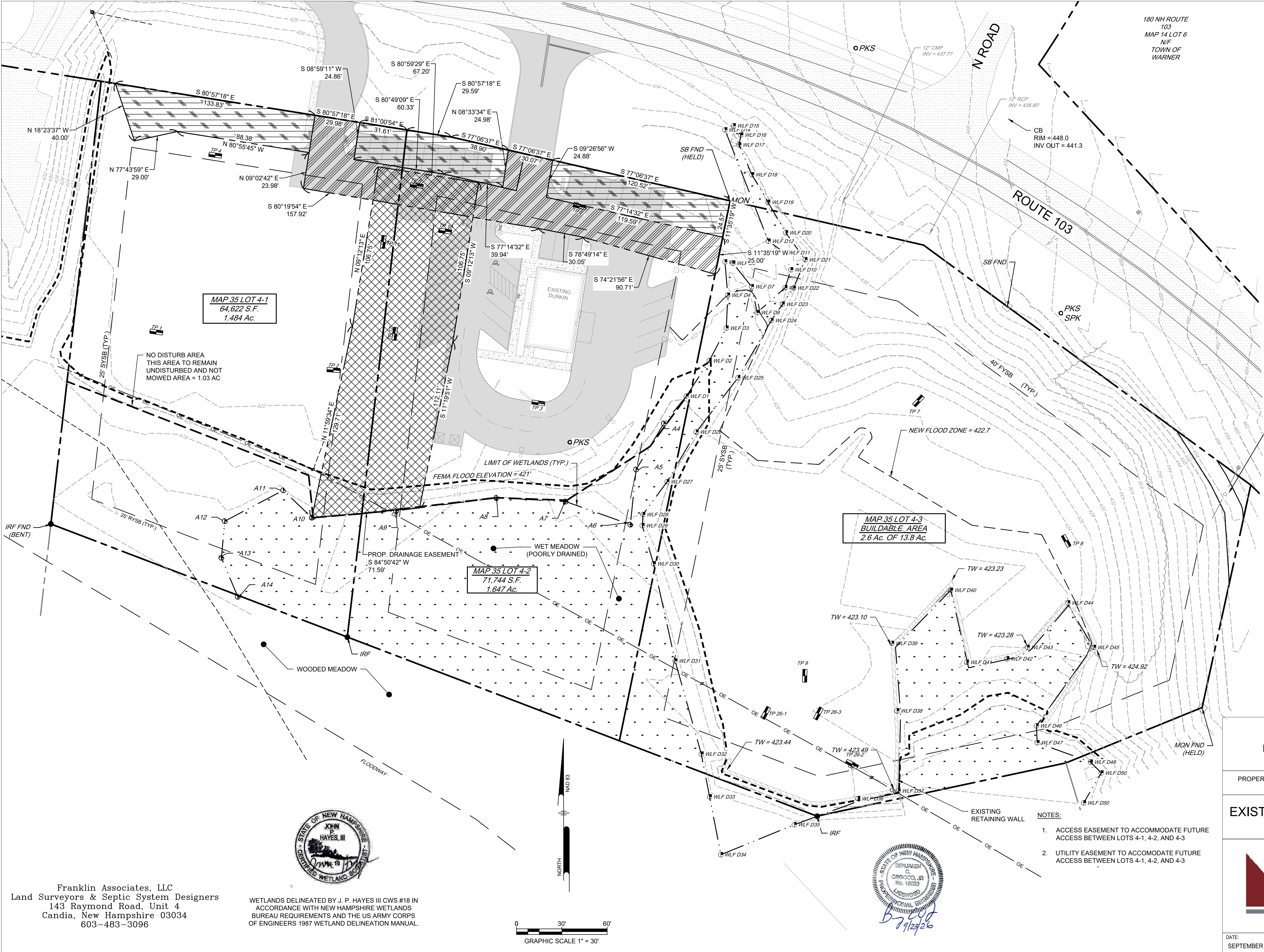
EXISTING LOT PLAN
CS0201



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Land Surveyors & Septic System Designers
143 Raymond Road, Unit 4
Candia, New Hampshire 03034
603-483-3096

WETLANDS DELINEATED BY J. P. HAYES III CWS #18 IN ACCORDANCE WITH NEW HAMPSHIRE WETLANDS BUREAU REQUIREMENTS AND THE US ARMY CORPS OF ENGINEERS 1987 WETLAND DELINEATION MANUAL.



LEGEND: EXISTING

- WETLANDS
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- SETBACK LINE
- EASEMENT LINE
- WETLANDS LINE
- WOOD FENCE
- WATER LINE DOMESTIC
- STORM SEWER
- OVERHEAD ELECTRIC
- UNDERGROUND GAS
- UTILITY POLE
- SANITARY MANHOLE
- STORM DRAIN MANHOLE
- STORM DRAIN INLET
- FIRE HYDRANT
- WATER VALVE
- TREE LINE
- RETAINING WALL
- CONCRETE HEADWALL
- STONE BOUND
- IRON ROD
- TEST PIT
- TRAVERSE POINT

PROPOSED EASEMENTS

- ACCESS & UTILITY EASEMENT
9275 SF
- UTILITY EASEMENT
8857 SF
- DRAINAGE EASEMENT
16471 SF

DATE	NO.	REVISIONS	BY
9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

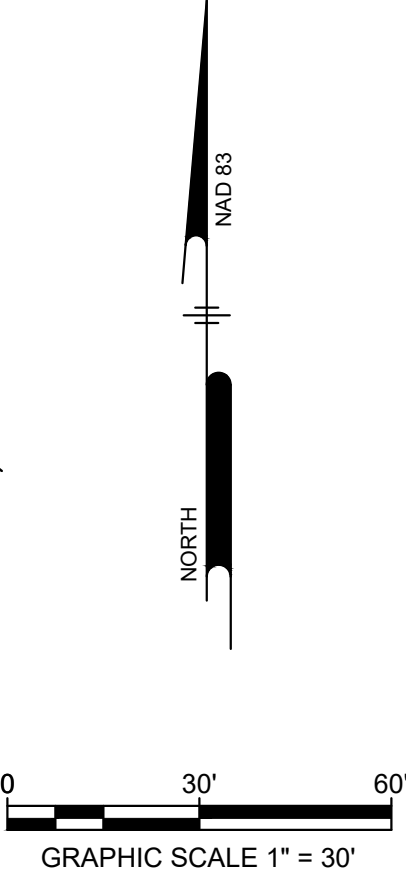
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EXISTING CONDITIONS PLAN - SITE VIEW
CS0202

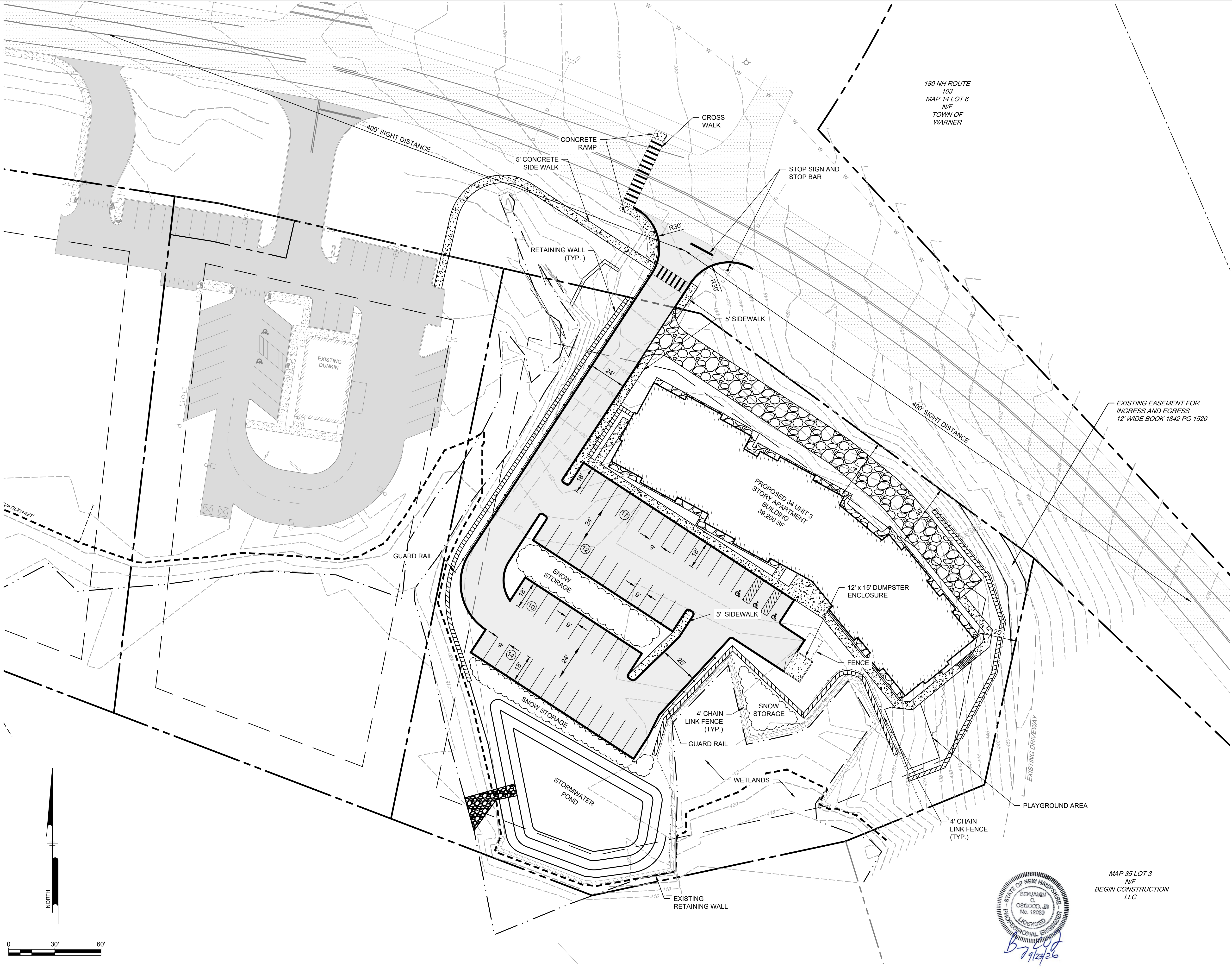
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WETLANDS DELINEATED BY J. P. HAYES III CWS #18 IN
ACCORDANCE WITH NEW HAMPSHIRE WETLANDS
BUREAU REQUIREMENTS AND THE US ARMY CORPS
OF ENGINEERS 1987 WETLAND DELINEATION MANUAL.



- NOTES:**
- ACCESS EASEMENT TO ACCOMMODATE FUTURE ACCESS BETWEEN LOTS 4-1, 4-2, AND 4-3
 - UTILITY EASEMENT TO ACCOMMODATE FUTURE ACCESS BETWEEN LOTS 4-1, 4-2, AND 4-3



PARKING CALCULATION:
PER SECTION XIX.B TABLE OF OFF-STREET PARKING REQUIREMENT OF THE SITE PLAN REVIEW REGULATIONS OF THE TOWN OF WARNER:

PARKING REQUIRED (MULTI UNIT HOUSING): LOT 3
2.5 SPACES PER UNIT = 85 SPACES REQUIRED FOR 34 UNITS

TOTAL REQUIRED = 85 SPACES
TOTAL PROVIDED = 53 SPACES = 1.53 SPACES PER UNIT

ZONING REQUIREMENTS: C1-COMMERCIAL DISTRICT INTERVALE OVERLAY DISTRICT		
	REQUIRED	PROVIDED LOT 3
MIN. LOT AREA	40,000 SF	113,256 SF
MIN. LOT FRONT.	200'	400'
FRONT SETBACK	40'	40'
SIDE SETBACK	25'	27'
MAX IMPERVIOUS AREA	70%	40.6%
MAX BUILDING AREA	40,000	39,200
BUILDING HEIGHT	45'	41' - 10"

- NOTES:**
THIS PLAN REQUIRES THE APPROVAL OF THE FOLLOWING WAIVERS
1. WAIVER FROM THE PLANNING BOARD FROM SECTION X.A OF THE SITE PLAN REVIEW REGULATIONS TO PERMIT 1.53 SPACES PER UNIT WHERE 2.5 ARE REQUIRED.
 2. A SPECIAL EXCEPTION FROM THE ZONING BOARD OF ADJUSTMENT IS REQUIRED TO ALLOW MULTI FAMILY APARTMENT UNITS IN THE INT DISTRICT.

9/23/2026	2	DRAINAGE CALCS	
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PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

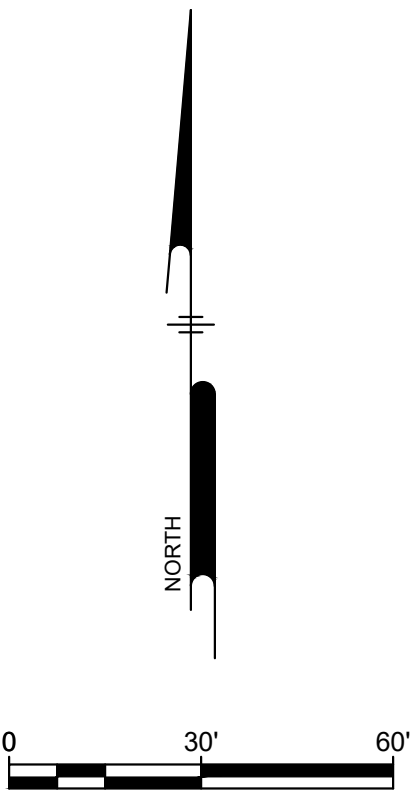
LAYOUT AND MATERIALS PLAN
CS1001

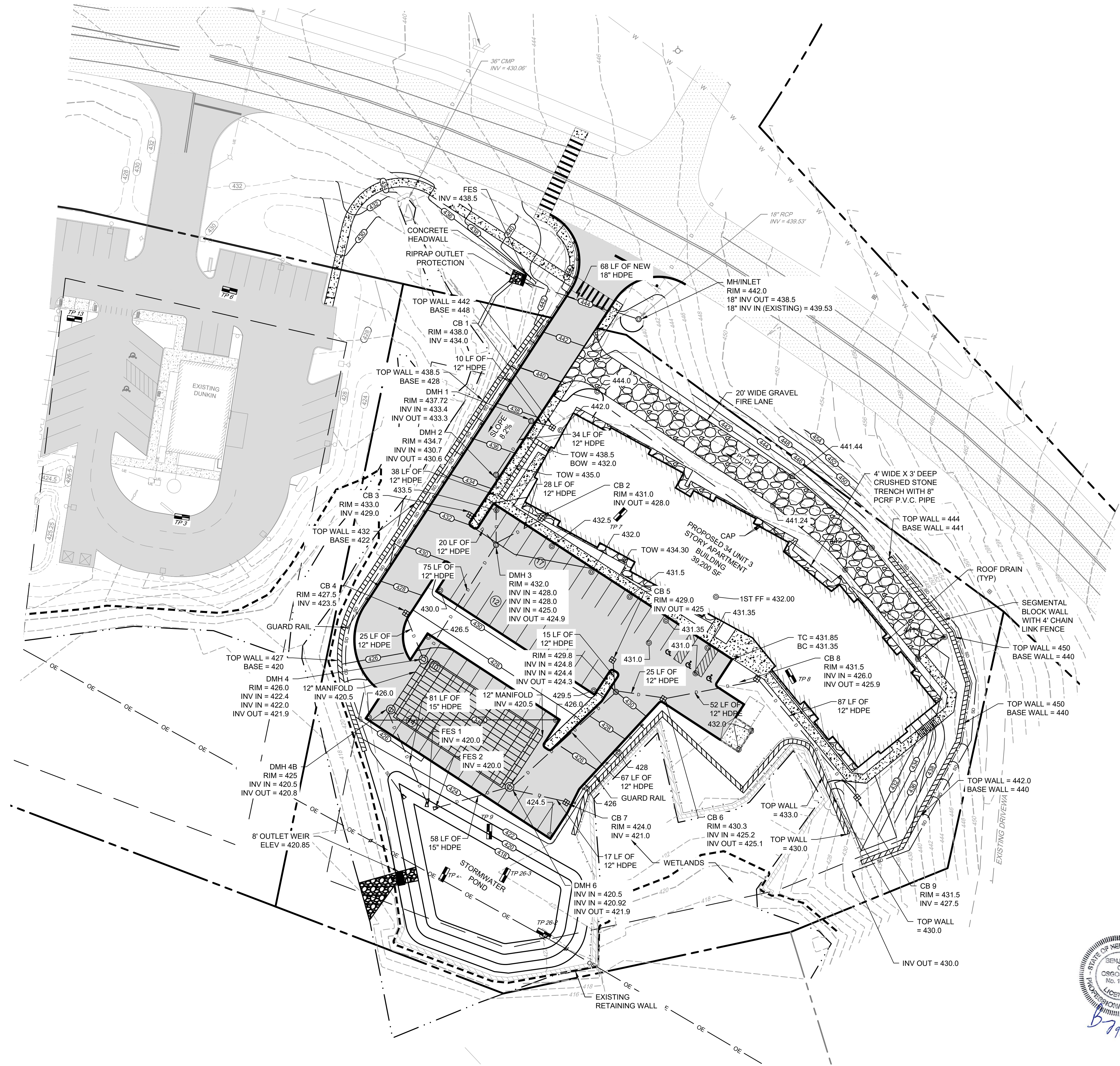


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MAP 35 LOT 3
N/F
BEGIN CONSTRUCTION
LLC





TOP ELEVATION = 424.0			ESHGW = 419.67	
TP 7				
DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING
0'-24"	SAND FILL			
24'-60"	A	L.S.	10YR 3/2	
60'-84"	B	F.S.	10YR 4/6	
84'-96"	C	G.S.	7.55YR 3/3	
			REDOX	@ 52"
			WEEDING @ 60"	10Y 5/8

TOP ELEVATION = 423.0			ESHGW = 420.33	
TP 8				
DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING
0'-32"	A/B MIX	VARIES		
32' - 55"	Cd	S.L.	5Y 4/4	
			REDOX	@ 32"
				10Y 5/8

TOP ELEVATION = 421.5			ESHGW = NONE	
TP 9				
DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING
0'-32"	FILL	VARIES		
4'-53"	A/B	VARIES.		
57'-85"	C	G.S.	10Y 3/4	
			REDOX	NONE

TOP ELEVATION = 421.5			ESHGW = 415.50	
TP 26-1				
DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING
0'-4"	A	F.S.L.	10Y 2/2	
4'-53"	FILL	F.S.L.	5Y 4/4	
53'-72"	C1	SAND	10Y 3/4	
72'-96"	C2	G.S.	5Y 4/6	
			REDOX	@ 72"
				10Y 5/8

TOP ELEVATION = 421.8			ESHGW = 415.80	
TP 26-2				
DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING
0'-6"	A	F.S.L.	10Y 3/2	
6'-72"	FILL	F.S.L.	5Y 4/4	
72'-90"	C1	SAND	2.5Y 4/4	10% GRAV
90'-104"	C2	G.S.	5Y 4/6	
			REDOX	@ 72"
				10Y 5/8

TOP ELEVATION = 422.0			ESHGW = 415.33	
TP 26-3				
DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING
0'-6"	A	F.S.L.	10Y 3/2	
6'-54"	FILL	F.S.L.	5Y 4/4	
54'-80"	C1	SAND	10Y 3/4	
80'-100"	C2	G.S.	5Y 4/6	
			REDOX	@ 80"
				10Y 5/8

LOCATION	TESTED DEPTH (IN.)	KSAT (IN./HR.)
TEST PIT 1	45	1.2
TEST PIT 2	64	3.8
TEST PIT 3	48	4.9

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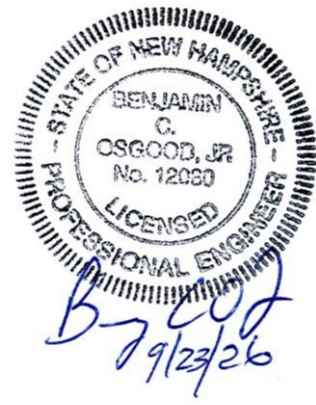
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

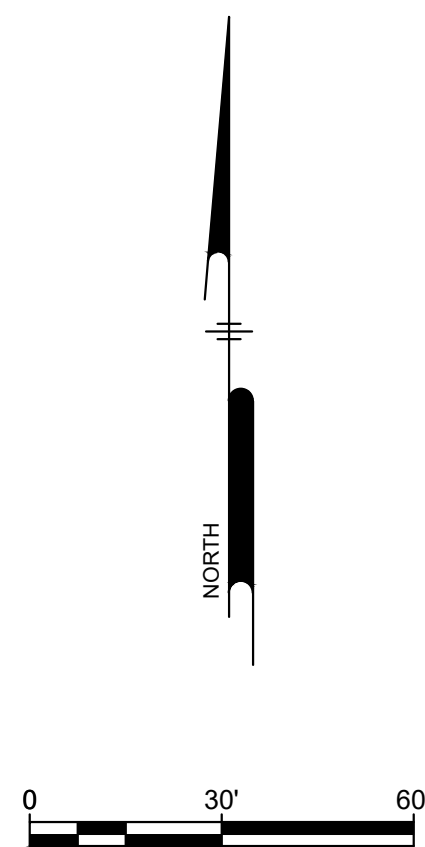
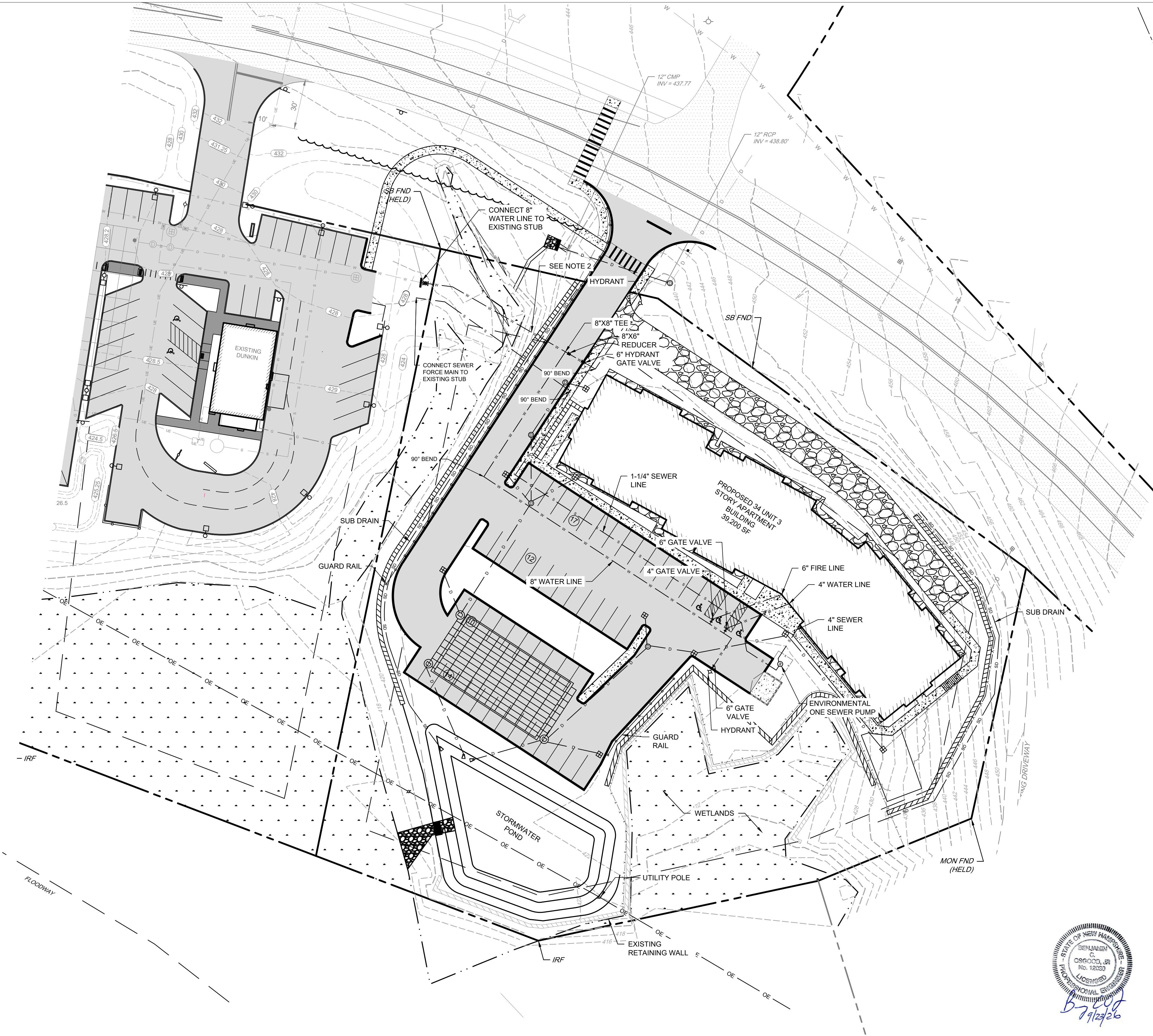
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GRADING AND DRAINAGE PLAN
CS1501



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- NOTES:
- 1. OVERHEAD ELECTRIC AND COMMUNICATIONS LINES TO BE INSTALLED AT A LOCATION DETERMINED BY THE UTILITY PROVIDERS.
 - 2. WATER AND SEWER LINES SHALL BE INSTALLED BY DIRECTIONAL BORING UNDER THE BROOK WITH A MINIMUM COVER OF 5' BELOW BROOK BED.

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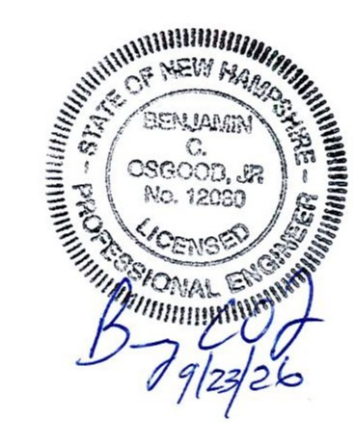
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

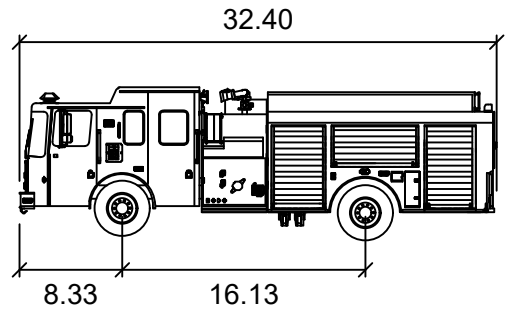
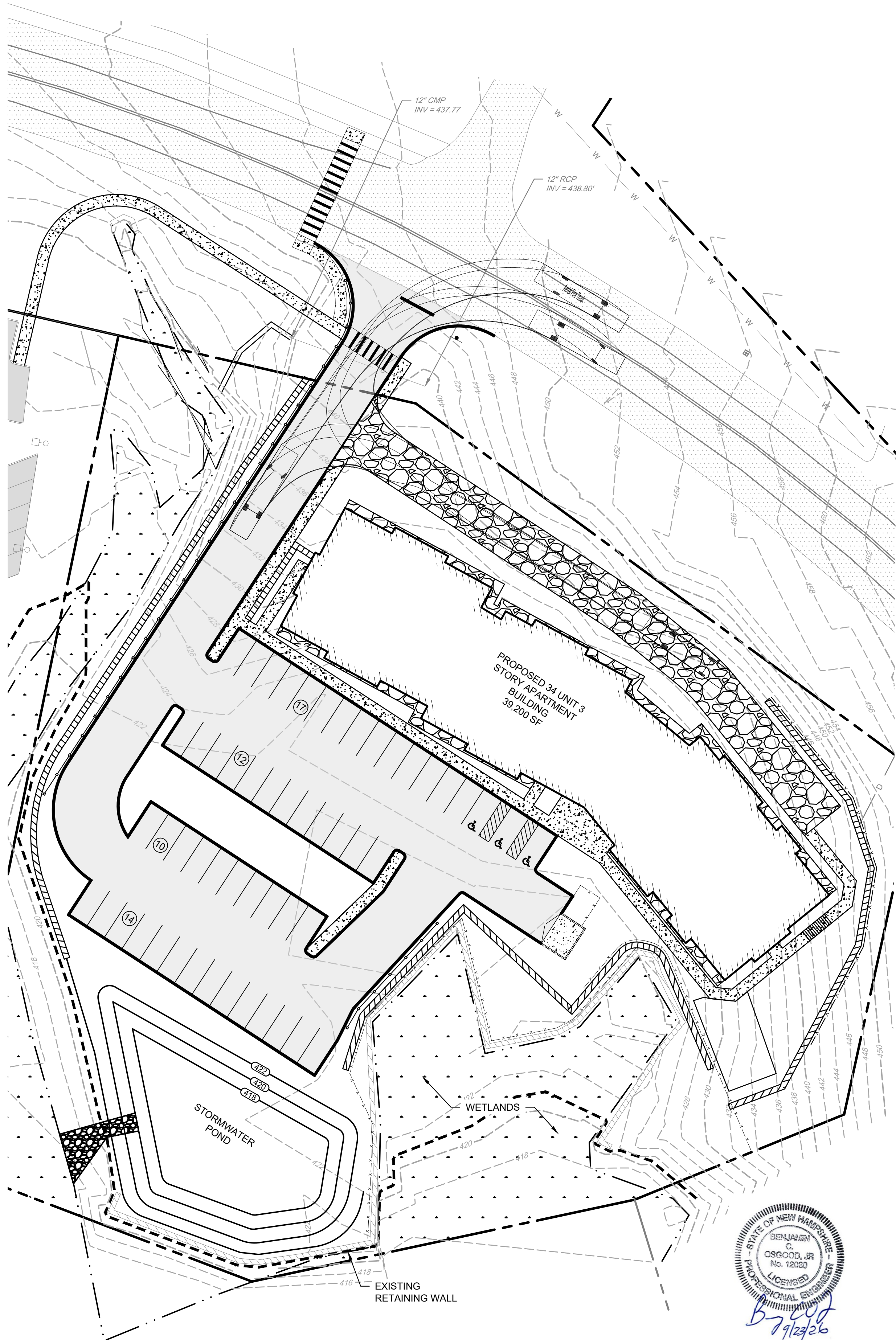
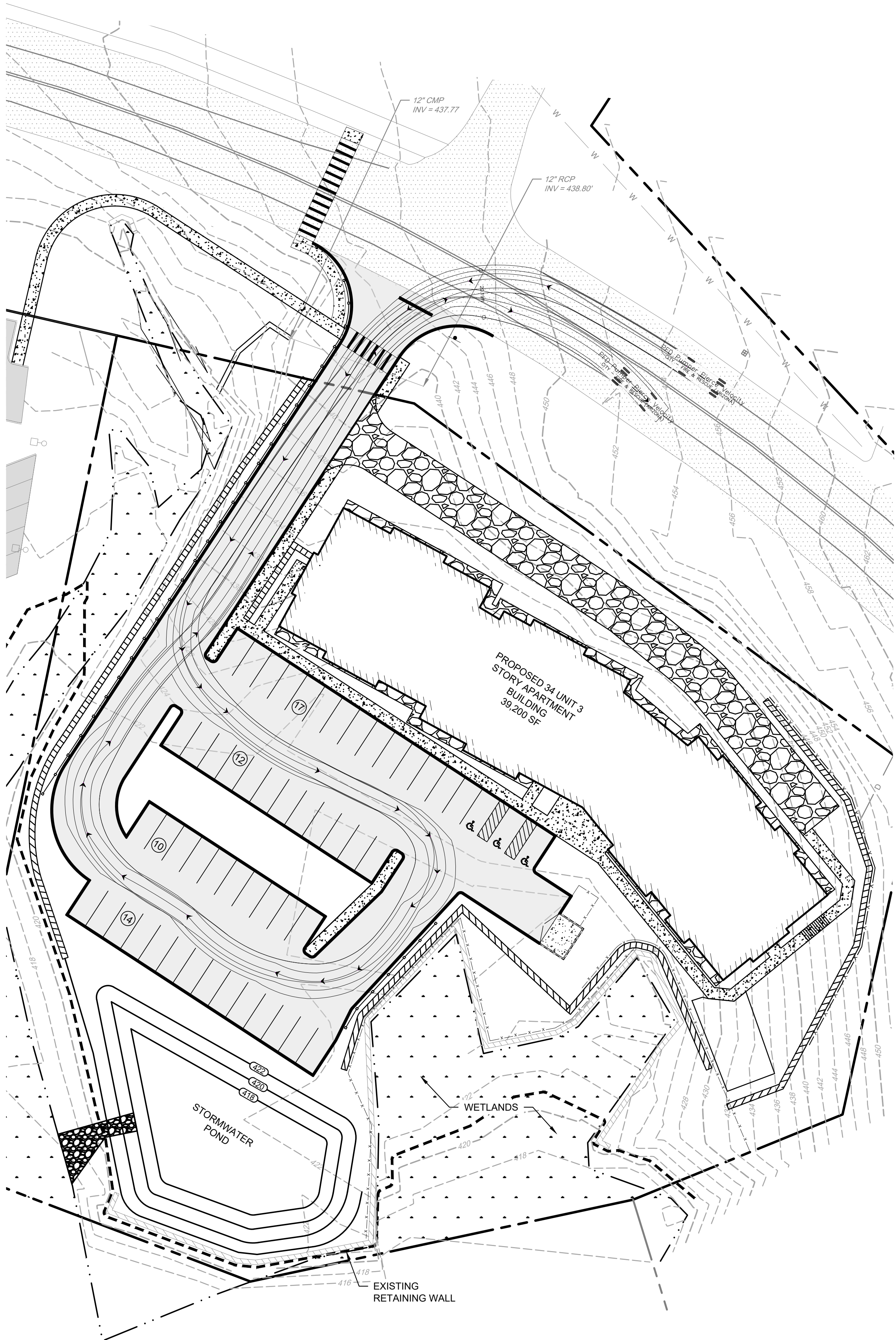
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UTILITY PLAN
CS1701



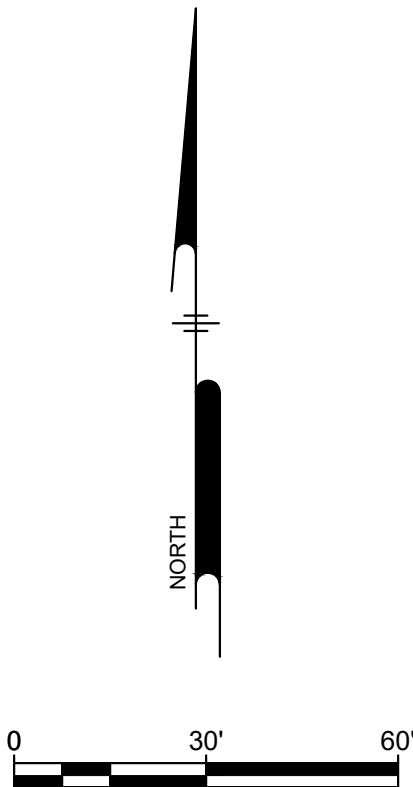
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PFD Pumper Pierce Velocity

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 45.0



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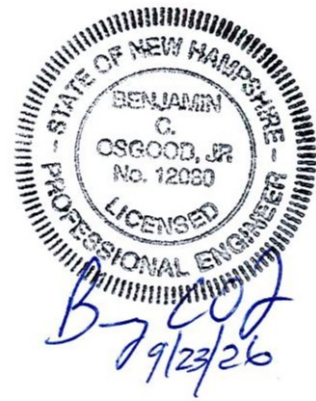
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

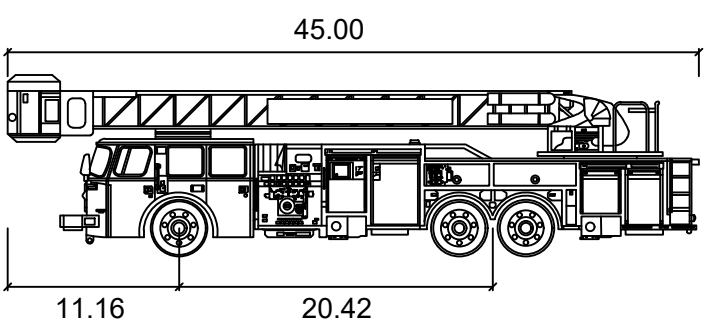
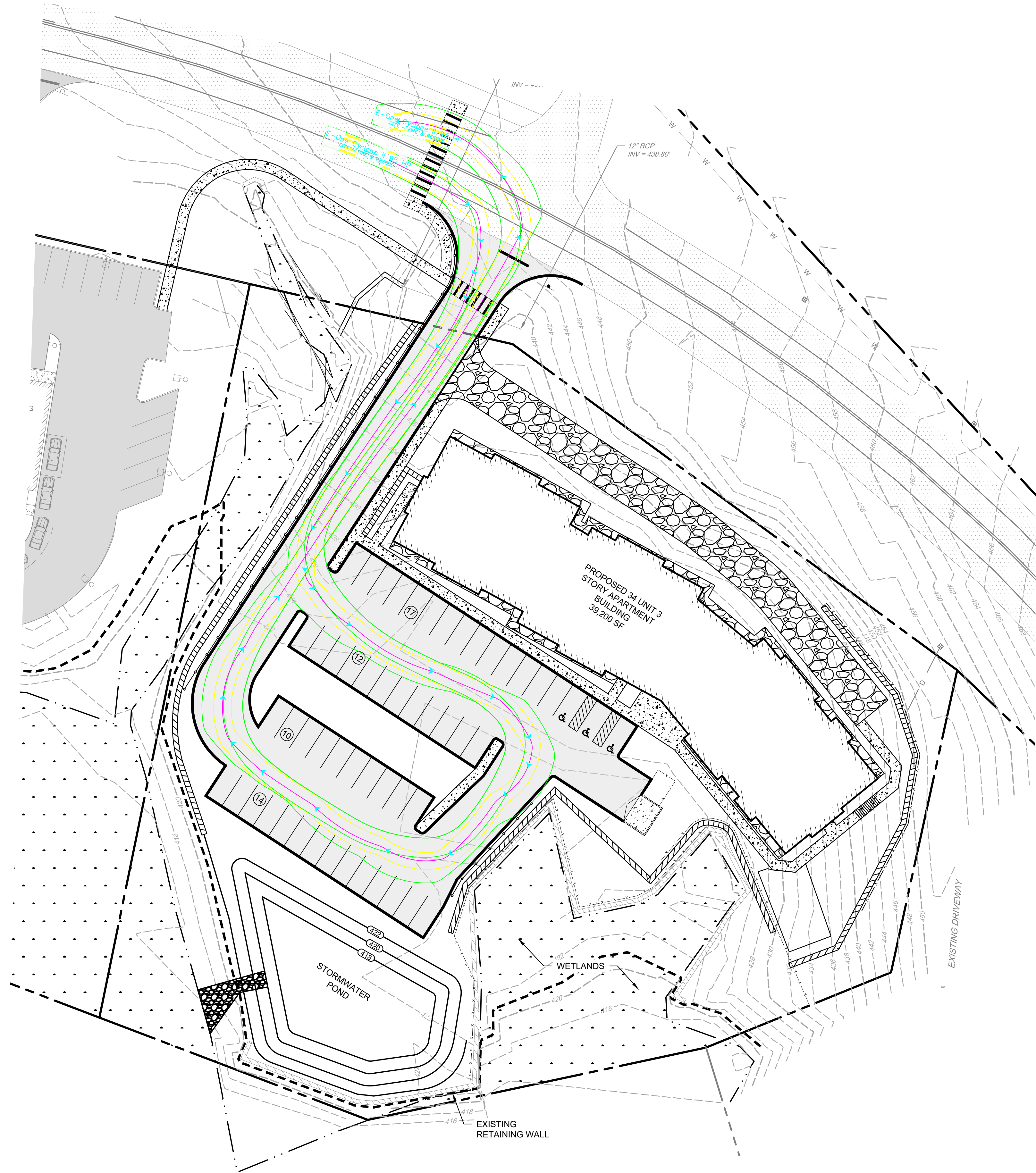
PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

VEHICLE TURNING PLAN - PUMPER TRUCK
CS2701

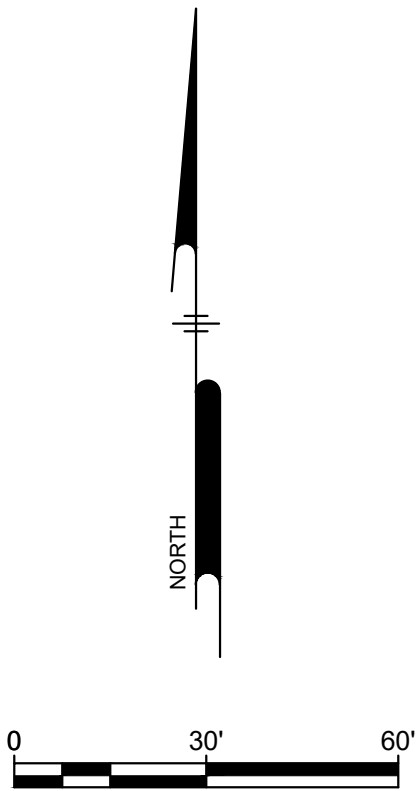


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E-One Cyclone II 95 HP
Width : 9.50
Track : 9.35
Lock to Lock Time : 6.0
Steering Angle : 43.4



9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	
DATE	NO.	REVISIONS	BY

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

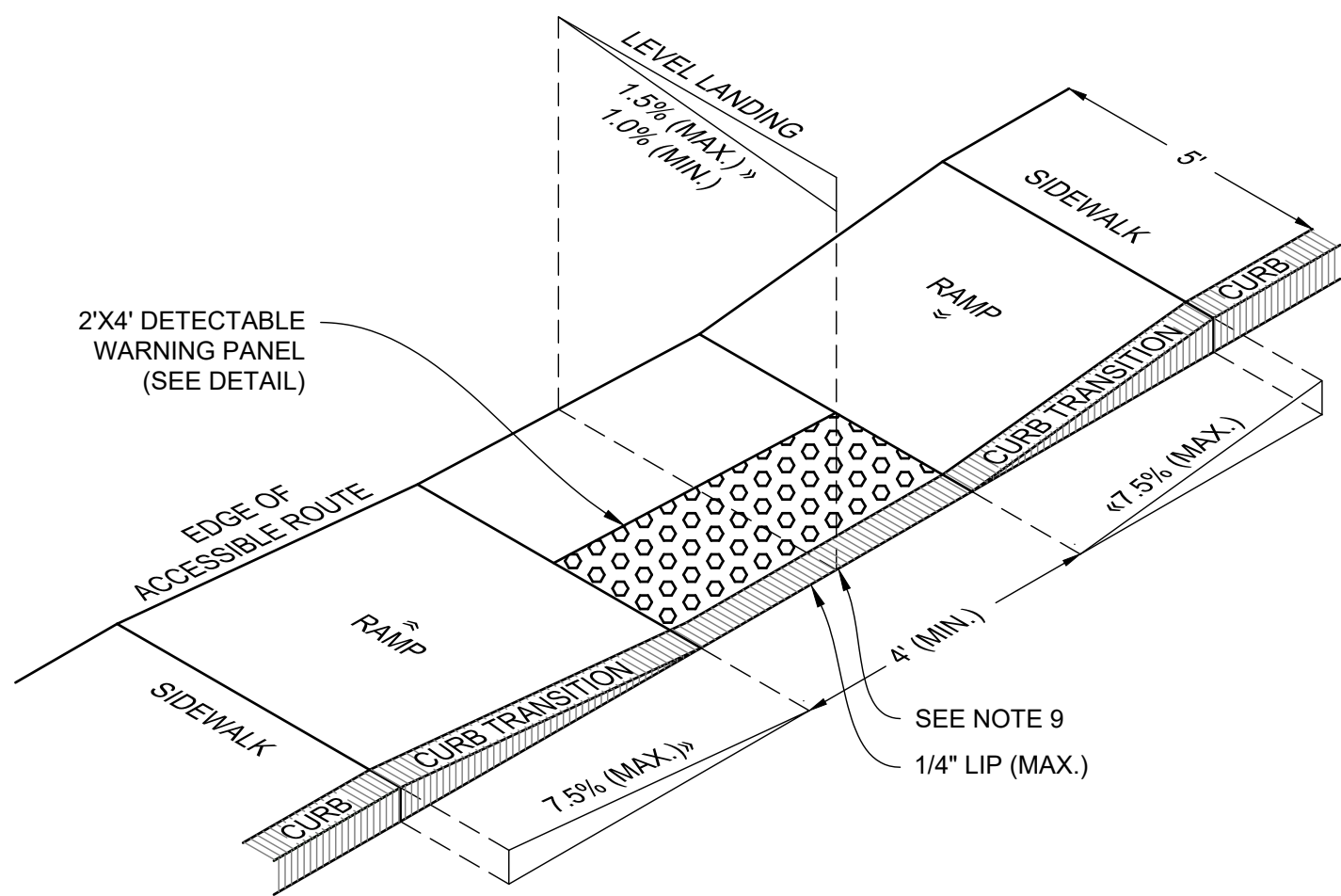
PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

VEHICLE TURNING PLAN - LADDER TRUCK
CS2702



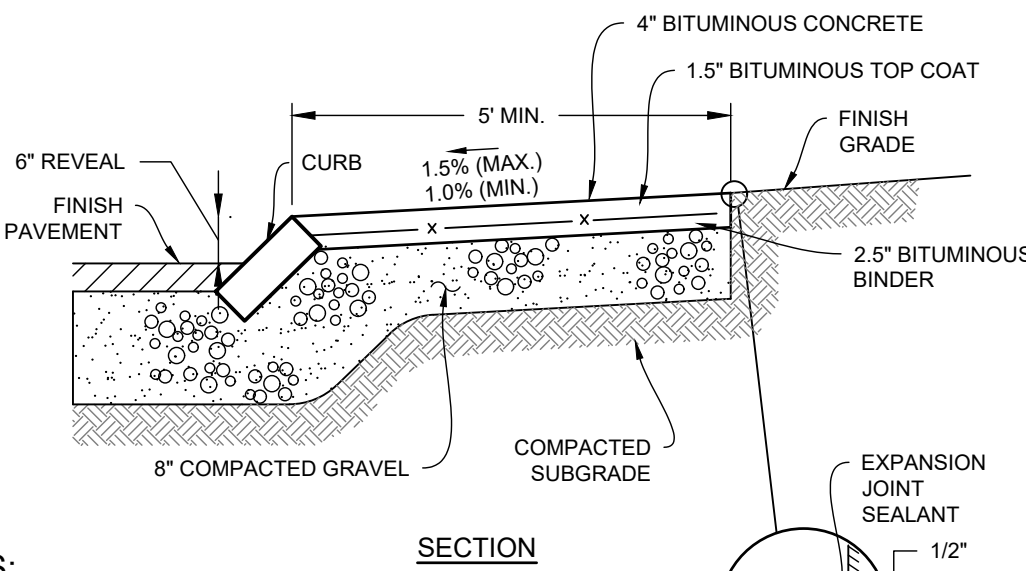
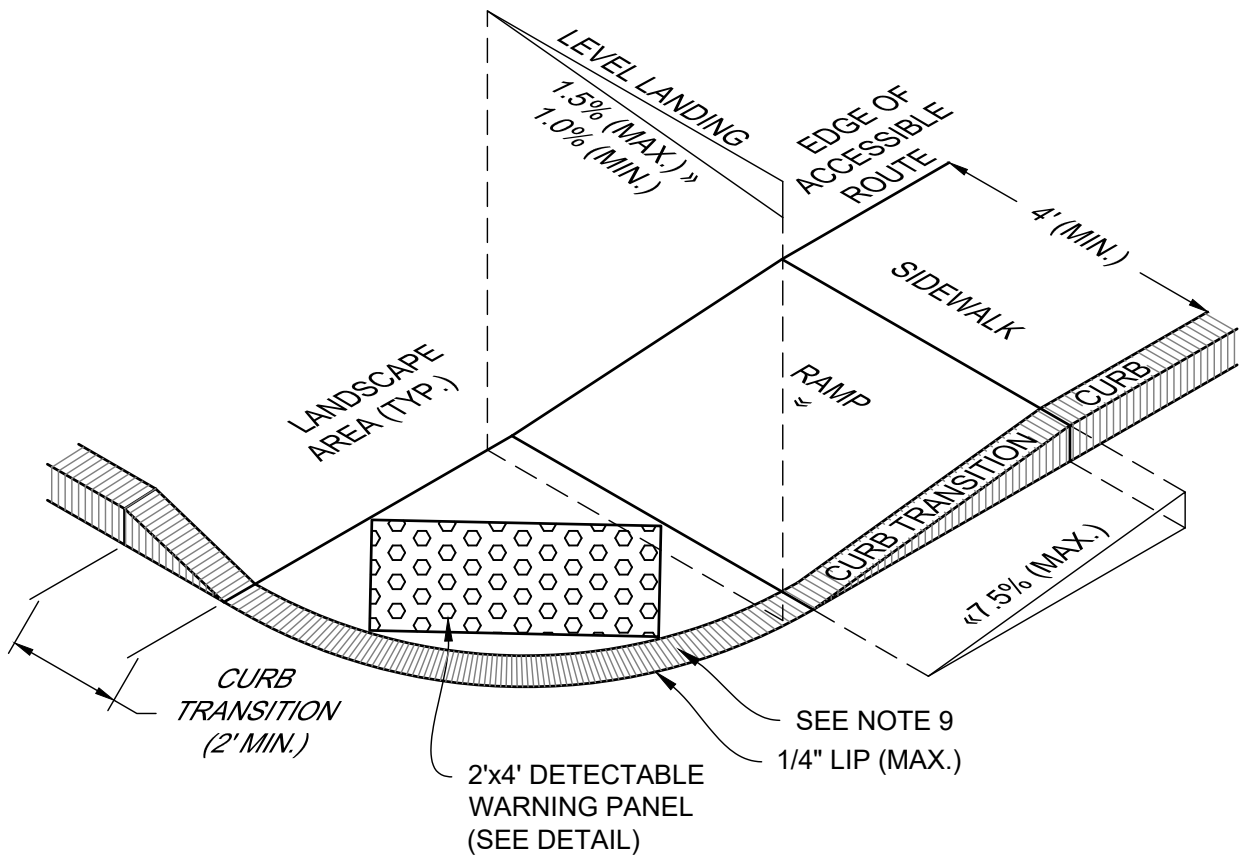
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NOTES:

1. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 1.5 (1% MIN.)
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 7.5%.
4. THE MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.)
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. RAMP, CURB, AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
8. WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5'x5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
9. ELIMINATE CURBING AT RAMP WHERE IT ABUTS ROADWAY, EXCEPT WHERE VERTICAL CURBING IS INDICATED ON THE DRAWINGS TO BE INSTALLED AND SET FLUSH.



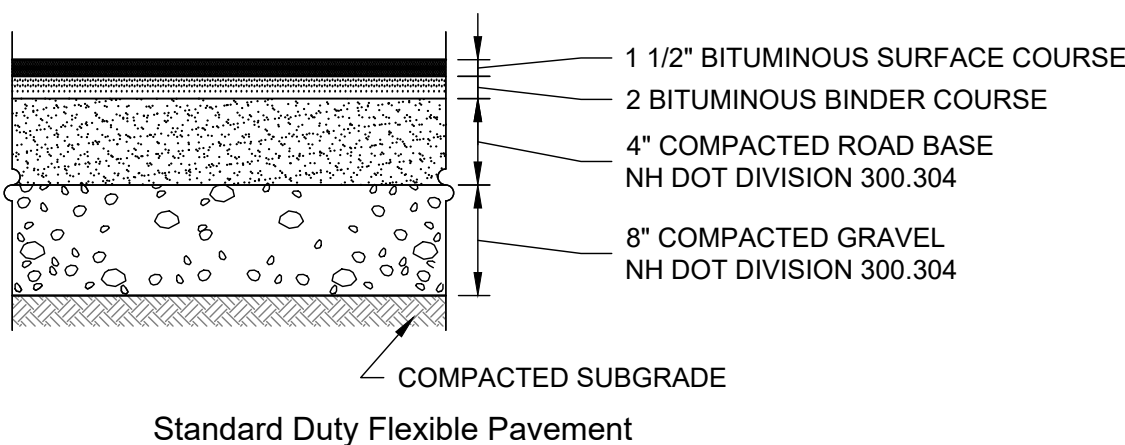
NOTES:

1. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE- FORMED JOINT FILLER.
2. PROVIDE TOOLED CONTROL JOINTS AT 6' O.C.
3. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
4. CEMENT CONCRETE SHALL BE 4000 PSI-TYPE II

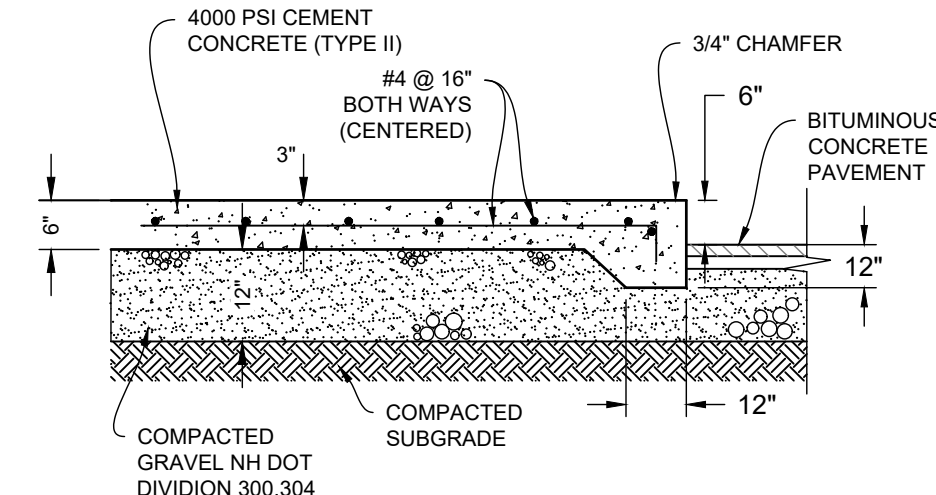
SECTION

CONCRETE SIDEWALK
1/2\"/>

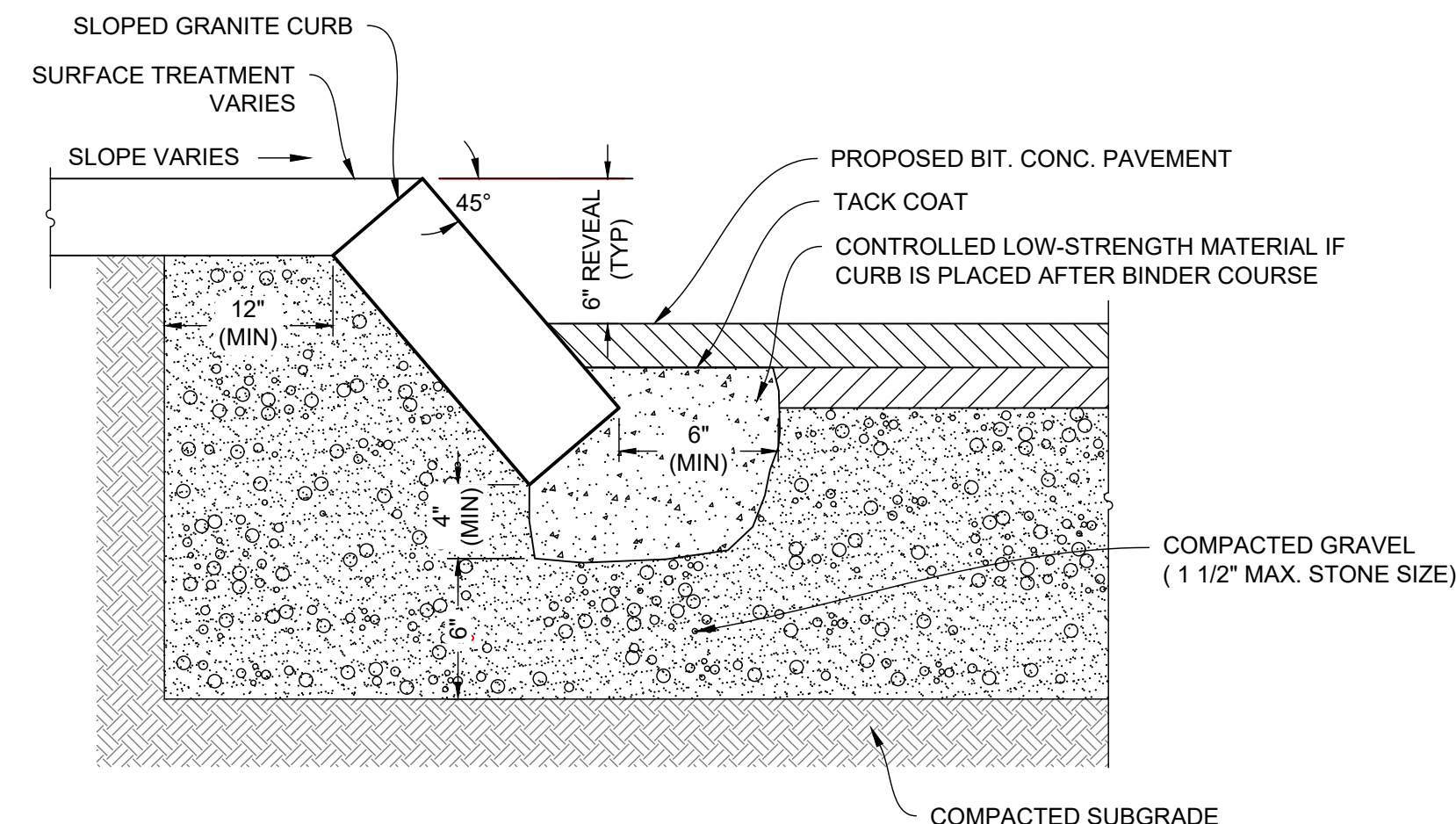
1 ACCESSIBLE CURB RAMP (ACR) - TYPE 'A' W/DETECTABLE WARNING PANEL
NOT TO SCALE



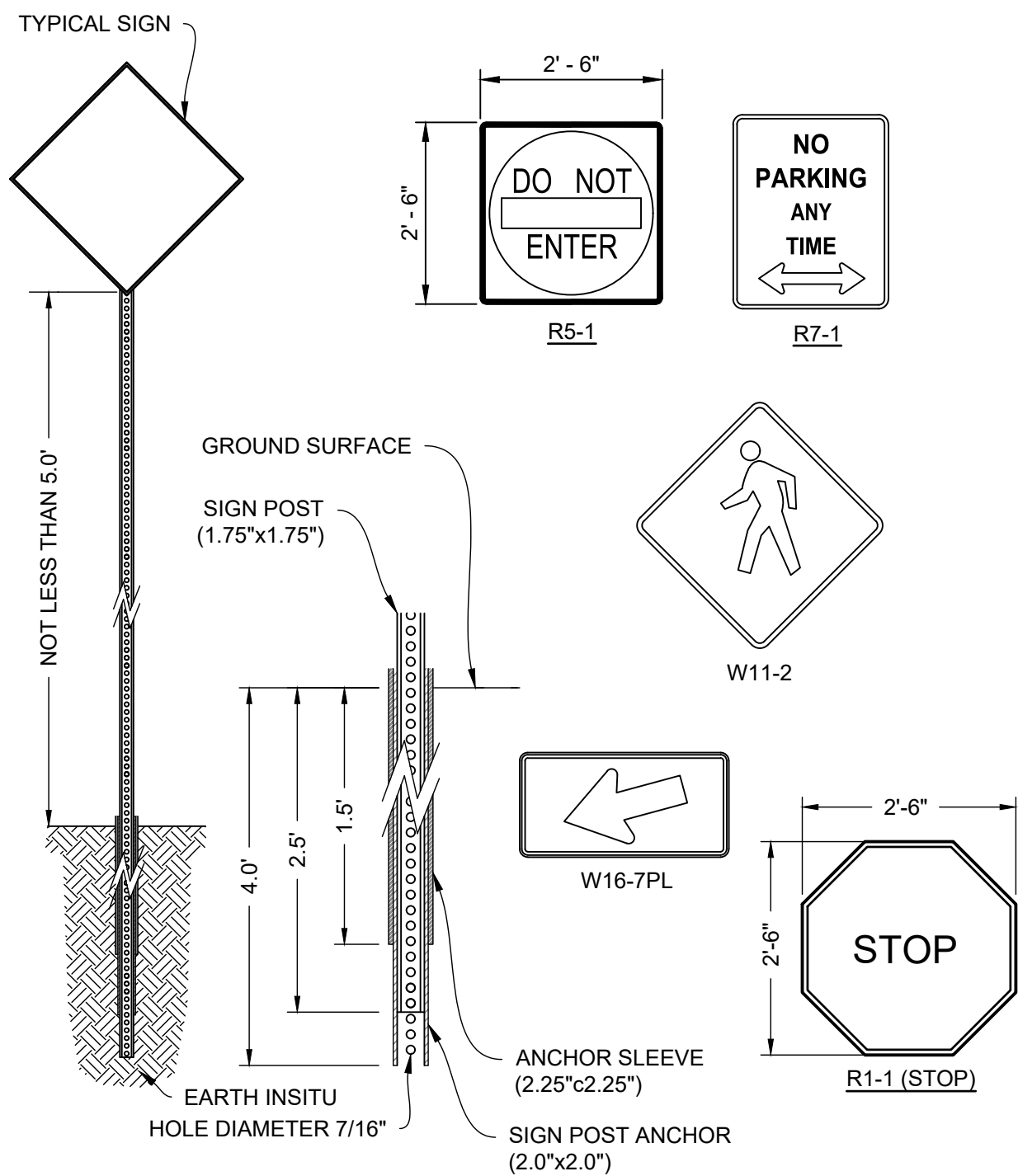
4 BIT. CONC. PAVE. SECTION - PARKING LOT
NOT TO SCALE



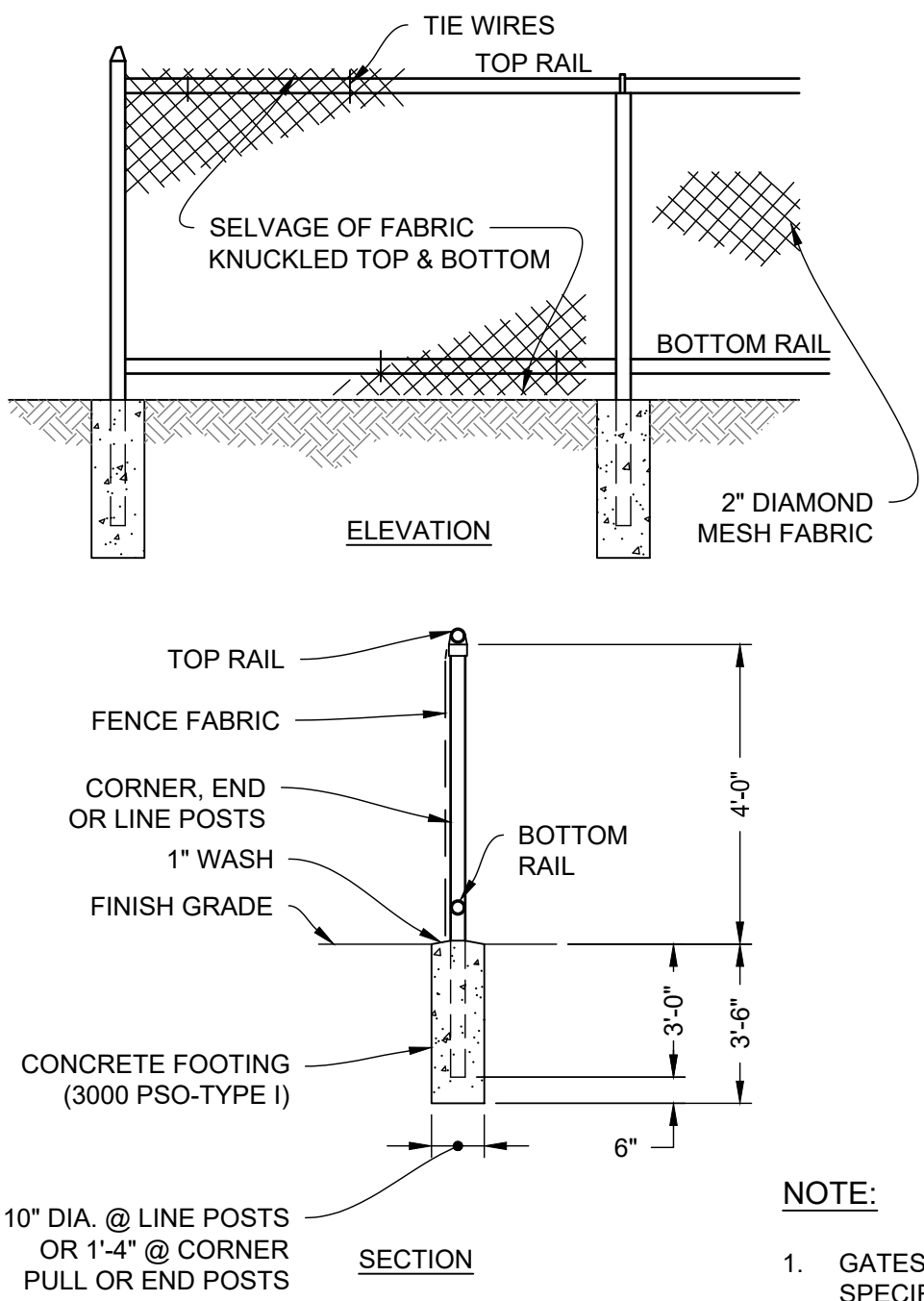
5 TYPICAL PRECAST CONCRETE SIDEWALK AND CURB SECTION
NOT TO SCALE



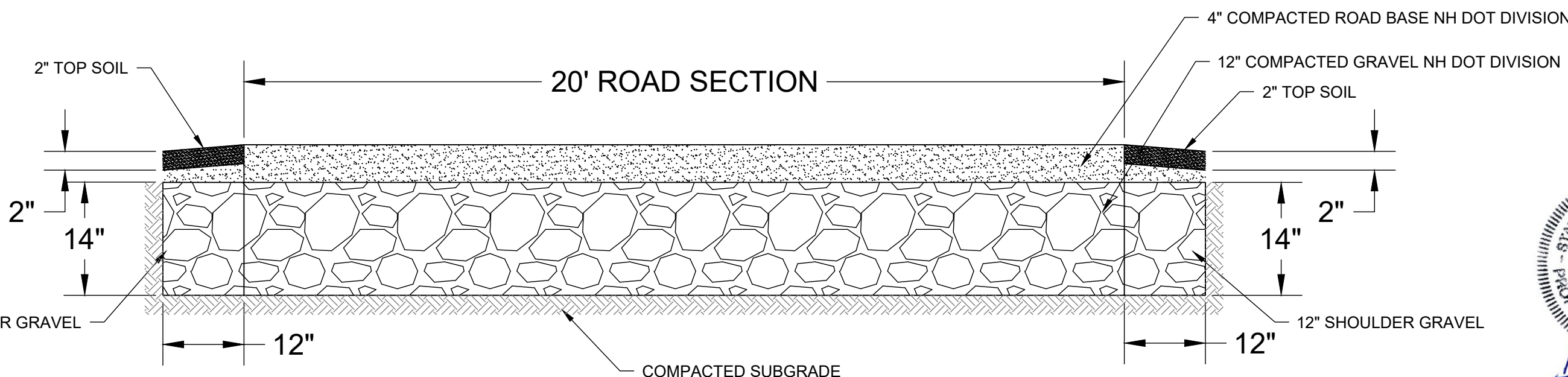
9 SLOPED GRANITE CURB
NOT TO SCALE



6 SIGN POST DETAIL
NOT TO SCALE

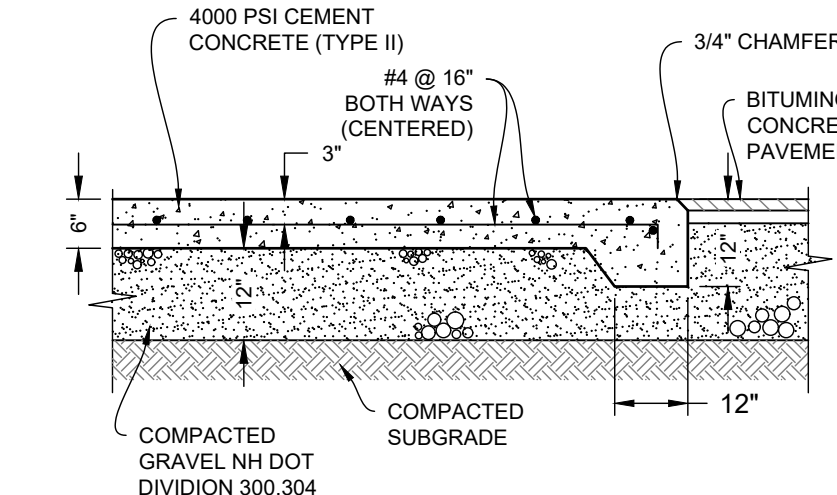


7 CHAIN LINK FENCE UP TO 6'
NOT TO SCALE



9 GRAVEL ROAD CROSS SECTION
NOT TO SCALE

3 BITUMINOUS CONCRETE SIDEWALK
NOT TO SCALE



NOTES:

1. SIZE OF COMPACTOR PAD TO BE AS INDICATED ON PLANS. CONSTRUCTION JOINTS TO BE SET AT INTERVALS OF 1/3 OF LENGTH
2. SQUARE CONCRETE PAD TO BE 16\"/>

8 TYPICAL CONCRETE PAD SECTION
NOT TO SCALE

DATE	NO.	REVISIONS	BY
9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	

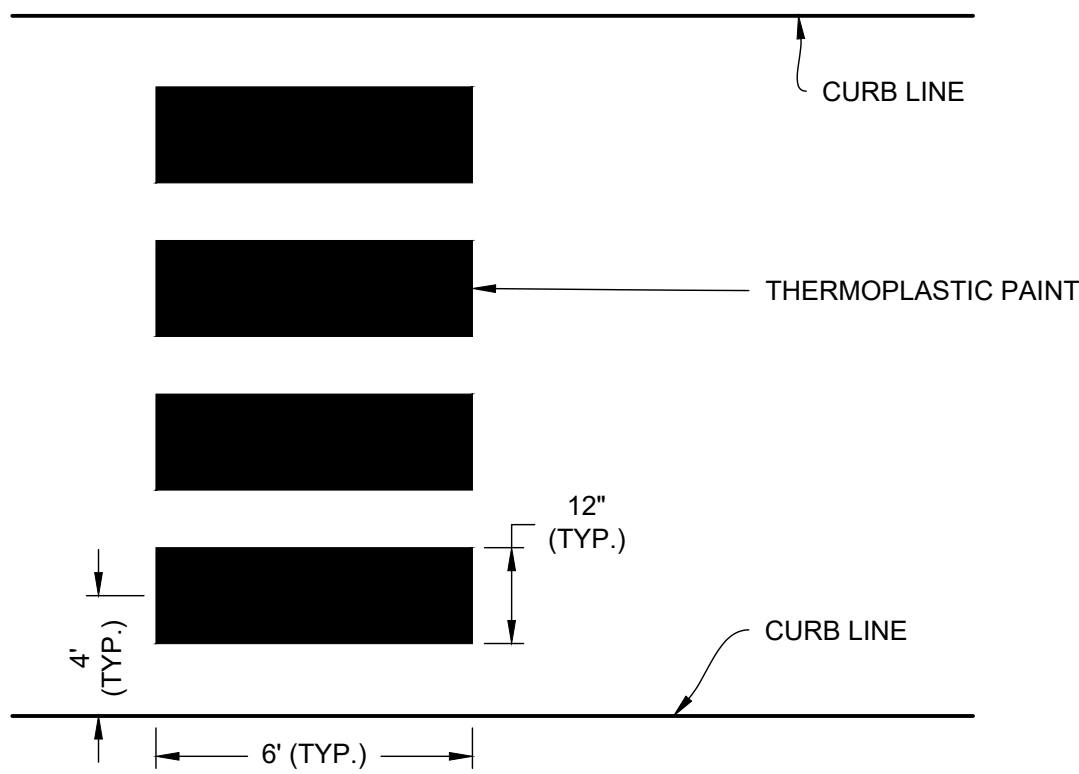
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

SITE DETAILS
CS6001

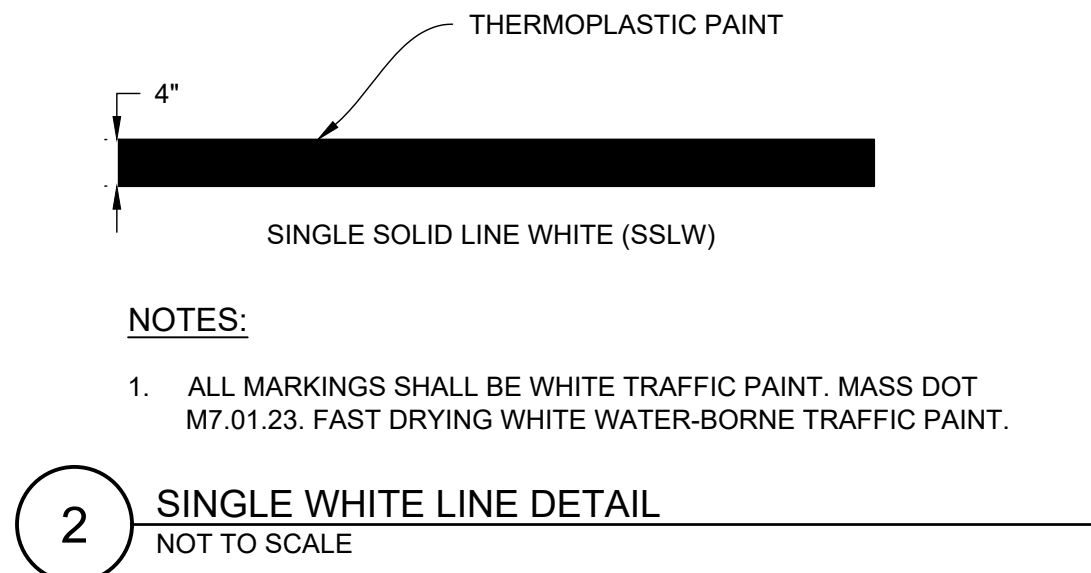


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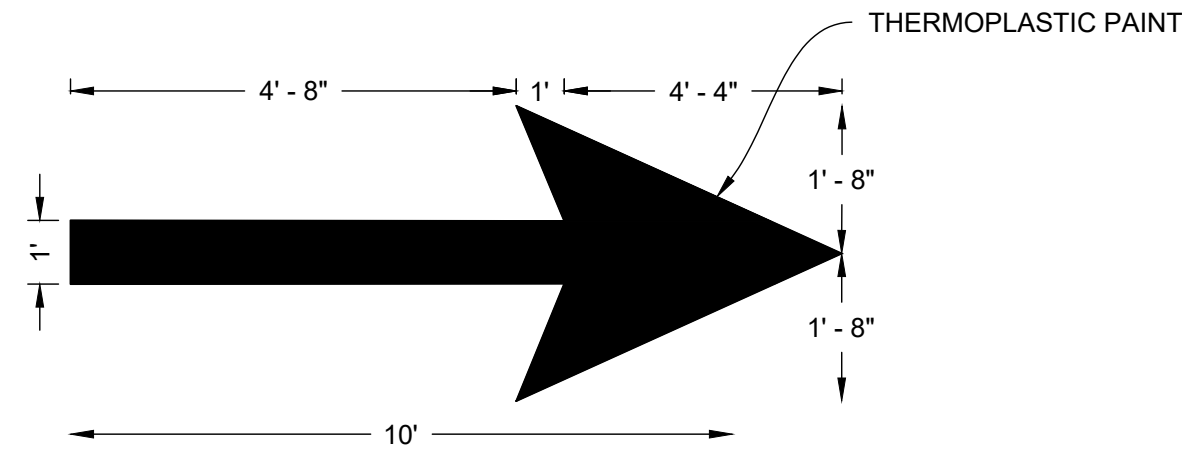


- NOTES:
1. TWELVE INCH (12") LINES SHALL BE APPLIED IN ONE APPLICATION. NO COMBINATION OF LINES (TWO - 6 INCH LINES) WILL BE ACCEPTED.
 2. LONGITUDINAL CROSSWALK LINES TO BE PARALLEL TO CURB LINE.
 3. ALL LONGITUDINAL CROSSWALK LINES TO BE THE SAME LENGTH AND PROPERLY ALIGNED.
 4. CROSS WALK SIDE SLOPE SHALL NOT EXCEED 1.5%.

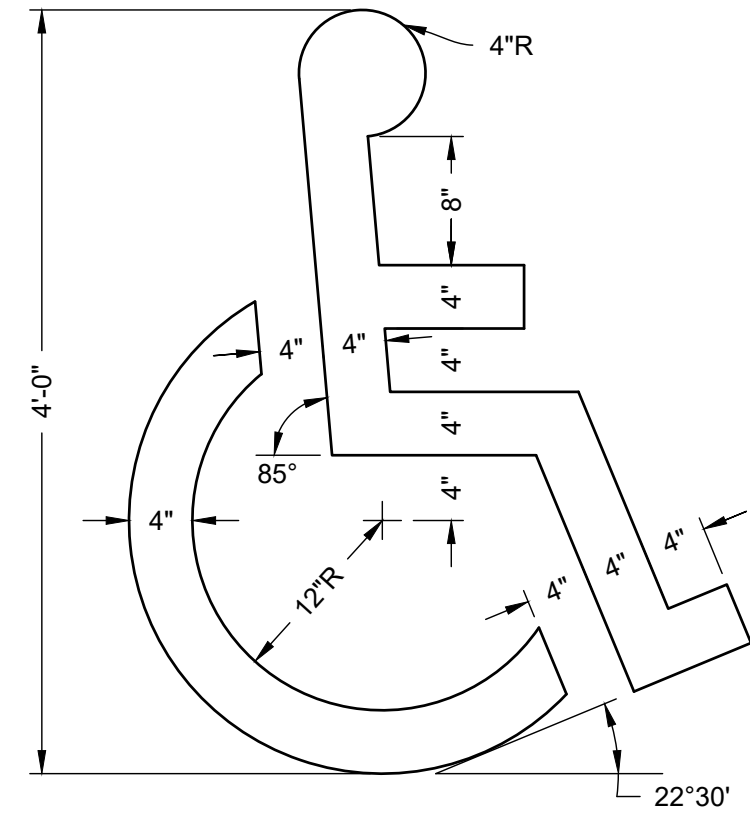
1 CROSSWALK
NOT TO SCALE



2 SINGLE WHITE LINE DETAIL
NOT TO SCALE

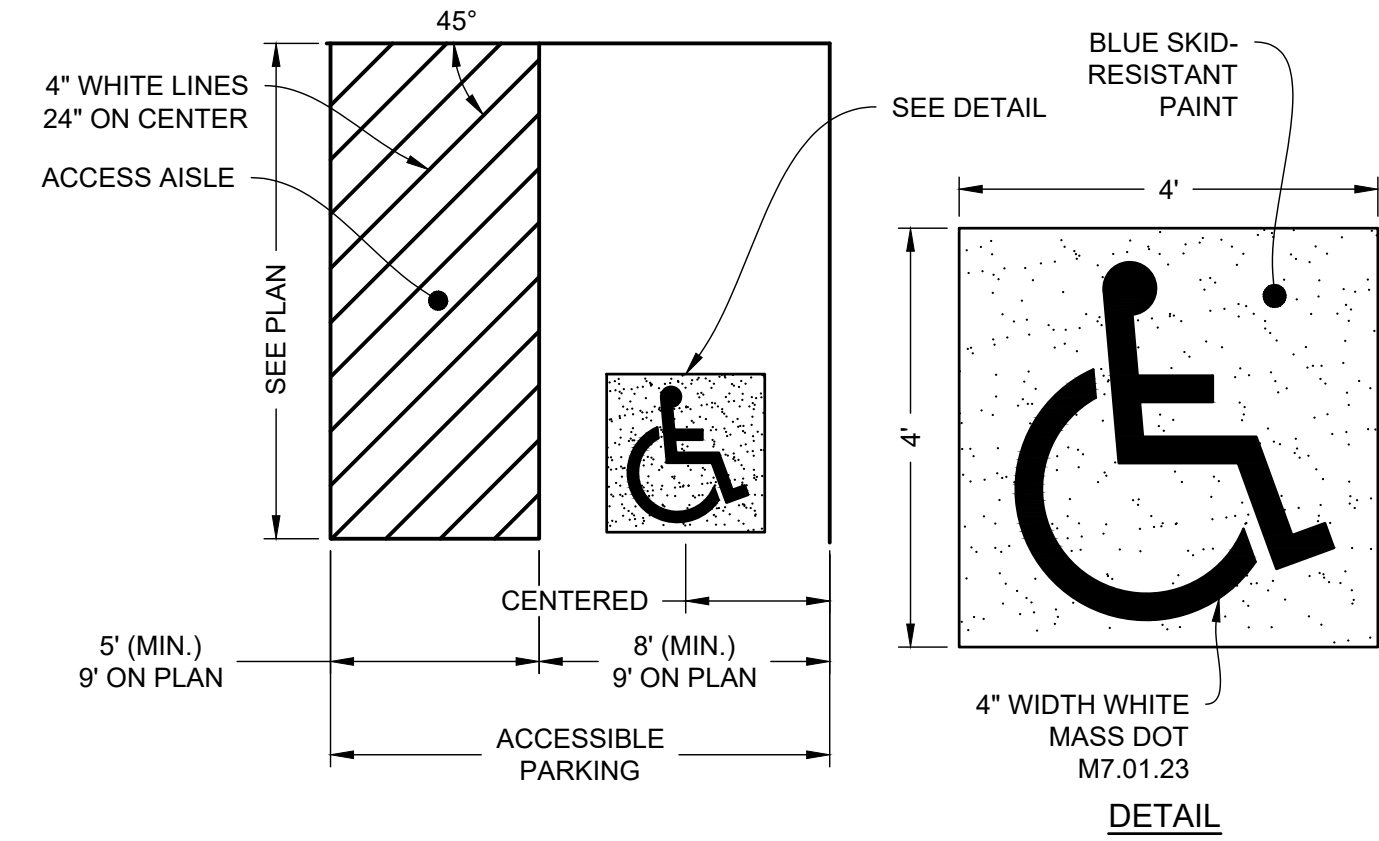


3 STRAIGHT ARROW
NOT TO SCALE



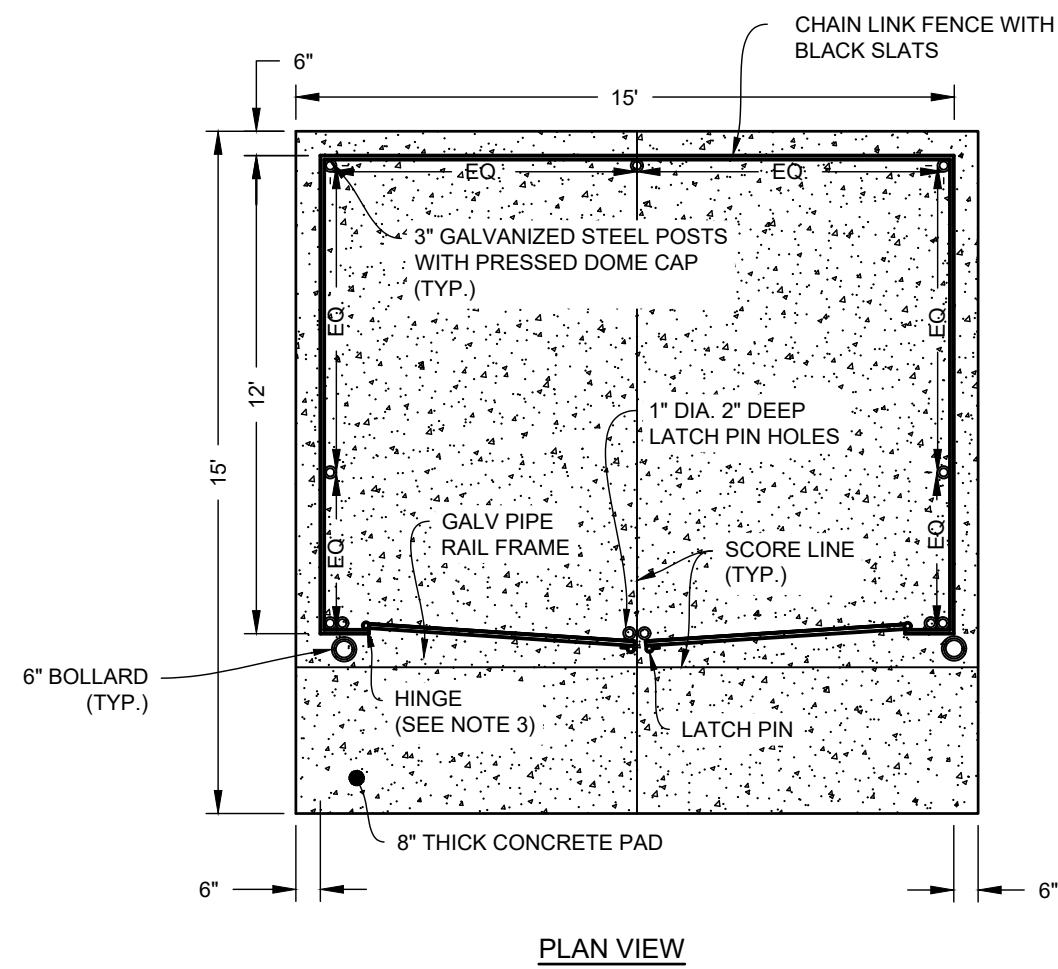
- NOTES:
1. SYMBOL SHALL BE CENTERED IN THE PARKING STALL AND SHALL BE WHITE.
 2. PAVEMENT MARKING STRIPES SHALL BE WHITE. (DOUBLE STRIPED - SEE STALL LAYOUT DETAIL) MASS DOT M7.01.23 FAST DRYING WHITE WATER-BORNE TRAFFIC PAINT.
 3. SYMBOL TO BE PAINTED IN ALL HANDICAP SPACES.

4 ACCESSIBLE PARKING SPACE SYMBOL
NOT TO SCALE

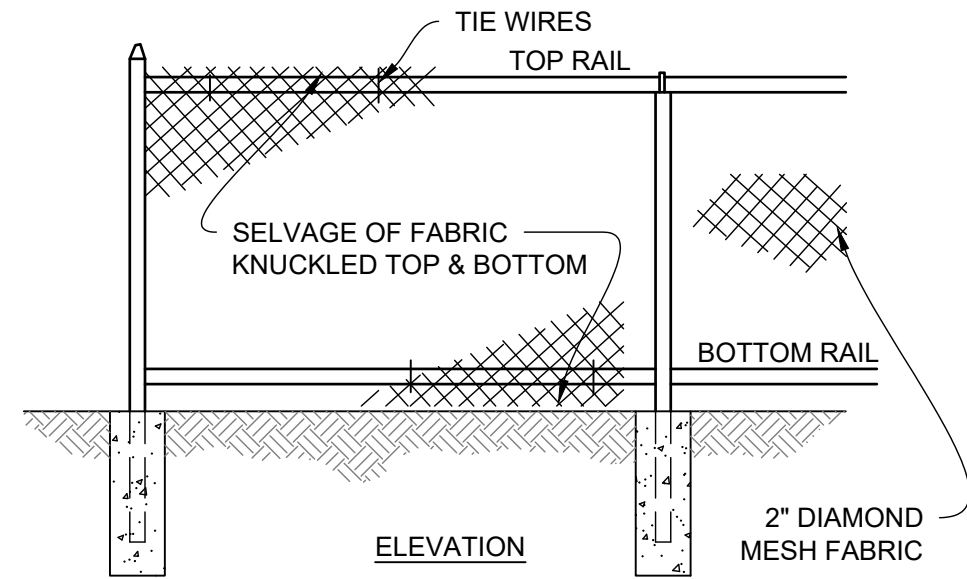


- NOTES:
1. ALL DIMENSIONS TO EDGES OF 4" PAVEMENT STRIPING.
 2. ALL STRIPING SHALL BE 4" WIDE SOLID WHITE PAVEMENT MARKINGS UNLESS OTHERWISE NOTED. MASS DOT M7.01.23 FAST DRYING WHITE WATER-BORNE TRAFFIC PAINT.
 3. 8' STALL WIDTH REFERS TO 8' CLEAR BETWEEN INSIDE EDGES OF PAVEMENT MARKINGS.

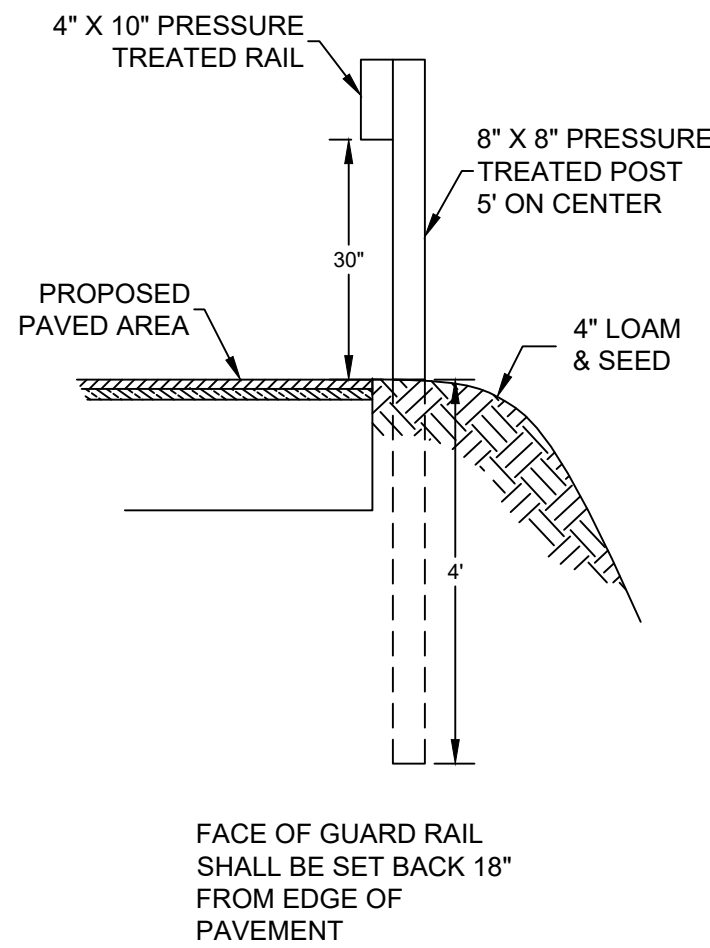
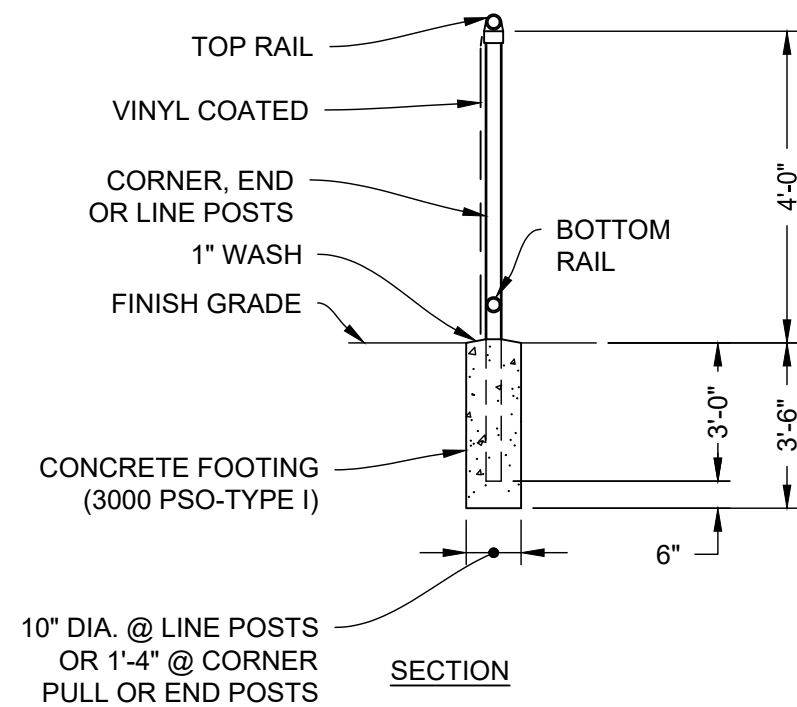
5 ACCESSIBLE PARKING SPACE
NOT TO SCALE



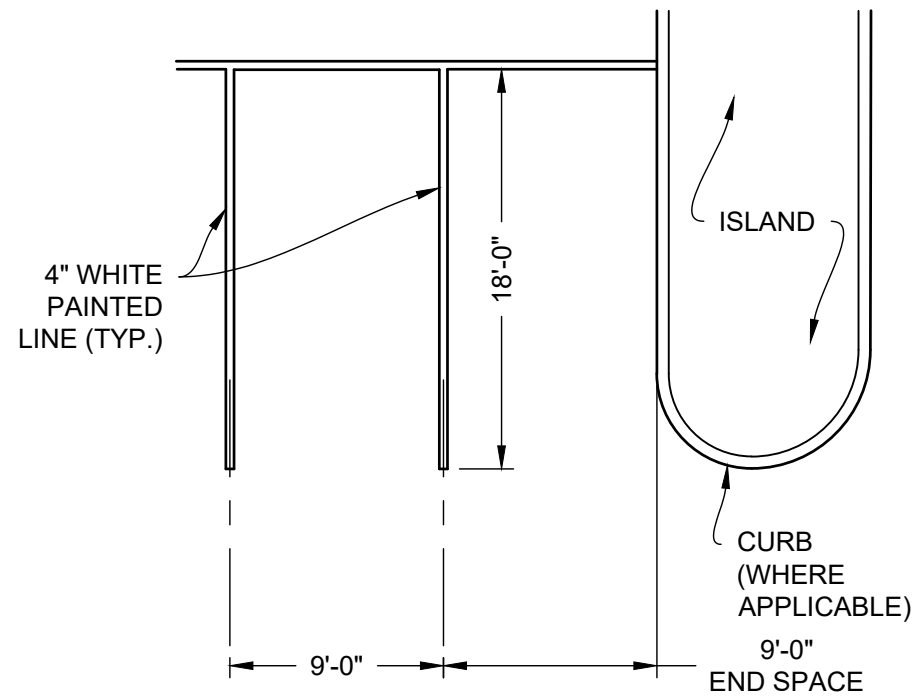
- DUMPSTER PAD NOTES
1. SIZE OF DUMPSTER PAD TO BE AS INDICATED ON PLANS.
 2. CONSTRUCTION JOINTS SHALL BE PLACED NO MORE THAN 40 FEET ON CENTER AND SHALL BE EQUALLY SPACED OVER THE LENGTH AND WIDTH OF PAD.
 3. ALL HINGES TO BE SELF CLOSING SPRING HINGE FOR A MINIMUM 300 LB GATE CARRYING A 700LB POINT LOAD.



- NOTE:
1. GATES AND HARDWARE TO BE AS PER MANUFACTURER'S SPECIFICATION. SUBMIT MANUFACTURER'S LITERATURE FOR APPROVAL.



7 WOOD BEAM GUARDRAIL WITH WOOD POST
NOT TO SCALE



8 SINGLE STRIPE PAVEMENT MARKING
NOT TO SCALE

9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	
DATE	NO.	REVISIONS	BY

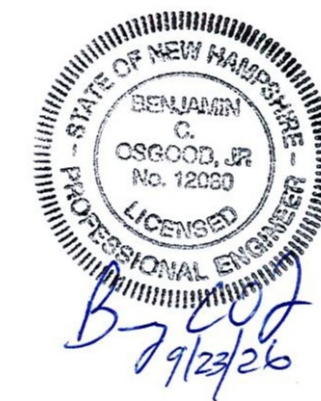
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

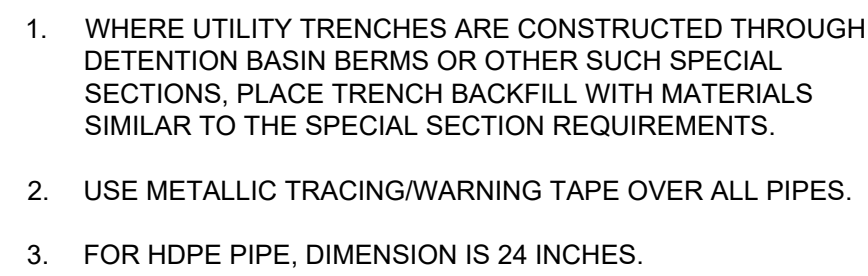
PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

SITE DETAILS
CS6002

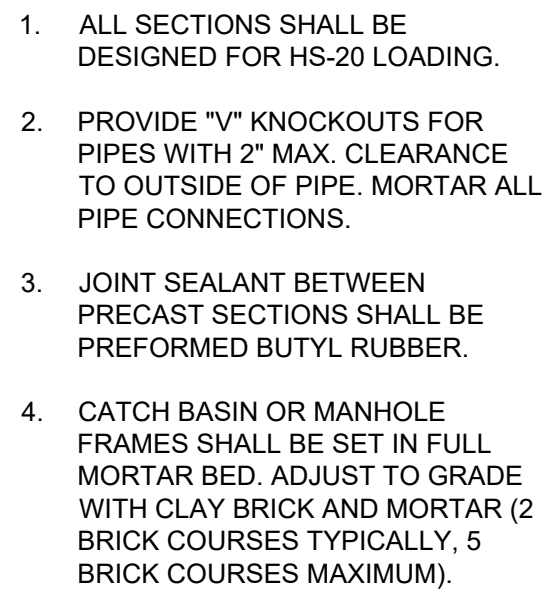


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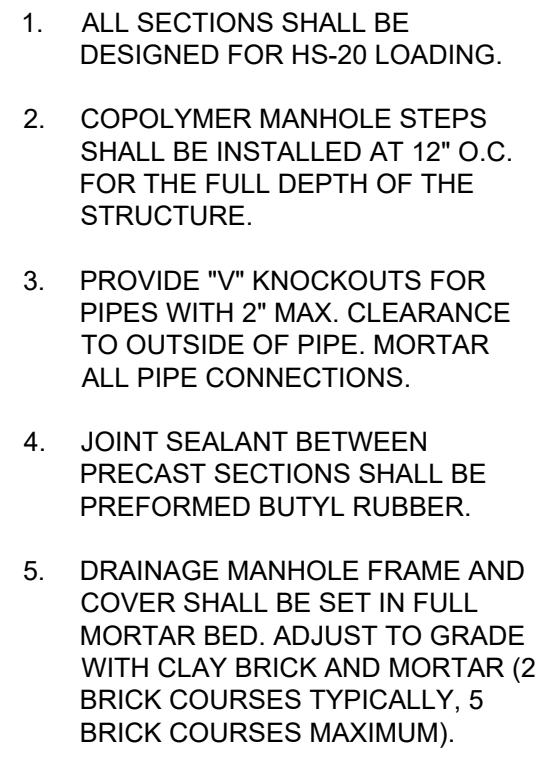




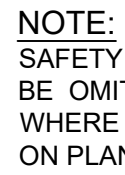
1 DRAINAGE TRENCH
NOT TO SCALE



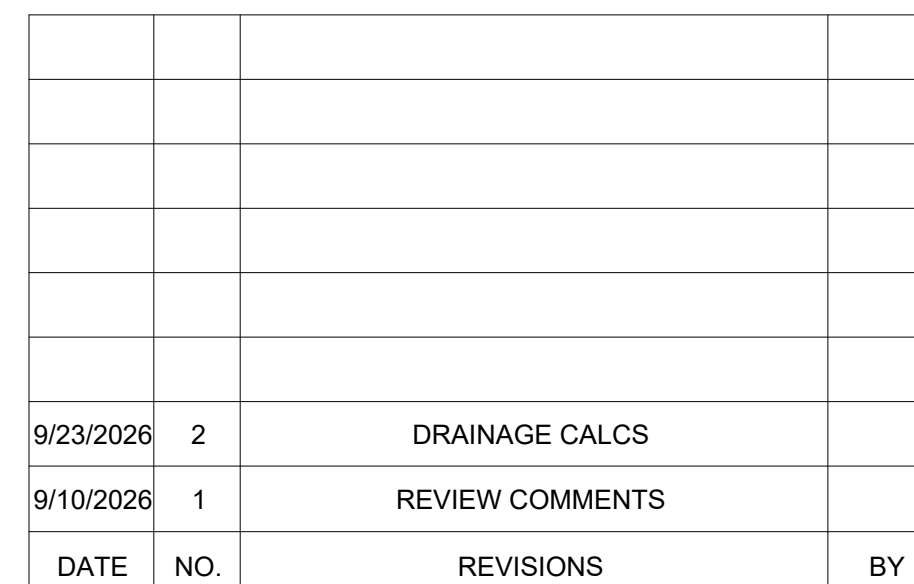
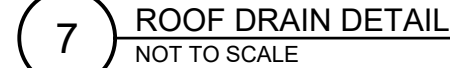
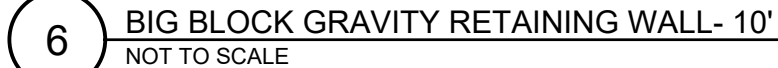
2 CATCH BASIN (CB) WITH HOOD
NOT TO SCALE



3 DRAINAGE MANHOLE (DMH)
NOT TO SCALE

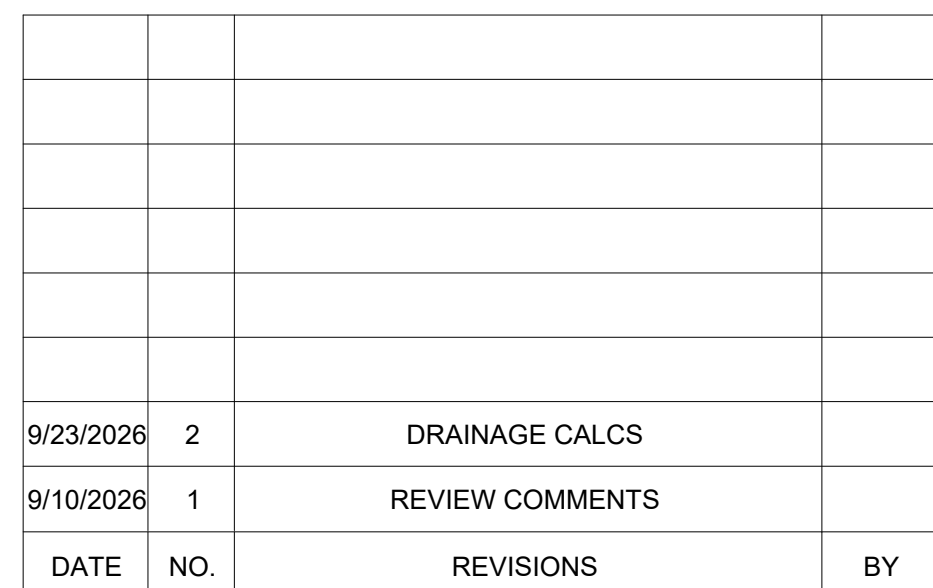
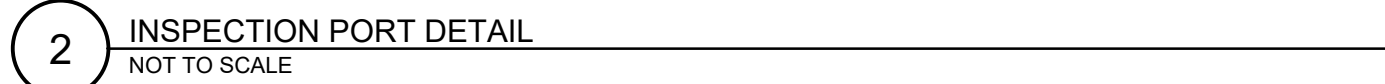
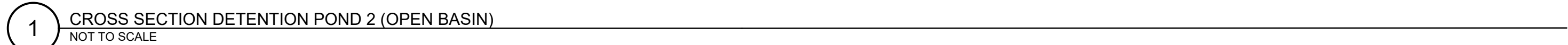


4 FLARED END SECTION (FES) WITH STONE PROTECTION
NOT TO SCALE

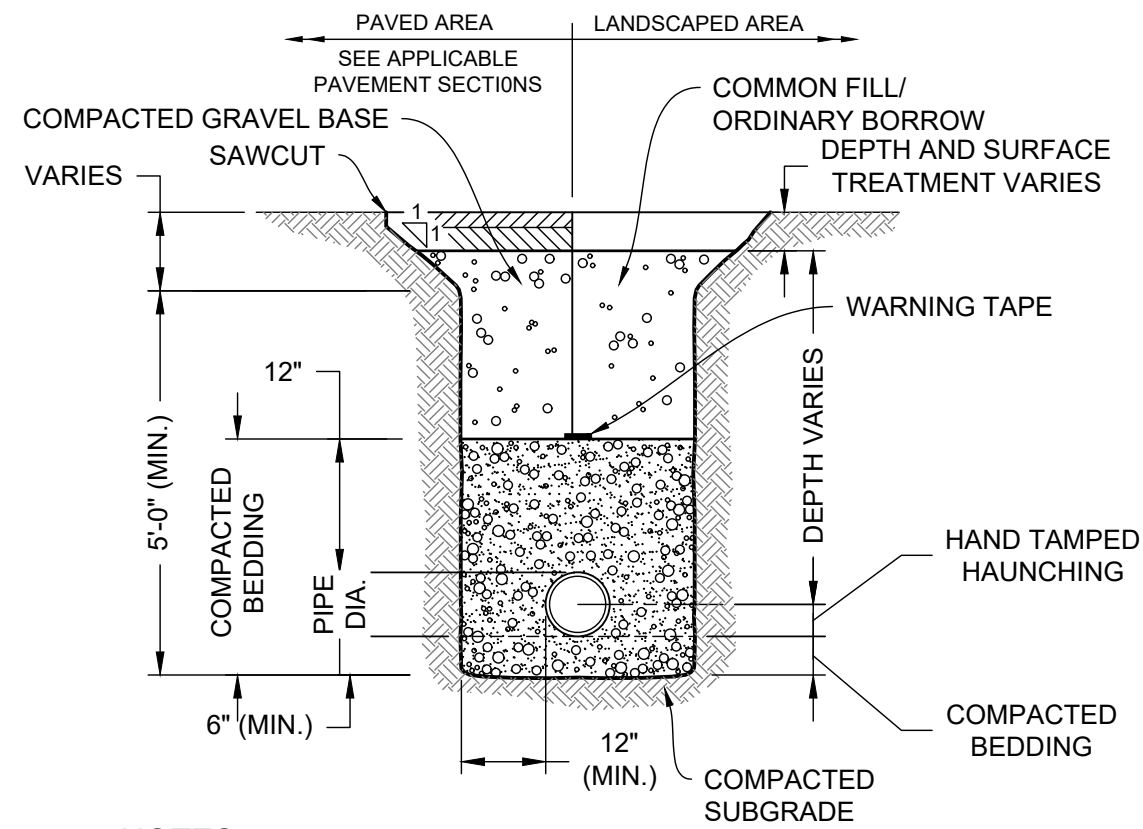


PROPERTY OWNER: COMET, LLC
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DATE: SEPTEMBER 23, 2026	SCALE:	SHEET 13 OF 22
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NOTES:

- WHERE UTILITY TRENCHES ARE CONSTRUCTED THROUGH DETENTION BASIN BERMS OR OTHER SUCH SPECIAL SECTIONS, PLACE TRENCH BACKFILL WITH MATERIALS SIMILAR TO THE SPECIAL SECTION REQUIREMENTS.
- USE METALLIC TRACING/WARNING TAPE OVER ALL PIPES.

1 WATER TRENCH
NOT TO SCALE

TABLE OF DIMENSIONS											
BENDS	B	C	D	E	F	BENDS	B	C	D	E	F
6" 11 1/4"	8"	15"	12"	24"	12"	6" 45°	8"	30"	12"	24"	14"
6" 22 1/2"	-	19"	-	-	13"	6" 90°	-	30"	-	-	27"
8" 11 1/4"	-	20"	-	-	12"	8" 45°	-	30"	-	-	24"
8" 22 1/2"	-	22"	-	-	17"	8" 90°	-	38"	-	-	36"
12" 11 1/4"	-	30"	-	-	15"	12" 45°	-	40"	-	-	40"
12" 22 1/2"	-	35"	-	-	25"	12" 90°	-	60"	-	-	52"

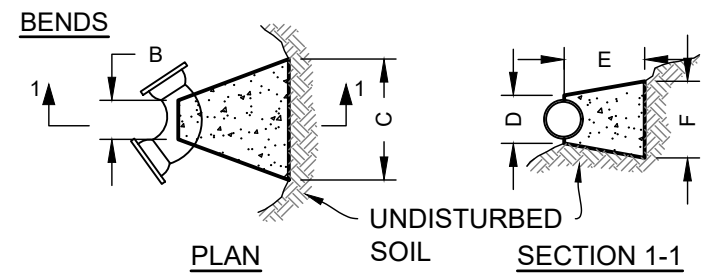
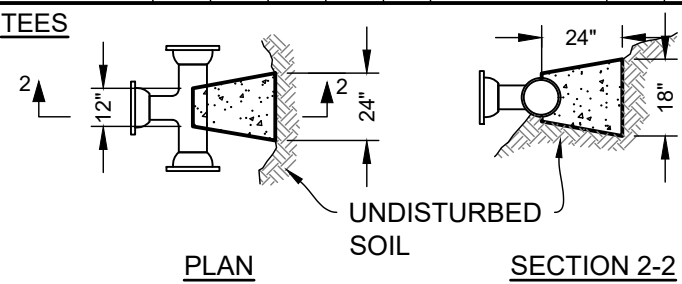


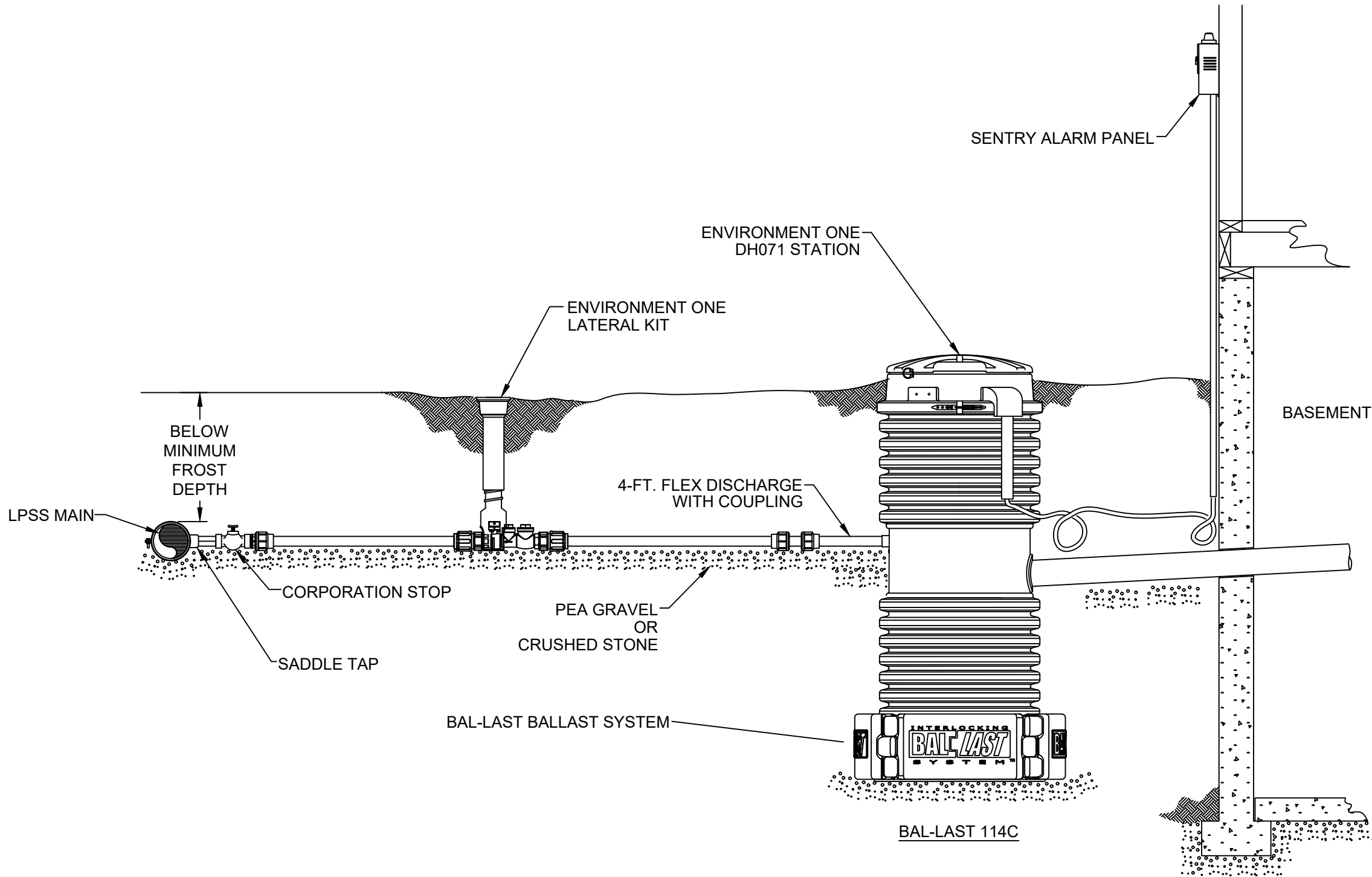
TABLE OF DIMENSIONS									
TEES	G	H	I	J	TEES	G	H	I	J
6"x 6"x 6"	12"	24"	24"	18"	12"x 12"x 6"	12"	24"	24"	18"
8"x 8"x 6"	"	"	"	"	12"x 12"x 8"	"	"	"	24"
8"x 8"x 8"	"	"	"	24"	12"x 12"x 12"	"	36"	"	36"



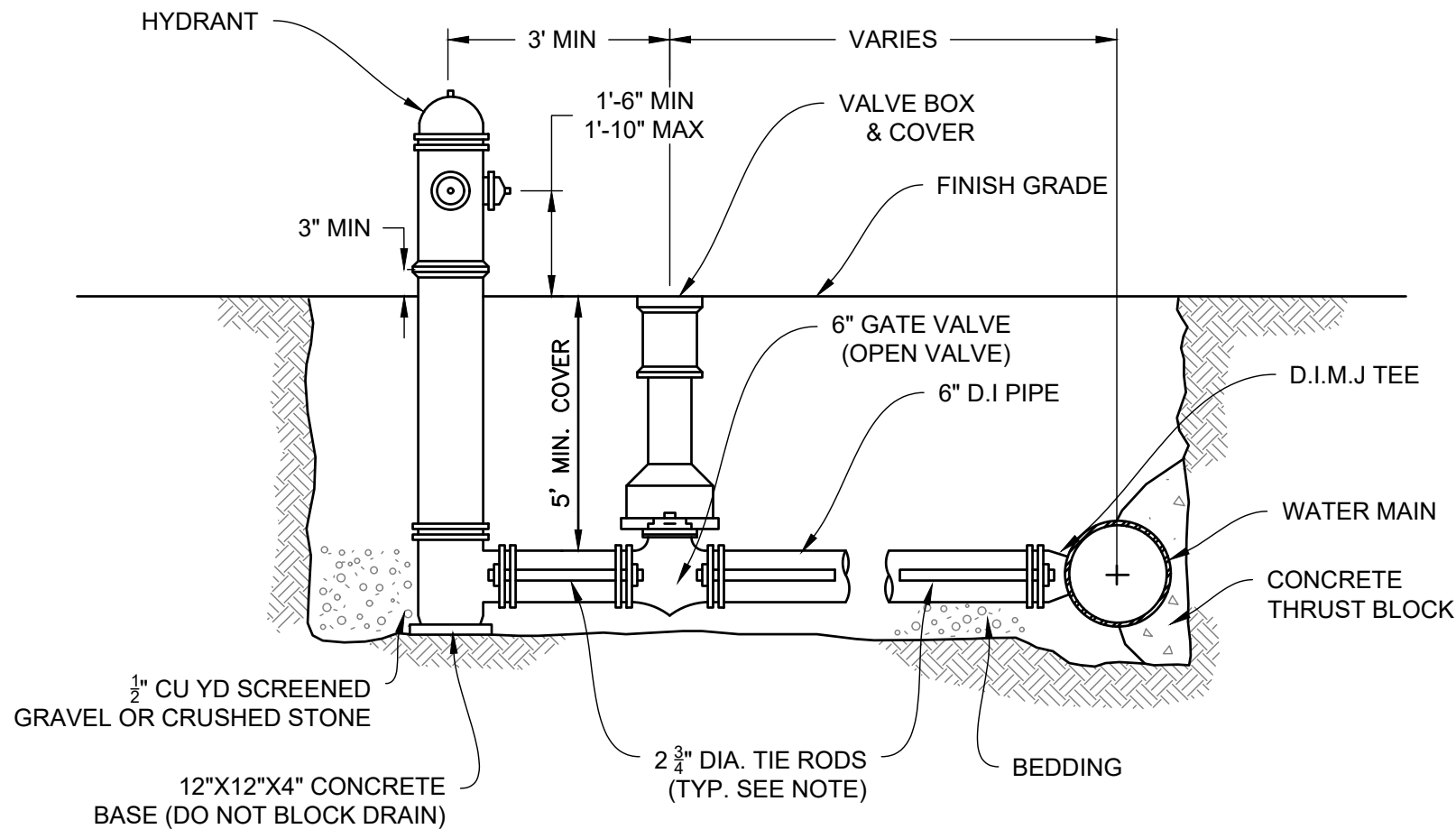
NOTES:

- PROVIDE BLOCKS FOR TAPPING SLEEVES, DEAD ENDS, GATE VALVES, AND VERTICAL BENDS (SAME SIZE AS REQUIRED FOR TEES). PROVIDE ANCHOR RODS AT VERTICAL BENDS AND GATE VALVES.
- CONCRETE SHALL NOT BE PLACED AGAINST PIPE BEYOND FITTING.
- CONCRETE SHALL BE 3000 PSI-TYPE I.

2 CONCRETE THRUST BLOCK
NOT TO SCALE



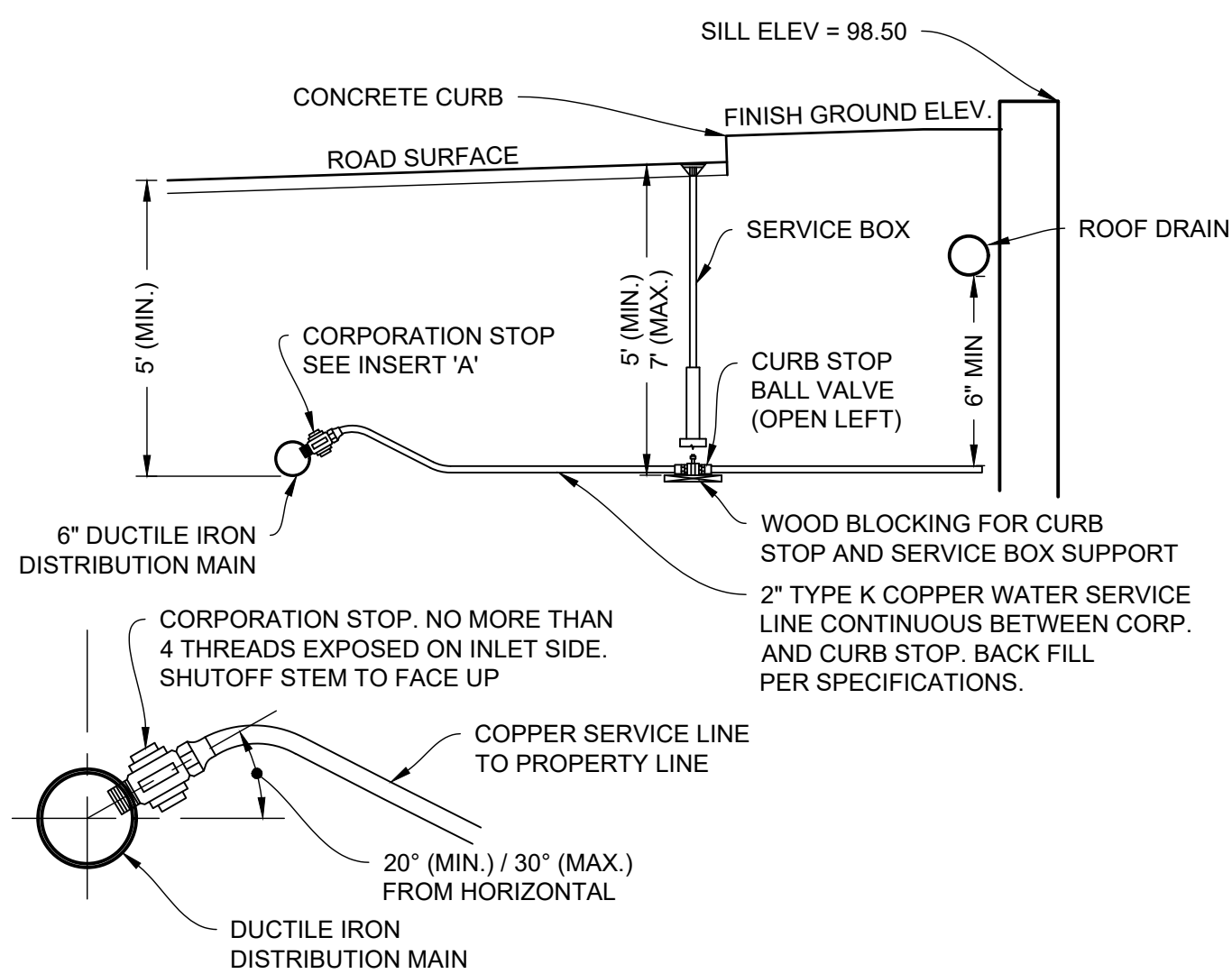
3 TYPICAL E/ONE PUMP AND BALLAST INSTALLATION
NOT TO SCALE



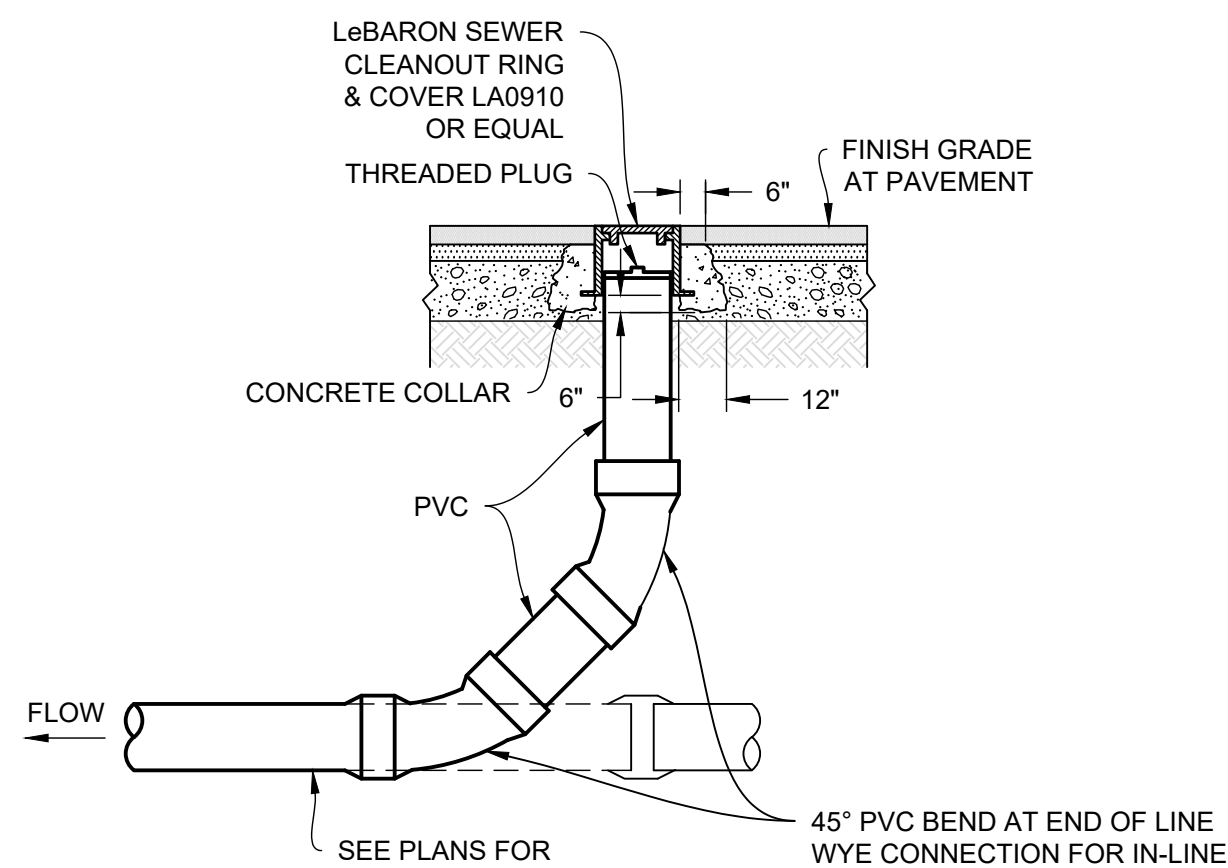
NOTES:

- CONTINUE TIE RODS TO MAIN OR AT LEAST 20' ALONG HYDRANT LATERAL.
- HYDRANT AND VALVE TO OPEN LEFT

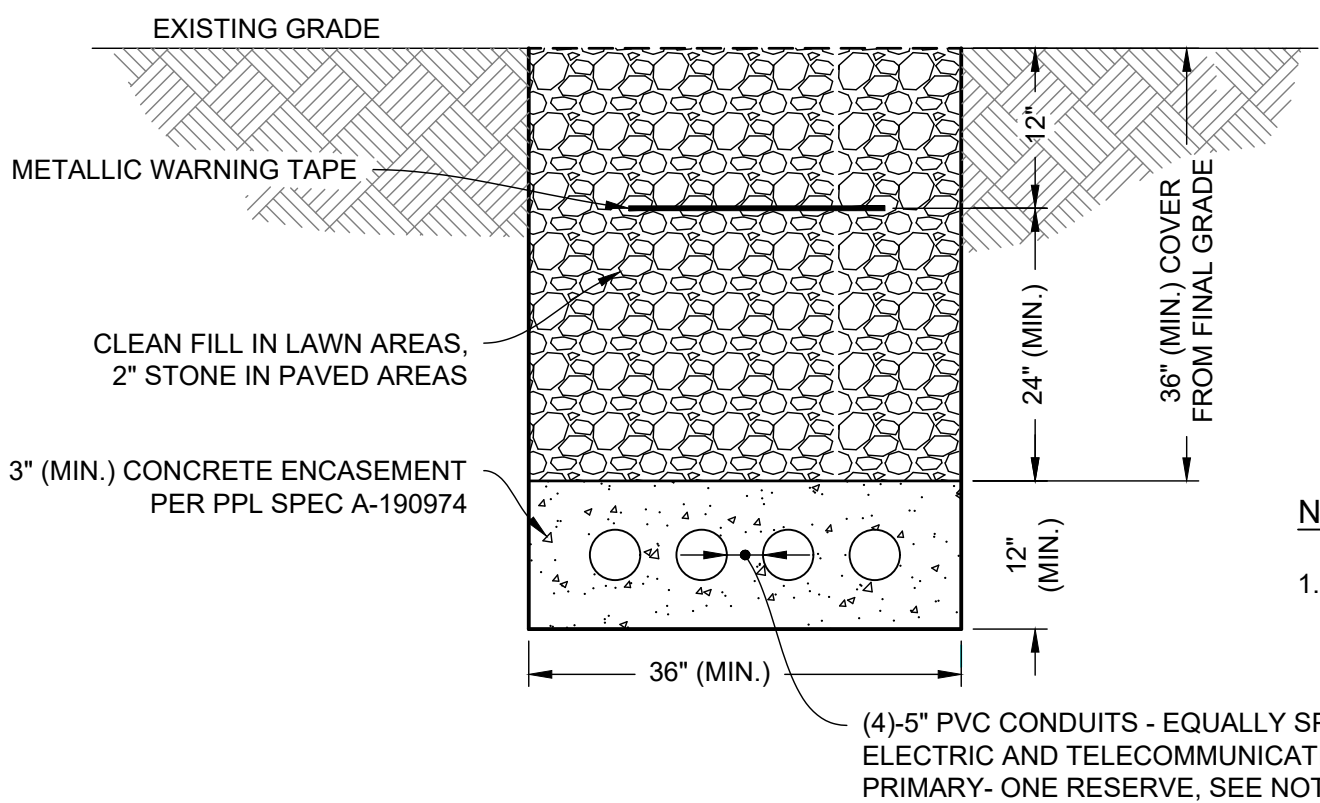
4 HYDRANT
NOT TO SCALE



6 WATER SERVICE INSTALLATION
NOT TO SCALE



7 SEWER SERVICE CLEANOUT AREA
NOT TO SCALE



NOTE:

- ADD ONE ADDITIONAL 5" CONDUIT WHERE FIRE ALARM (FA) IS DESIGNATED ON UTILITY PLANS.

7 ELECTRIC/TELECOMMUNICATION DUCT BANK
NOT TO SCALE

DATE	NO.	REVISIONS	BY
9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	

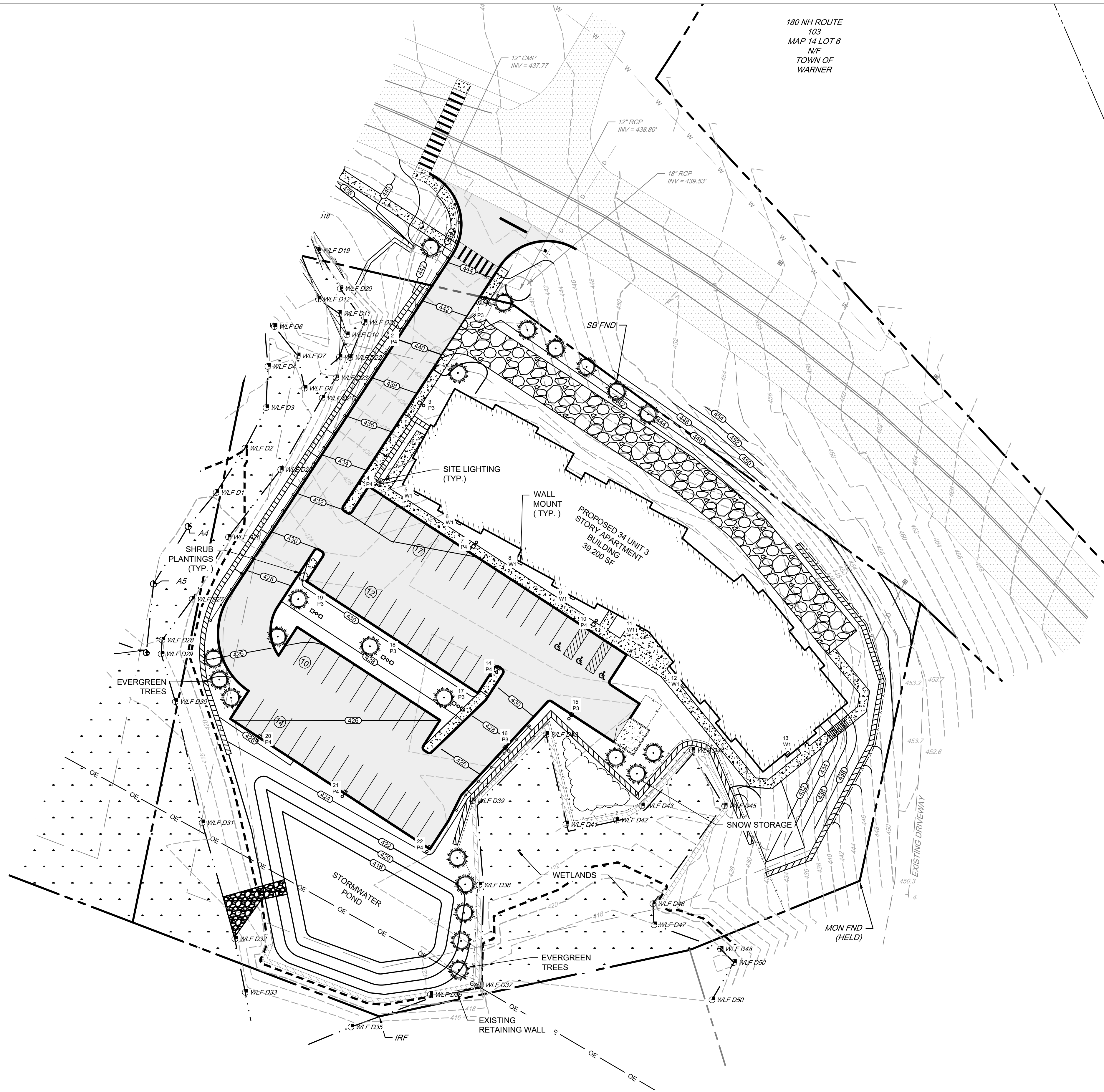
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

UTILITY DETAILS
CS6051



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180 NH ROUTE
103
MAP 14 LOT 6
N/F
TOWN OF
WARNER

PERFORMANCE SPECIFICATIONS

- CLEAN AND GRUB TOP SOIL OF ALL UNSUITABLE MATERIALS INCLUDING BUT NOT LIMITED TO STUMPS, ROOTS, TRASH, AND ROCKS AND STOCKPILE FOR RE-USE. SOILS WITH INVASIVE SPECIES SHALL BE DISPOSED OF OFF SITE.
- AFTER SLOPES AND PONDS HAVE BEEN INSTALLED, LOAM AND SEED USING NEW ENGLAND CONSERVATION/ WILDLIFE MIX. A MINIMUM 6" OF TOPSOIL IS REQUIRED.
- UPON COMPLETION OF PAVING AND ALL SITE WORK, OPEN SPACE AREAS ARE TO BE MULCHED/SEEDED AND LANDSCAPE PLANTS/SHRUBS ARE TO BE PLANTED.
- WITHIN ONE YEAR OF PLANTING, ALL DEAD, DYING, OR DISEASED VEGETATION SHALL BE PROMPTLY REPLACED, BASED ON SEASONAL PLANTING PRACTICES, WITH HEALTHY PLANTS IN ALL REQUIRED LANDSCAPE AREAS.

LANDSCAPE NOTES:

- A MINIMUM OF ONE SHADE TREE AND (5) SHRUBS PER 900 SQUARE FEET OF LANDSCAPE AREA
- DECIDUOUS TREES SHALL BE MIN 2.5" CALIPER AND 12' IN HEIGHT.
- EVERGREEN TREES SHALL BE MIN 8' TALL.
- SHRUBS SHALL BE MIN 2' TALL.
- LOAM AND SEED ALL DISTURBED AREAS TO A MIN DEPTH OF 4". RE-USE TOPSOIL WHERE APPLICABLE.
- WHERE SLOPES ARE 33% OR GREATER, DEEP ROOTED SPECIES SHALL BE PLANTED TO PREVENT EROSION.

9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	
DATE	NO.	REVISIONS	BY

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

LANDSCAPE & LIGHTING PLAN
CS7001



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BUXUS MICROPHYLLA
CORNUS ALTERNIFOLIA

WETLAND SEED MIX		
COMMON NAME	AMOUNT	SUPPLIER
NEW ENGLAND CONSERVATION/ WILDLIFE MIX	1.0 LB./1750 S.F.	NEW ENGLAND WETLAND PLANTS, INC

PERFORMANCE SPECIFICATIONS

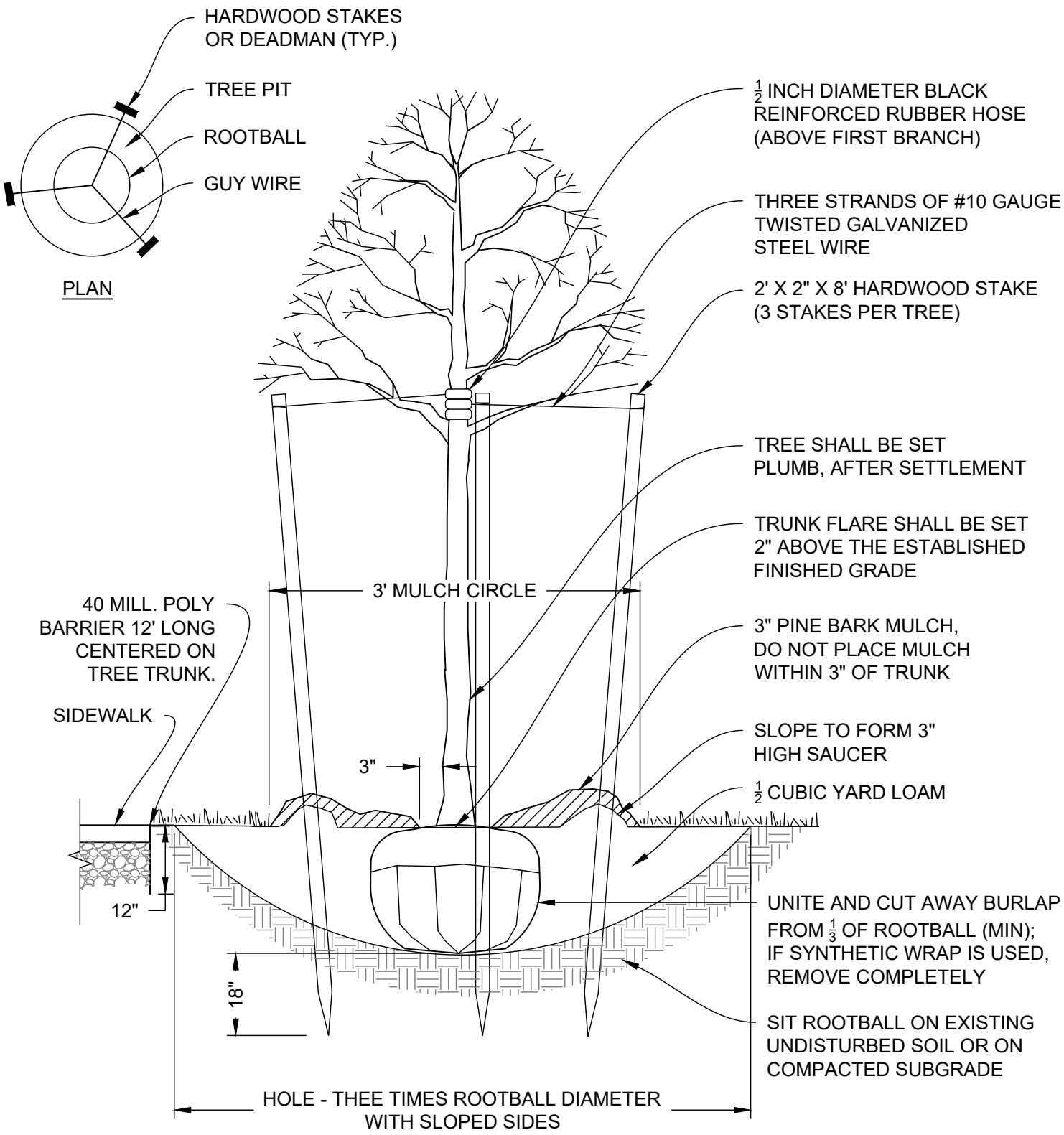
- CLEAN AND GRUB TOP SOIL OF ALL UNSUITABLE MATERIALS INCLUDING BUT NOT LIMITED TO STUMPS, ROOTS, TRASH, AND ROCKS AND STOCKPILE FOR RE-USE. SOILS WITH INVASIVE SPECIES SHALL BE DISPOSED OF OFF SITE.
- AFTER SLOPES AND PONDS HAVE BEEN INSTALLED, LOAM AND SEED USING NEW ENGLAND CONSERVATION/ WILDLIFE MIX. A MINIMUM 6" OF TOPSOIL IS REQUIRED.
- UPON COMPLETION OF PAVING AND ALL SITE WORK, OPEN SPACE AREAS ARE TO BE MULCHED/SEEDED AND LANDSCAPE PLANTS/SHRUBS ARE TO BE PLANTED.
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LANDSCAPE NOTES:

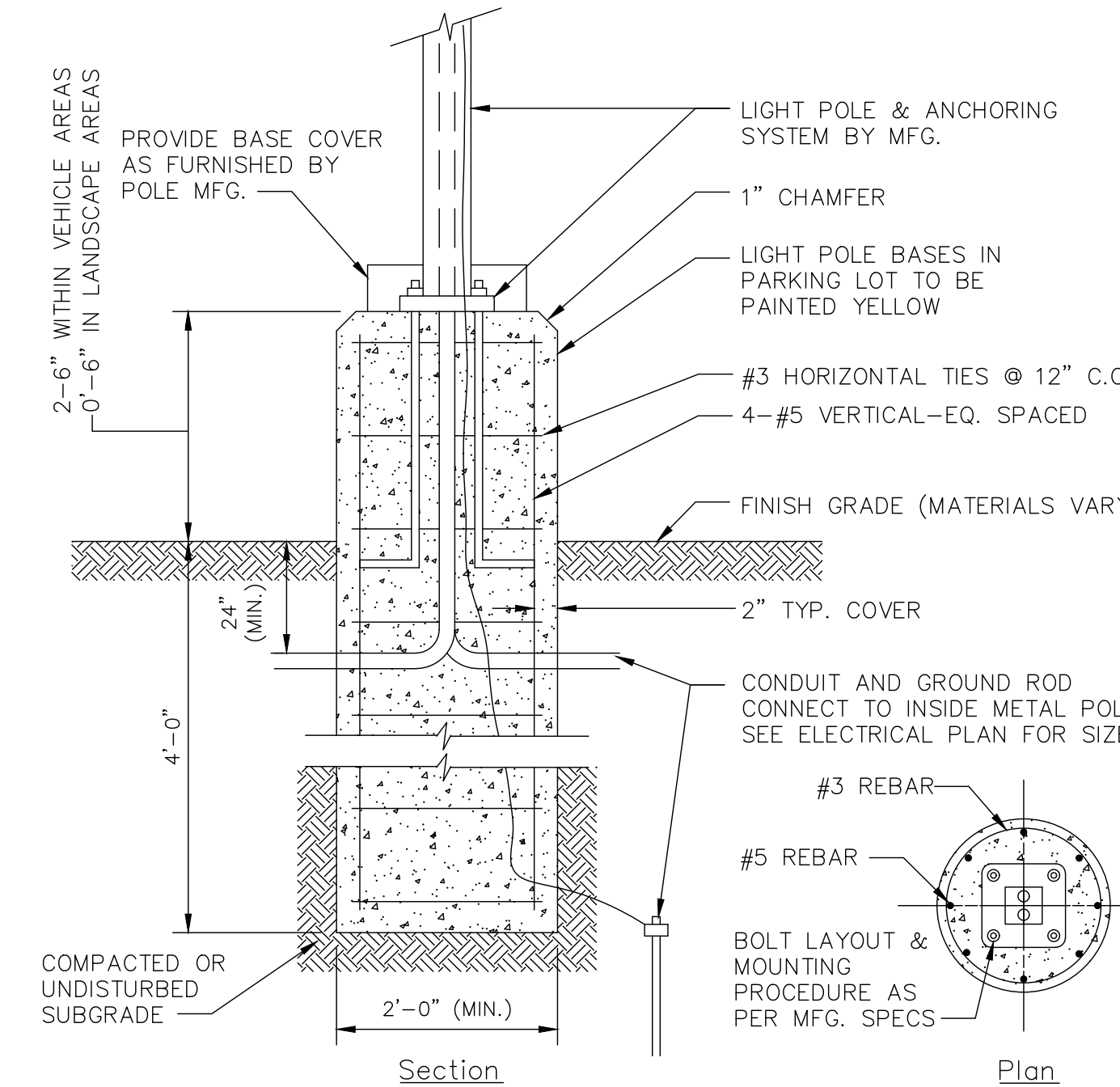
- A MINIMUM OF ONE SHADE TREE AND (5) SHRUBS PER 900 SQUARE FEET OF LANDSCAPE AREA
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- LOAM AND SEED ALL DISTURBED AREAS TO A MIN DEPTH OF 4". RE-USE TOPSOIL WHERE APPLICABLE.
- WHERE SLOPES ARE 33% OR GREATER, DEEP ROOTED SPECIES SHALL BE PLANTED TO PREVENT EROSION.

APPROVED TREE SPECIES			
	SCIENTIFIC NAME	COMMON NAME	
	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	
	PICEA GLAUCA	WHITE SPRUCE	
	JUNIPERUS VIRGINIANA	RED CEDAR	
	ACER RUBRUM	RED MAPLE	
	QUERCUS RUBRA	CRAB APPLE	
	QUERCUS ALBA	WHITE OAK	
	PINUS STROBUS	WHITE PINE	

APPROVED SHRUB SPECIES			
	SCIENTIFIC NAME	COMMON NAME	
	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	
	SPIREA BETULIFOLIA	WHITE SPIREA	
	ILEX GLABRA	EVERGREEN WINTERBERRY	
	RHODODENDRON FERRUGINEUM	RHODODENDRON	
		WINTERGEM BOXWOOD	
		ALTERNATE LEAVED DOGWOOD	



1 TREE PLANTING (FOR 2" CALIPER 12' TALL TREES)
NOT TO SCALE



NOTES:

- LIGHT POLE FOUNDATION DESIGN IS SUBJECT TO CHANGE BASED ON FINAL POLE AND FIXTURE SELECTION AND GEOTECHNICAL SITE INVESTIGATION.

2 LIGHT POLE FOUNDATION (UP TO 15' POLE)
NOT TO SCALE

All quotes/orders generated from this layout must be forwarded to the Local Rep Agency														
Luminaire Schedule	Symbol	Qty	Tag	Label	Arrangement	Lum. Lumens	Arr. Lum. Lumens	LLF	Description	Lum. Watts	Arr. Watts	Total Watts	BUG Rating	Mounting height
		4	P3	ALED33TY WS2 @ 80 W	Single	10433	10433	1.000	Pole mounted (Type III)	79.8	79.8	319.2	B1-U0-G2	15
		3	P3	ALED33TY WS2 @ 80 W X 2@180	Back - Back	10433	20866	1.000	Pole mounted (Type III)	79.8	159.6	478.8	B1-U0-G2	15
		8	P4	ALED34TY WS2 @ 80 W	Single	10172	10172	1.000	Pole mounted (Type III)	81.1	81.1	648.8	B1-U0-G2	15
		7	W1	SLIM15Y @ 34 W	Single	3638	3638	1.000	Wall mounted	34.4	34.4	206.4	B1-U0-G1	12

9/23/2026	2	DRAINAGE CALCS		
9/10/2026	1	REVIEW COMMENTS		
DATE	NO.	REVISIONS		
				BY

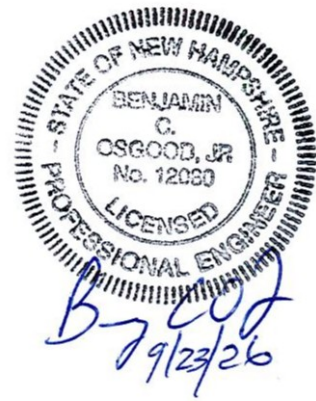
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

LANDSCAPE & LIGHTING DETAILS
CS7002

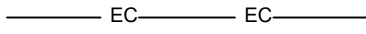


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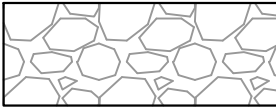


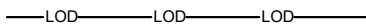
LEGEND

- 

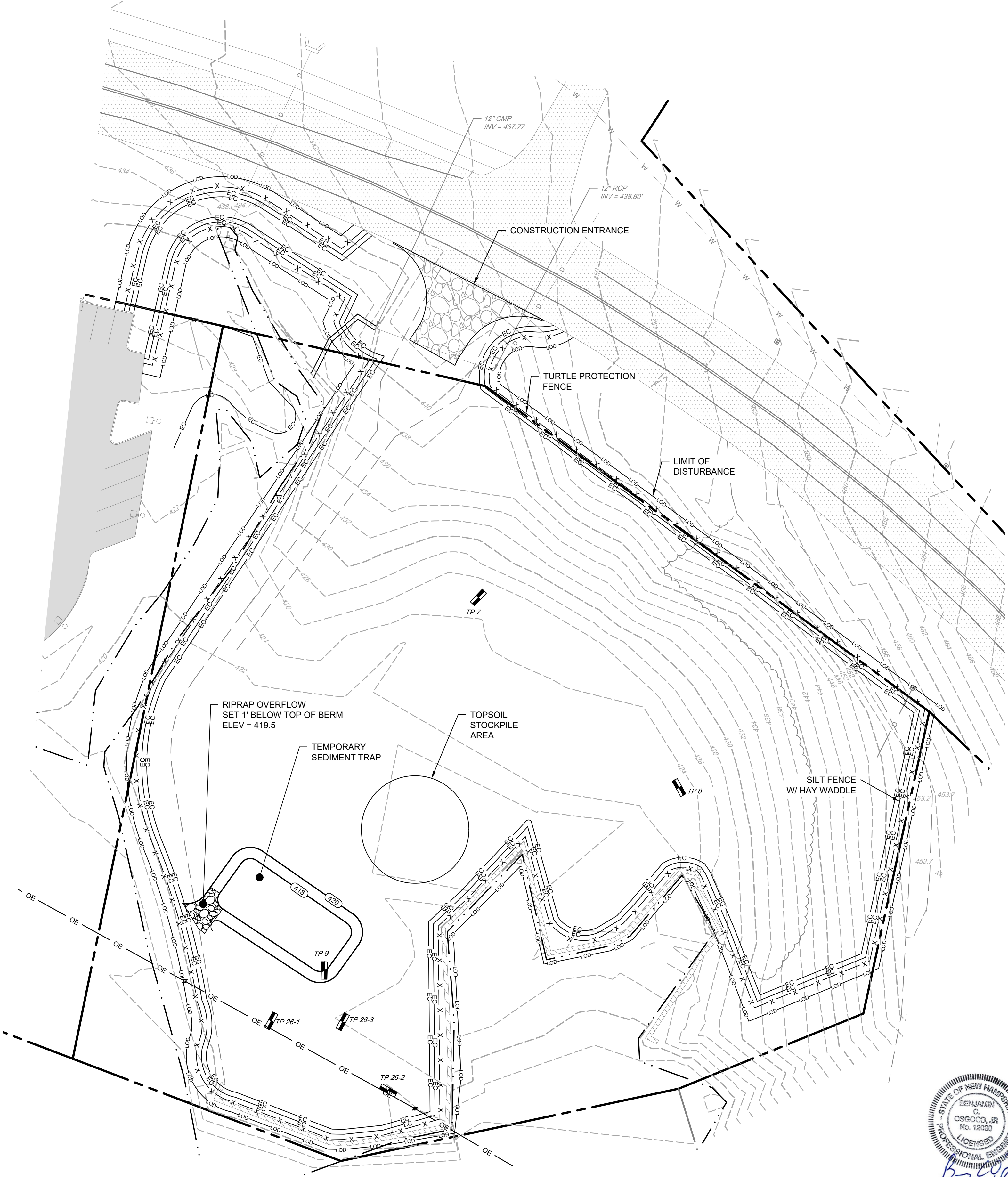
CHECK DAM WITH EROSION CONTROL
- 

EC EC EROSION CONTROL FENCE/SILT SOCK
- 

SILT/SEDIMENT RAP
- 

CONSTRUCTION ENTRANCE
- 

100 100 100 LIMIT OF DISTURBANCE



9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	
DATE	NO.	REVISIONS	BY

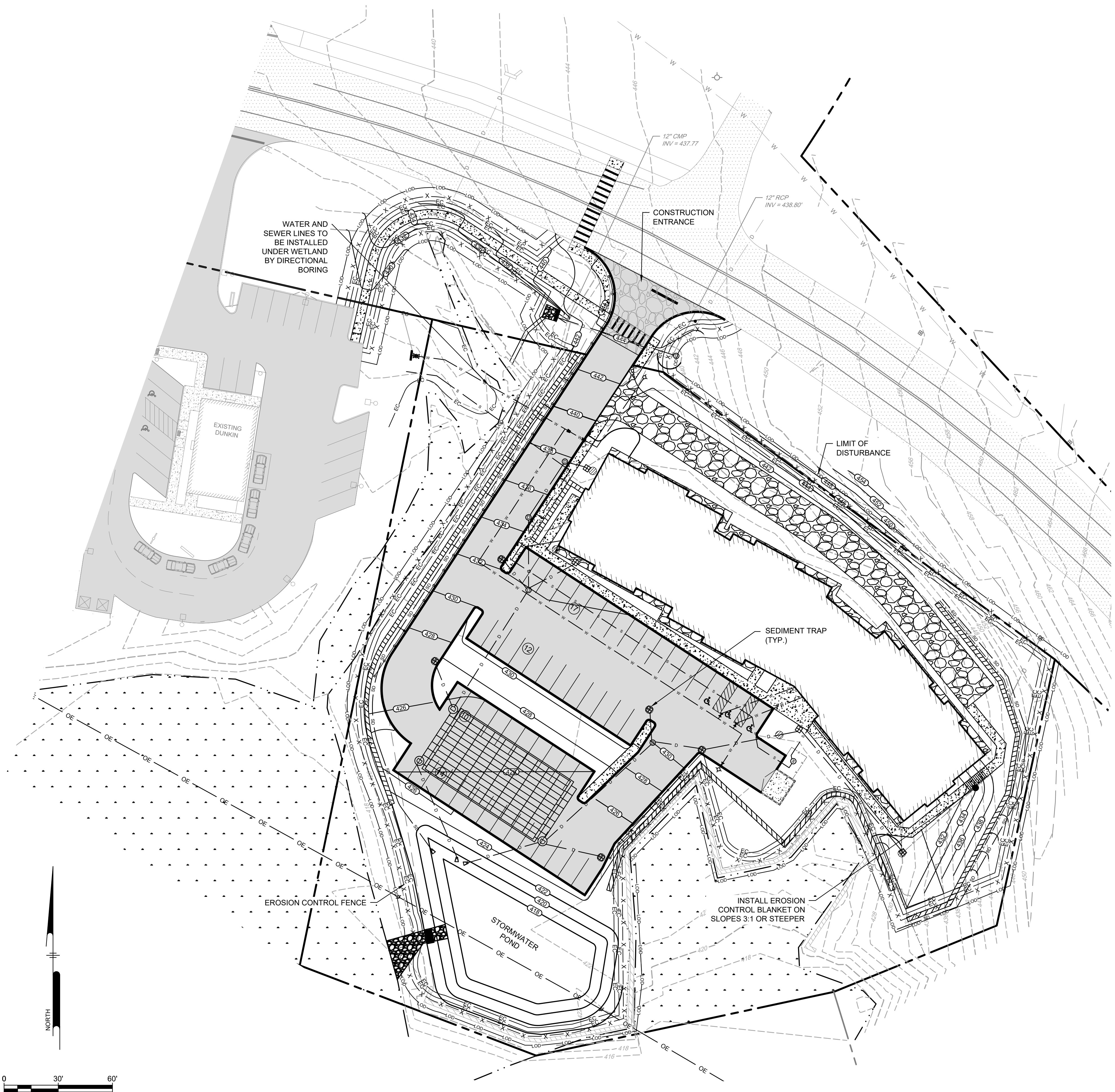
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
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EROSION CONTROL PLAN - PHASE 1
CS8001



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LEGEND

- EC EC EROSION CONTROL FENCE/SILT SOCK
- SILT/SEDIMENT RAP
- CONSTRUCTION ENTRANCE
- LOO LOO LOO LIMIT OF DISTURBANCE

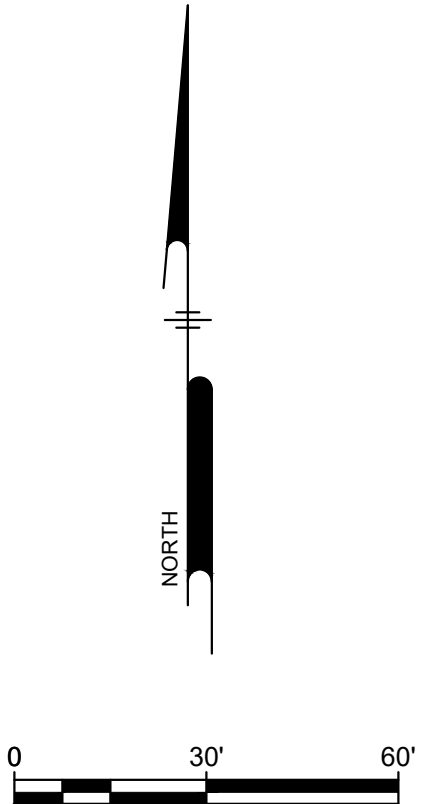
9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	
DATE	NO.	REVISIONS	BY

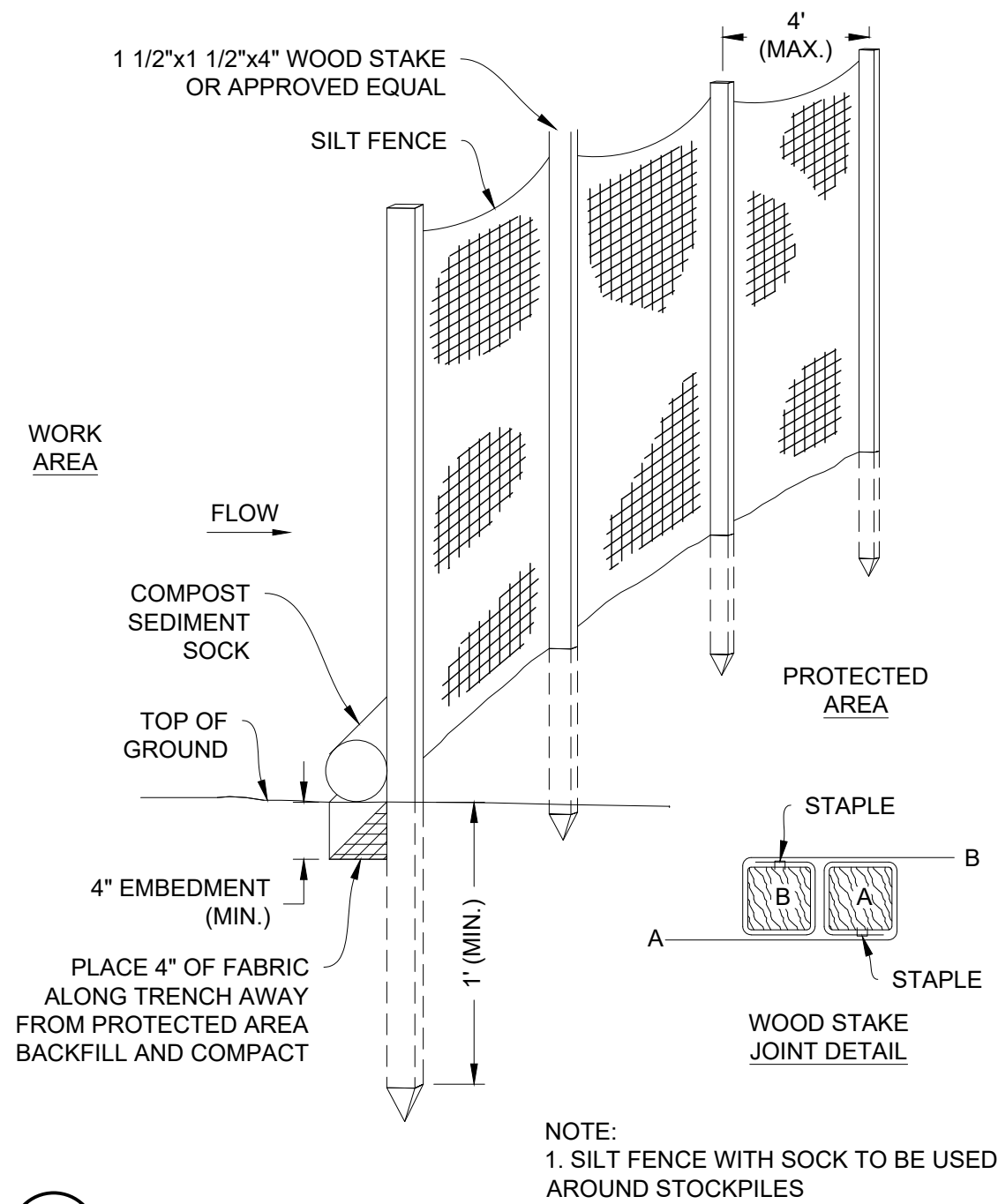
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

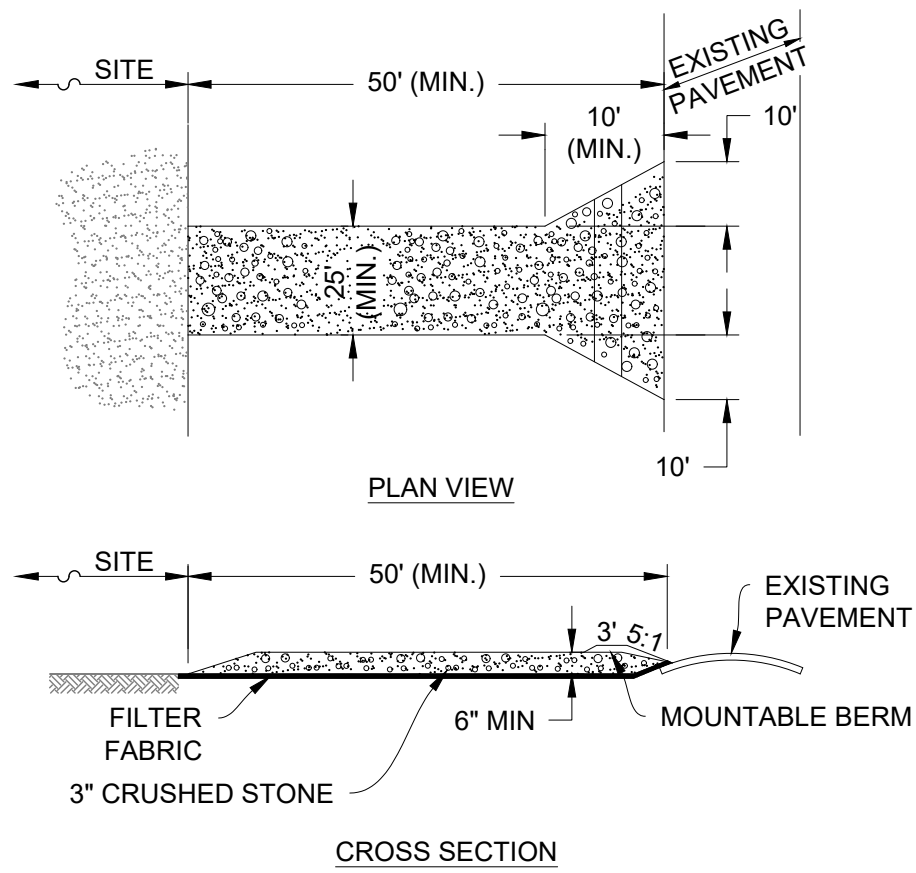
EROSION CONTROL PLAN - PHASE 2
CS8002

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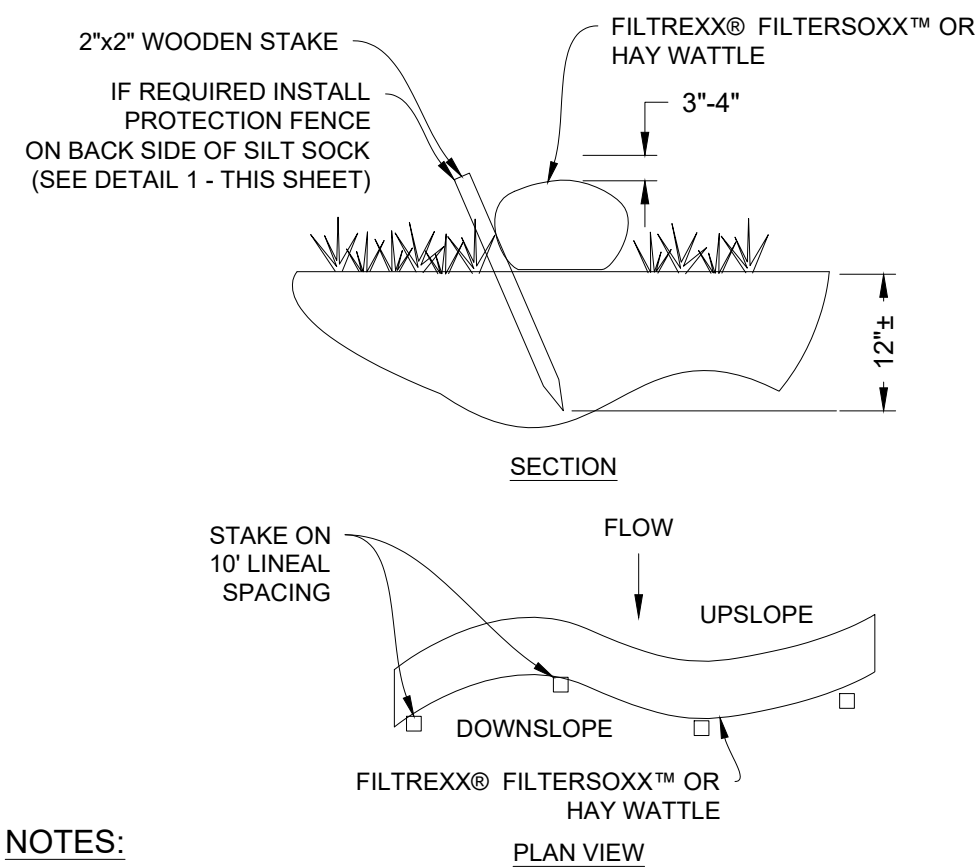


1 SILT FENCE BARRIER
NOT TO SCALE



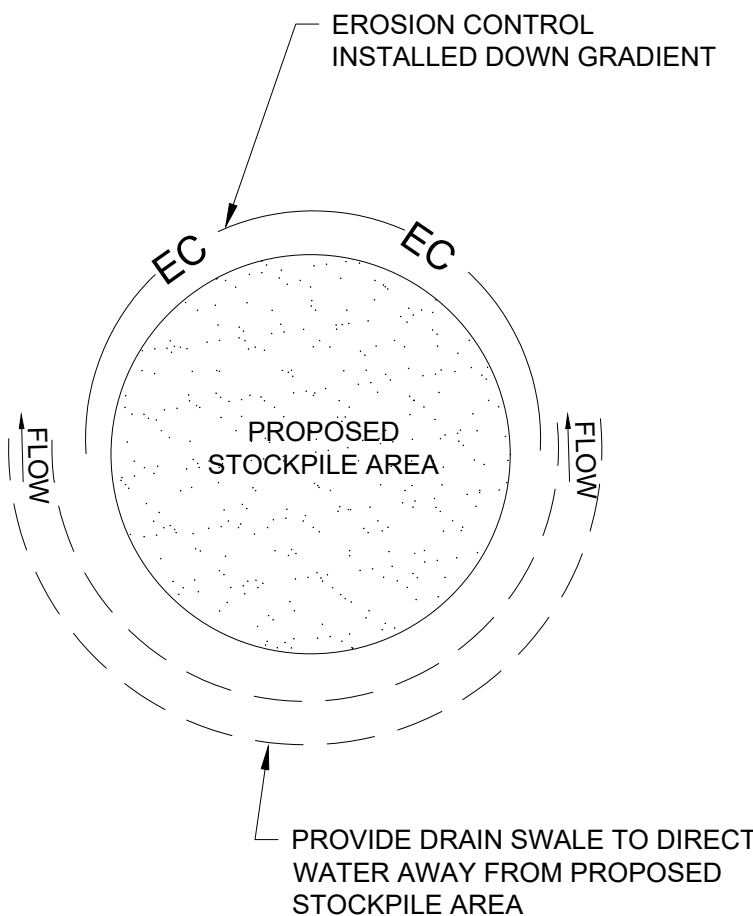
- NOTES:
- ENTRANCE WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
 - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

2 STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

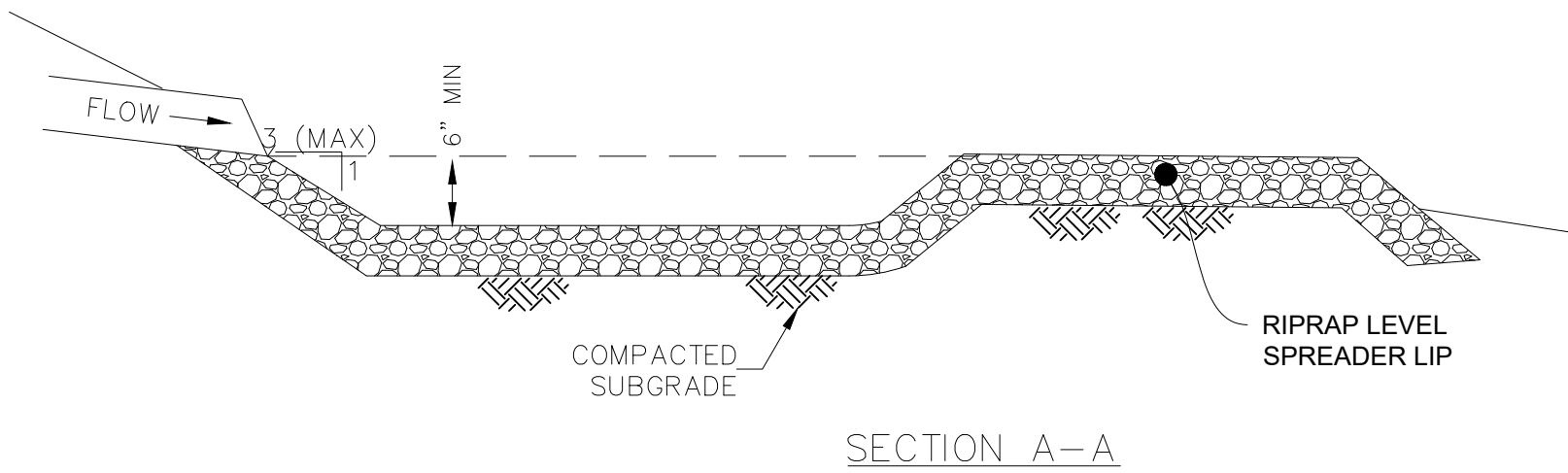


- NOTES:
- ALL MATERIALS TO MEET FILTREXX® SPECIFICATIONS.
 - FILTERSOXX™ COMPOST/SEED FILL TO MEET APPLICATION REQUIREMENTS.
 - COMPOST MATERIAL TO BE DISPENSED ON SITE, AS DETERMINED BY ENGINEER.

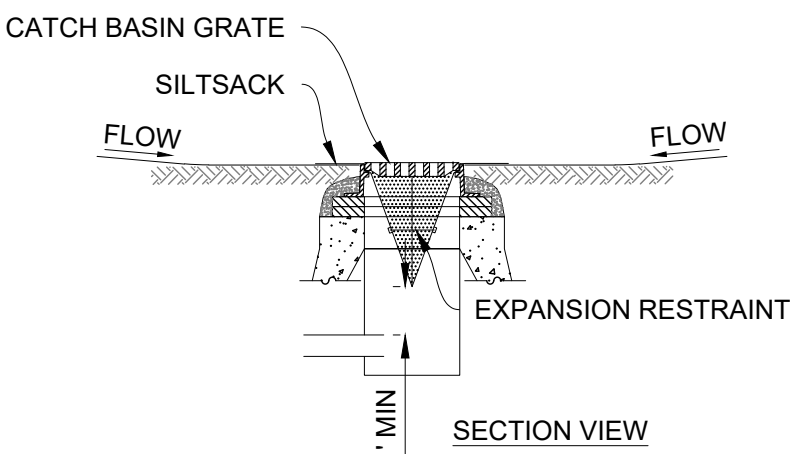
3 SEDIMENT SOCK / HAY WATTLE DETAIL
NOT TO SCALE



4 STOCKPILE PROTECTION
NOT TO SCALE

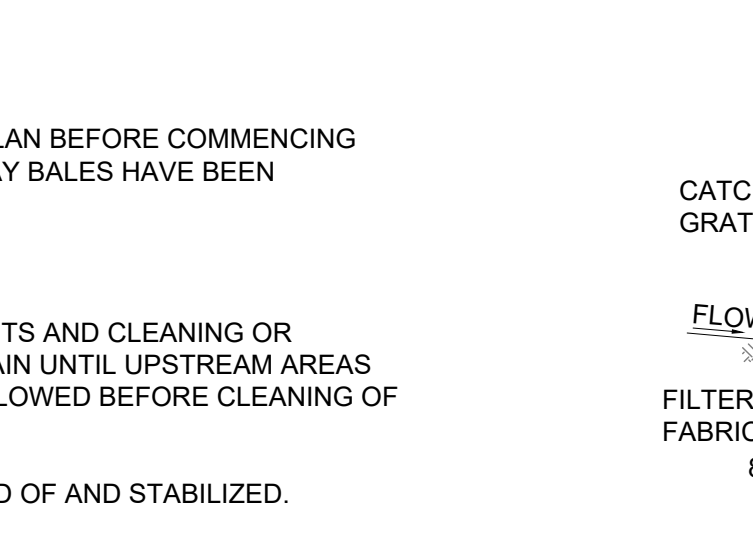
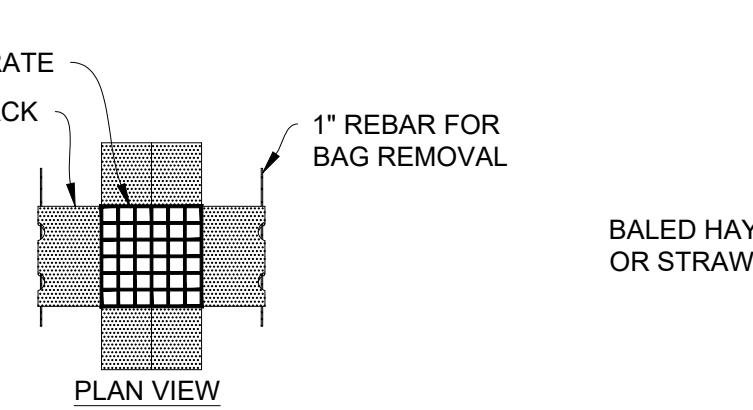


5 LEVEL LIP SPREADER
NOT TO SCALE

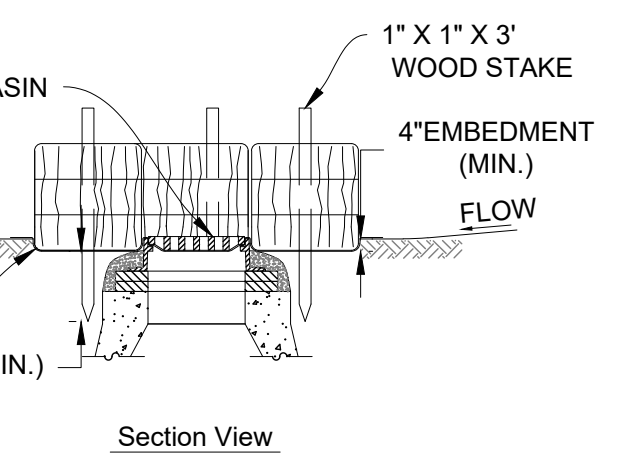
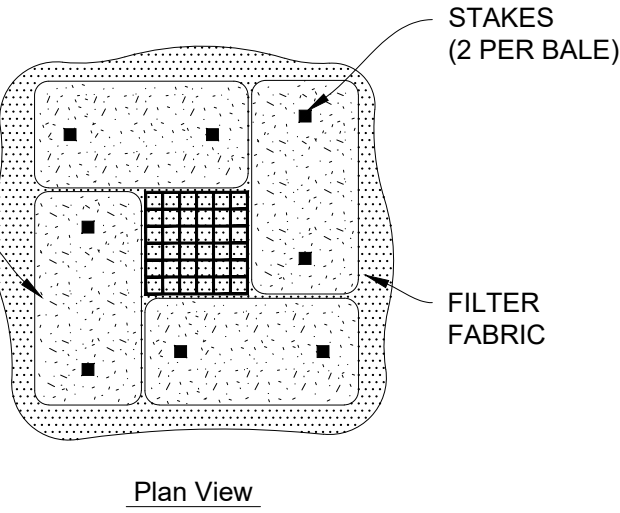


- NOTES:
- INSTALL SILTSACK IN ALL CATCH BASINS WHERE INDICATED ON THE PLAN BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER BINDER COURSE IS PLACED AND HAY BALES HAVE BEEN REMOVED.
 - GRATE TO BE PLACED OVER SILTSACK.
 - SILTSACK SHALL BE INSPECTED WEEKLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED. MAINTAIN UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED. MAXIMUM VOLUME OF SILT ALLOWED BEFORE CLEANING OF THE VOLUME OF THE SILT TRAP.
 - MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.

6 SILTSACK SEDIMENT TRAP
NOT TO SCALE



6 CATCH BASIN SEDIMENT TRAP
NOT TO SCALE



6 CATCH BASIN SEDIMENT TRAP
NOT TO SCALE

- CONSTRUCTION SEQUENCE NOTES:
- INSTALL EROSION AND SEDIMENT CONTROLS AS SHOWN ON PLAN.
 - COMMENCE CLEARING, GRUBBING AND EARTHWORK.
 - CUT AND DISPOSE OF ANY DEBRIS PRODUCED DURING EARTHWORK.
 - INSTALL TEMPORARY SEDIMENT CONTROL BASINS.
 - FILL SITE TO SUBGRADE AND ROUGH GRADE.
 - INSTALL STORMWATER PONDS, INFILTRATION BASINS, SWALES, AND UTILITIES.
 - INSTALL BUILDING FOUNDATION.
 - CONSTRUCT PAVED AREA BASE COURSES.
 - STABILIZE SIDE SLOPES. SIDE SLOPES MUST BE FULLY STABILIZED BEFORE ANY STORMWATER DISCHARGE.
 - DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 72 HOURS OF THE ESTABLISHMENT OF FINAL GRADE.
 - CONSTRUCT BUILDING.
 - FINAL PAVING OF DRIVEWAY AND PARKING AREAS.
 - INSPECT ALL SEDIMENT AND EROSION CONTROL MEASURES.
 - INSTALL SITE LANDSCAPING AND PERMANENT SEEDING OF ALL DISTURBED AREAS.
 - AFTER ALL SEEDED AREAS HAVE ESTABLISHED STABLE GROWTH, ALL TEMPORARY EROSION CONTROL CAN BE REMOVED.
 - CONTRACTOR SHALL NOTIFY AND COORDINATE WITH ALL AUTHORITIES RESPONSIBLE FOR INSPECTIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL REQUIRED INSPECTION SIGN-OFFS.

OPERATION AND MAINTENANCE:

CONSTRUCTION PHASE

THE BMP'S ASSOCIATED WITH THIS PROJECT WILL BE OWNED BY THE CONTRACTOR, WHO WILL BE RESPONSIBLE FOR INSPECTION, OPERATION AND MAINTENANCE. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES

- PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL PHYSICALLY MARK THE LIMITS OF NO LAND DISTURBANCE ON THE SITE AND INSTALL PERIMETER CONTROLS.
- THE CONTRACTOR IS TO INSTALL AND MAINTAIN DRAINAGE FACILITIES AS SHOWN ON THE SITE PLANS.
- PRIOR TO CONSTRUCTION, ALL EROSION/SILTATION CONTROL DEVICES SHOWN ON ABOVE PLAN ARE TO BE INSTALLED. TO PREVENT SILT INTRUSION INTO THE DRAINAGE SYSTEM DURING CONSTRUCTION, THE CONTRACTOR IS TO INSTALL AND MAINTAIN INLET PROTECTION AT ALL CATCH BASINS, AND SET A SILT FENCE OR SEDIMENT SOCK AT ALL SLOPES WHICH MAY ERODE IN THE DIRECTION OF ANY OPEN DRAINAGE FACILITIES. SUCH PREVENTIVE MEASURES ARE TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROCESS. TEMPORARY CONTROLS SHALL BE INSTALLED TO REDUCE DUST AND SEDIMENT TRANSPORT. EROSION CONTROL DEVICES SHALL NOT CONTAIN WELDED PLASTICS, PLASTIC, OR MULTIMONO-FILAMENT POLYPROPYLENE NETTING OR MESH.
- CONSTRUCTION OF DRAINAGE FACILITIES IS TO BE INSPECTED BY DESIGN ENGINEER TO VERIFY CONFORMANCE TO THE DESIGN PLAN.
- THE SEQUENCE OF DRAINAGE CONSTRUCTION SHALL BE AS FOLLOWS:
 - CLEAR, GRUB, EXCAVATE AREAS FOR DRAINAGE SYSTEMS.
 - TRENCH AND INSTALL PIPES, CATCH BASINS MANHOLES
 - INSTALL INLET PROTECTION.
- EROSION CONTROLS ARE TO BE INSPECTED AND MAINTAINED ON A WEEKLY BASIS OR AFTER EVERY HALF INCH OF RAIN FALL. UPON DISCOVERY OF SILT BUILD-UP IN ANY CATCH BASIN SUMPS, OR ANY OTHER STRUCTURES, THEY ARE TO BE CLEANED.
 - DITCHES AND SWALES SHALL BE STABILIZED BEFORE DIRECTING WATER TO THEM.
 - ROADWAYS AND PARKING LOTS SHALL BE STABILIZED BEFORE DIRECTING WATER TO THEM.
 - CUT AND FILL SLOPES SHALL BE SEEDED/ LOAMED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
- MULCH BERMS SHALL BE USED ONLY WHERE SHEET FLOW OCCURS AND WHERE THE UPSTREAM SLOPE IS LESS THAN 5%. BERM MUST BE AT LEAST 12" HIGH AND 2 FEET WIDE.
- PRIOR TO CONSTRUCTION OF IMPERVIOUS AREAS, ALL DRAINAGE STRUCTURES AND PIPES SHALL BE INSTALLED AND INSPECTED FOR PROPER FUNCTION. DURING CONSTRUCTION OF OTHER SITE FEATURES, ALL DRAINAGE FACILITIES SHALL BE INSPECTED ON A WEEKLY BASIS AND CLEANED/REPAIRED IMMEDIATELY UPON DISCOVERY OF SEDIMENT BUILD-UP OR DAMAGE.
- AFTER PAVING IS INSTALLED, IT SHALL BE SWEEPED CLEAN ON A REGULAR BASIS.
- IF DEWATERING IS NECESSARY DURING CONSTRUCTION, THE WATER WILL BE TREATED FOR TOTAL SUSPENDED SOLIDS (TSS) REMOVAL PRIOR TO DISCHARGE TO RECEIVING WATER.

POST-DEVELOPMENT PHASE

THE OWNER(S) IS TO BE RESPONSIBLE FOR MAINTENANCE OF ALL DRAINAGE STRUCTURES IN THE PROJECT - INCLUDING ROOF DRAINS, DRAIN PIPES, CATCH BASINS, AND DRAIN MANHOLES.

REGULAR MAINTENANCE IS TO INCLUDE THE FOLLOWING:

- INSPECTION OF ALL DRAINAGE FACILITIES (CATCH BASINS, PIPES, OUTLET CONTROL STRUCTURES, AND DETENTION BASINS) EVERY THREE MONTHS. DURING THESE INSPECTIONS, THE INSPECTOR (A REGISTERED PROFESSIONAL CIVIL ENGINEER QUALIFIED IN DRAINAGE SYSTEMS) SHALL LOOK FOR EVIDENCE OF THE FOLLOWING: STRUCTURAL DAMAGE, SILT ACCUMULATION (NEAR INLET INVERTS ON CATCH BASINS AND OUTLET CONTROL STRUCTURES), AND IMPROPER FUNCTION. A REPORT ON THE SYSTEM SHALL BE DELIVERED TO THE OWNER.
- AFTER INSPECTION, IF ANY OF THE ABOVE CONDITIONS EXIST, THE INSPECTOR SHALL NOTIFY THE OWNER, WHO SHALL IMMEDIATELY ARRANGE FOR ALL NECESSARY REPAIRS AND/OR SEDIMENT REMOVAL.
- THE PAVEMENT AREA IS TO BE SWEEPED CLEAN, AS REQUIRED (I.E., VISUALLY NOTICEABLE DEBRIS BUILD-UP). A MINIMUM OF ONCE PER YEAR.
- ALL GRADED SLOPES SHALL BE INSPECTED EVERY SPRING FOR EROSION. UPON DISCOVERY OF ANY FAILURE (IE. EROSION), LOAM AND SEED SHALL BE PUT IN PLACE AND NURTURED.
- DURING THE WINTER MONTHS, ALL SNOW IS TO BE STORED SUCH THAT SNOW MELT IS CONTROLLED WITHIN THE PAVED AREA.

WINTER CONSTRUCTION SEQUENCE NOTES:

- ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1 AND SEEDING AND PLACING 3-4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORING NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
- ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH OR WHICH ARE DISTURBED AFTER OCTOBER 15TH SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE FLOW.
- AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3

EROSION CONTROL NOTES (DURING CONSTRUCTION)

- THE CONTRACTOR MUST INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND IN THE DETAILS PRIOR TO STARTING ANY OTHER WORK ON THE SITE. EROSION CONTROL MUST BE INSTALLED AT EVERY INLET STRUCTURE (EXISTING AND PROPOSED) AND MAINTAINED FOR THE DURATION OF THE PROJECT.
- EROSION CONTROLS AS SHOWN ON PLANS SHALL BE INSPECTED, REPAIRED AND/OR MAINTAINED BY THE CONTRACTOR DAILY AND WITHIN 12 HOURS OF EACH STORM EVENT.
- SEDIMENT DEPOSITS SHALL BE REMOVED WHEN THEY REACH A DEPTH OF 1/4 TO 1/2 THE HEIGHT OF THE SILT FENCE OR SEDIMENT SOCK.
- SEDIMENT SHALL BE CONTAINED WITHIN THE CONSTRUCTION SITE, AWAY FROM DRAINAGE STRUCTURES. SEDIMENT REACHING THE PUBLIC WAY SHALL BE REMOVED BY STREET SWEEPING AND NOT BY FLUSHING.
- STABILIZE SLOPES STEEPER THAN 3:1 (HORIZONTAL TO VERTICAL) WITH SEED, SECURED GEOTEXTILE FABRIC, OR ROCK RIP-RAP AS REQUIRED TO PREVENT EROSION DURING CONSTRUCTION.
- TEMPORARY SEEDING WILL BE APPLIED AS NECESSARY ON ANY ROUGH GRADED SURFACE WHICH WILL REMAIN UNDISTURBED FOR A PERIOD GREATER THAN 30 DAYS AND UPON LONG STANDING SOIL STOCKPILES. WASHED OUT OR ERODED AREAS SHALL BE RE-STABILIZED WITH ADDITIONAL COMPACTED LOAM AND SEED AND PROTECTED AS REQUIRED. TEMPORARY SEED SPECIES SHALL BE PER TABLE 4-1.
- STABILIZE PAVEMENT AREAS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE
- CLEAN OUT CATCH BASINS, DRAIN MANHOLES AND STORM DRAIN PIPES AFTER COMPLETION OF CONSTRUCTION.
- LOAM AND SEED ALL DISTURBED AREAS. PERMANENT SEEDING SHALL OCCUR IN THE SPRING FROM LATE MARCH THROUGH MAY AND IN LATE SUMMER OR EARLY FALL BETWEEN AUGUST AND OCTOBER
- DUST SHALL BE CONTROLLED AT THE SITE WITH MECHANICAL WATER SPRAYING AS NECESSARY AND DURING EXTENDED DRY PERIODS.
- UPON ESTABLISHMENT OF PERMANENT VEGETATION OVER DISTURBED AREAS, REMOVE AND DISPOSE OF STRAW WATTLES AND STAKES.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN AND SUPPLEMENT THE SPECIFIED SEDIMENTATION CONTROLS AS NECESSARY TO PREVENT SEDIMENTATION OF OFF-SITE AREAS AND/OR ANY REGULATED RESOURCE AREAS. FAILURE BY THE CONTRACTOR TO CONTROL EROSION, POLLUTION AND/OR SILTATION SHALL BE CAUSE FOR THE OWNER TO EMPLOY OUTSIDE ASSISTANCE OR TO USE HIS OWN MEANS TO PROVIDE THE NECESSARY CORRECTIVE MEASURE. THE COST OF SUCH ASSISTANCE PLUS PROJECT ENGINEERING COSTS WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- THE CONTRACTOR SHALL CHECK THE CONDITION OF EROSION CONTROLS WEEKLY TO KEEP THEM IN GOOD OPERATING CONDITION. EROSION CONTROLS SHALL ALSO BE INSPECTED, REPAIRED AND MAINTAINED BY THE CONTRACTOR WITHIN 12 HOURS OF ANY STORM EVENT PRODUCING 1/2 INCH OF RAINFALL OR MORE. EROSION CONTROLS SHALL BE REPLACED WHEN DETERIORATED, OR WHEN ORDERED BY THE ENGINEER. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN THEY REACH A DEPTH OF 6 INCHES.
- IN ADDITION TO THOSE LOCATIONS SHOWN ON THIS PLAN AND ON THE GRADING AND DRAINAGE PLANS, EROSION CONTROLS SHALL BE INSTALLED AT THE FOLLOWING LOCATIONS: TOE OF SLOPE OF EMBANKMENT CONSTRUCTION, TOE OF TEMPORARY EARTHWORK STOCKPILES. STOCKPILE SIDE SLOPES SHALL NOT EXCEED 2:1.
- EROSION AND SEDIMENTATION CONTROL SHALL BE IN COMPLIANCE WITH NEW HAMPSHIRE STORMWATER MANUAL DATED FEBRUARY 2025.
- AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - BASE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
 - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED.
 - A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED.
 - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
 - ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE
- THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION BUT IN NO CASE EXCEED 2.75 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED
- ANY SEDIMENTS REMOVED FROM EROSION CONTROL DEVICES, CATCH BASINS, AND STORMWATER STRUCTURES SHALL BE DISPOSED OF IN ACCORDANCE WITH STATE REGULATIONS AND BEST MANAGEMENT PRACTICES

9/23/2026	2	DRAINAGE CALCS		
9/10/2026	1	REVIEW COMMENTS		
DATE	NO.	REVISIONS		BY

PLAN OF LAND LOT 3 - ROUTE 103 WEST, WARNER NH, ASSESSOR'S MAP 35 LOTS 4-3

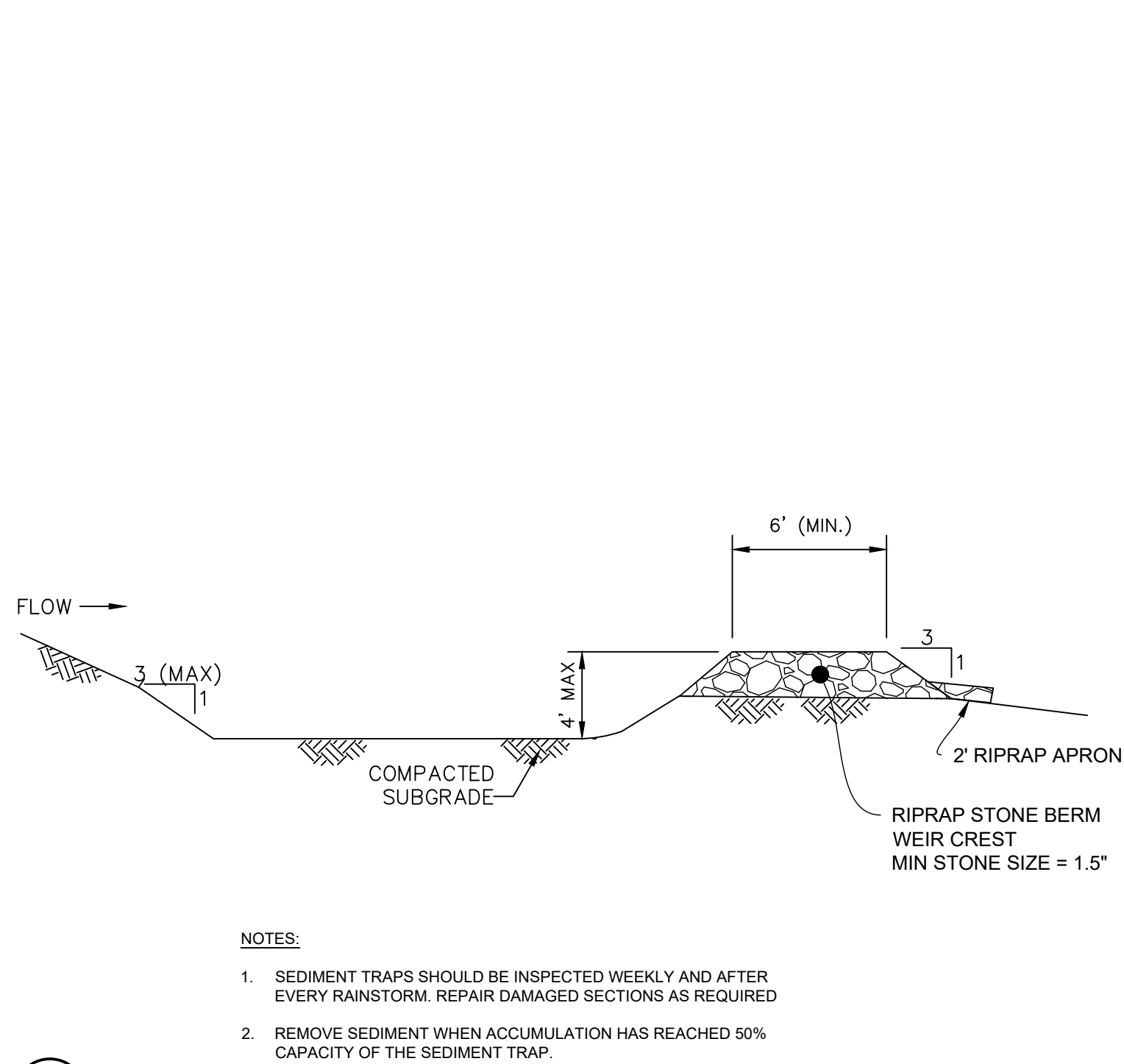
PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

EROSION CONTROL NOTES AND DETAILS CS8501

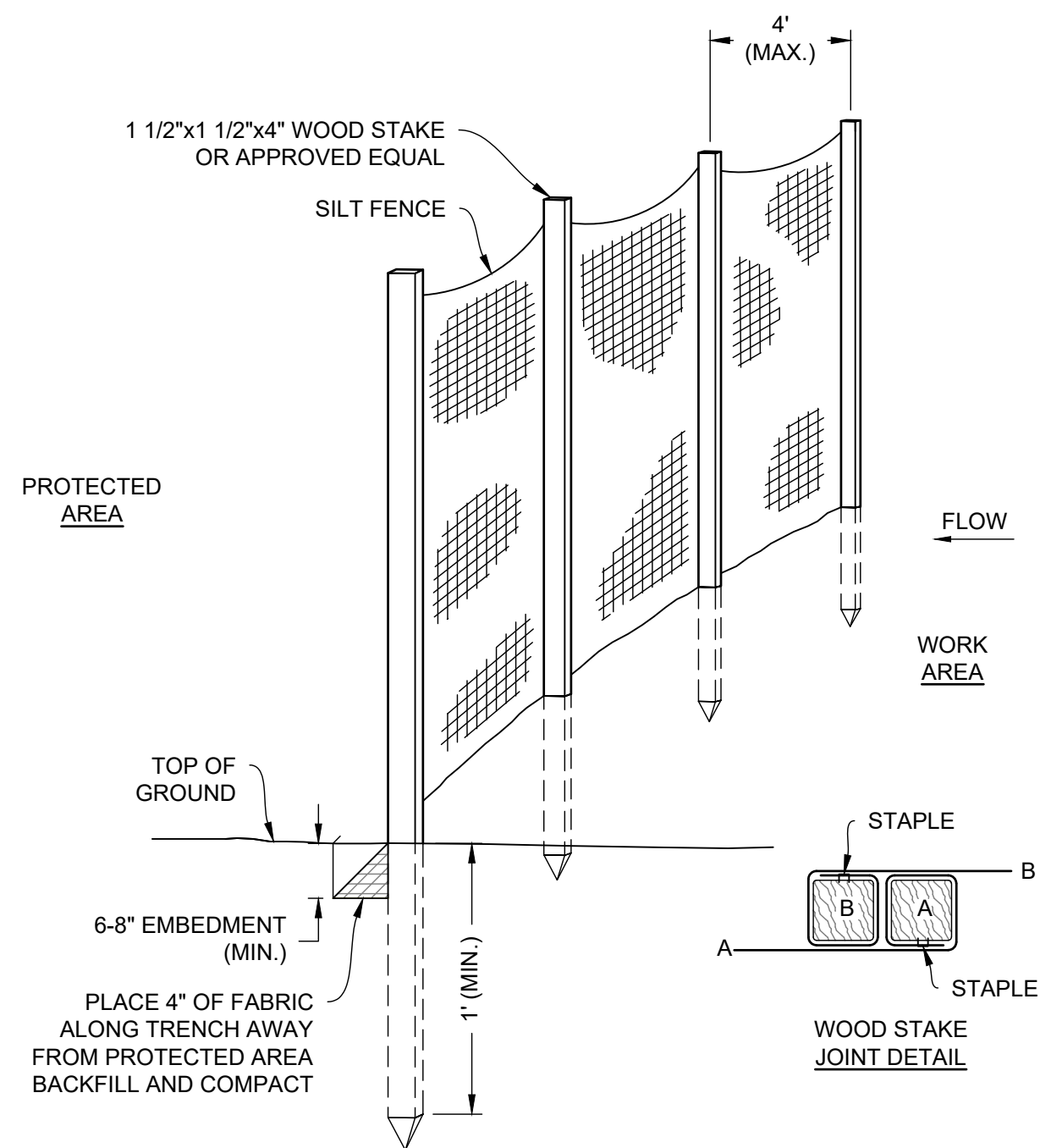


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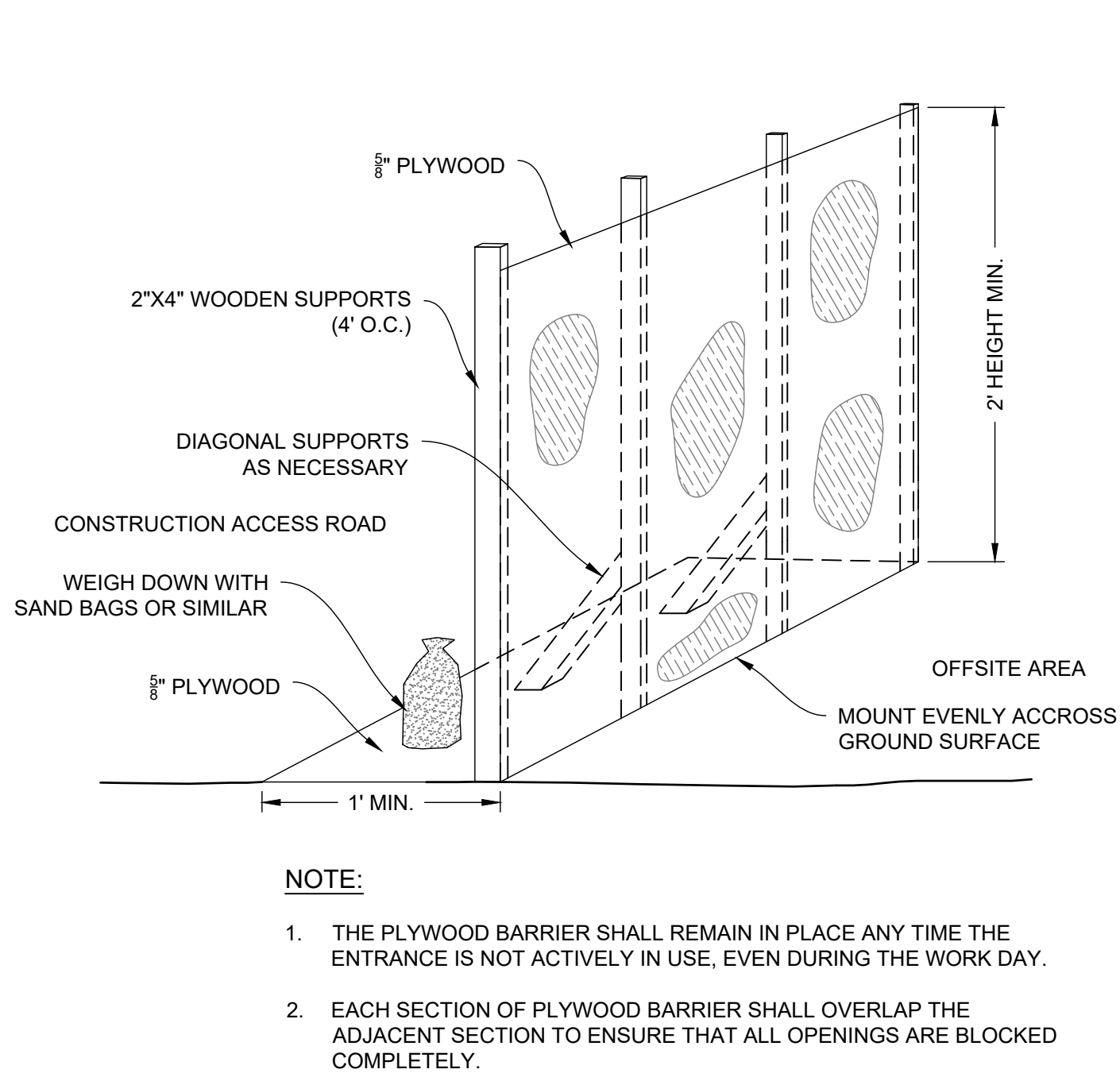




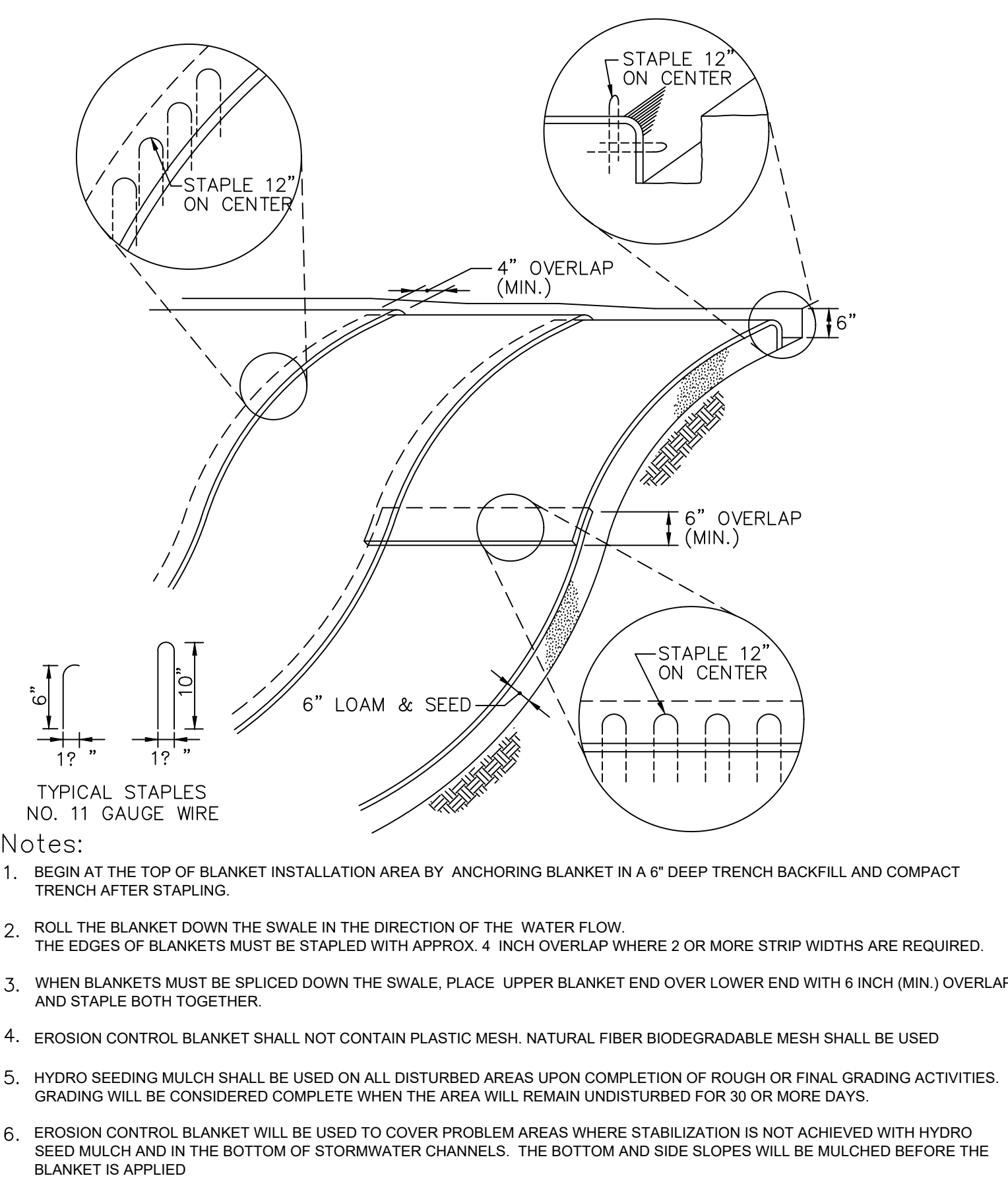
1 TEMPORARY SEDIMENT TRAP
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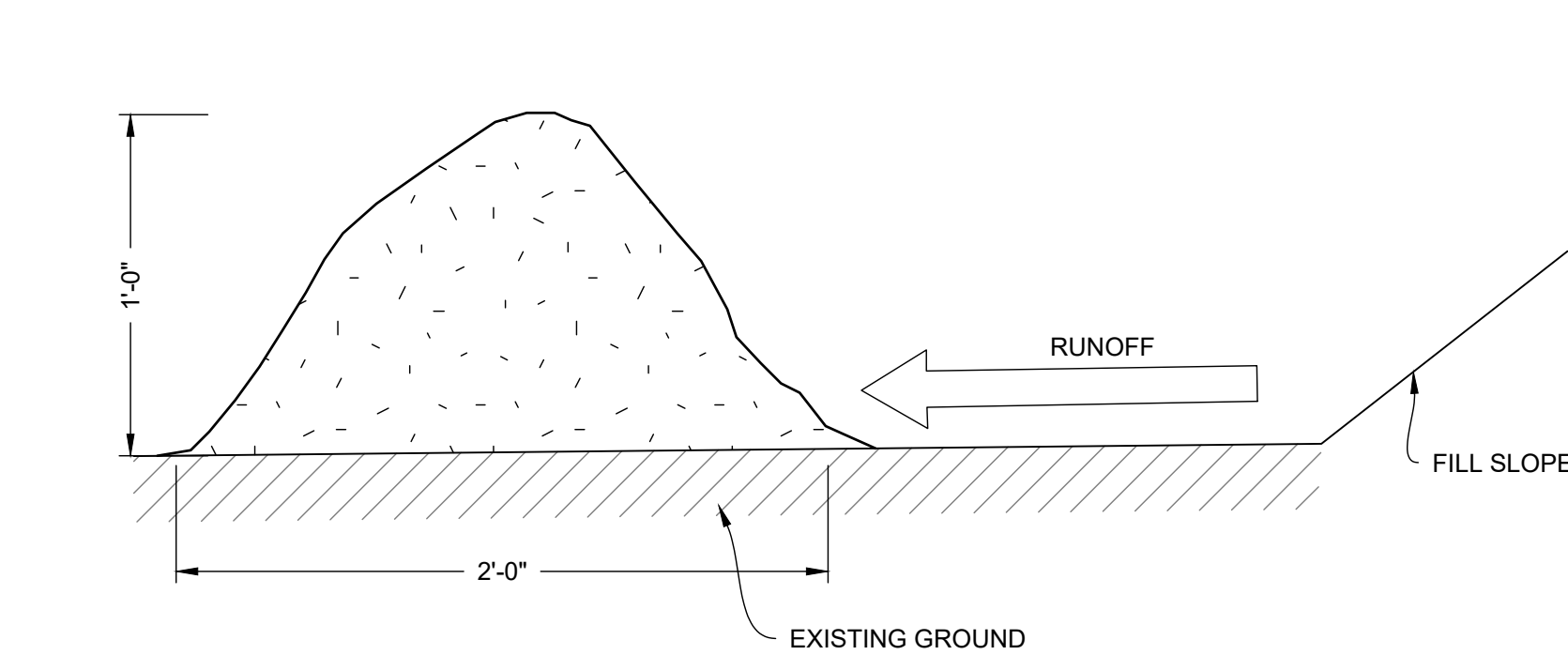
2 TURTLE PROTECTION FENCE
NOT TO SCALE



3 TURTLE PROTECTION GATE
NOT TO SCALE

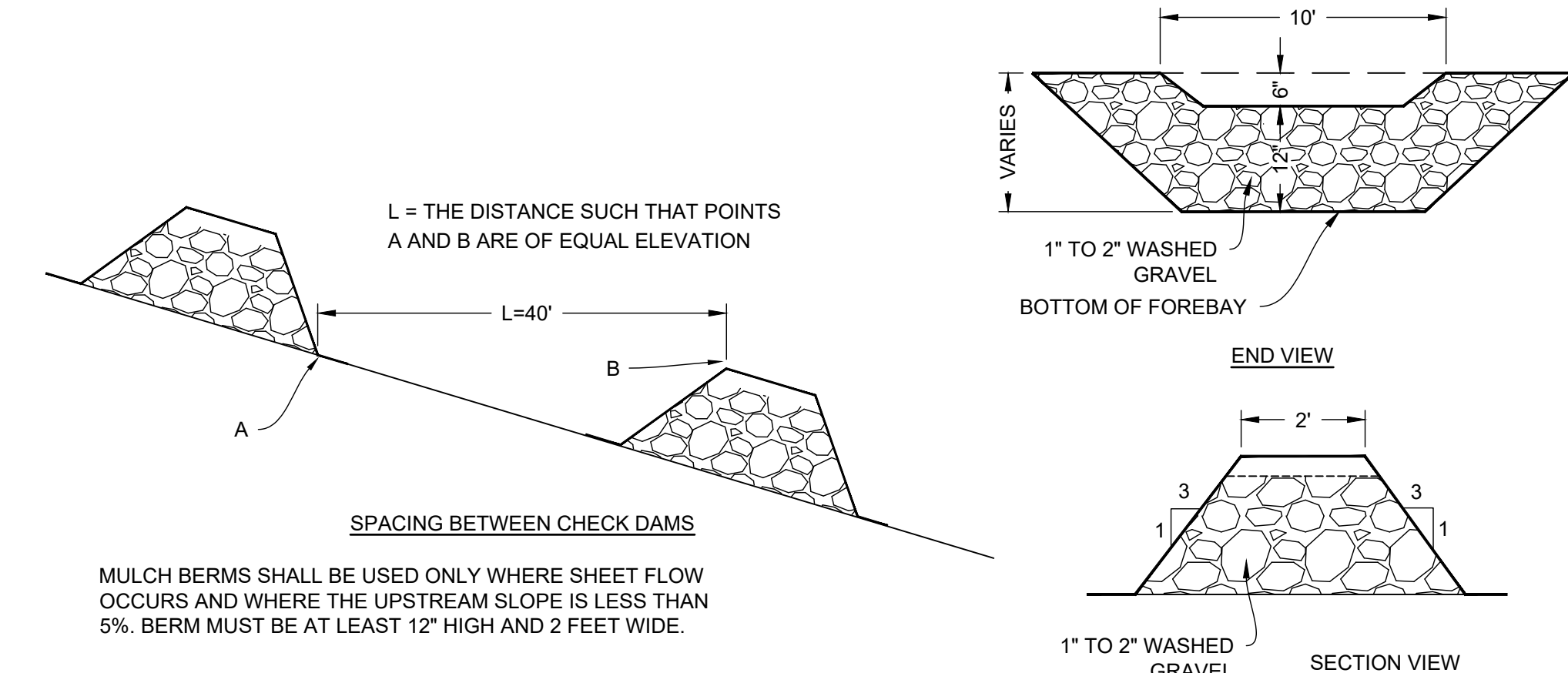


4 EROSION CONTROL BLANKET
NOT TO SCALE



5 EROSION CONTROL MIX BERM
NOT TO SCALE

- NOTES:
- BERMS SHALL BE USED ONLY WHERE SHEET FLOW OCCURS AND WHERE THE UPSTREAM SLOPE IS LESS THAN 5%.
 - EROSION CONTROL MIX SHALL HAVE AN ORGANIC PORTION BETWEEN 25% AND 65% DRY WEIGHT BASIS THAT IS\"/>



6 TEMPORARY CHECK DAM DETAIL
NOT TO SCALE

DATE	NO.	REVISIONS	BY
9/23/2026	2	DRAINAGE CALCS	
9/10/2026	1	REVIEW COMMENTS	

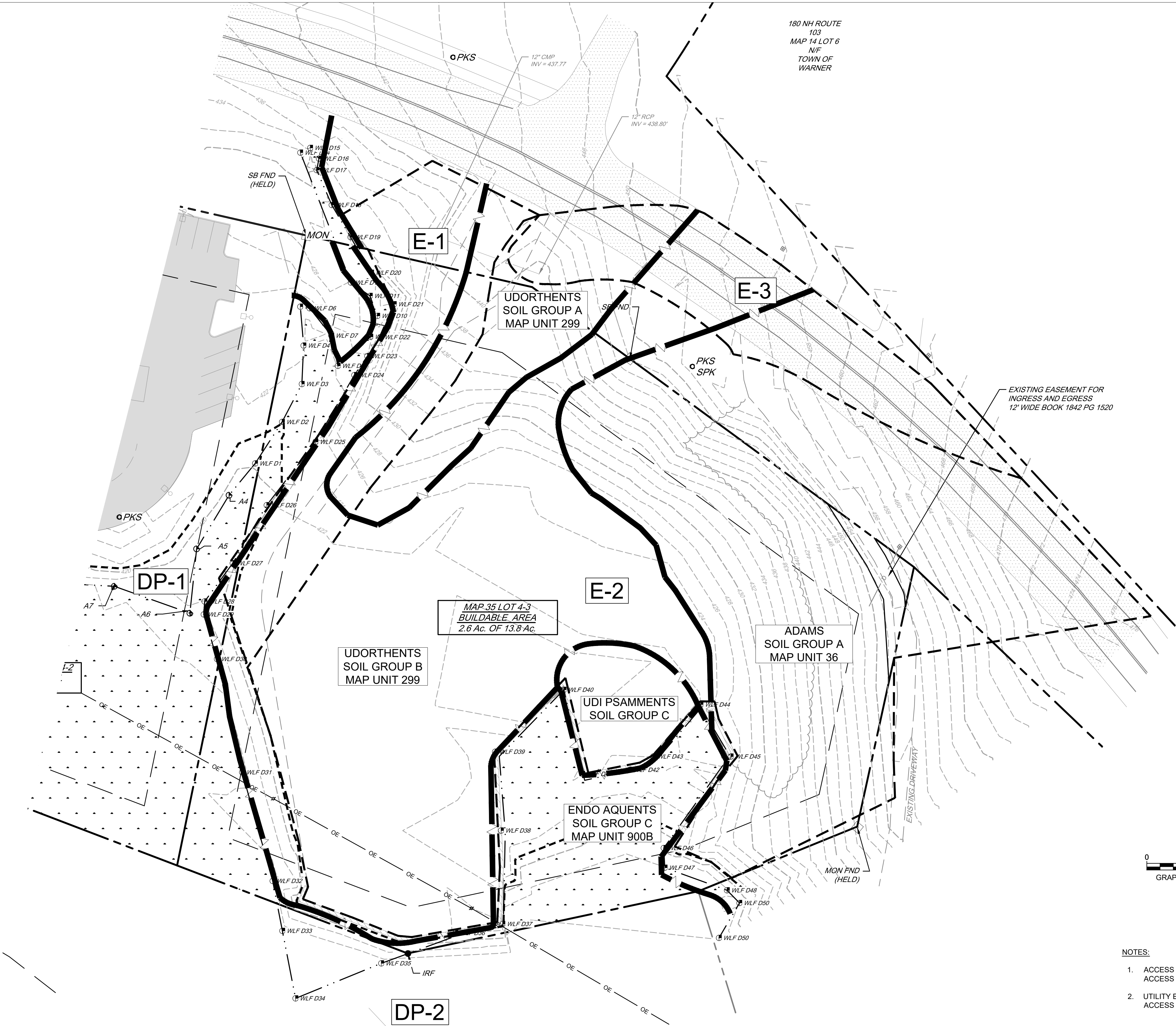
PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
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EROSION CONTROL NOTES AND DETAILS
CS8502



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PRE - DEVELOPMENT AREA E-1			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
PERVIOUS	UDORTHENTS	GROUP A	4121
PERVIOUS	UDORTHENTS	GROUP B	11001

PRE - DEVELOPMENT AREA E-2			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
PERVIOUS	UDORTHENTS	GROUP A	6528
PERVIOUS	UDORTHENTS	GROUP B	43637
PERVIOUS	ADAMS	GROUP A	46230
IMPERVIOUS	ADAMS	GROUP A	829
PERVIOUS	UDI PSAMMENTS	GROUP C	3929

PRE - DEVELOPMENT AREA E-3			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
PERVIOUS	UDORTHENTS	GROUP A	1941
IMPERVIOUS	UDORTHENTS	GROUP A	1517
PERVIOUS	UDORTHENTS	GROUP B	403
IMPERVIOUS	UDORTHENTS	GROUP B	3047
PERVIOUS	ADAMS	GROUP A	323
IMPERVIOUS	ADAMS	GROUP A	5333



9/23/2026	2	DRAINAGE CALCS		
9/10/2026	1	REVIEW COMMENTS		
DATE	NO.	REVISIONS	BY	

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

PRE - DEVELOPMENT DRAINAGE
CS9201



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POST - DEVELOPMENT AREA R-1			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	572
IMPERVIOUS	UDORTHENTS	GROUP B	1344
IMPERVIOUS	ADAMS	GROUP A	1922

POST - DEVELOPMENT AREA R-2			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	ADAMS	GROUP A	4073

POST - DEVELOPMENT AREA R-3			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	362
IMPERVIOUS	ADAMS	GROUP A	2447

POST - DEVELOPMENT AREA R-4			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	593
IMPERVIOUS	UDORTHENTS	GROUP B	2874

POST - DEVELOPMENT AREA R-5			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	996
IMPERVIOUS	ADAMS	GROUP A	175

POST - DEVELOPMENT AREA P-1			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	11
PERVIOUS	UDORTHENTS	GROUP A	66
IMPERVIOUS	UDORTHENTS	GROUP B	441
PERVIOUS	UDORTHENTS	GROUP B	5341

POST - DEVELOPMENT AREA P-2			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	3081
PERVIOUS	UDORTHENTS	GROUP A	185
IMPERVIOUS	UDORTHENTS	GROUP B	978
PERVIOUS	UDORTHENTS	GROUP B	218

POST - DEVELOPMENT AREA P-3			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	1170
IMPERVIOUS	UDORTHENTS	GROUP B	1286
PERVIOUS	UDORTHENTS	GROUP B	596

POST - DEVELOPMENT AREA P-4			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	964
PERVIOUS	UDORTHENTS	GROUP A	119
IMPERVIOUS	UDORTHENTS	GROUP B	6860
PERVIOUS	UDORTHENTS	GROUP B	629

POST - DEVELOPMENT AREA P-5			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	1630
PERVIOUS	UDORTHENTS	GROUP B	216
IMPERVIOUS	UDORTHENTS	GROUP C	1041

POST - DEVELOPMENT AREA P-6			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	10838
PERVIOUS	UDORTHENTS	GROUP B	2990

POST - DEVELOPMENT AREA P-7			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	411
PERVIOUS	UDORTHENTS	GROUP B	12431
IMPERVIOUS	UDI PSAMMENTS	GROUP C	21
PERVIOUS	UDI PSAMMENTS	GROUP C	30

POST - DEVELOPMENT AREA P-8			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	234
PERVIOUS	UDORTHENTS	GROUP A	3666
PERVIOUS	UDORTHENTS	GROUP B	2517
PERVIOUS	ADAMS	GROUP A	7199

POST - DEVELOPMENT AREA P-9			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	484
PERVIOUS	UDORTHENTS	GROUP B	760
IMPERVIOUS	UDI PSAMMENTS	GROUP C	252
PERVIOUS	UDI PSAMMENTS	GROUP C	1341
IMPERVIOUS	ADAMS	GROUP A	7768
PERVIOUS	ADAMS	GROUP A	23781

POST - DEVELOPMENT AREA P-10			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	1887
PERVIOUS	UDORTHENTS	GROUP A	1556
IMPERVIOUS	UDORTHENTS	GROUP B	3058
PERVIOUS	UDORTHENTS	GROUP B	402
IMPERVIOUS	ADAMS	GROUP A	4819
PERVIOUS	ADAMS	GROUP A	409

9/23/2026	2	DRAINAGE CALCS		
9/10/2026	1	REVIEW COMMENTS		
DATE	NO.	REVISIONS		BY

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

POST DRAINAGE PLAN
CS9301



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RE: [EXTERNAL]Request to Consider Rescheduling Planning Board Review of CATCH Application

From Thomas Furtado <tfurtado@catchhousing.org>

Date Wed 9/23/2026 4:29 PM

To Karen Coyne <kcoyne@warnernh.gov>; bosgood@rangereng.com <bosgood@rangereng.com>

Cc George Holt <gholt@aries-eng.com>; Landuse Secretary <landuse@warnernh.gov>; Alexandria Panagiotakos <apanagiotakos@catchhousing.org>

External (tfurtado@catchhousing.org)

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Karen:

We (CATCH) are fine with rescheduling to provide the town's engineer the time he needs to review the plans.

October 5th works for us too.

Thank you
Tom

Tom Furtado
President/CEO
CATCH Neighborhood Housing
105 Loudon Road, Unit #1
Concord, New Hampshire 03301

www.catchhousing.org | www.alliancenh.com | www.hometeamnh.org

From: Karen Coyne <kcoyne@warnernh.gov>

Sent: Wednesday, September 23, 2026 4:06 PM

To: bosgood@rangereng.com

Cc: George Holt <gholt@aries-eng.com>; Thomas Furtado <tfurtado@catchhousing.org>; Landuse Secretary <landuse@warnernh.gov>; Alexandria Panagiotakos <apanagiotakos@catchhousing.org>

Subject: [EXTERNAL]Request to Consider Rescheduling Planning Board Review of CATCH Application

Ben and CATCH Team,

I am writing regarding the upcoming Planning Board review of the CATCH site plan application scheduled for September 28th.

As discussed on your call with Peg, a number of revisions to the site plan are being proposed and have been submitted. The Planning Board's consulting engineer, George of Aries Engineering, is currently on vacation and will not return until October 1. Given the extent of the proposed changes, I would like to ask whether CATCH would be willing to defer the Planning Board's consideration of the application by one week, to the October 5 meeting.

My hope is that this additional time would allow Ben and the project team to provide a written summary of the proposed revisions to both the Planning Board and George so that everyone is working from the same understanding of the changes submitted. It would also give George an opportunity to review those revisions, provide feedback, and potentially prepare an updated estimate for any additional engineering review that may be required.

Ideally, George would be able to attend the October 5 meeting to discuss the revisions and answer questions from both the Planning Board and the applicant. If an updated engineering review can be completed by that date, all the better. However, even if the revised review is not yet available, I believe having George present would make for a much more productive discussion and would help identify any remaining issues early in the process.

Should the engineering review not be completed by October 5, my thought is that the Board could still hold a substantive discussion that evening, with the updated engineering review becoming the primary outstanding item for consideration at the Board's second meeting in October.

Please let me know whether CATCH would be amenable to this approach. My goal is simply to ensure that the Planning Board, the applicant, and our consulting engineer all have sufficient opportunity to review and discuss the revised plans, and submit his findings before the Board is asked to take further action.

Thank you for your consideration.

Best Regards,
Karen Coyne
Chair, Warner Planning Board

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STORMWATER MANAGEMENT REPORT

9 Route 103, Lot 3, Warner, NH

ASSESSORS MAP 57 PARCEL 52

September 23, 2026

Submitted to:

Town of Warner Planning Board
5 East Main Street
Warner, NH 03278

Prepared for:

Catch Neighborhood Housing
105 Loudon Road, Unit #1
Concord, NH 03301

Prepared by:

Ranger Engineering Group, Inc.
130 Main Street Suite 202
Salem, NH 03079
978-208-1762



Benjamin C. Osgood, Jr PE
Director of Engineering

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INTRODUCTION

In accordance with New Hampshire Alteration of Terrain (AOT) program requirements and the New Hampshire Stormwater Manual, Ranger Engineering Group (Ranger) has prepared a comprehensive Stormwater Management Plan for submittal to the Town of Warner, NH Planning Board and the New Hampshire AOT program on behalf of Catch Neighborhood Housing in support of an *Application for a Site Plan Review* for the proposed development of a 3 story 34 unit residential apartment building in Warner NH.

The proposed site improvements include construction of the building, parking areas, grading, a new water and sewer utilities, and associates site work. Proposed site improvements also include Best Management Practices (BMP) to effectively handle all Stormwater runoff from the site.

The proposed Stormwater Management System (SMS) incorporates structural and non-structural BMPs to provide stormwater peak flow mitigation, quality treatment, infiltration, and conveyance. The SMS includes roof drains, drain manholes, underground piping, deep sump catch basins, a buried detention structure and an open infiltration basin, and a long term Operation and Maintenance Plan.

EXISTING CONDITIONS

The project site consists of an existing commercially zoned lot that fronts on Route 103 in Warner NH with a total area of 13.8 Acres. The rear 11.2 Acres is encumbered by a conservation easement and is non buildable and not included in this analysis. The front of the property has a buildable area of $2.6 \pm$ acres. The property is known as Lot 3, 9 Route 103 West (Assessors Map 35 Lot 4-3, (see Dwg. CS9201). The site abuts a commercially zoned property on the west that is owned by the same property owner, a commercially zoned property on the east, commercially zoned property on the opposite side of Rt 103 on the north, and the conservation easement on the south, which is also commercially zoned. The Warner River forms the rear property line for the unbuildable portion of the lot, however, the shoreline protection zone does not encroach on the buildable portion of the lot.

The property slopes down from elevation 450 at the roadway to elevation 421 along the back side of the buildable area. There is floodplain on the property which is mapped as elevation 421 as shown on the plans, however FEMA has proposed a flood plain adjustment to elevation 423.7'. The flood way associated with the Warner River does not encroach on the buildable portion of the lot.

The site does not contain any structures but has been altered in the past as evidenced by a retaining wall along the rear of the buildable portion of the lot. The retaining wall separates the upland areas from wetland areas on the south side of the property. There is a stream along the north side of the property which is primarily fed by a culvert under Route 103 and drainage from the roadway.

The site is primarily vegetated with grass and sapling growth.

PROPOSED CONDITIONS

The Applicant proposes to construct a three story 39,800 sf +/- square foot apartment building with a 14,480 square foot footprint. The building will be situated 40' from the front property line with the site driveway extending on the west side of the building from the road to a parking area behind the building. Access to the building will be from the rear. The parking lot will contain 53 spaces with 24' drive aisles and an area reserved for a small playground

A closed drainage system will be constructed to collect and convey stormwater runoff from the building roofs and parking areas adjacent to the buildings to an open in-ground infiltration basin. Pre-treatment of runoff will be provided by deep sump catch basins and a sediment forebay that will be part of the in-ground infiltration basin. Final Treatment of runoff from the site will occur in the in-ground infiltration system which will have an outlet structure that will retain sufficient volume to provide the required treatment of the water quality volume. The outlet structure will allow stormwater to be discharged to the adjacent stream along the west side of the property in a controlled manner with reduction in flow rate in all storms.

The proposed development will be serviced by municipal sewer, municipal water, electric, cable and fiberoptic communication.

STORMWATER DESIGN

The proposed stormwater system will maintain the same drainage patterns as under the pre-development conditions. Increases to peak rates of flow will be mitigated onsite to minimize or eliminate impacts to downstream areas. Stormwater presently flows off site at the rear of the property into the adjacent wetland areas which border the Warner River.

Closed Drainage Systems

The proposed closed drainage system consists of deep sump catch basins, drain manholes, and HDPE piping. The system conforms to the NH Dot and Town of Warner regulations.

Stormwater Treatment

Stormwater treatment starts with the use of deep sump catch basins at each stormwater collection point within the paved areas. A buried pipe system conveys stormwater flows to a buried infiltration structure that captures runoff and provides treatment through infiltration. Once the buried structure fills the remaining stormwater is conveyed to an open detention / infiltration pond which provides additional infiltration and detention of stormwater to control flows.

Stormwater Detention

Stormwater detention occurs in the subsurface chamber system and the open detention/ infiltration basin. The subsurface chamber system is designed to infiltrate stormwater. The open basin retains flow for infiltration and reduces runoff in each design storm.

Infiltration

Stormwater flows from most of the impervious surfaces will flow through a buried infiltration system comprised of Stormtech SC 310 chambers set in a bed of crushed stone. The volume of storage within the system which is below the outlet of the system is sufficient to contain the required water quality infiltration volume. See the stage storage tables attached to the hydrocad printouts.

SITE PARAMETERS

Wetland Resource Areas

Wetland resource areas exist on the property and have been delineated and shown on the plans.

Flood Zone Classification

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Merrimack County, New Hampshire, Community Panel 33013C0287E, effective date April 19, 2010, the site and nearby properties are located within a Zone AE which has a flood elevation of 421.00.

More recent proposed flood mapping places the flood elevation at elevation 422.7 which does encroach on the property, however, the property is not in the flood way associated with the Warner River. Both flood lines are shown on the plans.

Estimated Habitat for Rare Wildlife and Rare Species

A submittal was made to the New Hampshire National Heritage Bureau through the online data check website which resulted in a determination that this property may be habitat for Blanding's Turtle, Wood Turtle, and Spotted Turtle. A wildlife study has been performed and submitted to NH Natural Heritage, along with the project plans, for review and approval.

Soil Classification

According to the Soil Survey of Rockingham County, New Hampshire, prepared by the US Department of Agriculture, Soil Conservation Service, underlying soils located within the site consist primarily of Urban Land and Adams Loamy Sand (see Soils Map). Soil testing was performed by Benjamin C. Osgood, Jr. and Geotechnical Services Inc. Soil testing results were consistent with the soil mapping for the site. A detailed site-specific soil survey was developed by John Hayes, CCS. The site soils are as follows.

Table 1
Hydrologic Soil Group Ratings

Map Unit Symbol	Map Unit Name	Rating
299	Udorthents	A
36	Adams Loamy Sand, 8 – 35% slopes	A
299	Udorthents	B

The on-site soils consist of series, described by NRCS, as follows:

Adams Loamy Sand: Adams loamy sand is a very deep, excessively to somewhat excessively drained soil formed in glacial-fluvial or glacio-lacustrine sand

Udorthents: Udorthents are human-disturbed mineral soils where the original soil horizons have been heavily altered, removed, covered by two feet or more of earthy fill, or excavated

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

Per the soil survey, the general characteristics of the four (4) hydrologic soil groups are as follows:

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

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

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

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

Subsurface Investigation

Test pit investigations were conducted within the site to determine the presence of the Seasonal High Groundwater (SHGW) elevation, soil classification, and depth to bedrock. The fill soils were found to be consistent with a B soil type (see test pit logs results in the appendix)

Three Guelph Permeameter tests were performed to determine in place conductivity in the original C layer soil which was found at a depth of between 45" and 65". These in situ tests indicate the soil has a hydraulic conductivity between 1.2 and 4.9 inches per hour.

DRAINAGE ANALYSIS

Methodology

The comparative hydrologic analysis of pre-development conditions to post-development conditions was performed using the Soil Conservation Service, Technical Release 20 (TR-20). The 1, 2, 10, and 50-year storm events were modeled for a 24-hour, Type III storm using HydroCAD version 10.00. HydroCAD calculations for pre-and post-development conditions are include in the Appendices.

The following rainfall amounts were utilized for each design storm event as determined using the Northeast Regional Climate Center Extreme Precipitation Tables.

2-year Frequency Storm:	2.0 inches per 24-hours
2-year Frequency Storm:	2.94 inches per 24-hours
10-year Frequency Storm:	4.56 inches per 24-hours
50-year Frequency Storm:	6.32 inches per 24-hours

Existing Watershed

The existing site is located on the south side of Route 103 West. Stormwater flows from the front of the lot to the wetland at the rear of the lot. Stormwater flows include some roadway runoff from Rt 103, part of which flows over the site and part of which flows to an inlet within the state right of way to a pipe that discharges to the stream channel on the west side of the site.

The existing catchment areas and drainage runoff flow patterns associated with the site are illustrated on the attached Pre-Development Watershed Plan (Dwg. CS9201). The drainage patterns will be maintained under post-development conditions.

For the purposes of the hydrologic analyses, the existing site has been delineated as three (3) existing catchment areas which flow to two (2) design point. Additionally, Catchment E-4 carries water from the north side of Route 103 to a culvert under the site driveway that also discharges to the brook on the west side of the site (DP1). The catchment areas which have been modeled flow offsite and are described as follows:

- Design Point #1 (DP1) – Flow to intermittent brook on the west side of the site.
- Design Point #2 (DP2) – Flow to wetland at the rear of the site

Catchment E1

Catchment E1 includes the west side of the site. The area contains grass and scrub underbrush and stormwater flows to the brook on the west side of the site (DP1)

Catchment E2

Catchment E2 includes the balance of the site and roadway areas above the site that flow onto the site. The area has grass and scrub brush, wooded areas, and pavement in the roadway area.

Catchment E3

Catchment E3 includes portions of the roadway that flow to an inlet in the state right of way that discharges to the brook on the west side of the site (DP1).

Catchment E4

Catchment E4 includes portions of the roadway and grass areas on the north side of Route 103. This area flows to an inlet that is piped under the road to the inlet in the right of way that discharges to the intermittent brook on the west side of the property.

Proposed Watershed

The proposed development will include a closed drainage system which will collect and convey stormwater runoff into an open detention basin and a subsurface detention system. For the purposes of the analyses, the proposed site has been divided into a total of fourteen catchment areas 5 of which are roof areas that flow to the subsurface detention system. The proposed catchment areas are shown on the Post-Development Watershed Plan (Dwg. CS9301) and can be described as follows

Catchment P1

Catchment P1 includes flow from grass and scrub areas on the west side of the site that drain to the intermittent brook.

Catchment P2

Catchment P-2 includes flow from paved areas grass shoulder areas which flow to CB-3 and then into the stormwater conveyance system and eventually into the stormwater detention/infiltration system.

Catchment P3

Catchment P-1B includes flow from paved areas grass shoulder areas which flow to CB-4 and then into the stormwater conveyance system and eventually into the stormwater detention/infiltration system.

Catchment P4

Catchment P-4 includes flow from paved areas, sidewalks, and grass shoulder areas which flow to CB-5 and then into the stormwater conveyance system and eventually into the stormwater detention/infiltration system.

Catchment P5

Catchment P5 includes flow from paved areas grass shoulder areas which flow to CB-6 and then into the stormwater conveyance system and eventually into the stormwater detention/infiltration system.

Catchment P6

Catchment P6 includes flow from paved areas grass shoulder areas which flow to CB-7 and then into the stormwater conveyance system and eventually into the stormwater detention/infiltration system.

Catchment P7

Catchment P7 includes the grass area on the outside of the parking area that flows directly to the open detention area. The catchment also includes the open detention pond.

Catchment P8

Catchment P6 includes grass areas and portions of the gravel fire road at the front of the building that flow to CB-1 and eventually to the stormwater detention/infiltration system.

Catchment P9

Catchment P9 includes portions of landscape areas at the front of the property which flows around the stormwater system and eventually directly to the wetland at the rear of the property.

Catchment P10

Catchment P10 includes portions of the roadway in front of the property that flow to a pipe inlet that conveys flow below the site driveway to the adjacent brook.

Catchment P11

Catchment P9 includes portions of landscape areas at the front of the property which flows around the stormwater system and eventually directly to the wetland at the rear of the property.

Catchment R-1 through R-5

Catchment R-1 through R-5 includes roof areas that are captured in a stone trench around the building where it is collected in a subdrain pipe that flows to various catch basins that flow to the stormwater system.

SUMMARY OF PEAK DISCHARGE RATES AND VOLUMES

The estimation of flow rates and volumes were calculated utilizing *HydroCad* stormwater modeling software. The methodology is SCS TR-20, Type III, 24-hour rainfalls (1, 2, 10, and 50 year frequency storm events). Supporting calculations are included in the Appendix.

FLOW RATE TABLES

Point of Analysis	Storm	Pre-Development Rate (CFS)	Post-Development Rate (CFS)
<u>DP1</u>	1-year	0.20	0.15
	2-year	0.29	0.25
	10-year	0.58	0.58
	50-year	3.36	3.42

Point of Analysis	Storm	Pre-Development Rate (CFS)	Post-Development Rate (CFS)
<u>DP2</u>	1-year	0	0
	2-year	0	0
	10-year	0.09	0
	50-year	1.15	0.55

AOT STANDARDS AND WATER QUALITY PROTECTION

The project has been designed to meet the requirements the New Hampshire Code of Administrative Rules CHAPTER Env-Wq 1500.

Construction Phase Sediment Control

A detailed sedimentation and erosion control plan has been included as part of the plan set. Erosion and sediment control methods will include the use of perimeter controls consisting of silt fence and mulch waddles which will be installed prior to any work being performed. A construction entrance will be installed to prevent vehicle tracking of sediment onto the adjacent roadway.

Prior to earth disturbance a sediment trap will be installed at the base of the project to trap and contain sediment. Stormwater flows from the upper portions of the site will be directed to the sediment trap until the permanent detention/infiltration pond can be constructed.

Once the site has been graded to sub grade all slopes will be stabilized with Loam and seed or erosion control blankets and the drainage system will be protected with inlet protection devices. Erosion control devices will be used as needed to prevent sediment laden runoff from traveling off site. The maximum open area allowed by AOT requirements is greater than the work area proposed for this project.

Post Construction Water Quality Protection

There will be no new untreated outfalls proposed as part of this project; the stormwater management system is designed to provide the required minimal level of water quality treatment for all new discharges.

Stormwater from proposed paved surfaces on the new portion of the site are captured with deep sump catch basins before it is routed into the buried detention/infiltration pond where it is treated and released through infiltration and a controlled outlet structure to the open detention pond where additional infiltration and an outlet structure provide additional flow control.

Calculations of Water Quality Volume and treatment system function included on the printouts from the AOT BMP worksheet which are included in this report.

Peak Rate Attenuation

There will be an increase to the impervious area as a result of this project. The drainage collection and conveyance system has been designed to direct stormwater to detention structures to attenuate increases in peak runoff. Pre- and post-development watershed analyses of the drainage systems were performed for the 1, 2, 10, and 50-year storm events. A summary of peak discharge rates for the pre and post development conditions is presented in section IX and the full Hydrocad printouts are included in the Appendix to this report. The

results of the analysis indicate that post-development peak discharge rates will not increase from the pre-development peak discharge rates for all design points in the analysis.

Groundwater Recharge Requirement

The groundwater recharge volume requirement is calculated by multiplying the total impervious cover in the proposed development by 0.40". The 0.40" value is determined by the soil classification of hydraulic class A. The area of impervious surface in the project that flows to Design Point 2 is 55,594 square feet. The impervious area flowing to design point 1 is comprised of existing roadway and no new paved area is being installed in this design point.

The recharge volume for this site can be calculated as $55,594 \text{ SF} \times (0.40"/12") = 1,986 \text{ cubic feet}$.

The volume of infiltration provided in the buried detention structure is the volume of stormwater retained below the 2 outlet weirs at elevation 422.8. This volume can be taken from the stage storage table (Attached in the appendix) and is 4,418 cubic feet.

The subsurface infiltration structure has a volume of 4,418 cubic feet below the lowest outlet which exceeds the required infiltration value 1,986 cubic feet.

72-Hour Drawdown Calculations

The drawdown time for the detention basin is determined with the following equation.

$$\text{Time (drawdown)} = \frac{\text{ReV}}{(K) \times \text{Area}}$$

Where, ReV = recharge Volume Provided
 K = Saturated Hydraulic Conductivity (From Testing)
 Area = Average Surface area of basin bottom

Soil test pits done in the area of the proposed detention basins demonstrate that the fill soils are loamy sand. Permeability testing was performed

Underground Structure 3

$$\text{Time (drawdown)} = \frac{4,418 \text{ cf}}{(.6"/\text{hr})/12 \times 2,997\text{sf}} = 29.48 \text{ hours}$$

Channel Protection Requirement

Channel protection requirements are met by keeping post development flows in the 2 year storm less than the pre development flow for the 2 year storm with a peak runoff rate less than 2 cfs.

For design point 1 the pre -development 2 -year runoff rate is 0.29 cfs and the 2-year post development runoff is 0.25 cfs.

For design point 2 the pre -development 2 -year runoff rate is 0.0 cfs and the 2-year post development runoff is 0.0 cfs.

STORMWATER POLLUTION PREVENTION PLANS AND SYSTEM MAINTENANCE

Lot 3 - 9 Route 103 West

Construction Period Erosion and Sedimentation Control Plan:

The BMP's associated with the construction phase this project will be owned by the Applicant's Contractor, which will be responsible for inspection, operation, and maintenance. A more detailed SWPPP – per NPDES Phase 2 requirements – is to be kept on site, along with inspection logs. All details and plans required are included in the Site Plan set attached herewith.

1. The contractor is to install and maintain drainage facilities as shown on site plan prepared by Ranger Engineering Group. (Ranger), dated May 12, 2026, revised to September 23, 2026.
2. Prior to commencement of construction the contractor shall file a notice of intent under the EPA NPDES construction permit.
3. Any dewatering requires coverage under the NPDES construction site dewatering general permit.
4. The contractor must install erosion control measures as shown on the plans and in the details prior to starting any other work on the site. Erosion control must be installed at every inlet structure (existing and proposed) and maintained for the duration of the project.
5. Erosion controls as shown on plans shall be inspected, repaired and/or maintained by the contractor daily and within 12 hours of each storm event.
6. Sediment deposits shall be removed when they reach a depth of 1/4 to 1/2 the height of the silt fence or sediment sock.
7. Sediment shall be contained within the construction site, away from drainage structures. Sediment reaching the public way shall be removed by street sweeping and not by flushing.
8. Stabilize slopes steeper than 3:1 (horizontal to vertical) with seed, secured geotextile fabric, or rock rip-rap as required to prevent erosion during construction.
9. Clean out catch basins, drain manholes and storm drain pipes after completion of construction.
10. Loam and seed all disturbed areas. Permanent seeding shall occur in the spring from late march through may and in late summer or early fall between August and October.
11. Dust shall be controlled at the site with mechanical water spraying as necessary and during extended dry periods.
12. Upon establishment of permanent vegetation over disturbed areas, remove and dispose of wattles and stakes.
13. It is the responsibility of the contractor to maintain and supplement the specified sedimentation controls as necessary to prevent sedimentation of off-site areas and/or any regulated resource areas. Failure by the contractor to control erosion, pollution

and/or siltation shall be cause for the owner to employ outside assistance or to use his own means to provide the necessary corrective measure. The cost of such assistance plus project engineering costs will be the contractor's responsibility.

14. In addition to those locations shown on this plan and on the grading and drainage plans, erosion controls shall be installed at the following locations: toe of slope of embankment construction, toe of temporary earthwork stockpiles. Stockpile side slopes shall not exceed 2:1.
15. Erosion and sedimentation control shall be in compliance with New Hampshire Stormwater Manual

Long-Term Pollution Prevention:

The owner/applicant is to be responsible for maintenance of all drainage structures in the project, including drain pipes. The future owner is expected to be Mountain States, LLC which is the current property owner.

Regular maintenance is to include the following:

1. Inspection of all drainage facilities (pipes, catch basins and manholes, wet detention pond, and the buried infiltration system) every six months. During these inspections, the inspector (a person qualified in drainage system inspections) shall look for evidence of the following: structural damage, silt accumulation (near inlet inverts on pipes), and improper function. A report on the system shall be delivered to the Property Owner, with a copy delivered to the Town Engineer.
2. The sand filter shall be inspected to verify proper filtration and condition of filter surface. Existing trash and debris shall be removed and the surface media replaced as required to maintain infiltration.
3. After inspection, if any of the above conditions exist, the inspector shall notify the Owner who shall immediately arrange for all necessary repairs and sediment removal.
4. All graded slopes shall be inspected every spring for erosion. Upon discovery of any failure (ie. erosion, sloughing, rutting), loam and seed shall be put in place and nurtured.
5. Catch basins and sediment forebays shall be cleaned annually or when sediment has accumulated to within 6" of the inlet or outlet inverts.
6. Grassed channel slopes shall be mowed at least monthly to maintain grass cover. Trash and debris shall be removed monthly.
7. Roadway surfaces shall be swept clean at least once per year, preferably in the spring just after snow melt.

STORMWATER MANAGEMENT SYSTEM
Post-Development Inspection & Maintenance Log

BMP/System Component	Maintenance Required & Frequency	Date of Inspection	Inspection Inspector	Cleaning/Repair Needed (list items/comments)	Date of Cleaning/Repair	Cleaning/Repair Performed by
Pavement Sweeping	Swept clean as required (i.e. visual noticeable build-up). A minimum of once per year, preferably just after snow melt.					
Catch Basin Sumps/Drain Manholes/ Outlet Control Structure	- Inspect and clean annually for the evidence of structural damage, silt accumulation and improper function. - Remove accumulated sediments and debris from sump when sump is more than 25% full, minimum annually just after snow melt.					
Drain Pipes	Inspect annually for the evidence of					

BMP/System Component	Maintenance Required & Frequency	Date of Inspection	Inspection Inspector	Cleaning/Repair Needed (list items/comments)	Date of Cleaning/Repair	Cleaning/Repair Performed by
	structural damage, silt accumulation and improper function. Clean pipes when sediment occupies more than 20% of pipe diameter.					
Grassed Channels	- Inspect after every major storm during first three months of operation and annually thereafter for the evidence of structural damage, silt accumulation and improper function. - Mow the side slopes, remove trash and debris, grass clippings and accumulated organic dead matter every six months.					

BMP/System Component	Maintenance Required & Frequency	Date of Inspection	Inspection Inspector	Cleaning/Repair Needed (list items/comments)	Date of Cleaning/Repair	Cleaning/Repair Performed by
Buried Detention Structure	Inspect quarterly for silt accumulation or structural damage.					
Open Detention/Infiltration Pond	- Inspect Monthly for trash and debris - Clean silt accumulations in sediment forebay annually or when silt is closer than 6" to outlet invert.					
Graded Slopes/ Rip-Rap	Inspect every spring for erosion. Repair any erosion by placing rip-rap/ loam and seed in place and nurtured					

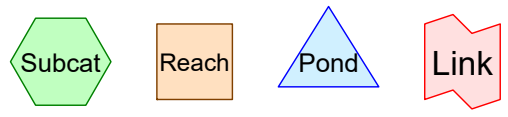
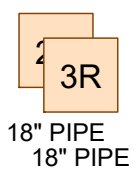
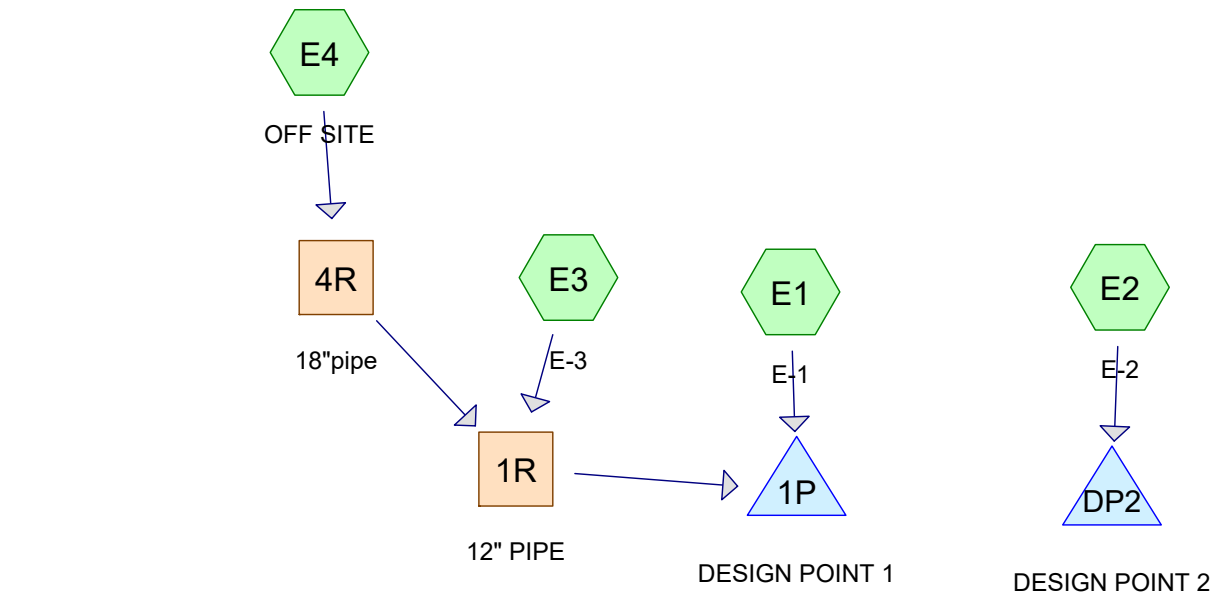
STORMWATER MANAGEMENT REPORT

APPENDICES

HYDROCAD CALCULATIONS STAGE
STORAGE TABLES PRECIPITATION
FREQUENCY TABLE
INFILTRATION PRACTICE DESIGN TABLE

STORMWATER MANAGEMENT REPORT

PRE-DEVELOPMENT DRAINAGE



COMET PRE DEVELOPMENT

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Project Notes

Rainfall events imported from "WARNER NH POST DEVELOPMENT Rev 2.hcp"

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1 YEAR	Type III 24-hr		Default	24.00	1	2.33	2
2	2 YEAR	Type III 24-hr		Default	24.00	1	2.76	2
3	10 YEAR	Type III 24-hr		Default	24.00	1	4.01	2
4	50 YEAR	Type III 24-hr		Default	24.00	1	5.86	2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
33,662	39	>75% Grass cover, Good, HSG A (E3, E4)
51,180	30	Brush, Good, HSG A (E1, E2)
54,638	48	Brush, Good, HSG B (E1, E2)
3,255	65	Brush, Good, HSG C (E2)
32,272	98	Paved parking and roof, HSG A (E4)
16,555	98	Paved parking, HSG A and B (E2, E3)
83,751	30	Woods, Good, HSG A (E4)
275,313	47	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
217,420	HSG A	E1, E2, E3, E4
54,638	HSG B	E1, E2
3,255	HSG C	E2
0	HSG D	
0	Other	
275,313		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
33,662	0	0	0	0	33,662	>75% Grass cover, Good
51,180	54,638	3,255	0	0	109,073	Brush, Good
16,555	0	0	0	0	16,555	Paved parking
32,272	0	0	0	0	32,272	Paved parking and roof
83,751	0	0	0	0	83,751	Woods, Good
217,420	54,638	3,255	0	0	275,313	TOTAL AREA

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1R	438.80	437.77	68.0	0.0151	0.012	0.0	12.0	0.0	
2	2R	441.30	437.85	87.0	0.0397	0.012	0.0	18.0	0.0	
3	3R	441.30	437.85	87.0	0.0397	0.012	0.0	18.0	0.0	
4	4R	441.30	437.85	87.0	0.0397	0.012	0.0	18.0	0.0	

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Type III 24-hr 1 YEAR Rainfall=2.33"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E1: E-1Runoff Area=15,122 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=170' Tc=7.5 min CN=43 Runoff=0.00 cfs 0 cf**Subcatchment E2: E-2**Runoff Area=102,979 sf 8.77% Impervious Runoff Depth=0.00"
Flow Length=377' Tc=6.0 min CN=45 Runoff=0.00 cfs 0 cf**Subcatchment E3: E-3**Runoff Area=11,175 sf 67.36% Impervious Runoff Depth>0.72"
Flow Length=303' Tc=6.0 min CN=79 Runoff=0.20 cfs 675 cf**Subcatchment E4: OFF SITE**Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.00"
Flow Length=729' Tc=6.0 min CN=47 Runoff=0.00 cfs 6 cf**Reach 1R: 12" PIPE**Avg. Flow Depth=0.14' Max Vel=3.00 fps Inflow=0.20 cfs 681 cf
12.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=4.75 cfs Outflow=0.20 cfs 680 cf**Reach 2R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 3R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 4R: 18" pipe**Avg. Flow Depth=0.00' Max Vel=1.14 fps Inflow=0.00 cfs 6 cf
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 6 cf**Pond 1P: DESIGN POINT 1**Inflow=0.20 cfs 680 cf
Primary=0.20 cfs 680 cf**Pond DP2: DESIGN POINT 2**Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf**Total Runoff Area = 275,313 sf Runoff Volume = 681 cf Average Runoff Depth = 0.03"**
82.26% Pervious = 226,486 sf 17.74% Impervious = 48,827 sf

COMET PRE DEVELOPMENT

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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment E1: E-1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond 1P : DESIGN POINT 1

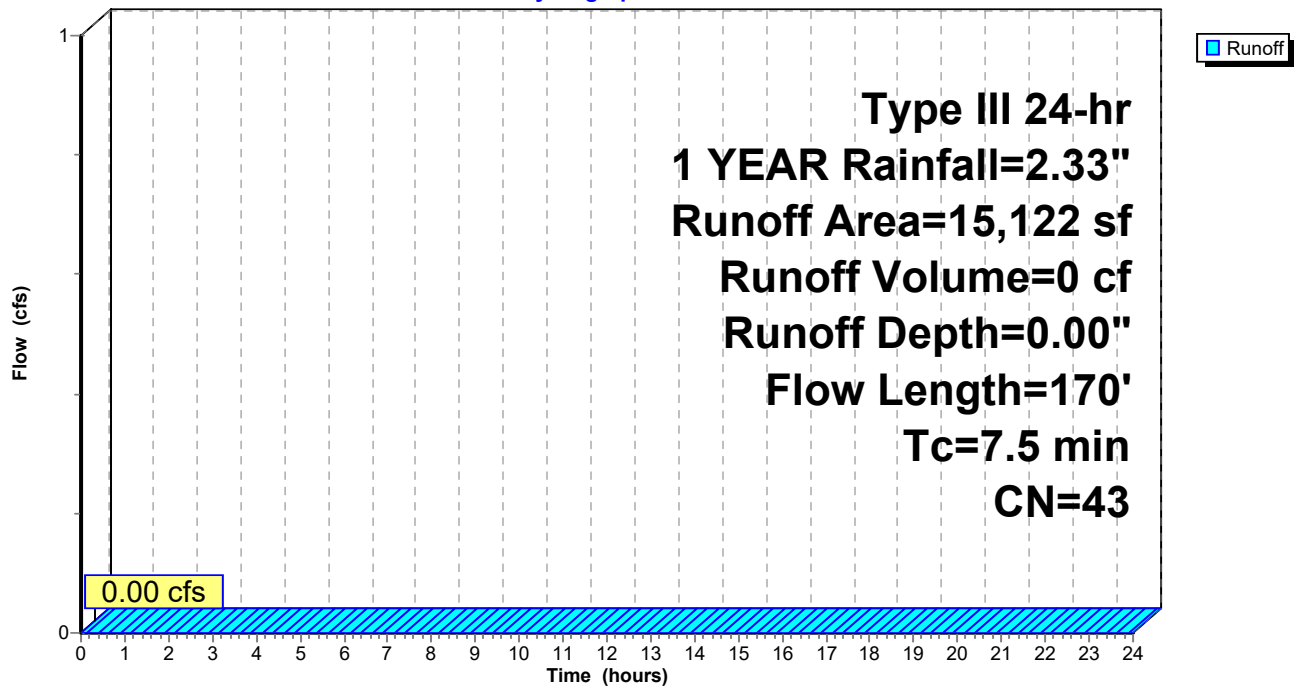
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
11,001	48	Brush, Good, HSG B
4,121	30	Brush, Good, HSG A
15,122	43	Weighted Average
15,122		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.1000	0.18		Sheet Flow, FLOW THROUGH Grass: Dense n= 0.240 P2= 2.76"
2.9	120	0.0100	0.70		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
7.5	170	Total			

Subcatchment E1: E-1

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment E2: E-2

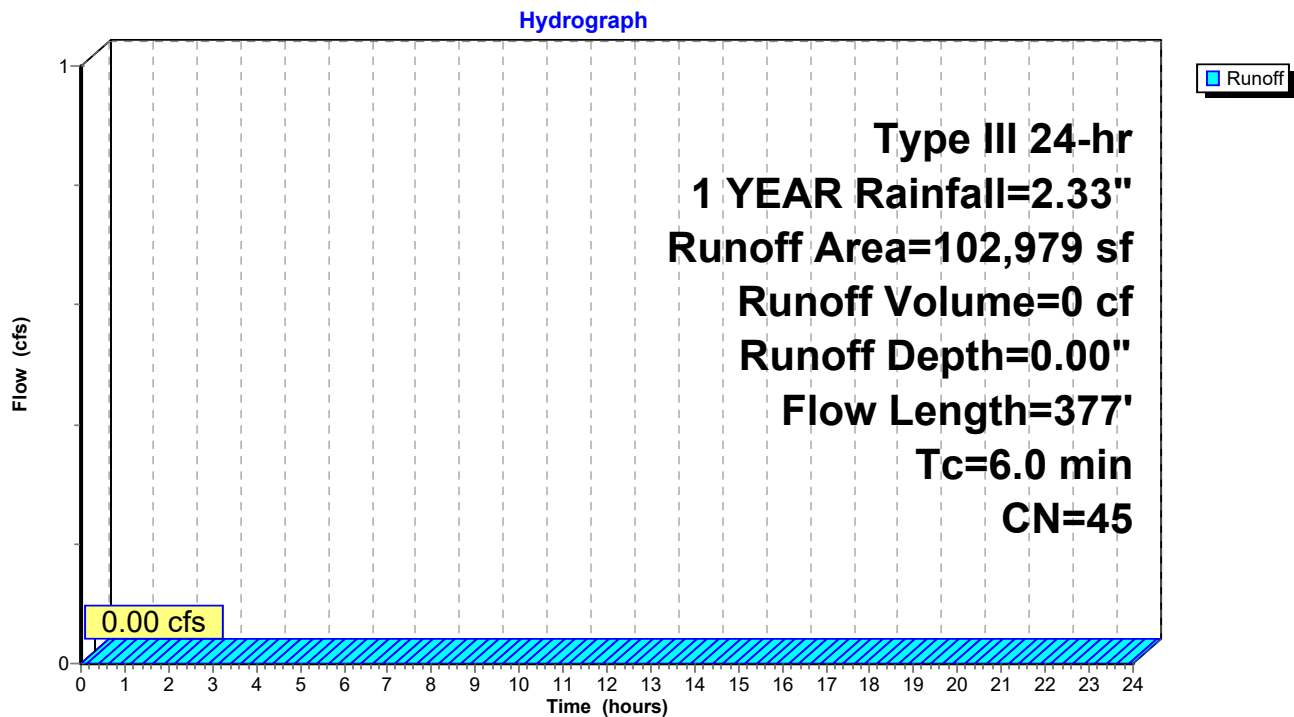
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond DP2 : DESIGN POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
43,637	48	Brush, Good, HSG B
47,059	30	Brush, Good, HSG A
3,255	65	Brush, Good, HSG C
* 9,028	98	Paved parking, HSG A and B
102,979	45	Weighted Average
93,951		91.23% Pervious Area
9,028		8.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOWON PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.6	73	0.0800	1.98		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
0.8	167	0.2300	3.36		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
1.4	87	0.0220	1.04		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
2.8					Direct Entry,
6.0	377	Total			

Subcatchment E2: E-2



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment E3: E-3

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 675 cf, Depth> 0.72"
Routed to Reach 1R : 12" PIPE

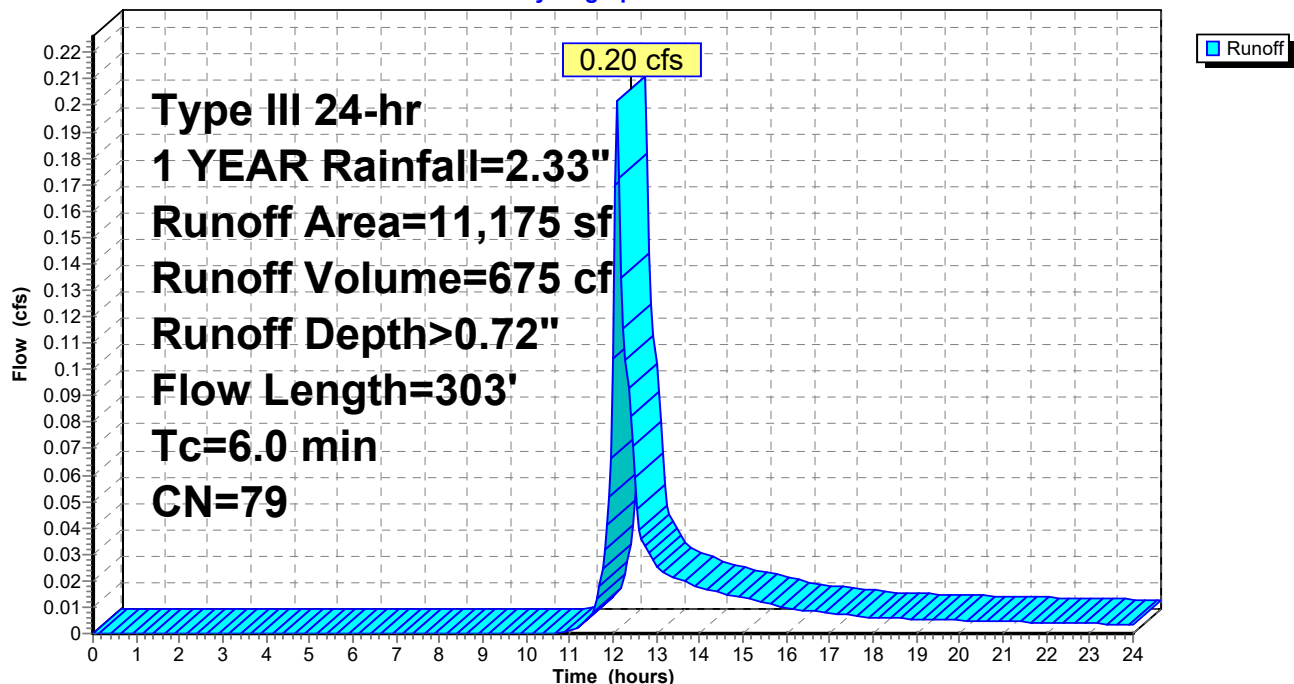
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 7,527	98	Paved parking, HSG A and B
11,175	79	Weighted Average
3,648		32.64% Pervious Area
7,527		67.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment E3: E-3

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment E4: OFF SITE

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 6 cf, Depth> 0.00"
 Routed to Reach 4R : 18"pipe

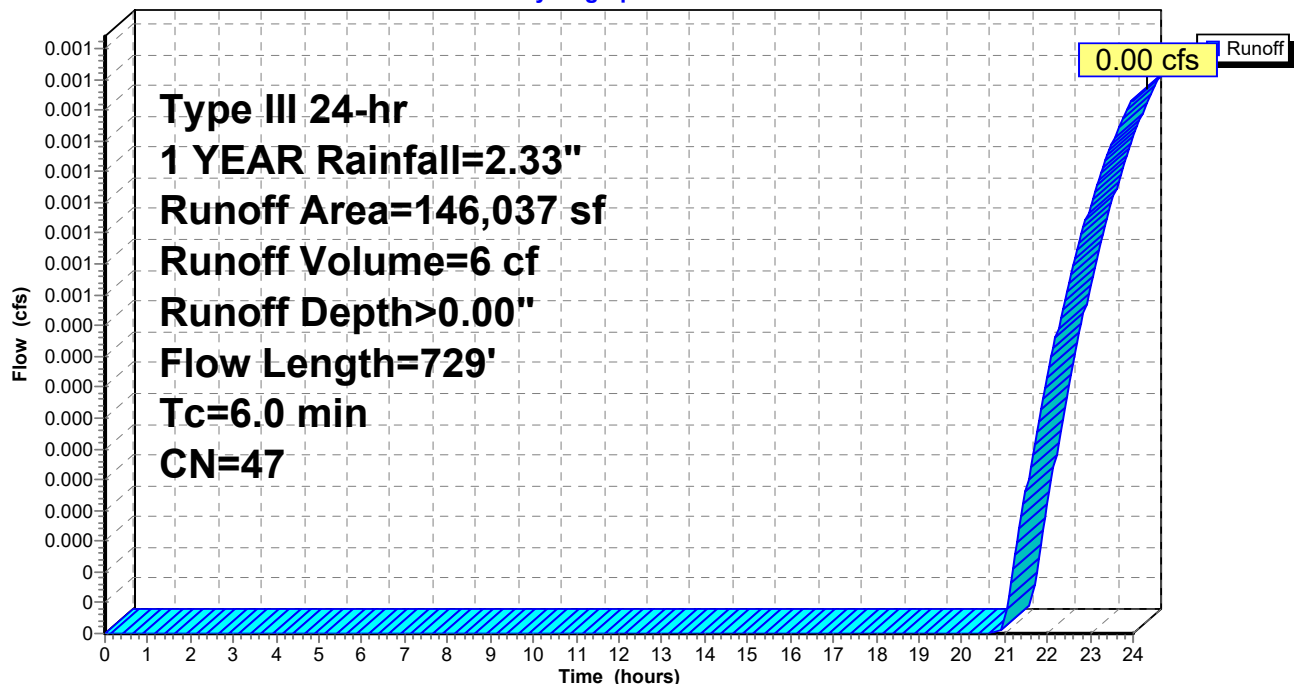
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
* 32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.84		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment E4: OFF SITE

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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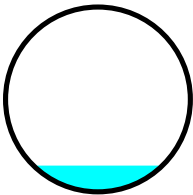
Summary for Reach 1R: 12" PIPE

Inflow Area = 157,212 sf, 25.32% Impervious, Inflow Depth > 0.05" for 1 YEAR event
Inflow = 0.20 cfs @ 12.10 hrs, Volume= 681 cf
Outflow = 0.20 cfs @ 12.11 hrs, Volume= 680 cf, Atten= 0%, Lag= 0.3 min
Routed to Pond 1P : DESIGN POINT 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.00 fps, Min. Travel Time= 0.4 min
Avg. Velocity= 1.20 fps, Avg. Travel Time= 0.9 min

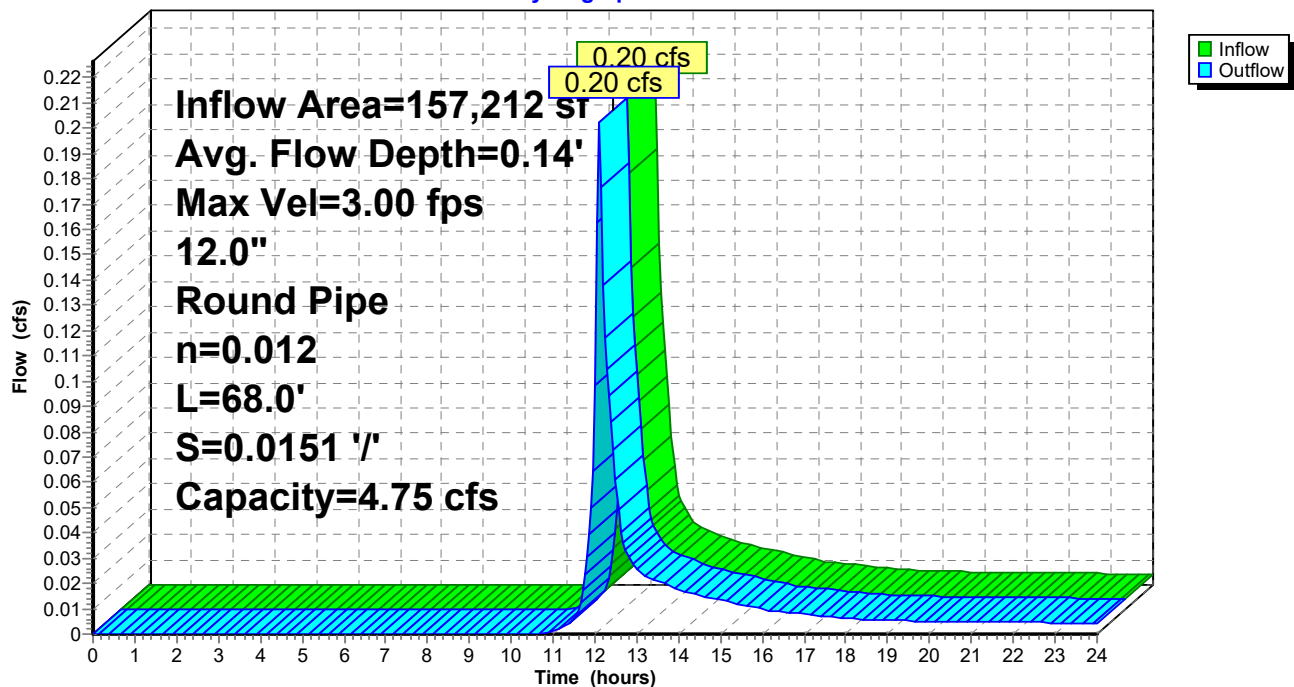
Peak Storage= 5 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 0.70'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.75 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 1R: 12" PIPE

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Reach 2R: 18" PIPE

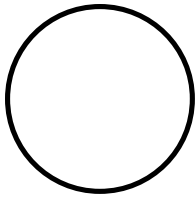
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

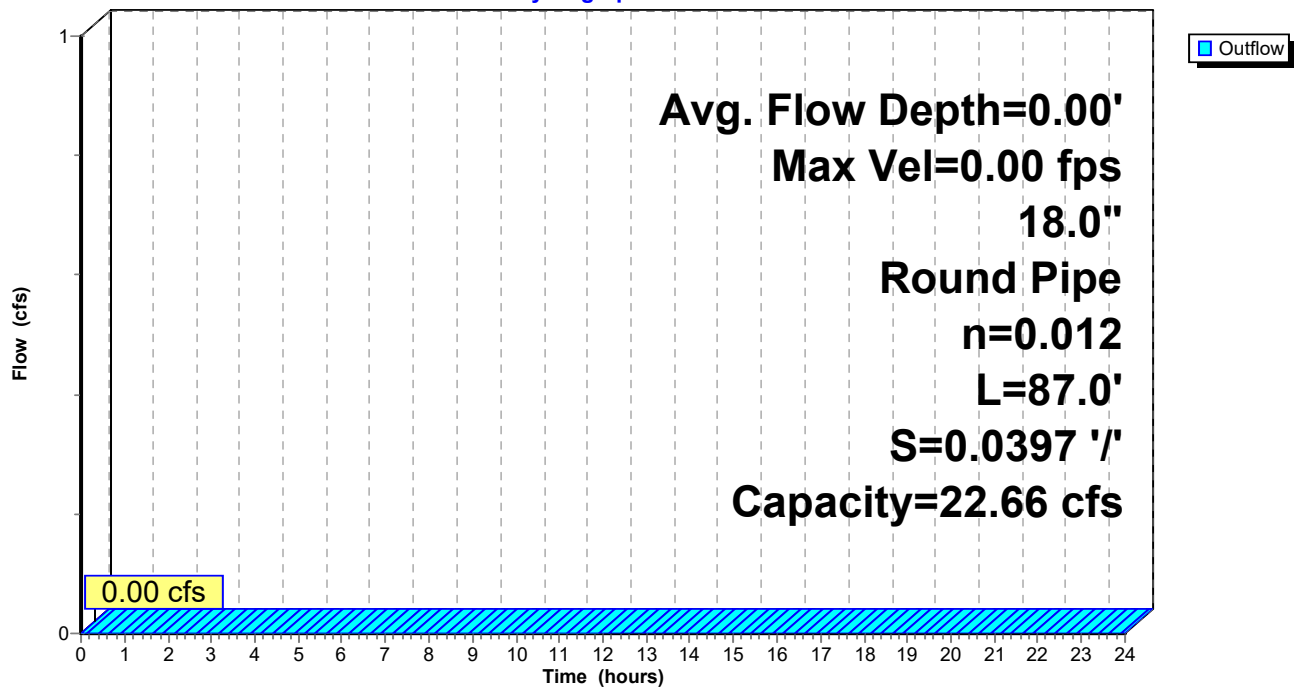
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 2R: 18" PIPE

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Reach 3R: 18" PIPE

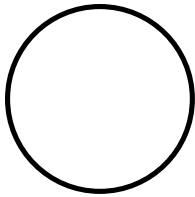
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

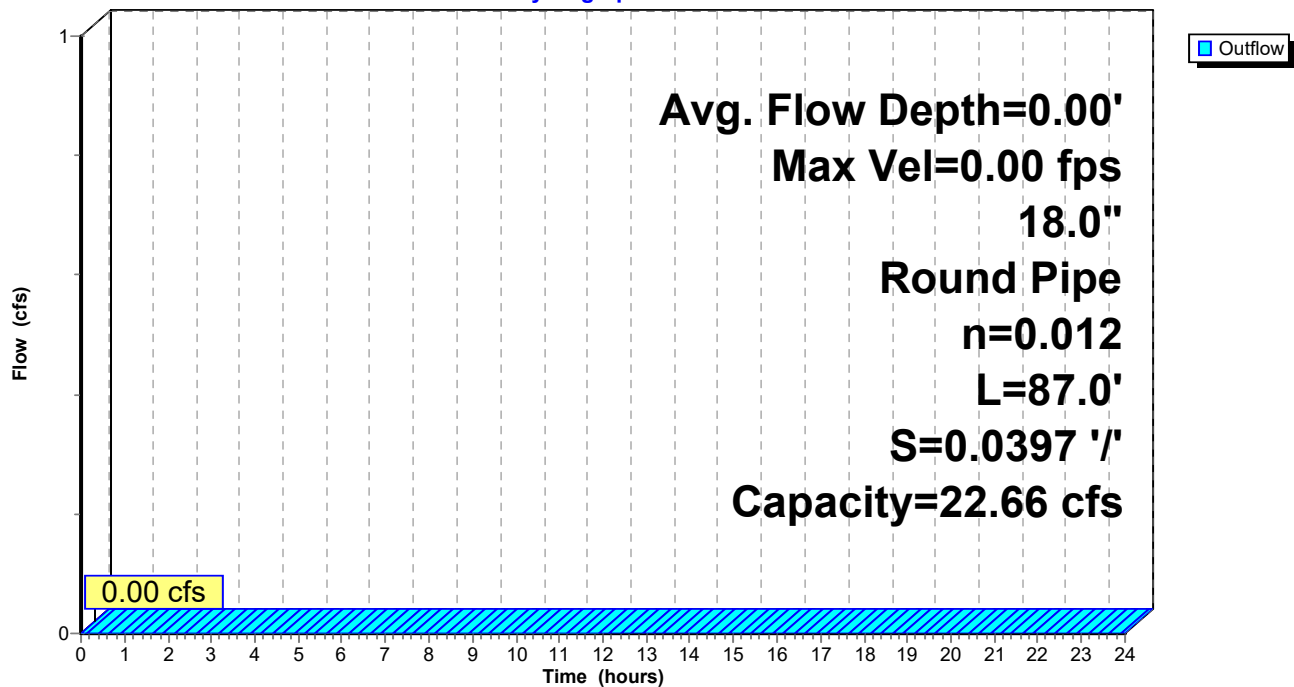
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 3R: 18" PIPE

Hydrograph



COMET PRE DEVELOPMENT

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Type III 24-hr 1 YEAR Rainfall=2.33"

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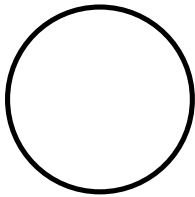
Summary for Reach 4R: 18"pipe

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.00" for 1 YEAR event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 6 cf
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 6 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 1R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.14 fps, Min. Travel Time= 1.3 min
Avg. Velocity= 1.14 fps, Avg. Travel Time= 1.3 min

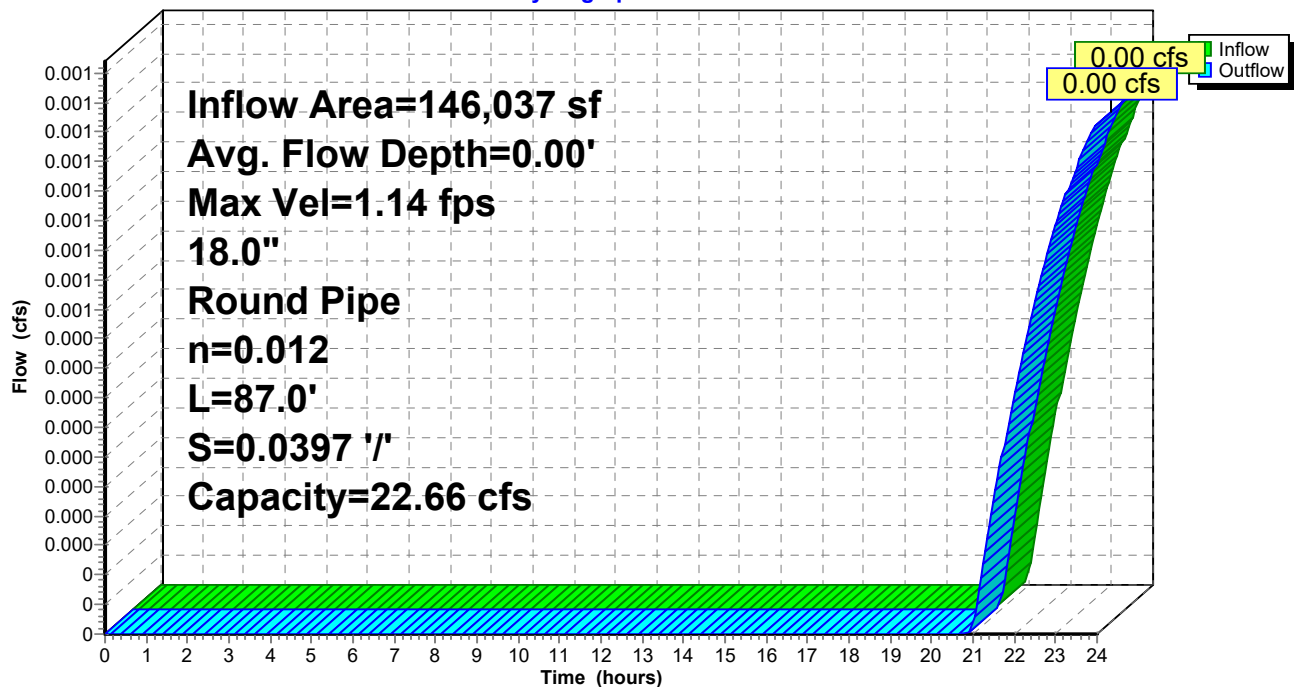
Peak Storage= 0 cf @ 24.00 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 0.15'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/'
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 4R: 18"pipe

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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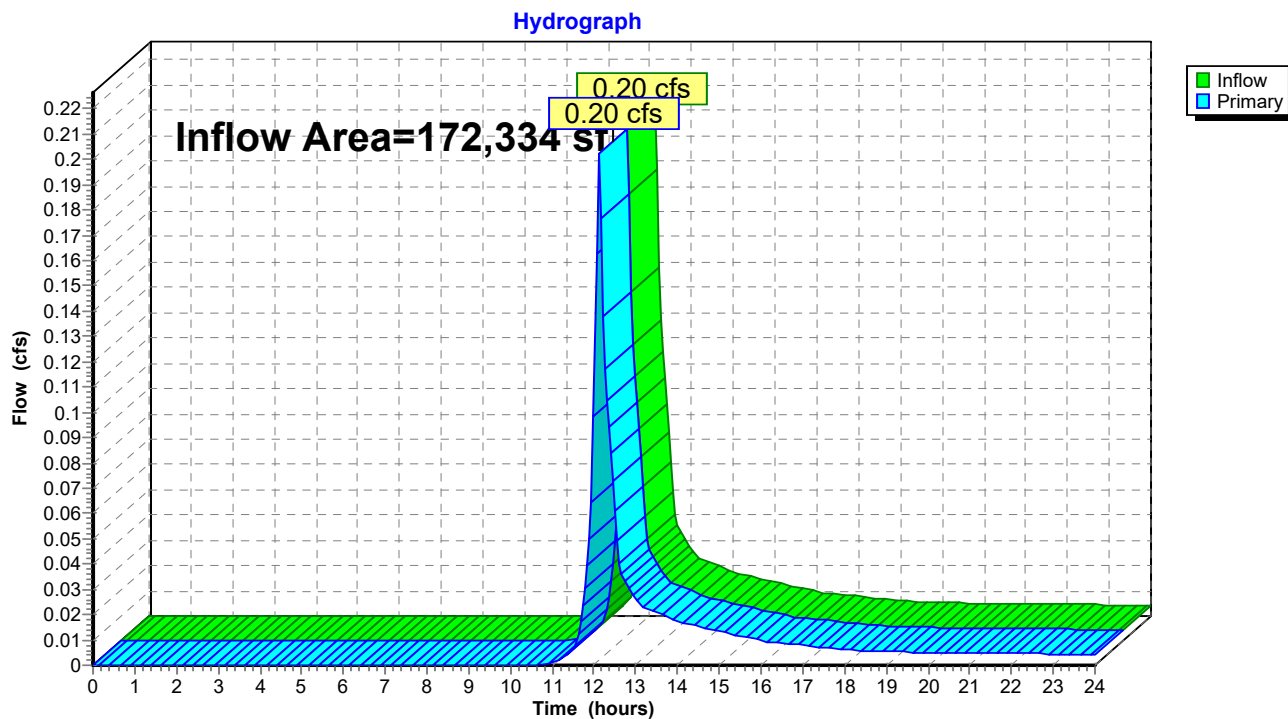
Page 18

Summary for Pond 1P: DESIGN POINT 1

Inflow Area = 172,334 sf, 23.09% Impervious, Inflow Depth > 0.05" for 1 YEAR event
Inflow = 0.20 cfs @ 12.11 hrs, Volume= 680 cf
Primary = 0.20 cfs @ 12.11 hrs, Volume= 680 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: DESIGN POINT 1



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Type III 24-hr 1 YEAR Rainfall=2.33"

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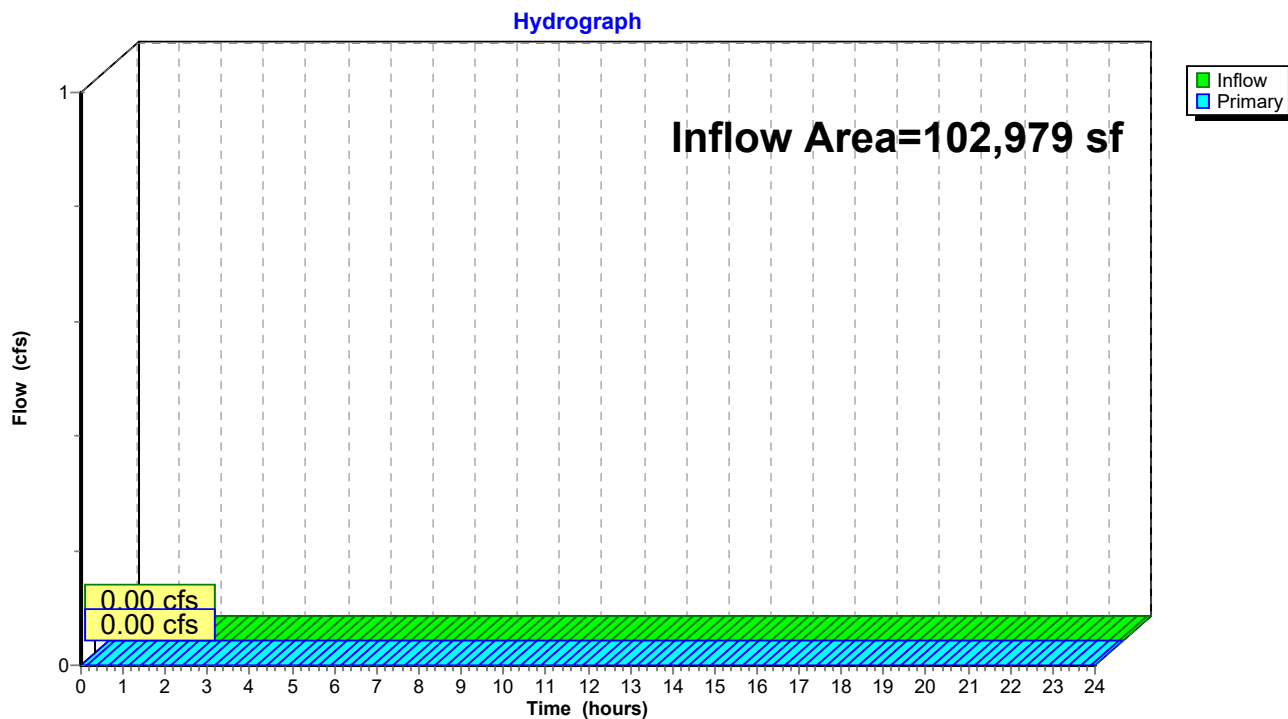
Page 19

Summary for Pond DP2: DESIGN POINT 2

Inflow Area = 102,979 sf, 8.77% Impervious, Inflow Depth = 0.00" for 1 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: DESIGN POINT 2



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E1: E-1Runoff Area=15,122 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=170' Tc=7.5 min CN=43 Runoff=0.00 cfs 1 cf**Subcatchment E2: E-2**Runoff Area=102,979 sf 8.77% Impervious Runoff Depth>0.01"
Flow Length=377' Tc=6.0 min CN=45 Runoff=0.00 cfs 67 cf**Subcatchment E3: E-3**Runoff Area=11,175 sf 67.36% Impervious Runoff Depth>1.02"
Flow Length=303' Tc=6.0 min CN=79 Runoff=0.29 cfs 945 cf**Subcatchment E4: OFF SITE**Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.02"
Flow Length=729' Tc=6.0 min CN=47 Runoff=0.01 cfs 261 cf**Reach 1R: 12" PIPE**Avg. Flow Depth=0.17' Max Vel=3.35 fps Inflow=0.29 cfs 1,206 cf
12.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=4.75 cfs Outflow=0.29 cfs 1,206 cf**Reach 2R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 3R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 4R: 18" pipe**Avg. Flow Depth=0.02' Max Vel=1.60 fps Inflow=0.01 cfs 261 cf
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.01 cfs 261 cf**Pond 1P: DESIGN POINT 1**Inflow=0.29 cfs 1,207 cf
Primary=0.29 cfs 1,207 cf**Pond DP2: DESIGN POINT 2**Inflow=0.00 cfs 67 cf
Primary=0.00 cfs 67 cf**Total Runoff Area = 275,313 sf Runoff Volume = 1,275 cf Average Runoff Depth = 0.06"**
82.26% Pervious = 226,486 sf 17.74% Impervious = 48,827 sf

COMET PRE DEVELOPMENT

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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment E1: E-1

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 1 cf, Depth> 0.00"
Routed to Pond 1P : DESIGN POINT 1

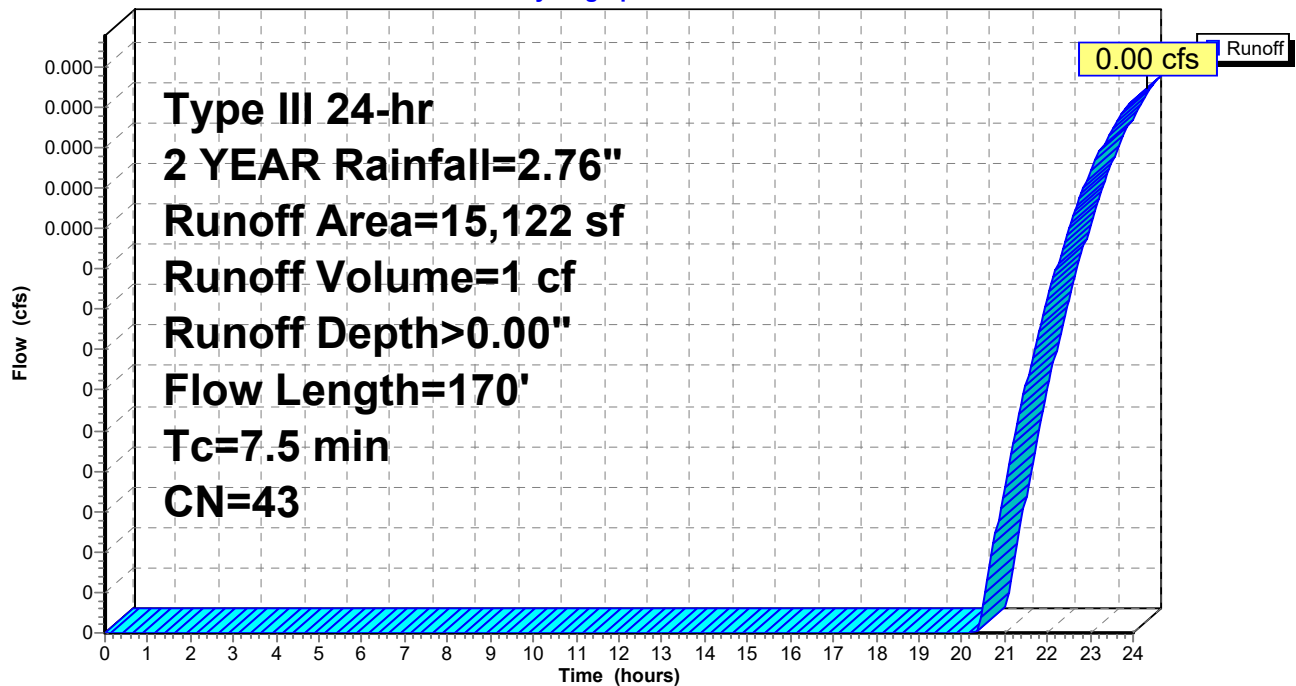
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
11,001	48	Brush, Good, HSG B
4,121	30	Brush, Good, HSG A
15,122	43	Weighted Average
15,122		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.1000	0.18		Sheet Flow, FLOW THROUGH Grass: Dense n= 0.240 P2= 2.76"
2.9	120	0.0100	0.70		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
7.5	170	Total			

Subcatchment E1: E-1

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment E2: E-2

Runoff = 0.00 cfs @ 22.22 hrs, Volume= 67 cf, Depth> 0.01"
 Routed to Pond DP2 : DESIGN POINT 2

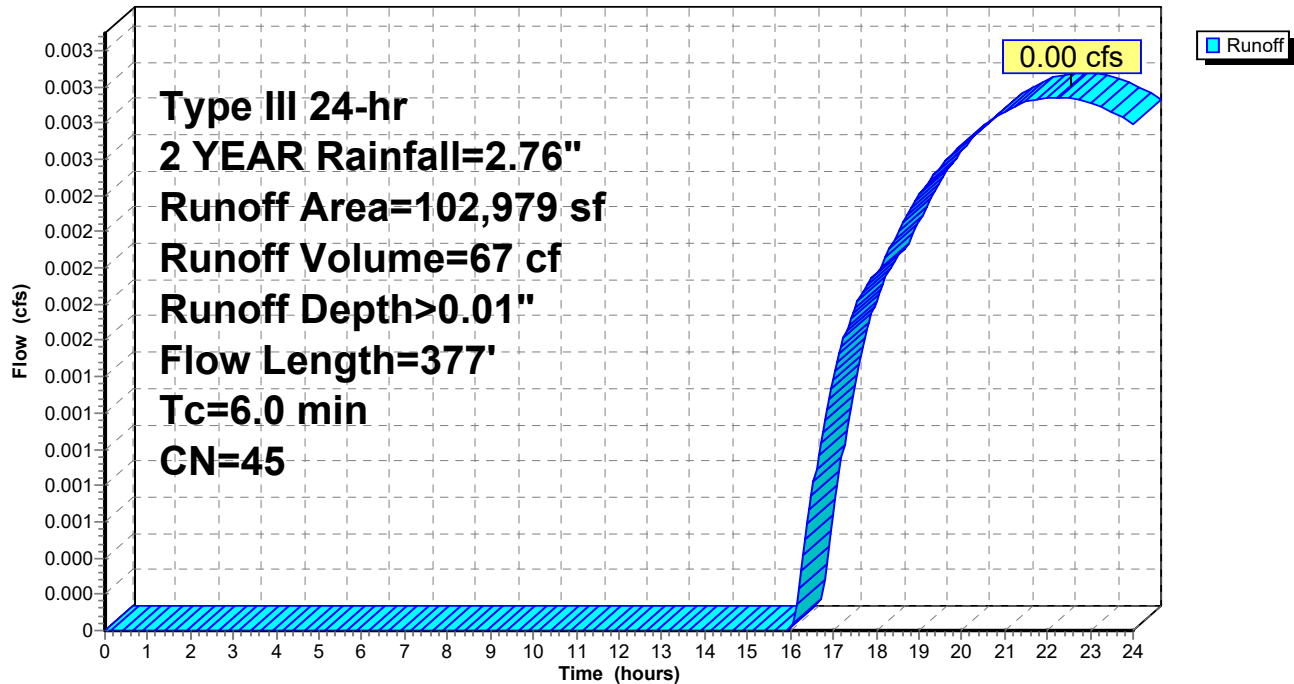
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
43,637	48	Brush, Good, HSG B
47,059	30	Brush, Good, HSG A
3,255	65	Brush, Good, HSG C
* 9,028	98	Paved parking, HSG A and B
102,979	45	Weighted Average
93,951		91.23% Pervious Area
9,028		8.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOWON PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.6	73	0.0800	1.98		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
0.8	167	0.2300	3.36		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
1.4	87	0.0220	1.04		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
2.8					Direct Entry,
6.0	377	Total			

Subcatchment E2: E-2

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment E3: E-3

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 945 cf, Depth> 1.02"
 Routed to Reach 1R : 12" PIPE

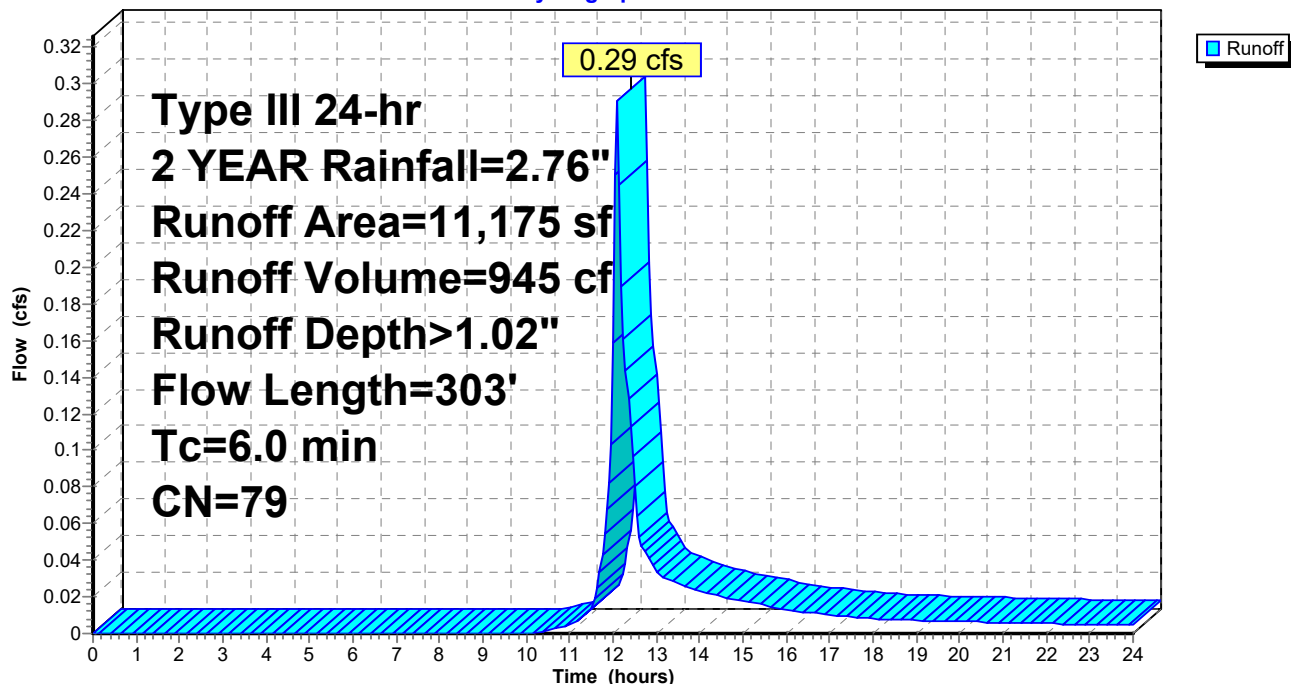
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 7,527	98	Paved parking, HSG A and B
11,175	79	Weighted Average
3,648		32.64% Pervious Area
7,527		67.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment E3: E-3

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment E4: OFF SITE

Runoff = 0.01 cfs @ 16.98 hrs, Volume= 261 cf, Depth> 0.02"
Routed to Reach 4R : 18"pipe

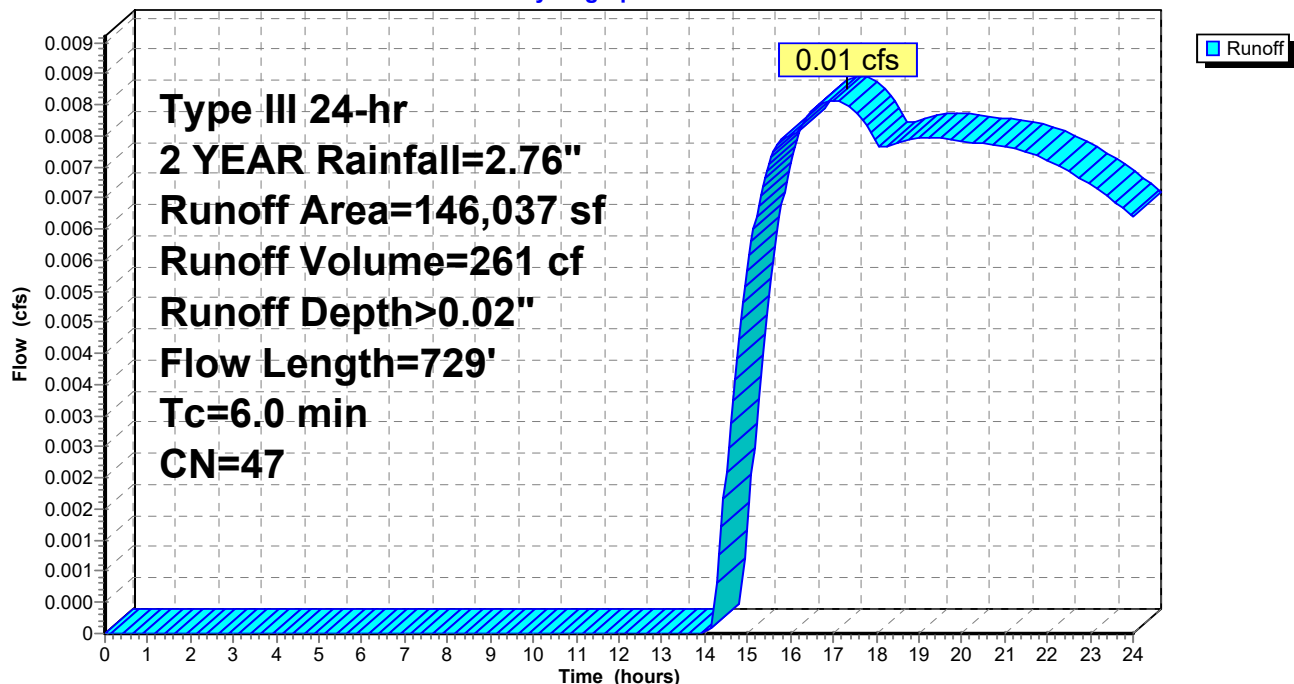
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
* 32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.84		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment E4: OFF SITE

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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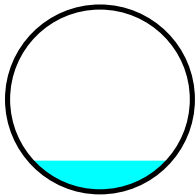
Summary for Reach 1R: 12" PIPE

Inflow Area = 157,212 sf, 25.32% Impervious, Inflow Depth > 0.09" for 2 YEAR event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 1,206 cf
Outflow = 0.29 cfs @ 12.10 hrs, Volume= 1,206 cf, Atten= 0%, Lag= 0.2 min
Routed to Pond 1P : DESIGN POINT 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.35 fps, Min. Travel Time= 0.3 min
Avg. Velocity= 1.46 fps, Avg. Travel Time= 0.8 min

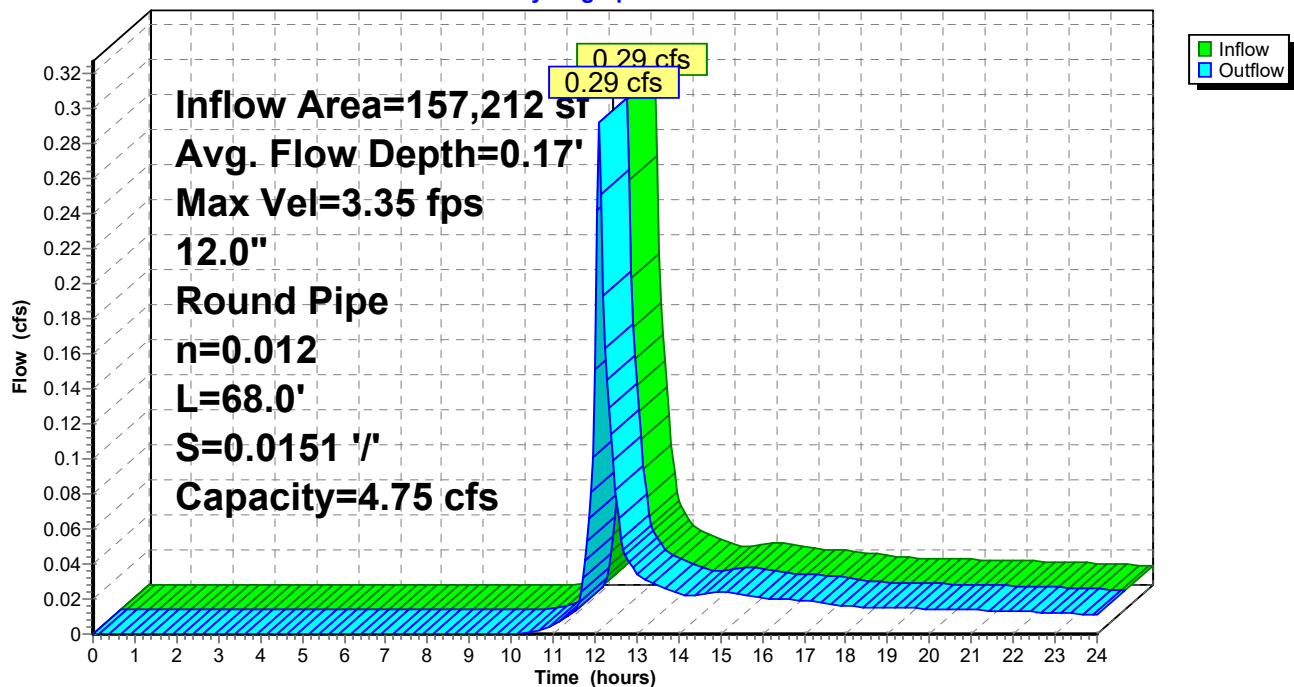
Peak Storage= 6 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 0.75'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.75 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 1R: 12" PIPE

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Reach 2R: 18" PIPE

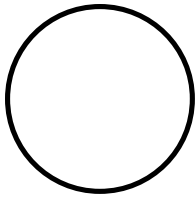
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

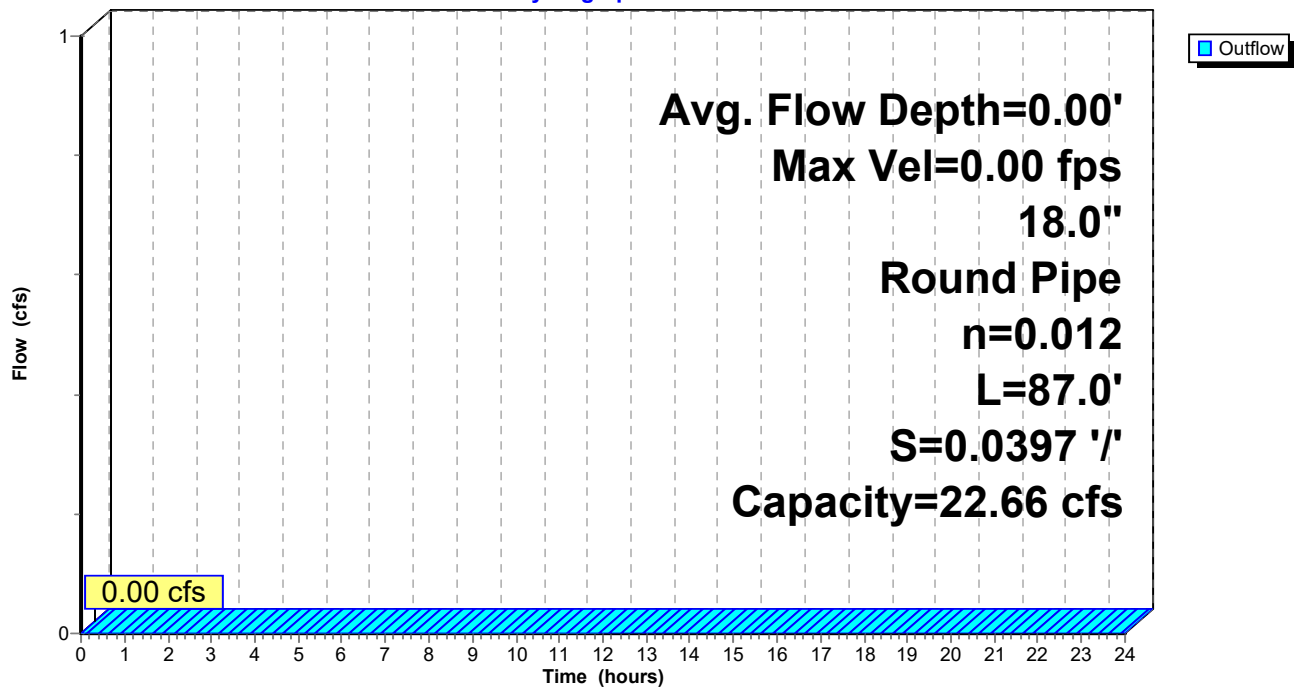
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 2R: 18" PIPE

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Reach 3R: 18" PIPE

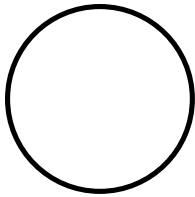
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

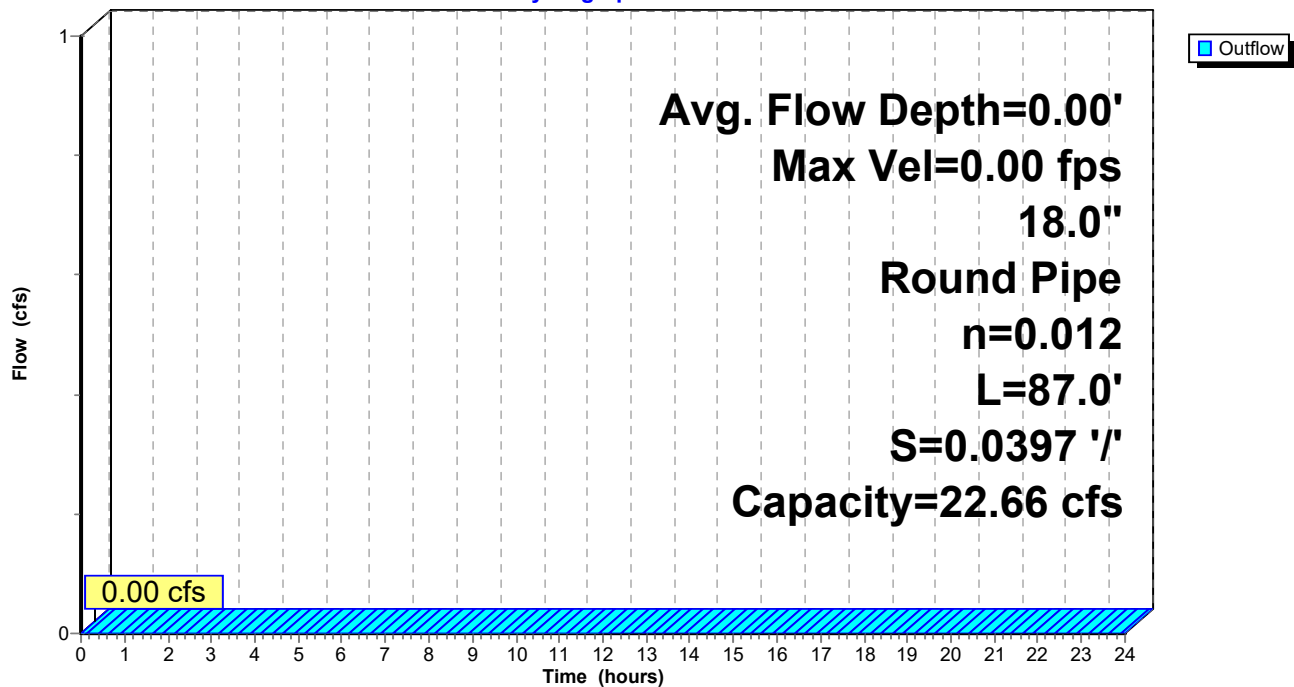
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 3R: 18" PIPE

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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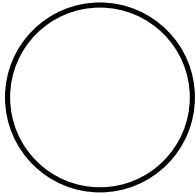
Summary for Reach 4R: 18"pipe

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.02" for 2 YEAR event
Inflow = 0.01 cfs @ 16.98 hrs, Volume= 261 cf
Outflow = 0.01 cfs @ 16.99 hrs, Volume= 261 cf, Atten= 0%, Lag= 0.6 min
Routed to Reach 1R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.60 fps, Min. Travel Time= 0.9 min
Avg. Velocity= 1.53 fps, Avg. Travel Time= 0.9 min

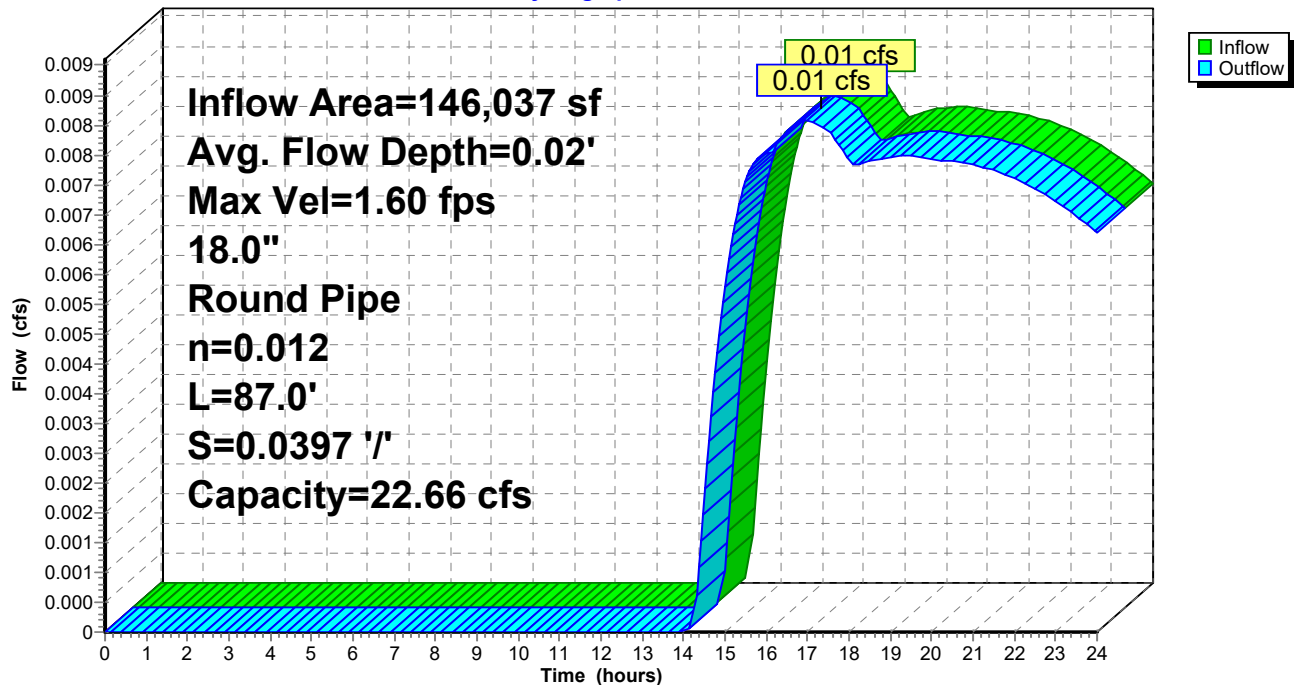
Peak Storage= 0 cf @ 16.99 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 0.36'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/'
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 4R: 18"pipe

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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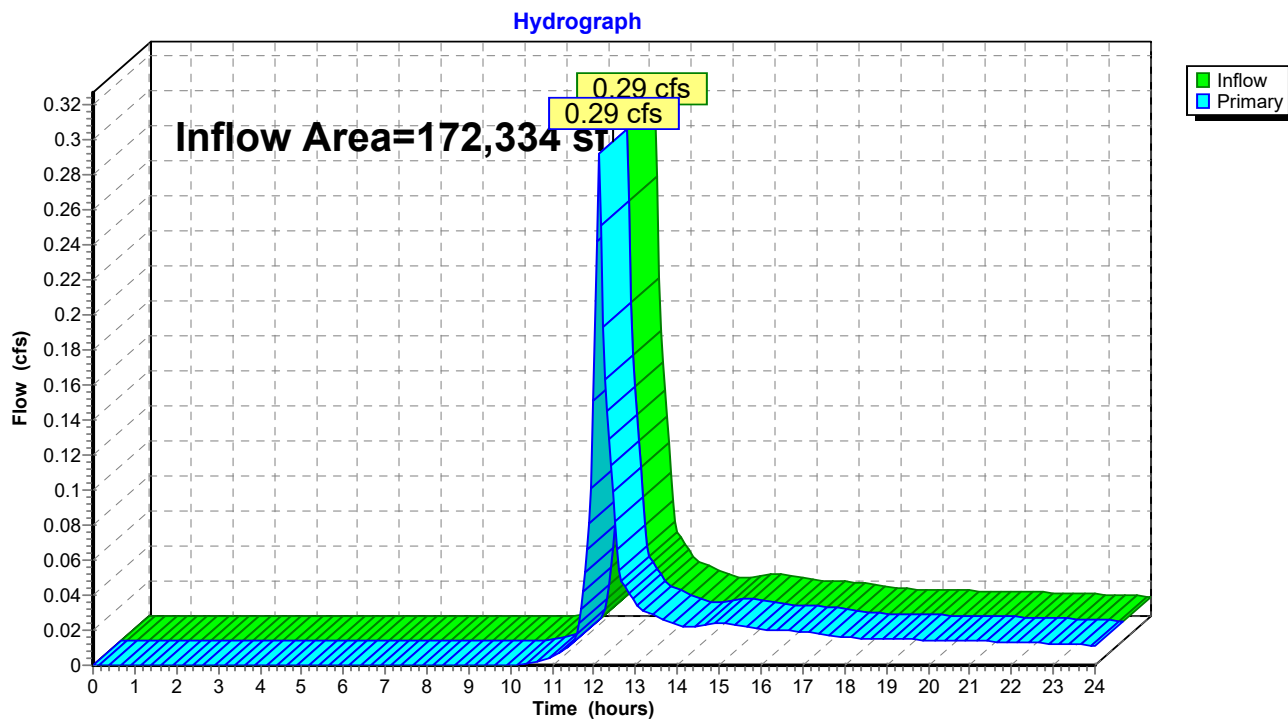
Page 30

Summary for Pond 1P: DESIGN POINT 1

Inflow Area = 172,334 sf, 23.09% Impervious, Inflow Depth > 0.08" for 2 YEAR event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 1,207 cf
Primary = 0.29 cfs @ 12.10 hrs, Volume= 1,207 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: DESIGN POINT 1



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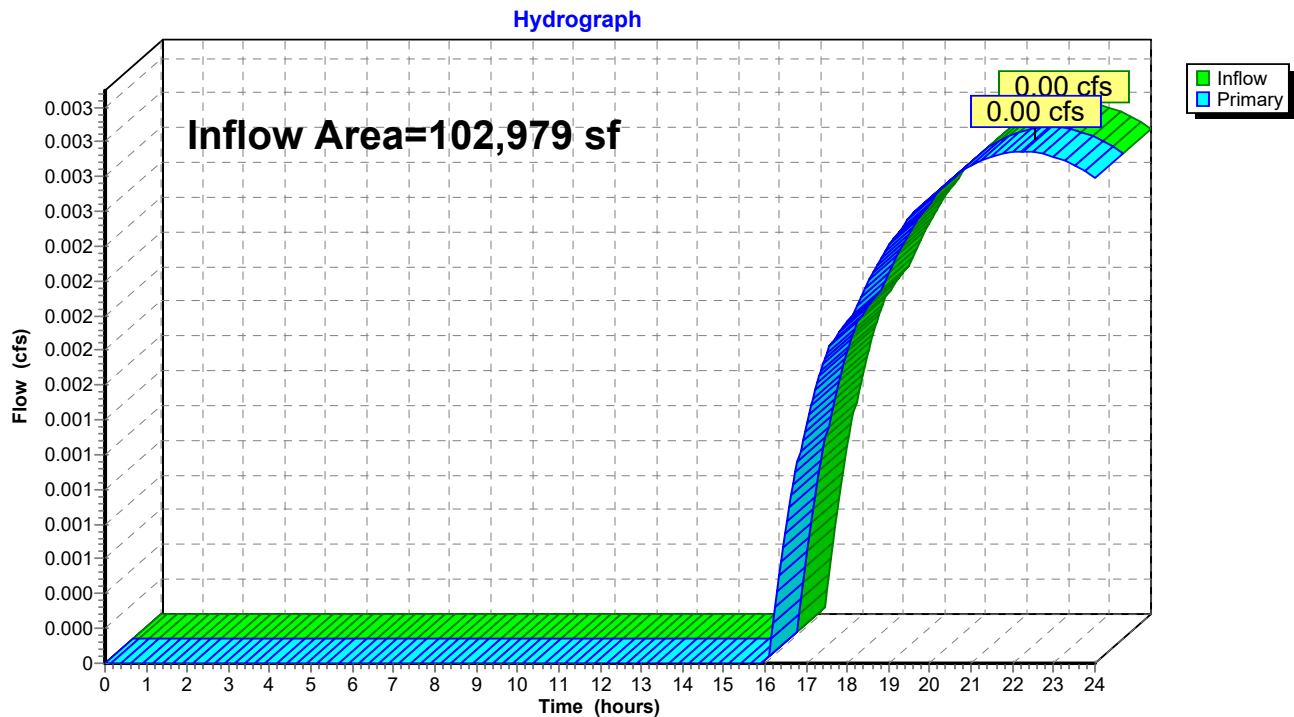
Page 31

Summary for Pond DP2: DESIGN POINT 2

Inflow Area = 102,979 sf, 8.77% Impervious, Inflow Depth > 0.01" for 2 YEAR event
Inflow = 0.00 cfs @ 22.22 hrs, Volume= 67 cf
Primary = 0.00 cfs @ 22.22 hrs, Volume= 67 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: DESIGN POINT 2



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E1: E-1Runoff Area=15,122 sf 0.00% Impervious Runoff Depth>0.13"
Flow Length=170' Tc=7.5 min CN=43 Runoff=0.01 cfs 159 cf**Subcatchment E2: E-2**Runoff Area=102,979 sf 8.77% Impervious Runoff Depth>0.18"
Flow Length=377' Tc=6.0 min CN=45 Runoff=0.09 cfs 1,521 cf**Subcatchment E3: E-3**Runoff Area=11,175 sf 67.36% Impervious Runoff Depth>1.97"
Flow Length=303' Tc=6.0 min CN=79 Runoff=0.58 cfs 1,834 cf**Subcatchment E4: OFF SITE**Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.24"
Flow Length=729' Tc=6.0 min CN=47 Runoff=0.26 cfs 2,868 cf**Reach 1R: 12" PIPE**Avg. Flow Depth=0.24' Max Vel=4.11 fps Inflow=0.58 cfs 4,701 cf
12.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=4.75 cfs Outflow=0.58 cfs 4,700 cf**Reach 2R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 3R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 4R: 18" pipe**Avg. Flow Depth=0.11' Max Vel=4.29 fps Inflow=0.26 cfs 2,868 cf
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.26 cfs 2,867 cf**Pond 1P: DESIGN POINT 1**Inflow=0.58 cfs 4,859 cf
Primary=0.58 cfs 4,859 cf**Pond DP2: DESIGN POINT 2**Inflow=0.09 cfs 1,521 cf
Primary=0.09 cfs 1,521 cf**Total Runoff Area = 275,313 sf Runoff Volume = 6,382 cf Average Runoff Depth = 0.28"**
82.26% Pervious = 226,486 sf 17.74% Impervious = 48,827 sf

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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment E1: E-1

Runoff = 0.01 cfs @ 13.76 hrs, Volume= 159 cf, Depth> 0.13"
Routed to Pond 1P : DESIGN POINT 1

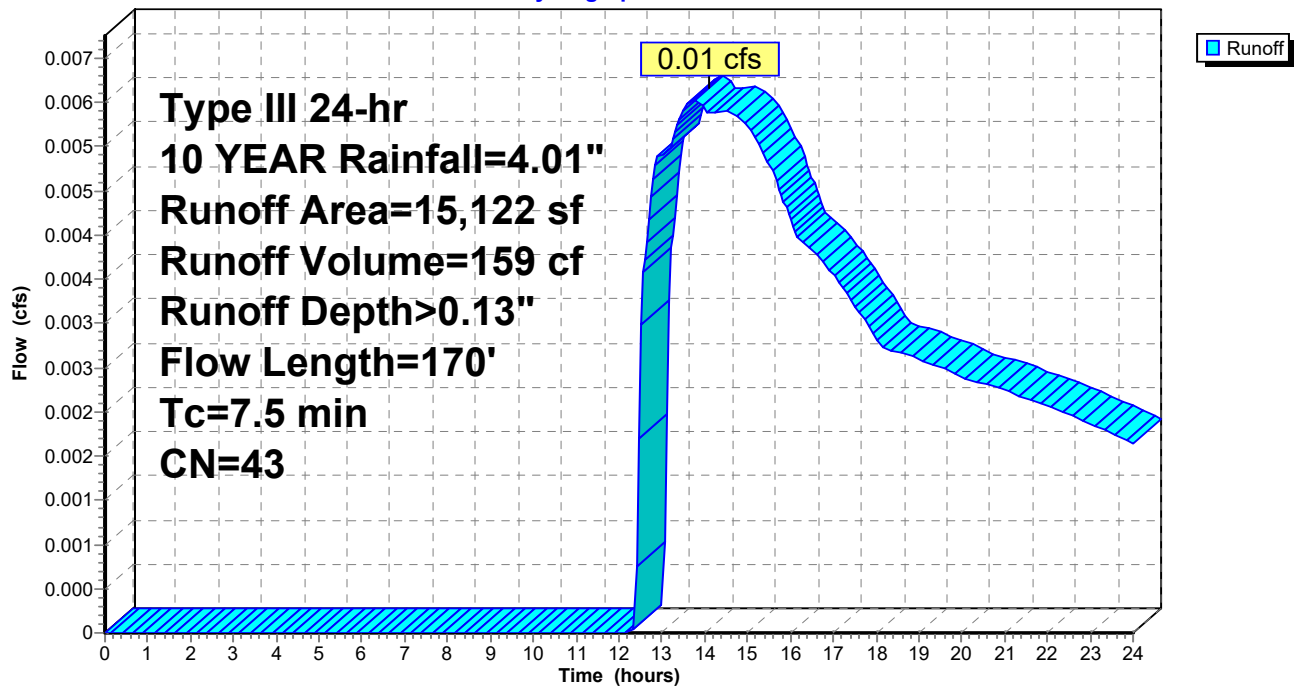
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
11,001	48	Brush, Good, HSG B
4,121	30	Brush, Good, HSG A
15,122	43	Weighted Average
15,122		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.1000	0.18		Sheet Flow, FLOW THROUGH Grass: Dense n= 0.240 P2= 2.76"
2.9	120	0.0100	0.70		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
7.5	170	Total			

Subcatchment E1: E-1

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment E2: E-2

Runoff = 0.09 cfs @ 12.45 hrs, Volume= 1,521 cf, Depth> 0.18"
 Routed to Pond DP2 : DESIGN POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
43,637	48	Brush, Good, HSG B
47,059	30	Brush, Good, HSG A
3,255	65	Brush, Good, HSG C
* 9,028	98	Paved parking, HSG A and B
102,979	45	Weighted Average
93,951		91.23% Pervious Area
9,028		8.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOWON PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.6	73	0.0800	1.98		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
0.8	167	0.2300	3.36		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
1.4	87	0.0220	1.04		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
2.8					Direct Entry,
6.0	377	Total			

COMET PRE DEVELOPMENT

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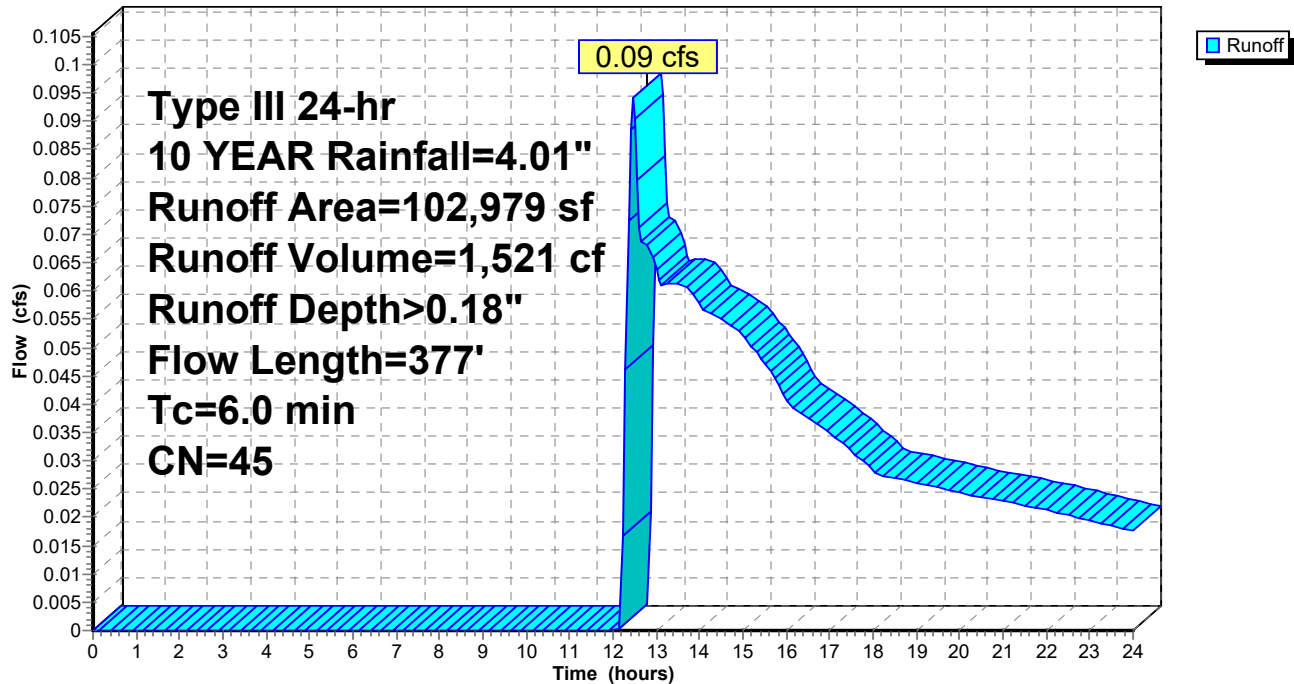
Type III 24-hr 10 YEAR Rainfall=4.01"

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Subcatchment E2: E-2

Hydrograph



COMET PRE DEVELOPMENT

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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment E3: E-3

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 1,834 cf, Depth> 1.97"
 Routed to Reach 1R : 12" PIPE

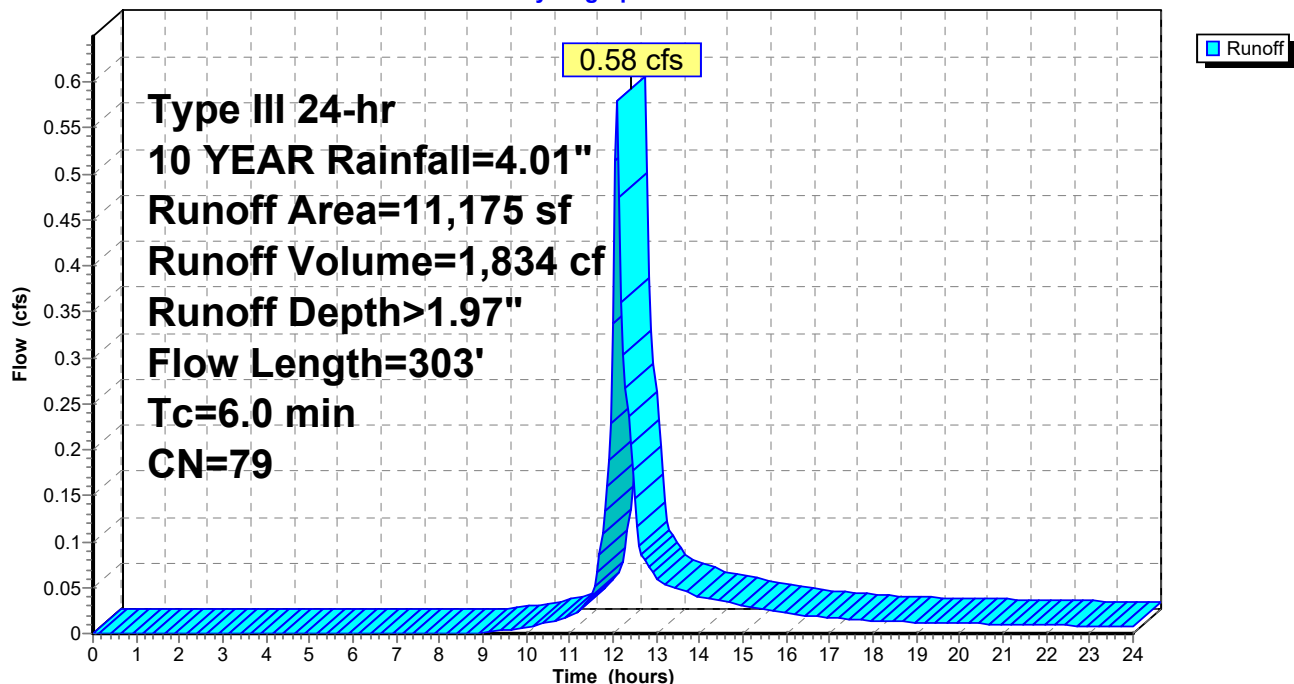
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 7,527	98	Paved parking, HSG A and B
11,175	79	Weighted Average
3,648		32.64% Pervious Area
7,527		67.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment E3: E-3

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment E4: OFF SITE

Runoff = 0.26 cfs @ 12.39 hrs, Volume= 2,868 cf, Depth> 0.24"
 Routed to Reach 4R : 18"pipe

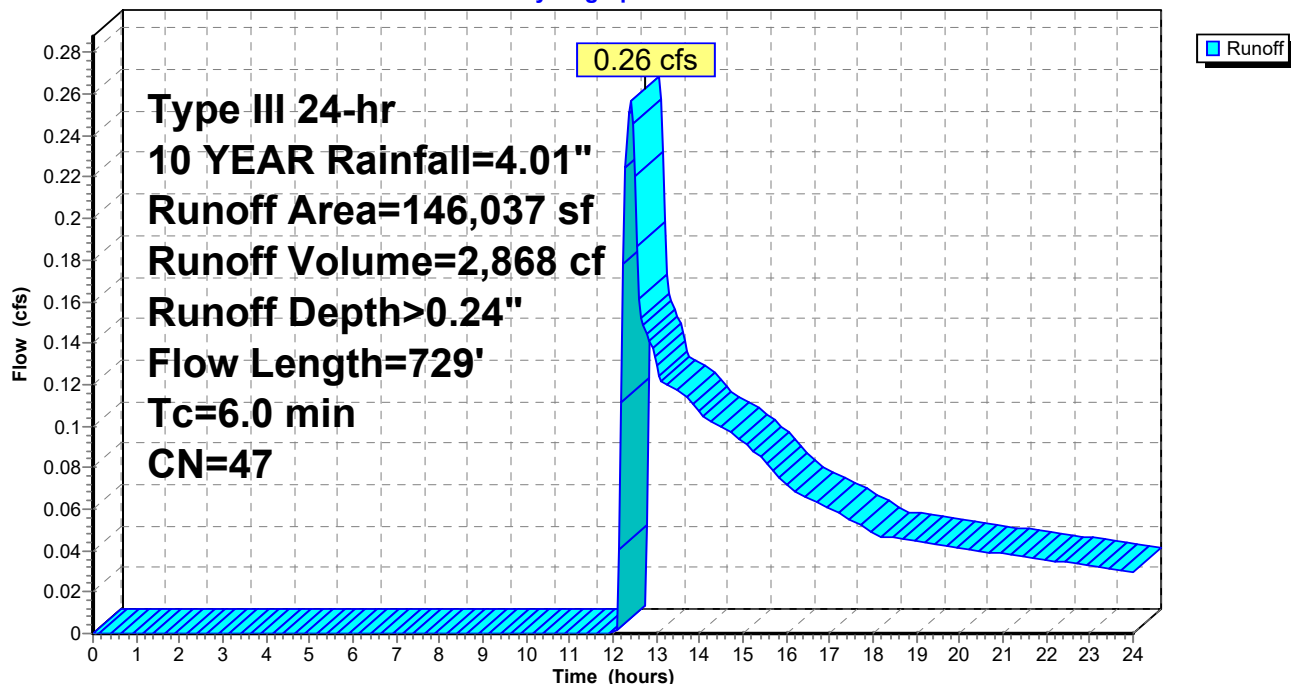
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
* 32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.84		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment E4: OFF SITE

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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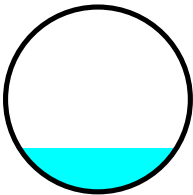
Summary for Reach 1R: 12" PIPE

Inflow Area = 157,212 sf, 25.32% Impervious, Inflow Depth > 0.36" for 10 YEAR event
Inflow = 0.58 cfs @ 12.10 hrs, Volume= 4,701 cf
Outflow = 0.58 cfs @ 12.10 hrs, Volume= 4,700 cf, Atten= 0%, Lag= 0.2 min
Routed to Pond 1P : DESIGN POINT 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.11 fps, Min. Travel Time= 0.3 min
Avg. Velocity= 2.10 fps, Avg. Travel Time= 0.5 min

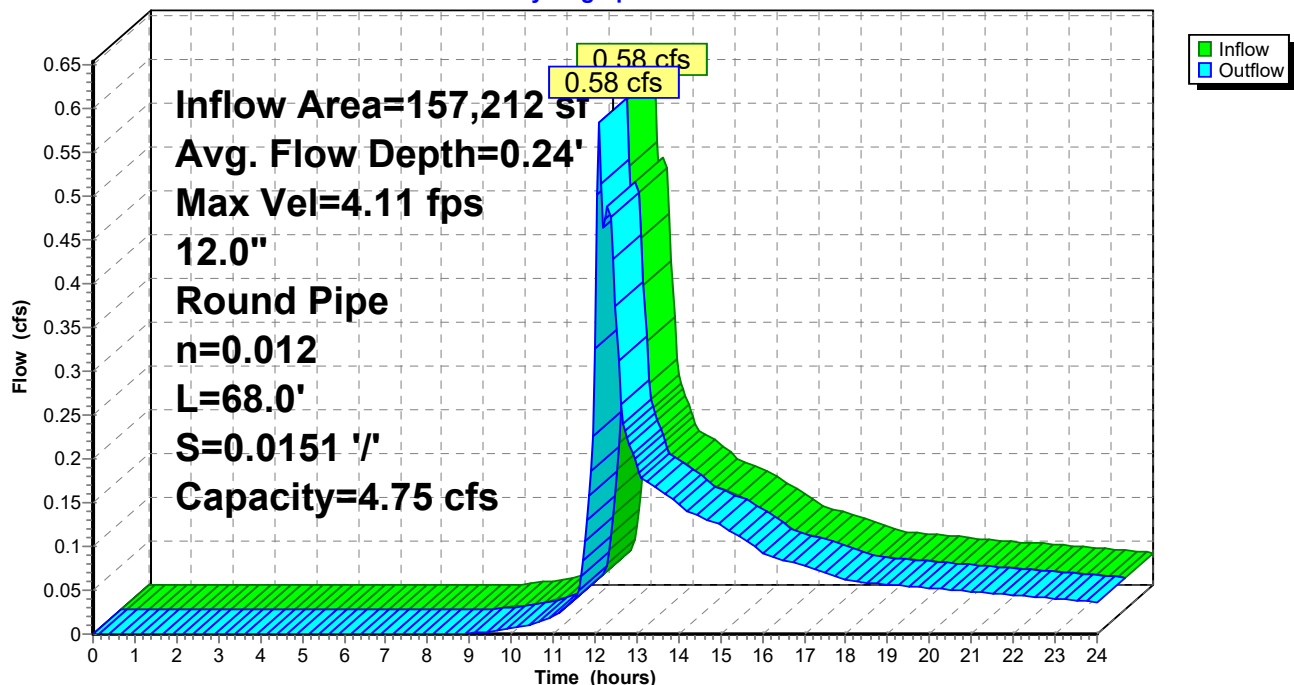
Peak Storage= 10 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 0.85'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.75 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 1R: 12" PIPE

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Reach 2R: 18" PIPE

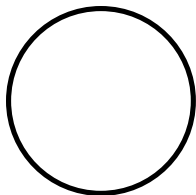
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

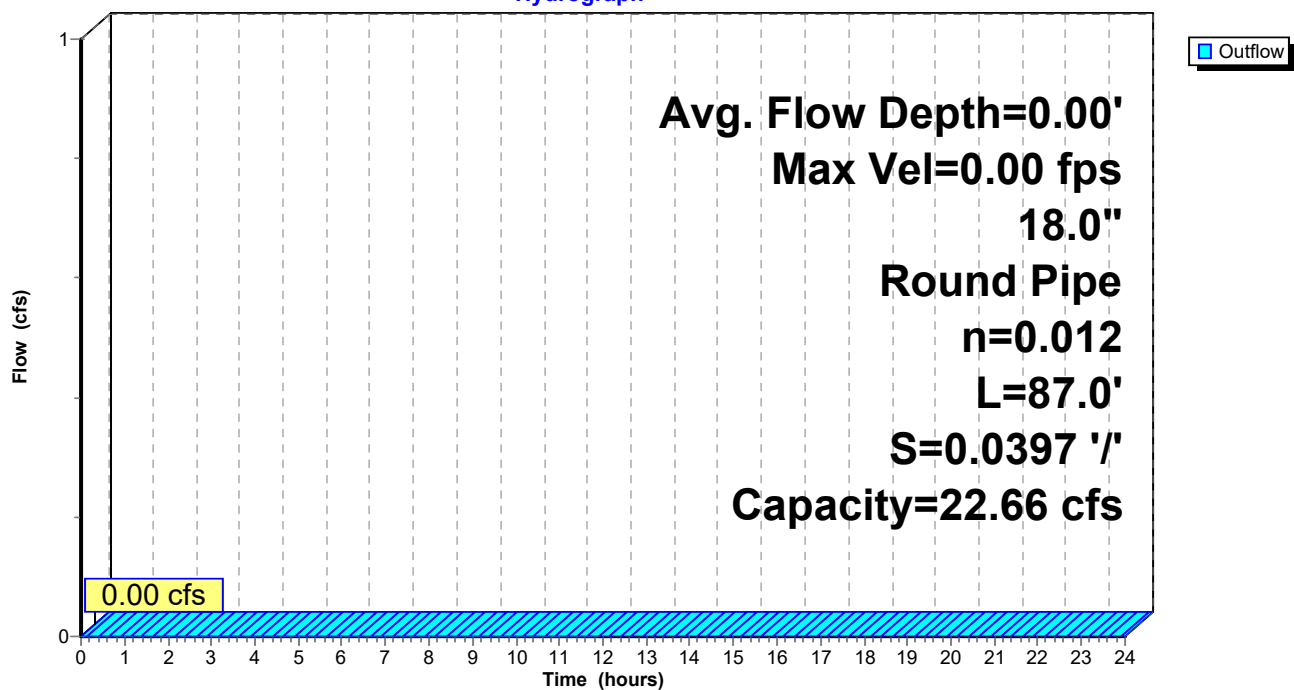
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 2R: 18" PIPE

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Reach 3R: 18" PIPE

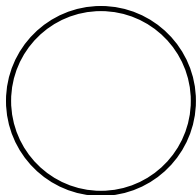
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

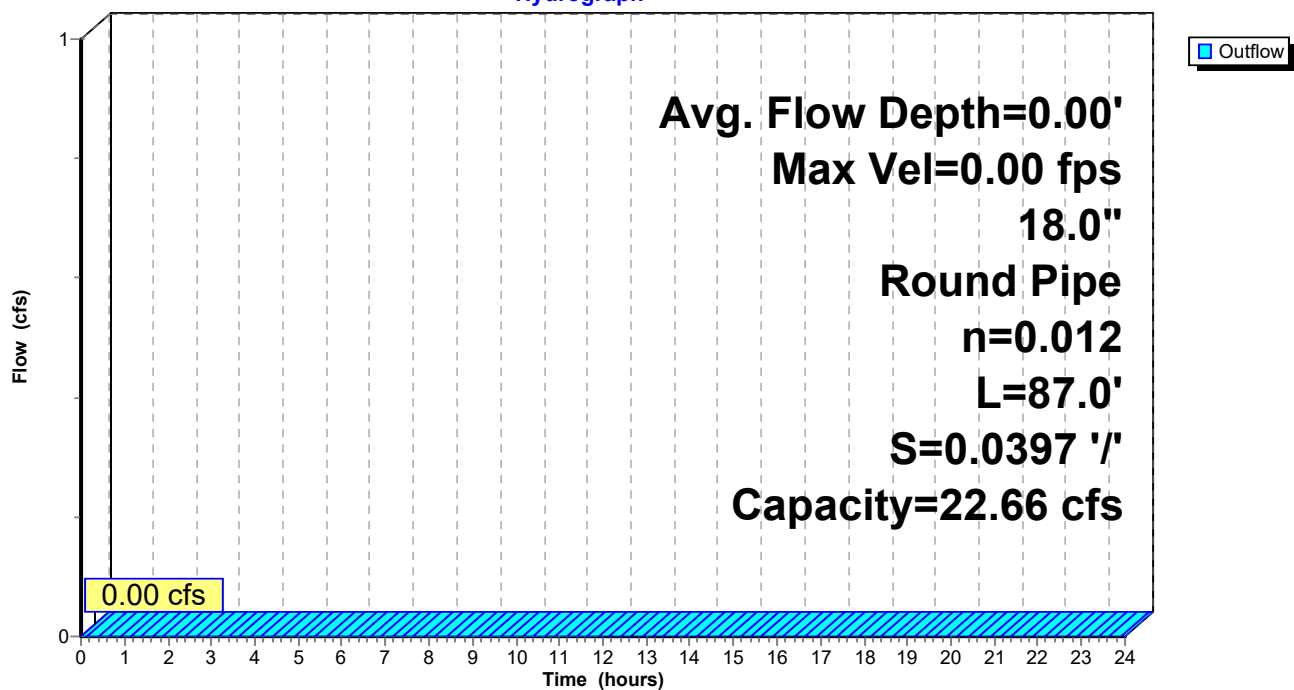
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 3R: 18" PIPE

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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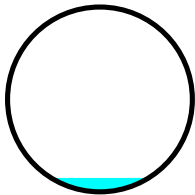
Summary for Reach 4R: 18"pipe

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.24" for 10 YEAR event
Inflow = 0.26 cfs @ 12.39 hrs, Volume= 2,868 cf
Outflow = 0.26 cfs @ 12.40 hrs, Volume= 2,867 cf, Atten= 0%, Lag= 0.2 min
Routed to Reach 1R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.29 fps, Min. Travel Time= 0.3 min
Avg. Velocity= 2.76 fps, Avg. Travel Time= 0.5 min

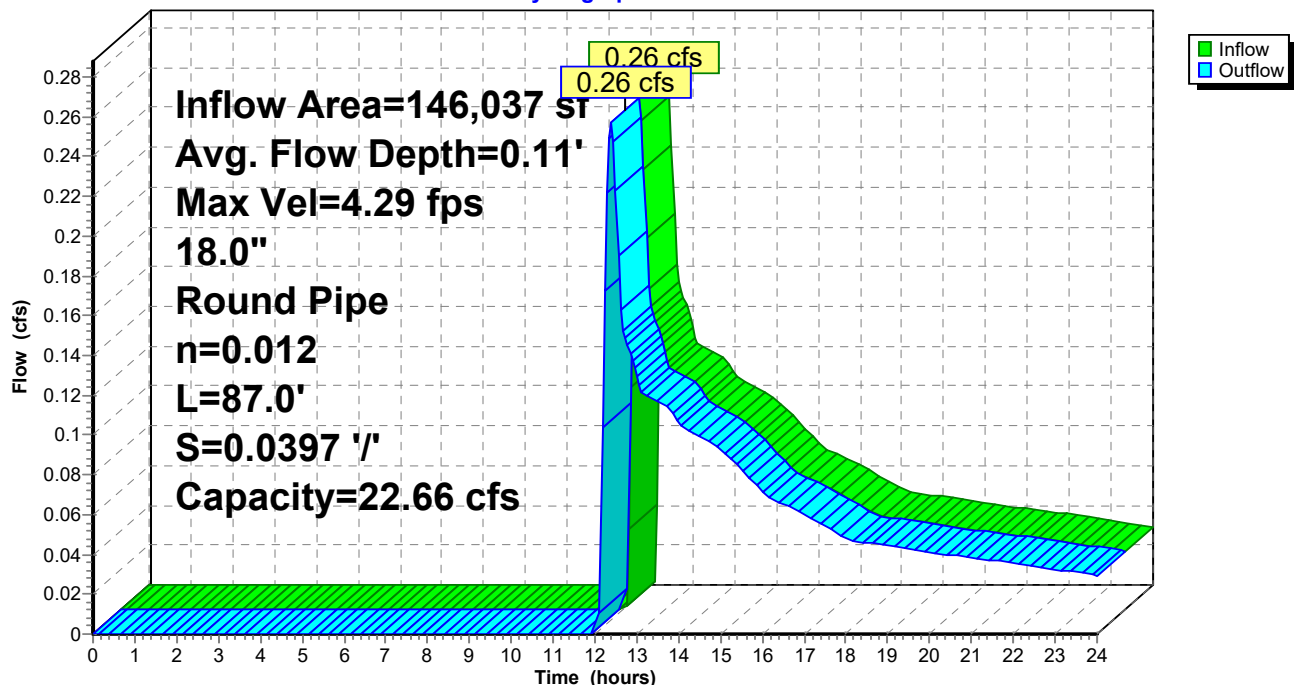
Peak Storage= 5 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 0.79'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 4R: 18"pipe

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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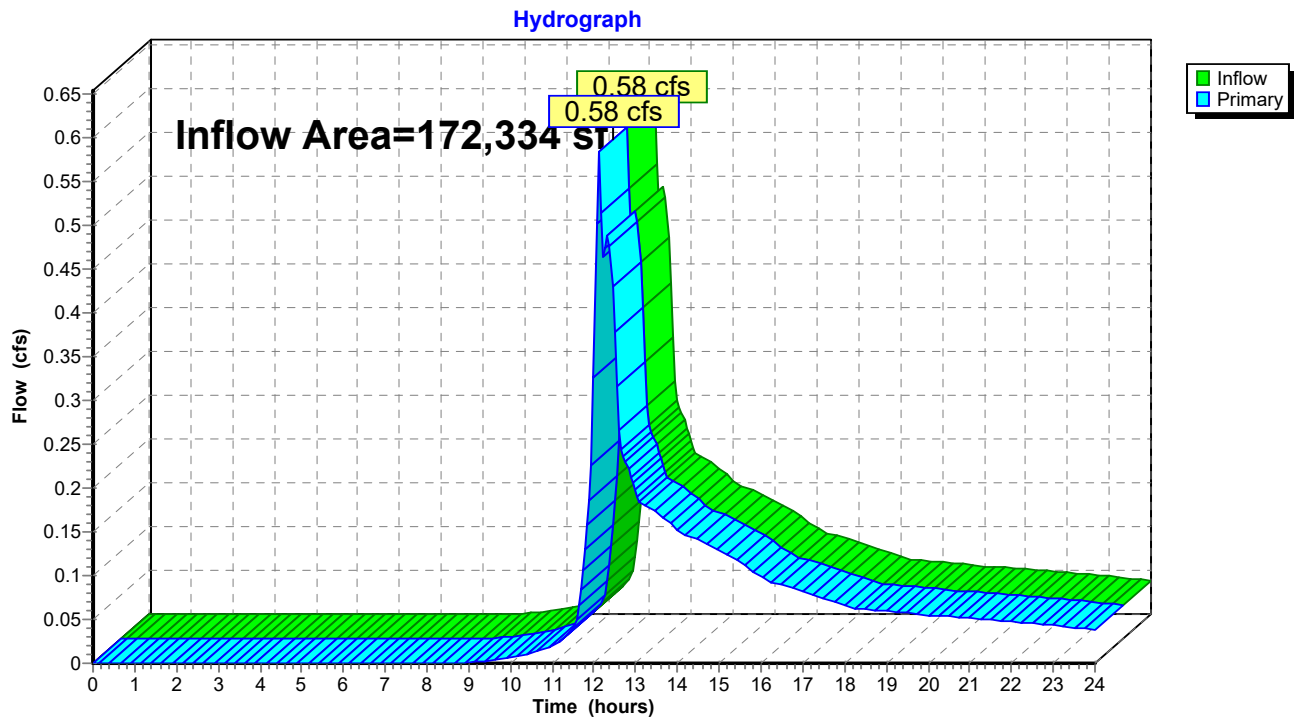
Page 42

Summary for Pond 1P: DESIGN POINT 1

Inflow Area = 172,334 sf, 23.09% Impervious, Inflow Depth > 0.34" for 10 YEAR event
Inflow = 0.58 cfs @ 12.10 hrs, Volume= 4,859 cf
Primary = 0.58 cfs @ 12.10 hrs, Volume= 4,859 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: DESIGN POINT 1



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Type III 24-hr 10 YEAR Rainfall=4.01"

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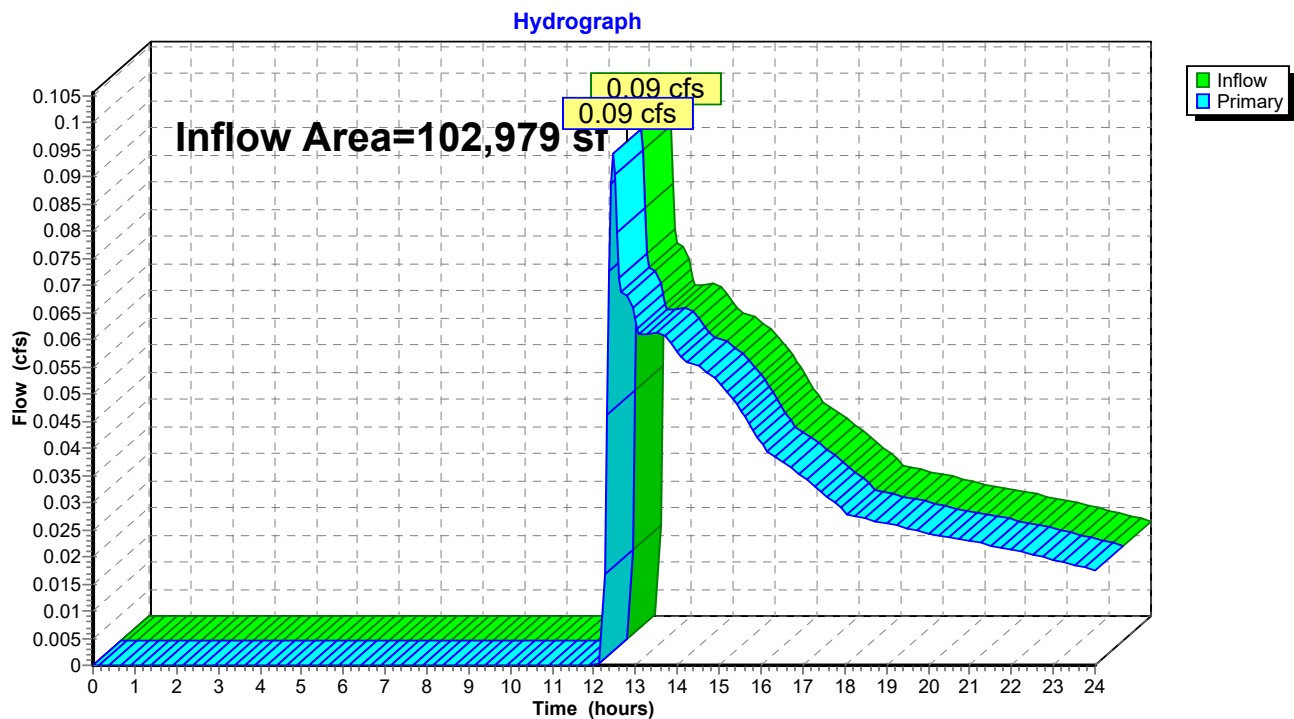
Page 43

Summary for Pond DP2: DESIGN POINT 2

Inflow Area = 102,979 sf, 8.77% Impervious, Inflow Depth > 0.18" for 10 YEAR event
Inflow = 0.09 cfs @ 12.45 hrs, Volume= 1,521 cf
Primary = 0.09 cfs @ 12.45 hrs, Volume= 1,521 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: DESIGN POINT 2



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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E1: E-1Runoff Area=15,122 sf 0.00% Impervious Runoff Depth>0.62"
Flow Length=170' Tc=7.5 min CN=43 Runoff=0.11 cfs 786 cf**Subcatchment E2: E-2**Runoff Area=102,979 sf 8.77% Impervious Runoff Depth>0.74"
Flow Length=377' Tc=6.0 min CN=45 Runoff=1.15 cfs 6,391 cf**Subcatchment E3: E-3**Runoff Area=11,175 sf 67.36% Impervious Runoff Depth>3.55"
Flow Length=303' Tc=6.0 min CN=79 Runoff=1.05 cfs 3,308 cf**Subcatchment E4: OFF SITE**Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.87"
Flow Length=729' Tc=6.0 min CN=47 Runoff=2.26 cfs 10,609 cf**Reach 1R: 12" PIPE**Avg. Flow Depth=0.61' Max Vel=6.49 fps Inflow=3.26 cfs 13,914 cf
12.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=4.75 cfs Outflow=3.26 cfs 13,912 cf**Reach 2R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 3R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=0.00 fps
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 0 cf**Reach 4R: 18" pipe**Avg. Flow Depth=0.32' Max Vel=8.10 fps Inflow=2.26 cfs 10,609 cf
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=2.27 cfs 10,606 cf**Pond 1P: DESIGN POINT 1**Inflow=3.35 cfs 14,698 cf
Primary=3.35 cfs 14,698 cf**Pond DP2: DESIGN POINT 2**Inflow=1.15 cfs 6,391 cf
Primary=1.15 cfs 6,391 cf**Total Runoff Area = 275,313 sf Runoff Volume = 21,093 cf Average Runoff Depth = 0.92"**
82.26% Pervious = 226,486 sf 17.74% Impervious = 48,827 sf

COMET PRE DEVELOPMENT

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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment E1: E-1

Runoff = 0.11 cfs @ 12.21 hrs, Volume= 786 cf, Depth> 0.62"
Routed to Pond 1P : DESIGN POINT 1

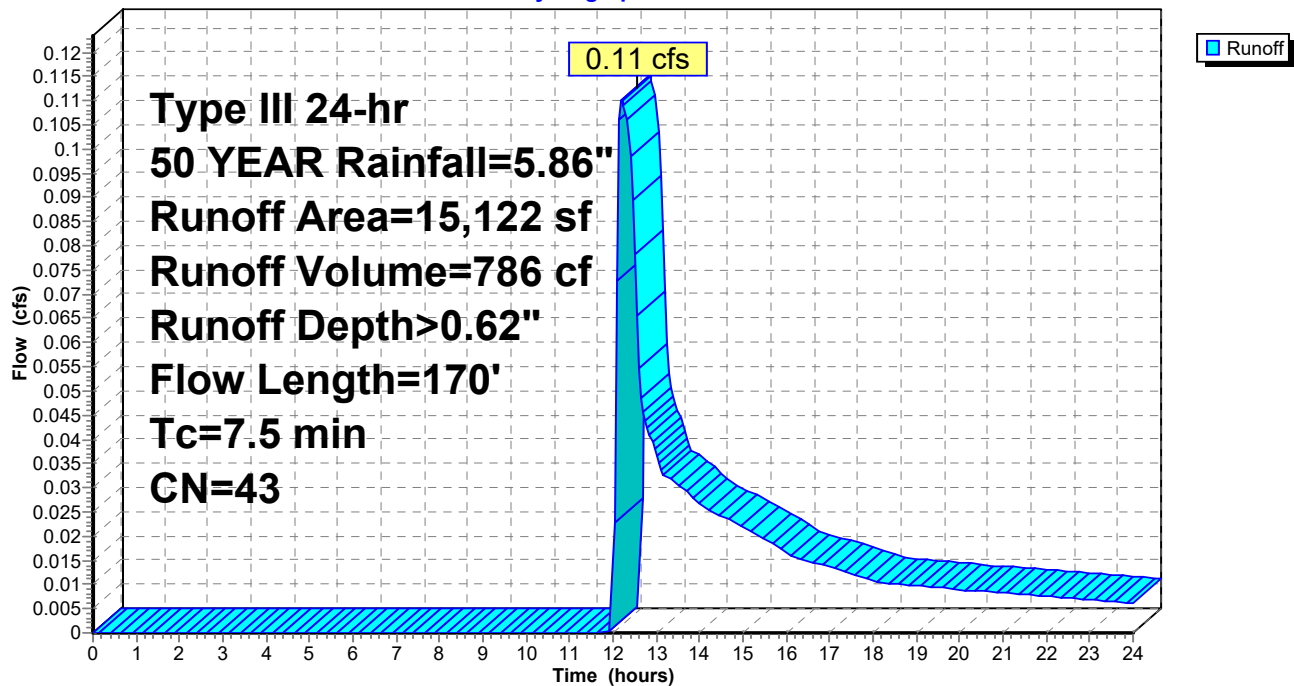
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
11,001	48	Brush, Good, HSG B
4,121	30	Brush, Good, HSG A
15,122	43	Weighted Average
15,122		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.1000	0.18		Sheet Flow, FLOW THROUGH Grass: Dense n= 0.240 P2= 2.76"
2.9	120	0.0100	0.70		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
7.5	170	Total			

Subcatchment E1: E-1

Hydrograph



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment E2: E-2

Runoff = 1.15 cfs @ 12.14 hrs, Volume= 6,391 cf, Depth> 0.74"
 Routed to Pond DP2 : DESIGN POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
43,637	48	Brush, Good, HSG B
47,059	30	Brush, Good, HSG A
3,255	65	Brush, Good, HSG C
* 9,028	98	Paved parking, HSG A and B
102,979	45	Weighted Average
93,951		91.23% Pervious Area
9,028		8.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOWON PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.6	73	0.0800	1.98		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
0.8	167	0.2300	3.36		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
1.4	87	0.0220	1.04		Shallow Concentrated Flow, FLOW THROUGH GRASS Short Grass Pasture Kv= 7.0 fps
2.8					Direct Entry,
6.0	377	Total			

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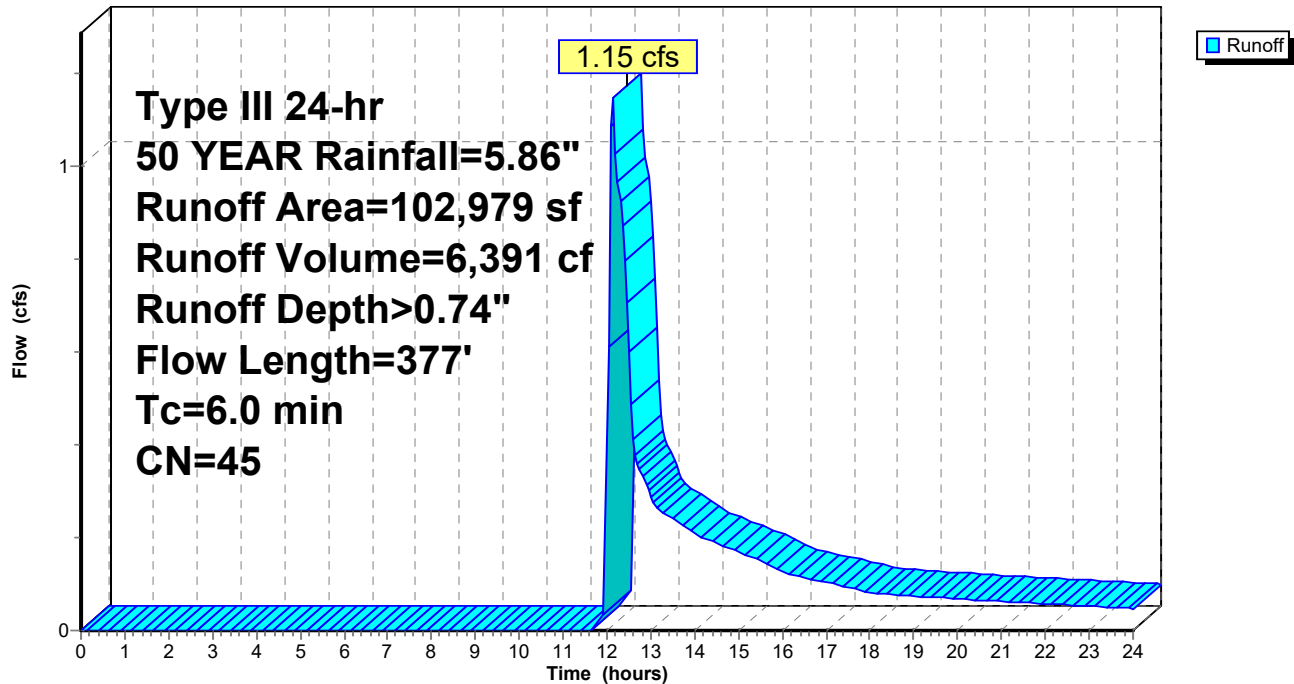
Type III 24-hr 50 YEAR Rainfall=5.86"

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Subcatchment E2: E-2

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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment E3: E-3

Runoff = 1.05 cfs @ 12.09 hrs, Volume= 3,308 cf, Depth> 3.55"
 Routed to Reach 1R : 12" PIPE

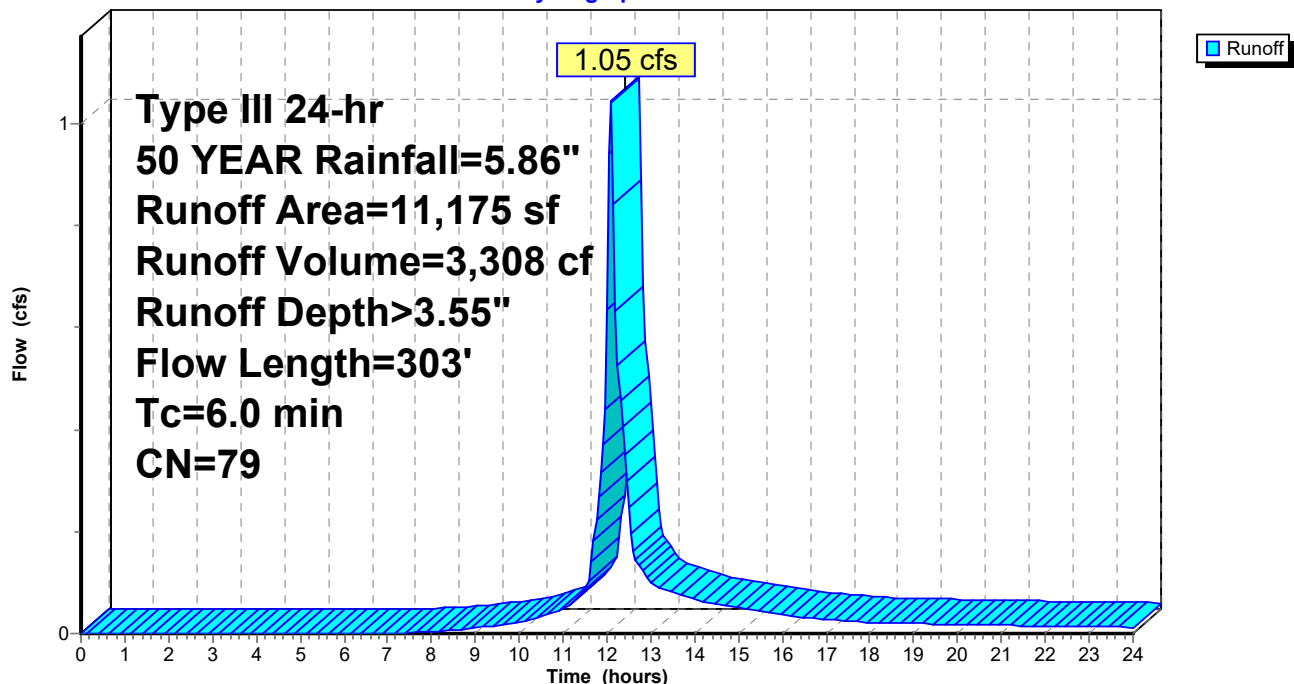
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 7,527	98	Paved parking, HSG A and B
11,175	79	Weighted Average
3,648		32.64% Pervious Area
7,527		67.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	1.94		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment E3: E-3

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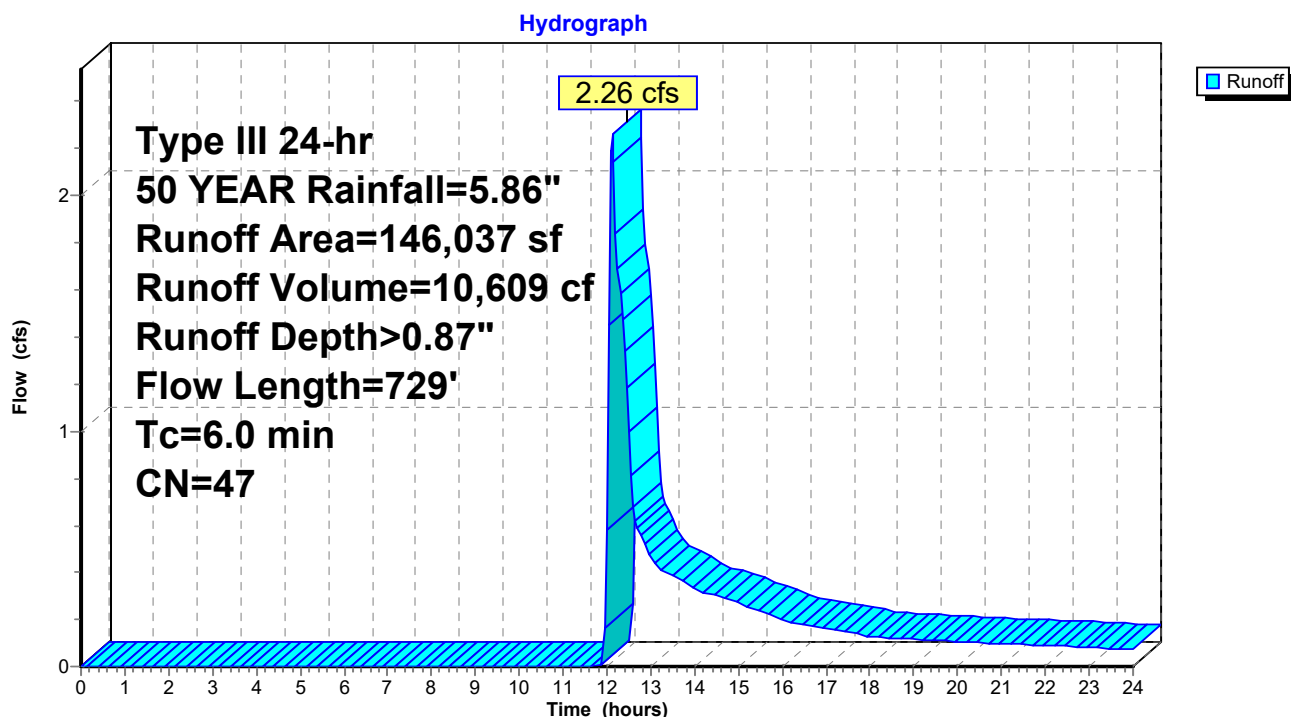
Summary for Subcatchment E4: OFF SITE

Runoff = 2.26 cfs @ 12.12 hrs, Volume= 10,609 cf, Depth> 0.87"
 Routed to Reach 4R : 18"pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
* 32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.84		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.76"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment E4: OFF SITE

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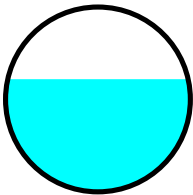
Summary for Reach 1R: 12" PIPE

Inflow Area = 157,212 sf, 25.32% Impervious, Inflow Depth > 1.06" for 50 YEAR event
Inflow = 3.26 cfs @ 12.12 hrs, Volume= 13,914 cf
Outflow = 3.26 cfs @ 12.12 hrs, Volume= 13,912 cf, Atten= 0%, Lag= 0.1 min
Routed to Pond 1P : DESIGN POINT 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.49 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.63 fps, Avg. Travel Time= 0.4 min

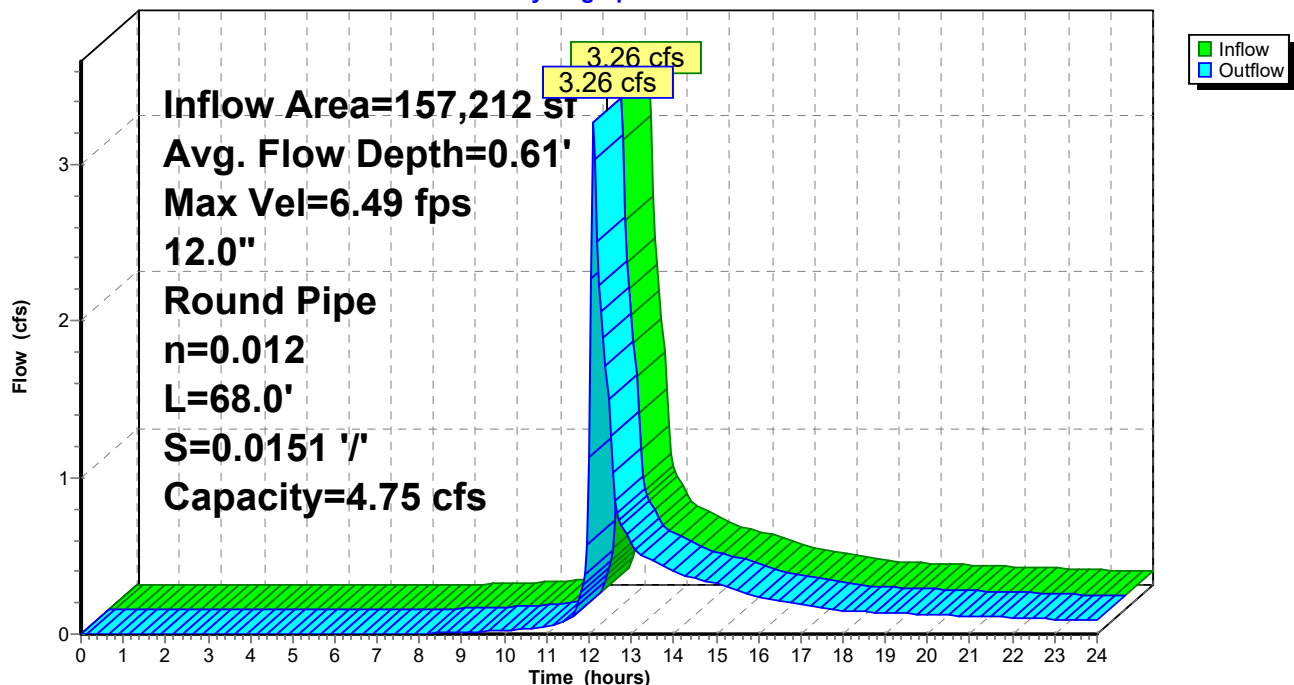
Peak Storage= 34 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.75 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 1R: 12" PIPE

Hydrograph



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Reach 2R: 18" PIPE

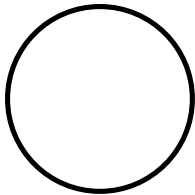
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

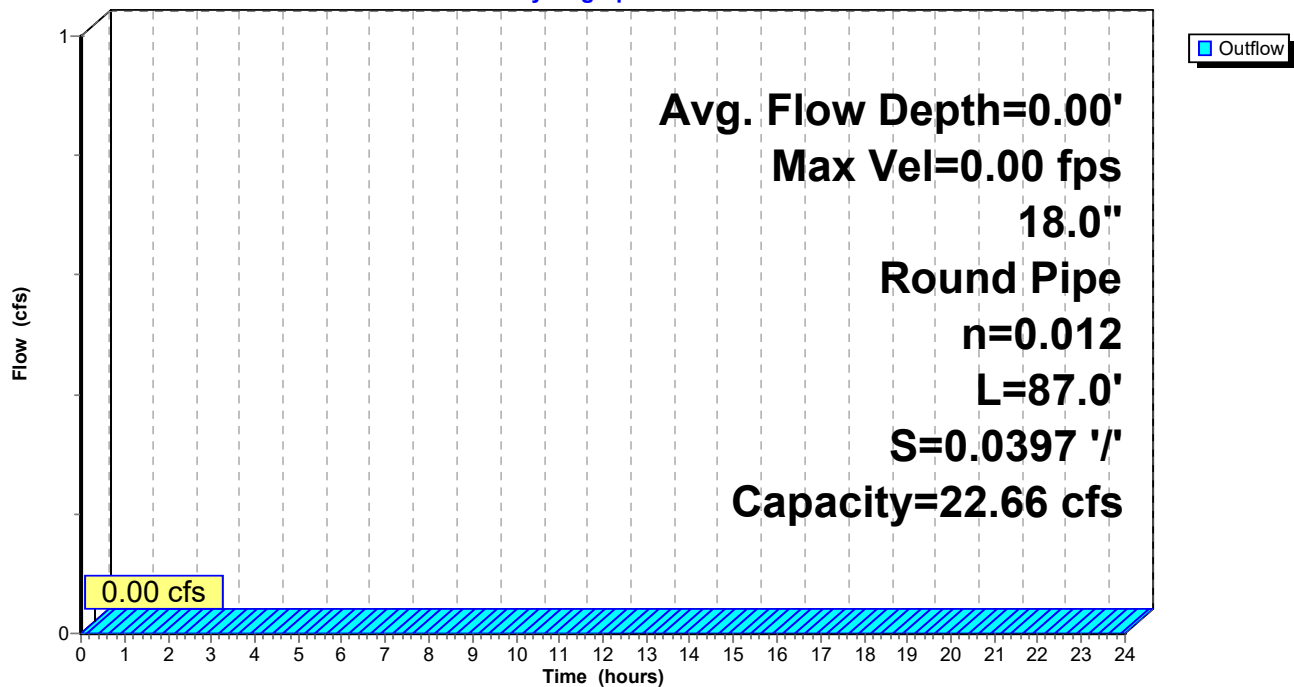
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 2R: 18" PIPE

Hydrograph



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Reach 3R: 18" PIPE

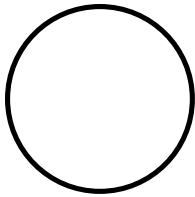
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe

n= 0.012 Concrete pipe, finished

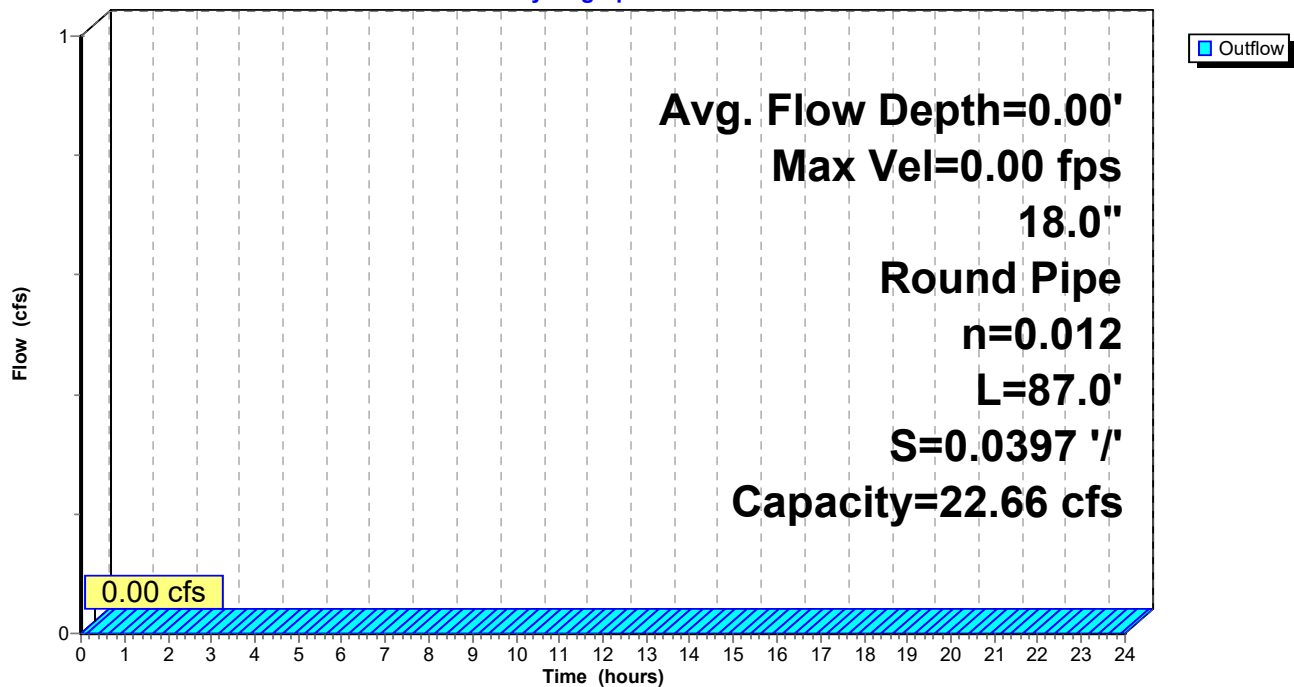
Length= 87.0' Slope= 0.0397 '/'

Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 3R: 18" PIPE

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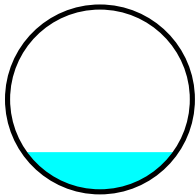
Summary for Reach 4R: 18"pipe

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.87" for 50 YEAR event
Inflow = 2.26 cfs @ 12.12 hrs, Volume= 10,609 cf
Outflow = 2.27 cfs @ 12.12 hrs, Volume= 10,606 cf, Atten= 0%, Lag= 0.1 min
Routed to Reach 1R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.10 fps, Min. Travel Time= 0.2 min
Avg. Velocity= 3.86 fps, Avg. Travel Time= 0.4 min

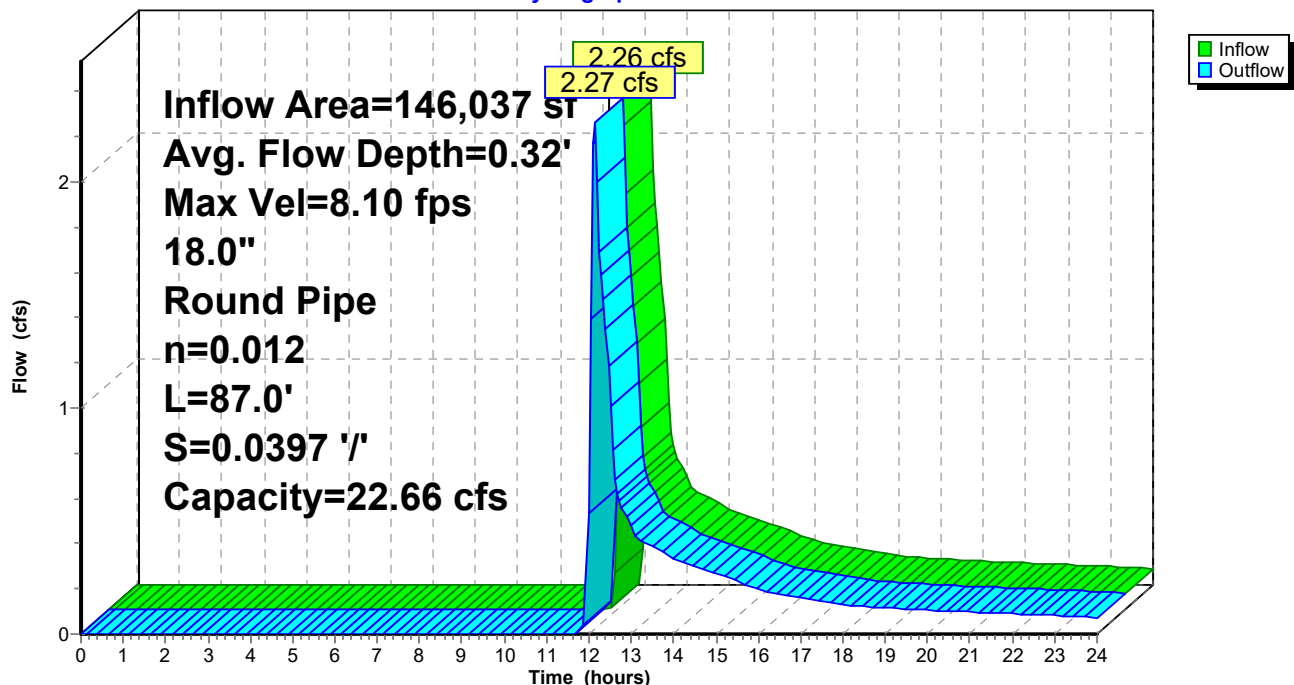
Peak Storage= 24 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 1.23'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 4R: 18"pipe

Hydrograph



COMET PRE DEVELOPMENT

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Type III 24-hr 50 YEAR Rainfall=5.86"

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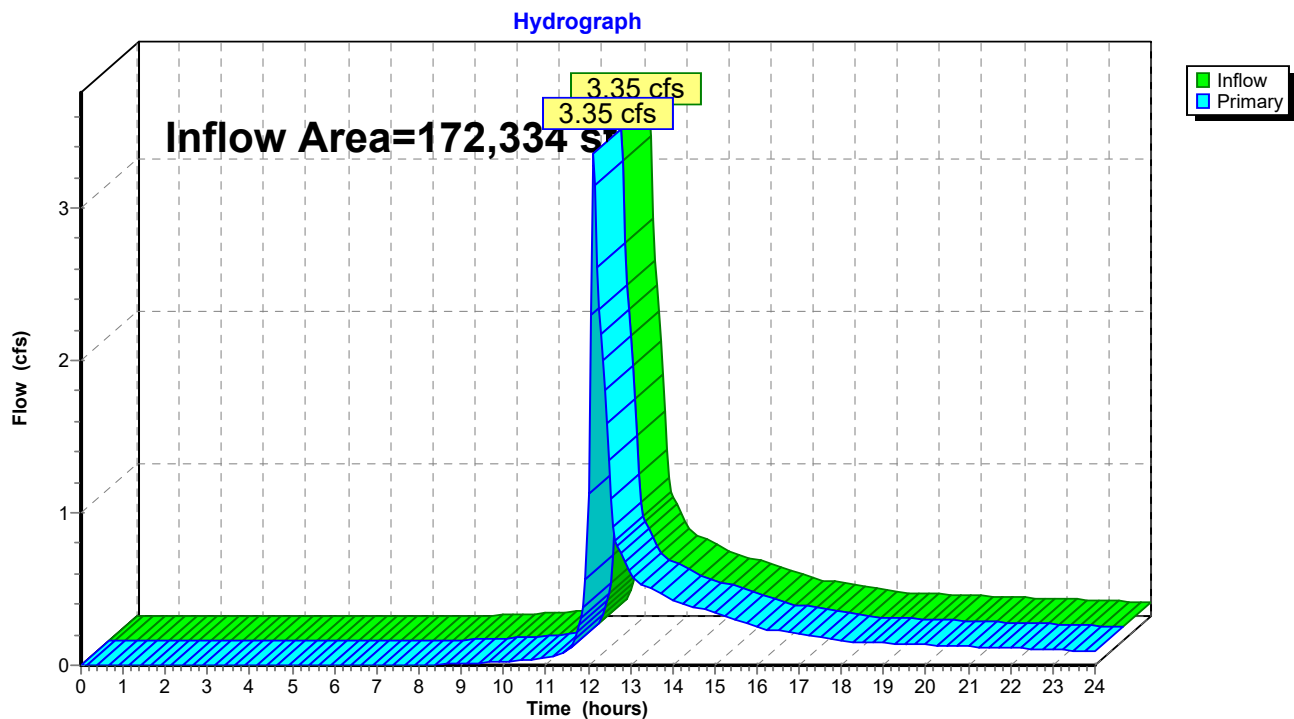
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Summary for Pond 1P: DESIGN POINT 1

Inflow Area = 172,334 sf, 23.09% Impervious, Inflow Depth > 1.02" for 50 YEAR event
Inflow = 3.35 cfs @ 12.12 hrs, Volume= 14,698 cf
Primary = 3.35 cfs @ 12.12 hrs, Volume= 14,698 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: DESIGN POINT 1



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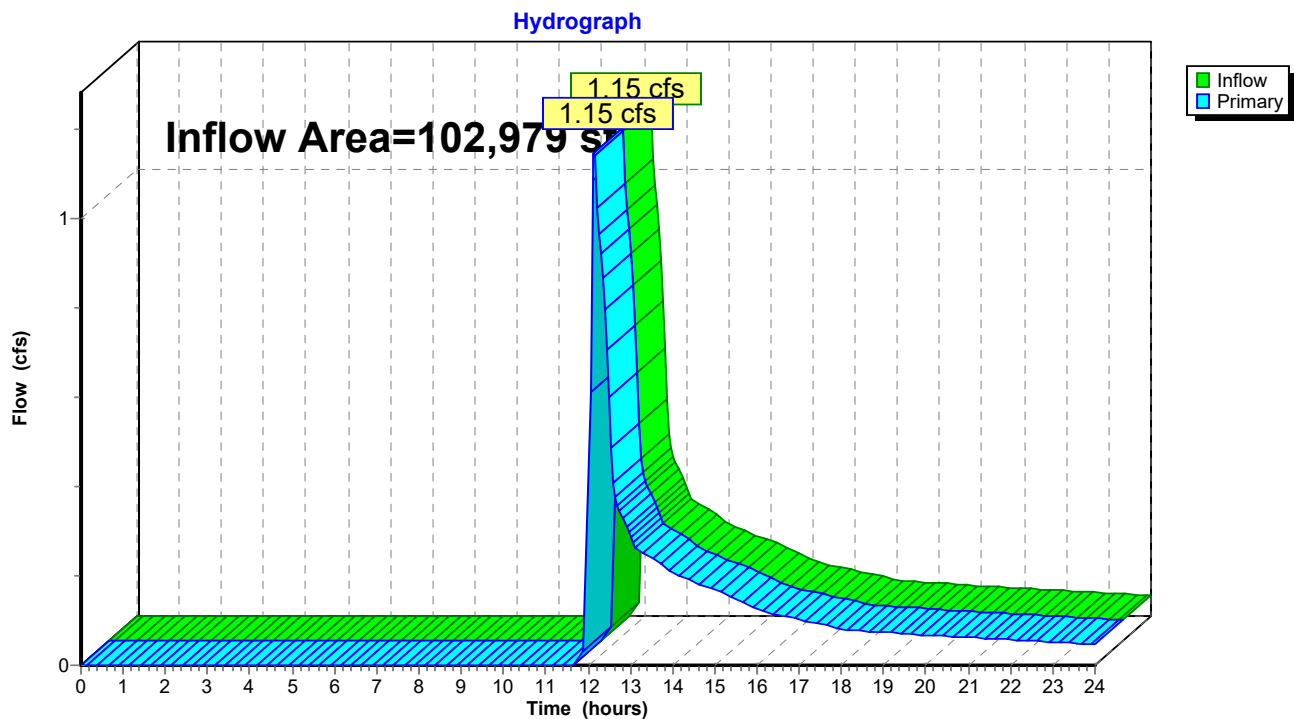
Page 55

Summary for Pond DP2: DESIGN POINT 2

Inflow Area = 102,979 sf, 8.77% Impervious, Inflow Depth > 0.74" for 50 YEAR event
Inflow = 1.15 cfs @ 12.14 hrs, Volume= 6,391 cf
Primary = 1.15 cfs @ 12.14 hrs, Volume= 6,391 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 3P

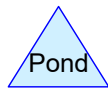
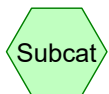
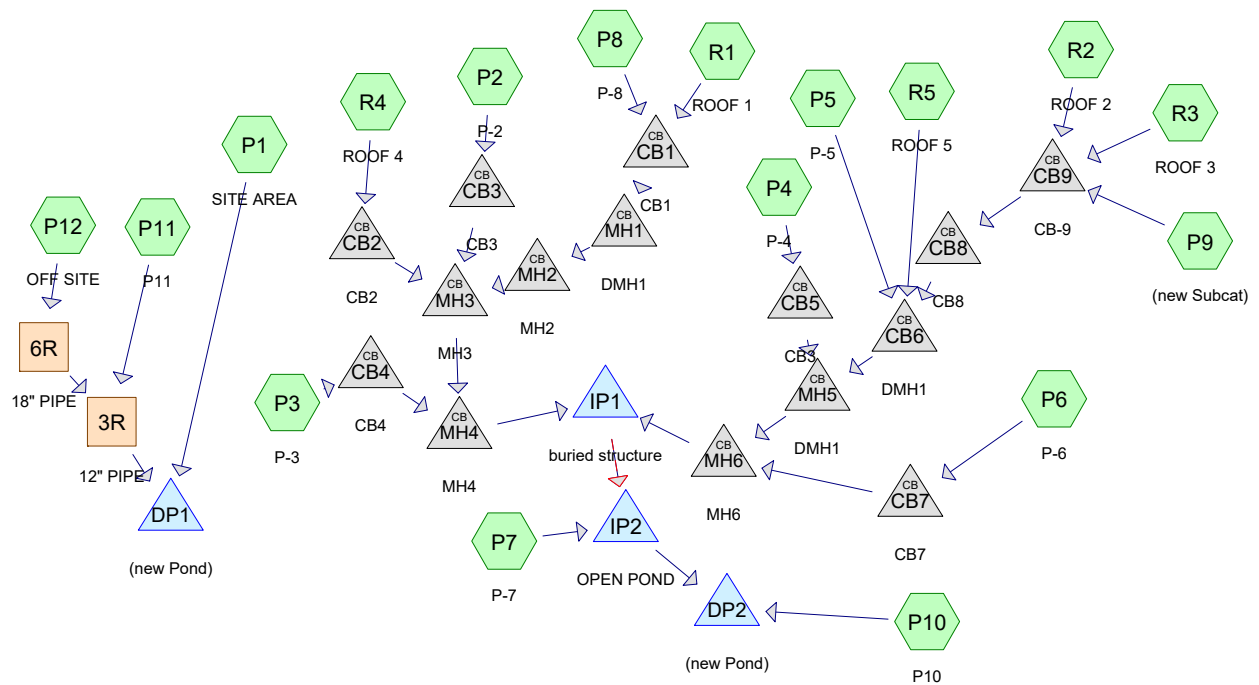
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: DESIGN POINT 2



STORMWATER MANAGEMENT REPORT

POST-DEVELOPMENT DRAINAGE



Routing Diagram for COMET POST DEVELOPMENT
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COMET POST DEVELOPMENT

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Project Notes

Rainfall events imported from "COMET PRE DEVELOPMENT.hcp"

Rainfall events imported from "COMET PRE DEVELOPMENT.hcp"

Rainfall events imported from "COMET PRE DEVELOPMENT.hcp"

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1 YEAR	Type III 24-hr		Default	24.00	1	2.33	2
2	2 YEAR	Type III 24-hr		Default	24.00	1	2.76	2
3	10 YEAR	Type III 24-hr		Default	24.00	1	4.01	2
4	50 YEAR	Type III 24-hr		Default	24.00	1	5.86	2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
58,834	39	>75% Grass cover, Good, HSG A (P11, P12, P2, P4, P8, P9)
18,210	61	>75% Grass cover, Good, HSG B (P1, P2, P3, P4, P5, P6, P7, P8)
5,039	96	Gravel surface, HSG A (P8, P9)
434	96	Gravel surface, HSG B (P8)
32,272	98	Paved parking and roof, HSG A (P12)
13,484	98	Paved parking, HSG A (P2, P3, P8, P9)
6,353	98	Paved parking, HSG A and B (P11)
7,866	98	Paved parking, HSG A, B (P4)
12,110	98	Paved parking, HSG B (P1, P2, P6)
3,106	98	Paved parking, HSG B,C (P5, P7)
11,378	98	Roofs, HSG A (R1, R2, R4)
4,638	98	Roofs, HSG A,B (R3, R5)
7,569	98	Water Surface, HSG B (P3, P7)
83,751	30	Woods, Good, HSG A (P12)
4,887	32	Woods/grass comb., Good, HSG A (P10)
269,931	60	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
228,502	HSG A	P10, P11, P12, P2, P3, P4, P8, P9, R1, R2, R3, R4, R5
41,429	HSG B	P1, P2, P3, P4, P5, P6, P7, P8
0	HSG C	
0	HSG D	
0	Other	
269,931		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
58,834	18,210	0	0	0	77,044	>75% Grass cover, Good
5,039	434	0	0	0	5,473	Gravel surface
27,703	15,216	0	0	0	42,919	Paved parking
32,272	0	0	0	0	32,272	Paved parking and roof
16,016	0	0	0	0	16,016	Roofs
0	7,569	0	0	0	7,569	Water Surface
83,751	0	0	0	0	83,751	Woods, Good
4,887	0	0	0	0	4,887	Woods/grass comb., Good
228,502	41,429	0	0	0	269,931	TOTAL AREA

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	3R	438.80	437.77	68.0	0.0151	0.012	0.0	18.0	0.0	
2	6R	441.30	437.85	87.0	0.0397	0.012	0.0	18.0	0.0	
3	CB1	434.00	433.40	10.0	0.0600	0.013	0.0	12.0	0.0	
4	CB2	428.00	425.00	27.0	0.1111	0.013	0.0	12.0	0.0	
5	CB3	429.00	428.00	20.0	0.0500	0.013	0.0	12.0	0.0	
6	CB4	423.50	422.00	24.0	0.0625	0.013	0.0	12.0	0.0	
7	CB5	429.00	428.00	12.0	0.0833	0.013	0.0	12.0	0.0	
8	CB6	425.21	424.40	34.0	0.0238	0.013	0.0	15.0	0.0	
9	CB7	421.00	420.92	16.0	0.0050	0.013	0.0	12.0	0.0	
10	CB8	425.90	425.20	39.0	0.0179	0.013	0.0	12.0	0.0	
11	CB9	427.50	426.00	91.0	0.0165	0.013	0.0	12.0	0.0	
12	IP1	420.80	420.00	57.0	0.0140	0.013	0.0	12.0	0.0	
13	IP1	421.90	420.00	80.0	0.0237	0.013	0.0	15.0	0.0	
14	MH1	433.30	430.70	34.0	0.0765	0.013	0.0	12.0	0.0	
15	MH2	430.60	428.00	37.0	0.0703	0.013	0.0	12.0	0.0	
16	MH3	424.90	422.40	75.0	0.0333	0.013	0.0	12.0	0.0	
17	MH4	421.90	420.40	20.0	0.0750	0.013	0.0	15.0	0.0	
18	MH5	424.30	422.10	66.0	0.0333	0.013	0.0	12.0	0.0	
19	MH6	420.50	420.50	10.0	0.0000	0.013	0.0	15.0	0.0	

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Type III 24-hr 1 YEAR Rainfall=2.33"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

SubcatchmentP1: SITE AREA	Runoff Area=5,853 sf 9.53% Impervious Runoff Depth>0.24" Flow Length=68' Tc=6.0 min CN=65 Runoff=0.02 cfs 115 cf
SubcatchmentP10: P10	Runoff Area=4,887 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=32 Runoff=0.00 cfs 0 cf
SubcatchmentP11: P11	Runoff Area=10,001 sf 63.52% Impervious Runoff Depth>0.59" Flow Length=303' Tc=6.0 min CN=76 Runoff=0.14 cfs 494 cf
SubcatchmentP12: OFF SITE	Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.00" Flow Length=729' Tc=6.0 min CN=47 Runoff=0.00 cfs 6 cf
SubcatchmentP2: P-2	Runoff Area=4,257 sf 90.72% Impervious Runoff Depth>1.71" Tc=6.0 min CN=94 Runoff=0.19 cfs 605 cf
SubcatchmentP3: P-3	Runoff Area=3,164 sf 80.78% Impervious Runoff Depth>1.46" Tc=6.0 min CN=91 Runoff=0.12 cfs 384 cf
SubcatchmentP4: P-4	Runoff Area=8,614 sf 91.32% Impervious Runoff Depth>1.71" Tc=6.0 min CN=94 Runoff=0.38 cfs 1,225 cf
SubcatchmentP5: P-5	Runoff Area=2,890 sf 92.53% Impervious Runoff Depth>1.80" Tc=6.0 min CN=95 Runoff=0.13 cfs 433 cf
SubcatchmentP6: P-6	Runoff Area=13,675 sf 77.19% Impervious Runoff Depth>1.38" Tc=6.0 min CN=90 Runoff=0.50 cfs 1,572 cf
SubcatchmentP7: P-7	Runoff Area=12,891 sf 53.09% Impervious Runoff Depth>0.82" Tc=6.0 min CN=81 Runoff=0.27 cfs 883 cf
SubcatchmentP8: P-8	Runoff Area=12,175 sf 1.91% Impervious Runoff Depth>0.11" Flow Length=175' Tc=6.2 min CN=59 Runoff=0.01 cfs 113 cf
SubcatchmentP9: (new Subcat)	Runoff Area=29,471 sf 30.49% Impervious Runoff Depth>0.15" Flow Length=297' Tc=6.0 min CN=61 Runoff=0.04 cfs 364 cf
SubcatchmentR1: ROOF 1	Runoff Area=3,838 sf 100.00% Impervious Runoff Depth>2.10" Tc=6.0 min CN=98 Runoff=0.19 cfs 672 cf
SubcatchmentR2: ROOF 2	Runoff Area=4,073 sf 100.00% Impervious Runoff Depth>2.10" Tc=6.0 min CN=98 Runoff=0.20 cfs 713 cf
SubcatchmentR3: ROOF 3	Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>2.10" Tc=6.0 min CN=98 Runoff=0.17 cfs 607 cf
SubcatchmentR4: ROOF 4	Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>2.10" Tc=6.0 min CN=98 Runoff=0.17 cfs 607 cf

COMET POST DEVELOPMENT

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Type III 24-hr 1 YEAR Rainfall=2.33"

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SubcatchmentR5: ROOF 5Runoff Area=1,171 sf 100.00% Impervious Runoff Depth>2.10"
Tc=6.0 min CN=98 Runoff=0.06 cfs 205 cf**Reach 3R: 12" PIPE**Avg. Flow Depth=0.11' Max Vel=2.54 fps Inflow=0.14 cfs 500 cf
18.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=14.01 cfs Outflow=0.14 cfs 500 cf**Reach 6R: 18" PIPE**Avg. Flow Depth=0.00' Max Vel=1.14 fps Inflow=0.00 cfs 6 cf
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.00 cfs 6 cf**Pond CB1: CB1**Peak Elev=434.21' Inflow=0.19 cfs 785 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0600 '/' Outflow=0.19 cfs 785 cf**Pond CB2: CB2**Peak Elev=428.20' Inflow=0.17 cfs 607 cf
12.0" Round Culvert n=0.013 L=27.0' S=0.1111 '/' Outflow=0.17 cfs 607 cf**Pond CB3: CB3**Peak Elev=429.21' Inflow=0.19 cfs 605 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0500 '/' Outflow=0.19 cfs 605 cf**Pond CB4: CB4**Peak Elev=423.67' Inflow=0.12 cfs 384 cf
12.0" Round Culvert n=0.013 L=24.0' S=0.0625 '/' Outflow=0.12 cfs 384 cf**Pond CB5: CB3**Peak Elev=429.30' Inflow=0.38 cfs 1,225 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0833 '/' Outflow=0.38 cfs 1,225 cf**Pond CB6: DMH1**Peak Elev=425.56' Inflow=0.57 cfs 2,321 cf
15.0" Round Culvert n=0.013 L=34.0' S=0.0238 '/' Outflow=0.57 cfs 2,321 cf**Pond CB7: CB7**Peak Elev=422.83' Inflow=0.50 cfs 1,572 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=0.50 cfs 1,570 cf**Pond CB8: CB8**Peak Elev=426.20' Inflow=0.38 cfs 1,684 cf
12.0" Round Culvert n=0.013 L=39.0' S=0.0179 '/' Outflow=0.38 cfs 1,684 cf**Pond CB9: CB-9**Peak Elev=427.80' Inflow=0.38 cfs 1,684 cf
12.0" Round Culvert n=0.013 L=91.0' S=0.0165 '/' Outflow=0.38 cfs 1,684 cf**Pond DP1: (new Pond)**Inflow=0.15 cfs 615 cf
Primary=0.15 cfs 615 cf**Pond DP2: (new Pond)**Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf**Pond IP1: buried structure**Peak Elev=422.83' Storage=4,448 cf Inflow=2.12 cfs 7,492 cf
Discarded=0.04 cfs 2,563 cf Primary=0.04 cfs 325 cf Secondary=0.04 cfs 325 cf Outflow=0.13 cfs 3,212 cf**Pond IP2: OPEN POND**Peak Elev=418.09' Storage=325 cf Inflow=0.27 cfs 1,533 cf
Discarded=0.05 cfs 1,535 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 1,535 cf**Pond MH1: DMH1**Peak Elev=433.51' Inflow=0.19 cfs 785 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0765 '/' Outflow=0.19 cfs 785 cf**Pond MH2: MH2**Peak Elev=430.81' Inflow=0.19 cfs 785 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0703 '/' Outflow=0.19 cfs 785 cf

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Pond MH3: MH3

Peak Elev=425.27' Inflow=0.55 cfs 1,997 cf
12.0" Round Culvert n=0.013 L=75.0' S=0.0333 '/' Outflow=0.55 cfs 1,997 cf

Pond MH4: MH4

Peak Elev=422.83' Inflow=0.67 cfs 2,381 cf
15.0" Round Culvert n=0.013 L=20.0' S=0.0750 '/' Outflow=0.67 cfs 2,375 cf

Pond MH5: DMH1

Peak Elev=424.80' Inflow=0.95 cfs 3,546 cf
12.0" Round Culvert n=0.013 L=66.0' S=0.0333 '/' Outflow=0.95 cfs 3,546 cf

Pond MH6: MH6

Peak Elev=422.83' Inflow=1.45 cfs 5,117 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0000 '/' Outflow=1.45 cfs 5,117 cf

Total Runoff Area = 269,931 sf Runoff Volume = 8,997 cf Average Runoff Depth = 0.40"
63.41% Pervious = 171,155 sf 36.59% Impervious = 98,776 sf

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Summary for Subcatchment P1: SITE AREA

Runoff = 0.02 cfs @ 12.15 hrs, Volume= 115 cf, Depth> 0.24"
 Routed to Pond DP1 : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
558	98	Paved parking, HSG B
5,295	61	>75% Grass cover, Good, HSG B
5,853	65	Weighted Average
5,295		90.47% Pervious Area
558		9.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	5	0.0200	0.72		Sheet Flow, flow on pavement Smooth surfaces n= 0.011 P2= 2.94"
2.4	28	0.0600	0.20		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.1	5	0.0200	0.72		Sheet Flow, flow over pavement Smooth surfaces n= 0.011 P2= 2.94"
0.6	10	0.2000	0.26		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.2	20	0.1000	2.21		Shallow Concentrated Flow, flow over grass Short Grass Pasture Kv= 7.0 fps
2.6					Direct Entry,
6.0	68	Total			

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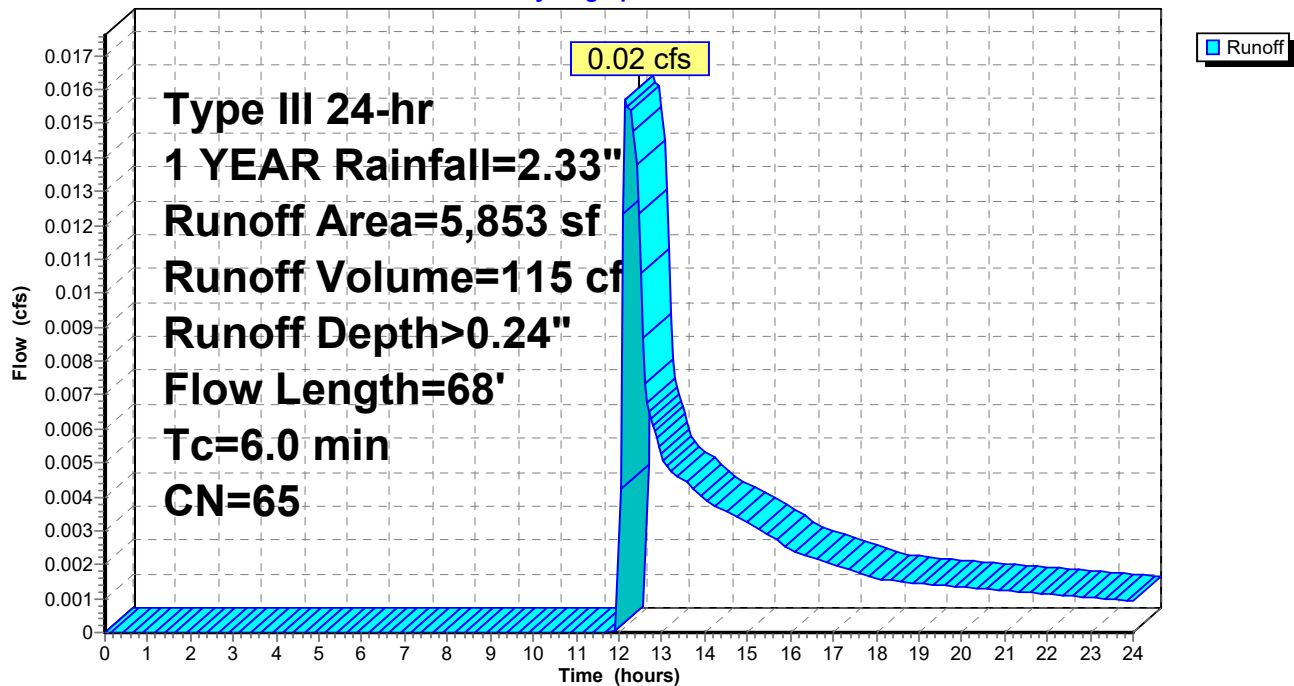
Type III 24-hr 1 YEAR Rainfall=2.33"

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Subcatchment P1: SITE AREA

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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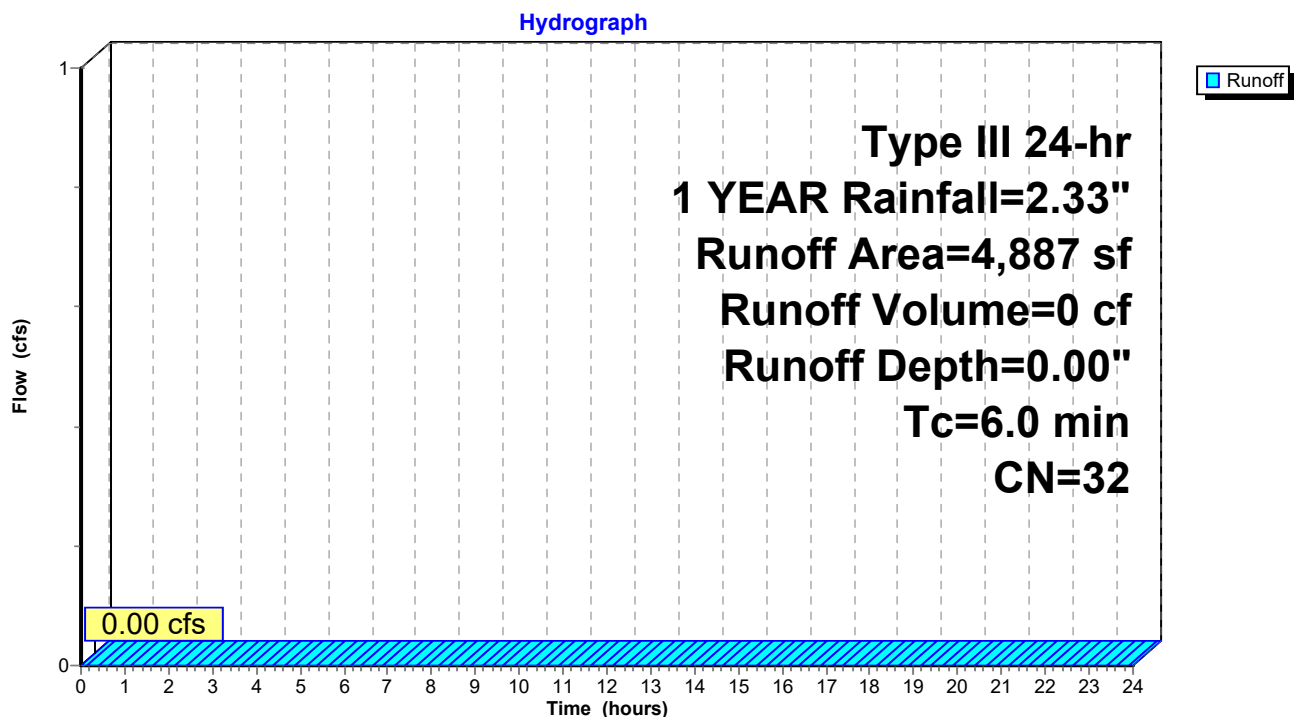
Summary for Subcatchment P10: P10

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond DP2 : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
4,887	32	Woods/grass comb., Good, HSG A
4,887		100.00% Pervious Area

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

Subcatchment P10: P10

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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P11: P11

Runoff = 0.14 cfs @ 12.10 hrs, Volume= 494 cf, Depth> 0.59"
Routed to Reach 3R : 12" PIPE

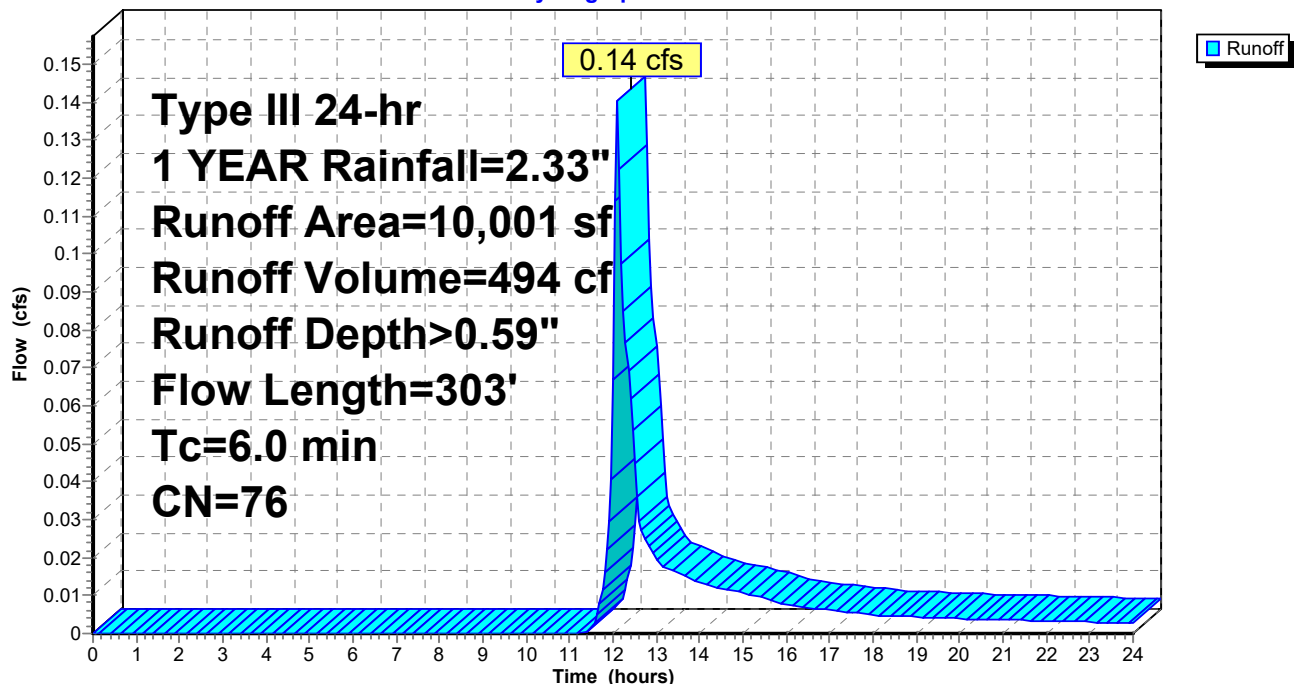
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 6,353	98	Paved parking, HSG A and B
10,001	76	Weighted Average
3,648		36.48% Pervious Area
6,353		63.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.00		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment P11: P11

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P12: OFF SITE

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 6 cf, Depth> 0.00"
Routed to Reach 6R : 18" PIPE

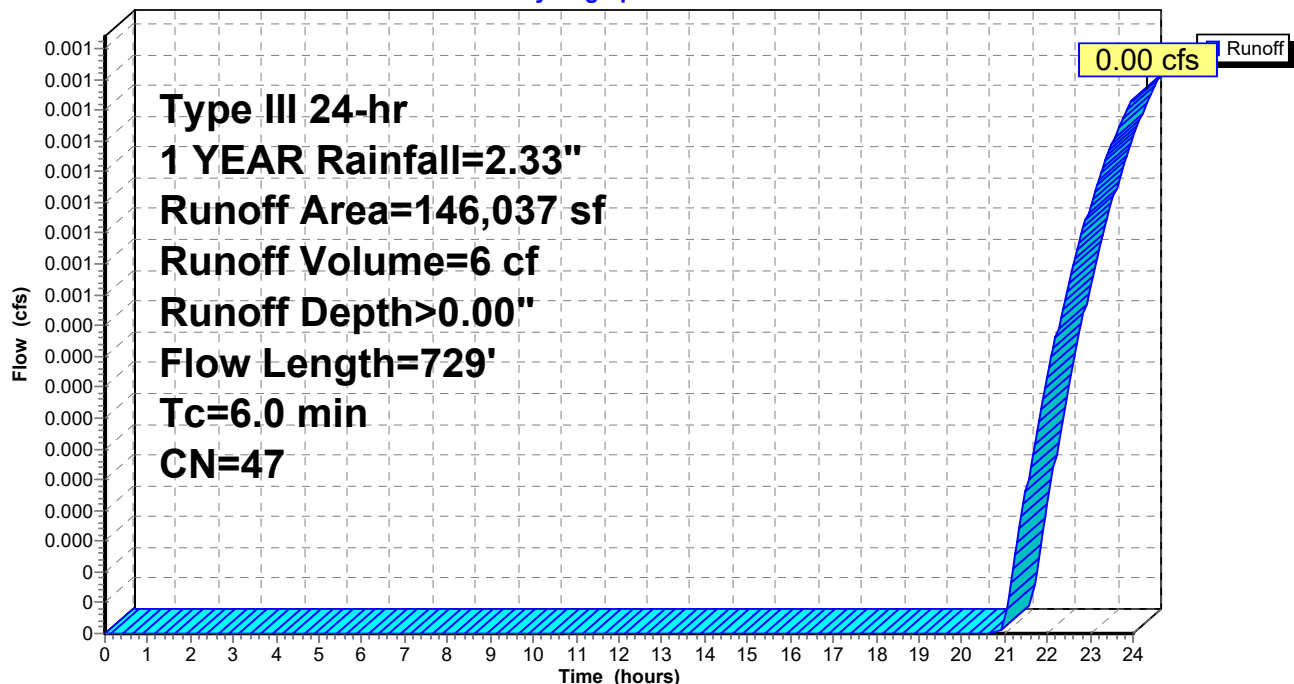
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.87		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment P12: OFF SITE

Hydrograph



COMET POST DEVELOPMENT

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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P2: P-2

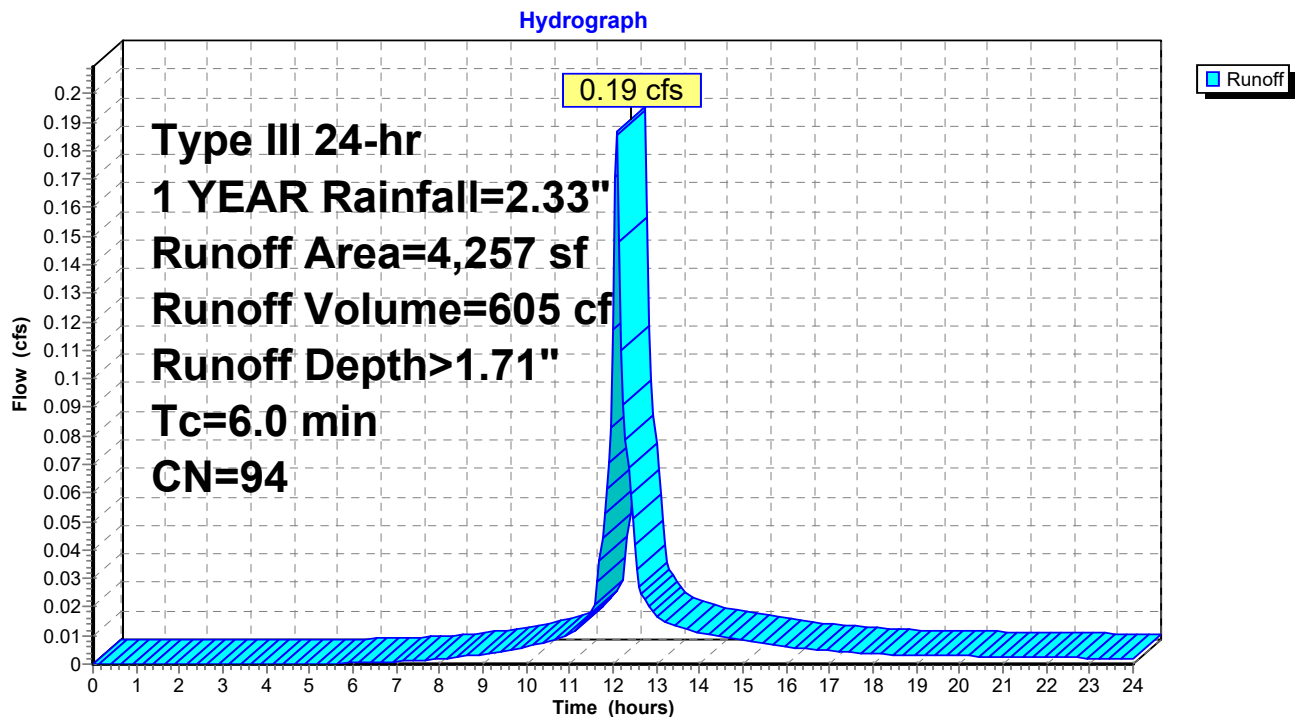
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 605 cf, Depth> 1.71"
Routed to Pond CB3 : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
2,866	98	Paved parking, HSG A
996	98	Paved parking, HSG B
185	39	>75% Grass cover, Good, HSG A
210	61	>75% Grass cover, Good, HSG B
4,257	94	Weighted Average
395		9.28% Pervious Area
3,862		90.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P2: P-2



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P3: P-3

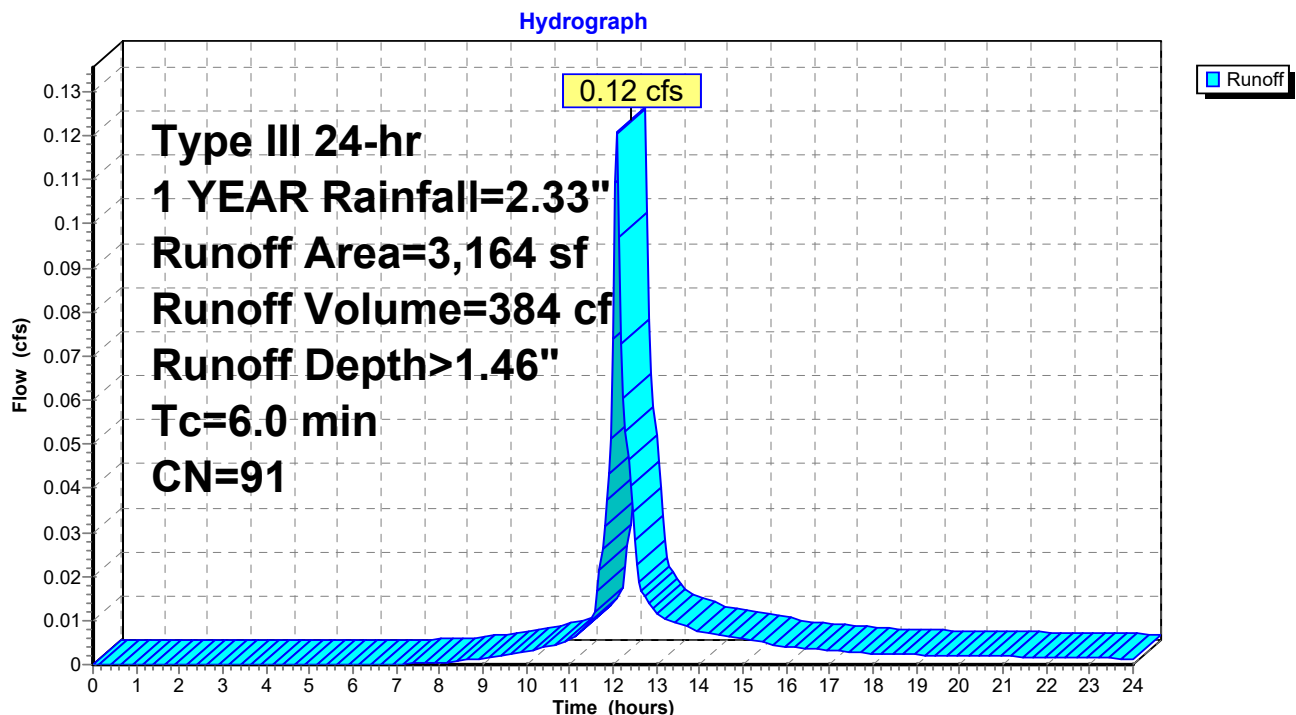
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 384 cf, Depth> 1.46"
Routed to Pond CB4 : CB4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
1,399	98	Paved parking, HSG A
1,157	98	Water Surface, HSG B
608	61	>75% Grass cover, Good, HSG B
3,164	91	Weighted Average
608		19.22% Pervious Area
2,556		80.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P3: P-3



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P4: P-4

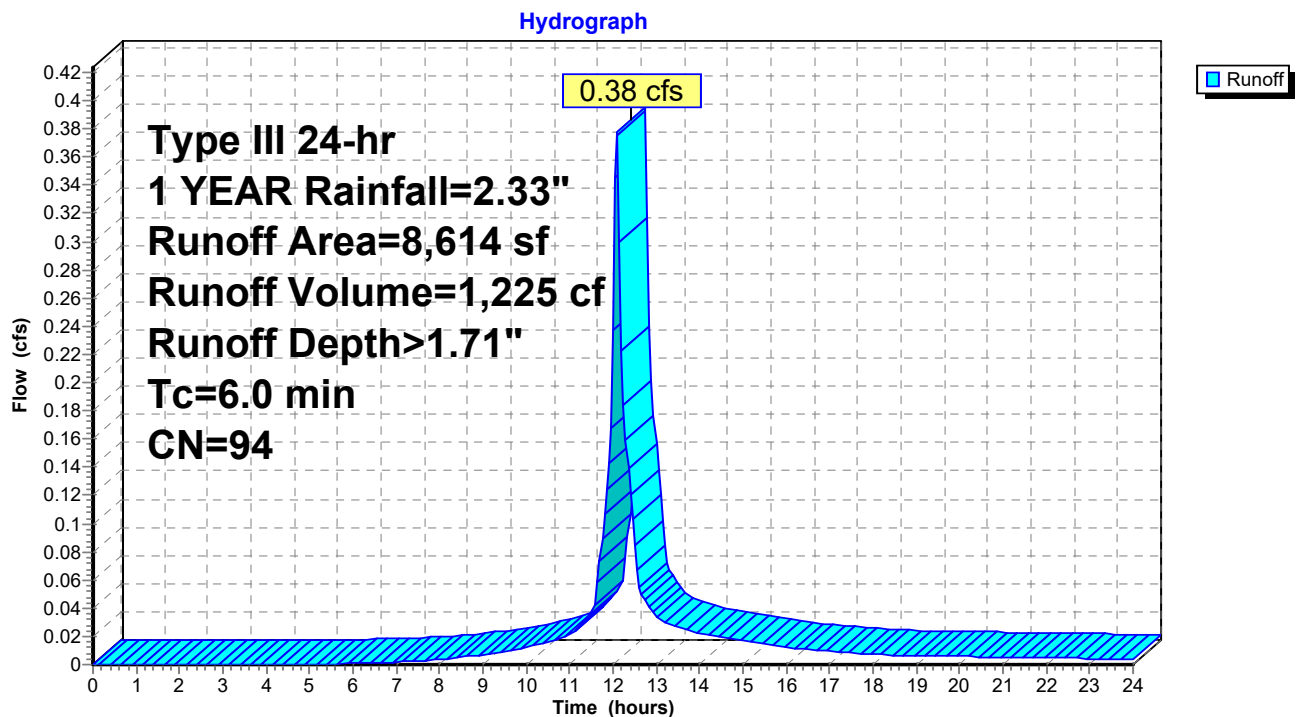
Runoff = 0.38 cfs @ 12.09 hrs, Volume= 1,225 cf, Depth> 1.71"
Routed to Pond CB5 : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

	Area (sf)	CN	Description
*	7,866	98	Paved parking, HSG A, B
	119	39	>75% Grass cover, Good, HSG A
	629	61	>75% Grass cover, Good, HSG B
	8,614	94	Weighted Average
	748		8.68% Pervious Area
	7,866		91.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P4: P-4



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P5: P-5

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 433 cf, Depth> 1.80"
Routed to Pond CB6 : DMH1

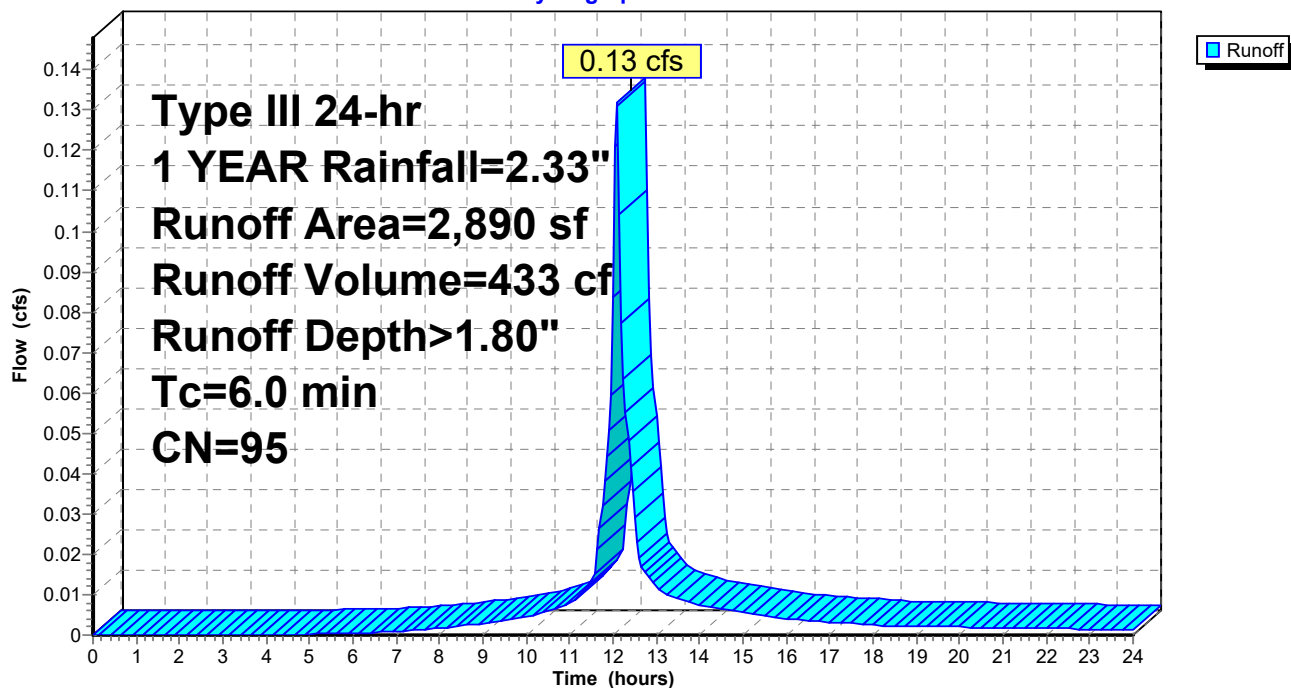
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

	Area (sf)	CN	Description
*	2,674	98	Paved parking, HSG B,C
	216	61	>75% Grass cover, Good, HSG B
	2,890	95	Weighted Average
	216		7.47% Pervious Area
	2,674		92.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P5: P-5

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P6: P-6

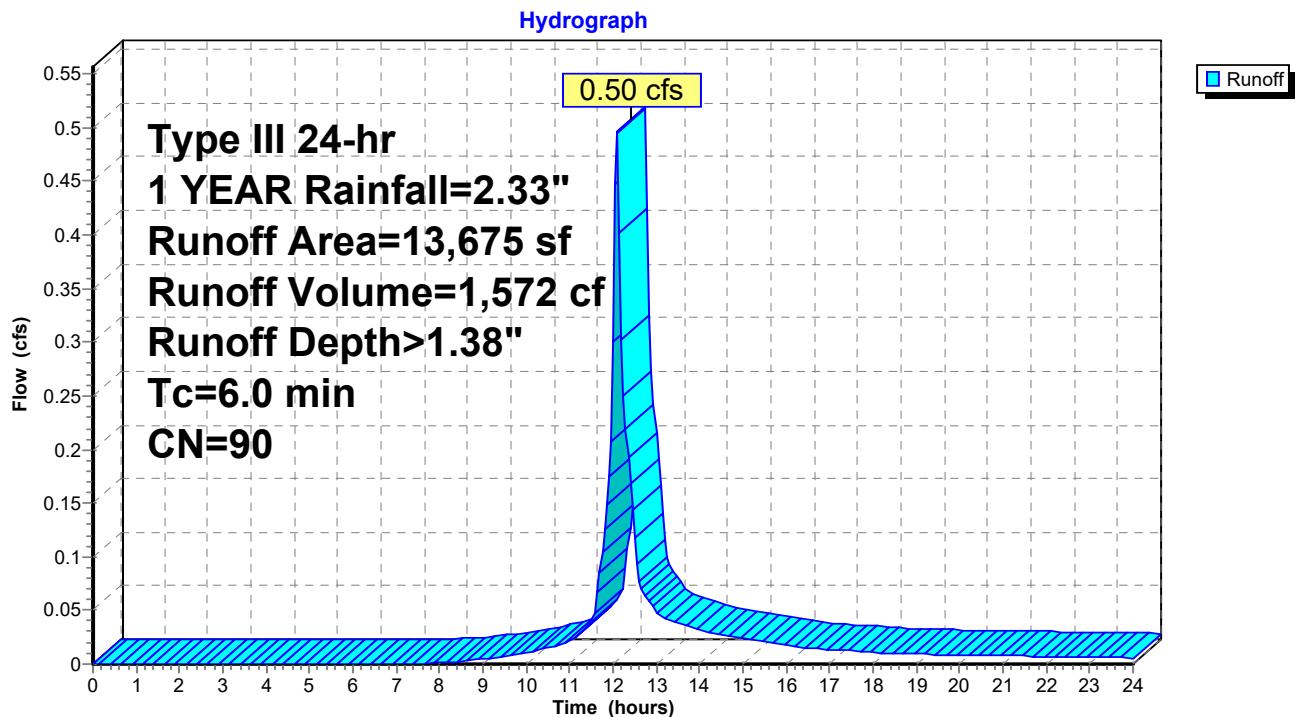
Runoff = 0.50 cfs @ 12.09 hrs, Volume= 1,572 cf, Depth> 1.38"
Routed to Pond CB7 : CB7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
10,556	98	Paved parking, HSG B
3,119	61	>75% Grass cover, Good, HSG B
13,675	90	Weighted Average
3,119		22.81% Pervious Area
10,556		77.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P6: P-6



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P7: P-7

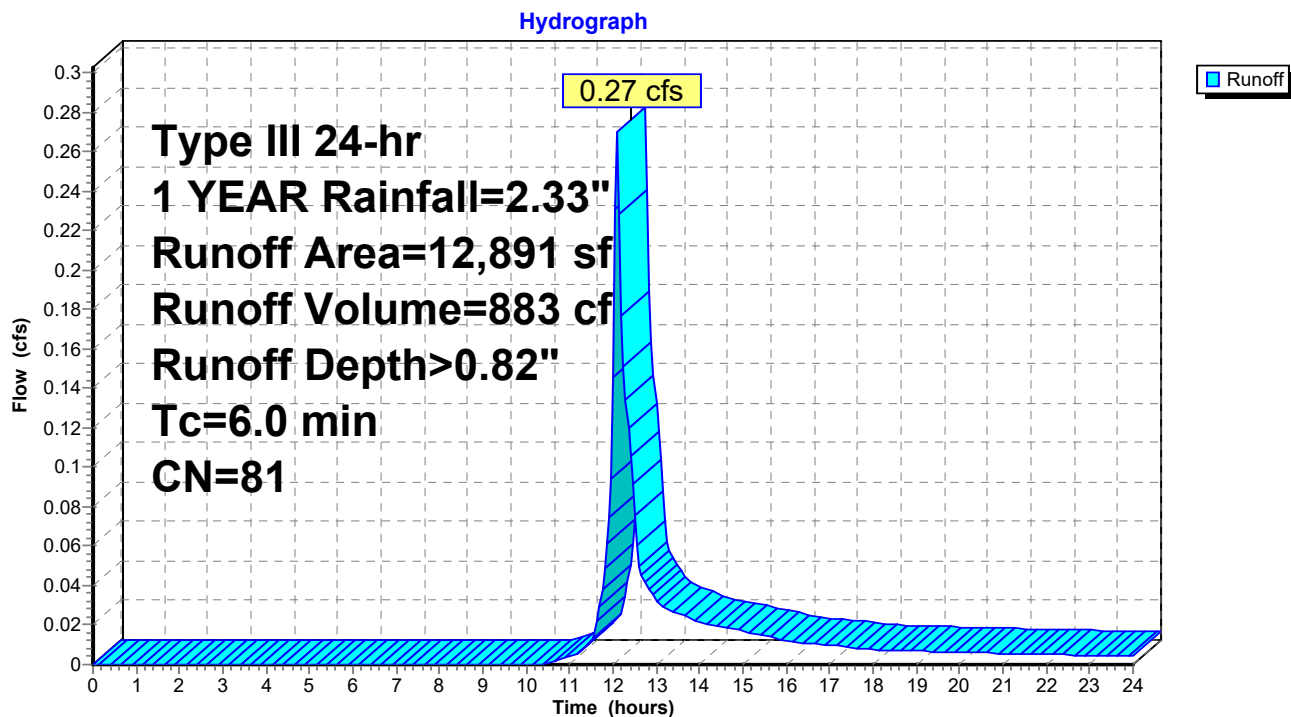
Runoff = 0.27 cfs @ 12.10 hrs, Volume= 883 cf, Depth> 0.82"
Routed to Pond IP2 : OPEN POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

	Area (sf)	CN	Description
	6,412	98	Water Surface, HSG B
*	432	98	Paved parking, HSG B,C
	6,047	61	>75% Grass cover, Good, HSG B
	12,891	81	Weighted Average
	6,047		46.91% Pervious Area
	6,844		53.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER GRASS TO POND

Subcatchment P7: P-7



COMET POST DEVELOPMENT

Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P8: P-8

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 113 cf, Depth> 0.11"
 Routed to Pond CB1 : CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
233	98	Paved parking, HSG A
6,658	39	>75% Grass cover, Good, HSG A
2,764	96	Gravel surface, HSG A
2,086	61	>75% Grass cover, Good, HSG B
434	96	Gravel surface, HSG B
12,175	59	Weighted Average
11,942		98.09% Pervious Area
233		1.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.2400	0.26		Sheet Flow, FLOW OVER GRASS Grass: Dense n= 0.240 P2= 2.94"
0.7	80	0.0100	2.03		Shallow Concentrated Flow, FLOW OVER GRAVEL Paved Kv= 20.3 fps
0.5	45	0.0400	1.40		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
1.8					Direct Entry, ADD FLOW TIME
6.2	175	Total			

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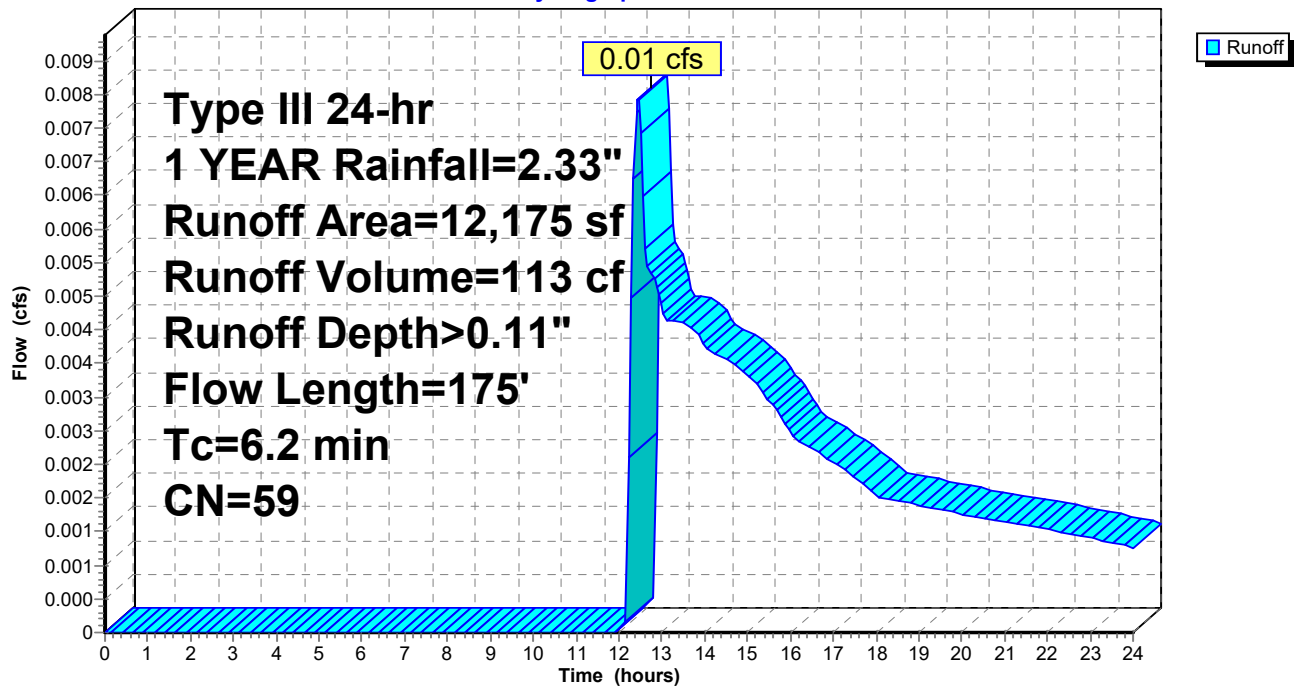
Type III 24-hr 1 YEAR Rainfall=2.33"

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Subcatchment P8: P-8

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment P9: (new Subcat)

Runoff = 0.04 cfs @ 12.38 hrs, Volume= 364 cf, Depth> 0.15"
 Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
8,986	98	Paved parking, HSG A
2,275	96	Gravel surface, HSG A
18,210	39	>75% Grass cover, Good, HSG A
29,471	61	Weighted Average
20,485		69.51% Pervious Area
8,986		30.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0600	1.78		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.2	50	0.0600	4.97		Shallow Concentrated Flow, FLOW OVER PAVEMENT Paved Kv= 20.3 fps
0.4	75	0.2400	3.43		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
1.0	122	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
3.9					Direct Entry,
6.0	297	Total			

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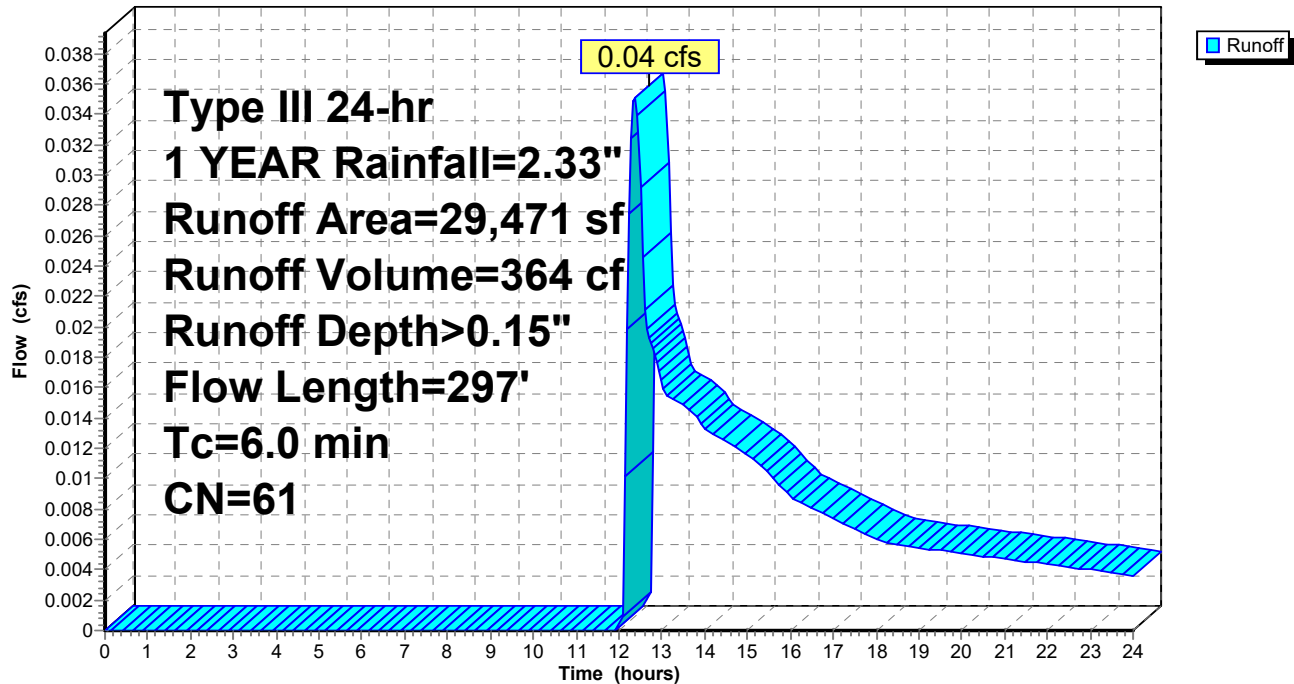
Type III 24-hr 1 YEAR Rainfall=2.33"

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Subcatchment P9: (new Subcat)

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment R1: ROOF 1

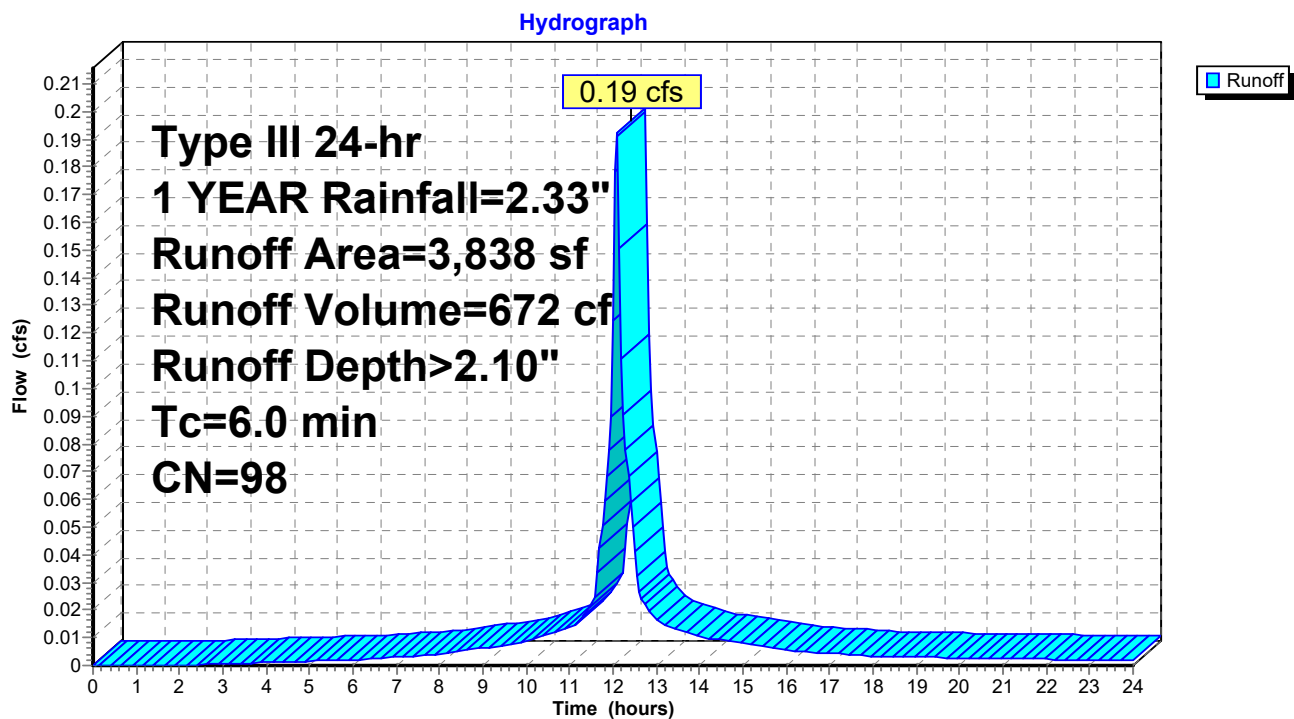
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 672 cf, Depth> 2.10"
Routed to Pond CB1 : CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
3,838	98	Roofs, HSG A
3,838		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB1

Subcatchment R1: ROOF 1



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment R2: ROOF 2

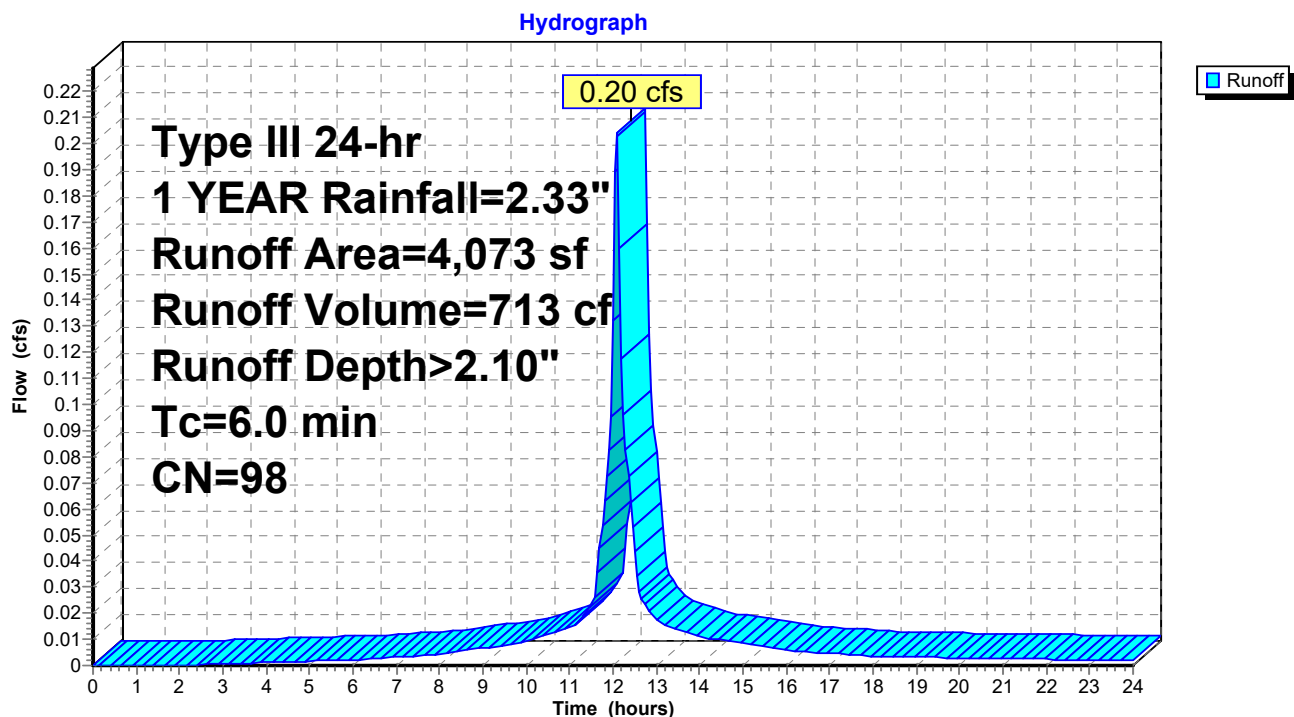
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 713 cf, Depth> 2.10"
Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
4,073	98	Roofs, HSG A
4,073		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R2: ROOF 2



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Subcatchment R3: ROOF 3

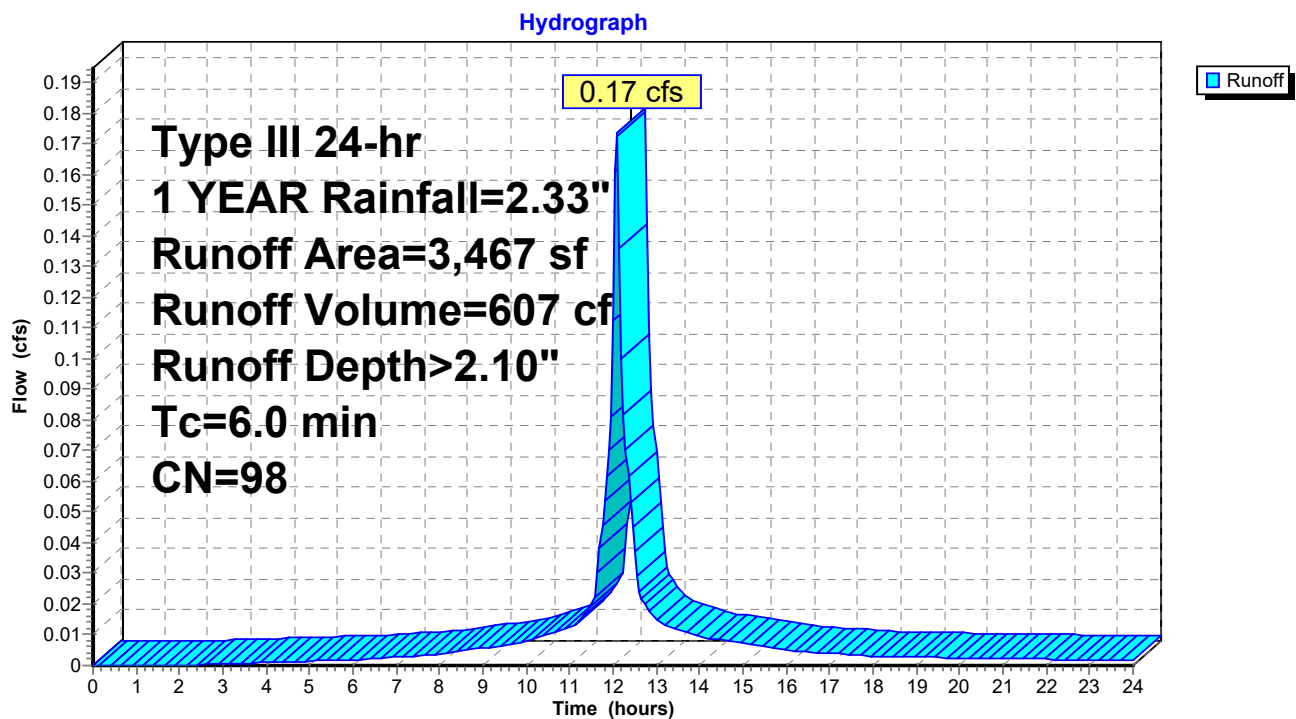
Runoff = 0.17 cfs @ 12.09 hrs, Volume= 607 cf, Depth> 2.10"
Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
* 3,467	98	Roofs, HSG A,B
3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R3: ROOF 3



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Summary for Subcatchment R4: ROOF 4

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 607 cf, Depth> 2.10"
Routed to Pond CB2 : CB2

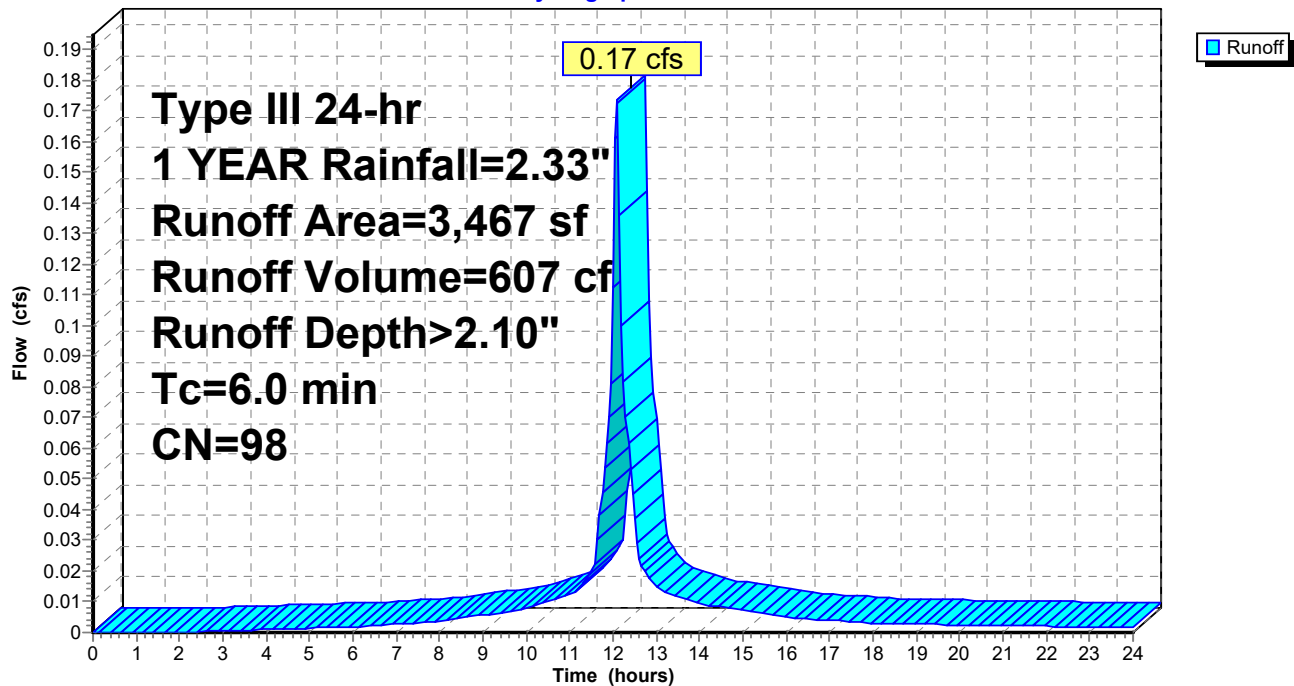
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
3,467	98	Roofs, HSG A
3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB2

Subcatchment R4: ROOF 4

Hydrograph



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Summary for Subcatchment R5: ROOF 5

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 205 cf, Depth> 2.10"
Routed to Pond CB6 : DMH1

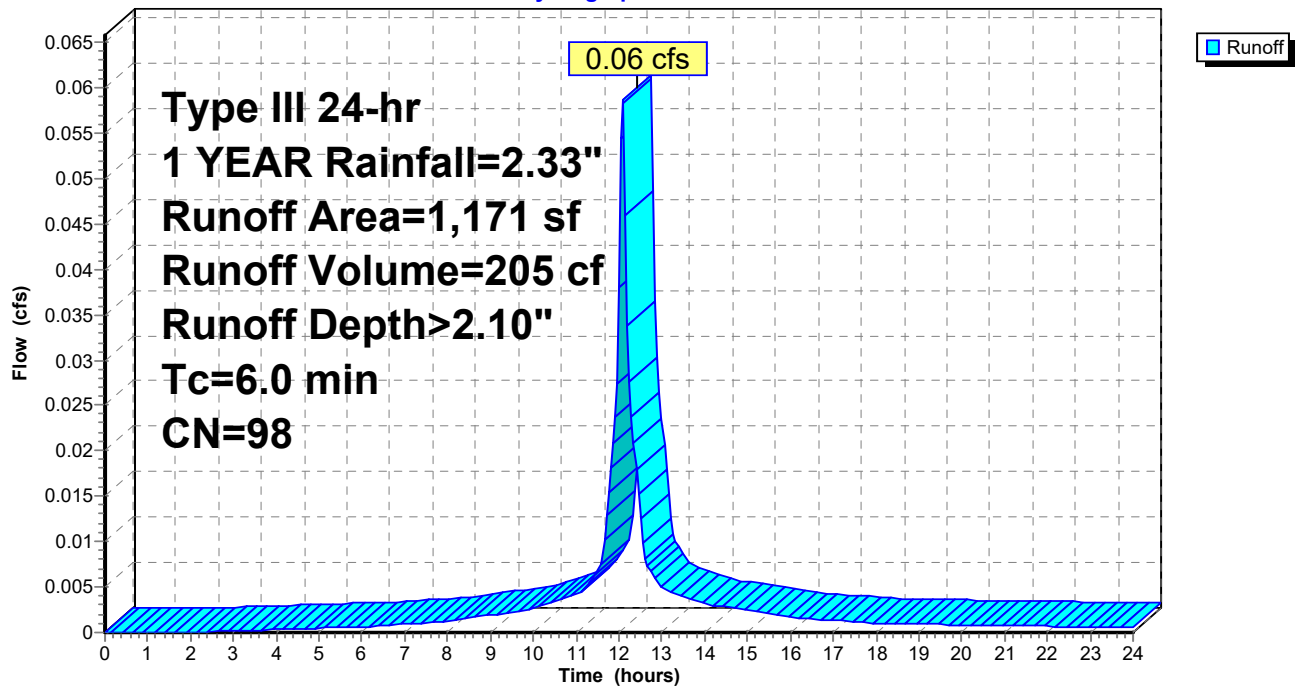
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.33"

Area (sf)	CN	Description
* 1,171	98	Roofs, HSG A,B
1,171		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB6

Subcatchment R5: ROOF 5

Hydrograph



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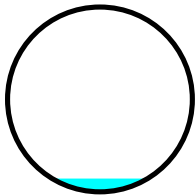
Summary for Reach 3R: 12" PIPE

Inflow Area = 156,038 sf, 24.75% Impervious, Inflow Depth > 0.04" for 1 YEAR event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 500 cf
Outflow = 0.14 cfs @ 12.11 hrs, Volume= 500 cf, Atten= 0%, Lag= 0.3 min
Routed to Pond DP1 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 0.4 min
Avg. Velocity= 1.08 fps, Avg. Travel Time= 1.0 min

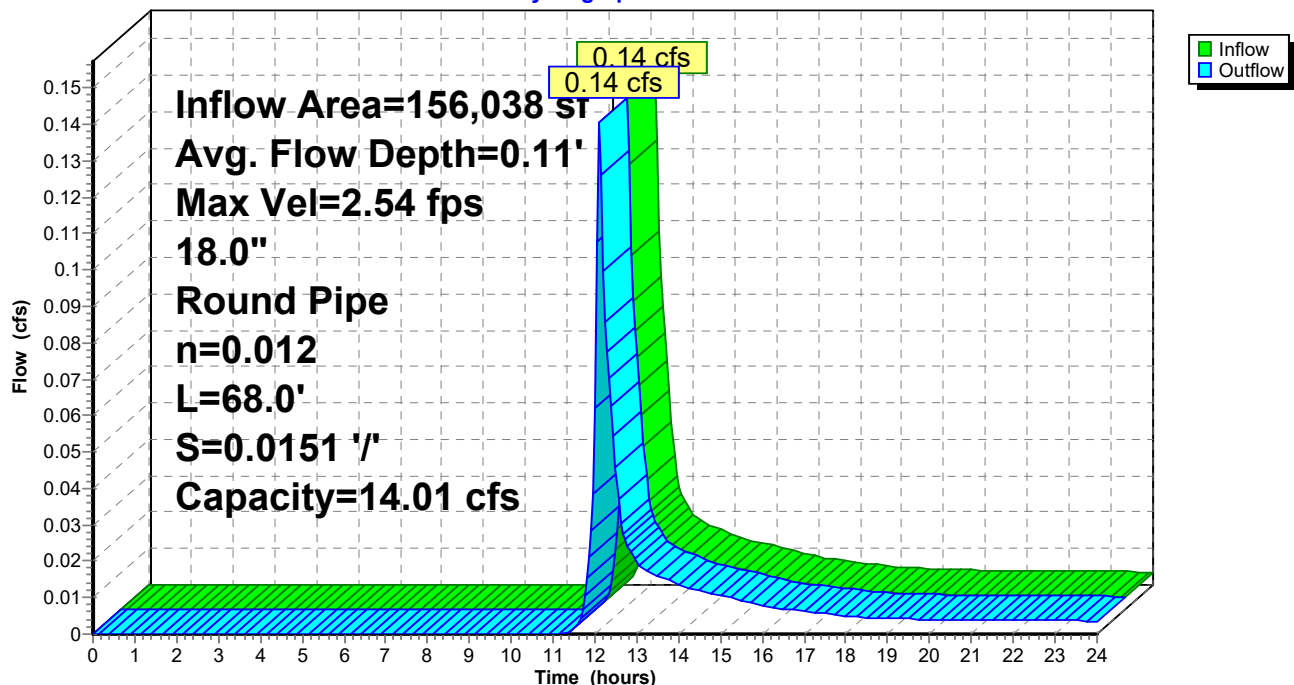
Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 0.77'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.01 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 3R: 12" PIPE

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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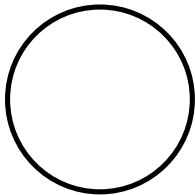
Summary for Reach 6R: 18" PIPE

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.00" for 1 YEAR event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 6 cf
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 6 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 3R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.14 fps, Min. Travel Time= 1.3 min
Avg. Velocity= 1.14 fps, Avg. Travel Time= 1.3 min

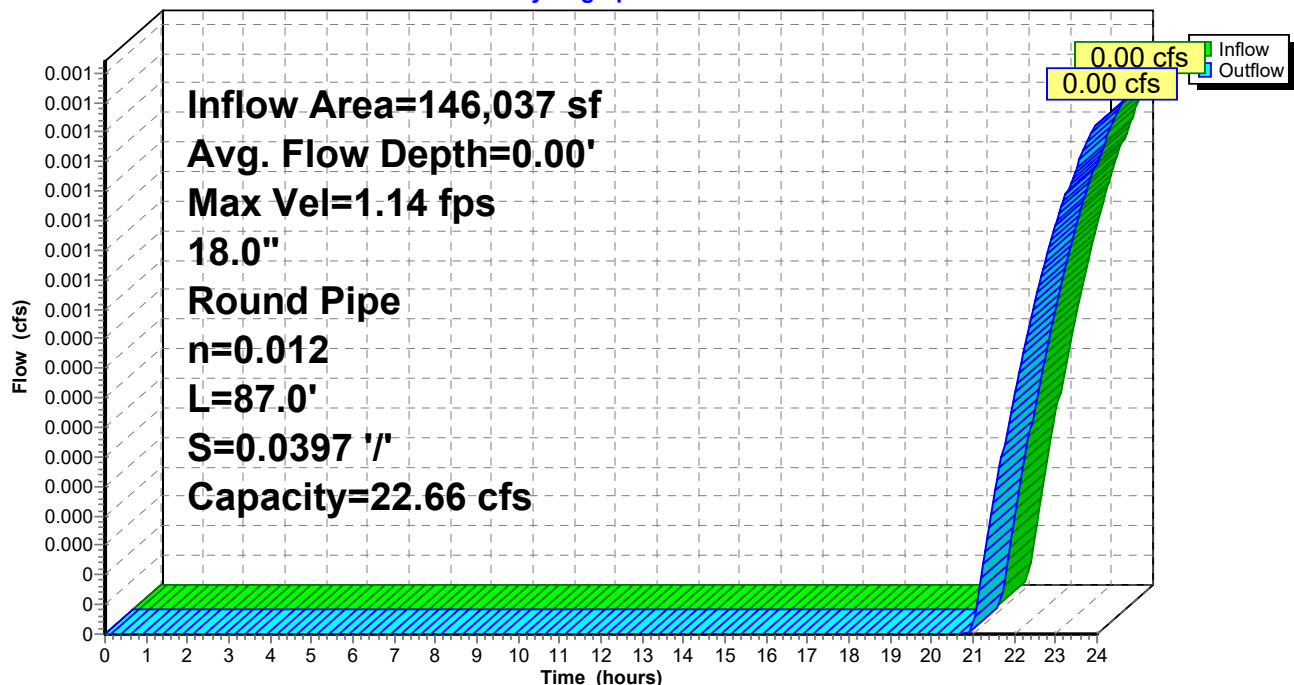
Peak Storage= 0 cf @ 24.00 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 0.15'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/'
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 6R: 18" PIPE

Hydrograph



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Type III 24-hr 1 YEAR Rainfall=2.33"

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Summary for Pond CB1: CB1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 0.59" for 1 YEAR event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 785 cf
Outflow = 0.19 cfs @ 12.09 hrs, Volume= 785 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.09 hrs, Volume= 785 cf
Routed to Pond MH1 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 434.21' @ 12.09 hrs

Flood Elev= 437.72'

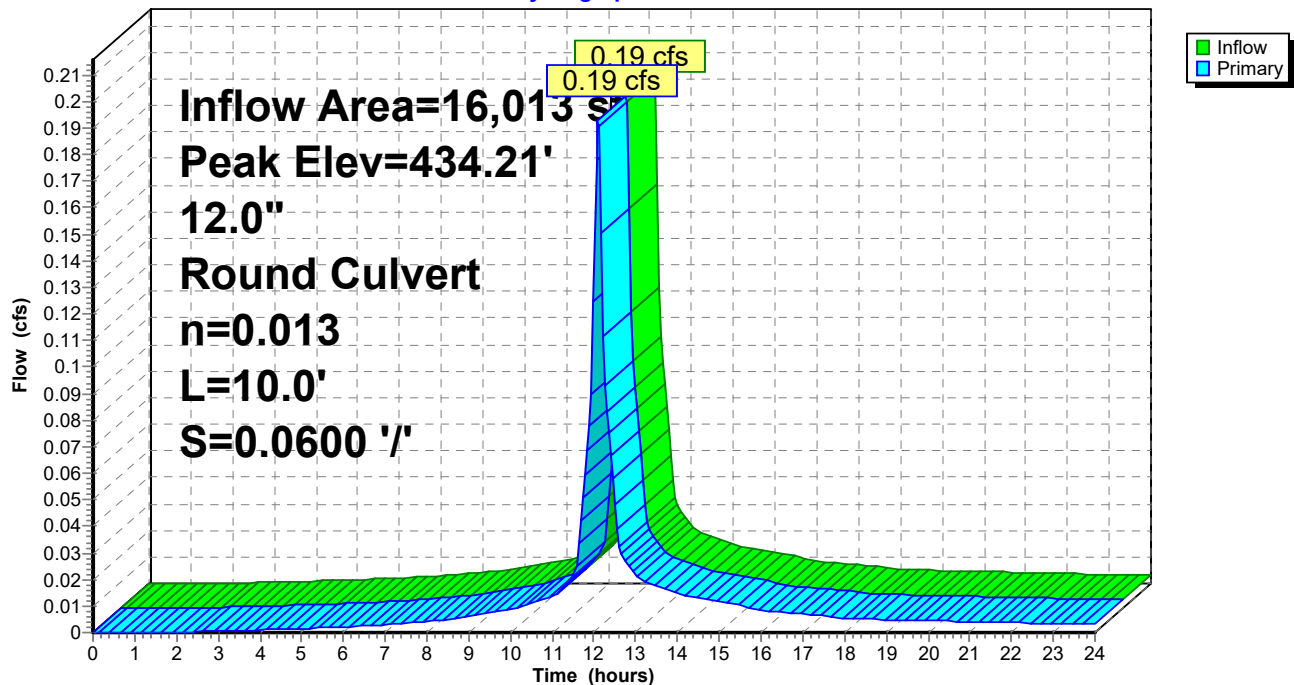
Device	Routing	Invert	Outlet Devices
#1	Primary	434.00'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 434.00' / 433.40' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.09 hrs HW=434.21' TW=433.51' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.19 cfs @ 1.56 fps)

Pond CB1: CB1

Hydrograph



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Summary for Pond CB2: CB2

Inflow Area = 3,467 sf, 100.00% Impervious, Inflow Depth > 2.10" for 1 YEAR event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 607 cf
Outflow = 0.17 cfs @ 12.09 hrs, Volume= 607 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.17 cfs @ 12.09 hrs, Volume= 607 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 428.20' @ 12.09 hrs

Flood Elev= 431.00'

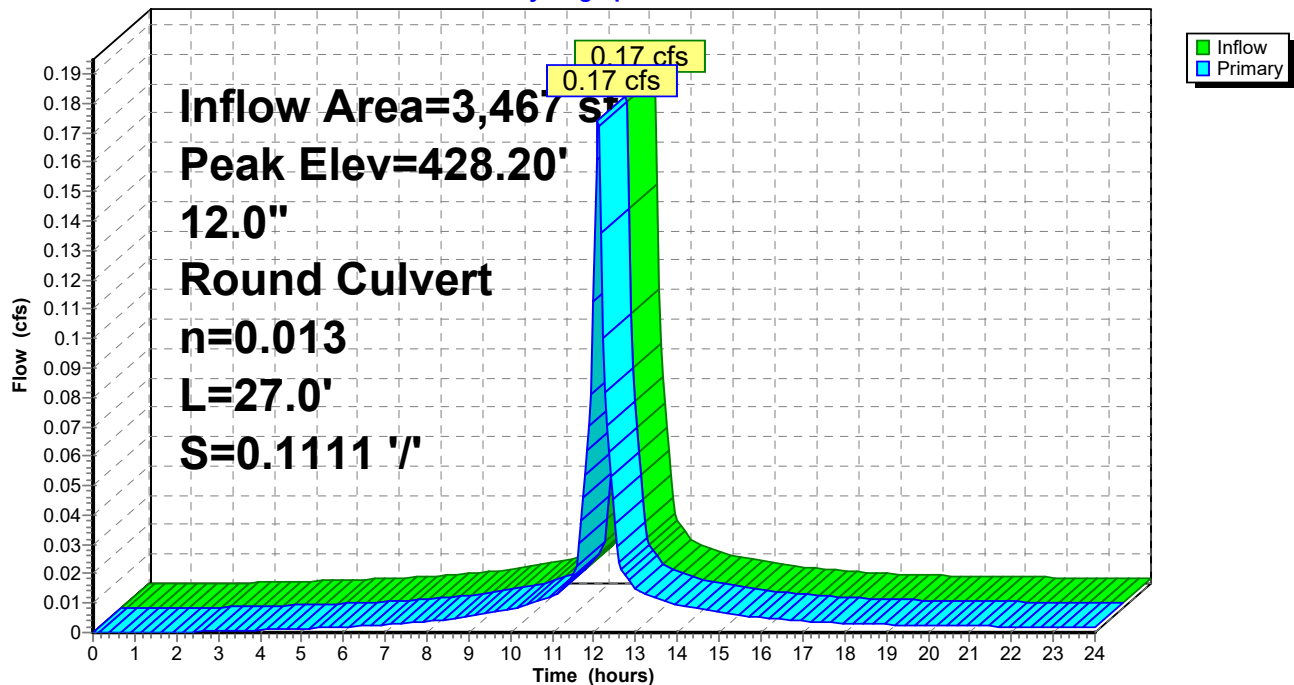
Device	Routing	Invert	Outlet Devices
#1	Primary	428.00'	12.0" Round Culvert L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 428.00' / 425.00' S= 0.1111 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.17 cfs @ 12.09 hrs HW=428.20' TW=425.27' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.17 cfs @ 1.52 fps)

Pond CB2: CB2

Hydrograph



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Summary for Pond CB3: CB3

Inflow Area = 4,257 sf, 90.72% Impervious, Inflow Depth > 1.71" for 1 YEAR event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 605 cf
Outflow = 0.19 cfs @ 12.09 hrs, Volume= 605 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.09 hrs, Volume= 605 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.21' @ 12.09 hrs

Flood Elev= 433.00'

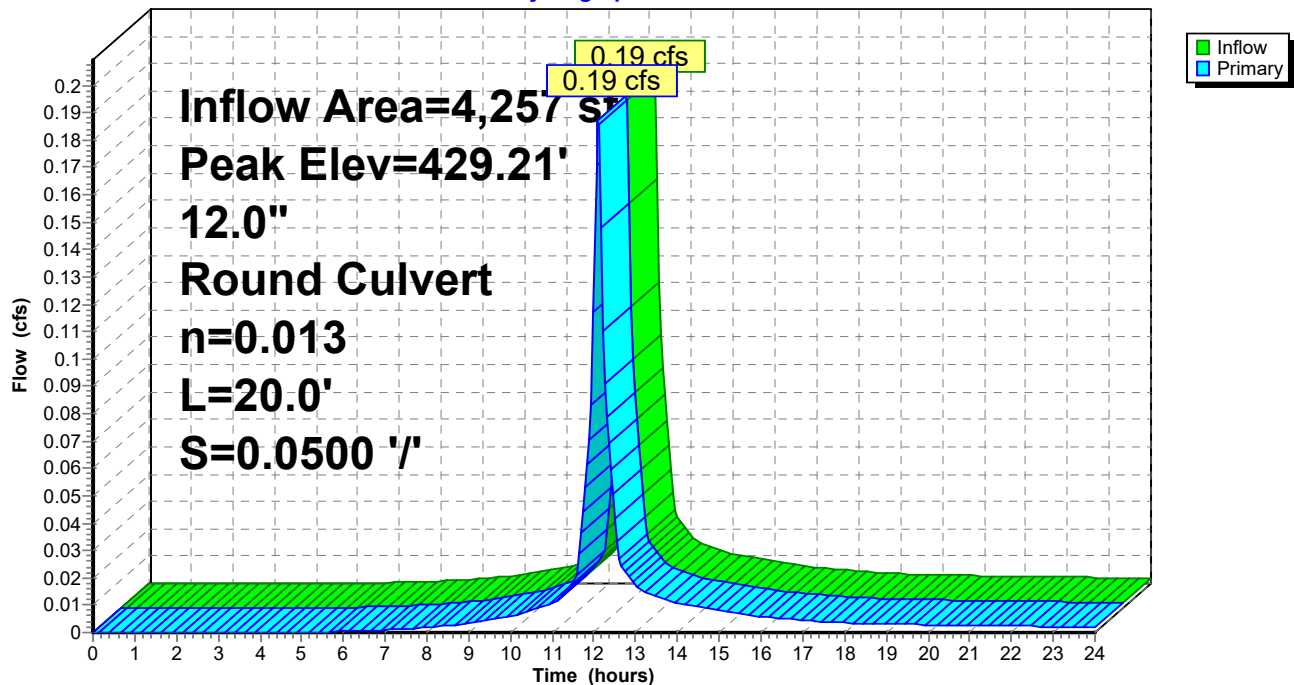
Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0500 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.09 hrs HW=429.21' TW=425.27' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.18 cfs @ 1.55 fps)

Pond CB3: CB3

Hydrograph



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Summary for Pond CB4: CB4

Inflow Area = 3,164 sf, 80.78% Impervious, Inflow Depth > 1.46" for 1 YEAR event
Inflow = 0.12 cfs @ 12.09 hrs, Volume= 384 cf
Outflow = 0.12 cfs @ 12.09 hrs, Volume= 384 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 12.09 hrs, Volume= 384 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.67' @ 12.09 hrs

Flood Elev= 427.50'

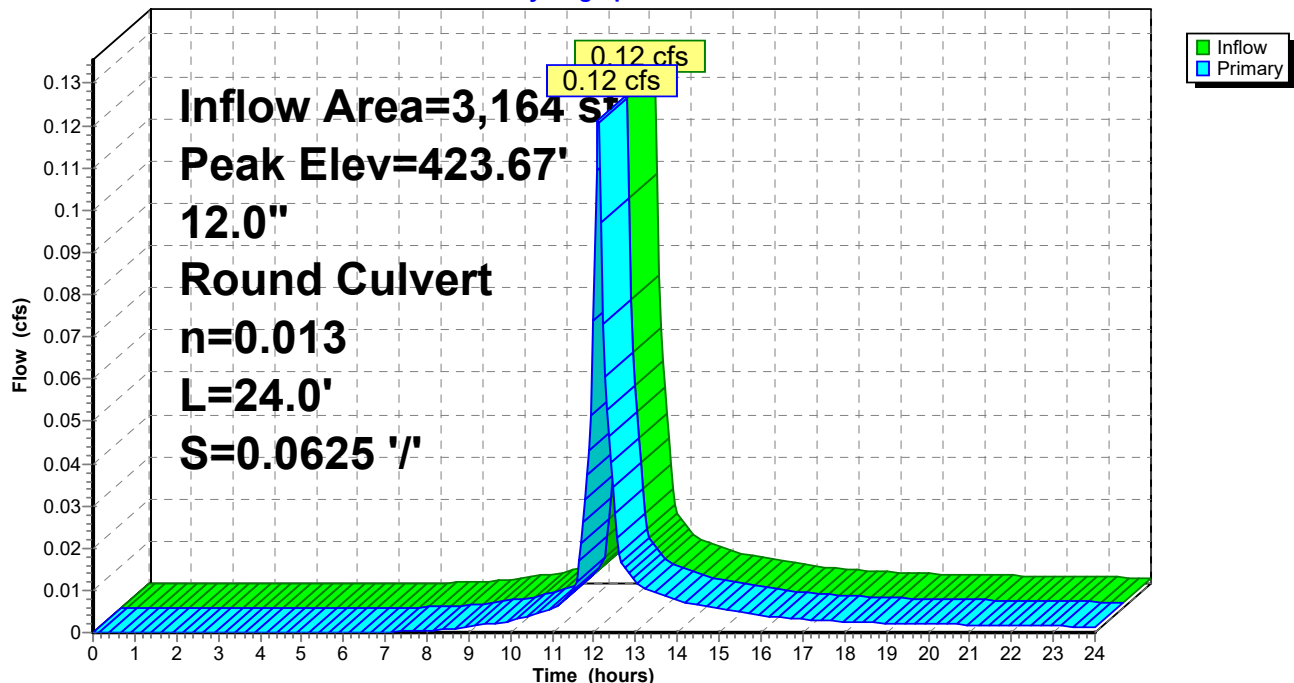
Device	Routing	Invert	Outlet Devices
#1	Primary	423.50'	12.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 423.50' / 422.00' S= 0.0625 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 12.09 hrs HW=423.67' TW=422.28' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.12 cfs @ 1.39 fps)

Pond CB4: CB4

Hydrograph



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Summary for Pond CB5: CB3

Inflow Area = 8,614 sf, 91.32% Impervious, Inflow Depth > 1.71" for 1 YEAR event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,225 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,225 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,225 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.30' @ 12.09 hrs

Flood Elev= 433.00'

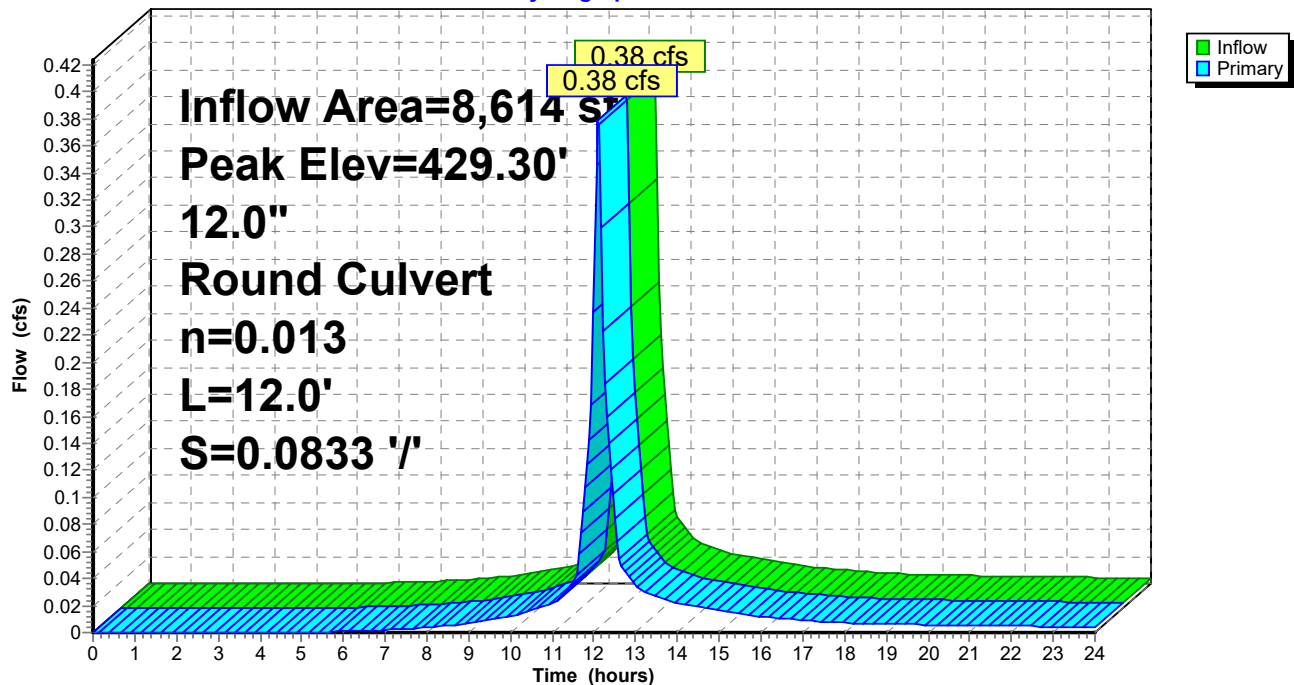
Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.09 hrs HW=429.30' TW=424.79' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.37 cfs @ 1.86 fps)

Pond CB5: CB3

Hydrograph



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Summary for Pond CB6: DMH1

Inflow Area = 41,072 sf, 49.60% Impervious, Inflow Depth > 0.68" for 1 YEAR event
Inflow = 0.57 cfs @ 12.09 hrs, Volume= 2,321 cf
Outflow = 0.57 cfs @ 12.09 hrs, Volume= 2,321 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 12.09 hrs, Volume= 2,321 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.56' @ 12.09 hrs

Flood Elev= 437.72'

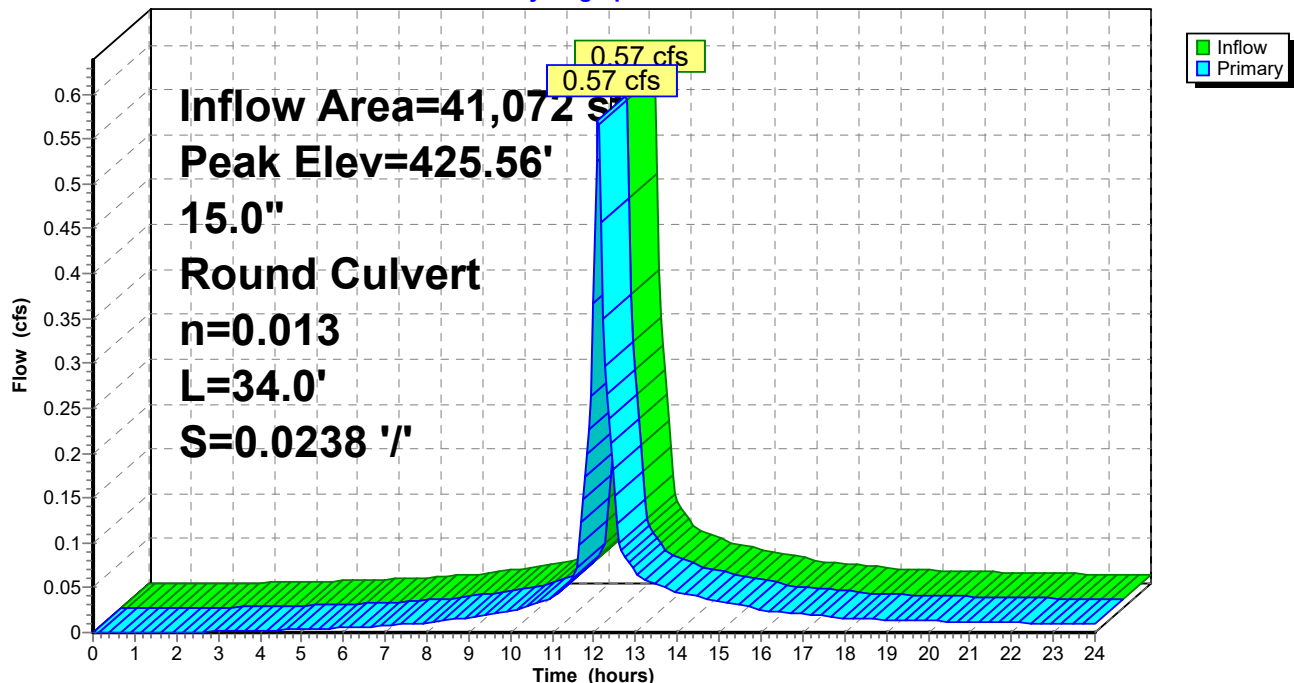
Device	Routing	Invert	Outlet Devices
#1	Primary	425.21'	15.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.21' / 424.40' S= 0.0238 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.56 cfs @ 12.09 hrs HW=425.56' TW=424.79' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.56 cfs @ 2.00 fps)

Pond CB6: DMH1

Hydrograph



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Summary for Pond CB7: CB7

Inflow Area = 13,675 sf, 77.19% Impervious, Inflow Depth > 1.38" for 1 YEAR event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 1,572 cf
Outflow = 0.50 cfs @ 12.09 hrs, Volume= 1,570 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.09 hrs, Volume= 1,570 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 422.83' @ 14.37 hrs

Flood Elev= 424.00'

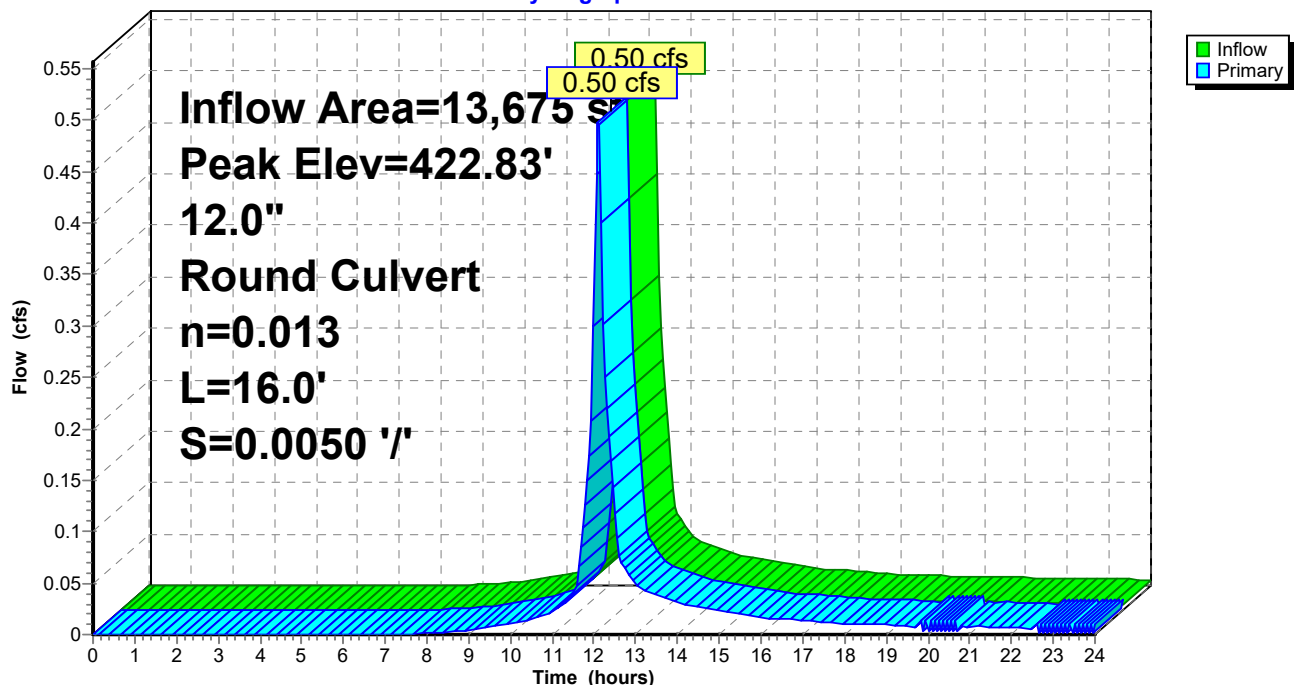
Device	Routing	Invert	Outlet Devices
#1	Primary	421.00'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.00' / 420.92' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.09 hrs HW=421.42' TW=421.25' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 0.46 cfs @ 2.18 fps)

Pond CB7: CB7

Hydrograph



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Summary for Pond CB8: CB8

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 0.55" for 1 YEAR event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,684 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,684 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,684 cf
Routed to Pond CB6 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 426.20' @ 12.09 hrs

Flood Elev= 431.50'

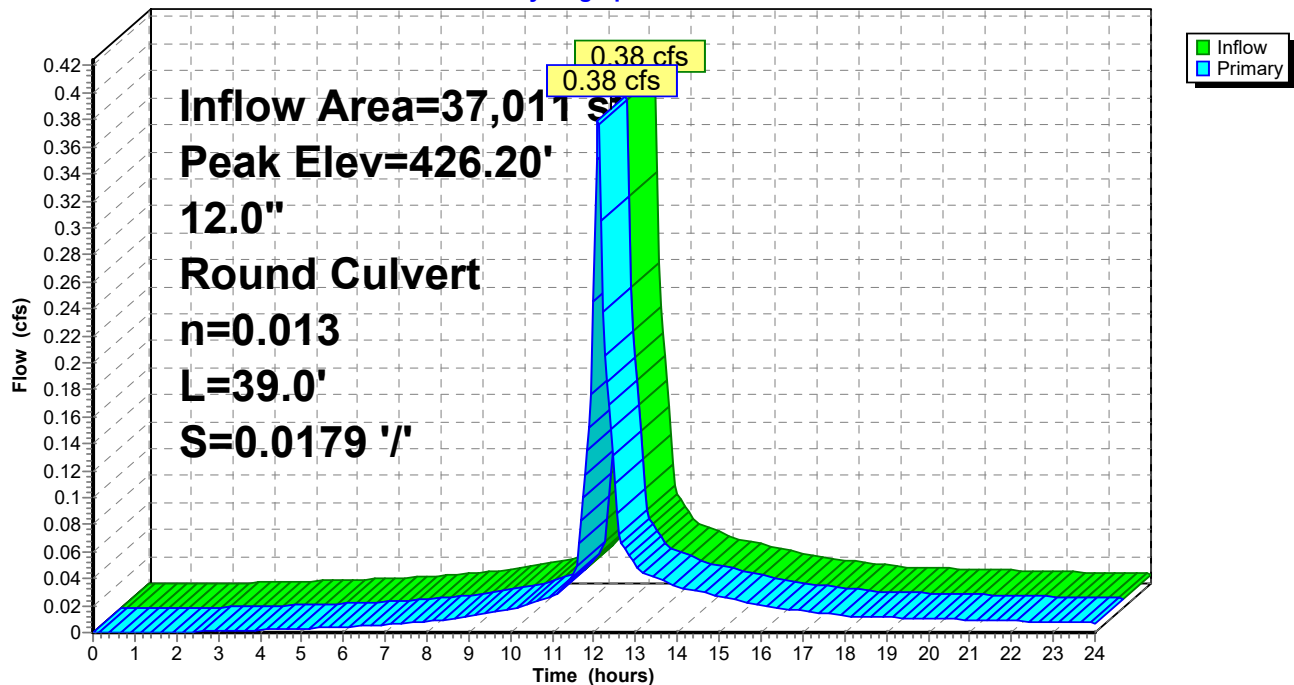
Device	Routing	Invert	Outlet Devices
#1	Primary	425.90'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.90' / 425.20' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.09 hrs HW=426.20' TW=425.56' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.37 cfs @ 1.87 fps)

Pond CB8: CB8

Hydrograph



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Summary for Pond CB9: CB-9

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 0.55" for 1 YEAR event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,684 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,684 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,684 cf
Routed to Pond CB8 : CB8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 427.80' @ 12.09 hrs

Flood Elev= 431.50'

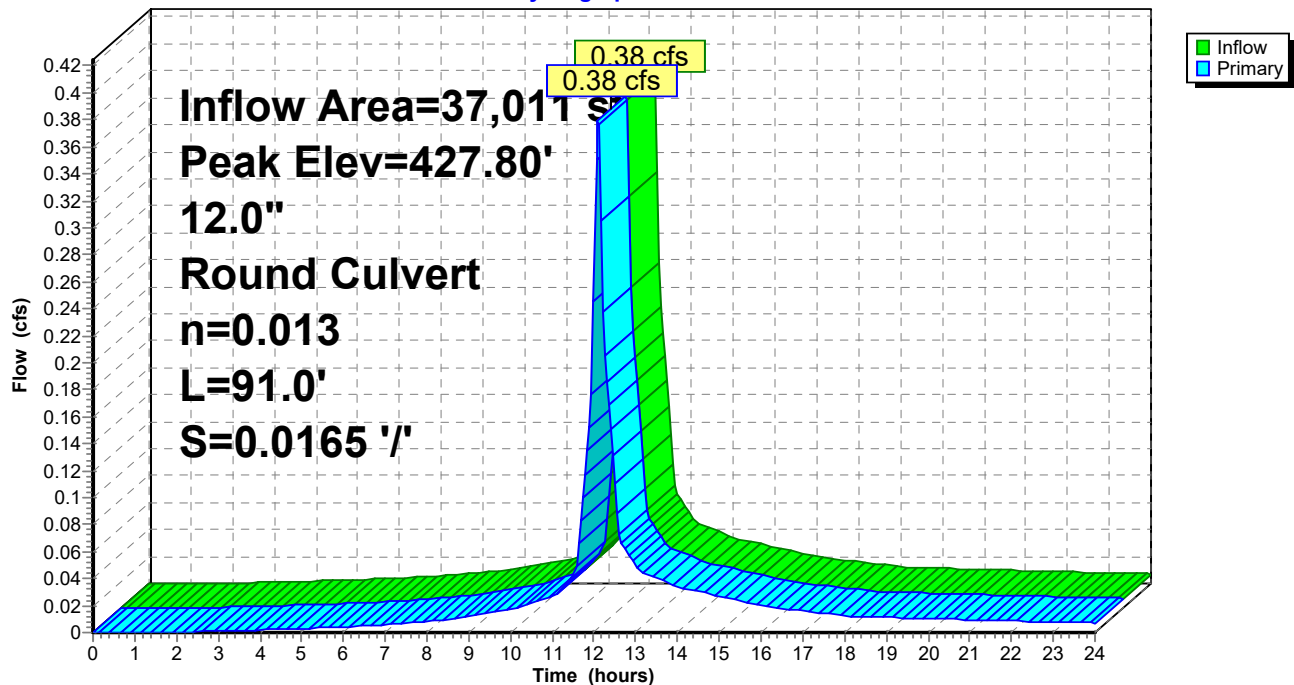
Device	Routing	Invert	Outlet Devices
#1	Primary	427.50'	12.0" Round Culvert L= 91.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 427.50' / 426.00' S= 0.0165 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.09 hrs HW=427.80' TW=426.20' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.37 cfs @ 1.87 fps)

Pond CB9: CB-9

Hydrograph



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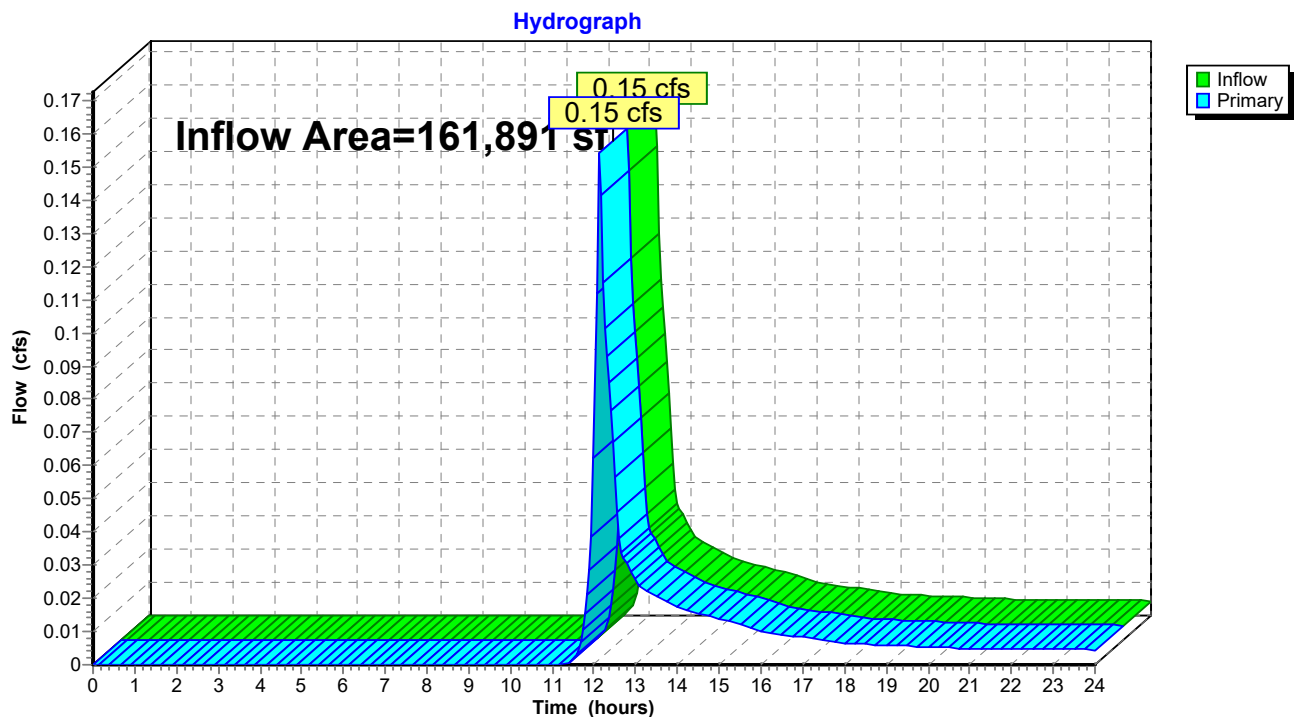
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Summary for Pond DP1: (new Pond)

Inflow Area = 161,891 sf, 24.20% Impervious, Inflow Depth > 0.05" for 1 YEAR event
Inflow = 0.15 cfs @ 12.11 hrs, Volume= 615 cf
Primary = 0.15 cfs @ 12.11 hrs, Volume= 615 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP1: (new Pond)



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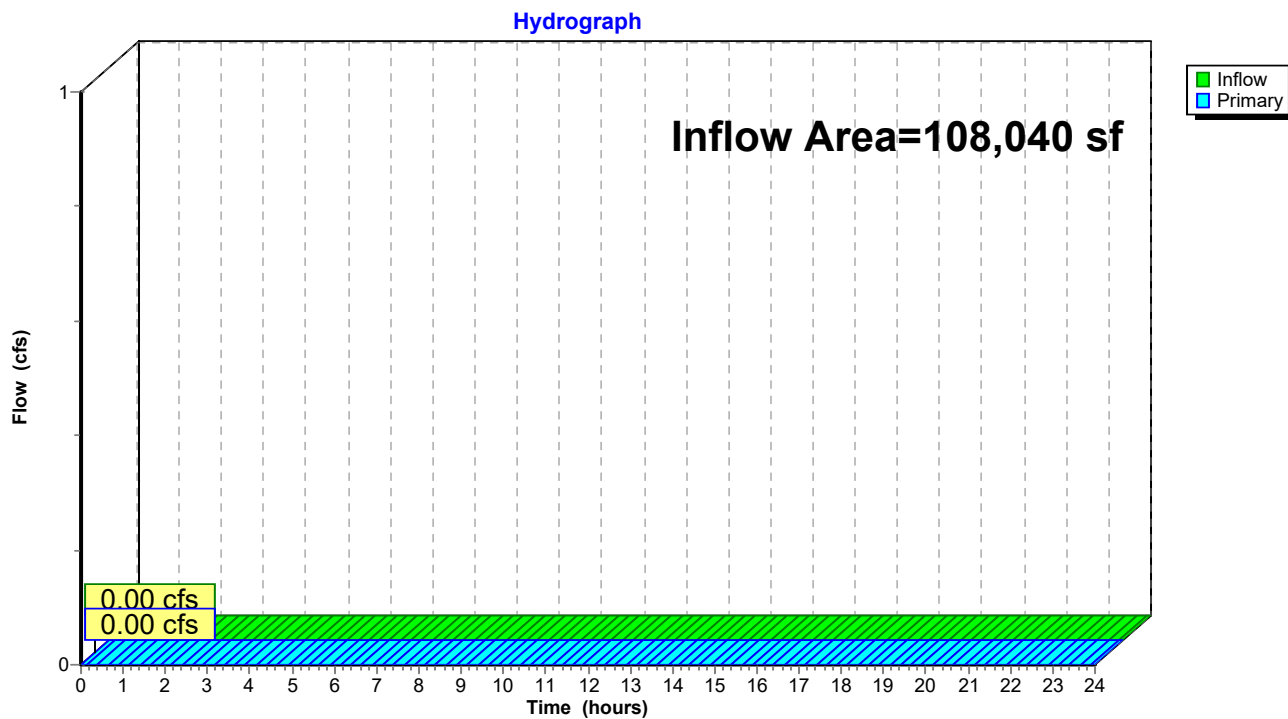
Page 43

Summary for Pond DP2: (new Pond)

Inflow Area = 108,040 sf, 55.16% Impervious, Inflow Depth = 0.00" for 1 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: (new Pond)



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Summary for Pond IP1: buried structure

Inflow Area = 90,262 sf, 58.44% Impervious, Inflow Depth > 1.00" for 1 YEAR event
 Inflow = 2.12 cfs @ 12.09 hrs, Volume= 7,492 cf
 Outflow = 0.13 cfs @ 14.27 hrs, Volume= 3,212 cf, Atten= 94%, Lag= 131.1 min
 Discarded = 0.04 cfs @ 9.75 hrs, Volume= 2,563 cf
 Primary = 0.04 cfs @ 14.27 hrs, Volume= 325 cf
 Routed to Pond IP2 : OPEN POND
 Secondary = 0.04 cfs @ 14.27 hrs, Volume= 325 cf
 Routed to Pond IP2 : OPEN POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 422.83' @ 14.27 hrs Surf.Area= 2,997 sf Storage= 4,448 cf
 Flood Elev= 423.08' Surf.Area= 2,997 sf Storage= 4,754 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 123.3 min (924.0 - 800.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	420.00'	2,989 cf	39.75'W x 75.40'L x 3.08'H Field A 9,241 cf Overall - 1,769 cf Embedded = 7,472 cf x 40.0% Voids
#2A	420.50'	1,769 cf	ADS_StormTech SC-310 +Cap x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		4,758 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	420.00'	0.600 in/hr Exfiltration over Surface area
#2	Primary	420.80'	12.0" Round Culvert L= 57.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.80' / 420.00' S= 0.0140 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Secondary	421.90'	15.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.00' S= 0.0237 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#5	Device 4	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

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Discarded OutFlow Max=0.04 cfs @ 9.75 hrs HW=420.03' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.04 cfs @ 14.27 hrs HW=422.83' TW=418.04' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 0.04 cfs of 4.67 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.44 fps)

Secondary OutFlow Max=0.04 cfs @ 14.27 hrs HW=422.83' TW=418.04' (Dynamic Tailwater)

↑ **4=Culvert** (Passes 0.04 cfs of 3.19 cfs potential flow)

↑ **5=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.44 fps)

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Pond IP1: buried structure - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)

Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf

Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 3.0" Spacing = 37.0" C-C Row Spacing

10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +18.0" End Stone x 2 = 75.40' Base Length

12 Rows x 34.0" Wide + 3.0" Spacing x 11 + 18.0" Side Stone x 2 = 39.75' Base Width

6.0" Stone Base + 16.0" Chamber Height + 15.0" Stone Cover = 3.08' Field Height

120 Chambers x 14.7 cf = 1,769.0 cf Chamber Storage

9,241.2 cf Field - 1,769.0 cf Chambers = 7,472.2 cf Stone x 40.0% Voids = 2,988.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,757.9 cf = 0.109 af

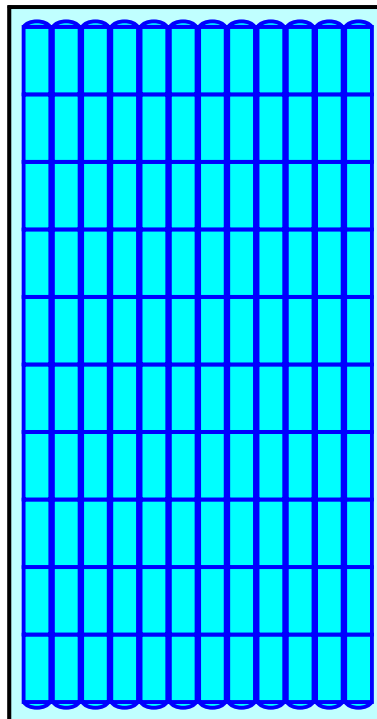
Overall Storage Efficiency = 51.5%

Overall System Size = 75.40' x 39.75' x 3.08'

120 Chambers

342.3 cy Field

276.7 cy Stone



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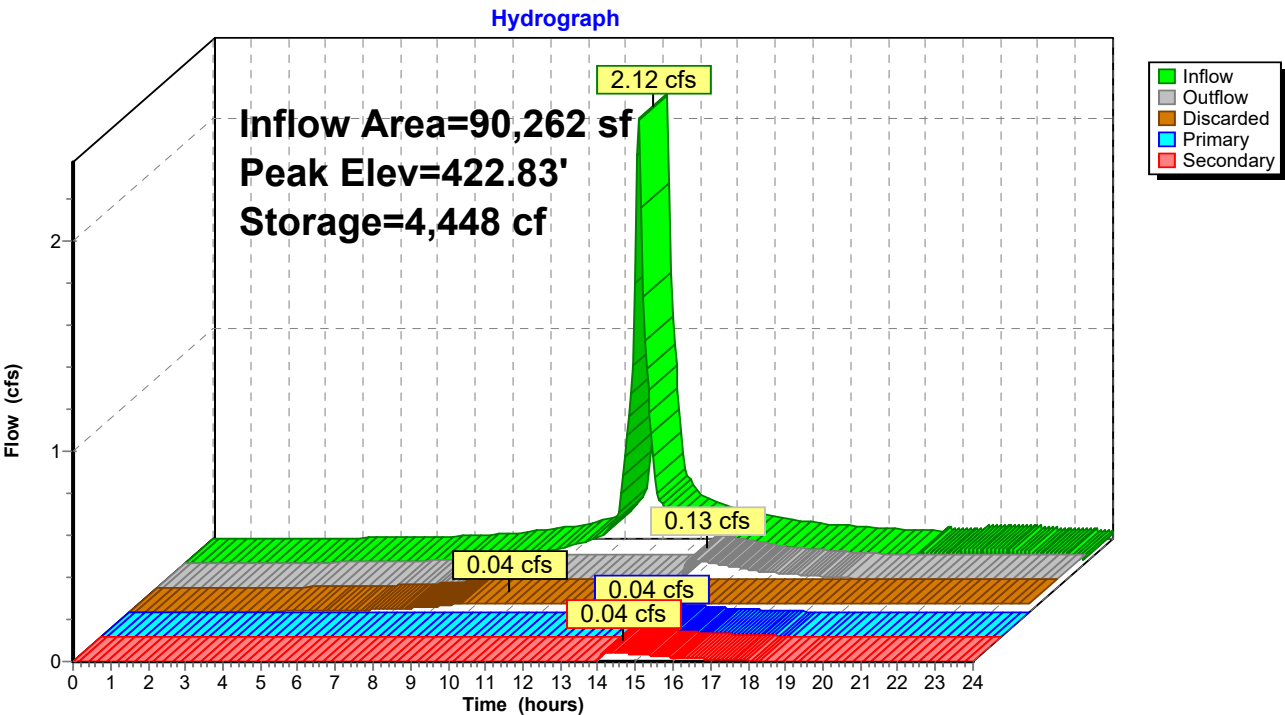
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Pond IP1: buried structure



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Summary for Pond IP2: OPEN POND

Inflow Area = 103,153 sf, 57.77% Impervious, Inflow Depth > 0.18" for 1 YEAR event
 Inflow = 0.27 cfs @ 12.10 hrs, Volume= 1,533 cf
 Outflow = 0.05 cfs @ 15.95 hrs, Volume= 1,535 cf, Atten= 81%, Lag= 231.2 min
 Discarded = 0.05 cfs @ 15.95 hrs, Volume= 1,535 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond DP2 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 418.09' @ 15.95 hrs Surf.Area= 3,792 sf Storage= 325 cf
 Flood Elev= 422.00' Surf.Area= 7,434 sf Storage= 21,946 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 58.6 min (945.5 - 886.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	418.00'	21,946 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)
418.00	3,724	260.0	0	0	3,724
420.00	5,447	311.0	9,117	9,117	6,111
422.00	7,434	351.0	12,830	21,946	8,319

Device	Routing	Invert	Outlet Devices												
#1	Primary	420.85'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir												
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00												
			2.50 3.00 3.50 4.00 4.50 5.00 5.50												
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64												
			2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74												
#2	Discarded	418.00'	0.600 in/hr Exfiltration over Surface area												

Discarded OutFlow Max=0.05 cfs @ 15.95 hrs HW=418.09' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=418.00' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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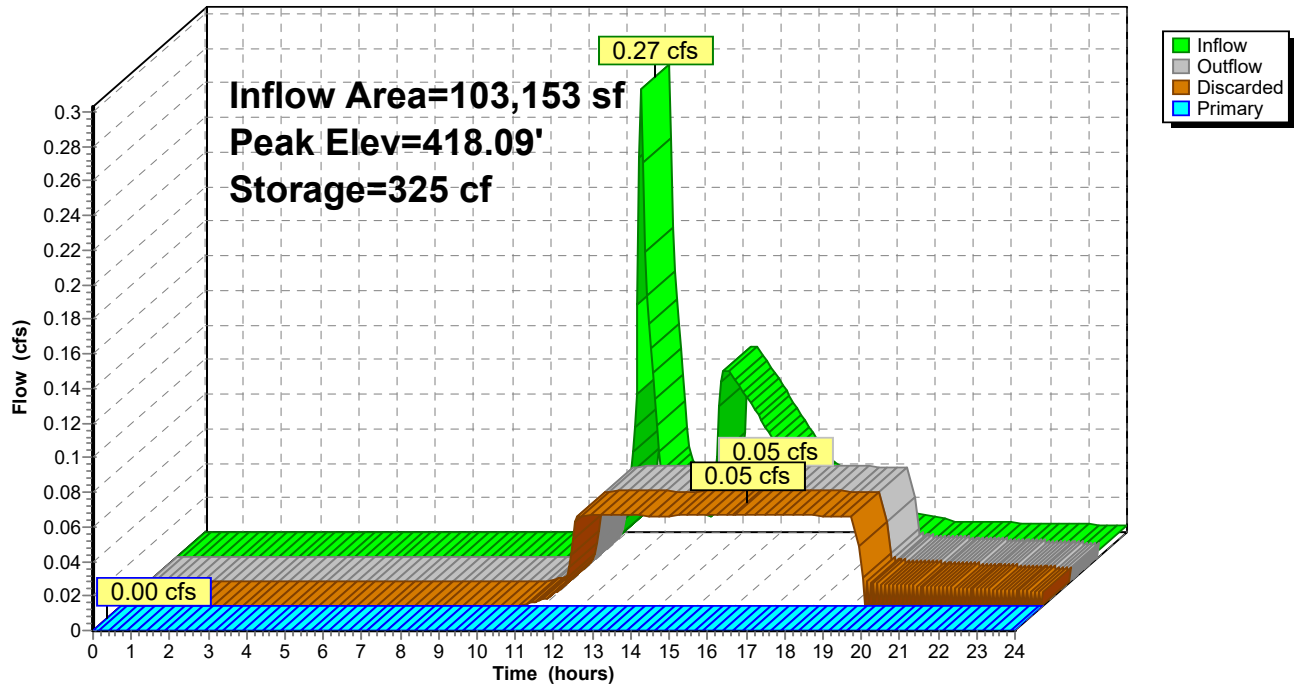
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Pond IP2: OPEN POND

Hydrograph



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Summary for Pond MH1: DMH1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 0.59" for 1 YEAR event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 785 cf
Outflow = 0.19 cfs @ 12.09 hrs, Volume= 785 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.09 hrs, Volume= 785 cf
Routed to Pond MH2 : MH2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 433.51' @ 12.09 hrs

Flood Elev= 437.72'

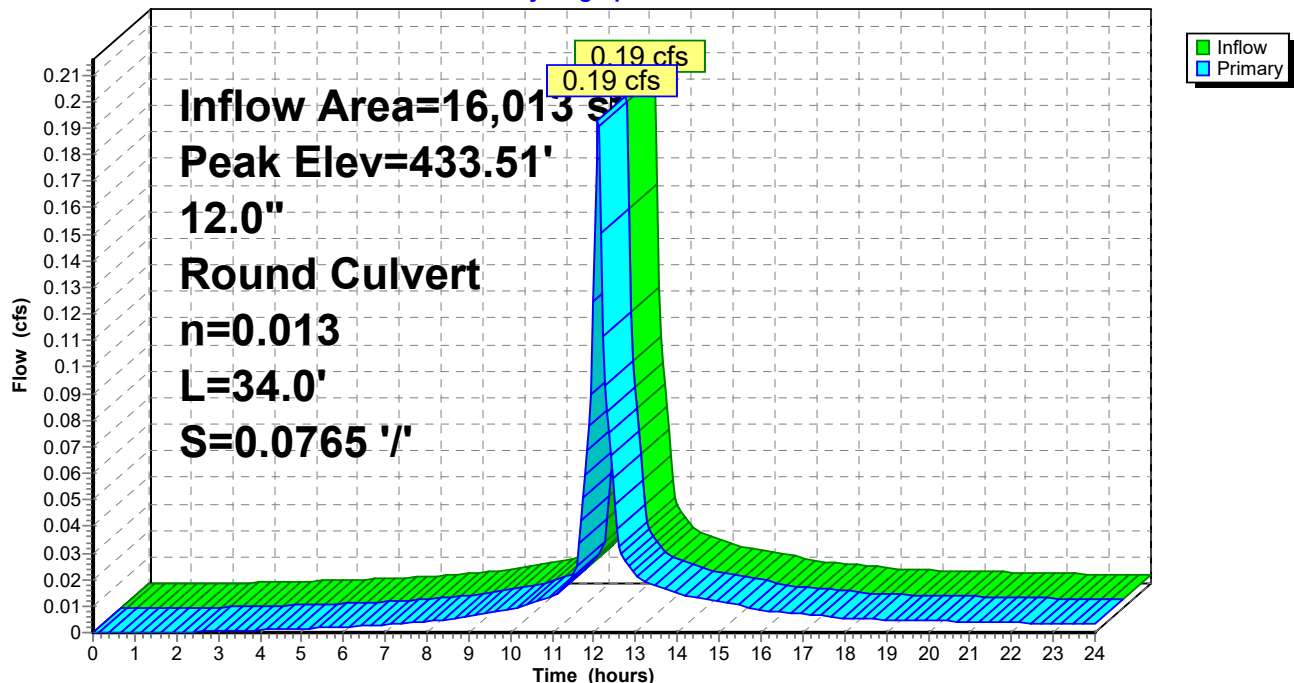
Device	Routing	Invert	Outlet Devices
#1	Primary	433.30'	12.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 433.30' / 430.70' S= 0.0765 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.09 hrs HW=433.51' TW=430.81' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.19 cfs @ 1.56 fps)

Pond MH1: DMH1

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Summary for Pond MH2: MH2

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 0.59" for 1 YEAR event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 785 cf
Outflow = 0.19 cfs @ 12.09 hrs, Volume= 785 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.09 hrs, Volume= 785 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 430.81' @ 12.09 hrs

Flood Elev= 434.70'

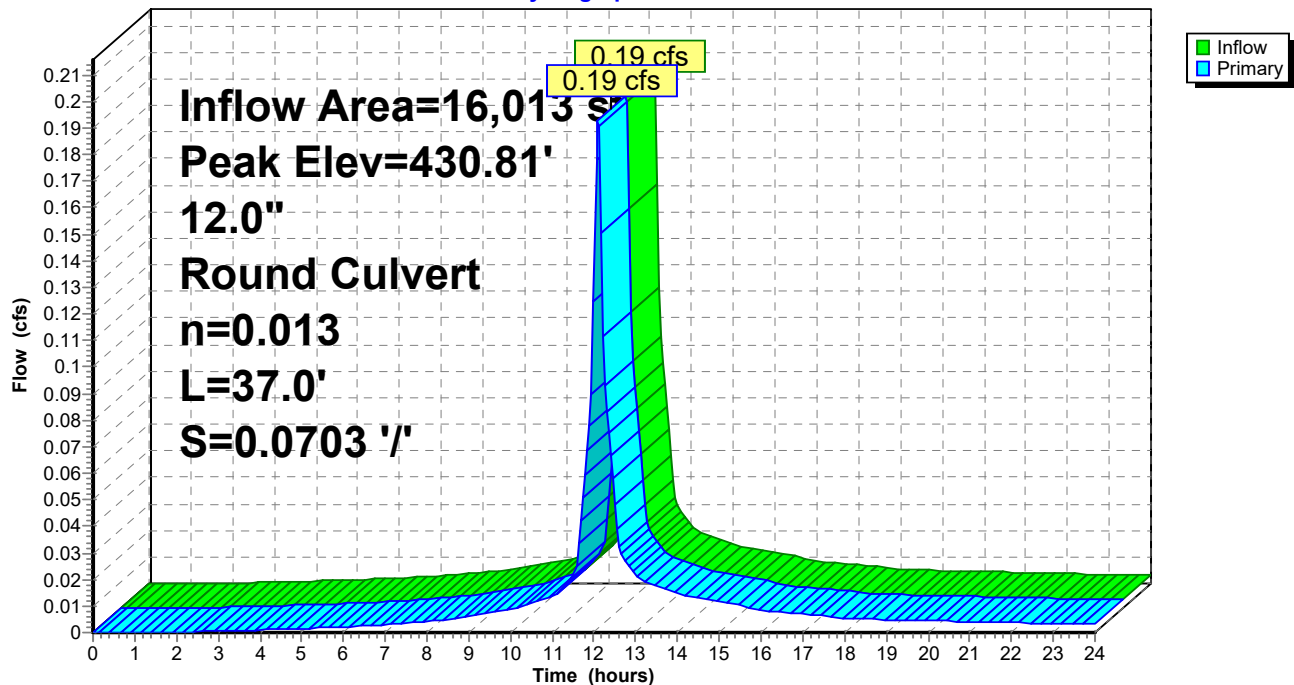
Device	Routing	Invert	Outlet Devices
#1	Primary	430.60'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 430.60' / 428.00' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.09 hrs HW=430.81' TW=425.27' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.19 cfs @ 1.56 fps)

Pond MH2: MH2

Hydrograph



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Summary for Pond MH3: MH3

Inflow Area = 23,737 sf, 48.03% Impervious, Inflow Depth > 1.01" for 1 YEAR event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 1,997 cf
Outflow = 0.55 cfs @ 12.09 hrs, Volume= 1,997 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.55 cfs @ 12.09 hrs, Volume= 1,997 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.27' @ 12.09 hrs

Flood Elev= 432.00'

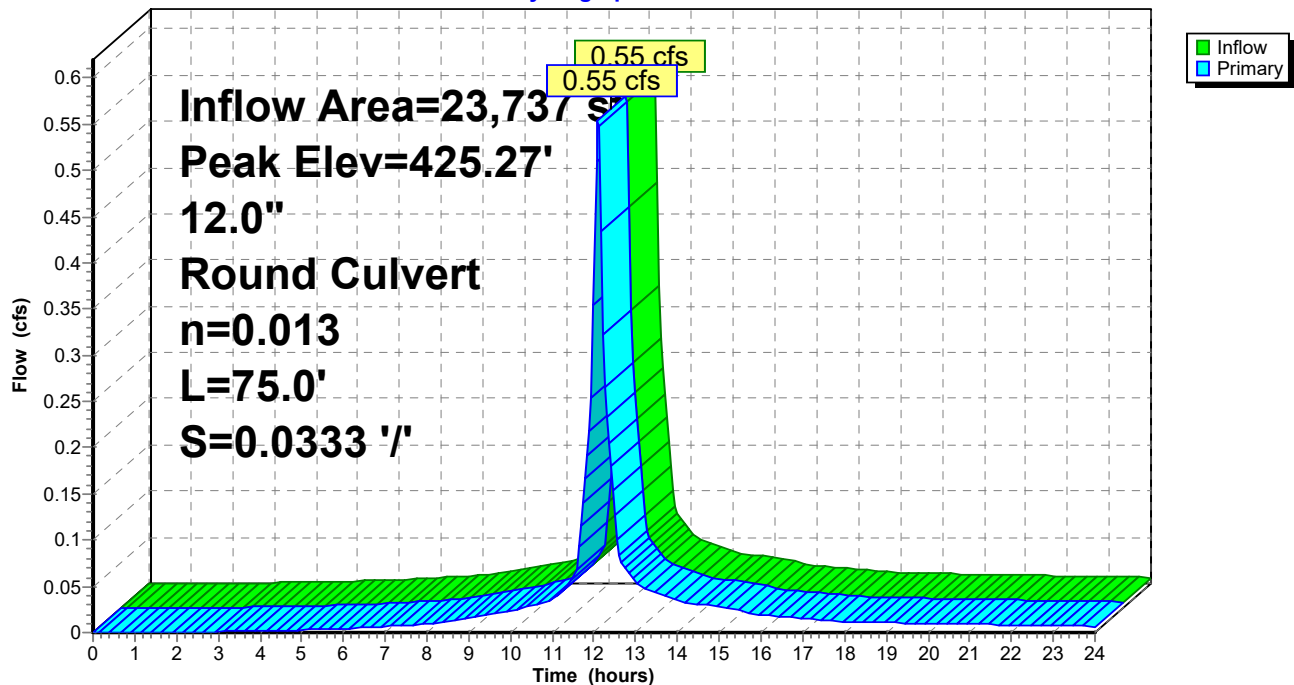
Device	Routing	Invert	Outlet Devices
#1	Primary	424.90'	12.0" Round Culvert L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.90' / 422.40' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.54 cfs @ 12.09 hrs HW=425.27' TW=422.28' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.54 cfs @ 2.06 fps)

Pond MH3: MH3

Hydrograph



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Summary for Pond MH4: MH4

Inflow Area = 26,901 sf, 51.88% Impervious, Inflow Depth > 1.06" for 1 YEAR event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,381 cf
Outflow = 0.67 cfs @ 12.09 hrs, Volume= 2,375 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,375 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 422.83' @ 14.32 hrs

Flood Elev= 426.00'

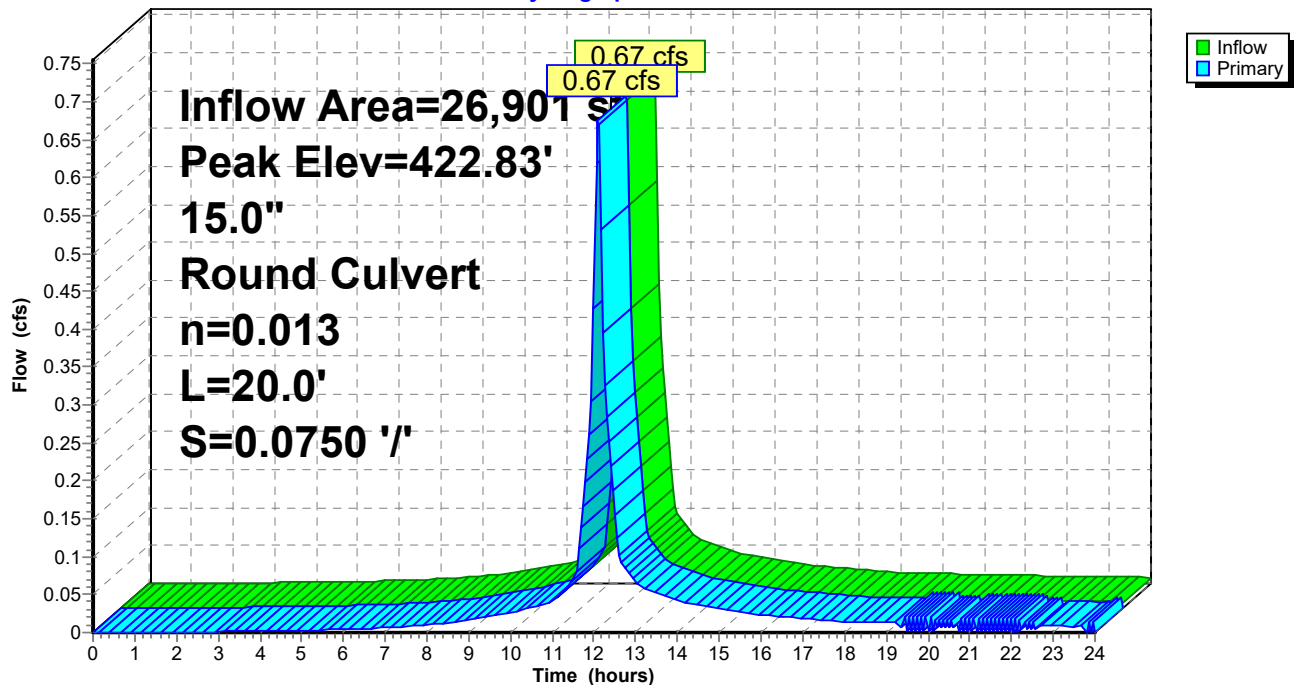
Device	Routing	Invert	Outlet Devices
#1	Primary	421.90'	15.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.40' S= 0.0750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.66 cfs @ 12.09 hrs HW=422.28' TW=421.08' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.66 cfs @ 2.10 fps)

Pond MH4: MH4

Hydrograph



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Summary for Pond MH5: DMH1

Inflow Area = 49,686 sf, 56.83% Impervious, Inflow Depth > 0.86" for 1 YEAR event
Inflow = 0.95 cfs @ 12.09 hrs, Volume= 3,546 cf
Outflow = 0.95 cfs @ 12.09 hrs, Volume= 3,546 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.95 cfs @ 12.09 hrs, Volume= 3,546 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 424.80' @ 12.09 hrs

Flood Elev= 430.00'

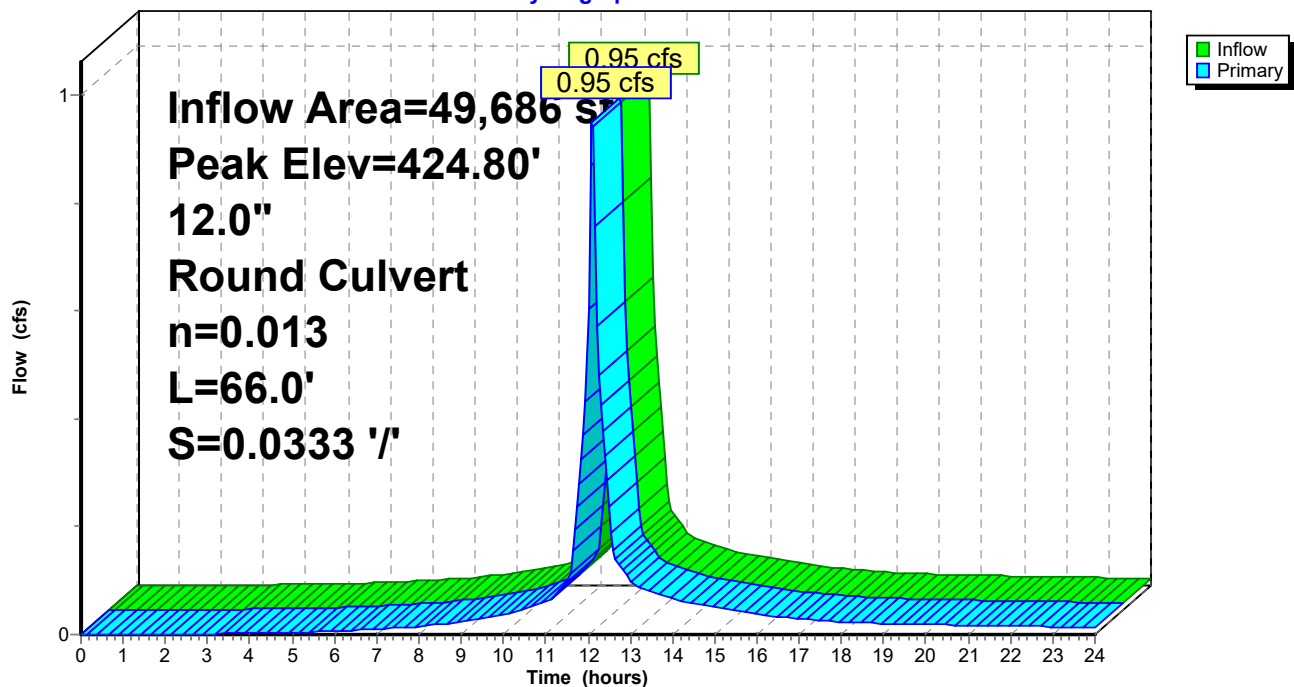
Device	Routing	Invert	Outlet Devices
#1	Primary	424.30'	12.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.30' / 422.10' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.93 cfs @ 12.09 hrs HW=424.79' TW=421.25' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.93 cfs @ 2.39 fps)

Pond MH5: DMH1

Hydrograph



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Summary for Pond MH6: MH6

Inflow Area = 63,361 sf, 61.23% Impervious, Inflow Depth > 0.97" for 1 YEAR event
Inflow = 1.45 cfs @ 12.09 hrs, Volume= 5,117 cf
Outflow = 1.45 cfs @ 12.09 hrs, Volume= 5,117 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.45 cfs @ 12.09 hrs, Volume= 5,117 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 422.83' @ 14.32 hrs

Flood Elev= 424.00'

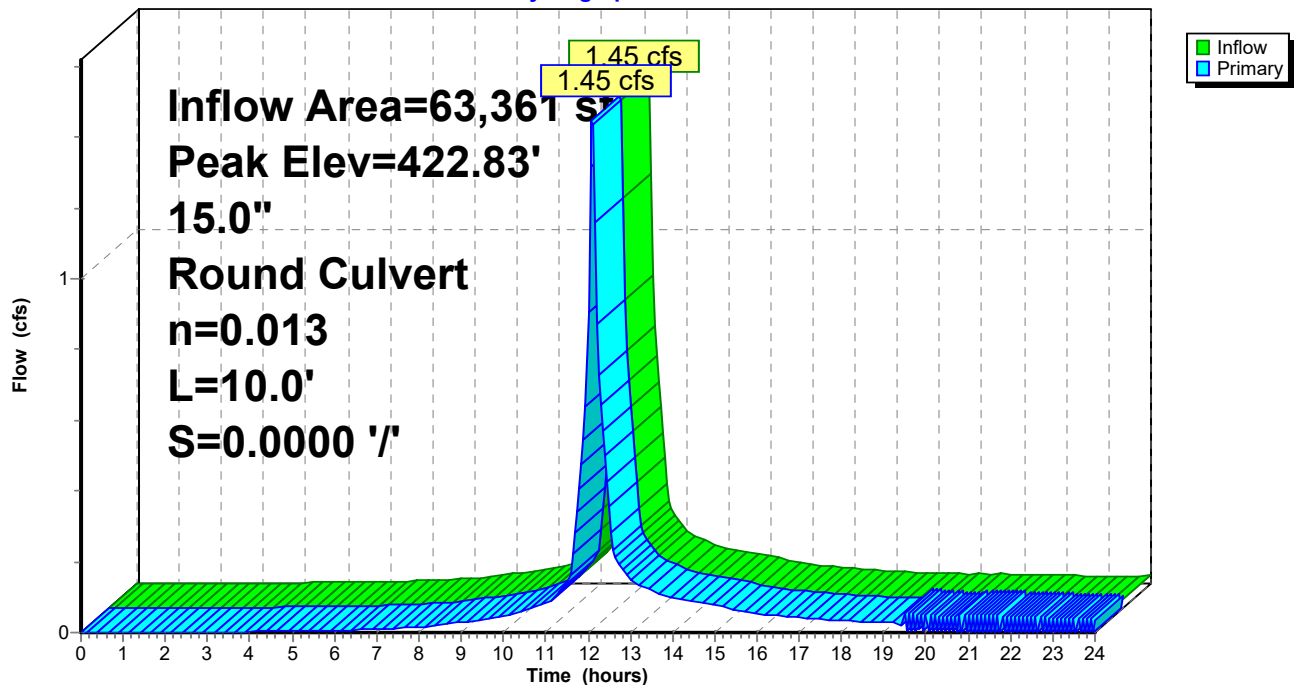
Device	Routing	Invert	Outlet Devices
#1	Primary	420.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.50' / 420.50' S= 0.0000 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.31 cfs @ 12.09 hrs HW=421.25' TW=421.09' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 1.31 cfs @ 2.44 fps)

Pond MH6: MH6

Hydrograph



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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

SubcatchmentP1: SITE AREA	Runoff Area=5,853 sf 9.53% Impervious Runoff Depth>0.40" Flow Length=68' Tc=6.0 min CN=65 Runoff=0.04 cfs 195 cf
SubcatchmentP10: P10	Runoff Area=4,887 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=32 Runoff=0.00 cfs 0 cf
SubcatchmentP11: P11	Runoff Area=10,001 sf 63.52% Impervious Runoff Depth>0.86" Flow Length=303' Tc=6.0 min CN=76 Runoff=0.21 cfs 713 cf
SubcatchmentP12: OFF SITE	Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.02" Flow Length=729' Tc=6.0 min CN=47 Runoff=0.01 cfs 261 cf
SubcatchmentP2: P-2	Runoff Area=4,257 sf 90.72% Impervious Runoff Depth>2.12" Tc=6.0 min CN=94 Runoff=0.23 cfs 751 cf
SubcatchmentP3: P-3	Runoff Area=3,164 sf 80.78% Impervious Runoff Depth>1.85" Tc=6.0 min CN=91 Runoff=0.15 cfs 487 cf
SubcatchmentP4: P-4	Runoff Area=8,614 sf 91.32% Impervious Runoff Depth>2.12" Tc=6.0 min CN=94 Runoff=0.46 cfs 1,520 cf
SubcatchmentP5: P-5	Runoff Area=2,890 sf 92.53% Impervious Runoff Depth>2.21" Tc=6.0 min CN=95 Runoff=0.16 cfs 533 cf
SubcatchmentP6: P-6	Runoff Area=13,675 sf 77.19% Impervious Runoff Depth>1.76" Tc=6.0 min CN=90 Runoff=0.63 cfs 2,010 cf
SubcatchmentP7: P-7	Runoff Area=12,891 sf 53.09% Impervious Runoff Depth>1.13" Tc=6.0 min CN=81 Runoff=0.38 cfs 1,215 cf
SubcatchmentP8: P-8	Runoff Area=12,175 sf 1.91% Impervious Runoff Depth>0.23" Flow Length=175' Tc=6.2 min CN=59 Runoff=0.03 cfs 228 cf
SubcatchmentP9: (new Subcat)	Runoff Area=29,471 sf 30.49% Impervious Runoff Depth>0.28" Flow Length=297' Tc=6.0 min CN=61 Runoff=0.09 cfs 683 cf
SubcatchmentR1: ROOF 1	Runoff Area=3,838 sf 100.00% Impervious Runoff Depth>2.53" Tc=6.0 min CN=98 Runoff=0.23 cfs 808 cf
SubcatchmentR2: ROOF 2	Runoff Area=4,073 sf 100.00% Impervious Runoff Depth>2.53" Tc=6.0 min CN=98 Runoff=0.24 cfs 858 cf
SubcatchmentR3: ROOF 3	Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>2.53" Tc=6.0 min CN=98 Runoff=0.21 cfs 730 cf
SubcatchmentR4: ROOF 4	Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>2.53" Tc=6.0 min CN=98 Runoff=0.21 cfs 730 cf

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SubcatchmentR5: ROOF 5Runoff Area=1,171 sf 100.00% Impervious Runoff Depth>2.53"
Tc=6.0 min CN=98 Runoff=0.07 cfs 247 cf**Reach 3R: 12" PIPE**Avg. Flow Depth=0.13' Max Vel=2.89 fps Inflow=0.21 cfs 974 cf
18.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=14.01 cfs Outflow=0.21 cfs 974 cf**Reach 6R: 18" PIPE**Avg. Flow Depth=0.02' Max Vel=1.60 fps Inflow=0.01 cfs 261 cf
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.01 cfs 261 cf**Pond CB1: CB1**Peak Elev=434.24' Inflow=0.24 cfs 1,037 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0600 '/' Outflow=0.24 cfs 1,037 cf**Pond CB2: CB2**Peak Elev=428.22' Inflow=0.21 cfs 730 cf
12.0" Round Culvert n=0.013 L=27.0' S=0.1111 '/' Outflow=0.21 cfs 730 cf**Pond CB3: CB3**Peak Elev=429.23' Inflow=0.23 cfs 751 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0500 '/' Outflow=0.23 cfs 751 cf**Pond CB4: CB4**Peak Elev=423.69' Inflow=0.15 cfs 487 cf
12.0" Round Culvert n=0.013 L=24.0' S=0.0625 '/' Outflow=0.15 cfs 487 cf**Pond CB5: CB3**Peak Elev=429.34' Inflow=0.46 cfs 1,520 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0833 '/' Outflow=0.46 cfs 1,520 cf**Pond CB6: DMH1**Peak Elev=425.62' Inflow=0.75 cfs 3,051 cf
15.0" Round Culvert n=0.013 L=34.0' S=0.0238 '/' Outflow=0.75 cfs 3,051 cf**Pond CB7: CB7**Peak Elev=422.90' Inflow=0.63 cfs 2,010 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=0.63 cfs 2,009 cf**Pond CB8: CB8**Peak Elev=426.26' Inflow=0.52 cfs 2,271 cf
12.0" Round Culvert n=0.013 L=39.0' S=0.0179 '/' Outflow=0.52 cfs 2,271 cf**Pond CB9: CB-9**Peak Elev=427.86' Inflow=0.52 cfs 2,271 cf
12.0" Round Culvert n=0.013 L=91.0' S=0.0165 '/' Outflow=0.52 cfs 2,271 cf**Pond DP1: (new Pond)**Inflow=0.25 cfs 1,169 cf
Primary=0.25 cfs 1,169 cf**Pond DP2: (new Pond)**Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf**Pond IP1: buried structure**Peak Elev=422.89' Storage=4,528 cf Inflow=2.67 cfs 9,582 cf
Discarded=0.04 cfs 2,666 cf Primary=0.31 cfs 1,266 cf Secondary=0.31 cfs 1,266 cf Outflow=0.65 cfs 5,198 cf**Pond IP2: OPEN POND**Peak Elev=418.55' Storage=2,173 cf Inflow=0.70 cfs 3,746 cf
Discarded=0.06 cfs 2,568 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 2,568 cf**Pond MH1: DMH1**Peak Elev=433.54' Inflow=0.24 cfs 1,037 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0765 '/' Outflow=0.24 cfs 1,037 cf**Pond MH2: MH2**Peak Elev=430.84' Inflow=0.24 cfs 1,037 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0703 '/' Outflow=0.24 cfs 1,037 cf

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Pond MH3: MH3

Peak Elev=425.31' Inflow=0.67 cfs 2,518 cf
12.0" Round Culvert n=0.013 L=75.0' S=0.0333 '/' Outflow=0.67 cfs 2,518 cf

Pond MH4: MH4

Peak Elev=422.89' Inflow=0.83 cfs 3,005 cf
15.0" Round Culvert n=0.013 L=20.0' S=0.0750 '/' Outflow=0.83 cfs 3,006 cf

Pond MH5: DMH1

Peak Elev=424.88' Inflow=1.21 cfs 4,571 cf
12.0" Round Culvert n=0.013 L=66.0' S=0.0333 '/' Outflow=1.21 cfs 4,571 cf

Pond MH6: MH6

Peak Elev=422.89' Inflow=1.84 cfs 6,579 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0000 '/' Outflow=1.84 cfs 6,576 cf

Total Runoff Area = 269,931 sf Runoff Volume = 11,970 cf Average Runoff Depth = 0.53"
63.41% Pervious = 171,155 sf 36.59% Impervious = 98,776 sf

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Summary for Subcatchment P1: SITE AREA

Runoff = 0.04 cfs @ 12.12 hrs, Volume= 195 cf, Depth> 0.40"
 Routed to Pond DP1 : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
558	98	Paved parking, HSG B
5,295	61	>75% Grass cover, Good, HSG B
5,853	65	Weighted Average
5,295		90.47% Pervious Area
558		9.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	5	0.0200	0.72		Sheet Flow, flow on pavement Smooth surfaces n= 0.011 P2= 2.94"
2.4	28	0.0600	0.20		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.1	5	0.0200	0.72		Sheet Flow, flow over pavement Smooth surfaces n= 0.011 P2= 2.94"
0.6	10	0.2000	0.26		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.2	20	0.1000	2.21		Shallow Concentrated Flow, flow over grass Short Grass Pasture Kv= 7.0 fps
2.6					Direct Entry,
6.0	68	Total			

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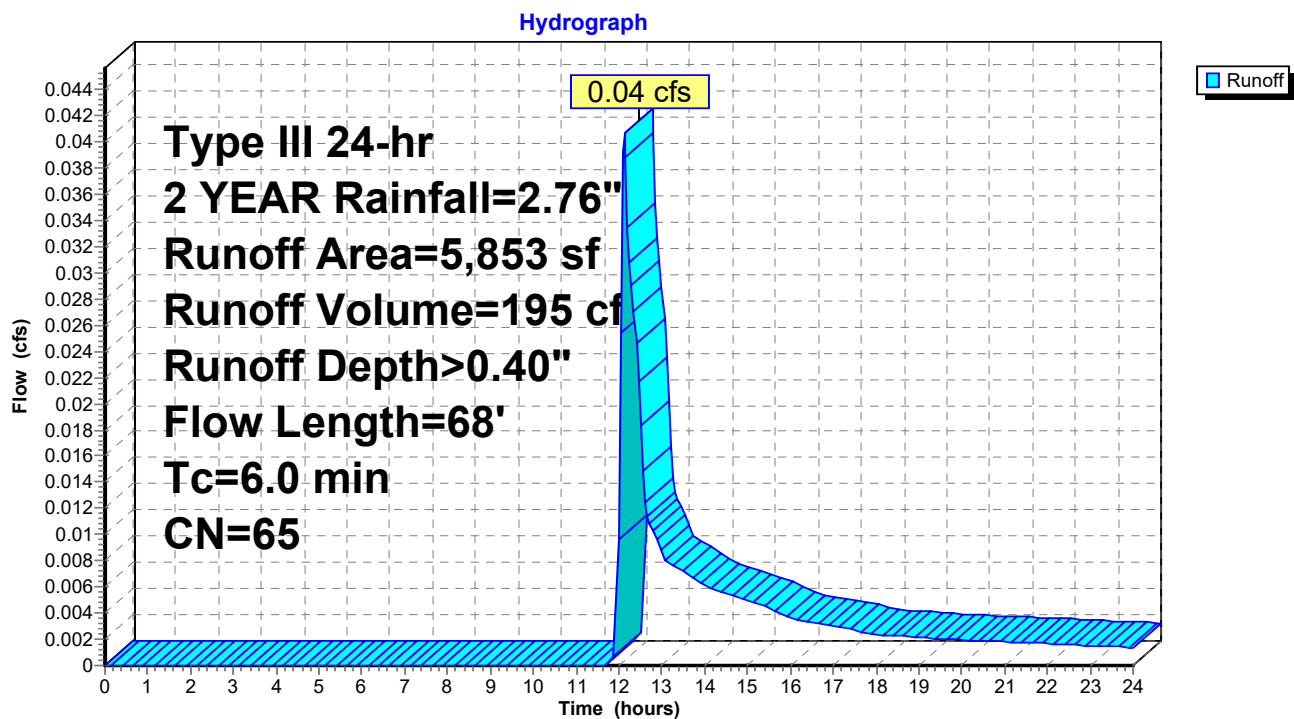
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Subcatchment P1: SITE AREA



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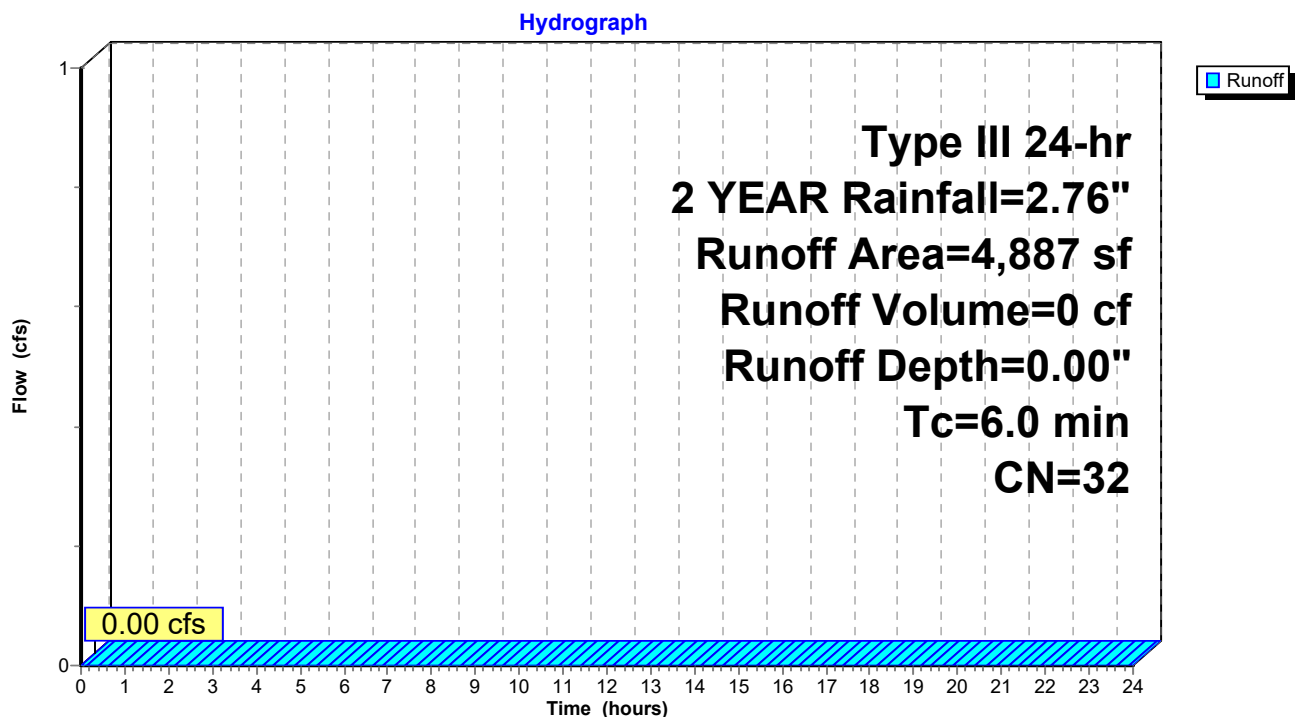
Summary for Subcatchment P10: P10

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond DP2 : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
4,887	32	Woods/grass comb., Good, HSG A
4,887		100.00% Pervious Area

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

Subcatchment P10: P10

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Summary for Subcatchment P11: P11

Runoff = 0.21 cfs @ 12.10 hrs, Volume= 713 cf, Depth> 0.86"
Routed to Reach 3R : 12" PIPE

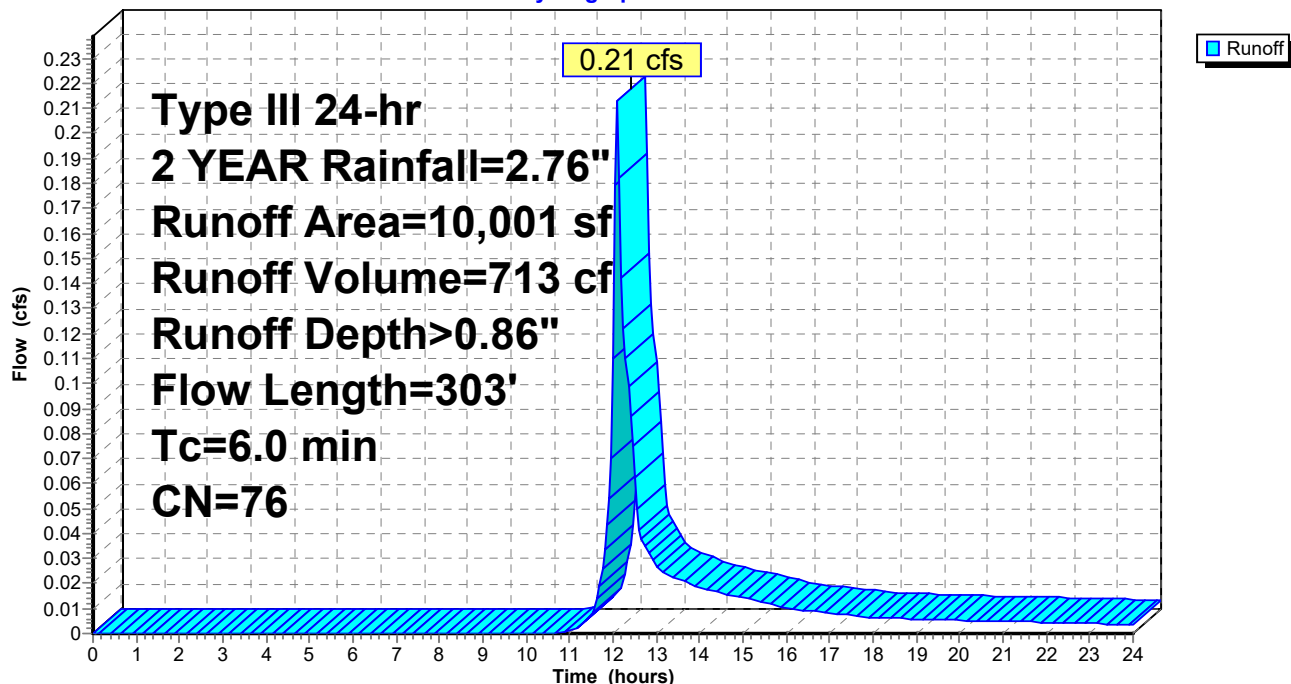
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 6,353	98	Paved parking, HSG A and B
10,001	76	Weighted Average
3,648		36.48% Pervious Area
6,353		63.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.00		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment P11: P11

Hydrograph



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Summary for Subcatchment P12: OFF SITE

Runoff = 0.01 cfs @ 16.98 hrs, Volume= 261 cf, Depth> 0.02"
Routed to Reach 6R : 18" PIPE

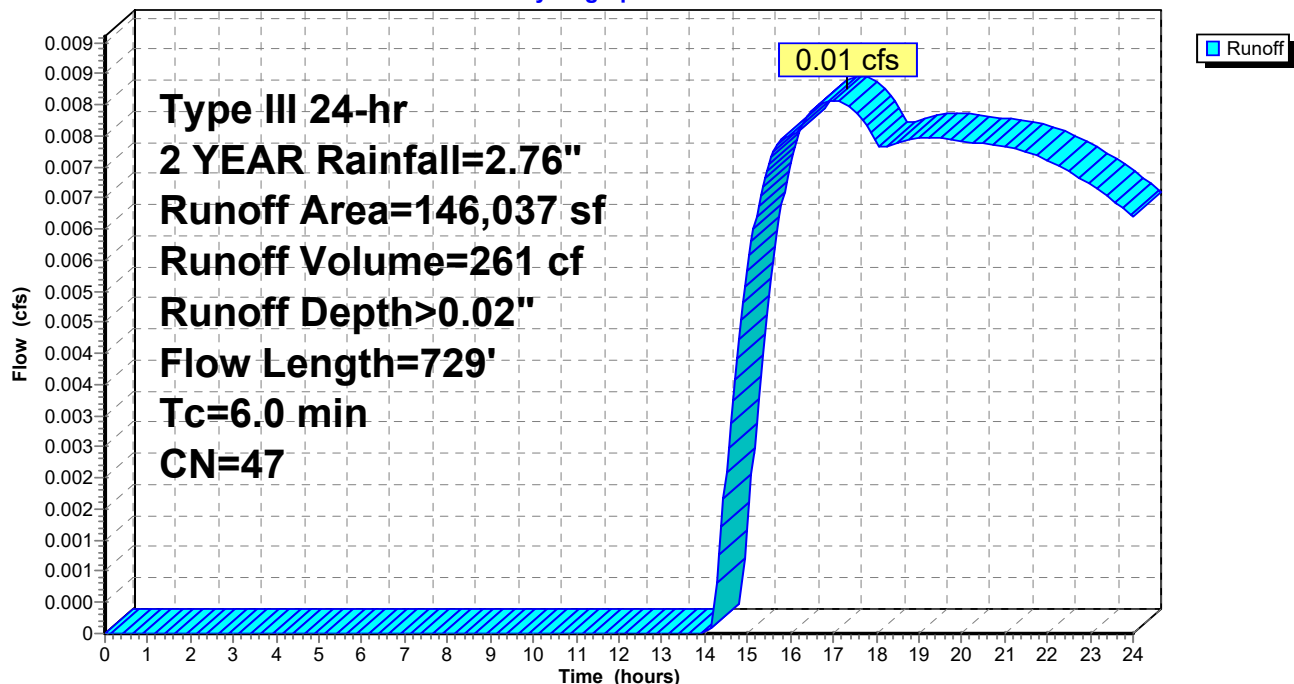
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
* 32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.87		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment P12: OFF SITE

Hydrograph



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Summary for Subcatchment P2: P-2

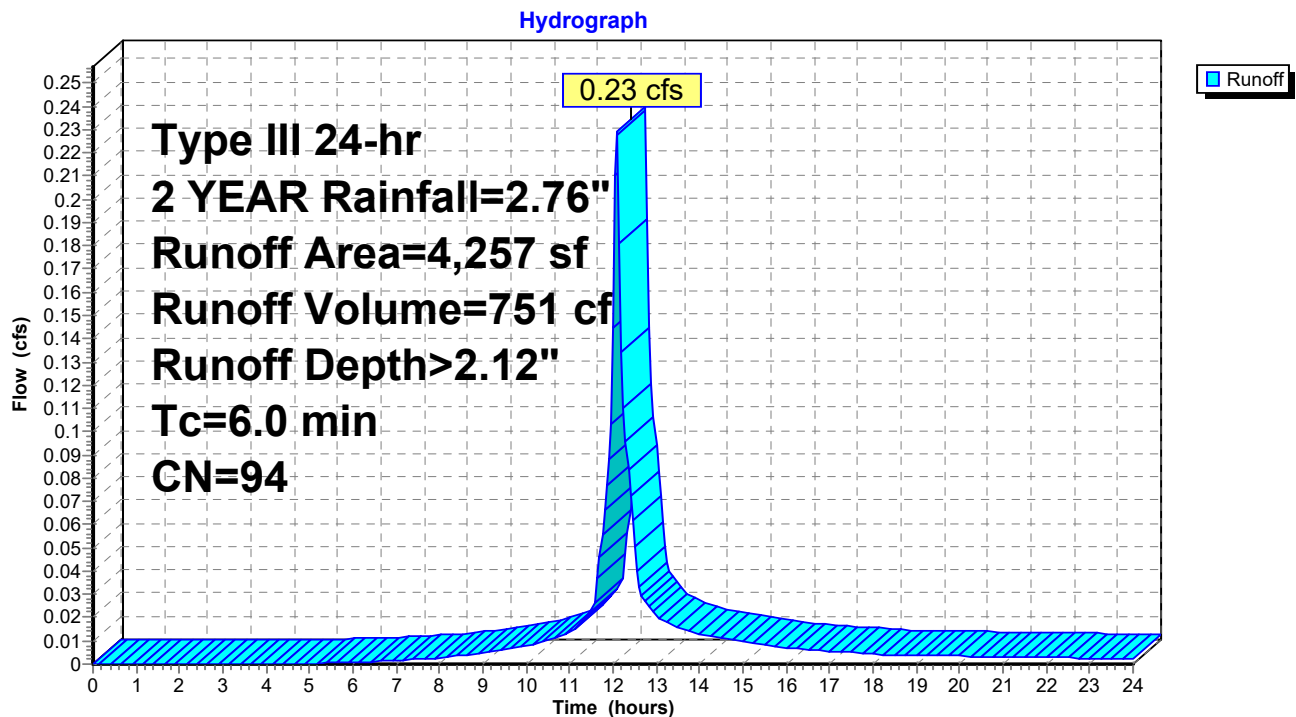
Runoff = 0.23 cfs @ 12.09 hrs, Volume= 751 cf, Depth> 2.12"
Routed to Pond CB3 : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
2,866	98	Paved parking, HSG A
996	98	Paved parking, HSG B
185	39	>75% Grass cover, Good, HSG A
210	61	>75% Grass cover, Good, HSG B
4,257	94	Weighted Average
395		9.28% Pervious Area
3,862		90.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P2: P-2



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Summary for Subcatchment P3: P-3

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 487 cf, Depth> 1.85"
Routed to Pond CB4 : CB4

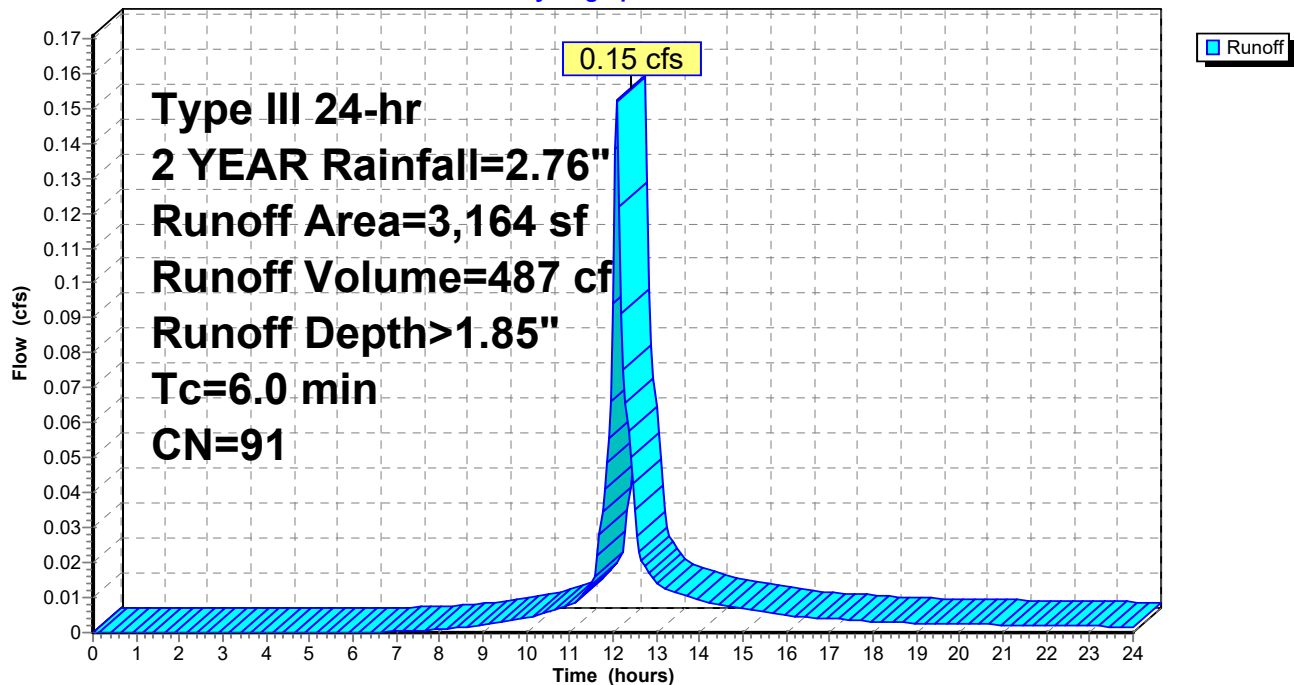
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
1,399	98	Paved parking, HSG A
1,157	98	Water Surface, HSG B
608	61	>75% Grass cover, Good, HSG B
3,164	91	Weighted Average
608		19.22% Pervious Area
2,556		80.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P3: P-3

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment P4: P-4

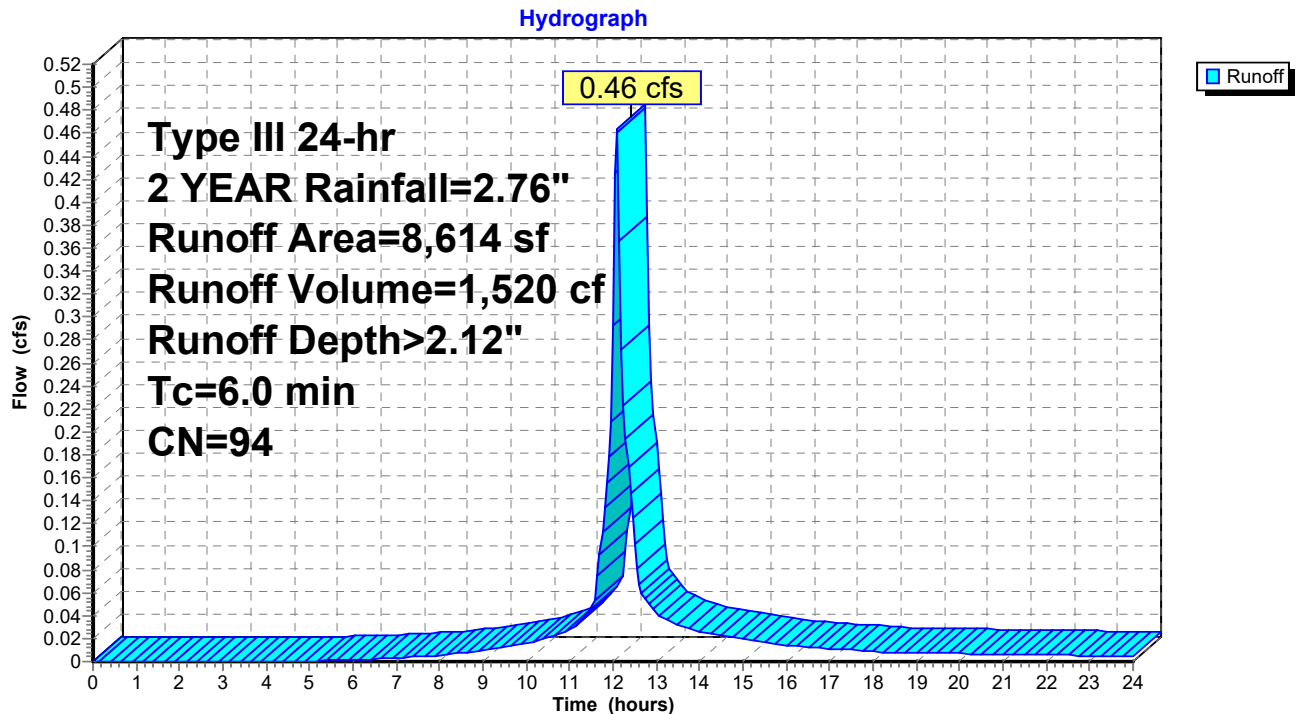
Runoff = 0.46 cfs @ 12.09 hrs, Volume= 1,520 cf, Depth> 2.12"
Routed to Pond CB5 : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

	Area (sf)	CN	Description
*	7,866	98	Paved parking, HSG A, B
	119	39	>75% Grass cover, Good, HSG A
	629	61	>75% Grass cover, Good, HSG B
	8,614	94	Weighted Average
	748		8.68% Pervious Area
	7,866		91.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P4: P-4



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Summary for Subcatchment P5: P-5

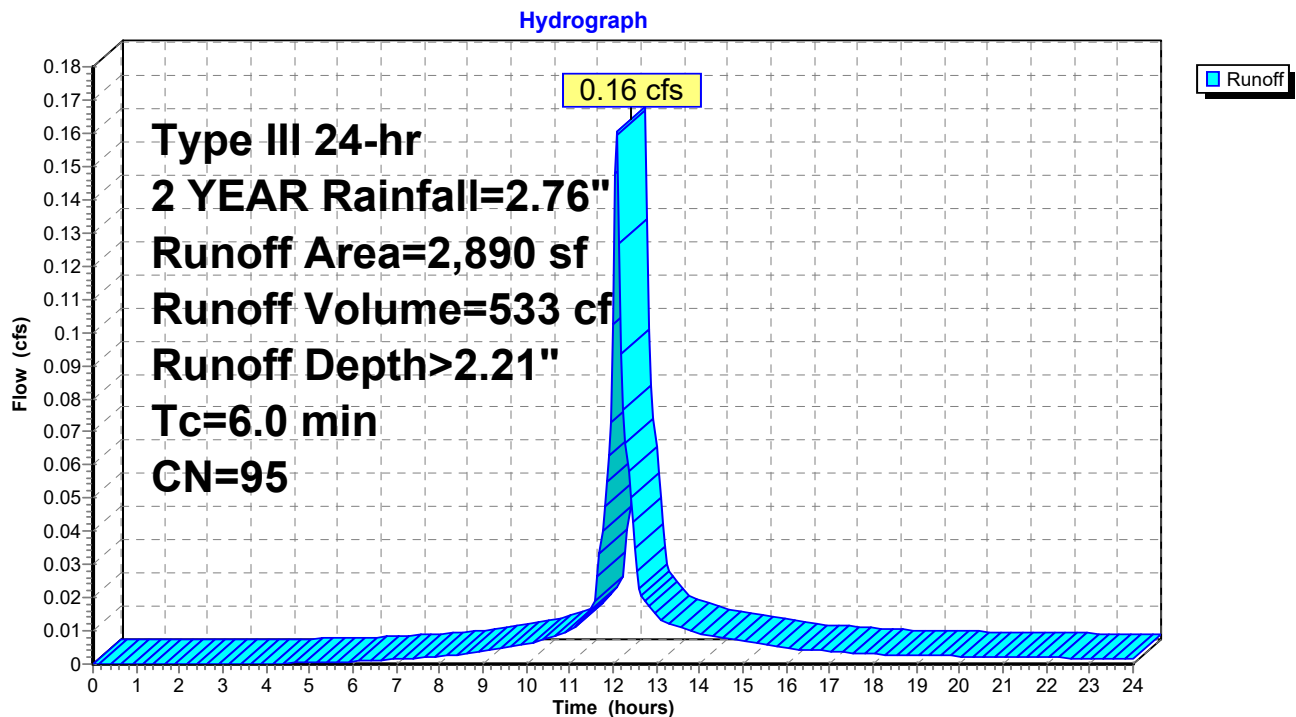
Runoff = 0.16 cfs @ 12.09 hrs, Volume= 533 cf, Depth> 2.21"
Routed to Pond CB6 : DMH1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

	Area (sf)	CN	Description
*	2,674	98	Paved parking, HSG B,C
	216	61	>75% Grass cover, Good, HSG B
	2,890	95	Weighted Average
	216		7.47% Pervious Area
	2,674		92.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P5: P-5



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment P6: P-6

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 2,010 cf, Depth> 1.76"
Routed to Pond CB7 : CB7

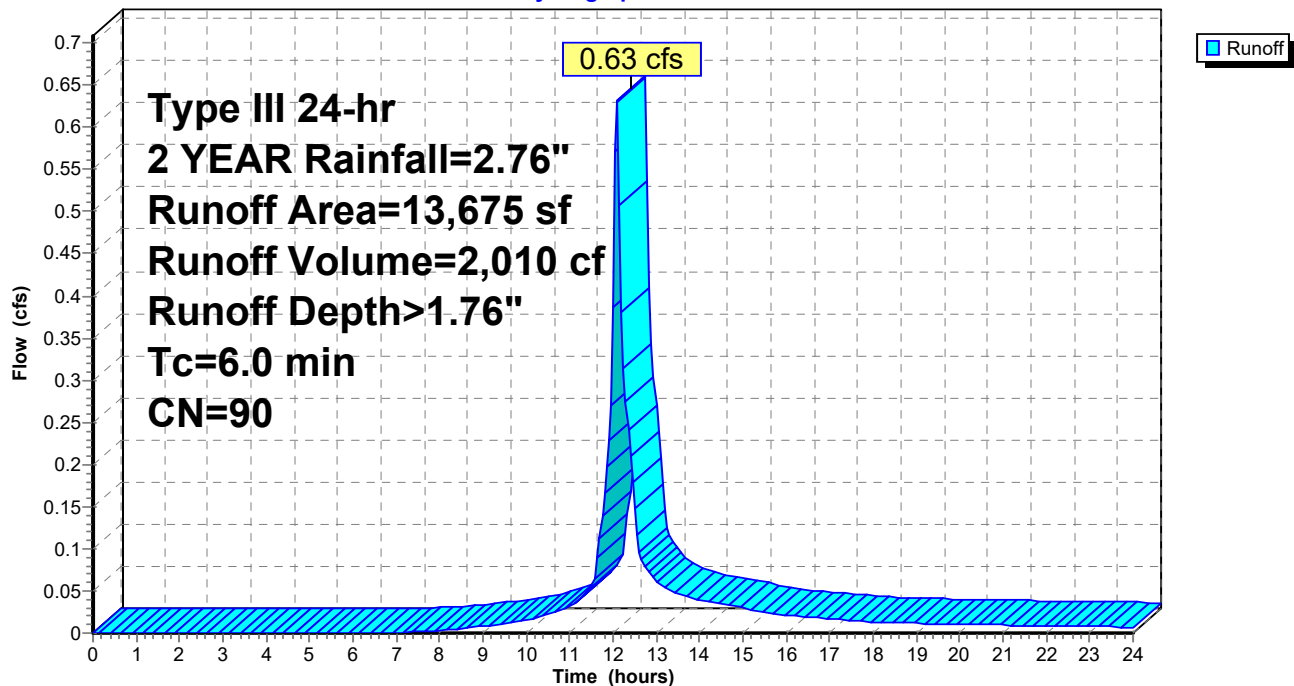
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
10,556	98	Paved parking, HSG B
3,119	61	>75% Grass cover, Good, HSG B
13,675	90	Weighted Average
3,119		22.81% Pervious Area
10,556		77.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P6: P-6

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment P7: P-7

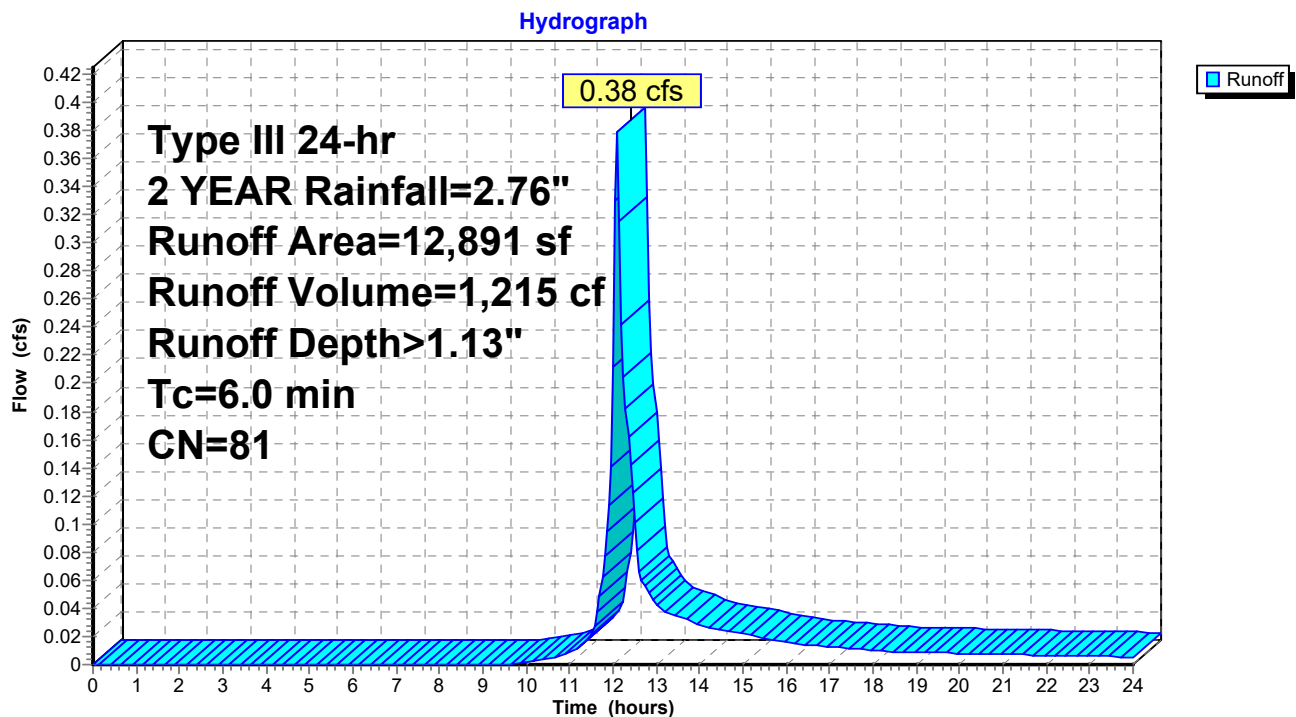
Runoff = 0.38 cfs @ 12.10 hrs, Volume= 1,215 cf, Depth> 1.13"
Routed to Pond IP2 : OPEN POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

	Area (sf)	CN	Description
	6,412	98	Water Surface, HSG B
*	432	98	Paved parking, HSG B,C
	6,047	61	>75% Grass cover, Good, HSG B
	12,891	81	Weighted Average
	6,047		46.91% Pervious Area
	6,844		53.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER GRASS TO POND

Subcatchment P7: P-7



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment P8: P-8

Runoff = 0.03 cfs @ 12.33 hrs, Volume= 228 cf, Depth> 0.23"
 Routed to Pond CB1 : CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
233	98	Paved parking, HSG A
6,658	39	>75% Grass cover, Good, HSG A
2,764	96	Gravel surface, HSG A
2,086	61	>75% Grass cover, Good, HSG B
434	96	Gravel surface, HSG B
12,175	59	Weighted Average
11,942		98.09% Pervious Area
233		1.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.2400	0.26		Sheet Flow, FLOW OVER GRASS Grass: Dense n= 0.240 P2= 2.94"
0.7	80	0.0100	2.03		Shallow Concentrated Flow, FLOW OVER GRAVEL Paved Kv= 20.3 fps
0.5	45	0.0400	1.40		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
1.8					Direct Entry, ADD FLOW TIME
6.2	175	Total			

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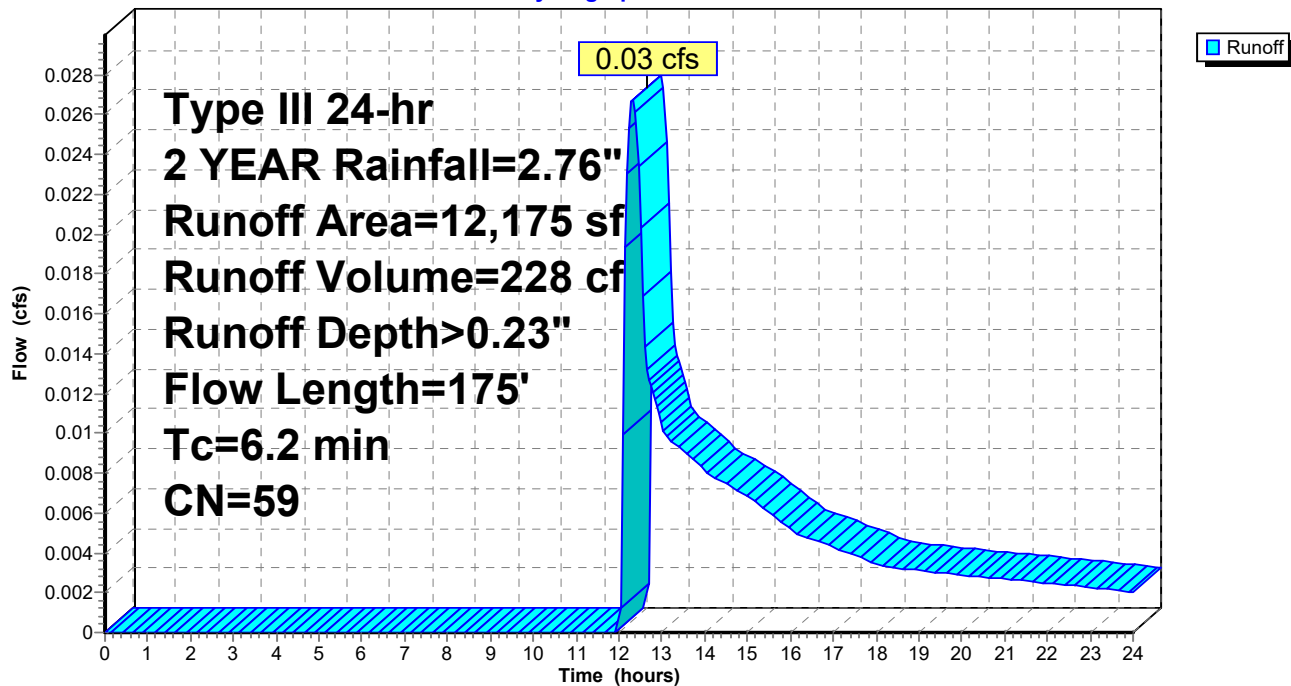
Type III 24-hr 2 YEAR Rainfall=2.76"

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Subcatchment P8: P-8

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment P9: (new Subcat)

Runoff = 0.09 cfs @ 12.15 hrs, Volume= 683 cf, Depth> 0.28"
 Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
8,986	98	Paved parking, HSG A
2,275	96	Gravel surface, HSG A
18,210	39	>75% Grass cover, Good, HSG A
29,471	61	Weighted Average
20,485		69.51% Pervious Area
8,986		30.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0600	1.78		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.2	50	0.0600	4.97		Shallow Concentrated Flow, FLOW OVER PAVEMENT Paved Kv= 20.3 fps
0.4	75	0.2400	3.43		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
1.0	122	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
3.9					Direct Entry,
6.0	297	Total			

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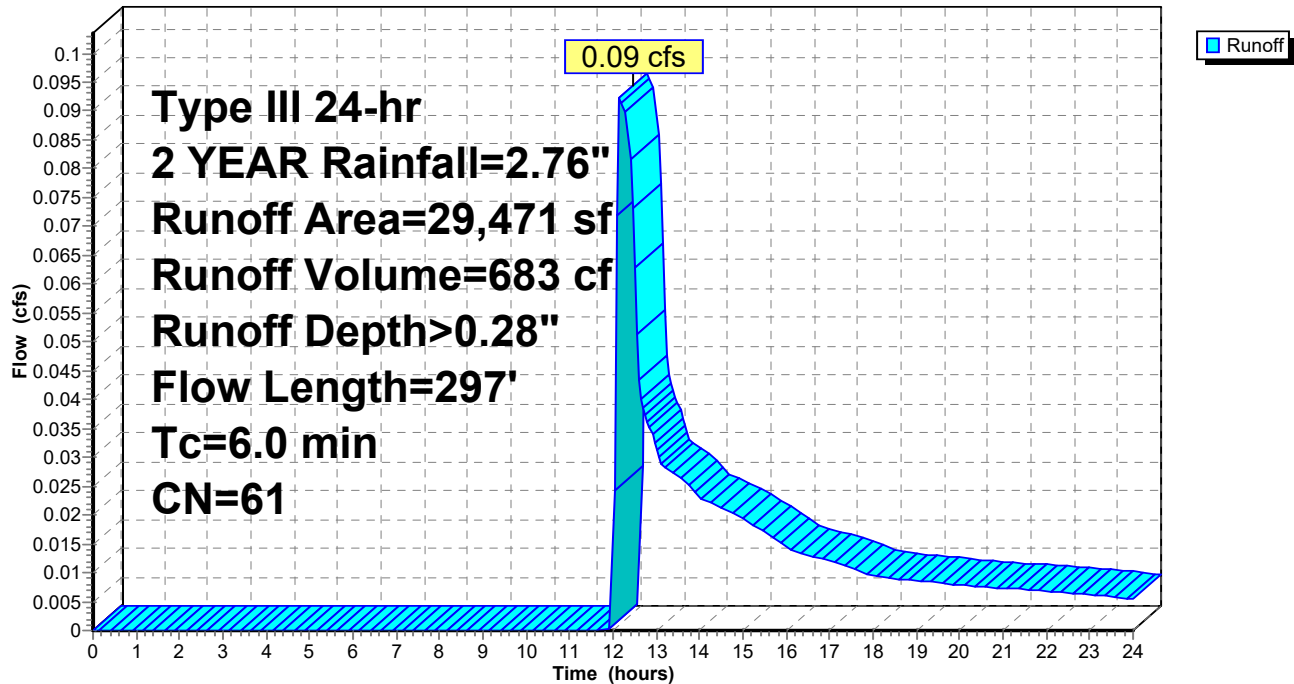
Type III 24-hr 2 YEAR Rainfall=2.76"

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Subcatchment P9: (new Subcat)

Hydrograph



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Summary for Subcatchment R1: ROOF 1

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 808 cf, Depth> 2.53"
Routed to Pond CB1 : CB1

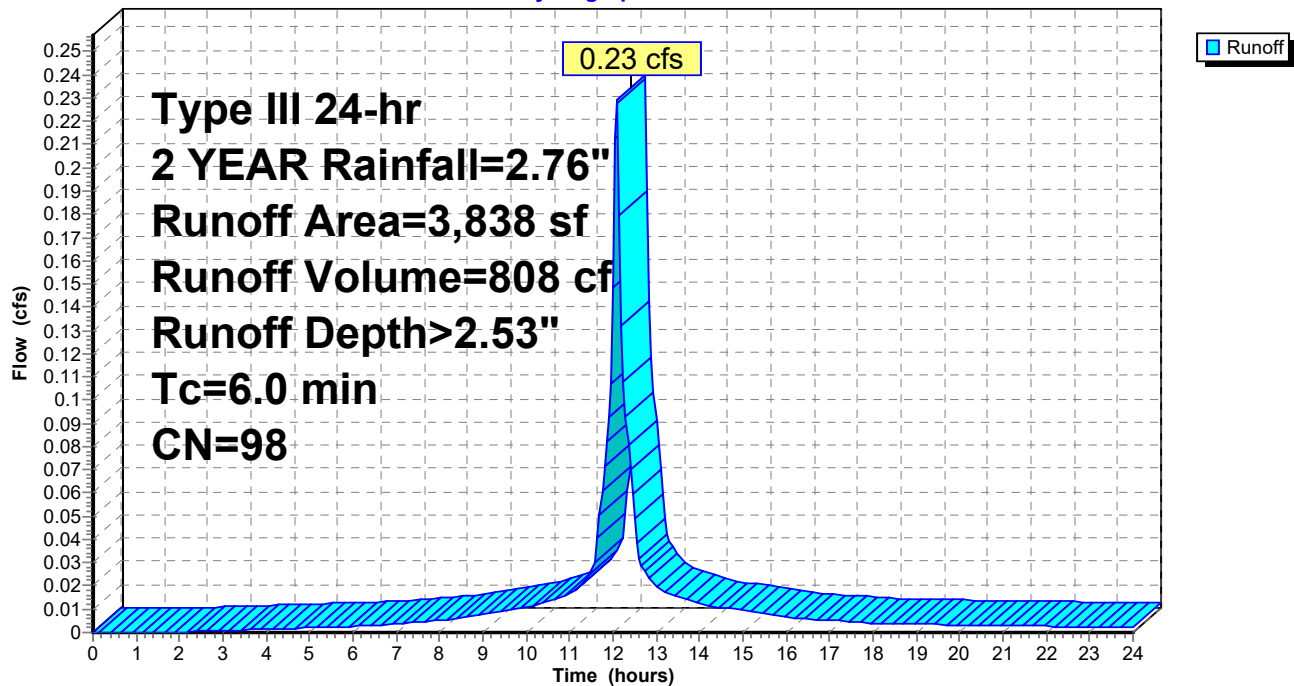
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
3,838	98	Roofs, HSG A
3,838		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB1

Subcatchment R1: ROOF 1

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment R2: ROOF 2

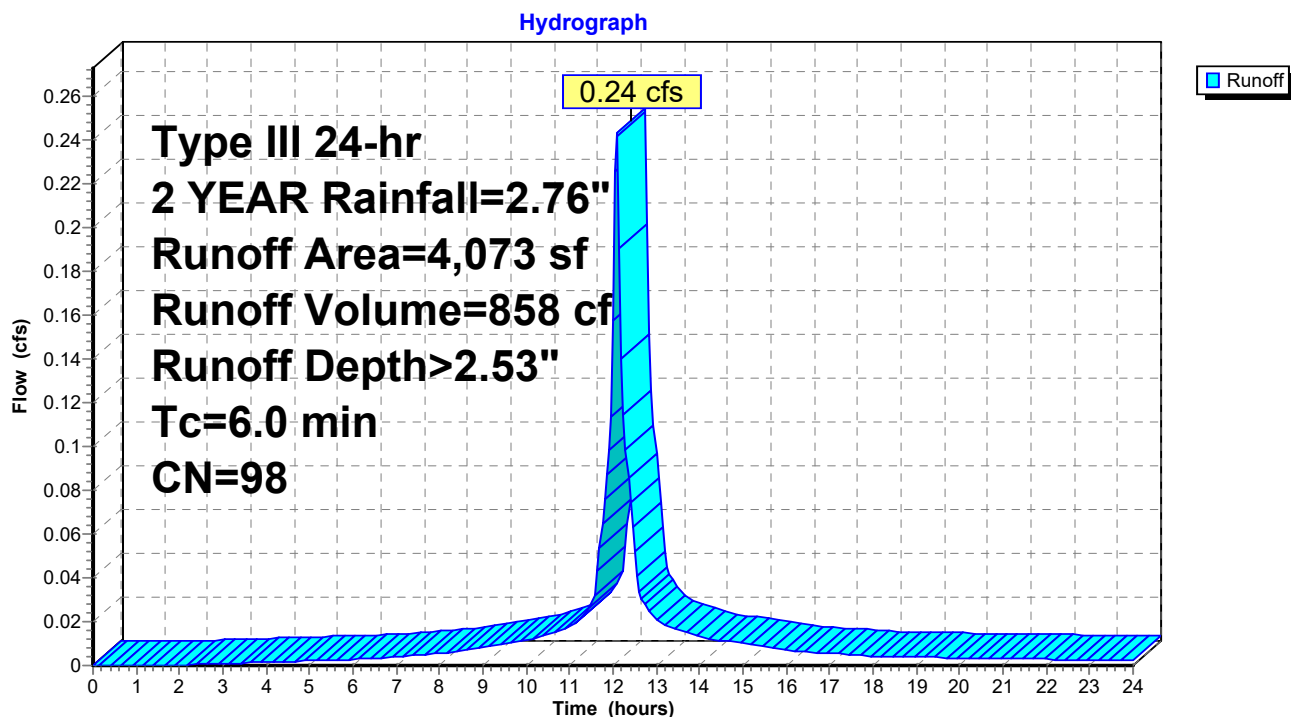
Runoff = 0.24 cfs @ 12.09 hrs, Volume= 858 cf, Depth> 2.53"
Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
4,073	98	Roofs, HSG A
4,073		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R2: ROOF 2



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Subcatchment R3: ROOF 3

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 730 cf, Depth> 2.53"
Routed to Pond CB9 : CB-9

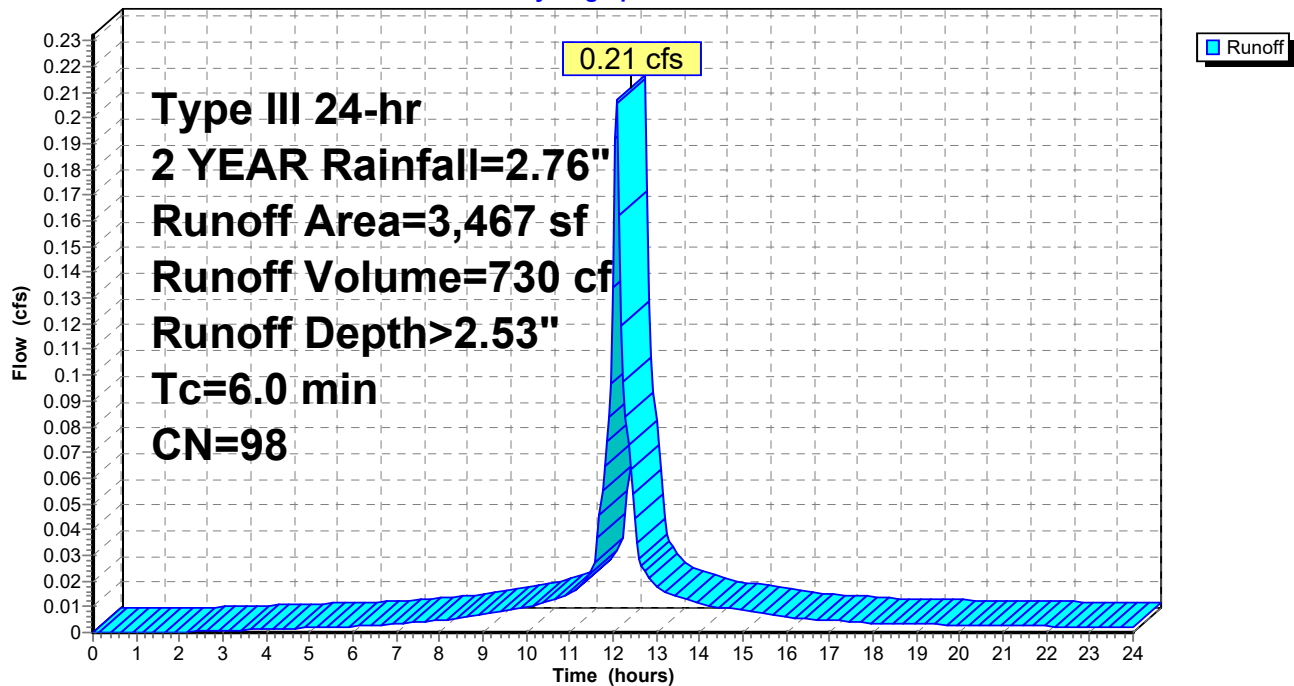
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

	Area (sf)	CN	Description
*	3,467	98	Roofs, HSG A,B
	3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R3: ROOF 3

Hydrograph



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Summary for Subcatchment R4: ROOF 4

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 730 cf, Depth> 2.53"
Routed to Pond CB2 : CB2

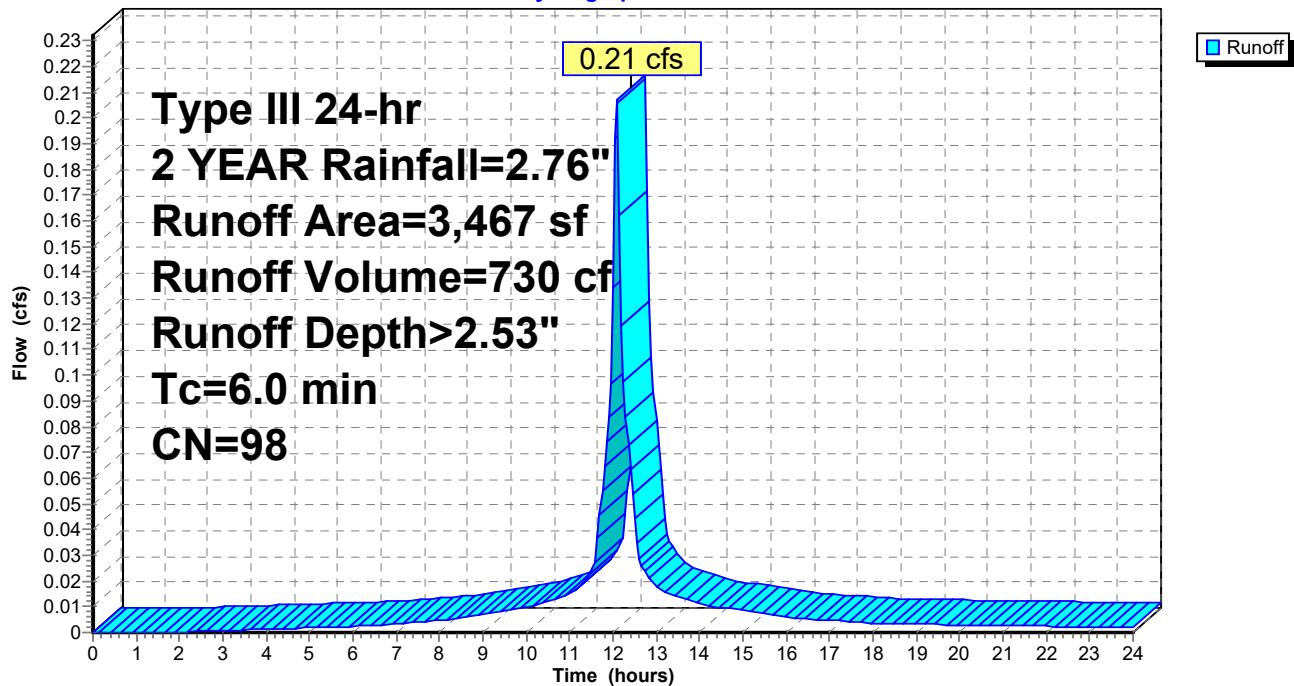
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

Area (sf)	CN	Description
3,467	98	Roofs, HSG A
3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB2

Subcatchment R4: ROOF 4

Hydrograph



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Summary for Subcatchment R5: ROOF 5

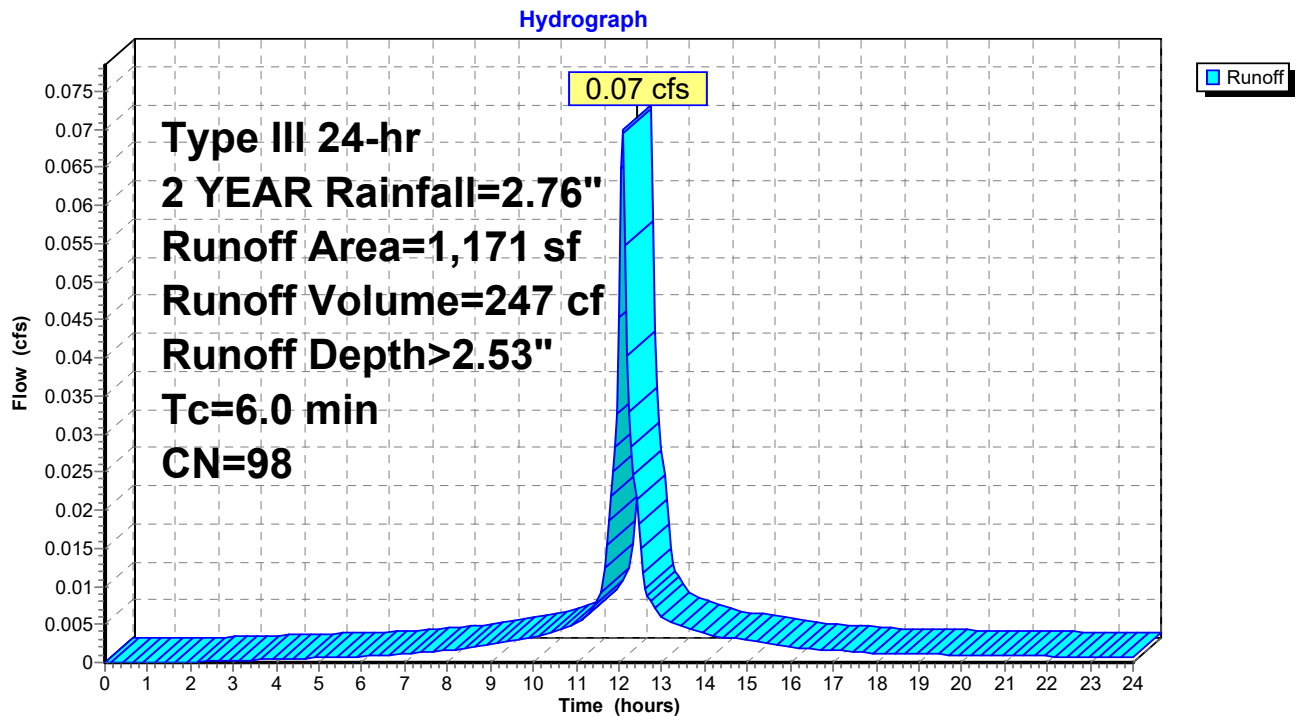
Runoff = 0.07 cfs @ 12.09 hrs, Volume= 247 cf, Depth> 2.53"
Routed to Pond CB6 : DMH1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=2.76"

	Area (sf)	CN	Description
*	1,171	98	Roofs, HSG A,B
	1,171		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB6

Subcatchment R5: ROOF 5



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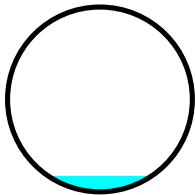
Summary for Reach 3R: 12" PIPE

Inflow Area = 156,038 sf, 24.75% Impervious, Inflow Depth > 0.07" for 2 YEAR event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 974 cf
Outflow = 0.21 cfs @ 12.11 hrs, Volume= 974 cf, Atten= 0%, Lag= 0.3 min
Routed to Pond DP1 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.89 fps, Min. Travel Time= 0.4 min
Avg. Velocity= 1.35 fps, Avg. Travel Time= 0.8 min

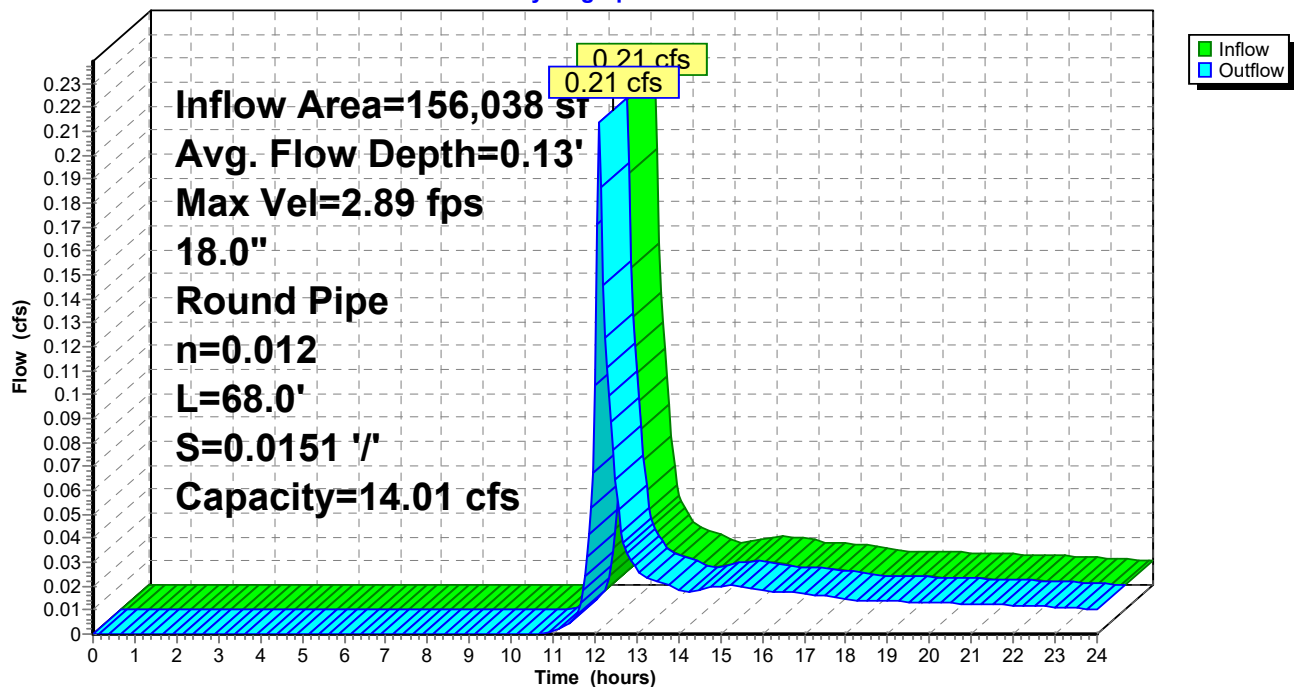
Peak Storage= 5 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 0.84'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.01 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 3R: 12" PIPE

Hydrograph



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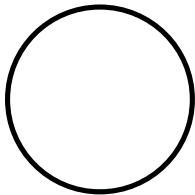
Summary for Reach 6R: 18" PIPE

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.02" for 2 YEAR event
Inflow = 0.01 cfs @ 16.98 hrs, Volume= 261 cf
Outflow = 0.01 cfs @ 16.99 hrs, Volume= 261 cf, Atten= 0%, Lag= 0.6 min
Routed to Reach 3R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.60 fps, Min. Travel Time= 0.9 min
Avg. Velocity= 1.53 fps, Avg. Travel Time= 0.9 min

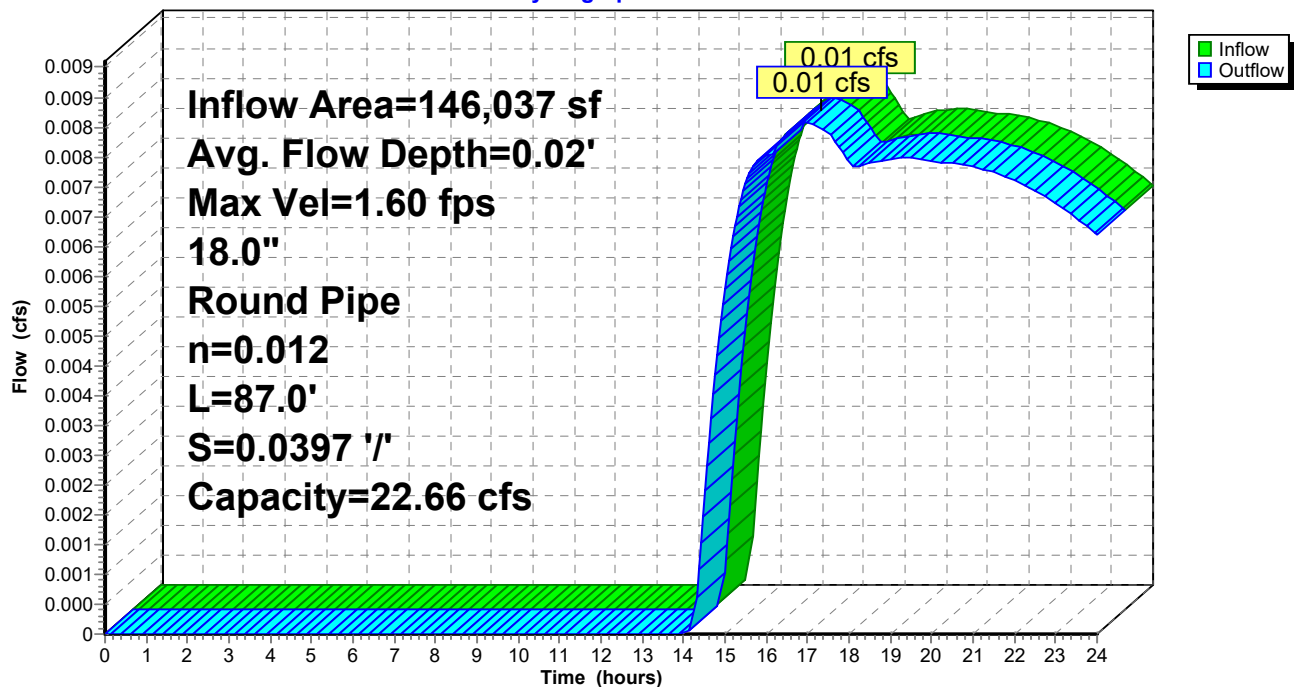
Peak Storage= 0 cf @ 16.99 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 0.36'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/'
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 6R: 18" PIPE

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Pond CB1: CB1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 0.78" for 2 YEAR event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf
Outflow = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf
Routed to Pond MH1 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 434.24' @ 12.09 hrs

Flood Elev= 437.72'

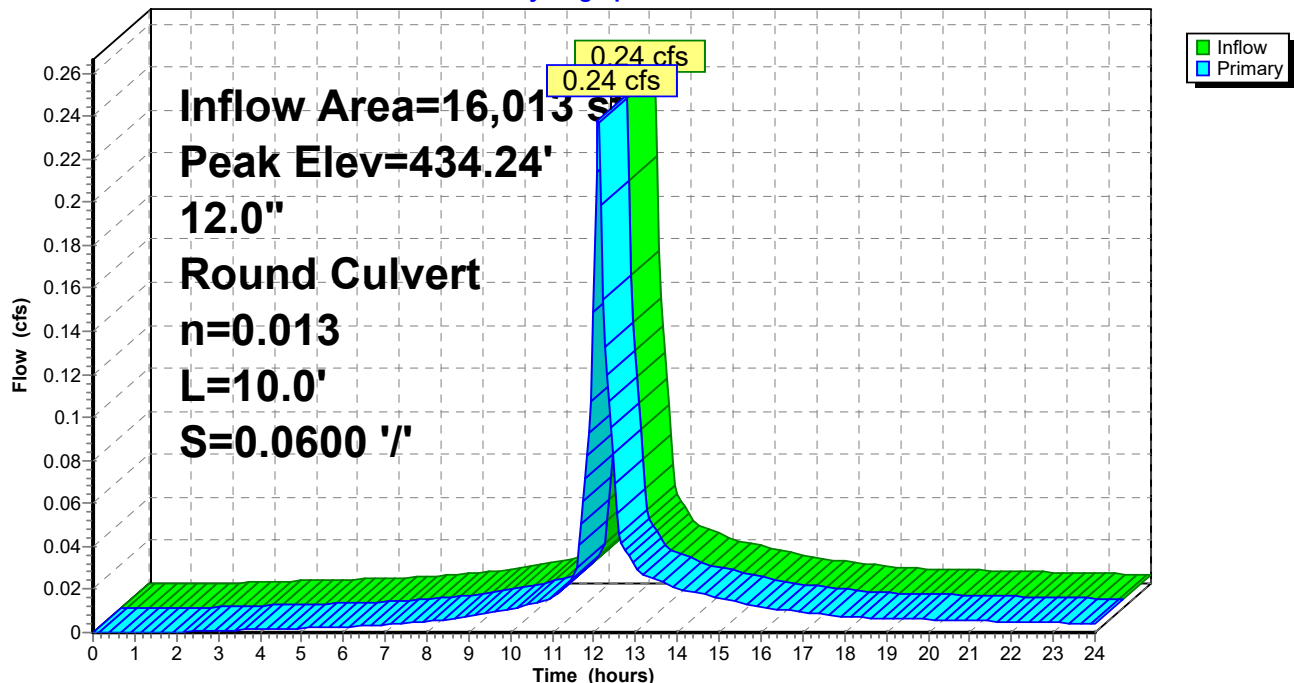
Device	Routing	Invert	Outlet Devices
#1	Primary	434.00'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 434.00' / 433.40' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.23 cfs @ 12.09 hrs HW=434.24' TW=433.54' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.23 cfs @ 1.65 fps)

Pond CB1: CB1

Hydrograph



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Summary for Pond CB2: CB2

Inflow Area = 3,467 sf, 100.00% Impervious, Inflow Depth > 2.53" for 2 YEAR event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 730 cf
Outflow = 0.21 cfs @ 12.09 hrs, Volume= 730 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.09 hrs, Volume= 730 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 428.22' @ 12.09 hrs

Flood Elev= 431.00'

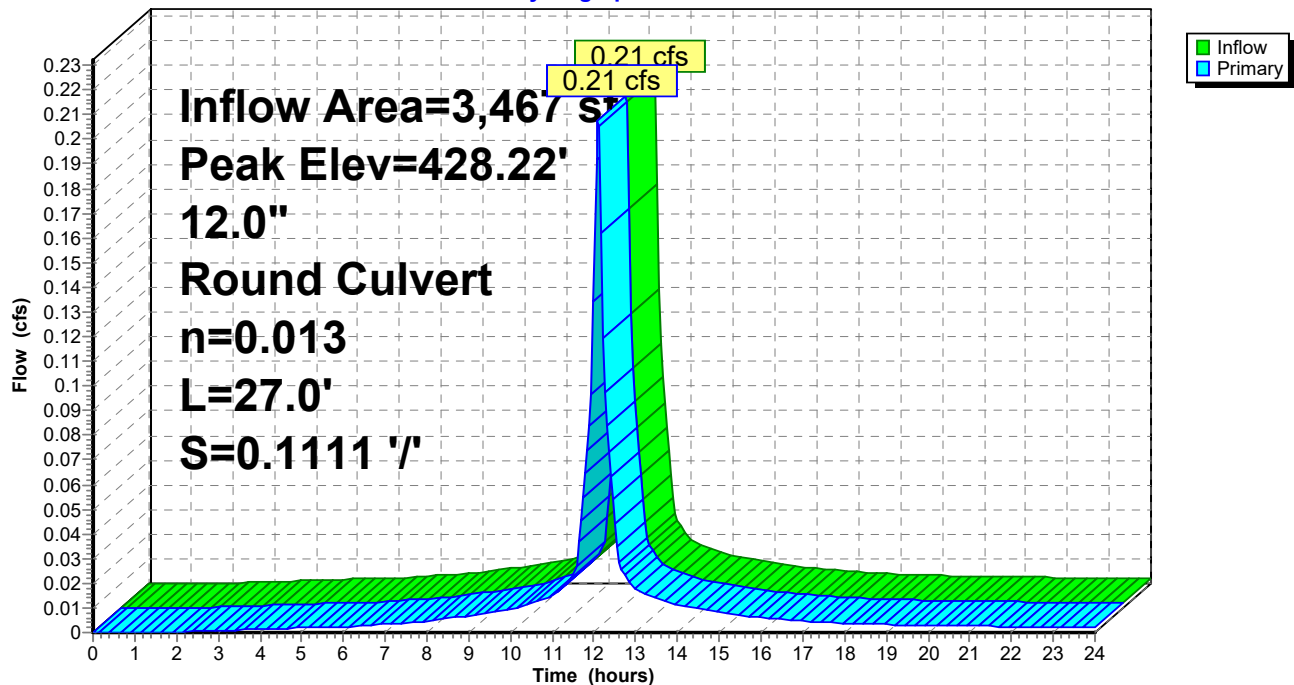
Device	Routing	Invert	Outlet Devices
#1	Primary	428.00'	12.0" Round Culvert L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 428.00' / 425.00' S= 0.1111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 12.09 hrs HW=428.22' TW=425.31' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.20 cfs @ 1.59 fps)

Pond CB2: CB2

Hydrograph



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Summary for Pond CB3: CB3

Inflow Area = 4,257 sf, 90.72% Impervious, Inflow Depth > 2.12" for 2 YEAR event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 751 cf
Outflow = 0.23 cfs @ 12.09 hrs, Volume= 751 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.23 cfs @ 12.09 hrs, Volume= 751 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.23' @ 12.09 hrs

Flood Elev= 433.00'

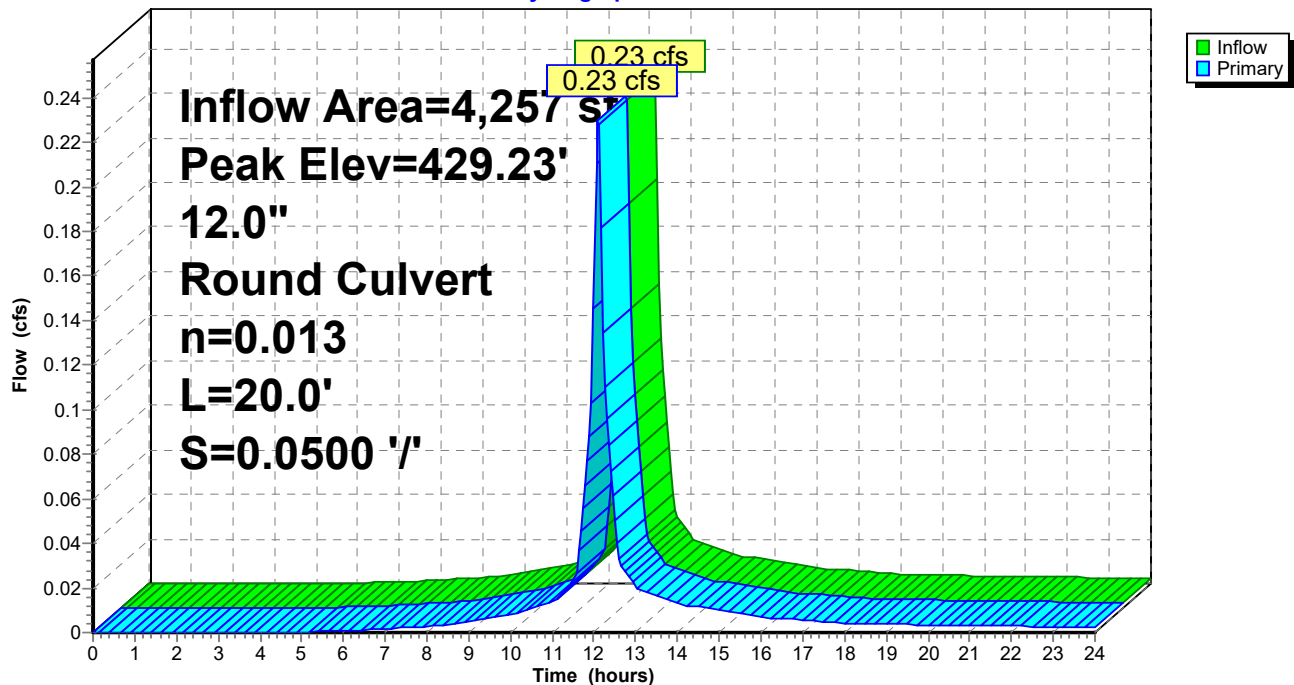
Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0500 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.22 cfs @ 12.09 hrs HW=429.23' TW=425.31' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.22 cfs @ 1.63 fps)

Pond CB3: CB3

Hydrograph



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Summary for Pond CB4: CB4

Inflow Area = 3,164 sf, 80.78% Impervious, Inflow Depth > 1.85" for 2 YEAR event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 487 cf
Outflow = 0.15 cfs @ 12.09 hrs, Volume= 487 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.09 hrs, Volume= 487 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.69' @ 12.09 hrs

Flood Elev= 427.50'

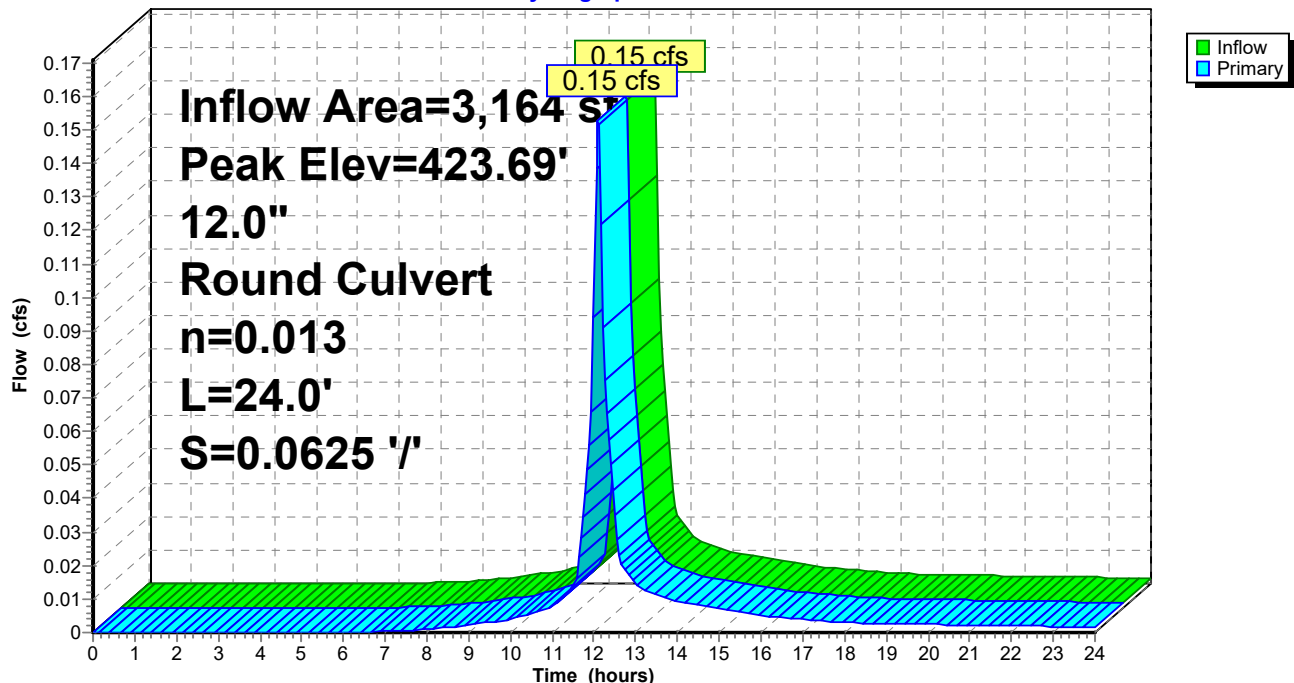
Device	Routing	Invert	Outlet Devices
#1	Primary	423.50'	12.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 423.50' / 422.00' S= 0.0625 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=423.69' TW=422.32' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.15 cfs @ 1.47 fps)

Pond CB4: CB4

Hydrograph



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Summary for Pond CB5: CB3

Inflow Area = 8,614 sf, 91.32% Impervious, Inflow Depth > 2.12" for 2 YEAR event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 1,520 cf
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 1,520 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.46 cfs @ 12.09 hrs, Volume= 1,520 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.34' @ 12.09 hrs

Flood Elev= 433.00'

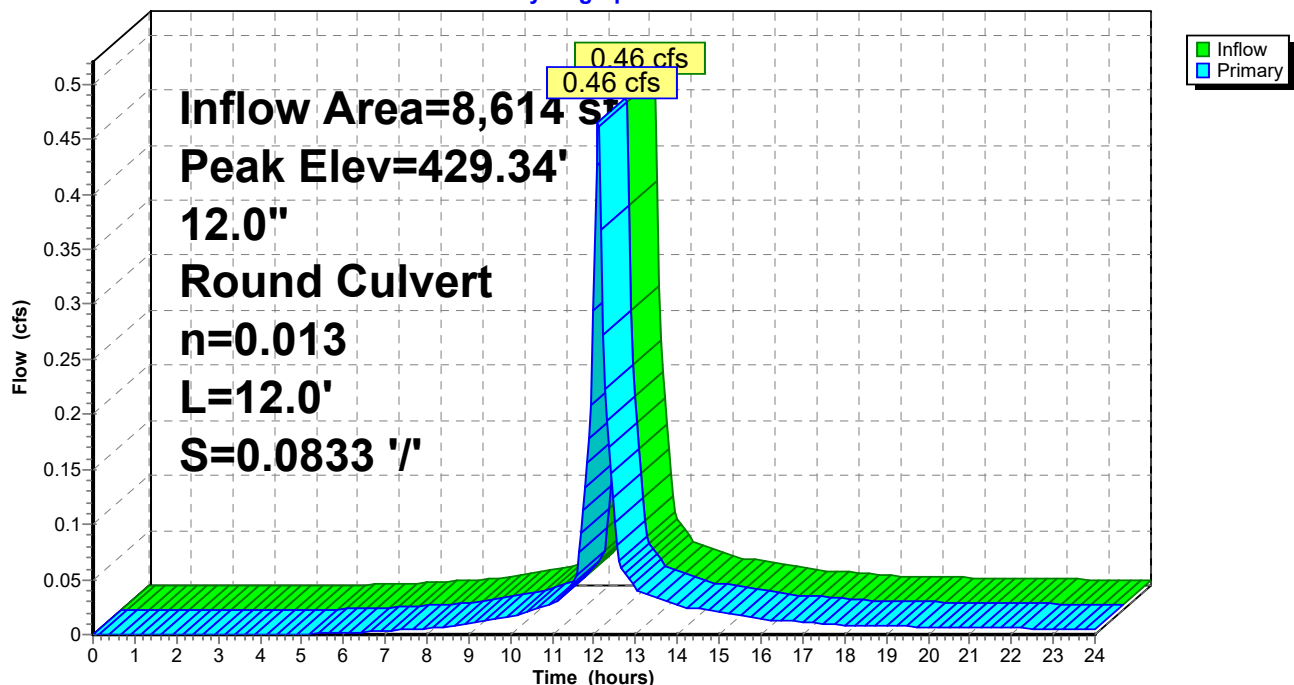
Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.45 cfs @ 12.09 hrs HW=429.33' TW=424.87' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.45 cfs @ 1.97 fps)

Pond CB5: CB3

Hydrograph



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Summary for Pond CB6: DMH1

Inflow Area = 41,072 sf, 49.60% Impervious, Inflow Depth > 0.89" for 2 YEAR event
Inflow = 0.75 cfs @ 12.10 hrs, Volume= 3,051 cf
Outflow = 0.75 cfs @ 12.10 hrs, Volume= 3,051 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.10 hrs, Volume= 3,051 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.62' @ 12.10 hrs

Flood Elev= 437.72'

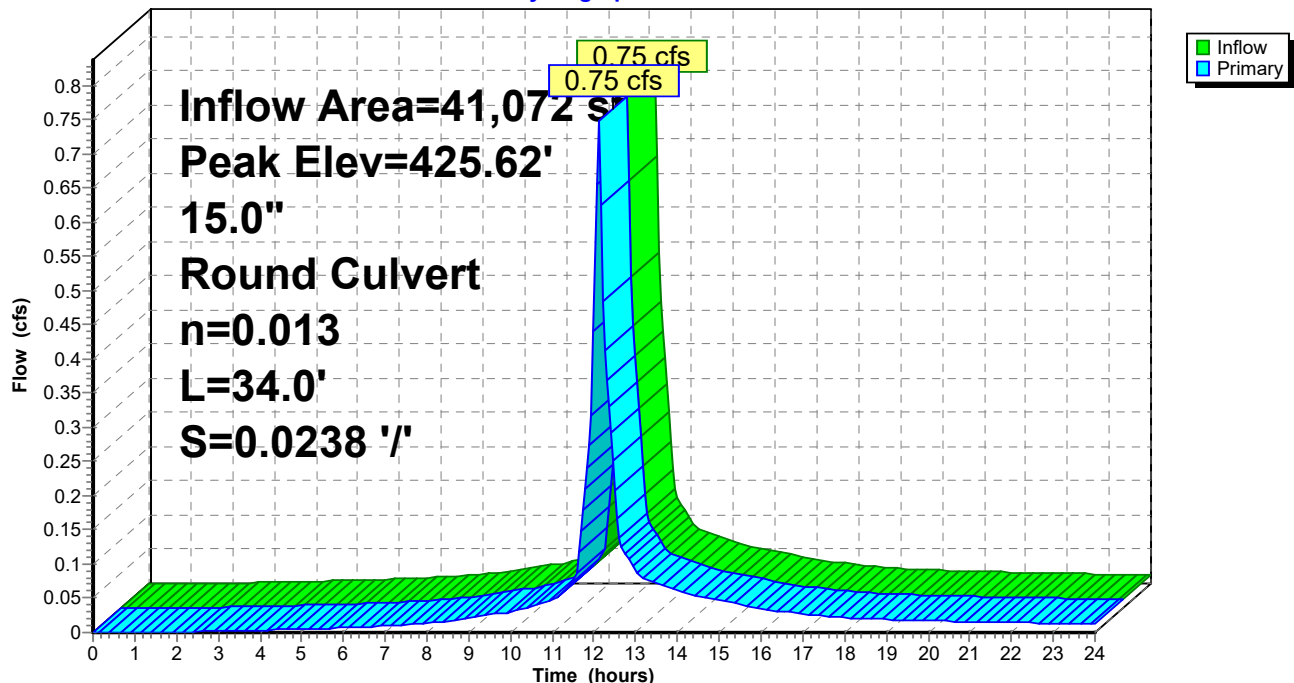
Device	Routing	Invert	Outlet Devices
#1	Primary	425.21'	15.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.21' / 424.40' S= 0.0238 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.74 cfs @ 12.10 hrs HW=425.61' TW=424.87' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.74 cfs @ 2.16 fps)

Pond CB6: DMH1

Hydrograph



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Summary for Pond CB7: CB7

Inflow Area = 13,675 sf, 77.19% Impervious, Inflow Depth > 1.76" for 2 YEAR event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 2,010 cf
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 2,009 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 2,009 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 422.90' @ 12.62 hrs

Flood Elev= 424.00'

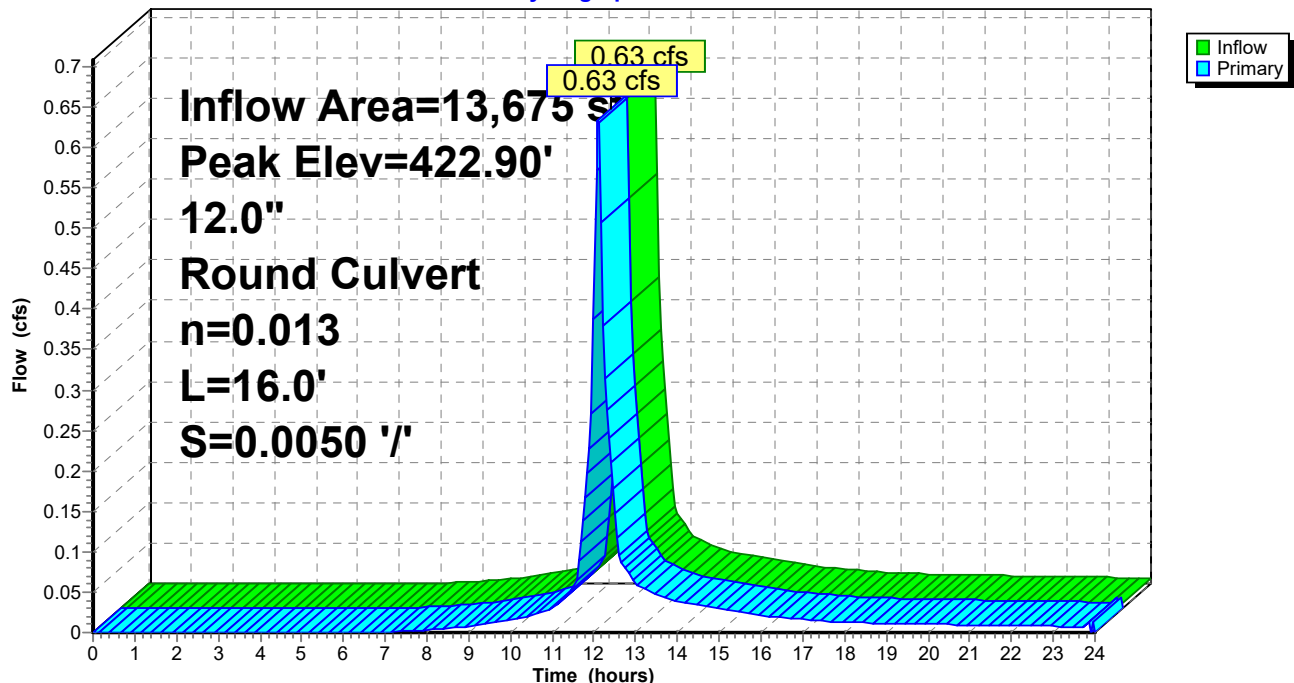
Device	Routing	Invert	Outlet Devices
#1	Primary	421.00'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.00' / 420.92' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.44 cfs @ 12.09 hrs HW=421.49' TW=421.40' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 0.44 cfs @ 1.67 fps)

Pond CB7: CB7

Hydrograph



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Summary for Pond CB8: CB8

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 0.74" for 2 YEAR event
Inflow = 0.52 cfs @ 12.10 hrs, Volume= 2,271 cf
Outflow = 0.52 cfs @ 12.10 hrs, Volume= 2,271 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.10 hrs, Volume= 2,271 cf
Routed to Pond CB6 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 426.26' @ 12.10 hrs

Flood Elev= 431.50'

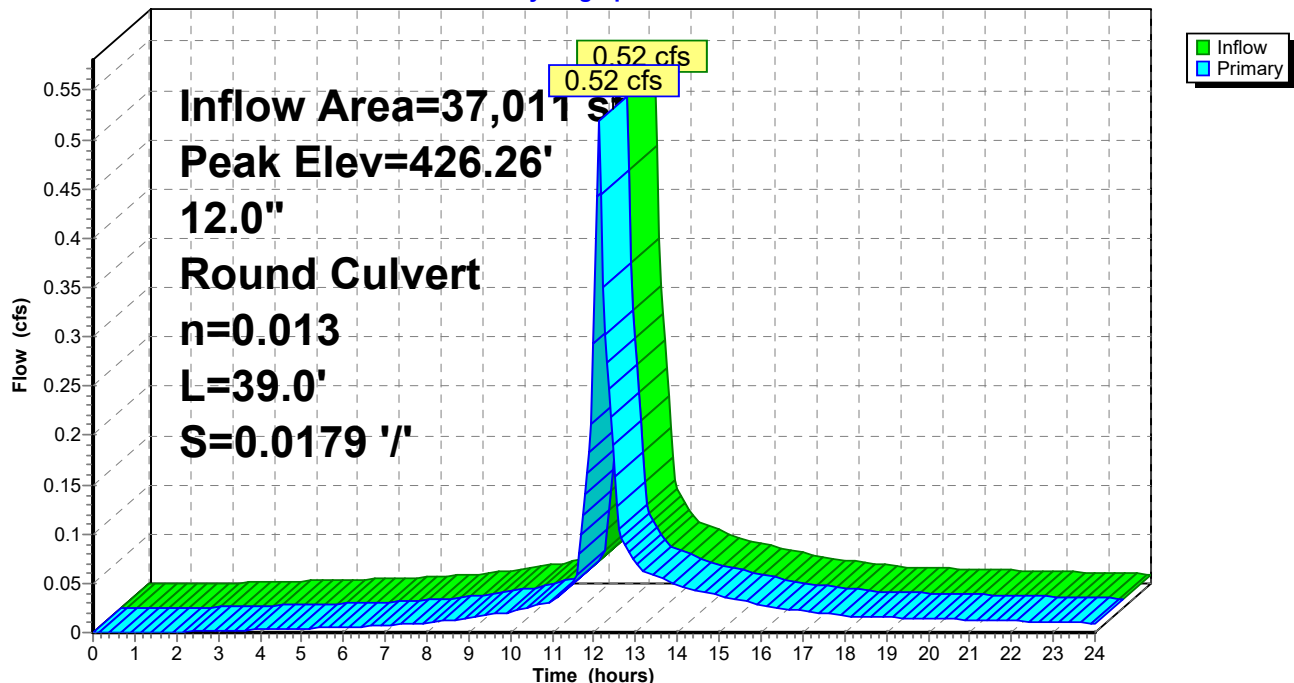
Device	Routing	Invert	Outlet Devices
#1	Primary	425.90'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.90' / 425.20' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.10 hrs HW=426.26' TW=425.62' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.52 cfs @ 2.04 fps)

Pond CB8: CB8

Hydrograph



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Summary for Pond CB9: CB-9

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 0.74" for 2 YEAR event
Inflow = 0.52 cfs @ 12.10 hrs, Volume= 2,271 cf
Outflow = 0.52 cfs @ 12.10 hrs, Volume= 2,271 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.10 hrs, Volume= 2,271 cf
Routed to Pond CB8 : CB8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 427.86' @ 12.10 hrs

Flood Elev= 431.50'

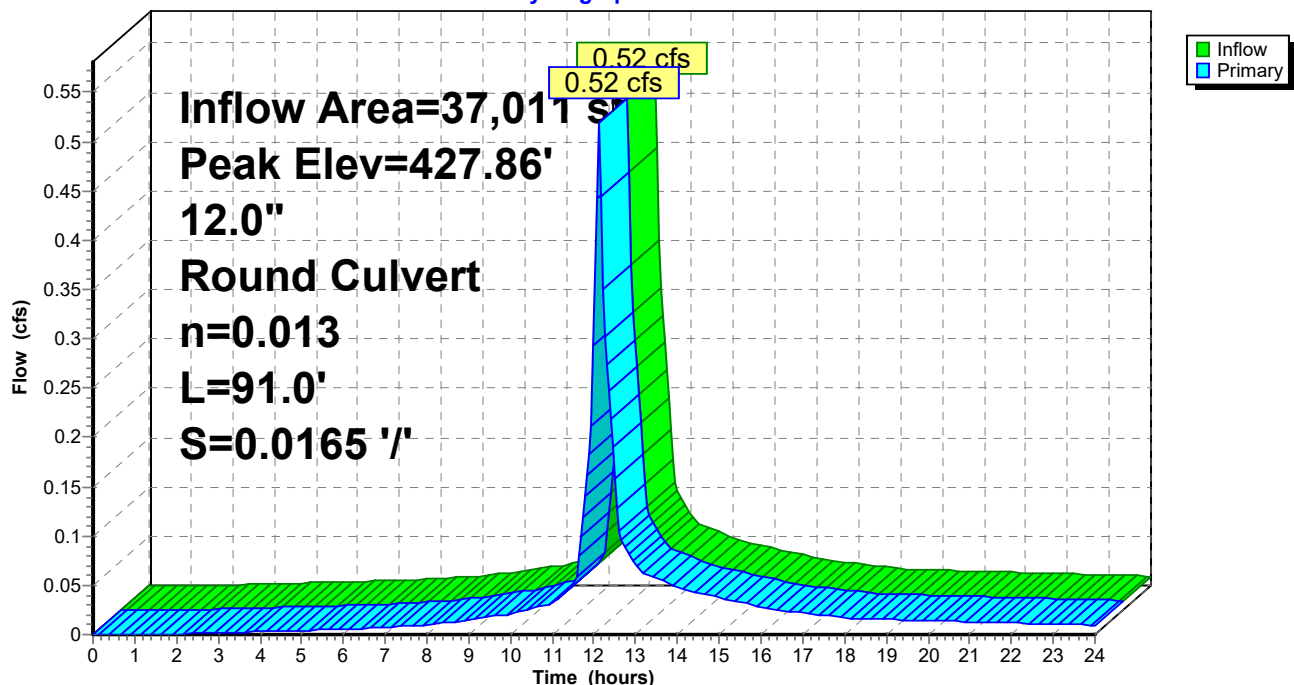
Device	Routing	Invert	Outlet Devices
#1	Primary	427.50'	12.0" Round Culvert L= 91.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 427.50' / 426.00' S= 0.0165 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.10 hrs HW=427.86' TW=426.26' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.52 cfs @ 2.04 fps)

Pond CB9: CB-9

Hydrograph



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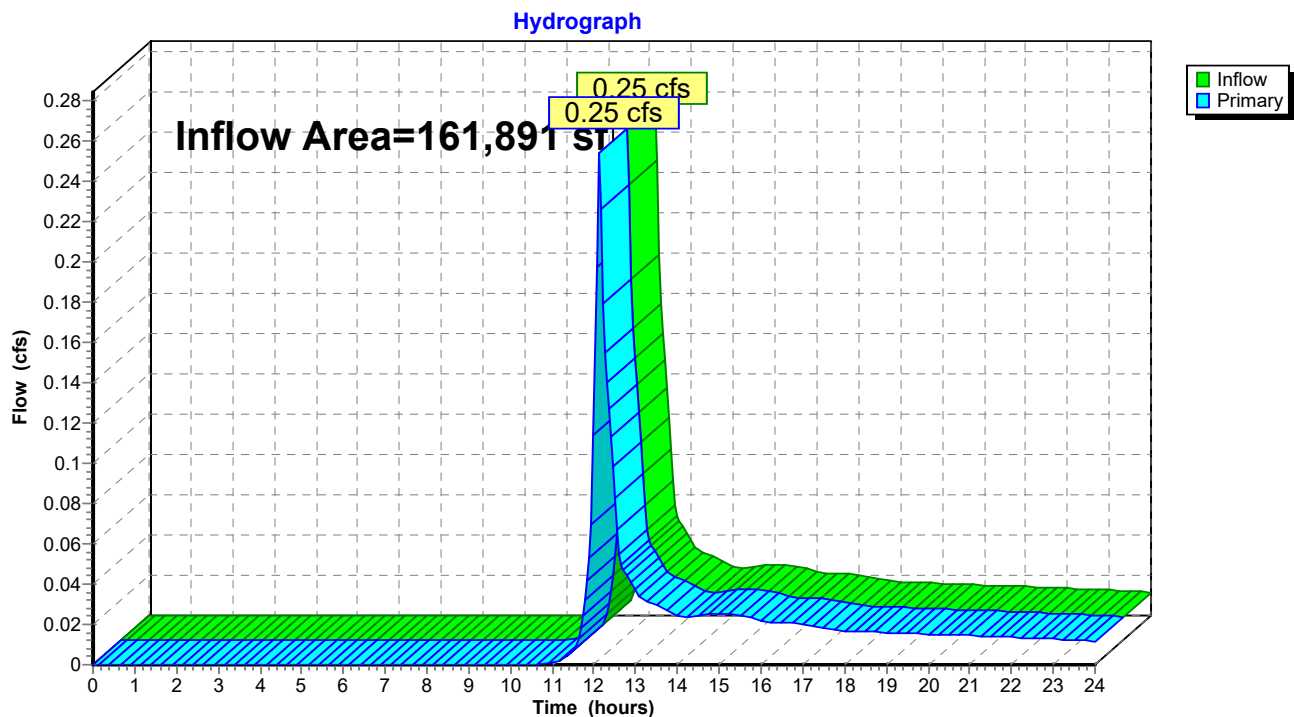
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Summary for Pond DP1: (new Pond)

Inflow Area = 161,891 sf, 24.20% Impervious, Inflow Depth > 0.09" for 2 YEAR event
Inflow = 0.25 cfs @ 12.11 hrs, Volume= 1,169 cf
Primary = 0.25 cfs @ 12.11 hrs, Volume= 1,169 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP1: (new Pond)



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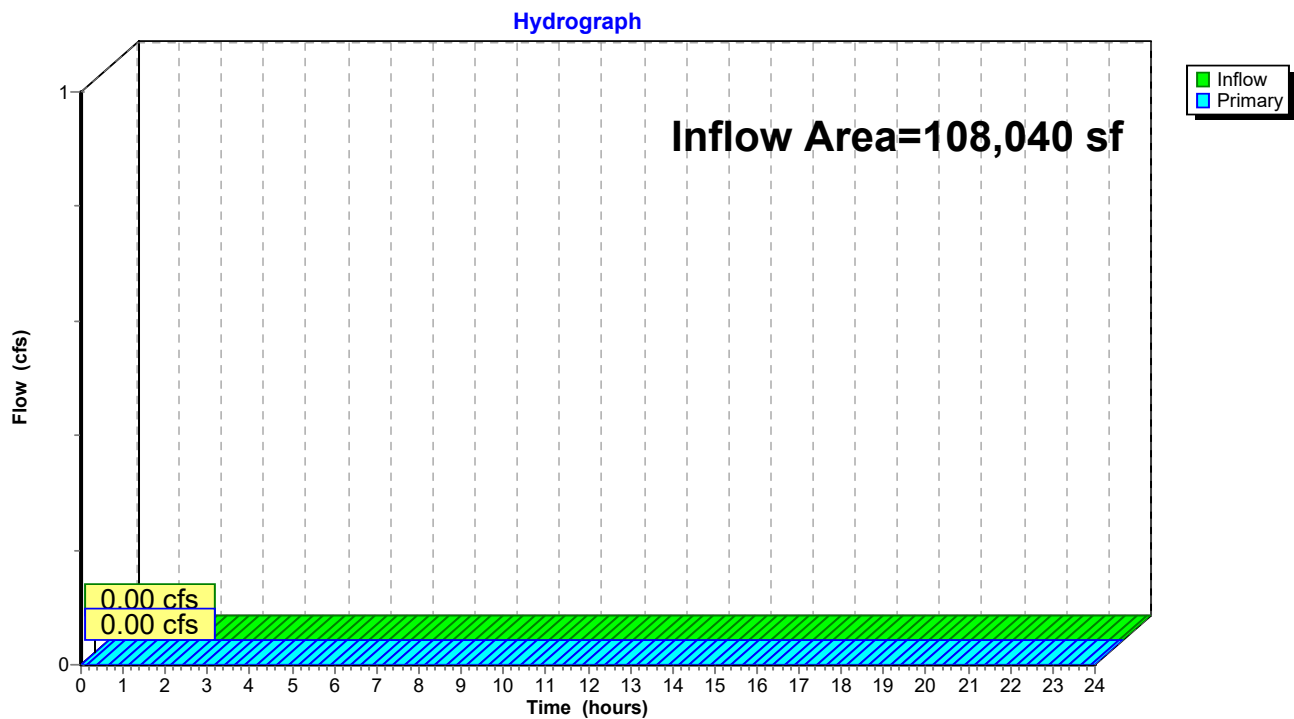
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Summary for Pond DP2: (new Pond)

Inflow Area = 108,040 sf, 55.16% Impervious, Inflow Depth = 0.00" for 2 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: (new Pond)



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Summary for Pond IP1: buried structure

Inflow Area = 90,262 sf, 58.44% Impervious, Inflow Depth > 1.27" for 2 YEAR event
 Inflow = 2.67 cfs @ 12.09 hrs, Volume= 9,582 cf
 Outflow = 0.65 cfs @ 12.52 hrs, Volume= 5,198 cf, Atten= 76%, Lag= 25.9 min
 Discarded = 0.04 cfs @ 9.20 hrs, Volume= 2,666 cf
 Primary = 0.31 cfs @ 12.52 hrs, Volume= 1,266 cf
 Routed to Pond IP2 : OPEN POND
 Secondary = 0.31 cfs @ 12.52 hrs, Volume= 1,266 cf
 Routed to Pond IP2 : OPEN POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 422.89' @ 12.52 hrs Surf.Area= 2,997 sf Storage= 4,528 cf
 Flood Elev= 423.08' Surf.Area= 2,997 sf Storage= 4,754 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 82.6 min (881.4 - 798.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	420.00'	2,989 cf	39.75'W x 75.40'L x 3.08'H Field A 9,241 cf Overall - 1,769 cf Embedded = 7,472 cf x 40.0% Voids
#2A	420.50'	1,769 cf	ADS_StormTech SC-310 +Cap x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		4,758 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	420.00'	0.600 in/hr Exfiltration over Surface area
#2	Primary	420.80'	12.0" Round Culvert L= 57.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.80' / 420.00' S= 0.0140 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Secondary	421.90'	15.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.00' S= 0.0237 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#5	Device 4	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

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Discarded OutFlow Max=0.04 cfs @ 9.20 hrs HW=420.03' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.28 cfs @ 12.52 hrs HW=422.89' TW=418.13' (Dynamic Tailwater)

↑**2=Culvert** (Passes 0.28 cfs of 4.76 cfs potential flow)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 0.28 cfs @ 0.82 fps)

Secondary OutFlow Max=0.28 cfs @ 12.52 hrs HW=422.89' TW=418.13' (Dynamic Tailwater)

↑**4=Culvert** (Passes 0.28 cfs of 3.51 cfs potential flow)

↑**5=Broad-Crested Rectangular Weir** (Weir Controls 0.28 cfs @ 0.82 fps)

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Pond IP1: buried structure - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)

Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf

Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 3.0" Spacing = 37.0" C-C Row Spacing

10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +18.0" End Stone x 2 = 75.40' Base Length

12 Rows x 34.0" Wide + 3.0" Spacing x 11 + 18.0" Side Stone x 2 = 39.75' Base Width

6.0" Stone Base + 16.0" Chamber Height + 15.0" Stone Cover = 3.08' Field Height

120 Chambers x 14.7 cf = 1,769.0 cf Chamber Storage

9,241.2 cf Field - 1,769.0 cf Chambers = 7,472.2 cf Stone x 40.0% Voids = 2,988.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,757.9 cf = 0.109 af

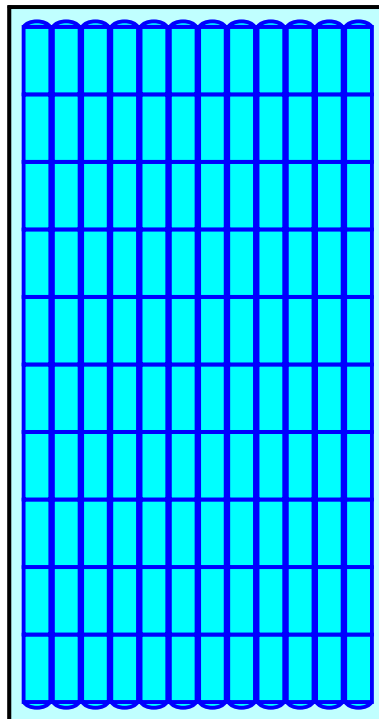
Overall Storage Efficiency = 51.5%

Overall System Size = 75.40' x 39.75' x 3.08'

120 Chambers

342.3 cy Field

276.7 cy Stone



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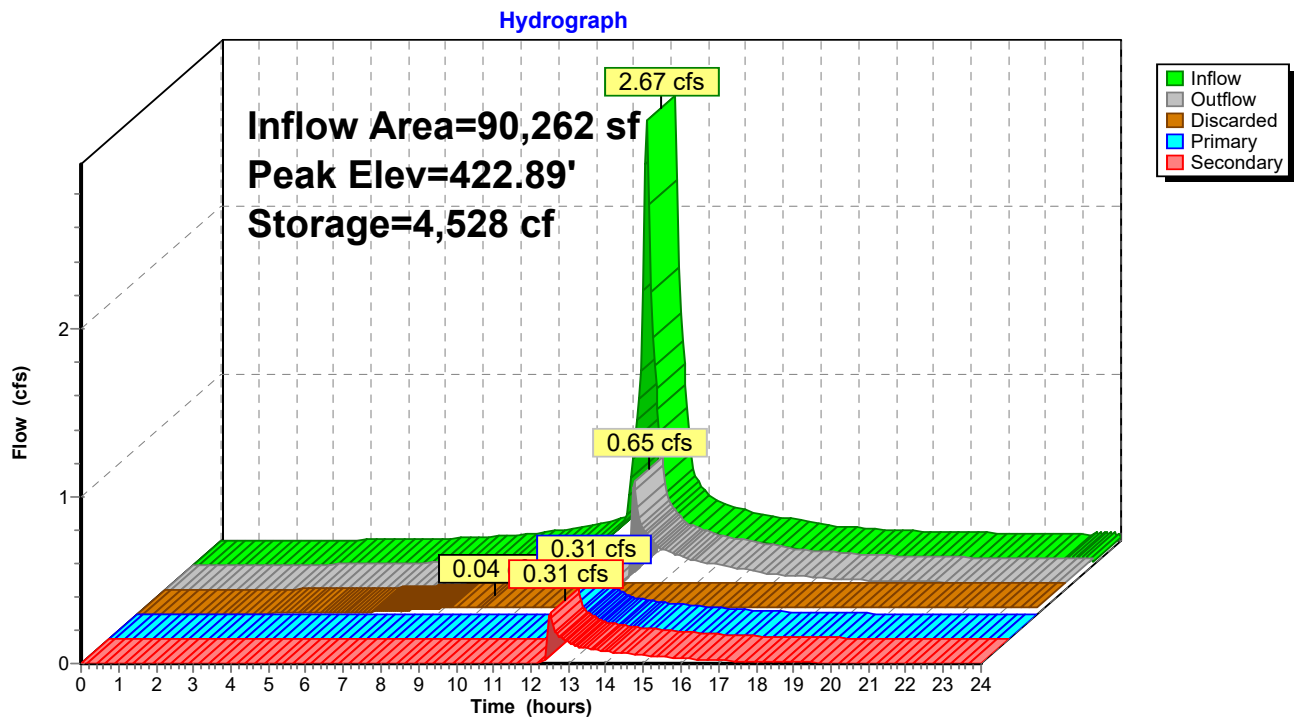
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Pond IP1: buried structure



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Summary for Pond IP2: OPEN POND

Inflow Area = 103,153 sf, 57.77% Impervious, Inflow Depth > 0.44" for 2 YEAR event
 Inflow = 0.70 cfs @ 12.52 hrs, Volume= 3,746 cf
 Outflow = 0.06 cfs @ 16.71 hrs, Volume= 2,568 cf, Atten= 92%, Lag= 251.1 min
 Discarded = 0.06 cfs @ 16.71 hrs, Volume= 2,568 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond DP2 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 418.55' @ 16.71 hrs Surf.Area= 4,166 sf Storage= 2,173 cf
 Flood Elev= 422.00' Surf.Area= 7,434 sf Storage= 21,946 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 207.7 min (1,063.0 - 855.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	418.00'	21,946 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)
418.00	3,724	260.0	0	0	3,724
420.00	5,447	311.0	9,117	9,117	6,111
422.00	7,434	351.0	12,830	21,946	8,319

Device	Routing	Invert	Outlet Devices
#1	Primary	420.85'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	418.00'	0.600 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.06 cfs @ 16.71 hrs HW=418.55' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=418.00' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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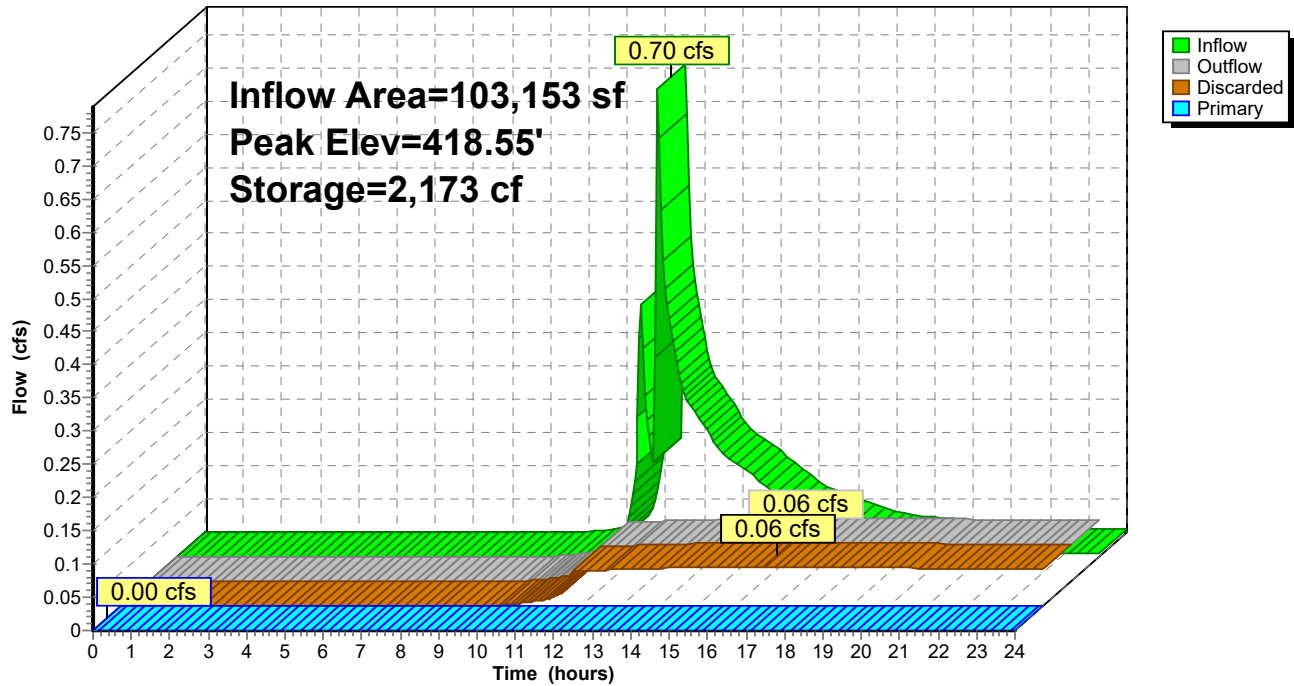
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Pond IP2: OPEN POND

Hydrograph



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Summary for Pond MH1: DMH1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 0.78" for 2 YEAR event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf
Outflow = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf
Routed to Pond MH2 : MH2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 433.54' @ 12.09 hrs

Flood Elev= 437.72'

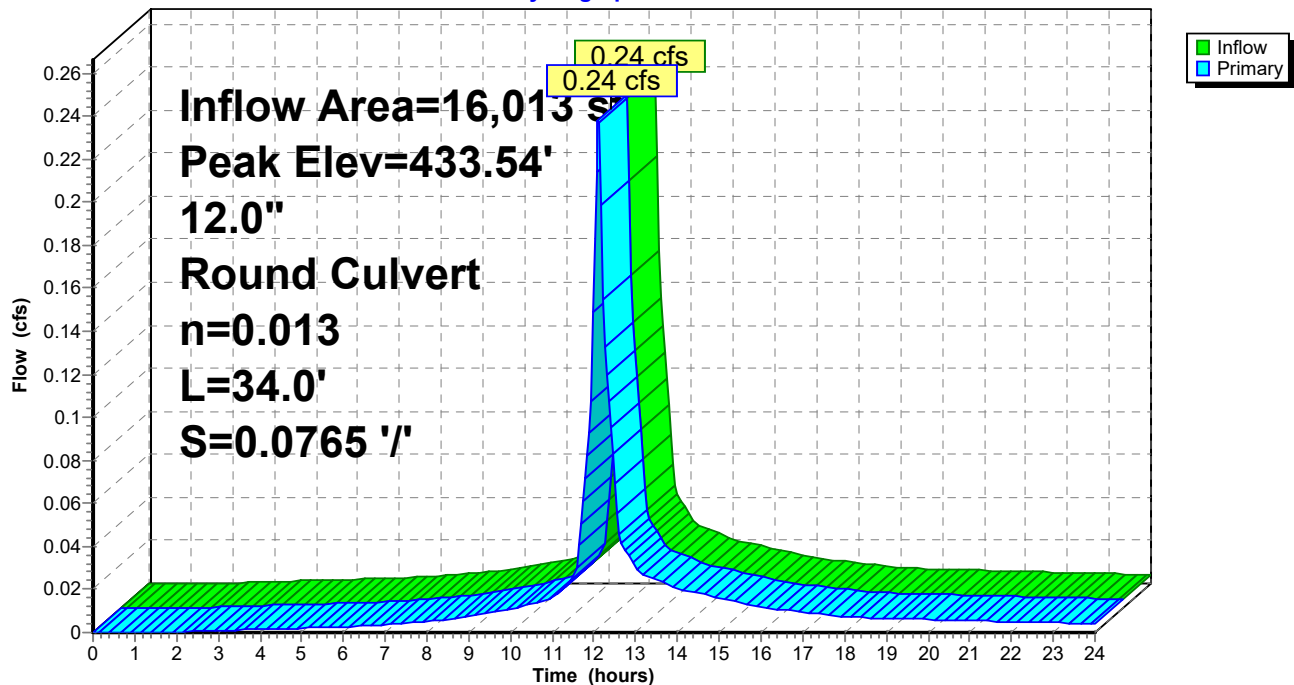
Device	Routing	Invert	Outlet Devices
#1	Primary	433.30'	12.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 433.30' / 430.70' S= 0.0765 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.23 cfs @ 12.09 hrs HW=433.54' TW=430.84' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.23 cfs @ 1.65 fps)

Pond MH1: DMH1

Hydrograph



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Summary for Pond MH2: MH2

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 0.78" for 2 YEAR event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf
Outflow = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.09 hrs, Volume= 1,037 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 430.84' @ 12.09 hrs

Flood Elev= 434.70'

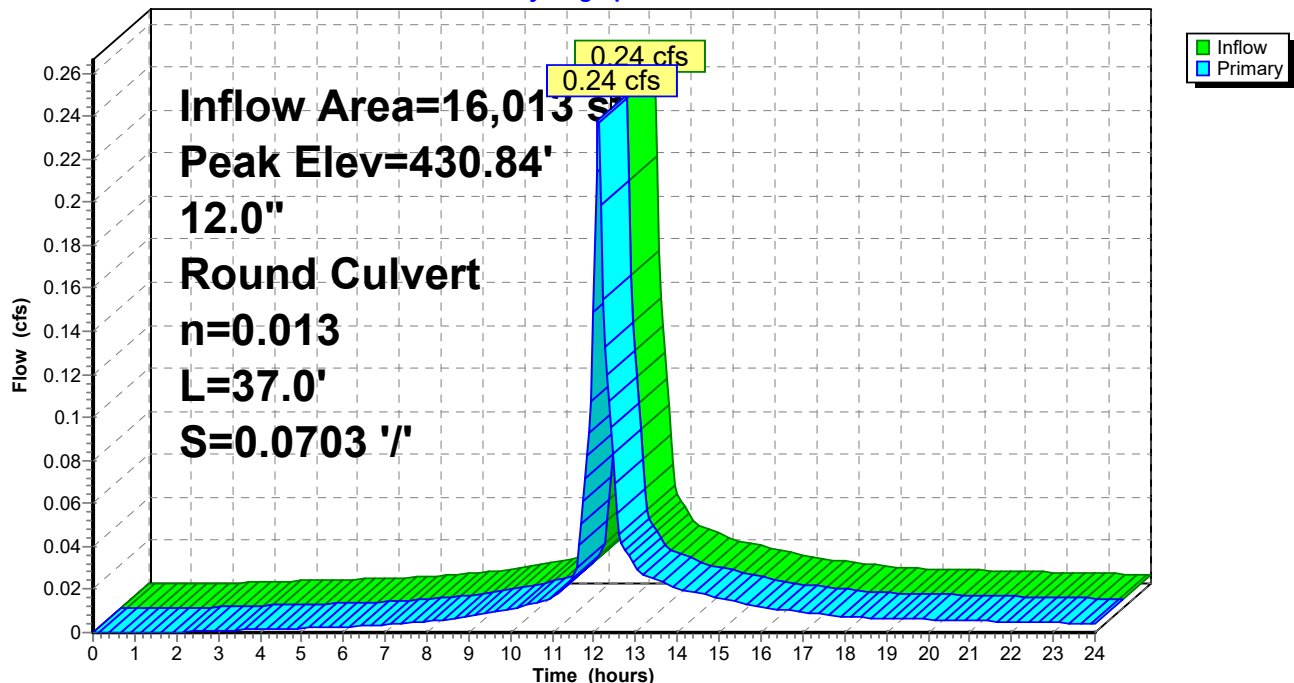
Device	Routing	Invert	Outlet Devices
#1	Primary	430.60'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 430.60' / 428.00' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.23 cfs @ 12.09 hrs HW=430.84' TW=425.31' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.23 cfs @ 1.65 fps)

Pond MH2: MH2

Hydrograph



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Summary for Pond MH3: MH3

Inflow Area = 23,737 sf, 48.03% Impervious, Inflow Depth > 1.27" for 2 YEAR event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,518 cf
Outflow = 0.67 cfs @ 12.09 hrs, Volume= 2,518 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,518 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.31' @ 12.09 hrs

Flood Elev= 432.00'

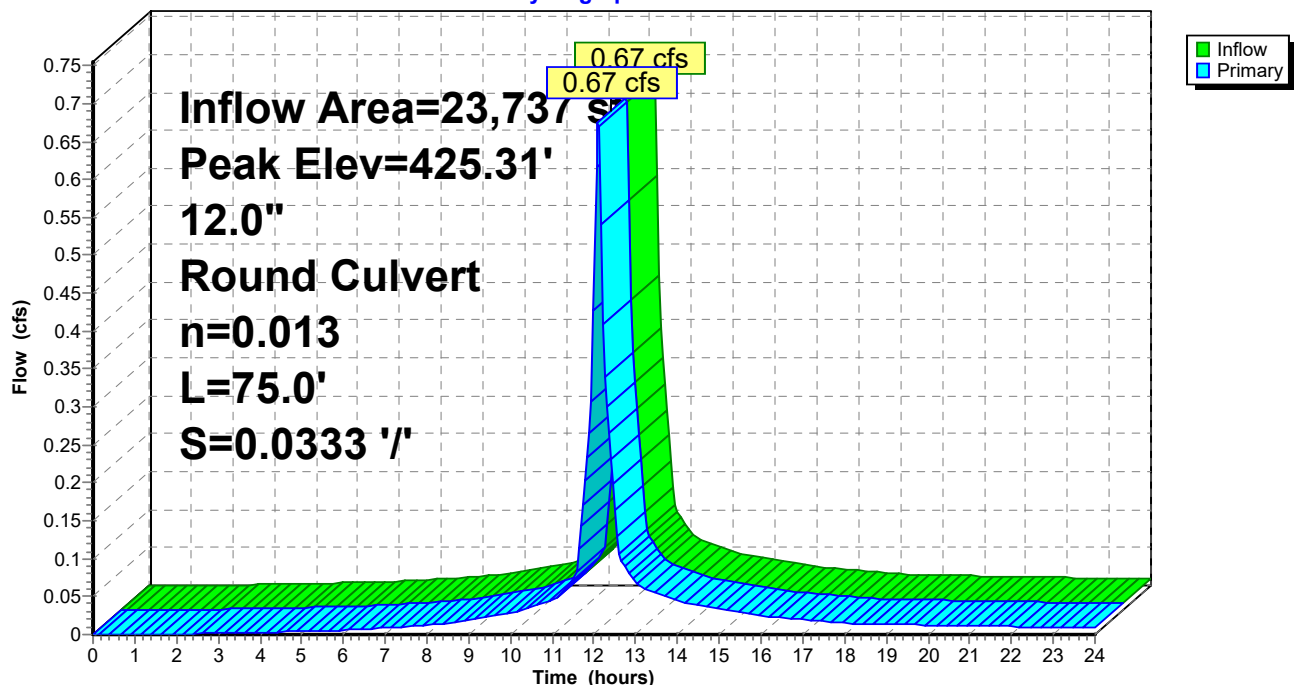
Device	Routing	Invert	Outlet Devices
#1	Primary	424.90'	12.0" Round Culvert L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.90' / 422.40' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.09 hrs HW=425.31' TW=422.32' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.66 cfs @ 2.18 fps)

Pond MH3: MH3

Hydrograph



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Summary for Pond MH4: MH4

Inflow Area = 26,901 sf, 51.88% Impervious, Inflow Depth > 1.34" for 2 YEAR event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 3,005 cf
Outflow = 0.83 cfs @ 12.09 hrs, Volume= 3,006 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.09 hrs, Volume= 3,006 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 422.89' @ 12.57 hrs

Flood Elev= 426.00'

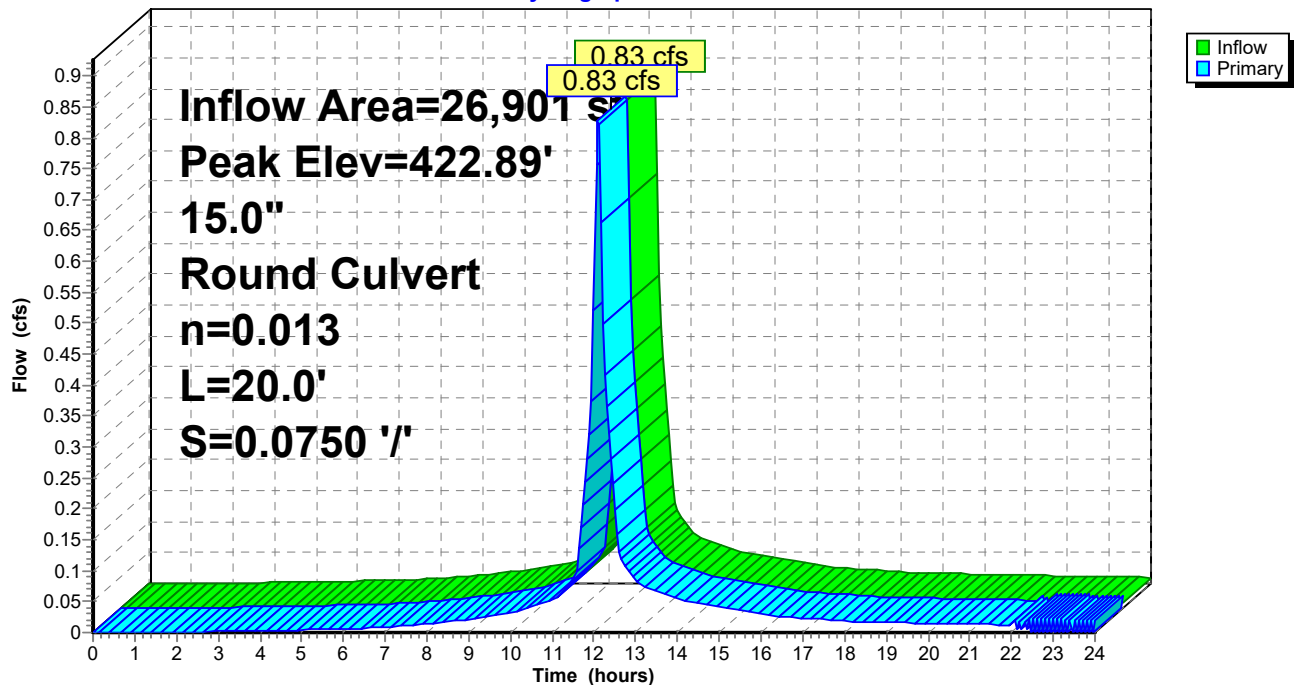
Device	Routing	Invert	Outlet Devices
#1	Primary	421.90'	15.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.40' S= 0.0750 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.81 cfs @ 12.09 hrs HW=422.32' TW=421.42' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.81 cfs @ 2.21 fps)

Pond MH4: MH4

Hydrograph



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Type III 24-hr 2 YEAR Rainfall=2.76"

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Summary for Pond MH5: DMH1

Inflow Area = 49,686 sf, 56.83% Impervious, Inflow Depth > 1.10" for 2 YEAR event
Inflow = 1.21 cfs @ 12.09 hrs, Volume= 4,571 cf
Outflow = 1.21 cfs @ 12.09 hrs, Volume= 4,571 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.21 cfs @ 12.09 hrs, Volume= 4,571 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 424.88' @ 12.09 hrs

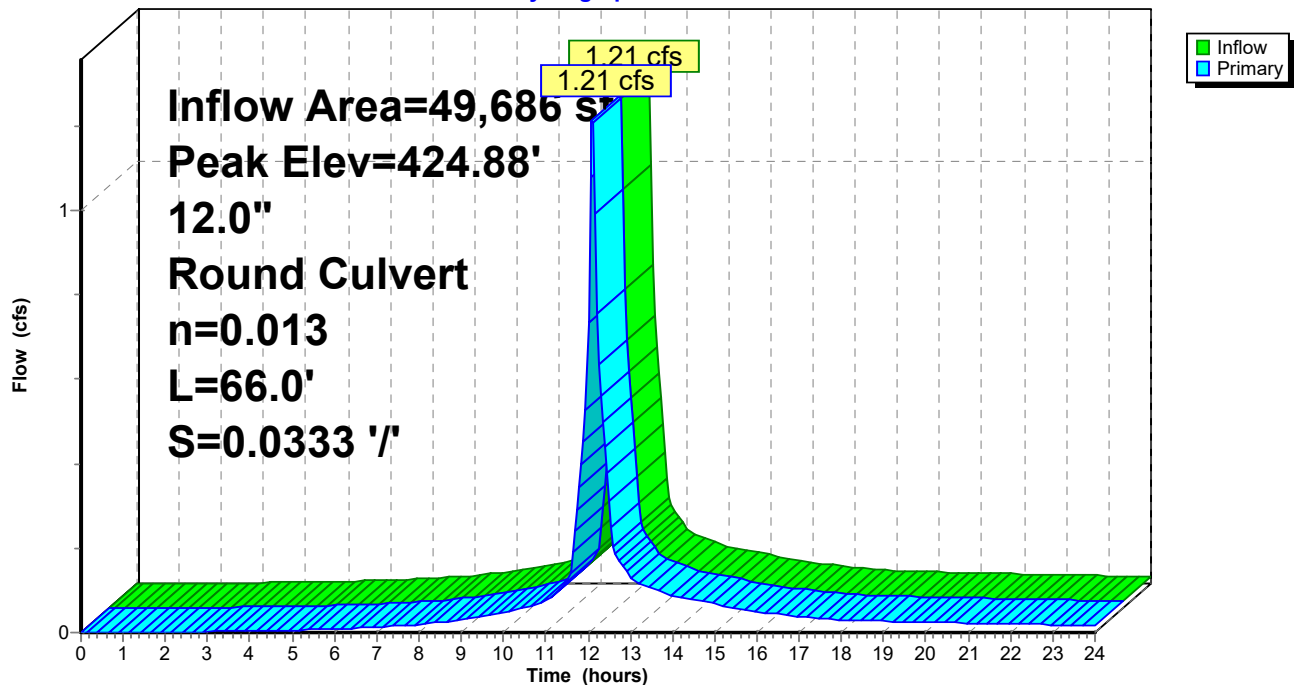
Flood Elev= 430.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	424.30'	12.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.30' / 422.10' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.09 hrs HW=424.87' TW=421.41' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.19 cfs @ 2.57 fps)

Pond MH5: DMH1

Hydrograph



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Summary for Pond MH6: MH6

Inflow Area = 63,361 sf, 61.23% Impervious, Inflow Depth > 1.25" for 2 YEAR event
Inflow = 1.84 cfs @ 12.09 hrs, Volume= 6,579 cf
Outflow = 1.84 cfs @ 12.09 hrs, Volume= 6,576 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.84 cfs @ 12.09 hrs, Volume= 6,576 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 422.89' @ 12.57 hrs

Flood Elev= 424.00'

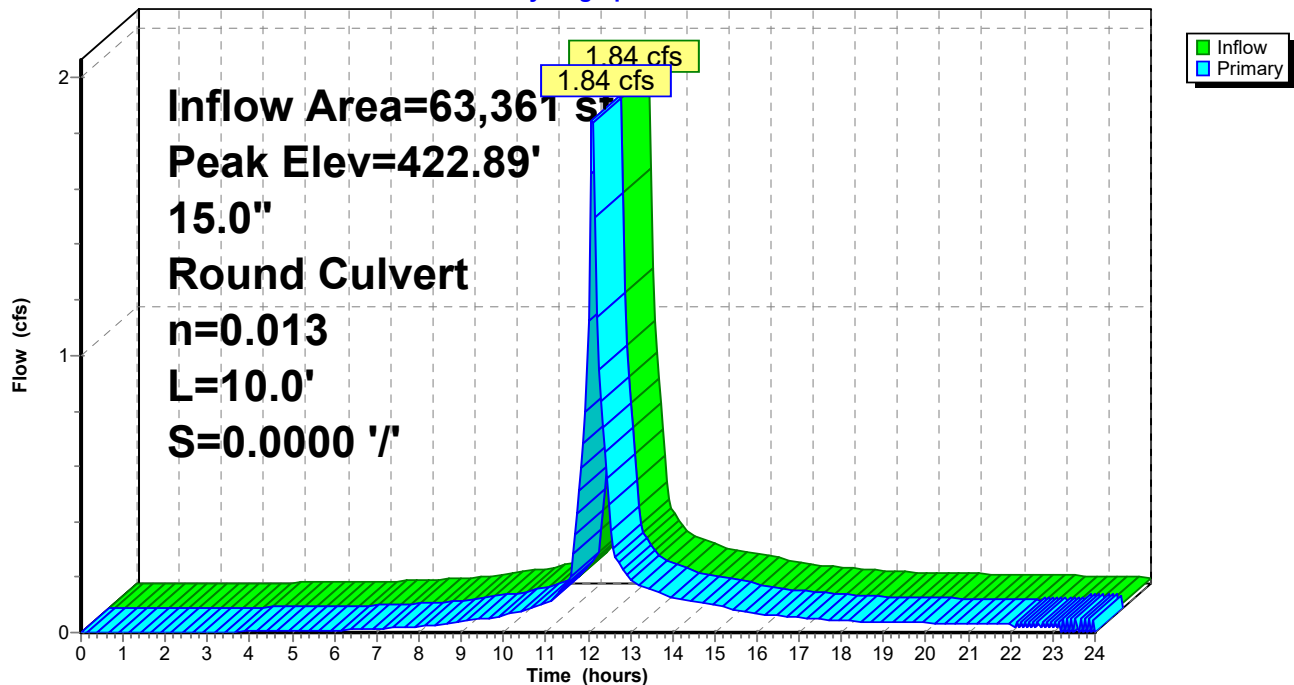
Device	Routing	Invert	Outlet Devices
#1	Primary	420.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.50' / 420.50' S= 0.0000 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=421.40' TW=421.43' (Dynamic Tailwater)

↑**1=Culvert** (Controls 0.00 cfs)

Pond MH6: MH6

Hydrograph



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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

SubcatchmentP1: SITE AREA	Runoff Area=5,853 sf 9.53% Impervious Runoff Depth>1.03" Flow Length=68' Tc=6.0 min CN=65 Runoff=0.14 cfs 504 cf
SubcatchmentP10: P10	Runoff Area=4,887 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=32 Runoff=0.00 cfs 0 cf
SubcatchmentP11: P11	Runoff Area=10,001 sf 63.52% Impervious Runoff Depth>1.74" Flow Length=303' Tc=6.0 min CN=76 Runoff=0.46 cfs 1,454 cf
SubcatchmentP12: OFF SITE	Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.24" Flow Length=729' Tc=6.0 min CN=47 Runoff=0.26 cfs 2,868 cf
SubcatchmentP2: P-2	Runoff Area=4,257 sf 90.72% Impervious Runoff Depth>3.33" Tc=6.0 min CN=94 Runoff=0.35 cfs 1,182 cf
SubcatchmentP3: P-3	Runoff Area=3,164 sf 80.78% Impervious Runoff Depth>3.02" Tc=6.0 min CN=91 Runoff=0.24 cfs 798 cf
SubcatchmentP4: P-4	Runoff Area=8,614 sf 91.32% Impervious Runoff Depth>3.33" Tc=6.0 min CN=94 Runoff=0.71 cfs 2,392 cf
SubcatchmentP5: P-5	Runoff Area=2,890 sf 92.53% Impervious Runoff Depth>3.44" Tc=6.0 min CN=95 Runoff=0.24 cfs 828 cf
SubcatchmentP6: P-6	Runoff Area=13,675 sf 77.19% Impervious Runoff Depth>2.93" Tc=6.0 min CN=90 Runoff=1.03 cfs 3,335 cf
SubcatchmentP7: P-7	Runoff Area=12,891 sf 53.09% Impervious Runoff Depth>2.13" Tc=6.0 min CN=81 Runoff=0.72 cfs 2,286 cf
SubcatchmentP8: P-8	Runoff Area=12,175 sf 1.91% Impervious Runoff Depth>0.72" Flow Length=175' Tc=6.2 min CN=59 Runoff=0.18 cfs 727 cf
SubcatchmentP9: (new Subcat)	Runoff Area=29,471 sf 30.49% Impervious Runoff Depth>0.82" Flow Length=297' Tc=6.0 min CN=61 Runoff=0.52 cfs 2,005 cf
SubcatchmentR1: ROOF 1	Runoff Area=3,838 sf 100.00% Impervious Runoff Depth>3.77" Tc=6.0 min CN=98 Runoff=0.34 cfs 1,207 cf
SubcatchmentR2: ROOF 2	Runoff Area=4,073 sf 100.00% Impervious Runoff Depth>3.77" Tc=6.0 min CN=98 Runoff=0.36 cfs 1,281 cf
SubcatchmentR3: ROOF 3	Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>3.77" Tc=6.0 min CN=98 Runoff=0.30 cfs 1,090 cf
SubcatchmentR4: ROOF 4	Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>3.77" Tc=6.0 min CN=98 Runoff=0.30 cfs 1,090 cf

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SubcatchmentR5: ROOF 5Runoff Area=1,171 sf 100.00% Impervious Runoff Depth>3.77"
Tc=6.0 min CN=98 Runoff=0.10 cfs 368 cf**Reach 3R: 12" PIPE**Avg. Flow Depth=0.19' Max Vel=3.64 fps Inflow=0.46 cfs 4,321 cf
18.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=14.01 cfs Outflow=0.46 cfs 4,320 cf**Reach 6R: 18" PIPE**Avg. Flow Depth=0.11' Max Vel=4.29 fps Inflow=0.26 cfs 2,868 cf
18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=0.26 cfs 2,867 cf**Pond CB1: CB1**Peak Elev=434.35' Inflow=0.51 cfs 1,933 cf
12.0" Round Culvert n=0.013 L=10.0' S=0.0600 '/' Outflow=0.51 cfs 1,933 cf**Pond CB2: CB2**Peak Elev=428.27' Inflow=0.30 cfs 1,090 cf
12.0" Round Culvert n=0.013 L=27.0' S=0.1111 '/' Outflow=0.30 cfs 1,090 cf**Pond CB3: CB3**Peak Elev=429.29' Inflow=0.35 cfs 1,182 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0500 '/' Outflow=0.35 cfs 1,182 cf**Pond CB4: CB4**Peak Elev=423.74' Inflow=0.24 cfs 798 cf
12.0" Round Culvert n=0.013 L=24.0' S=0.0625 '/' Outflow=0.24 cfs 798 cf**Pond CB5: CB3**Peak Elev=429.43' Inflow=0.71 cfs 2,392 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0833 '/' Outflow=0.71 cfs 2,392 cf**Pond CB6: DMH1**Peak Elev=425.81' Inflow=1.52 cfs 5,572 cf
15.0" Round Culvert n=0.013 L=34.0' S=0.0238 '/' Outflow=1.52 cfs 5,572 cf**Pond CB7: CB7**Peak Elev=423.33' Inflow=1.03 cfs 3,335 cf
12.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=1.03 cfs 3,335 cf**Pond CB8: CB8**Peak Elev=426.47' Inflow=1.17 cfs 4,376 cf
12.0" Round Culvert n=0.013 L=39.0' S=0.0179 '/' Outflow=1.17 cfs 4,376 cf**Pond CB9: CB-9**Peak Elev=428.07' Inflow=1.17 cfs 4,376 cf
12.0" Round Culvert n=0.013 L=91.0' S=0.0165 '/' Outflow=1.17 cfs 4,376 cf**Pond DP1: (new Pond)**Inflow=0.60 cfs 4,823 cf
Primary=0.60 cfs 4,823 cf**Pond DP2: (new Pond)**Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf**Pond IP1: buried structure**Peak Elev=423.16' Storage=4,758 cf Inflow=4.66 cfs 16,301 cf
Discarded=0.04 cfs 2,908 cf Primary=2.45 cfs 4,483 cf Secondary=2.45 cfs 4,483 cf Outflow=4.94 cfs 11,875 cf**Pond IP2: OPEN POND**Peak Elev=419.88' Storage=8,452 cf Inflow=5.51 cfs 11,252 cf
Discarded=0.07 cfs 3,380 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 3,380 cf**Pond MH1: DMH1**Peak Elev=433.65' Inflow=0.51 cfs 1,933 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0765 '/' Outflow=0.51 cfs 1,933 cf**Pond MH2: MH2**Peak Elev=430.95' Inflow=0.51 cfs 1,933 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0703 '/' Outflow=0.51 cfs 1,933 cf

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Pond MH3: MH3

Peak Elev=425.46' Inflow=1.16 cfs 4,205 cf
12.0" Round Culvert n=0.013 L=75.0' S=0.0333 '/' Outflow=1.16 cfs 4,205 cf

Pond MH4: MH4

Peak Elev=423.18' Inflow=1.40 cfs 5,003 cf
15.0" Round Culvert n=0.013 L=20.0' S=0.0750 '/' Outflow=1.40 cfs 5,003 cf

Pond MH5: DMH1

Peak Elev=425.15' Inflow=2.23 cfs 7,964 cf
12.0" Round Culvert n=0.013 L=66.0' S=0.0333 '/' Outflow=2.23 cfs 7,964 cf

Pond MH6: MH6

Peak Elev=423.31' Inflow=3.26 cfs 11,299 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0000 '/' Outflow=3.26 cfs 11,299 cf

Total Runoff Area = 269,931 sf Runoff Volume = 23,413 cf Average Runoff Depth = 1.04"
63.41% Pervious = 171,155 sf 36.59% Impervious = 98,776 sf

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Summary for Subcatchment P1: SITE AREA

Runoff = 0.14 cfs @ 12.10 hrs, Volume= 504 cf, Depth> 1.03"
 Routed to Pond DP1 : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
558	98	Paved parking, HSG B
5,295	61	>75% Grass cover, Good, HSG B
5,853	65	Weighted Average
5,295		90.47% Pervious Area
558		9.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	5	0.0200	0.72		Sheet Flow, flow on pavement Smooth surfaces n= 0.011 P2= 2.94"
2.4	28	0.0600	0.20		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.1	5	0.0200	0.72		Sheet Flow, flow over pavement Smooth surfaces n= 0.011 P2= 2.94"
0.6	10	0.2000	0.26		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.2	20	0.1000	2.21		Shallow Concentrated Flow, flow over grass Short Grass Pasture Kv= 7.0 fps
2.6					Direct Entry,
6.0	68	Total			

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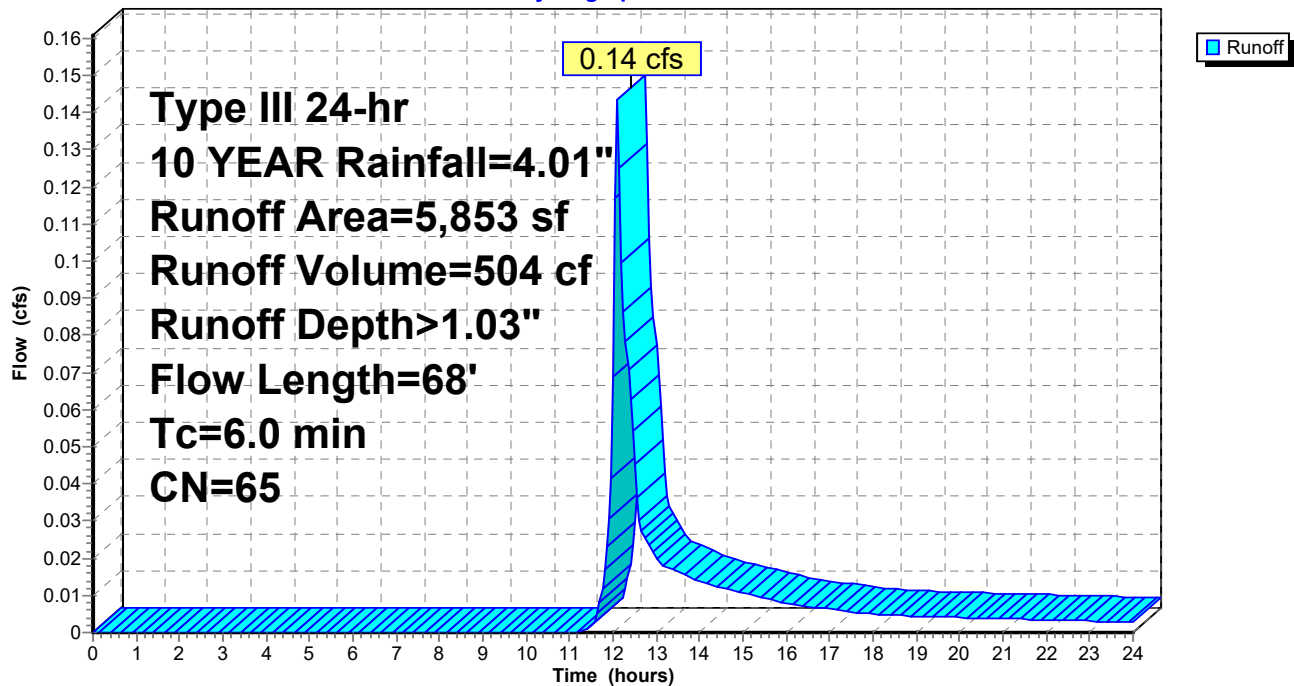
Type III 24-hr 10 YEAR Rainfall=4.01"

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Subcatchment P1: SITE AREA

Hydrograph



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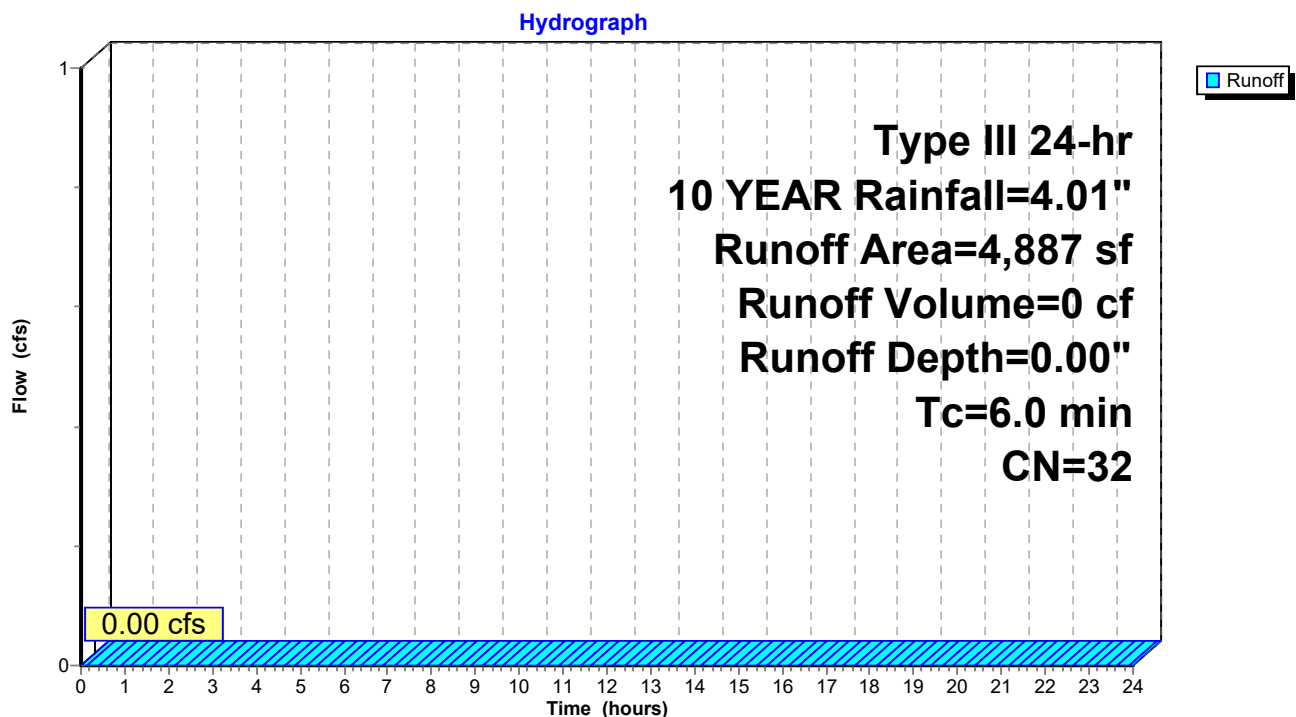
Summary for Subcatchment P10: P10

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Pond DP2 : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
4,887	32	Woods/grass comb., Good, HSG A
4,887		100.00% Pervious Area

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

Subcatchment P10: P10

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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment P11: P11

Runoff = 0.46 cfs @ 12.10 hrs, Volume= 1,454 cf, Depth> 1.74"
Routed to Reach 3R : 12" PIPE

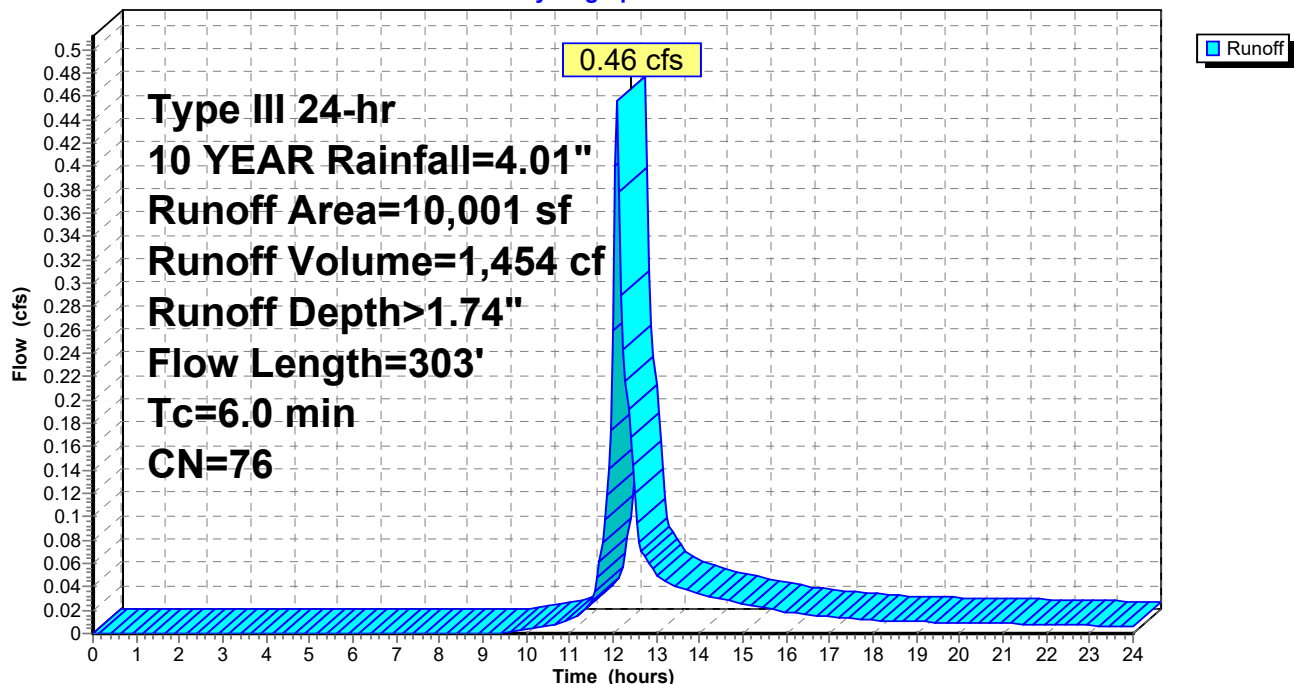
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 6,353	98	Paved parking, HSG A and B
10,001	76	Weighted Average
3,648		36.48% Pervious Area
6,353		63.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.00		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment P11: P11

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment P12: OFF SITE

Runoff = 0.26 cfs @ 12.39 hrs, Volume= 2,868 cf, Depth> 0.24"
Routed to Reach 6R : 18" PIPE

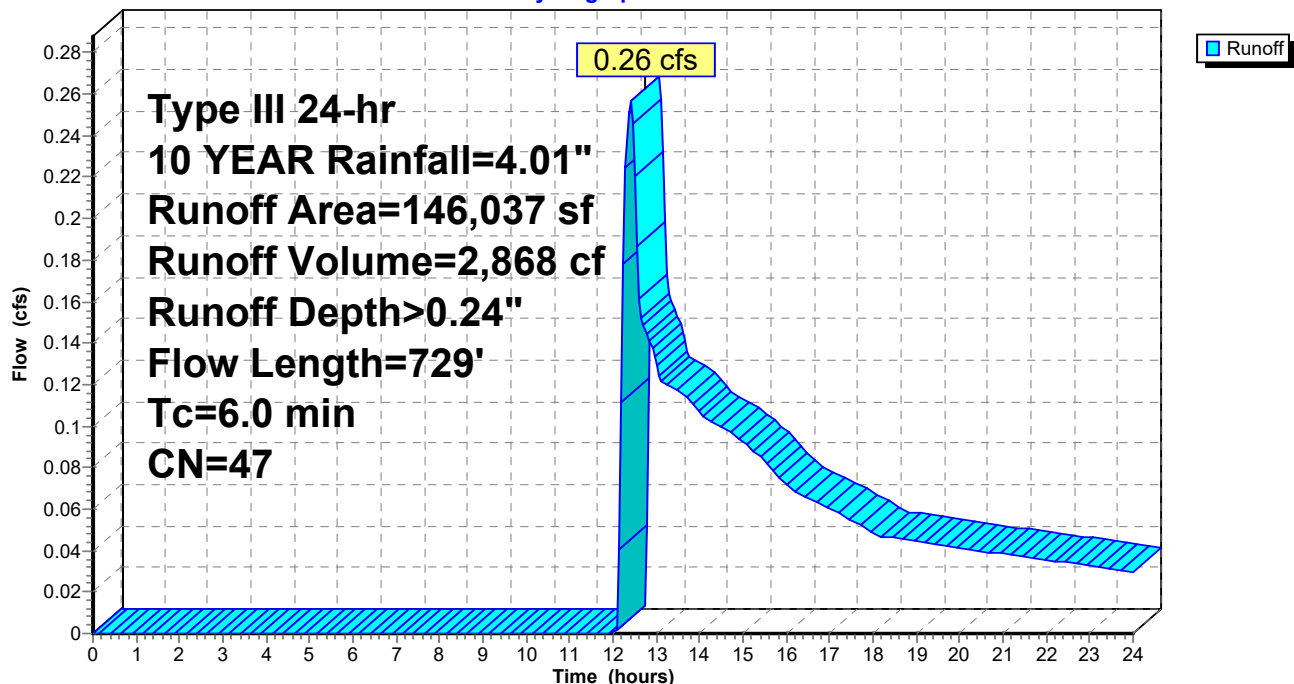
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
* 32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.87		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment P12: OFF SITE

Hydrograph



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Summary for Subcatchment P2: P-2

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 1,182 cf, Depth> 3.33"
Routed to Pond CB3 : CB3

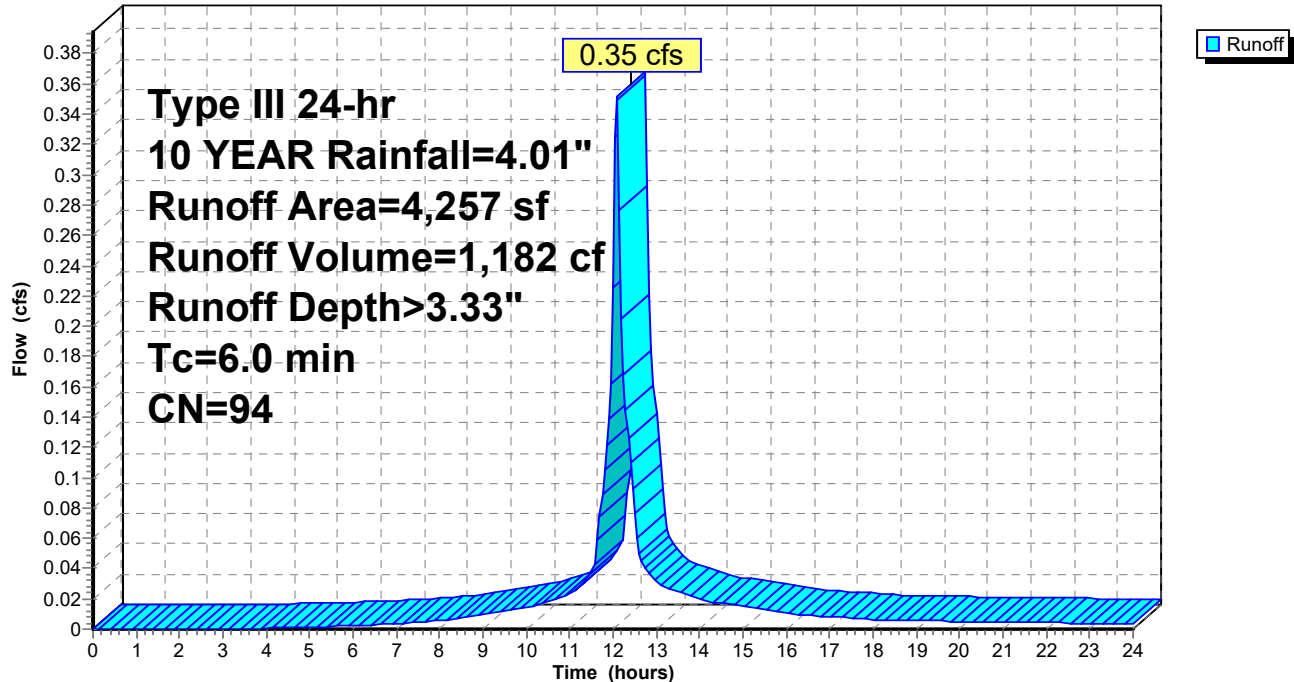
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
2,866	98	Paved parking, HSG A
996	98	Paved parking, HSG B
185	39	>75% Grass cover, Good, HSG A
210	61	>75% Grass cover, Good, HSG B
4,257	94	Weighted Average
395		9.28% Pervious Area
3,862		90.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P2: P-2

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment P3: P-3

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 798 cf, Depth> 3.02"
Routed to Pond CB4 : CB4

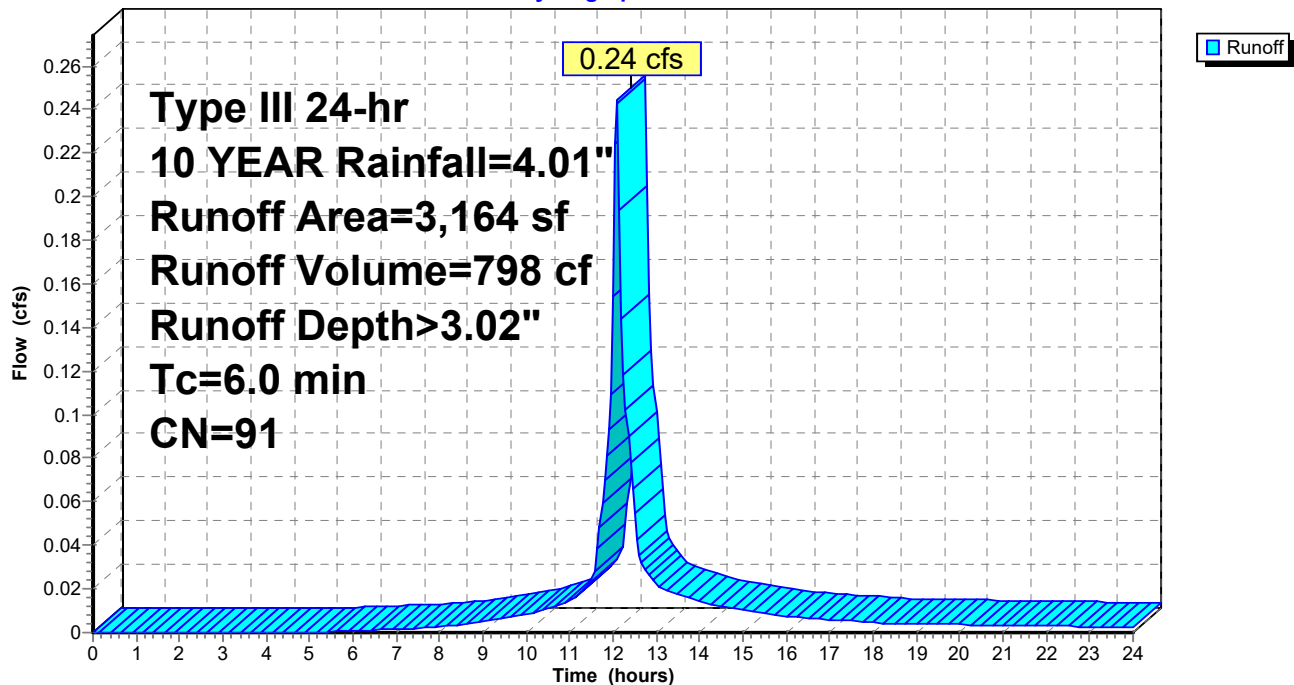
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
1,399	98	Paved parking, HSG A
1,157	98	Water Surface, HSG B
608	61	>75% Grass cover, Good, HSG B
3,164	91	Weighted Average
608		19.22% Pervious Area
2,556		80.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P3: P-3

Hydrograph



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Summary for Subcatchment P4: P-4

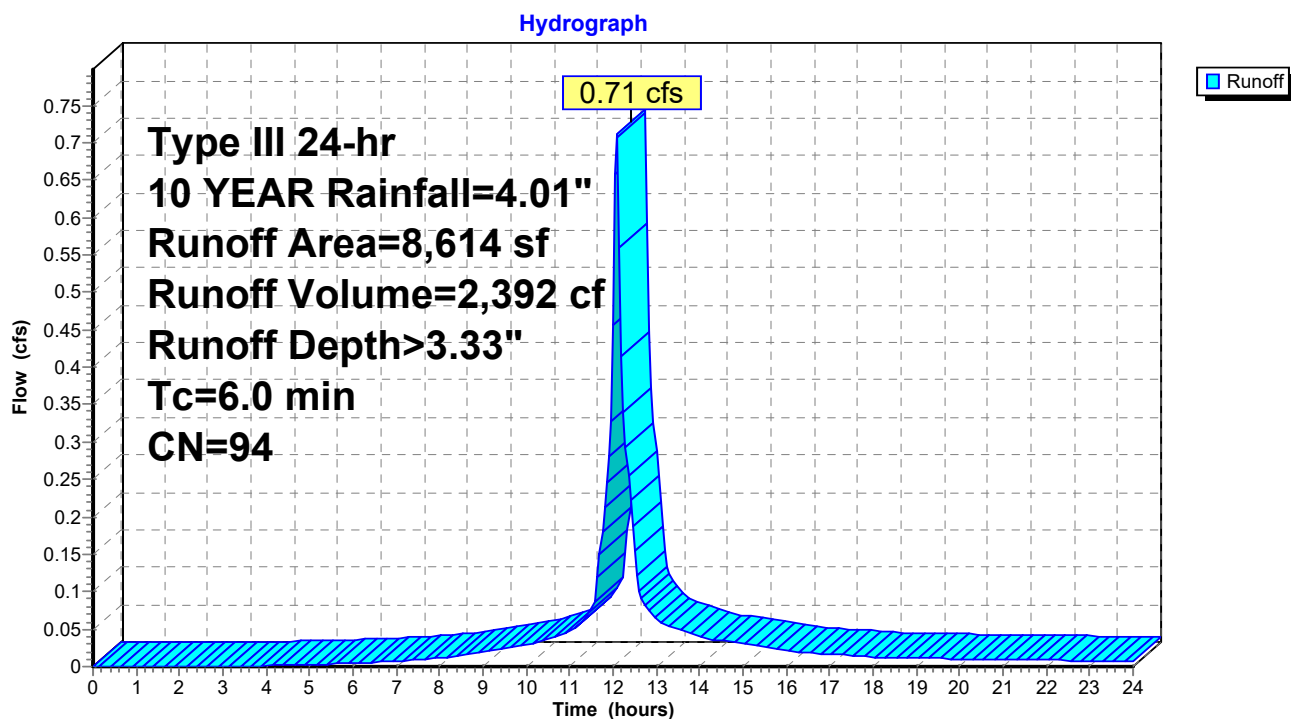
Runoff = 0.71 cfs @ 12.09 hrs, Volume= 2,392 cf, Depth> 3.33"
Routed to Pond CB5 : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

	Area (sf)	CN	Description
*	7,866	98	Paved parking, HSG A, B
	119	39	>75% Grass cover, Good, HSG A
	629	61	>75% Grass cover, Good, HSG B
	8,614	94	Weighted Average
	748		8.68% Pervious Area
	7,866		91.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P4: P-4



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Summary for Subcatchment P5: P-5

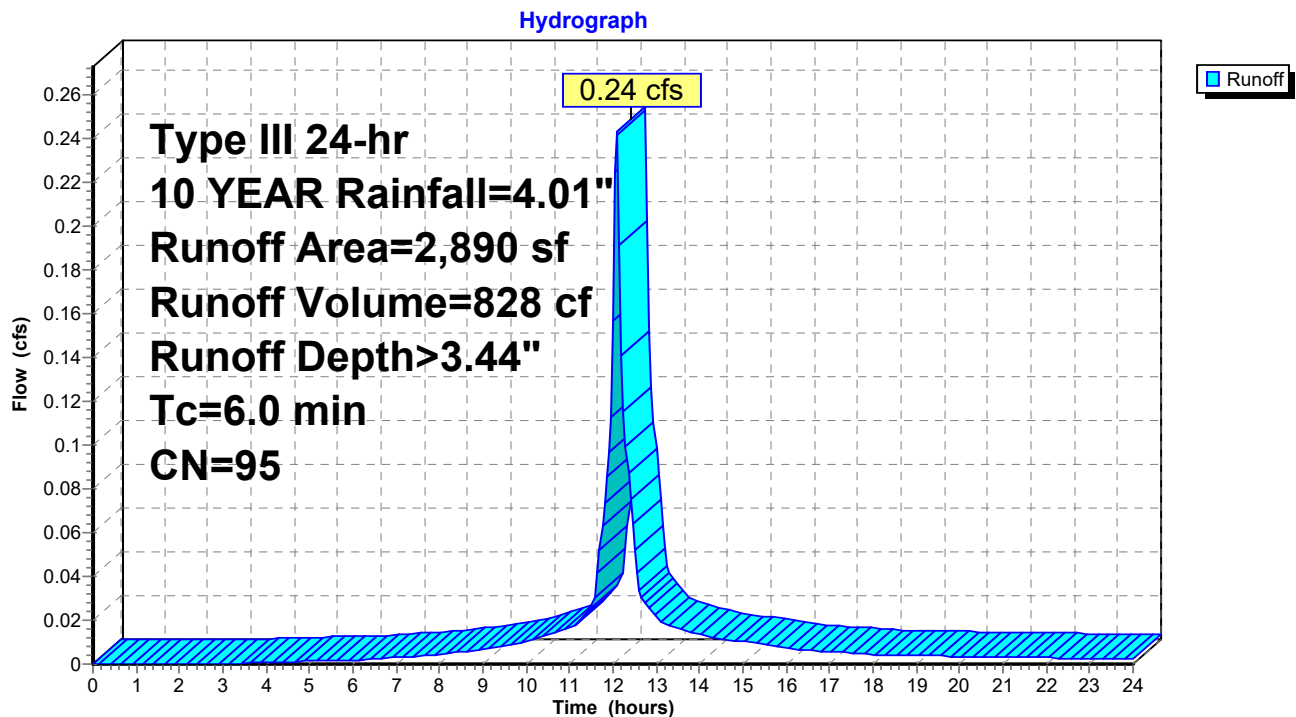
Runoff = 0.24 cfs @ 12.09 hrs, Volume= 828 cf, Depth> 3.44"
Routed to Pond CB6 : DMH1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

	Area (sf)	CN	Description
*	2,674	98	Paved parking, HSG B,C
	216	61	>75% Grass cover, Good, HSG B
	2,890	95	Weighted Average
	216		7.47% Pervious Area
	2,674		92.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P5: P-5



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment P6: P-6

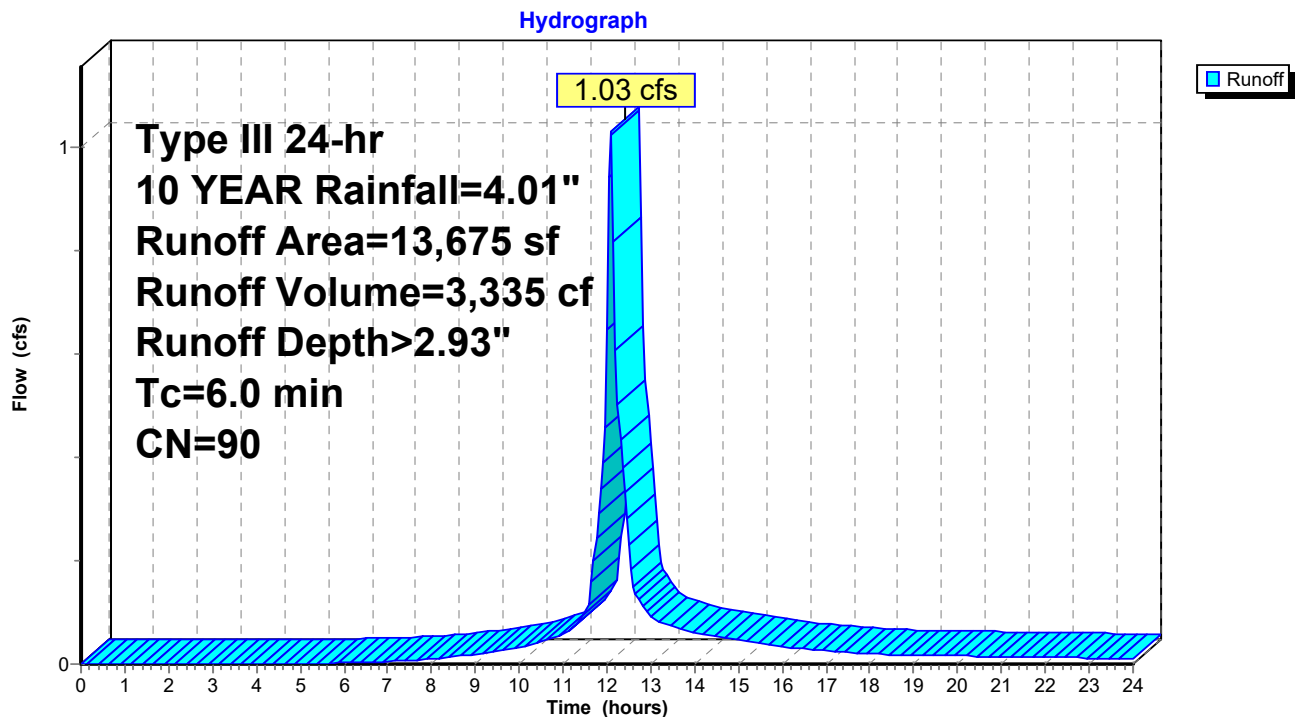
Runoff = 1.03 cfs @ 12.09 hrs, Volume= 3,335 cf, Depth> 2.93"
Routed to Pond CB7 : CB7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
10,556	98	Paved parking, HSG B
3,119	61	>75% Grass cover, Good, HSG B
13,675	90	Weighted Average
3,119		22.81% Pervious Area
10,556		77.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P6: P-6



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment P7: P-7

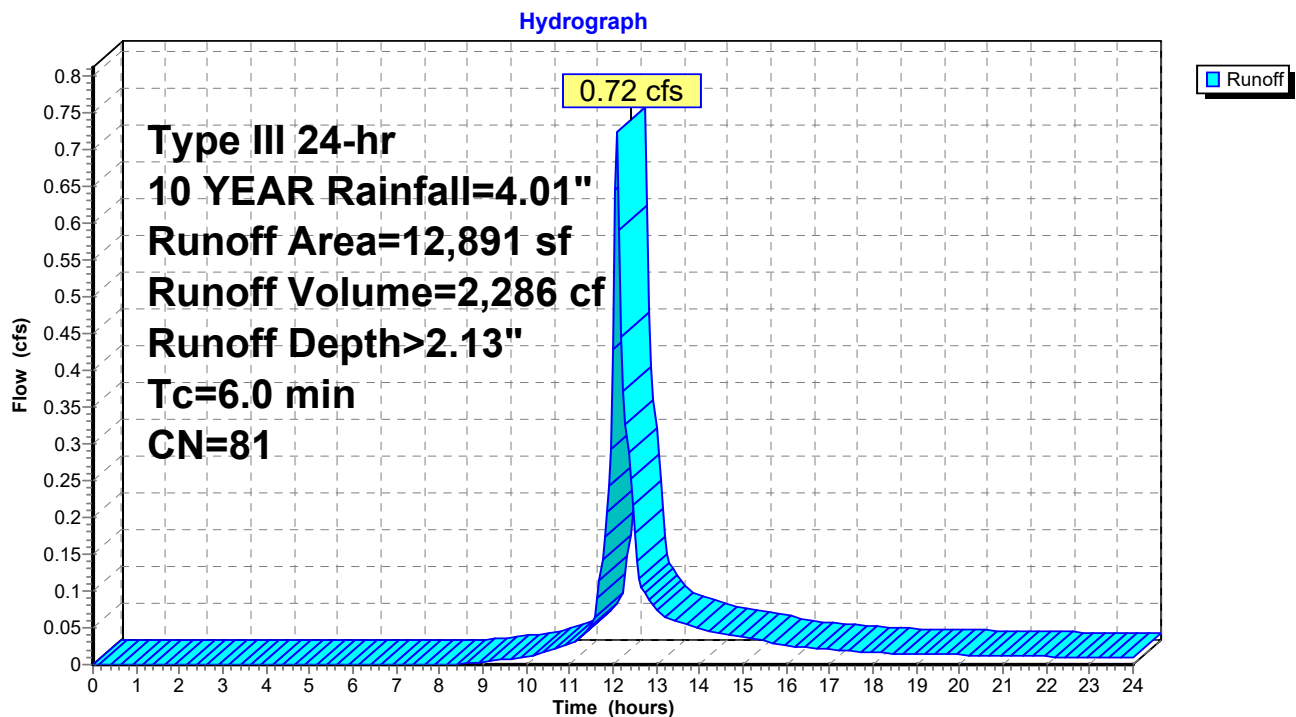
Runoff = 0.72 cfs @ 12.09 hrs, Volume= 2,286 cf, Depth> 2.13"
Routed to Pond IP2 : OPEN POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

	Area (sf)	CN	Description
	6,412	98	Water Surface, HSG B
*	432	98	Paved parking, HSG B,C
	6,047	61	>75% Grass cover, Good, HSG B
	12,891	81	Weighted Average
	6,047		46.91% Pervious Area
	6,844		53.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER GRASS TO POND

Subcatchment P7: P-7



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment P8: P-8

Runoff = 0.18 cfs @ 12.12 hrs, Volume= 727 cf, Depth> 0.72"
 Routed to Pond CB1 : CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
233	98	Paved parking, HSG A
6,658	39	>75% Grass cover, Good, HSG A
2,764	96	Gravel surface, HSG A
2,086	61	>75% Grass cover, Good, HSG B
434	96	Gravel surface, HSG B
12,175	59	Weighted Average
11,942		98.09% Pervious Area
233		1.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.2400	0.26		Sheet Flow, FLOW OVER GRASS Grass: Dense n= 0.240 P2= 2.94"
0.7	80	0.0100	2.03		Shallow Concentrated Flow, FLOW OVER GRAVEL Paved Kv= 20.3 fps
0.5	45	0.0400	1.40		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
1.8					Direct Entry, ADD FLOW TIME
6.2	175	Total			

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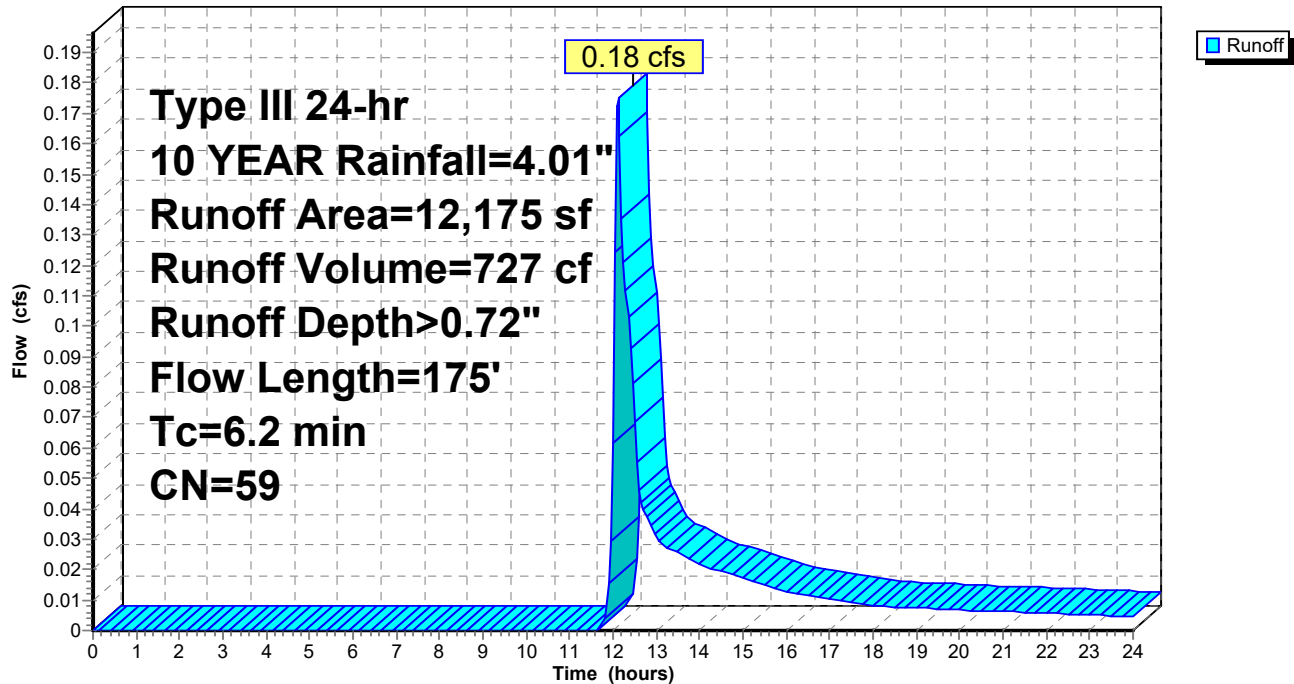
Type III 24-hr 10 YEAR Rainfall=4.01"

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Subcatchment P8: P-8

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment P9: (new Subcat)

Runoff = 0.52 cfs @ 12.11 hrs, Volume= 2,005 cf, Depth> 0.82"
 Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
8,986	98	Paved parking, HSG A
2,275	96	Gravel surface, HSG A
18,210	39	>75% Grass cover, Good, HSG A
29,471	61	Weighted Average
20,485		69.51% Pervious Area
8,986		30.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0600	1.78		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.2	50	0.0600	4.97		Shallow Concentrated Flow, FLOW OVER PAVEMENT Paved Kv= 20.3 fps
0.4	75	0.2400	3.43		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
1.0	122	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
3.9					Direct Entry,
6.0	297	Total			

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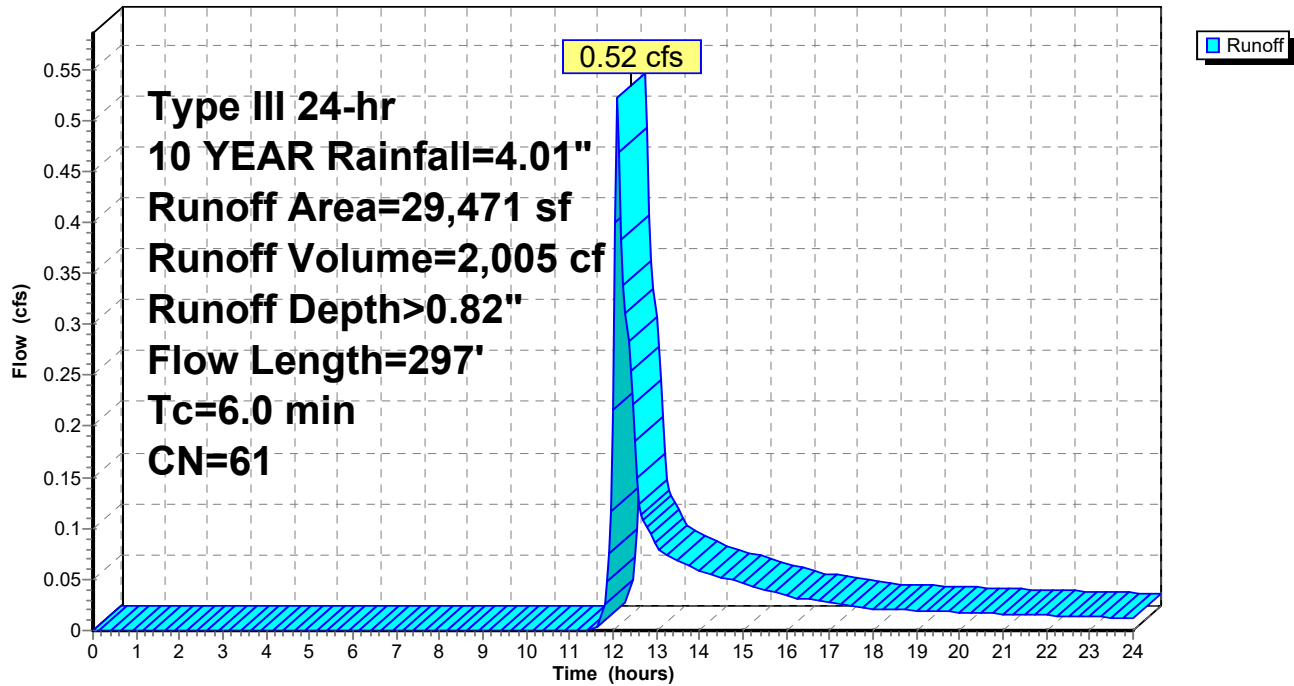
Type III 24-hr 10 YEAR Rainfall=4.01"

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Subcatchment P9: (new Subcat)

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment R1: ROOF 1

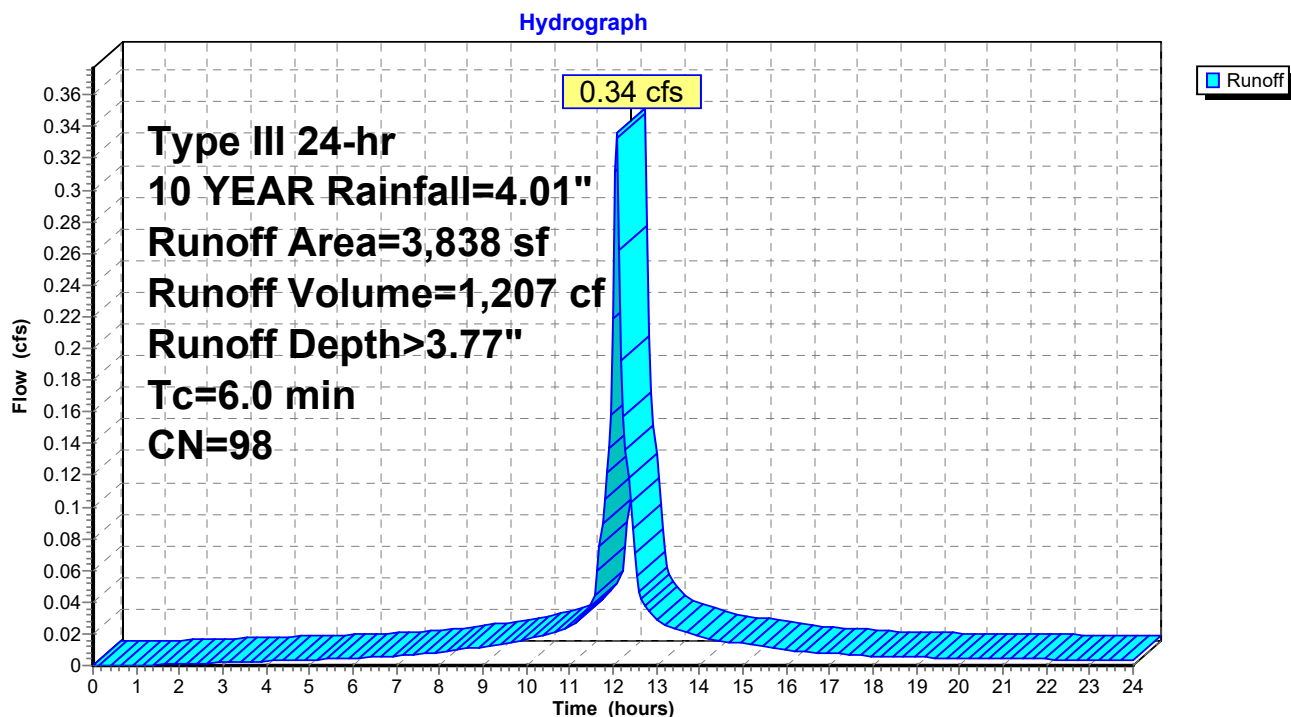
Runoff = 0.34 cfs @ 12.09 hrs, Volume= 1,207 cf, Depth> 3.77"
Routed to Pond CB1 : CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
3,838	98	Roofs, HSG A
3,838		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB1

Subcatchment R1: ROOF 1



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment R2: ROOF 2

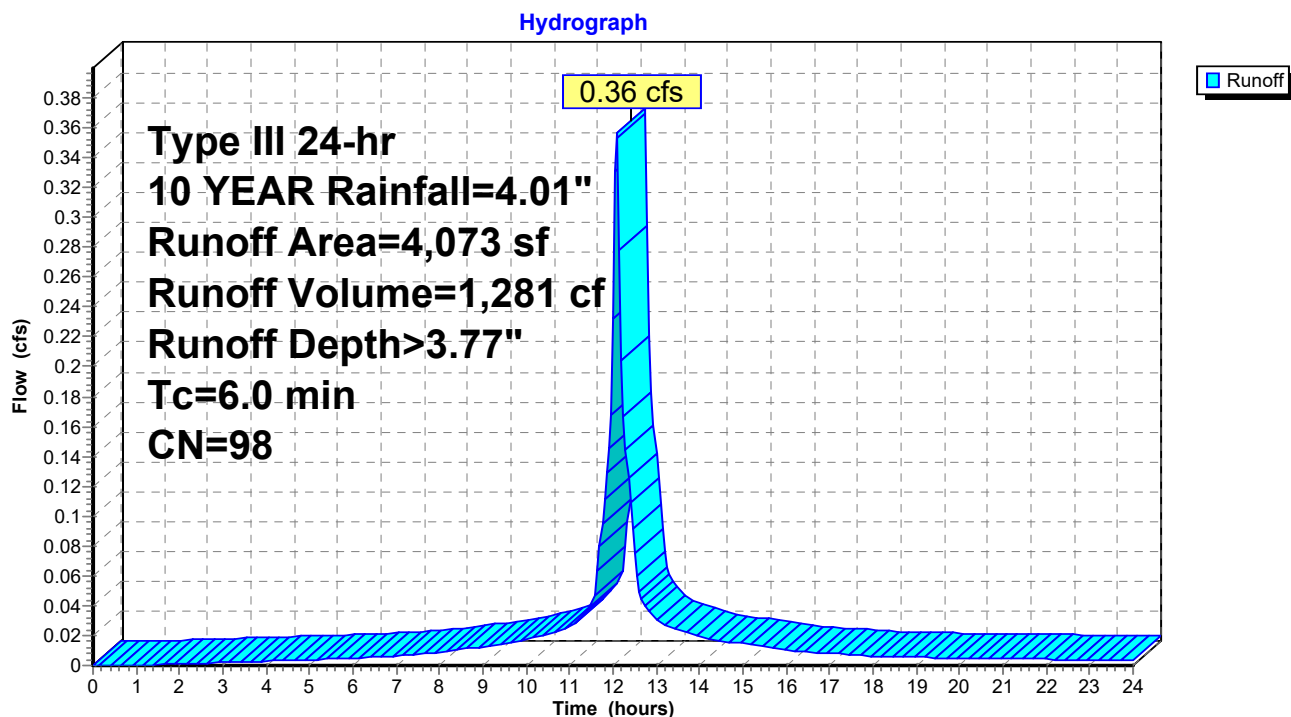
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 1,281 cf, Depth> 3.77"
Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
4,073	98	Roofs, HSG A
4,073		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R2: ROOF 2



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment R3: ROOF 3

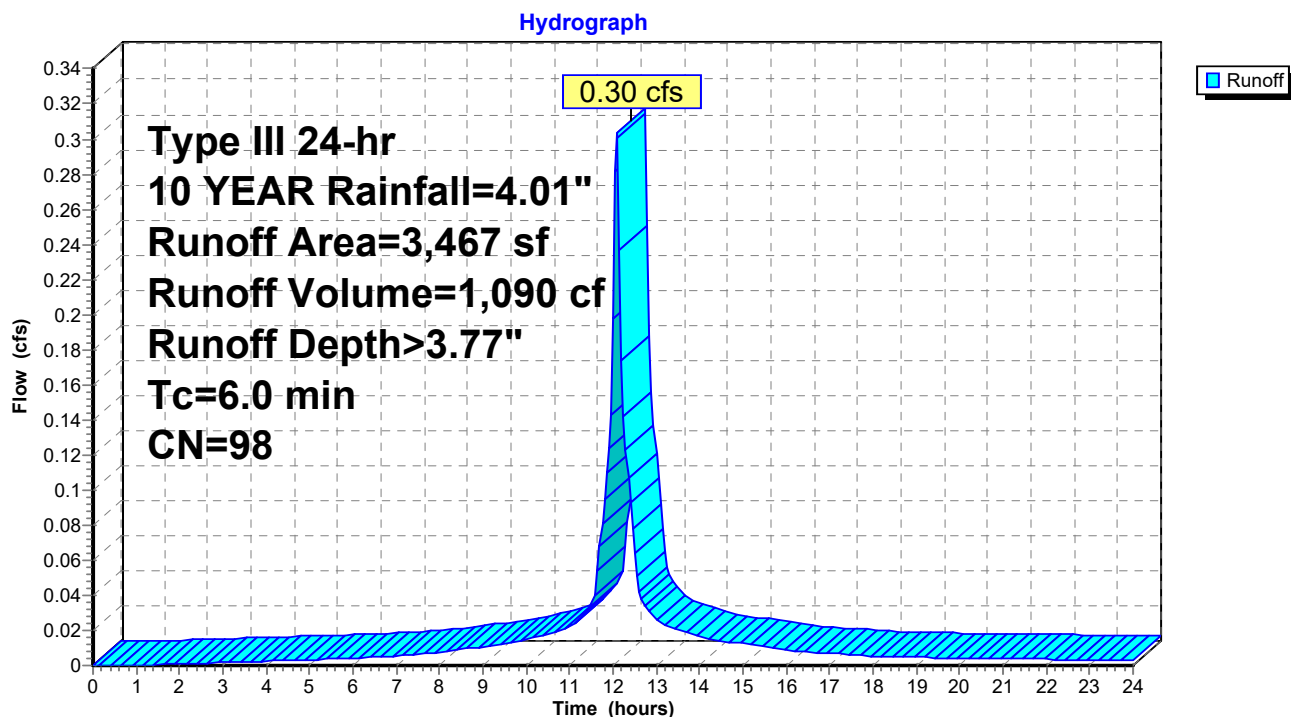
Runoff = 0.30 cfs @ 12.09 hrs, Volume= 1,090 cf, Depth> 3.77"
Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
* 3,467	98	Roofs, HSG A,B
3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R3: ROOF 3



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Summary for Subcatchment R4: ROOF 4

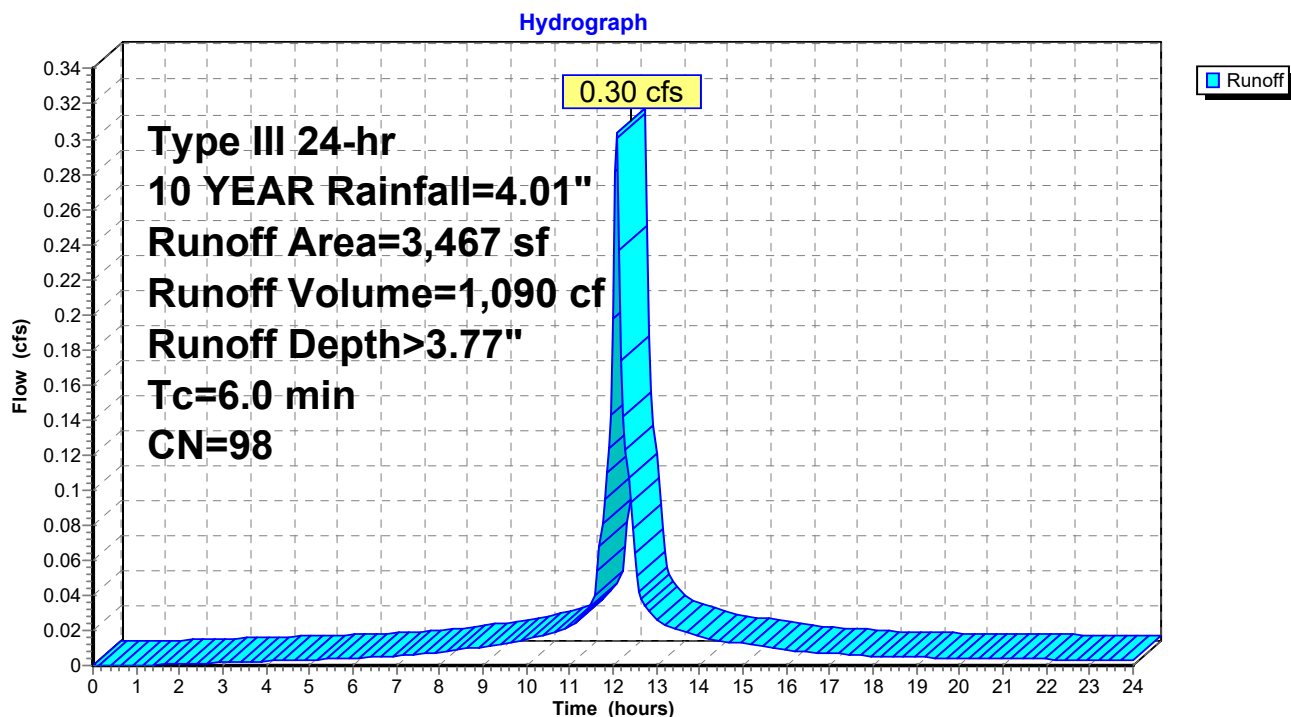
Runoff = 0.30 cfs @ 12.09 hrs, Volume= 1,090 cf, Depth> 3.77"
Routed to Pond CB2 : CB2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

Area (sf)	CN	Description
3,467	98	Roofs, HSG A
3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB2

Subcatchment R4: ROOF 4



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Subcatchment R5: ROOF 5

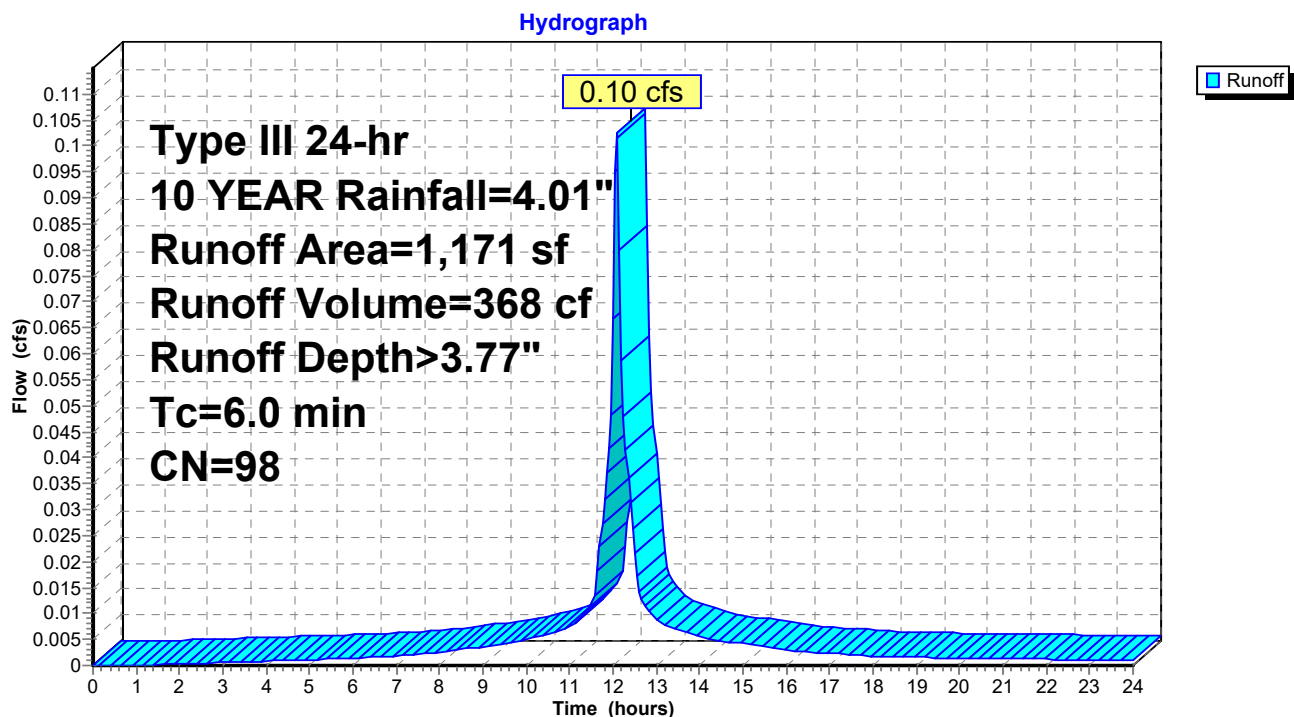
Runoff = 0.10 cfs @ 12.09 hrs, Volume= 368 cf, Depth> 3.77"
Routed to Pond CB6 : DMH1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.01"

	Area (sf)	CN	Description
*	1,171	98	Roofs, HSG A,B
	1,171		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB6

Subcatchment R5: ROOF 5



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Type III 24-hr 10 YEAR Rainfall=4.01"

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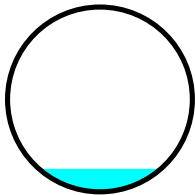
Summary for Reach 3R: 12" PIPE

Inflow Area = 156,038 sf, 24.75% Impervious, Inflow Depth > 0.33" for 10 YEAR event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 4,321 cf
Outflow = 0.46 cfs @ 12.11 hrs, Volume= 4,320 cf, Atten= 0%, Lag= 0.2 min
Routed to Pond DP1 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.64 fps, Min. Travel Time= 0.3 min
Avg. Velocity= 1.99 fps, Avg. Travel Time= 0.6 min

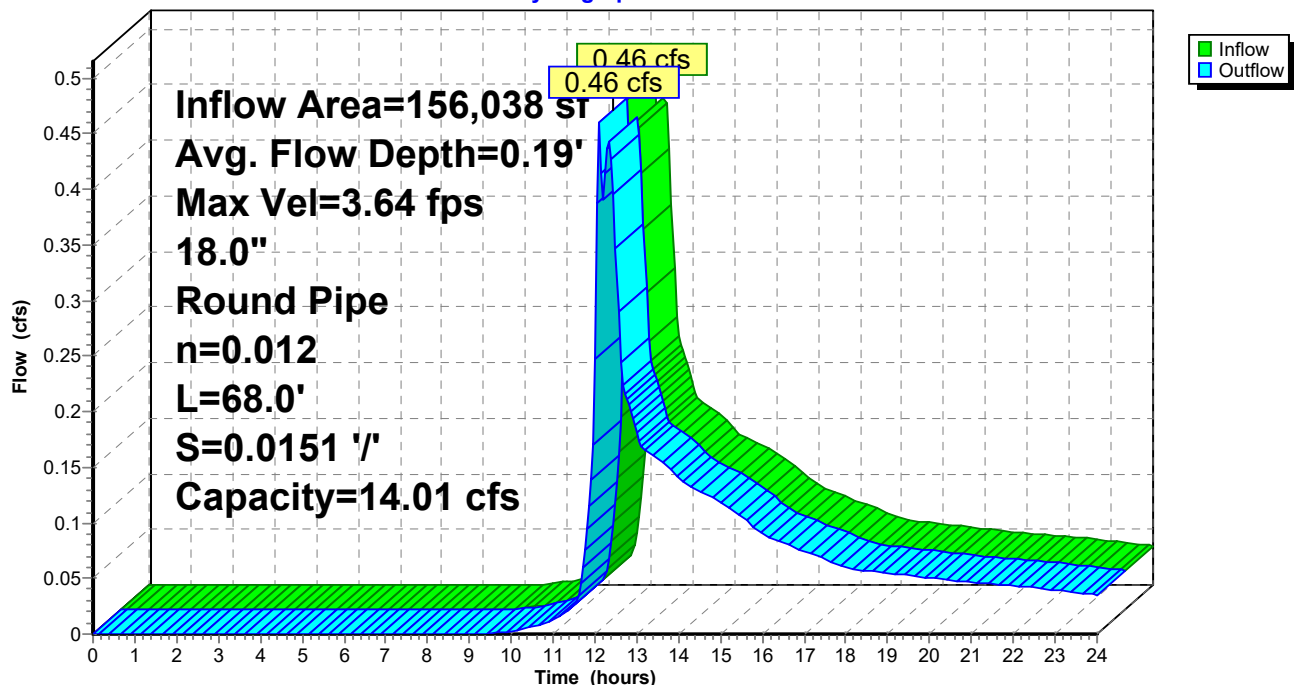
Peak Storage= 9 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.99'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.01 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 3R: 12" PIPE

Hydrograph



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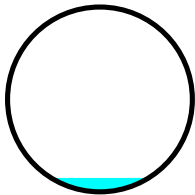
Summary for Reach 6R: 18" PIPE

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.24" for 10 YEAR event
Inflow = 0.26 cfs @ 12.39 hrs, Volume= 2,868 cf
Outflow = 0.26 cfs @ 12.40 hrs, Volume= 2,867 cf, Atten= 0%, Lag= 0.2 min
Routed to Reach 3R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.29 fps, Min. Travel Time= 0.3 min
Avg. Velocity= 2.76 fps, Avg. Travel Time= 0.5 min

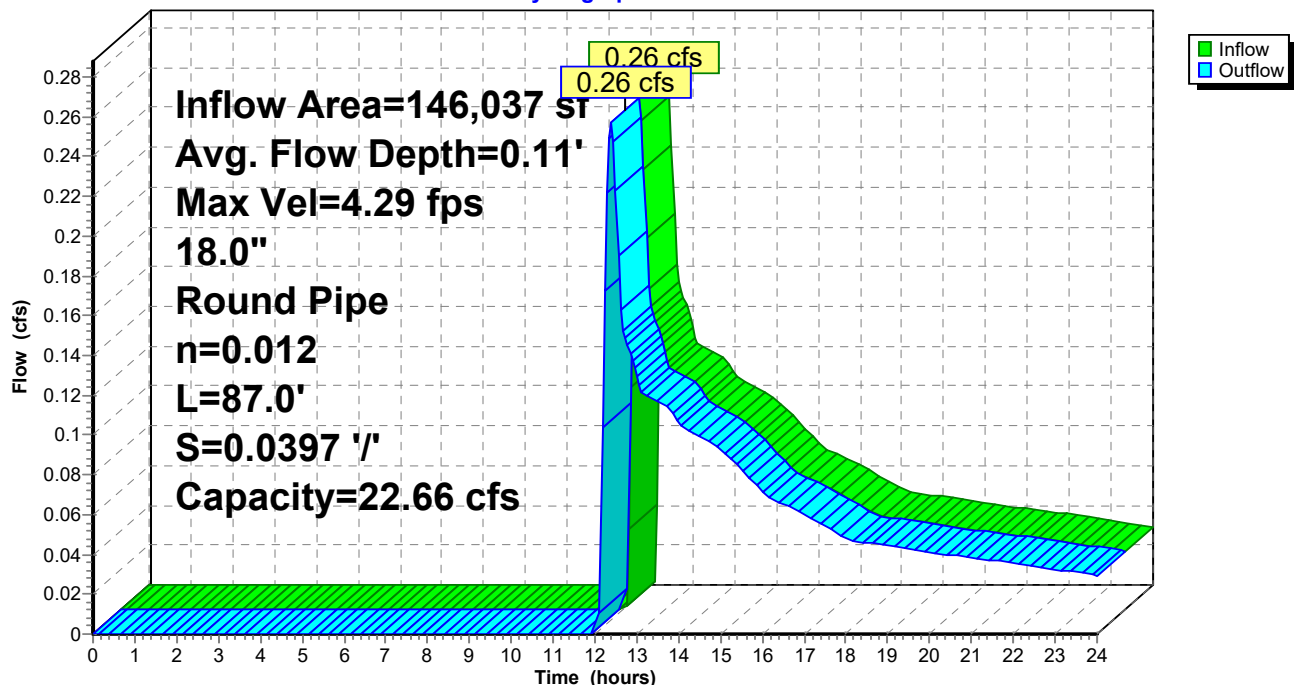
Peak Storage= 5 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 0.79'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 6R: 18" PIPE

Hydrograph



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Type III 24-hr 10 YEAR Rainfall=4.01"

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Summary for Pond CB1: CB1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 1.45" for 10 YEAR event
Inflow = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf
Outflow = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf
Routed to Pond MH1 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 434.35' @ 12.10 hrs

Flood Elev= 437.72'

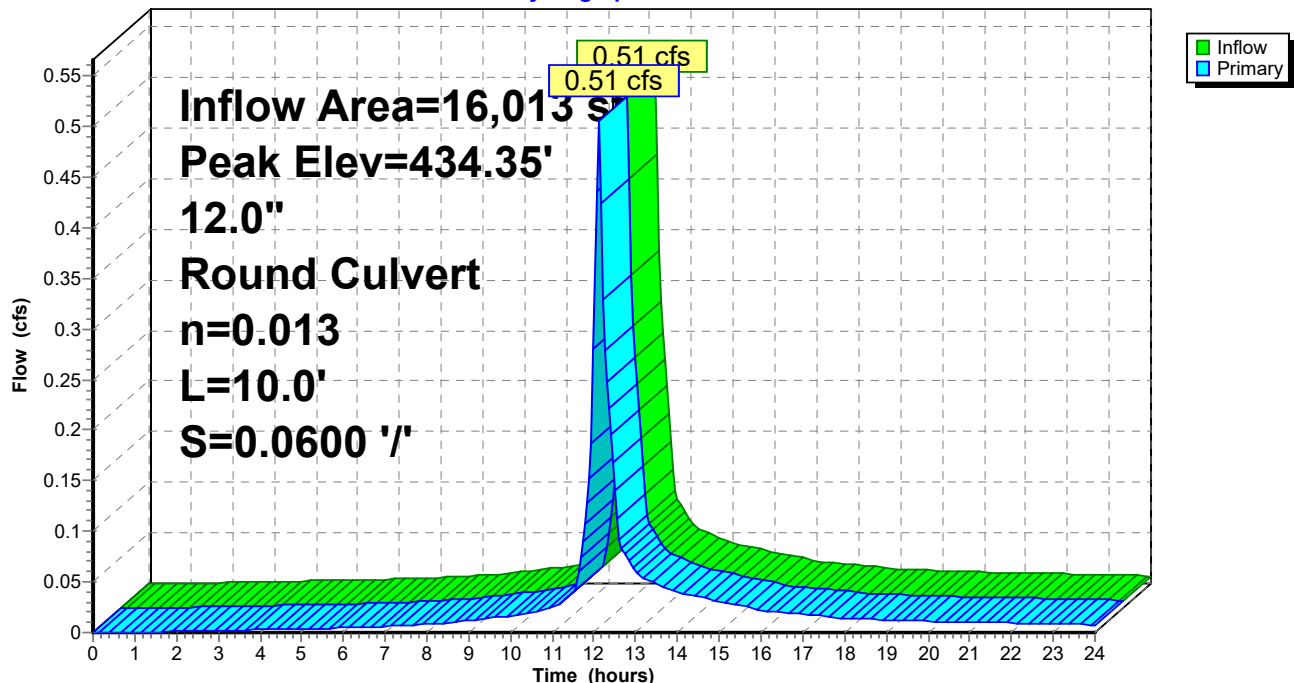
Device	Routing	Invert	Outlet Devices
#1	Primary	434.00'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 434.00' / 433.40' S= 0.0600 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.10 hrs HW=434.35' TW=433.65' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.50 cfs @ 2.02 fps)

Pond CB1: CB1

Hydrograph



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Summary for Pond CB2: CB2

Inflow Area = 3,467 sf, 100.00% Impervious, Inflow Depth > 3.77" for 10 YEAR event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 1,090 cf
Outflow = 0.30 cfs @ 12.09 hrs, Volume= 1,090 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.30 cfs @ 12.09 hrs, Volume= 1,090 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 428.27' @ 12.09 hrs

Flood Elev= 431.00'

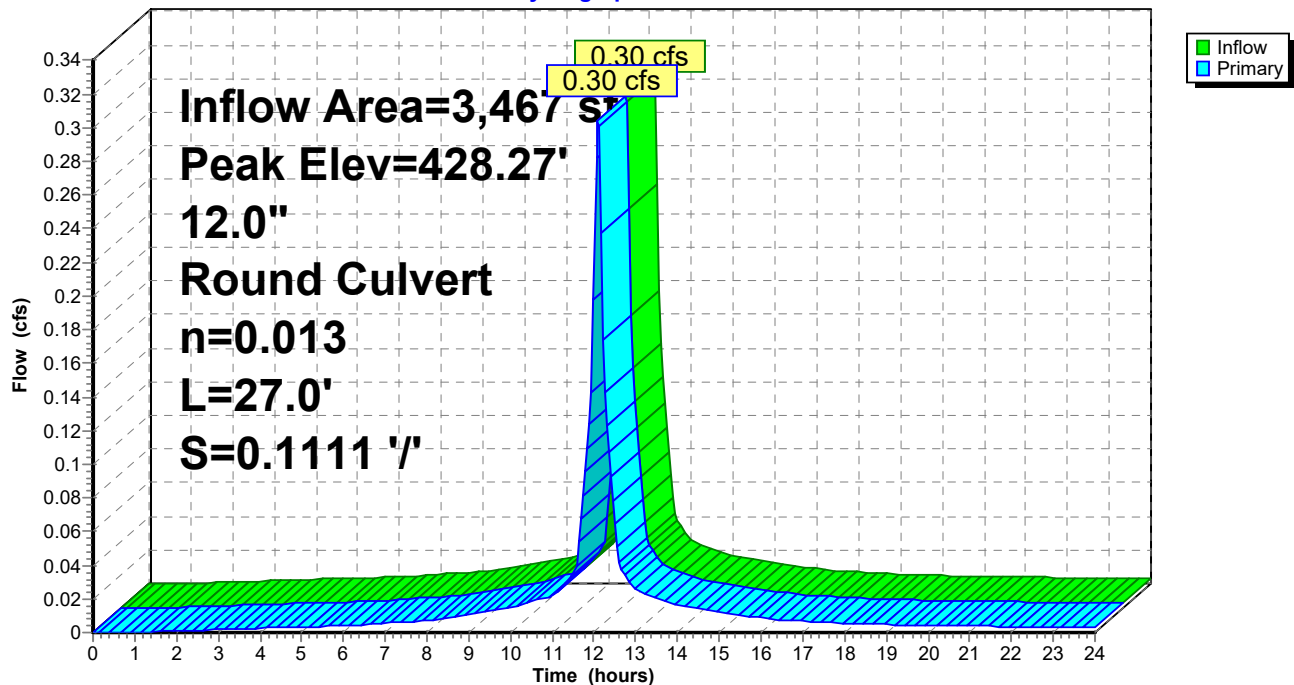
Device	Routing	Invert	Outlet Devices
#1	Primary	428.00'	12.0" Round Culvert L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 428.00' / 425.00' S= 0.1111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.30 cfs @ 12.09 hrs HW=428.27' TW=425.45' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 0.30 cfs @ 1.76 fps)

Pond CB2: CB2

Hydrograph



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Summary for Pond CB3: CB3

Inflow Area = 4,257 sf, 90.72% Impervious, Inflow Depth > 3.33" for 10 YEAR event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 1,182 cf
Outflow = 0.35 cfs @ 12.09 hrs, Volume= 1,182 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.35 cfs @ 12.09 hrs, Volume= 1,182 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.29' @ 12.09 hrs

Flood Elev= 433.00'

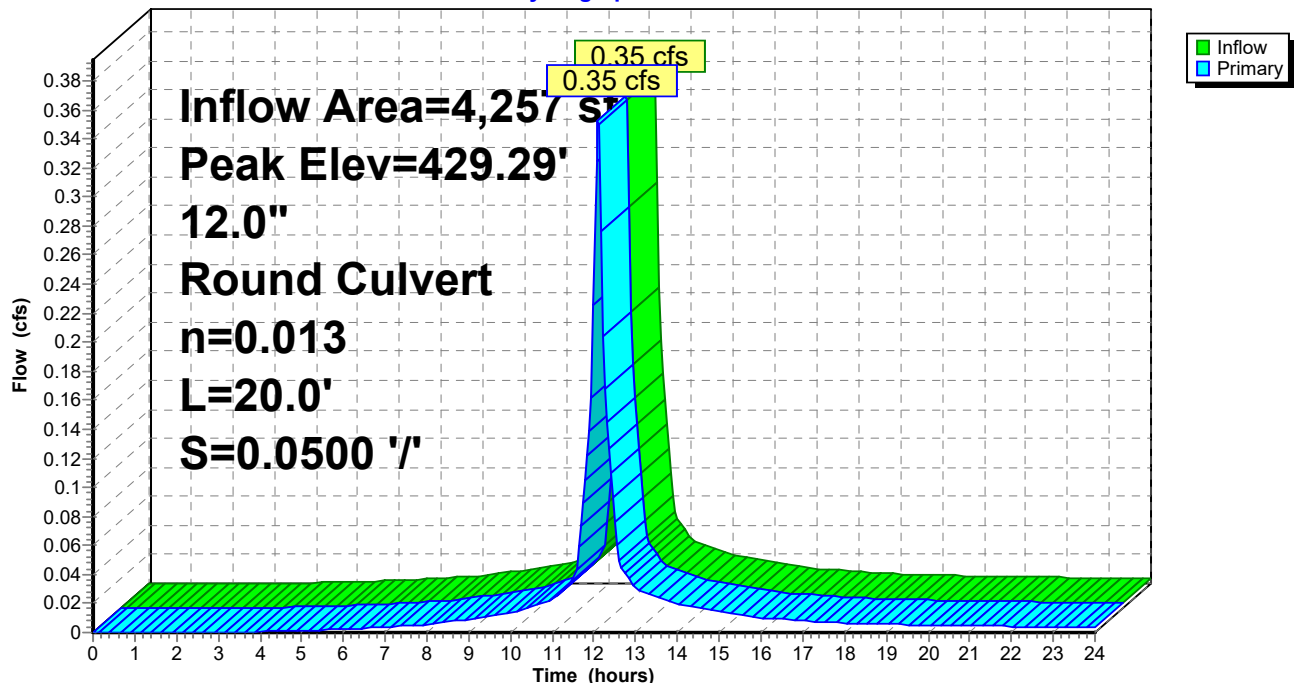
Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0500 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.34 cfs @ 12.09 hrs HW=429.29' TW=425.45' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.34 cfs @ 1.83 fps)

Pond CB3: CB3

Hydrograph



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Summary for Pond CB4: CB4

Inflow Area = 3,164 sf, 80.78% Impervious, Inflow Depth > 3.02" for 10 YEAR event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 798 cf
Outflow = 0.24 cfs @ 12.09 hrs, Volume= 798 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.09 hrs, Volume= 798 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.74' @ 12.09 hrs

Flood Elev= 427.50'

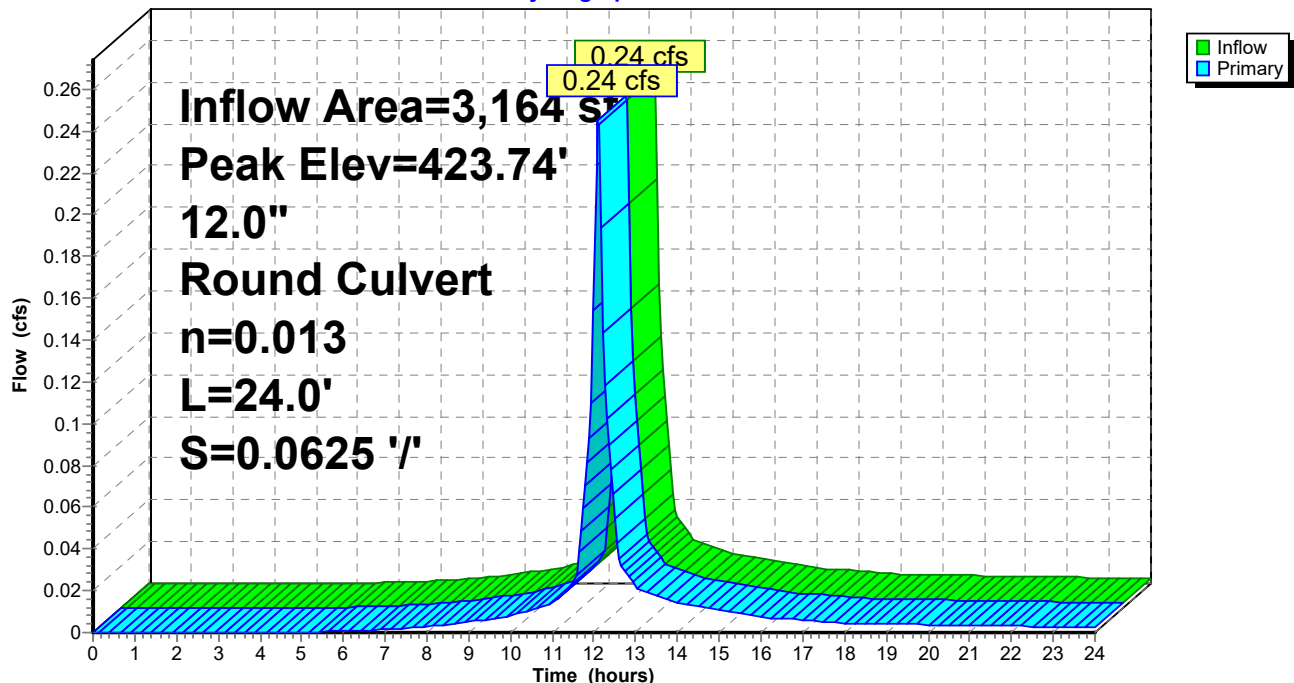
Device	Routing	Invert	Outlet Devices
#1	Primary	423.50'	12.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 423.50' / 422.00' S= 0.0625 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.24 cfs @ 12.09 hrs HW=423.74' TW=422.74' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.24 cfs @ 1.66 fps)

Pond CB4: CB4

Hydrograph



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Summary for Pond CB5: CB3

Inflow Area = 8,614 sf, 91.32% Impervious, Inflow Depth > 3.33" for 10 YEAR event
Inflow = 0.71 cfs @ 12.09 hrs, Volume= 2,392 cf
Outflow = 0.71 cfs @ 12.09 hrs, Volume= 2,392 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.71 cfs @ 12.09 hrs, Volume= 2,392 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.43' @ 12.09 hrs

Flood Elev= 433.00'

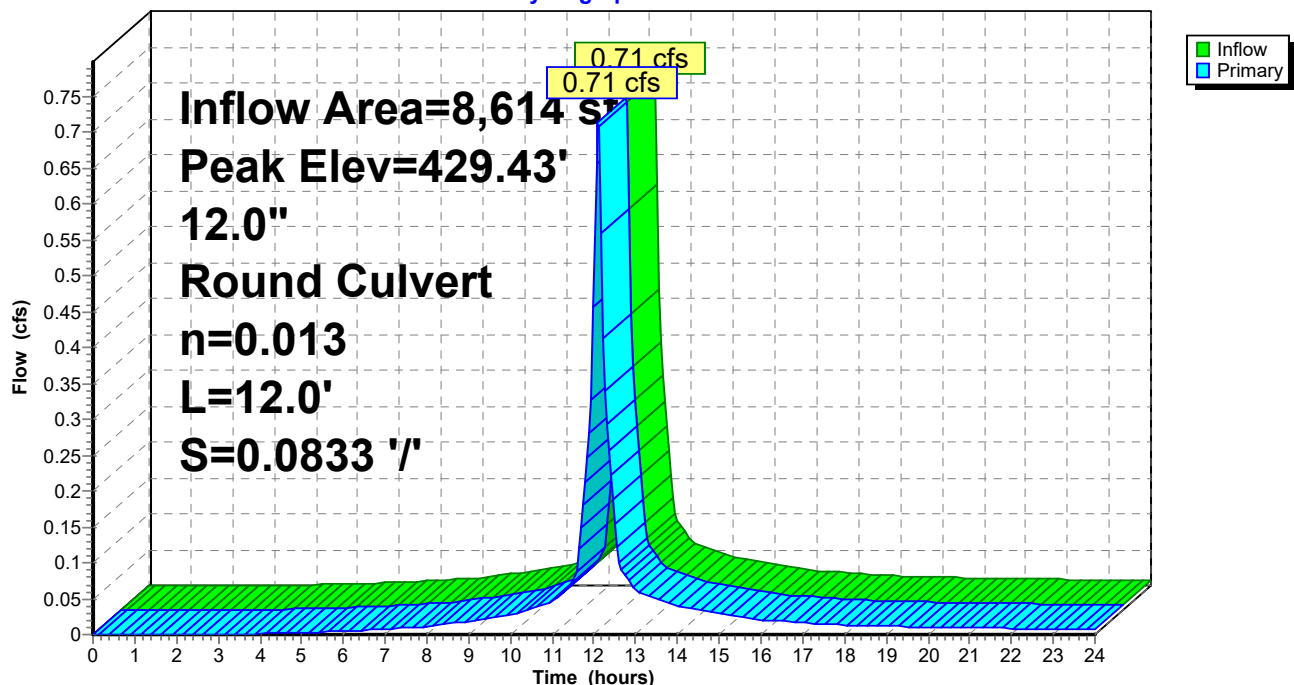
Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0833 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=429.42' TW=425.13' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.69 cfs @ 2.21 fps)

Pond CB5: CB3

Hydrograph



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Summary for Pond CB6: DMH1

Inflow Area = 41,072 sf, 49.60% Impervious, Inflow Depth > 1.63" for 10 YEAR event
Inflow = 1.52 cfs @ 12.10 hrs, Volume= 5,572 cf
Outflow = 1.52 cfs @ 12.10 hrs, Volume= 5,572 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.52 cfs @ 12.10 hrs, Volume= 5,572 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.81' @ 12.10 hrs

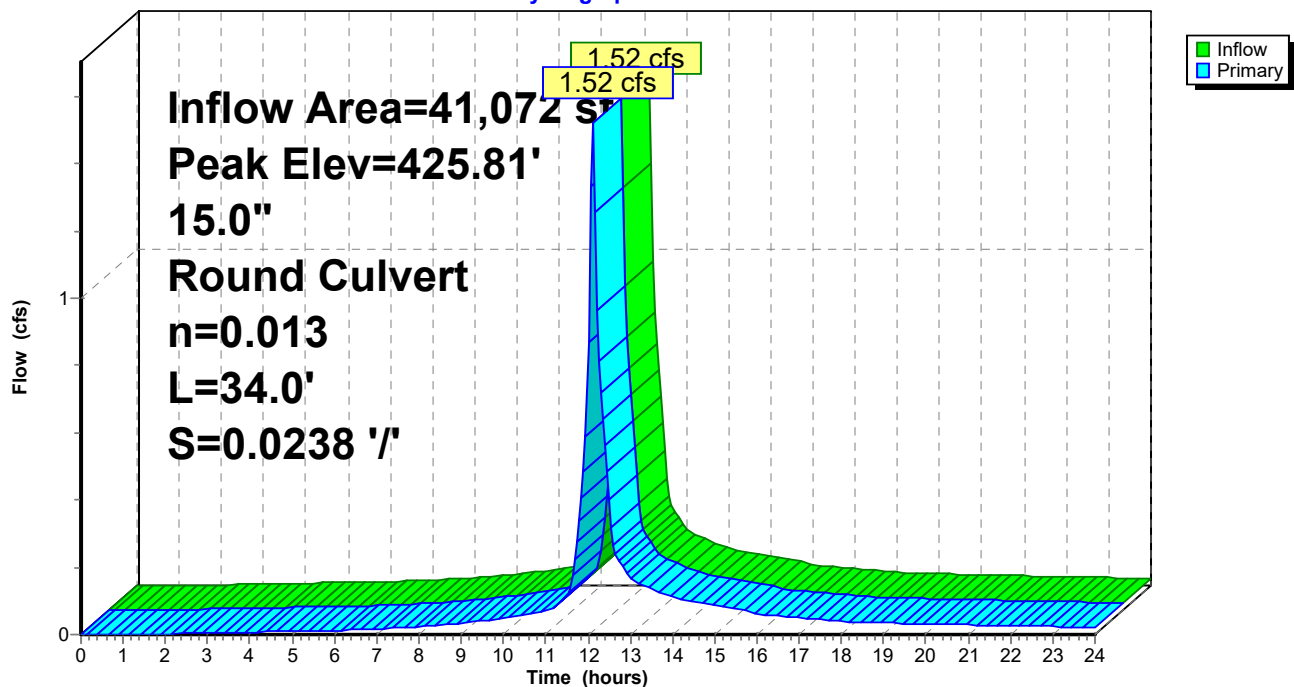
Flood Elev= 437.72'

Device	Routing	Invert	Outlet Devices
#1	Primary	425.21'	15.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.21' / 424.40' S= 0.0238 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.50 cfs @ 12.10 hrs HW=425.80' TW=425.14' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.50 cfs @ 2.62 fps)

Pond CB6: DMH1

Hydrograph



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Summary for Pond CB7: CB7

Inflow Area = 13,675 sf, 77.19% Impervious, Inflow Depth > 2.93" for 10 YEAR event
Inflow = 1.03 cfs @ 12.09 hrs, Volume= 3,335 cf
Outflow = 1.03 cfs @ 12.09 hrs, Volume= 3,335 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 12.09 hrs, Volume= 3,335 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.33' @ 12.22 hrs

Flood Elev= 424.00'

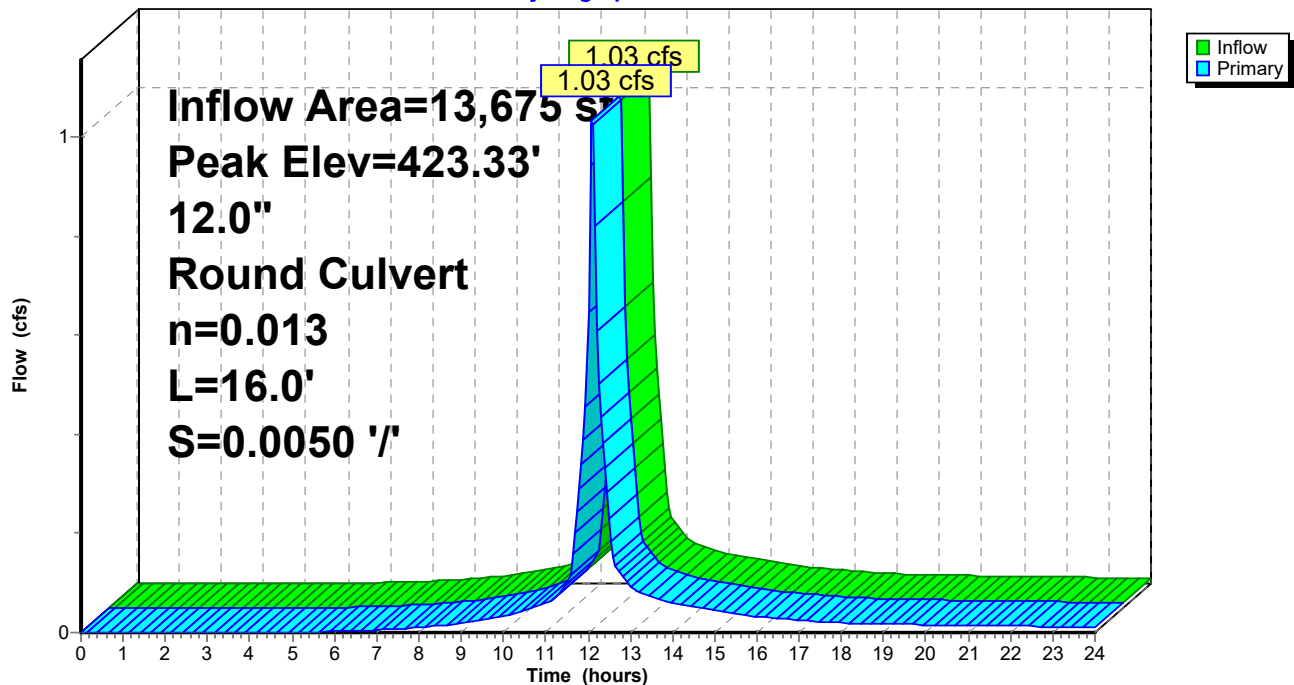
Device	Routing	Invert	Outlet Devices
#1	Primary	421.00'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.00' / 420.92' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=422.38' TW=422.86' (Dynamic Tailwater)

↑**1=Culvert** (Controls 0.00 cfs)

Pond CB7: CB7

Hydrograph



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Summary for Pond CB8: CB8

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 1.42" for 10 YEAR event
Inflow = 1.17 cfs @ 12.10 hrs, Volume= 4,376 cf
Outflow = 1.17 cfs @ 12.10 hrs, Volume= 4,376 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.10 hrs, Volume= 4,376 cf
Routed to Pond CB6 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 426.47' @ 12.10 hrs

Flood Elev= 431.50'

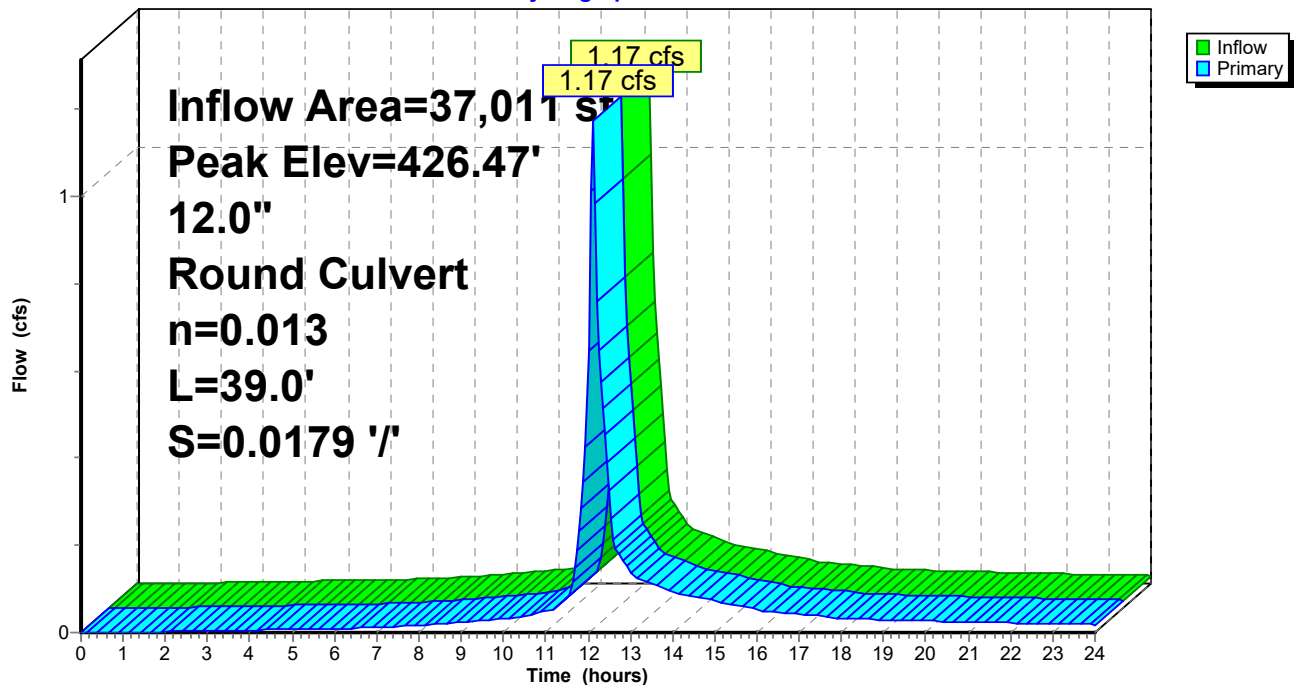
Device	Routing	Invert	Outlet Devices
#1	Primary	425.90'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.90' / 425.20' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.10 hrs HW=426.46' TW=425.80' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.17 cfs @ 2.56 fps)

Pond CB8: CB8

Hydrograph



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Summary for Pond CB9: CB-9

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 1.42" for 10 YEAR event
Inflow = 1.17 cfs @ 12.10 hrs, Volume= 4,376 cf
Outflow = 1.17 cfs @ 12.10 hrs, Volume= 4,376 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.10 hrs, Volume= 4,376 cf
Routed to Pond CB8 : CB8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 428.07' @ 12.10 hrs

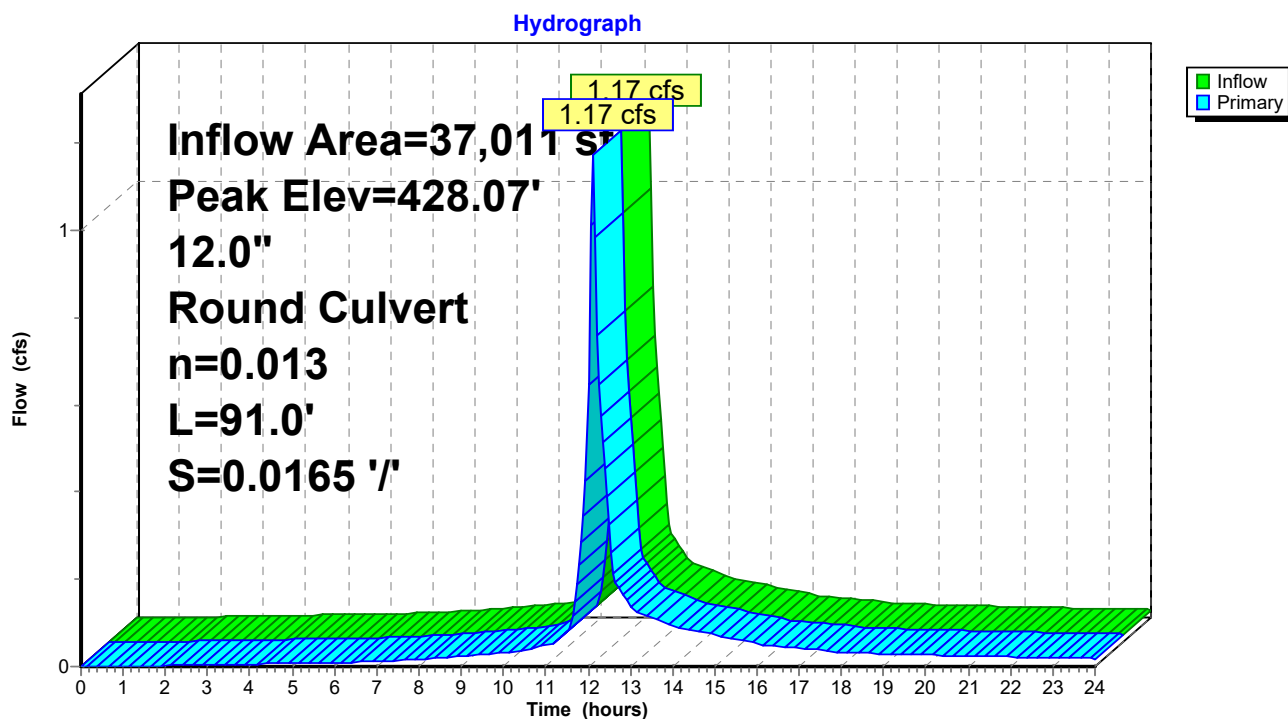
Flood Elev= 431.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	427.50'	12.0" Round Culvert L= 91.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 427.50' / 426.00' S= 0.0165 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.10 hrs HW=428.06' TW=426.46' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.17 cfs @ 2.56 fps)

Pond CB9: CB-9



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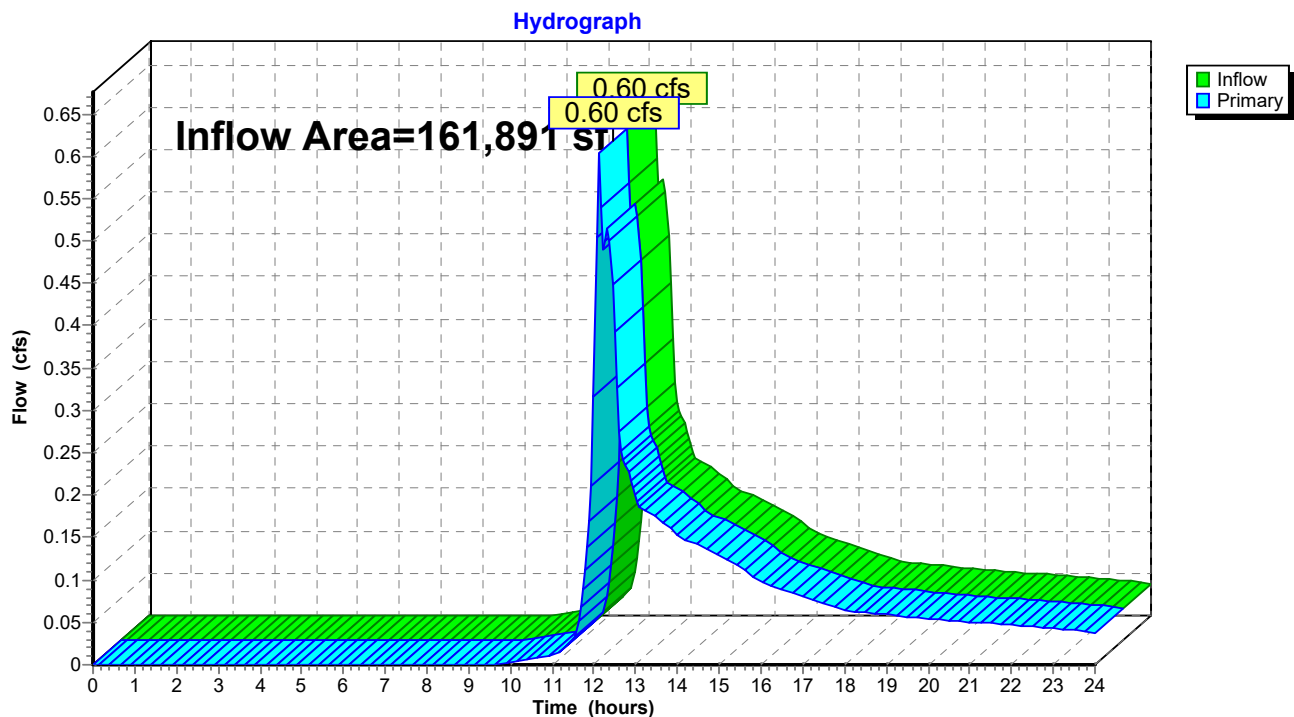
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Summary for Pond DP1: (new Pond)

Inflow Area = 161,891 sf, 24.20% Impervious, Inflow Depth > 0.36" for 10 YEAR event
Inflow = 0.60 cfs @ 12.11 hrs, Volume= 4,823 cf
Primary = 0.60 cfs @ 12.11 hrs, Volume= 4,823 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP1: (new Pond)



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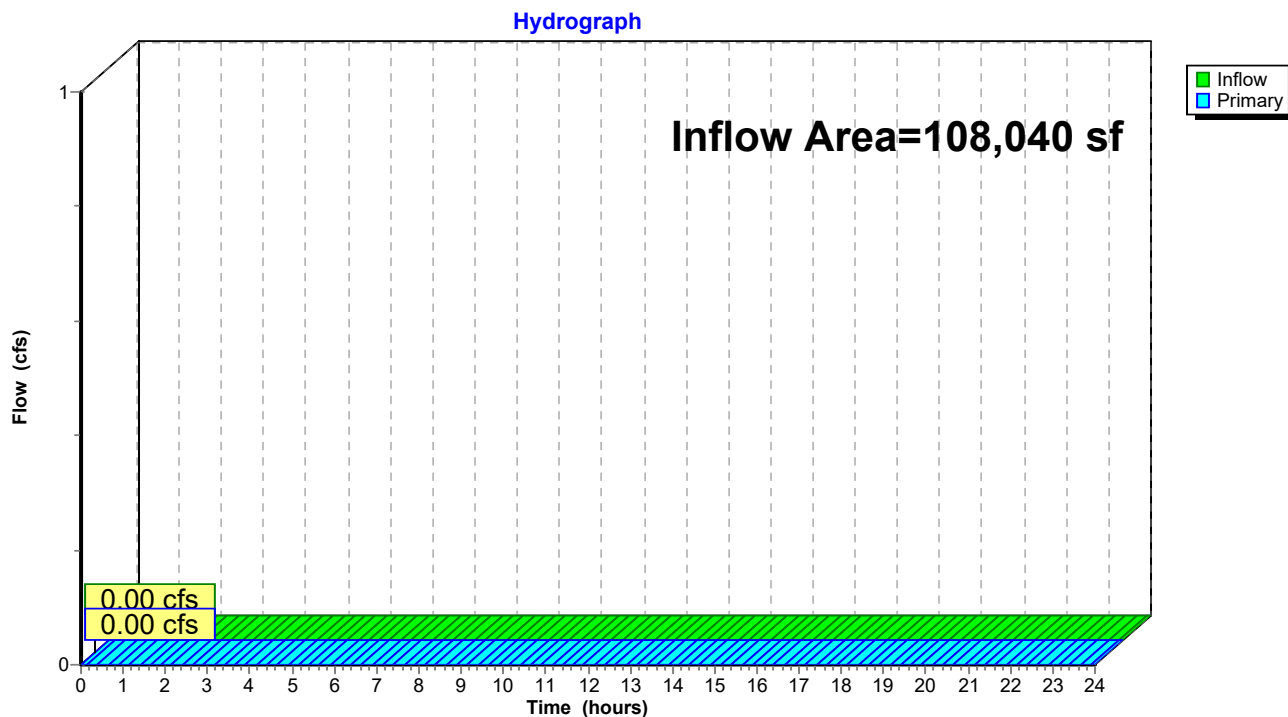
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Summary for Pond DP2: (new Pond)

Inflow Area = 108,040 sf, 55.16% Impervious, Inflow Depth = 0.00" for 10 YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: (new Pond)



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Summary for Pond IP1: buried structure

Inflow Area = 90,262 sf, 58.44% Impervious, Inflow Depth > 2.17" for 10 YEAR event
 Inflow = 4.66 cfs @ 12.09 hrs, Volume= 16,301 cf
 Outflow = 4.94 cfs @ 12.14 hrs, Volume= 11,875 cf, Atten= 0%, Lag= 3.1 min
 Discarded = 0.04 cfs @ 7.80 hrs, Volume= 2,908 cf
 Primary = 2.45 cfs @ 12.14 hrs, Volume= 4,483 cf
 Routed to Pond IP2 : OPEN POND
 Secondary = 2.45 cfs @ 12.14 hrs, Volume= 4,483 cf
 Routed to Pond IP2 : OPEN POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 423.16' @ 12.14 hrs Surf.Area= 2,997 sf Storage= 4,758 cf
 Flood Elev= 423.08' Surf.Area= 2,997 sf Storage= 4,754 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 45.7 min (839.5 - 793.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	420.00'	2,989 cf	39.75'W x 75.40'L x 3.08'H Field A 9,241 cf Overall - 1,769 cf Embedded = 7,472 cf x 40.0% Voids
#2A	420.50'	1,769 cf	ADS_StormTech SC-310 +Cap x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		4,758 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	420.00'	0.600 in/hr Exfiltration over Surface area
#2	Primary	420.80'	12.0" Round Culvert L= 57.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.80' / 420.00' S= 0.0140 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Secondary	421.90'	15.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.00' S= 0.0237 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#5	Device 4	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

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Discarded OutFlow Max=0.04 cfs @ 7.80 hrs HW=420.03' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=2.33 cfs @ 12.14 hrs HW=423.14' TW=418.37' (Dynamic Tailwater)

↑**2=Culvert** (Passes 2.33 cfs of 5.09 cfs potential flow)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 2.33 cfs @ 1.69 fps)

Secondary OutFlow Max=2.33 cfs @ 12.14 hrs HW=423.14' TW=418.37' (Dynamic Tailwater)

↑**4=Culvert** (Passes 2.33 cfs of 4.66 cfs potential flow)

↑**5=Broad-Crested Rectangular Weir** (Weir Controls 2.33 cfs @ 1.69 fps)

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Pond IP1: buried structure - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)

Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf

Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 3.0" Spacing = 37.0" C-C Row Spacing

10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +18.0" End Stone x 2 = 75.40' Base Length

12 Rows x 34.0" Wide + 3.0" Spacing x 11 + 18.0" Side Stone x 2 = 39.75' Base Width

6.0" Stone Base + 16.0" Chamber Height + 15.0" Stone Cover = 3.08' Field Height

120 Chambers x 14.7 cf = 1,769.0 cf Chamber Storage

9,241.2 cf Field - 1,769.0 cf Chambers = 7,472.2 cf Stone x 40.0% Voids = 2,988.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,757.9 cf = 0.109 af

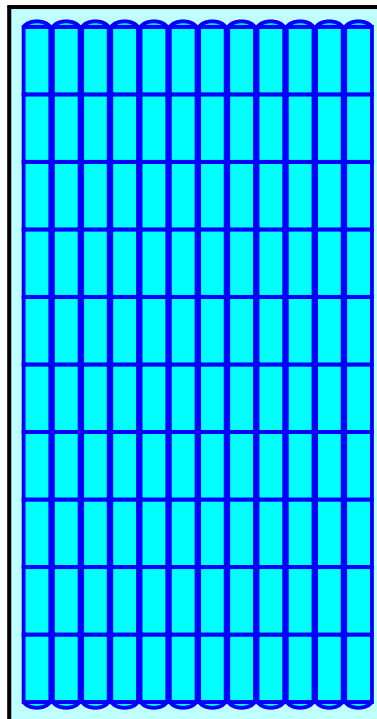
Overall Storage Efficiency = 51.5%

Overall System Size = 75.40' x 39.75' x 3.08'

120 Chambers

342.3 cy Field

276.7 cy Stone



COMET POST DEVELOPMENT

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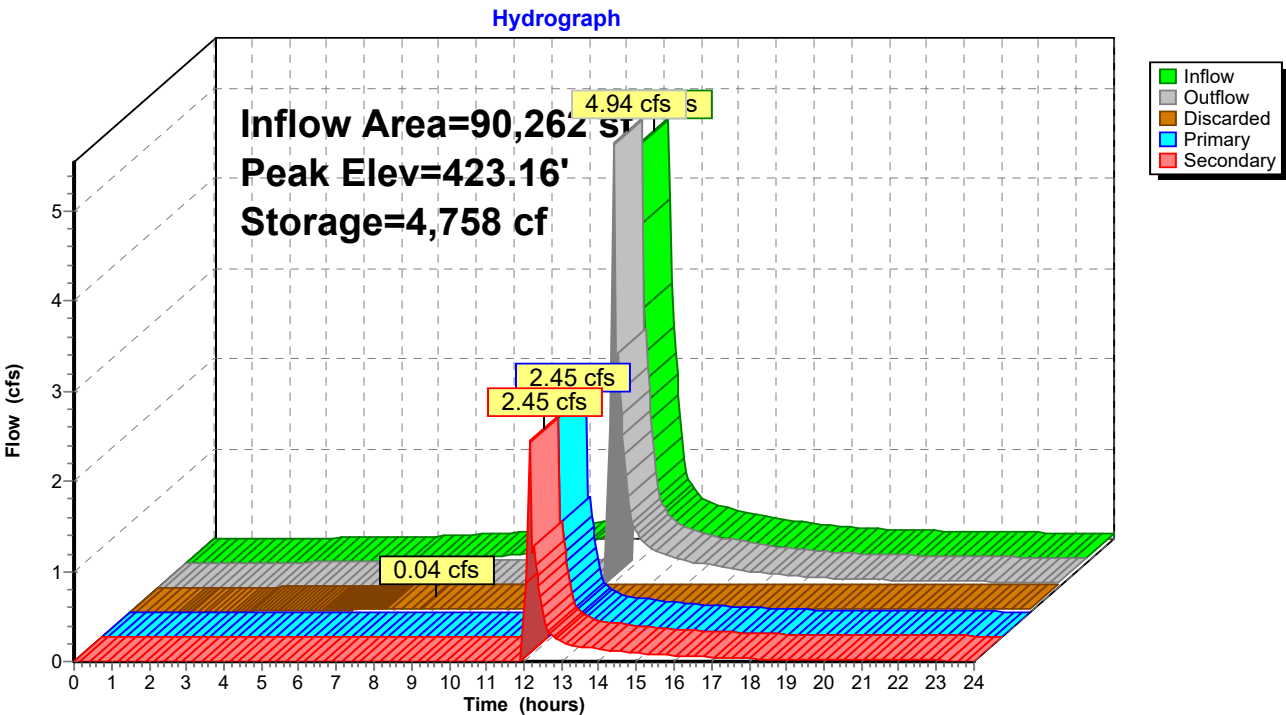
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Pond IP1: buried structure



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Summary for Pond IP2: OPEN POND

Inflow Area = 103,153 sf, 57.77% Impervious, Inflow Depth > 1.31" for 10 YEAR event
 Inflow = 5.51 cfs @ 12.14 hrs, Volume= 11,252 cf
 Outflow = 0.07 cfs @ 18.16 hrs, Volume= 3,380 cf, Atten= 99%, Lag= 360.8 min
 Discarded = 0.07 cfs @ 18.16 hrs, Volume= 3,380 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond DP2 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 419.88' @ 18.16 hrs Surf.Area= 5,331 sf Storage= 8,452 cf
 Flood Elev= 422.00' Surf.Area= 7,434 sf Storage= 21,946 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 221.1 min (1,054.3 - 833.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	418.00'	21,946 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)
418.00	3,724	260.0	0	0	3,724
420.00	5,447	311.0	9,117	9,117	6,111
422.00	7,434	351.0	12,830	21,946	8,319

Device	Routing	Invert	Outlet Devices												
#1	Primary	420.85'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir												
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00												
			2.50 3.00 3.50 4.00 4.50 5.00 5.50												
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64												
			2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74												
#2	Discarded	418.00'	0.600 in/hr Exfiltration over Surface area												

Discarded OutFlow Max=0.07 cfs @ 18.16 hrs HW=419.88' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=418.00' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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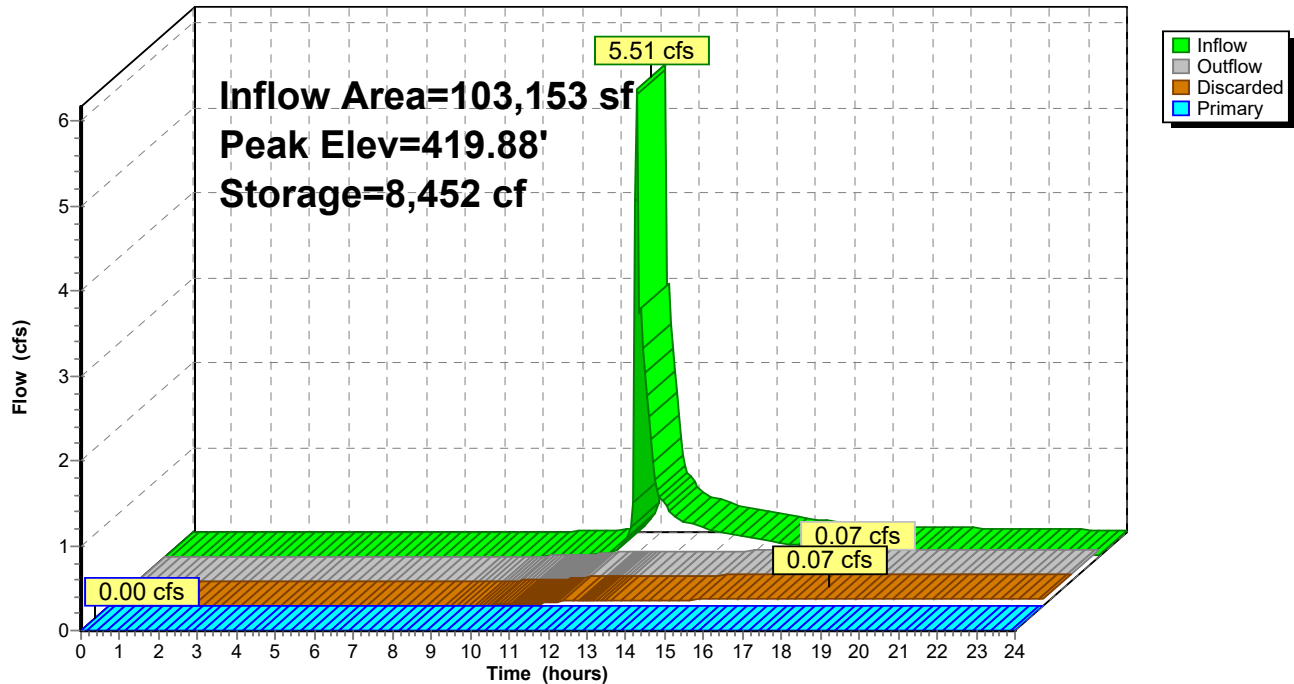
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Pond IP2: OPEN POND

Hydrograph



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Summary for Pond MH1: DMH1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 1.45" for 10 YEAR event
Inflow = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf
Outflow = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf
Routed to Pond MH2 : MH2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 433.65' @ 12.10 hrs

Flood Elev= 437.72'

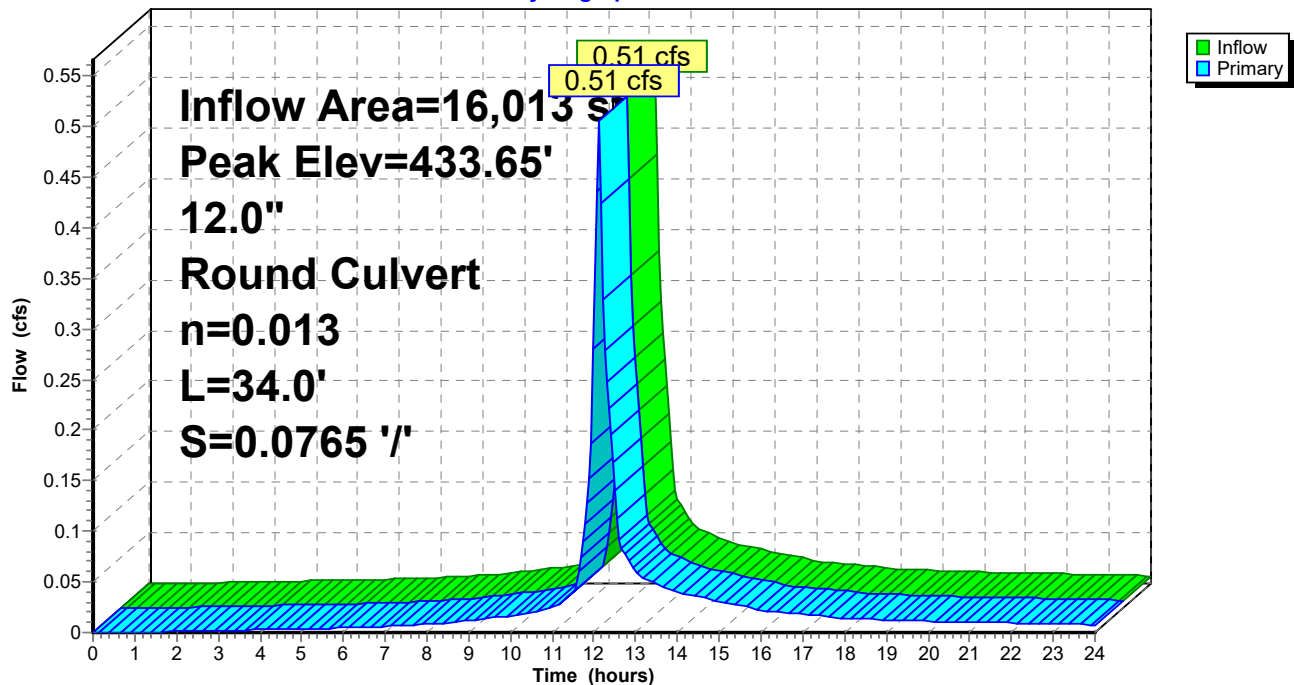
Device	Routing	Invert	Outlet Devices
#1	Primary	433.30'	12.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 433.30' / 430.70' S= 0.0765 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.10 hrs HW=433.65' TW=430.95' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.50 cfs @ 2.02 fps)

Pond MH1: DMH1

Hydrograph



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Summary for Pond MH2: MH2

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 1.45" for 10 YEAR event
Inflow = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf
Outflow = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.10 hrs, Volume= 1,933 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 430.95' @ 12.10 hrs

Flood Elev= 434.70'

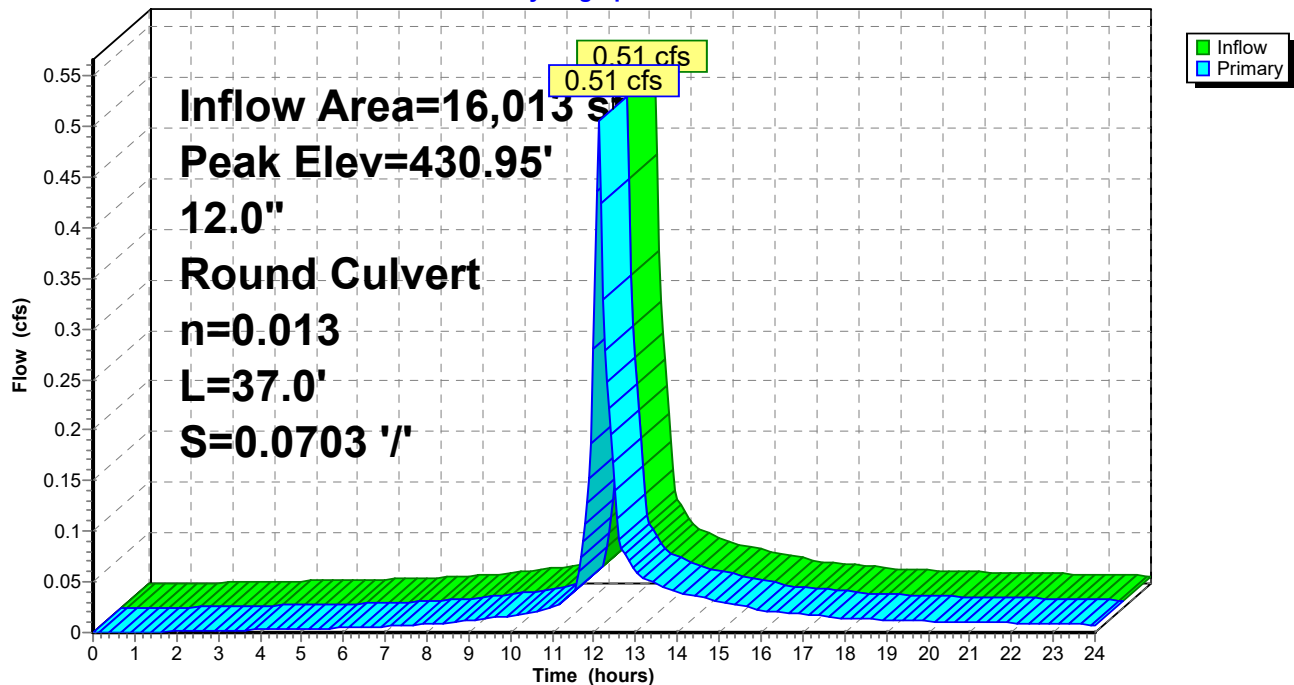
Device	Routing	Invert	Outlet Devices
#1	Primary	430.60'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 430.60' / 428.00' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.10 hrs HW=430.95' TW=425.46' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.50 cfs @ 2.02 fps)

Pond MH2: MH2

Hydrograph



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Summary for Pond MH3: MH3

Inflow Area = 23,737 sf, 48.03% Impervious, Inflow Depth > 2.13" for 10 YEAR event
Inflow = 1.16 cfs @ 12.09 hrs, Volume= 4,205 cf
Outflow = 1.16 cfs @ 12.09 hrs, Volume= 4,205 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.16 cfs @ 12.09 hrs, Volume= 4,205 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.46' @ 12.09 hrs

Flood Elev= 432.00'

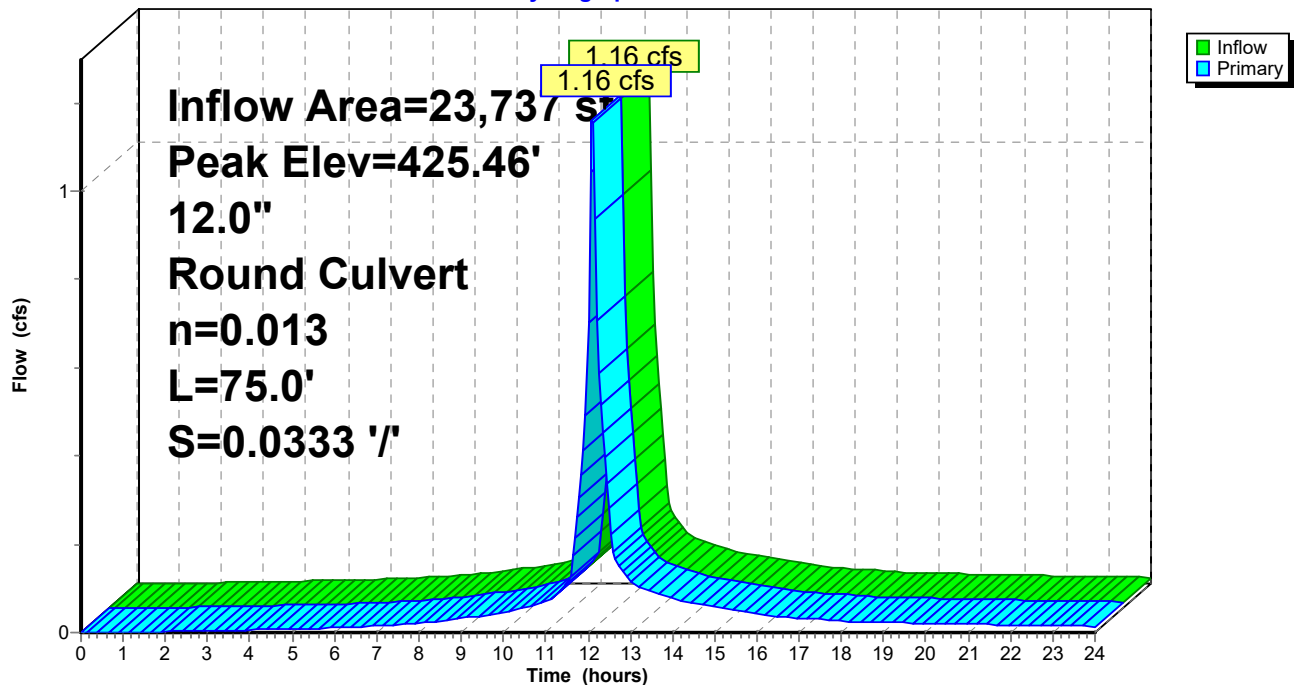
Device	Routing	Invert	Outlet Devices
#1	Primary	424.90'	12.0" Round Culvert L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.90' / 422.40' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.09 hrs HW=425.46' TW=422.76' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.14 cfs @ 2.54 fps)

Pond MH3: MH3

Hydrograph



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Summary for Pond MH4: MH4

Inflow Area = 26,901 sf, 51.88% Impervious, Inflow Depth > 2.23" for 10 YEAR event
Inflow = 1.40 cfs @ 12.09 hrs, Volume= 5,003 cf
Outflow = 1.40 cfs @ 12.09 hrs, Volume= 5,003 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.40 cfs @ 12.09 hrs, Volume= 5,003 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.18' @ 12.19 hrs

Flood Elev= 426.00'

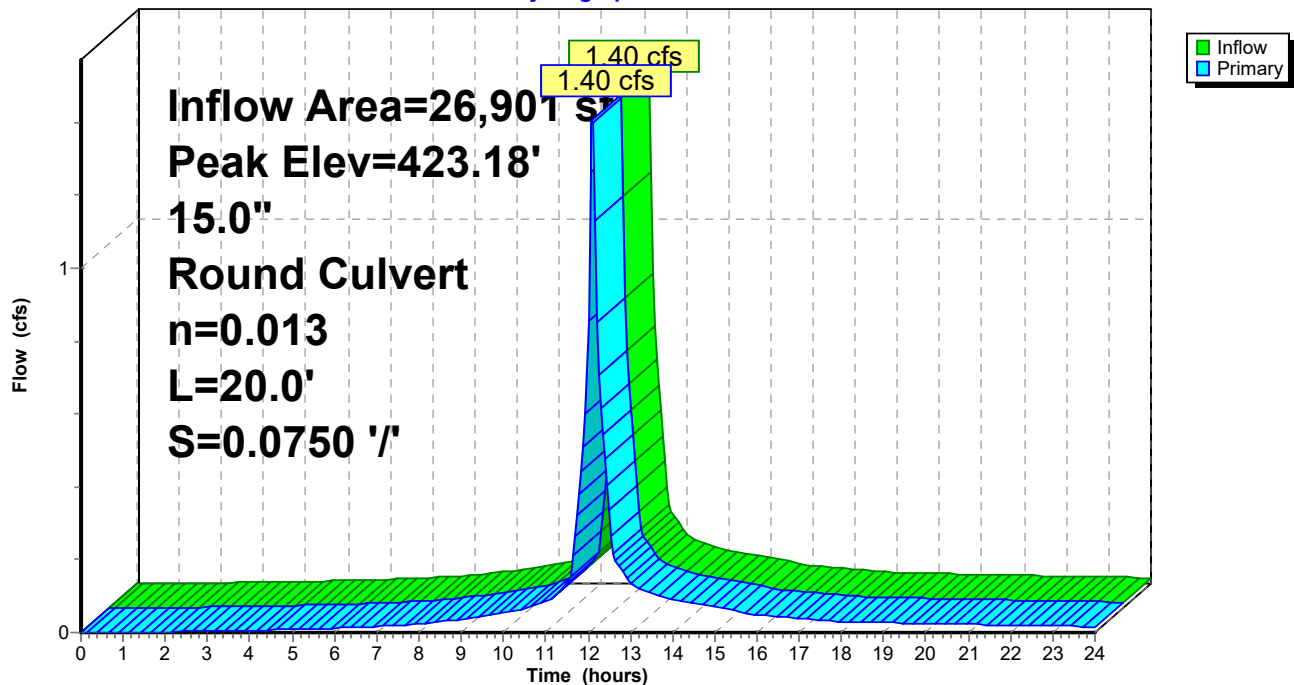
Device	Routing	Invert	Outlet Devices
#1	Primary	421.90'	15.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.40' S= 0.0750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=422.76' TW=423.02' (Dynamic Tailwater)

↑1=Culvert (Controls 0.00 cfs)

Pond MH4: MH4

Hydrograph



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Summary for Pond MH5: DMH1

Inflow Area = 49,686 sf, 56.83% Impervious, Inflow Depth > 1.92" for 10 YEAR event
Inflow = 2.23 cfs @ 12.09 hrs, Volume= 7,964 cf
Outflow = 2.23 cfs @ 12.09 hrs, Volume= 7,964 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.23 cfs @ 12.09 hrs, Volume= 7,964 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.15' @ 12.09 hrs

Flood Elev= 430.00'

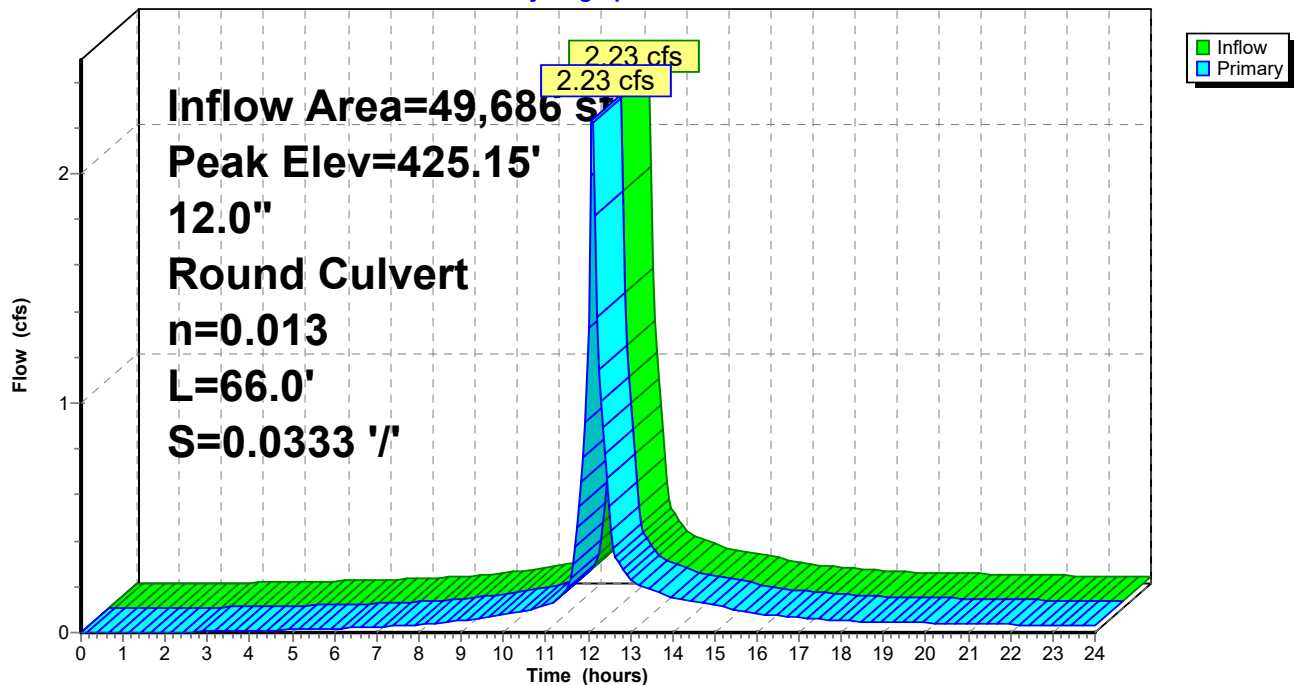
Device	Routing	Invert	Outlet Devices
#1	Primary	424.30'	12.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.30' / 422.10' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.19 cfs @ 12.09 hrs HW=425.14' TW=422.91' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 2.19 cfs @ 3.12 fps)

Pond MH5: DMH1

Hydrograph



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Summary for Pond MH6: MH6

Inflow Area = 63,361 sf, 61.23% Impervious, Inflow Depth > 2.14" for 10 YEAR event
Inflow = 3.26 cfs @ 12.09 hrs, Volume= 11,299 cf
Outflow = 3.26 cfs @ 12.09 hrs, Volume= 11,299 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.26 cfs @ 12.09 hrs, Volume= 11,299 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.31' @ 12.17 hrs

Flood Elev= 424.00'

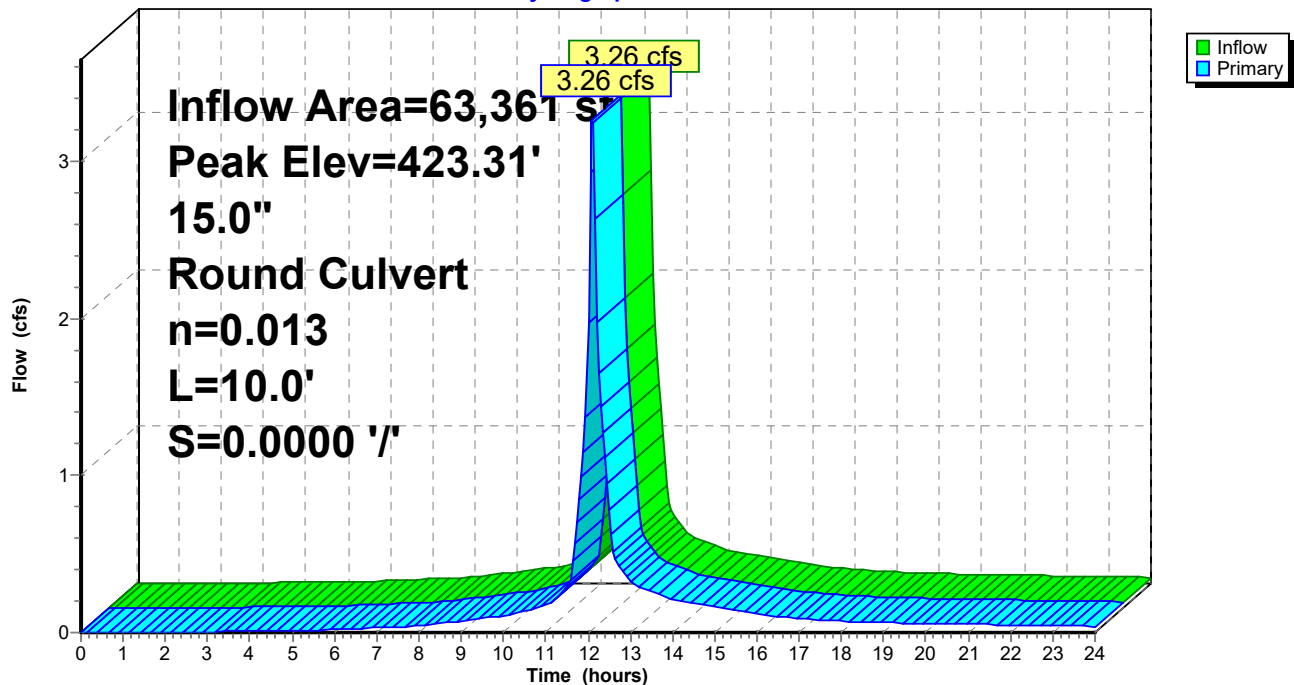
Device	Routing	Invert	Outlet Devices
#1	Primary	420.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.50' / 420.50' S= 0.0000 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=422.89' TW=423.02' (Dynamic Tailwater)

↑**1=Culvert** (Controls 0.00 cfs)

Pond MH6: MH6

Hydrograph



COMET POST DEVELOPMENT

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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

SubcatchmentP1: SITE AREA

Runoff Area=5,853 sf 9.53% Impervious Runoff Depth>2.25"
Flow Length=68' Tc=6.0 min CN=65 Runoff=0.34 cfs 1,096 cf

SubcatchmentP10: P10

Runoff Area=4,887 sf 0.00% Impervious Runoff Depth>0.11"
Tc=6.0 min CN=32 Runoff=0.00 cfs 46 cf

SubcatchmentP11: P11

Runoff Area=10,001 sf 63.52% Impervious Runoff Depth>3.26"
Flow Length=303' Tc=6.0 min CN=76 Runoff=0.86 cfs 2,714 cf

SubcatchmentP12: OFF SITE

Runoff Area=146,037 sf 22.10% Impervious Runoff Depth>0.87"
Flow Length=729' Tc=6.0 min CN=47 Runoff=2.26 cfs 10,609 cf

SubcatchmentP2: P-2

Runoff Area=4,257 sf 90.72% Impervious Runoff Depth>5.15"
Tc=6.0 min CN=94 Runoff=0.53 cfs 1,829 cf

SubcatchmentP3: P-3

Runoff Area=3,164 sf 80.78% Impervious Runoff Depth>4.82"
Tc=6.0 min CN=91 Runoff=0.38 cfs 1,270 cf

SubcatchmentP4: P-4

Runoff Area=8,614 sf 91.32% Impervious Runoff Depth>5.15"
Tc=6.0 min CN=94 Runoff=1.07 cfs 3,700 cf

SubcatchmentP5: P-5

Runoff Area=2,890 sf 92.53% Impervious Runoff Depth>5.27"
Tc=6.0 min CN=95 Runoff=0.36 cfs 1,269 cf

SubcatchmentP6: P-6

Runoff Area=13,675 sf 77.19% Impervious Runoff Depth>4.71"
Tc=6.0 min CN=90 Runoff=1.62 cfs 5,363 cf

SubcatchmentP7: P-7

Runoff Area=12,891 sf 53.09% Impervious Runoff Depth>3.75"
Tc=6.0 min CN=81 Runoff=1.27 cfs 4,032 cf

SubcatchmentP8: P-8

Runoff Area=12,175 sf 1.91% Impervious Runoff Depth>1.75"
Flow Length=175' Tc=6.2 min CN=59 Runoff=0.52 cfs 1,773 cf

SubcatchmentP9: (new Subcat)

Runoff Area=29,471 sf 30.49% Impervious Runoff Depth>1.91"
Flow Length=297' Tc=6.0 min CN=61 Runoff=1.42 cfs 4,691 cf

SubcatchmentR1: ROOF 1

Runoff Area=3,838 sf 100.00% Impervious Runoff Depth>5.62"
Tc=6.0 min CN=98 Runoff=0.49 cfs 1,797 cf

SubcatchmentR2: ROOF 2

Runoff Area=4,073 sf 100.00% Impervious Runoff Depth>5.62"
Tc=6.0 min CN=98 Runoff=0.52 cfs 1,907 cf

SubcatchmentR3: ROOF 3

Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>5.62"
Tc=6.0 min CN=98 Runoff=0.45 cfs 1,623 cf

SubcatchmentR4: ROOF 4

Runoff Area=3,467 sf 100.00% Impervious Runoff Depth>5.62"
Tc=6.0 min CN=98 Runoff=0.45 cfs 1,623 cf

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SubcatchmentR5: ROOF 5

Runoff Area=1,171 sf 100.00% Impervious Runoff Depth>5.62"

Tc=6.0 min CN=98 Runoff=0.15 cfs 548 cf

Reach 3R: 12" PIPE

Avg. Flow Depth=0.48' Max Vel=6.32 fps Inflow=3.09 cfs 13,321 cf

18.0" Round Pipe n=0.012 L=68.0' S=0.0151 '/' Capacity=14.01 cfs Outflow=3.09 cfs 13,318 cf

Reach 6R: 18" PIPE

Avg. Flow Depth=0.32' Max Vel=8.10 fps Inflow=2.26 cfs 10,609 cf

18.0" Round Pipe n=0.012 L=87.0' S=0.0397 '/' Capacity=22.66 cfs Outflow=2.27 cfs 10,606 cf

Pond CB1: CB1

Peak Elev=434.52' Inflow=1.01 cfs 3,570 cf

12.0" Round Culvert n=0.013 L=10.0' S=0.0600 '/' Outflow=1.01 cfs 3,570 cf

Pond CB2: CB2

Peak Elev=428.33' Inflow=0.45 cfs 1,623 cf

12.0" Round Culvert n=0.013 L=27.0' S=0.1111 '/' Outflow=0.45 cfs 1,623 cf

Pond CB3: CB3

Peak Elev=429.36' Inflow=0.53 cfs 1,829 cf

12.0" Round Culvert n=0.013 L=20.0' S=0.0500 '/' Outflow=0.53 cfs 1,829 cf

Pond CB4: CB4

Peak Elev=423.80' Inflow=0.38 cfs 1,270 cf

12.0" Round Culvert n=0.013 L=24.0' S=0.0625 '/' Outflow=0.38 cfs 1,270 cf

Pond CB5: CB3

Peak Elev=429.54' Inflow=1.07 cfs 3,700 cf

12.0" Round Culvert n=0.013 L=12.0' S=0.0833 '/' Outflow=1.07 cfs 3,700 cf

Pond CB6: DMH1

Peak Elev=426.24' Inflow=2.89 cfs 10,039 cf

15.0" Round Culvert n=0.013 L=34.0' S=0.0238 '/' Outflow=2.89 cfs 10,039 cf

Pond CB7: CB7

Peak Elev=424.25' Inflow=1.62 cfs 5,363 cf

12.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=1.62 cfs 5,363 cf

Pond CB8: CB8

Peak Elev=426.79' Inflow=2.38 cfs 8,222 cf

12.0" Round Culvert n=0.013 L=39.0' S=0.0179 '/' Outflow=2.38 cfs 8,222 cf

Pond CB9: CB-9

Peak Elev=428.39' Inflow=2.38 cfs 8,222 cf

12.0" Round Culvert n=0.013 L=91.0' S=0.0165 '/' Outflow=2.38 cfs 8,222 cf

Pond DP1: (new Pond)

Inflow=3.42 cfs 14,414 cf

Primary=3.42 cfs 14,414 cf

Pond DP2: (new Pond)

Inflow=0.55 cfs 5,643 cf

Primary=0.55 cfs 5,643 cf

Pond IP1: buried structure

Peak Elev=423.28' Storage=4,758 cf Inflow=7.95 cfs 27,394 cf

Discarded=0.04 cfs 3,149 cf Primary=3.97 cfs 9,904 cf Secondary=3.97 cfs 9,904 cf Outflow=7.98 cfs 22,957 cf

Pond IP2: OPEN POND

Peak Elev=420.94' Storage=14,669 cf Inflow=9.20 cfs 23,839 cf

Discarded=0.09 cfs 4,232 cf Primary=0.55 cfs 5,597 cf Outflow=0.64 cfs 9,829 cf

Pond MH1: DMH1

Peak Elev=433.82' Inflow=1.01 cfs 3,570 cf

12.0" Round Culvert n=0.013 L=34.0' S=0.0765 '/' Outflow=1.01 cfs 3,570 cf

Pond MH2: MH2

Peak Elev=431.12' Inflow=1.01 cfs 3,570 cf

12.0" Round Culvert n=0.013 L=37.0' S=0.0703 '/' Outflow=1.01 cfs 3,570 cf

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Type III 24-hr 50 YEAR Rainfall=5.86"

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Pond MH3: MH3

Peak Elev=425.68' Inflow=1.99 cfs 7,022 cf
12.0" Round Culvert n=0.013 L=75.0' S=0.0333 '/' Outflow=1.99 cfs 7,022 cf

Pond MH4: MH4

Peak Elev=423.42' Inflow=2.37 cfs 8,292 cf
15.0" Round Culvert n=0.013 L=20.0' S=0.0750 '/' Outflow=2.37 cfs 8,292 cf

Pond MH5: DMH1

Peak Elev=425.90' Inflow=3.97 cfs 13,739 cf
12.0" Round Culvert n=0.013 L=66.0' S=0.0333 '/' Outflow=3.97 cfs 13,739 cf

Pond MH6: MH6

Peak Elev=424.13' Inflow=5.58 cfs 19,102 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0000 '/' Outflow=5.58 cfs 19,102 cf

Total Runoff Area = 269,931 sf Runoff Volume = 45,891 cf Average Runoff Depth = 2.04"
63.41% Pervious = 171,155 sf 36.59% Impervious = 98,776 sf

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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment P1: SITE AREA

Runoff = 0.34 cfs @ 12.10 hrs, Volume= 1,096 cf, Depth> 2.25"
 Routed to Pond DP1 : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
558	98	Paved parking, HSG B
5,295	61	>75% Grass cover, Good, HSG B
5,853	65	Weighted Average
5,295		90.47% Pervious Area
558		9.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	5	0.0200	0.72		Sheet Flow, flow on pavement Smooth surfaces n= 0.011 P2= 2.94"
2.4	28	0.0600	0.20		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.1	5	0.0200	0.72		Sheet Flow, flow over pavement Smooth surfaces n= 0.011 P2= 2.94"
0.6	10	0.2000	0.26		Sheet Flow, flow over grass Grass: Short n= 0.150 P2= 2.94"
0.2	20	0.1000	2.21		Shallow Concentrated Flow, flow over grass Short Grass Pasture Kv= 7.0 fps
2.6					Direct Entry,
6.0	68	Total			

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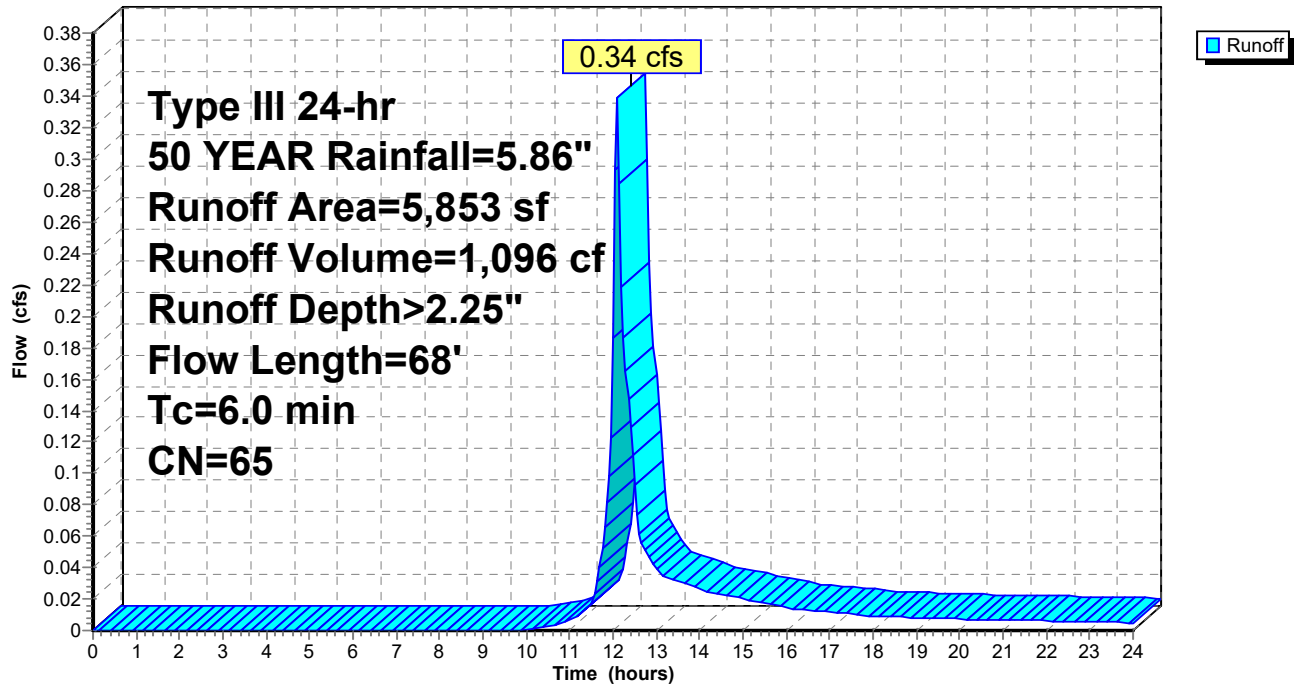
Type III 24-hr 50 YEAR Rainfall=5.86"

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Subcatchment P1: SITE AREA

Hydrograph



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Summary for Subcatchment P10: P10

Runoff = 0.00 cfs @ 14.98 hrs, Volume= 46 cf, Depth> 0.11"
Routed to Pond DP2 : (new Pond)

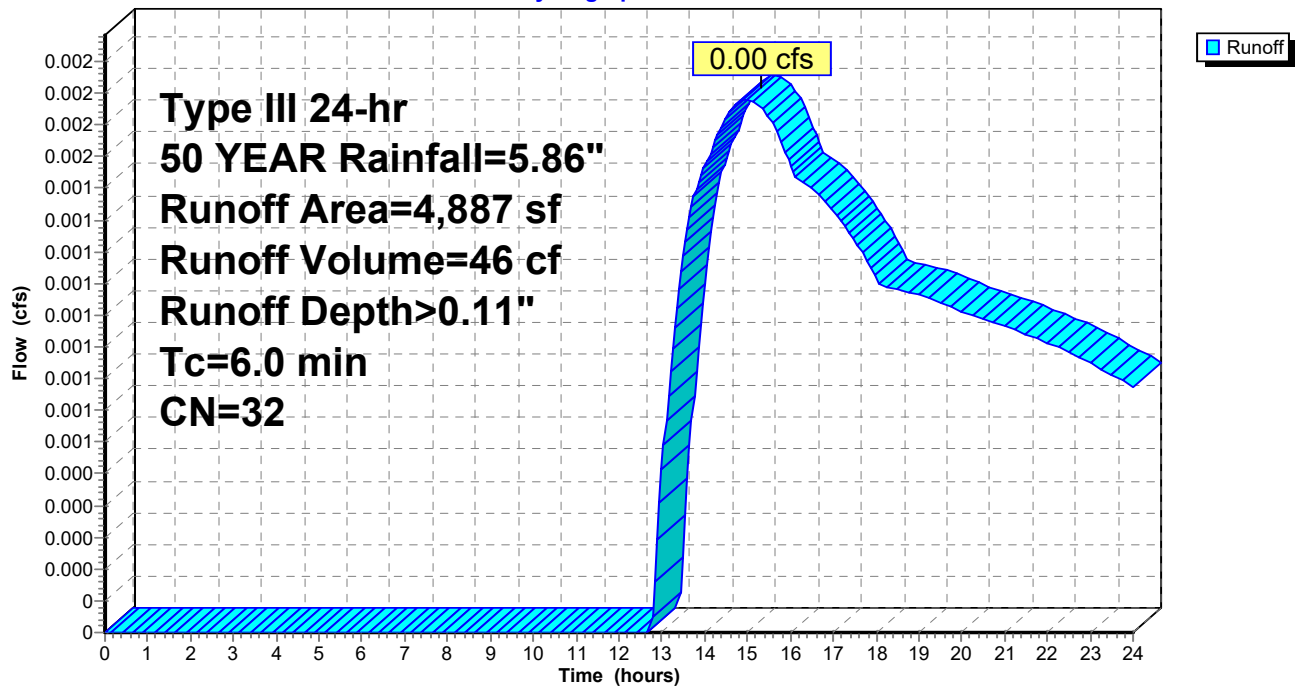
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
4,887	32	Woods/grass comb., Good, HSG A
4,887		100.00% Pervious Area

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

Subcatchment P10: P10

Hydrograph



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment P11: P11

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 2,714 cf, Depth> 3.26"
Routed to Reach 3R : 12" PIPE

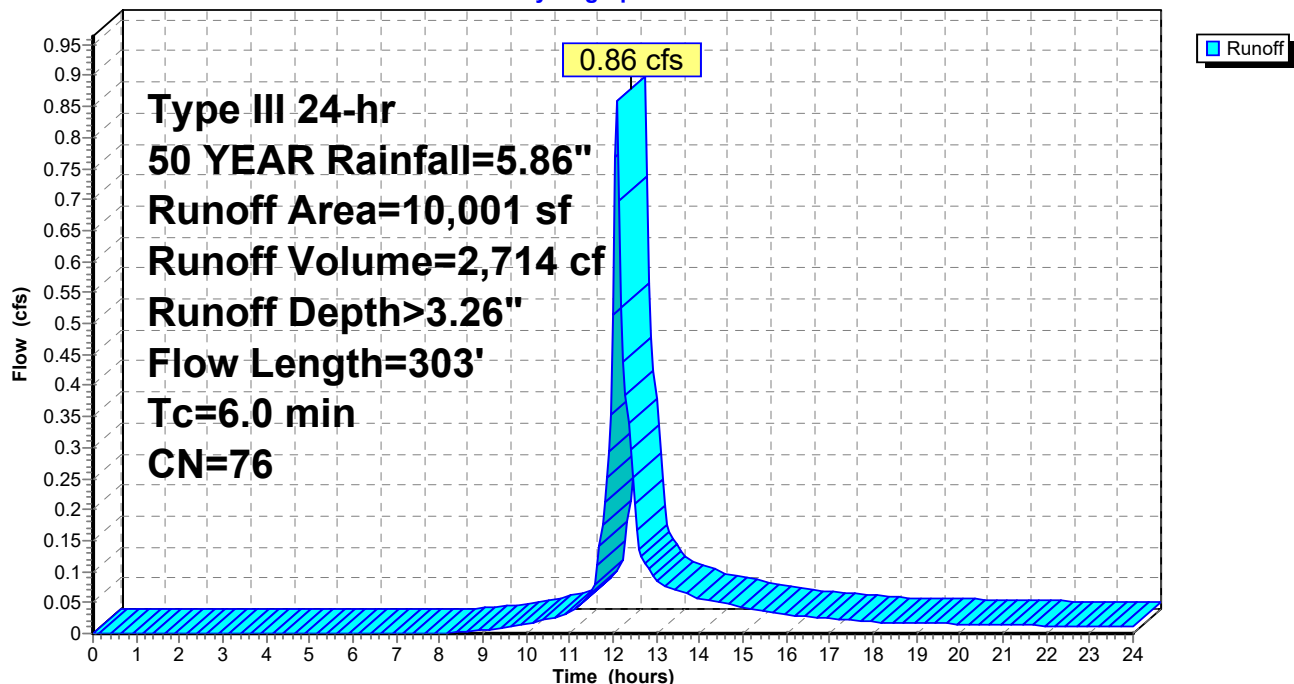
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
3,245	39	>75% Grass cover, Good, HSG A
403	39	>75% Grass cover, Good, HSG A
* 6,353	98	Paved parking, HSG A and B
10,001	76	Weighted Average
3,648		36.48% Pervious Area
6,353		63.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.00		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.8	96	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER PAVEMENT Short Grass Pasture Kv= 7.0 fps
1.2	157	0.1000	2.21		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
3.6					Direct Entry, ADD TO MAKE MIN 6 MIN
6.0	303	Total			

Subcatchment P11: P11

Hydrograph



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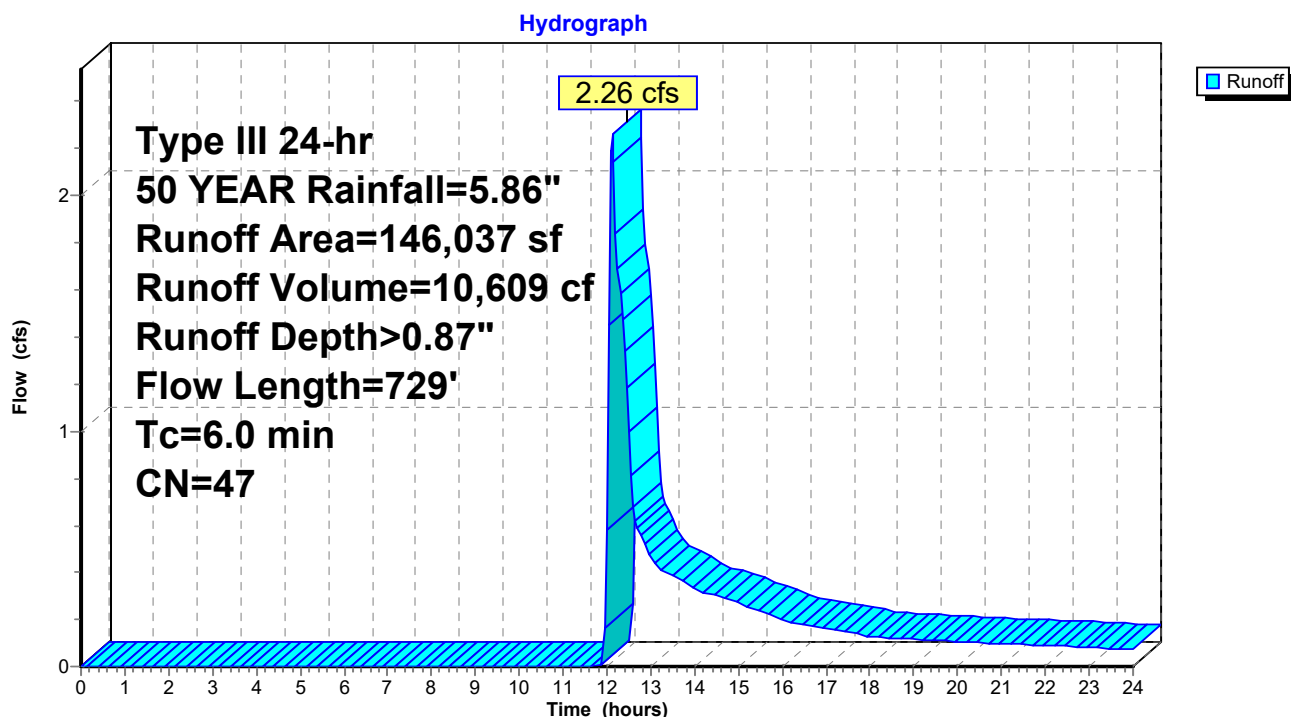
Summary for Subcatchment P12: OFF SITE

Runoff = 2.26 cfs @ 12.12 hrs, Volume= 10,609 cf, Depth> 0.87"
 Routed to Reach 6R : 18" PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
83,751	30	Woods, Good, HSG A
30,014	39	>75% Grass cover, Good, HSG A
* 32,272	98	Paved parking and roof, HSG A
146,037	47	Weighted Average
113,765		77.90% Pervious Area
32,272		22.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	50	0.0100	0.87		Sheet Flow, FLOW ALONG PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
1.6	513	0.0660	5.22		Shallow Concentrated Flow, FLOW ALONG PAVEMENT Paved Kv= 20.3 fps
0.7	166	0.0660	3.85		Shallow Concentrated Flow, FLOW IN GRASS Grassed Waterway Kv= 15.0 fps
2.7					Direct Entry,
6.0	729	Total			

Subcatchment P12: OFF SITE

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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment P2: P-2

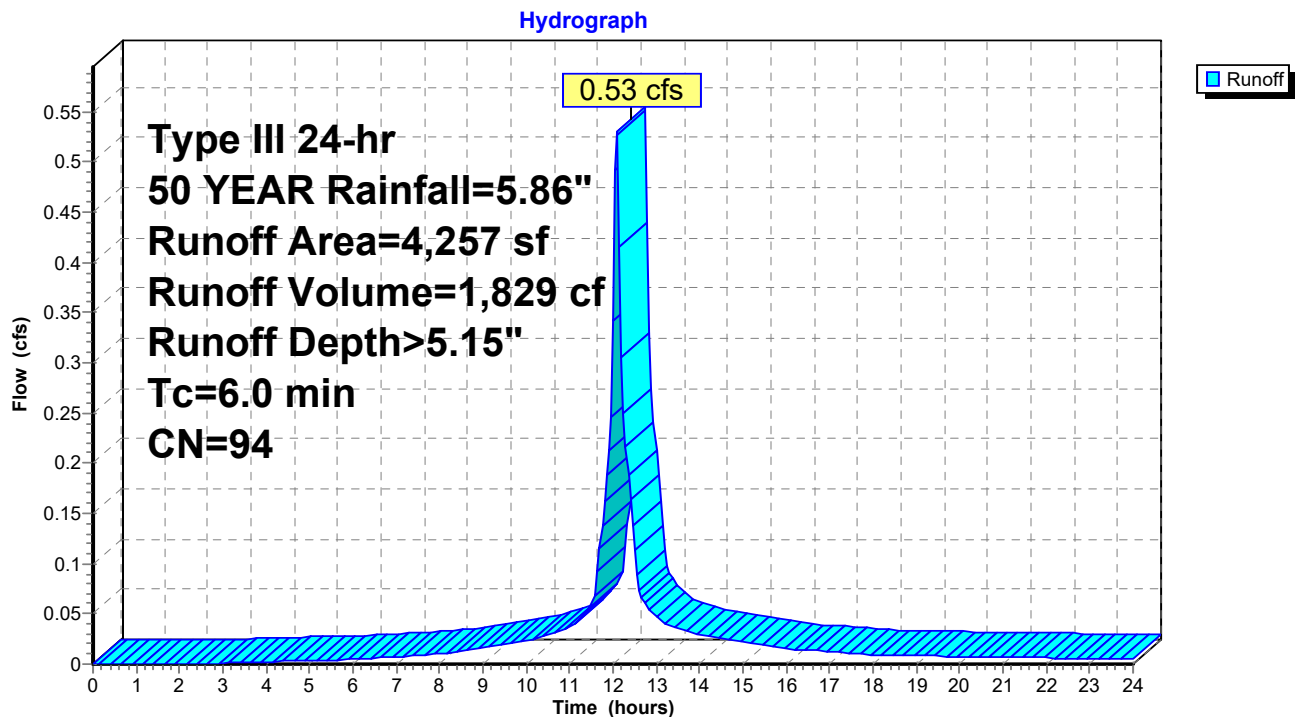
Runoff = 0.53 cfs @ 12.09 hrs, Volume= 1,829 cf, Depth> 5.15"
Routed to Pond CB3 : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
2,866	98	Paved parking, HSG A
996	98	Paved parking, HSG B
185	39	>75% Grass cover, Good, HSG A
210	61	>75% Grass cover, Good, HSG B
4,257	94	Weighted Average
395		9.28% Pervious Area
3,862		90.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P2: P-2



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Summary for Subcatchment P3: P-3

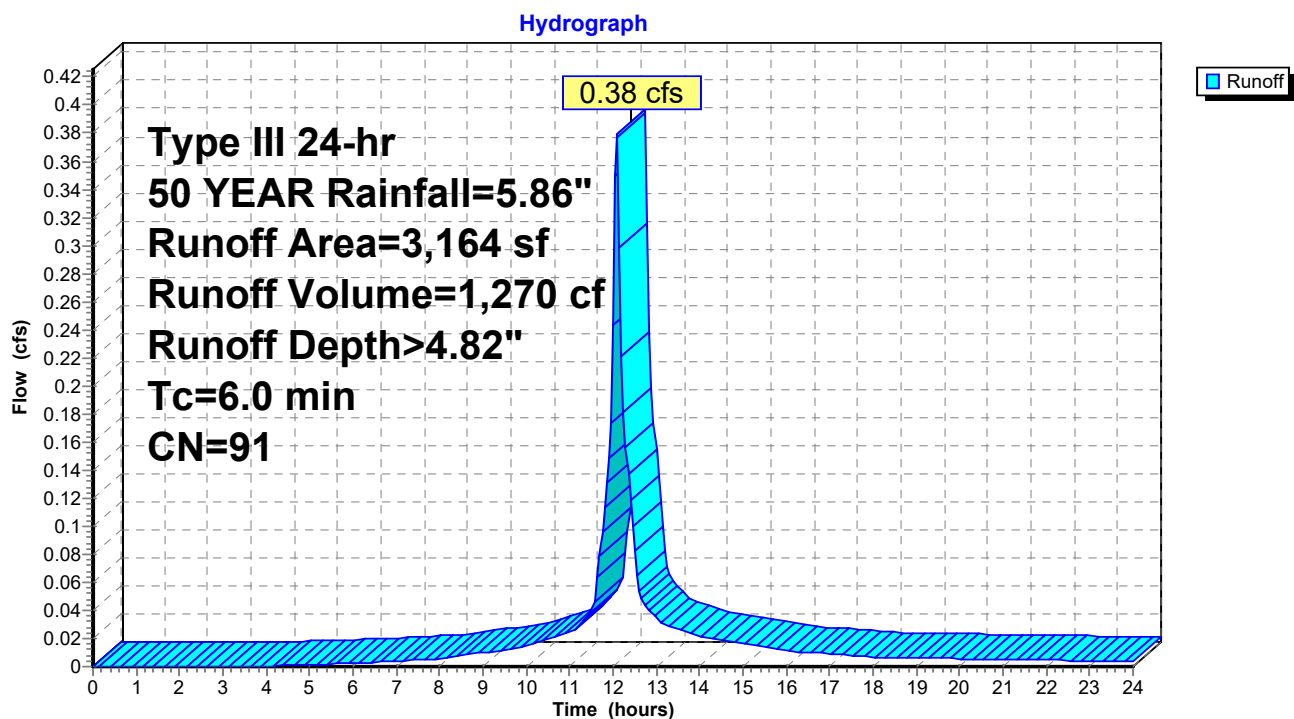
Runoff = 0.38 cfs @ 12.09 hrs, Volume= 1,270 cf, Depth> 4.82"
Routed to Pond CB4 : CB4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
1,399	98	Paved parking, HSG A
1,157	98	Water Surface, HSG B
608	61	>75% Grass cover, Good, HSG B
3,164	91	Weighted Average
608		19.22% Pervious Area
2,556		80.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P3: P-3



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Summary for Subcatchment P4: P-4

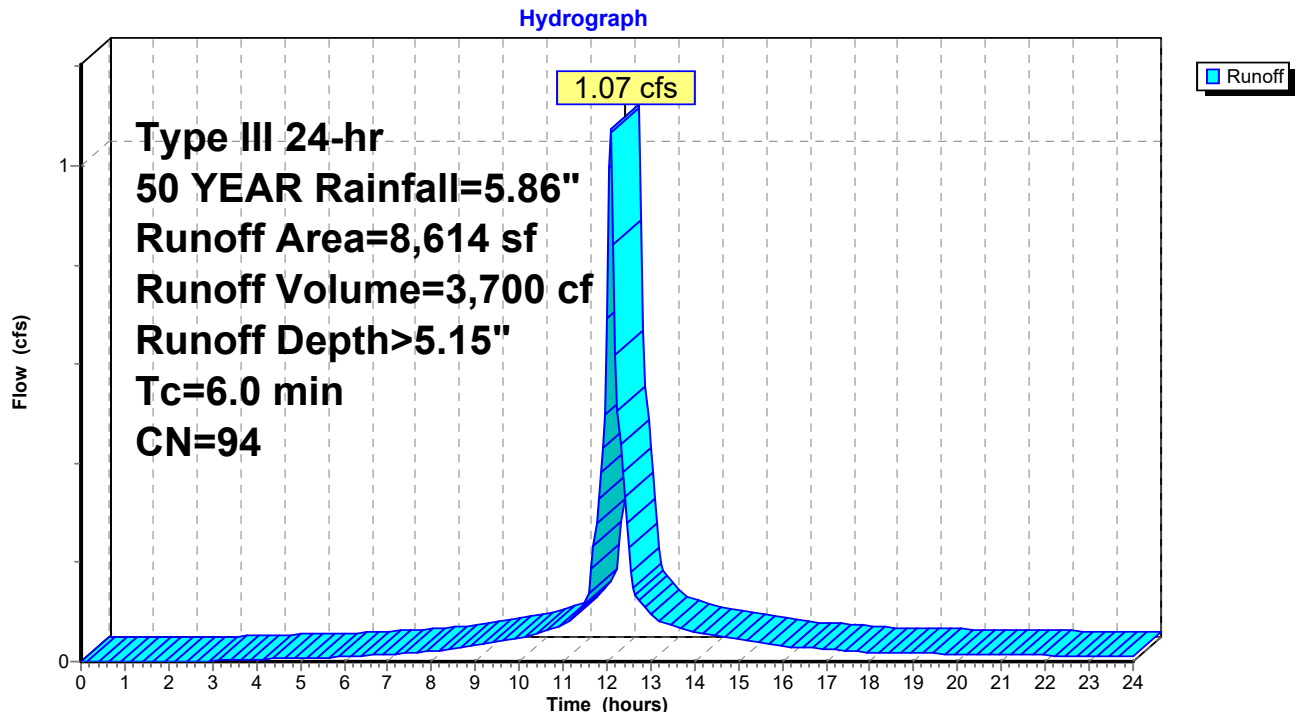
Runoff = 1.07 cfs @ 12.09 hrs, Volume= 3,700 cf, Depth> 5.15"
Routed to Pond CB5 : CB3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

	Area (sf)	CN	Description
*	7,866	98	Paved parking, HSG A, B
	119	39	>75% Grass cover, Good, HSG A
	629	61	>75% Grass cover, Good, HSG B
	8,614	94	Weighted Average
	748		8.68% Pervious Area
	7,866		91.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P4: P-4



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment P5: P-5

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 1,269 cf, Depth> 5.27"
Routed to Pond CB6 : DMH1

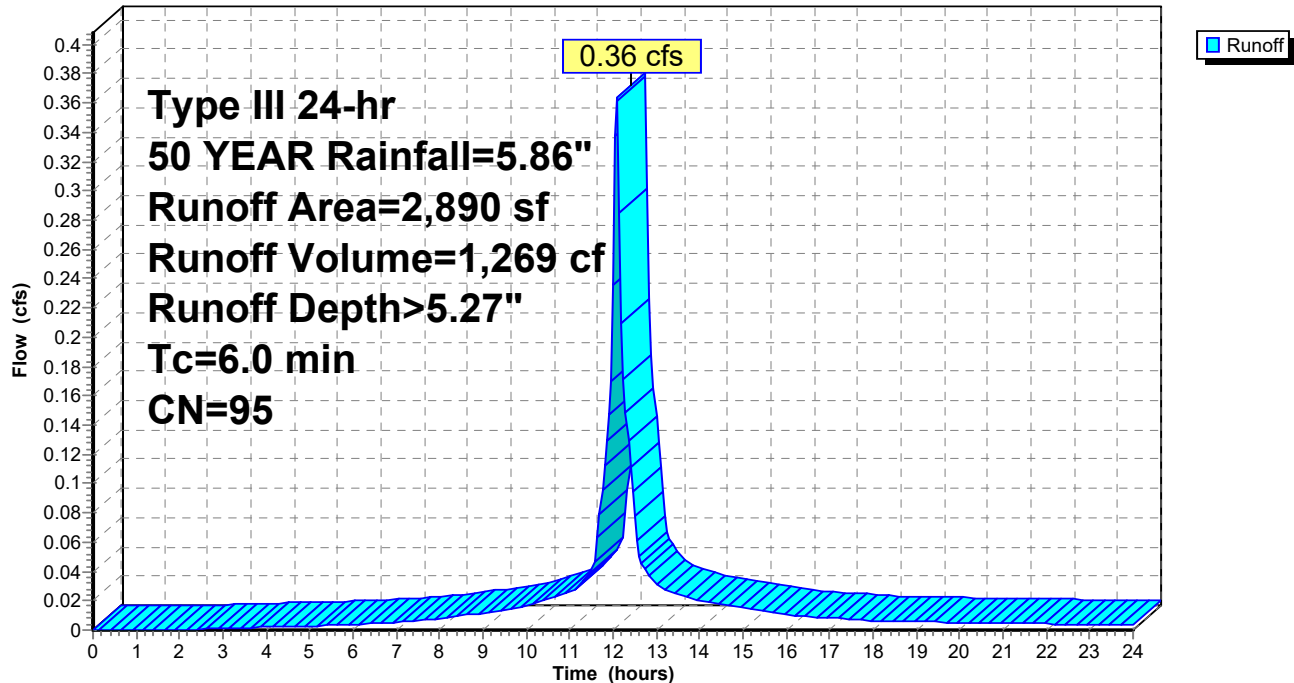
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

	Area (sf)	CN	Description
*	2,674	98	Paved parking, HSG B,C
	216	61	>75% Grass cover, Good, HSG B
	2,890	95	Weighted Average
	216		7.47% Pervious Area
	2,674		92.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P5: P-5

Hydrograph



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Summary for Subcatchment P6: P-6

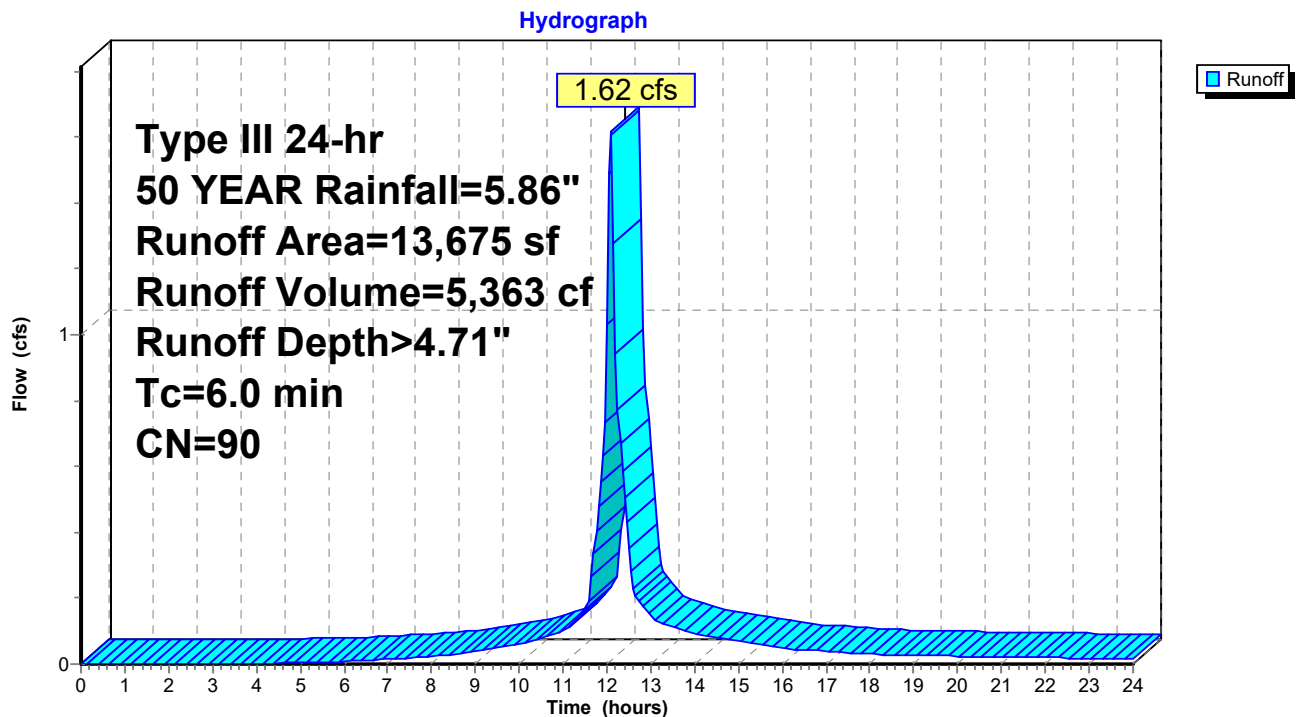
Runoff = 1.62 cfs @ 12.09 hrs, Volume= 5,363 cf, Depth> 4.71"
Routed to Pond CB7 : CB7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
10,556	98	Paved parking, HSG B
3,119	61	>75% Grass cover, Good, HSG B
13,675	90	Weighted Average
3,119		22.81% Pervious Area
10,556		77.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER PAVEMENT

Subcatchment P6: P-6



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Summary for Subcatchment P7: P-7

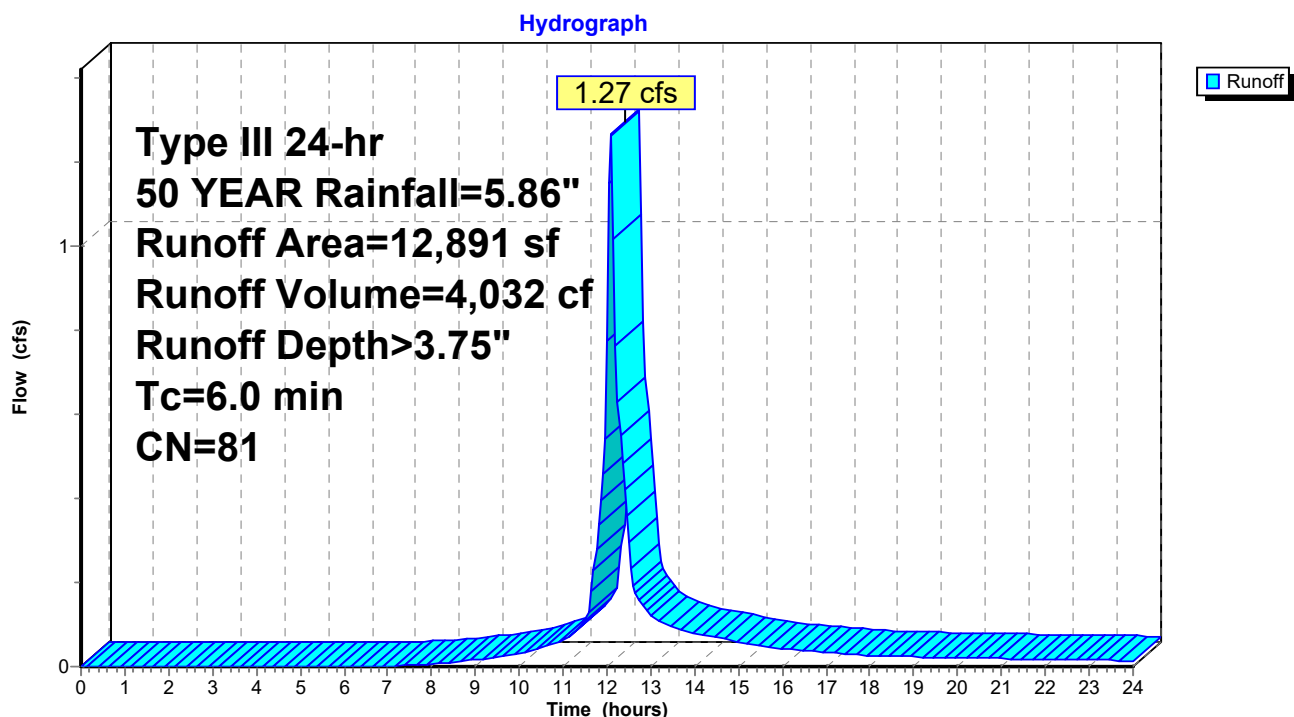
Runoff = 1.27 cfs @ 12.09 hrs, Volume= 4,032 cf, Depth> 3.75"
Routed to Pond IP2 : OPEN POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
6,412	98	Water Surface, HSG B
* 432	98	Paved parking, HSG B,C
6,047	61	>75% Grass cover, Good, HSG B
12,891	81	Weighted Average
6,047		46.91% Pervious Area
6,844		53.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW OVER GRASS TO POND

Subcatchment P7: P-7



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Summary for Subcatchment P8: P-8

Runoff = 0.52 cfs @ 12.10 hrs, Volume= 1,773 cf, Depth> 1.75"
 Routed to Pond CB1 : CB1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
233	98	Paved parking, HSG A
6,658	39	>75% Grass cover, Good, HSG A
2,764	96	Gravel surface, HSG A
2,086	61	>75% Grass cover, Good, HSG B
434	96	Gravel surface, HSG B
12,175	59	Weighted Average
11,942		98.09% Pervious Area
233		1.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.2400	0.26		Sheet Flow, FLOW OVER GRASS Grass: Dense n= 0.240 P2= 2.94"
0.7	80	0.0100	2.03		Shallow Concentrated Flow, FLOW OVER GRAVEL Paved Kv= 20.3 fps
0.5	45	0.0400	1.40		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
1.8					Direct Entry, ADD FLOW TIME
6.2	175	Total			

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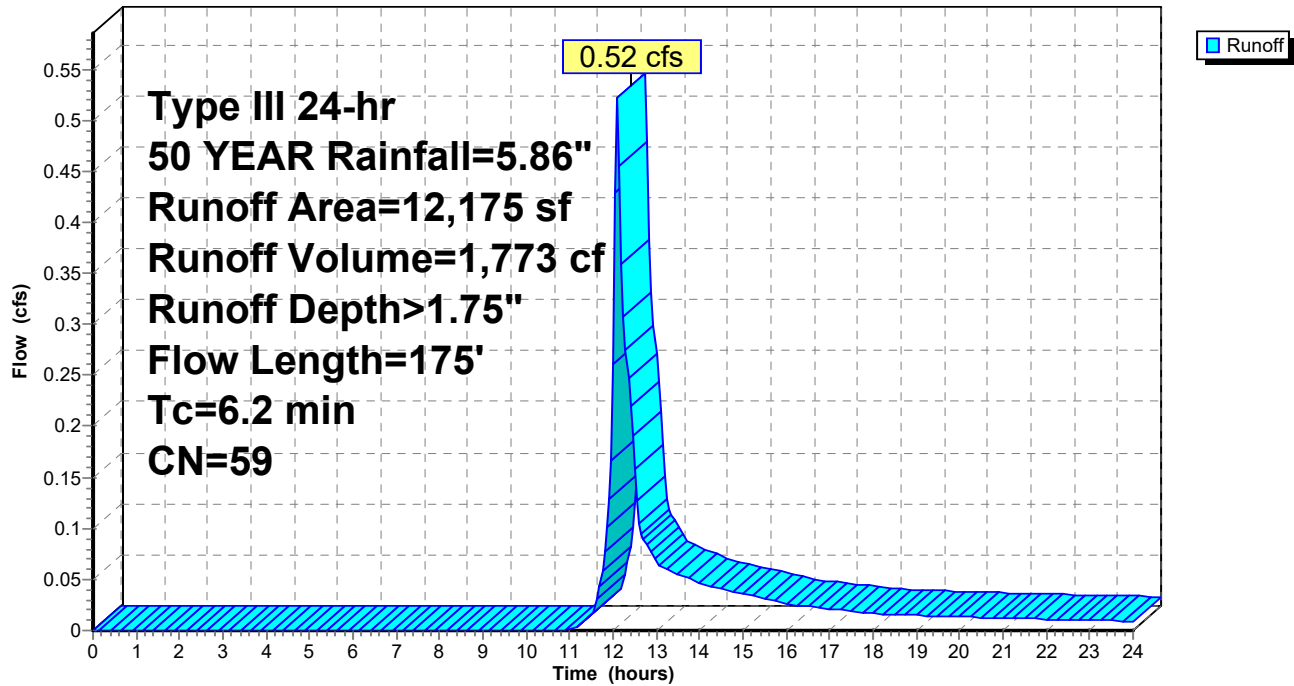
Type III 24-hr 50 YEAR Rainfall=5.86"

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Subcatchment P8: P-8

Hydrograph



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Summary for Subcatchment P9: (new Subcat)

Runoff = 1.42 cfs @ 12.10 hrs, Volume= 4,691 cf, Depth> 1.91"
 Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
8,986	98	Paved parking, HSG A
2,275	96	Gravel surface, HSG A
18,210	39	>75% Grass cover, Good, HSG A
29,471	61	Weighted Average
20,485		69.51% Pervious Area
8,986		30.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0600	1.78		Sheet Flow, FLOW OVER PAVEMENT Smooth surfaces n= 0.011 P2= 2.94"
0.2	50	0.0600	4.97		Shallow Concentrated Flow, FLOW OVER PAVEMENT Paved Kv= 20.3 fps
0.4	75	0.2400	3.43		Shallow Concentrated Flow, FLOW IN GRASS Short Grass Pasture Kv= 7.0 fps
1.0	122	0.0800	1.98		Shallow Concentrated Flow, FLOW OVER GRASS Short Grass Pasture Kv= 7.0 fps
3.9					Direct Entry,
6.0	297	Total			

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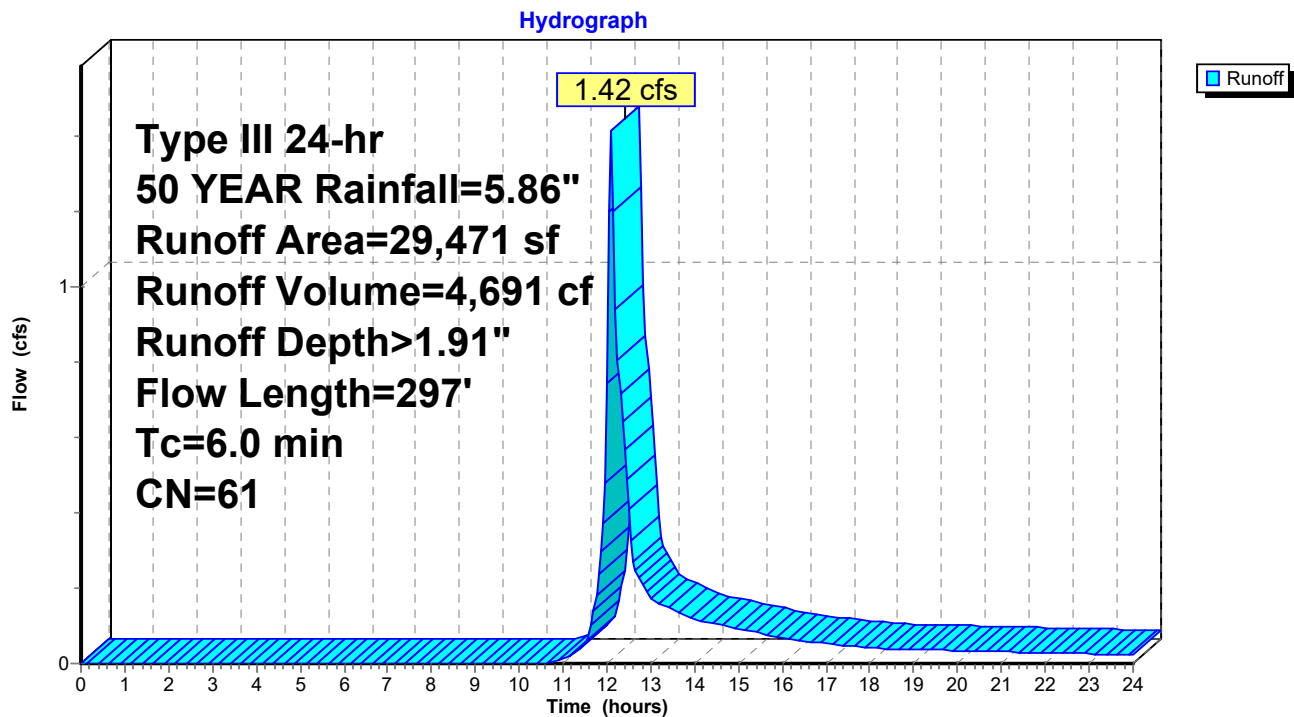
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Type III 24-hr 50 YEAR Rainfall=5.86"

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Subcatchment P9: (new Subcat)



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment R1: ROOF 1

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 1,797 cf, Depth> 5.62"
Routed to Pond CB1 : CB1

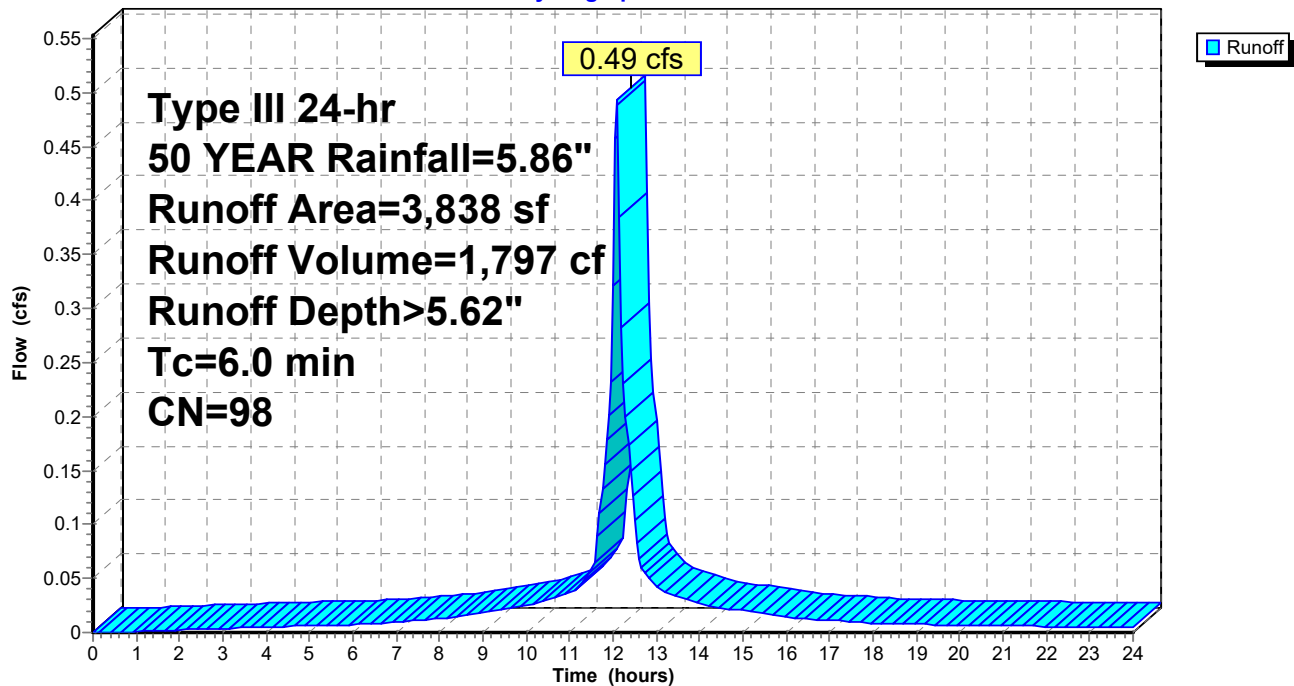
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
3,838	98	Roofs, HSG A
3,838		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB1

Subcatchment R1: ROOF 1

Hydrograph



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment R2: ROOF 2

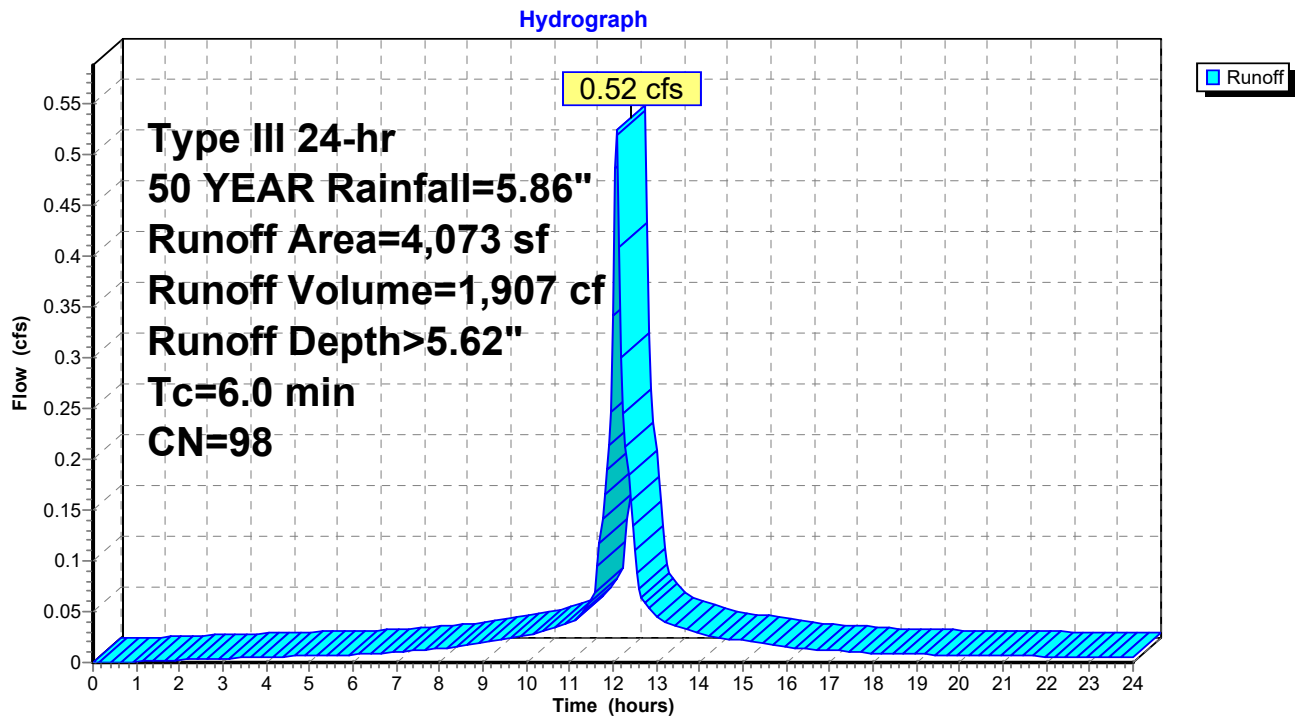
Runoff = 0.52 cfs @ 12.09 hrs, Volume= 1,907 cf, Depth> 5.62"
Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
4,073	98	Roofs, HSG A
4,073		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R2: ROOF 2



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Subcatchment R3: ROOF 3

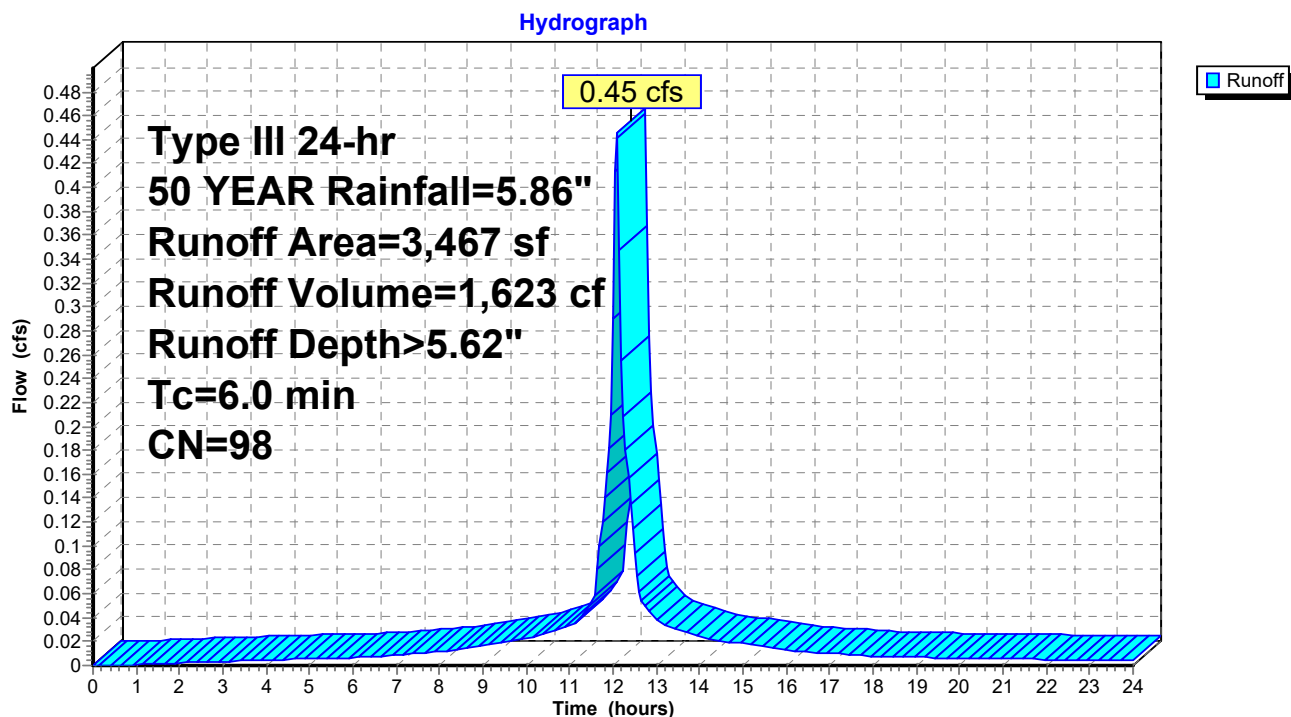
Runoff = 0.45 cfs @ 12.09 hrs, Volume= 1,623 cf, Depth> 5.62"
Routed to Pond CB9 : CB-9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

	Area (sf)	CN	Description
*	3,467	98	Roofs, HSG A,B
	3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO ROOF DRAIN AND CB9

Subcatchment R3: ROOF 3



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Summary for Subcatchment R4: ROOF 4

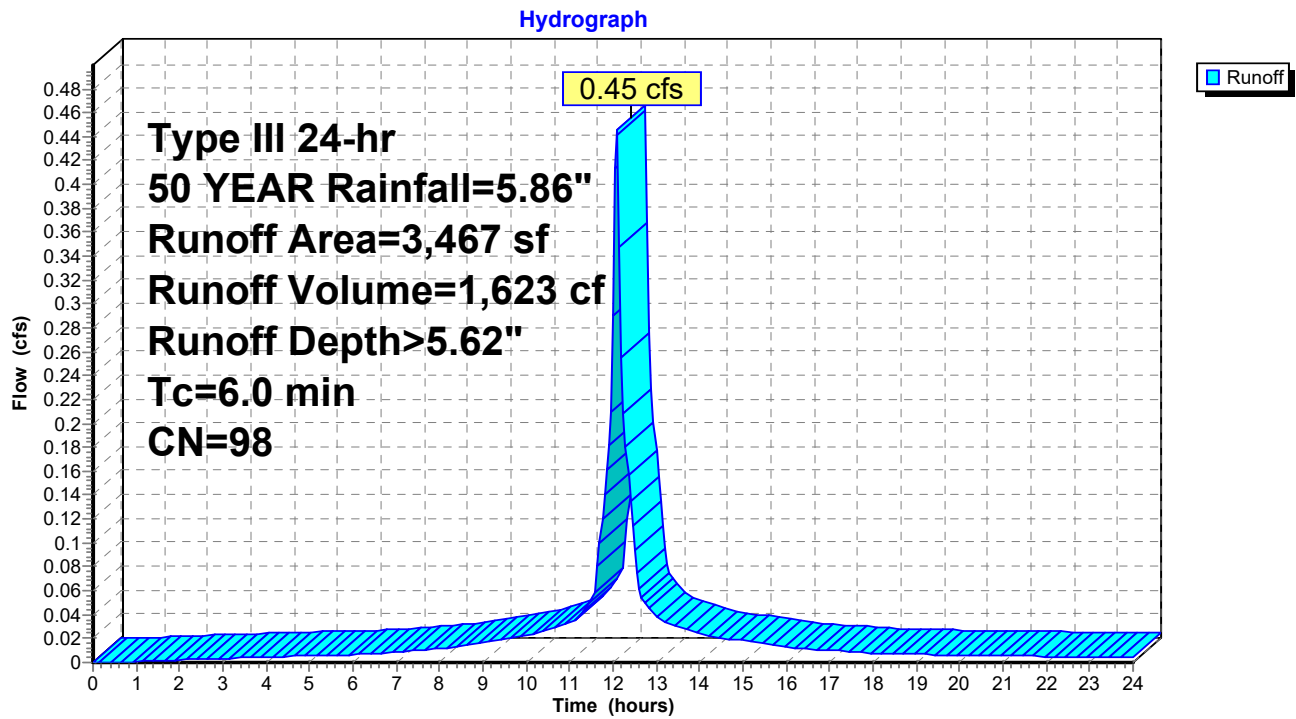
Runoff = 0.45 cfs @ 12.09 hrs, Volume= 1,623 cf, Depth> 5.62"
Routed to Pond CB2 : CB2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

Area (sf)	CN	Description
3,467	98	Roofs, HSG A
3,467		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB2

Subcatchment R4: ROOF 4



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Summary for Subcatchment R5: ROOF 5

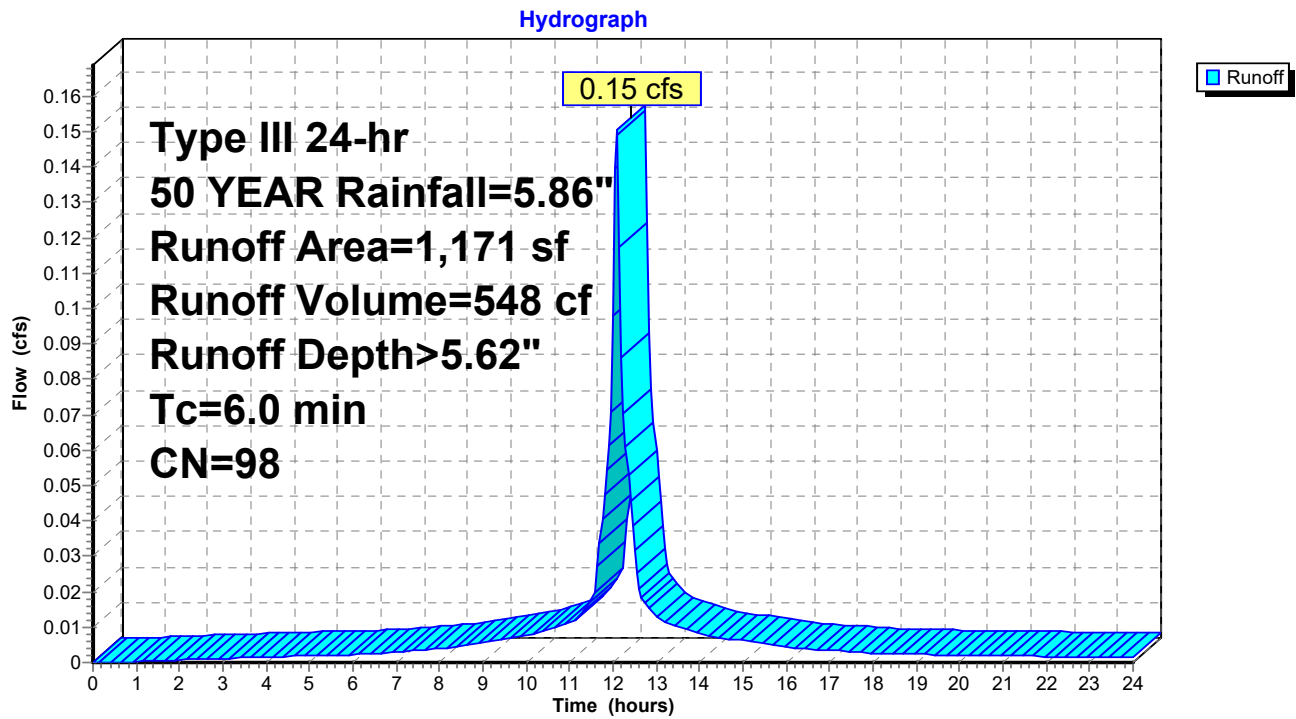
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 548 cf, Depth> 5.62"
Routed to Pond CB6 : DMH1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR Rainfall=5.86"

	Area (sf)	CN	Description
*	1,171	98	Roofs, HSG A,B
	1,171		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, FLOW TO CB6

Subcatchment R5: ROOF 5



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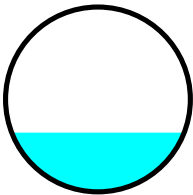
Summary for Reach 3R: 12" PIPE

Inflow Area = 156,038 sf, 24.75% Impervious, Inflow Depth > 1.02" for 50 YEAR event
Inflow = 3.09 cfs @ 12.12 hrs, Volume= 13,321 cf
Outflow = 3.09 cfs @ 12.12 hrs, Volume= 13,318 cf, Atten= 0%, Lag= 0.1 min
Routed to Pond DP1 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.32 fps, Min. Travel Time= 0.2 min
Avg. Velocity= 2.52 fps, Avg. Travel Time= 0.4 min

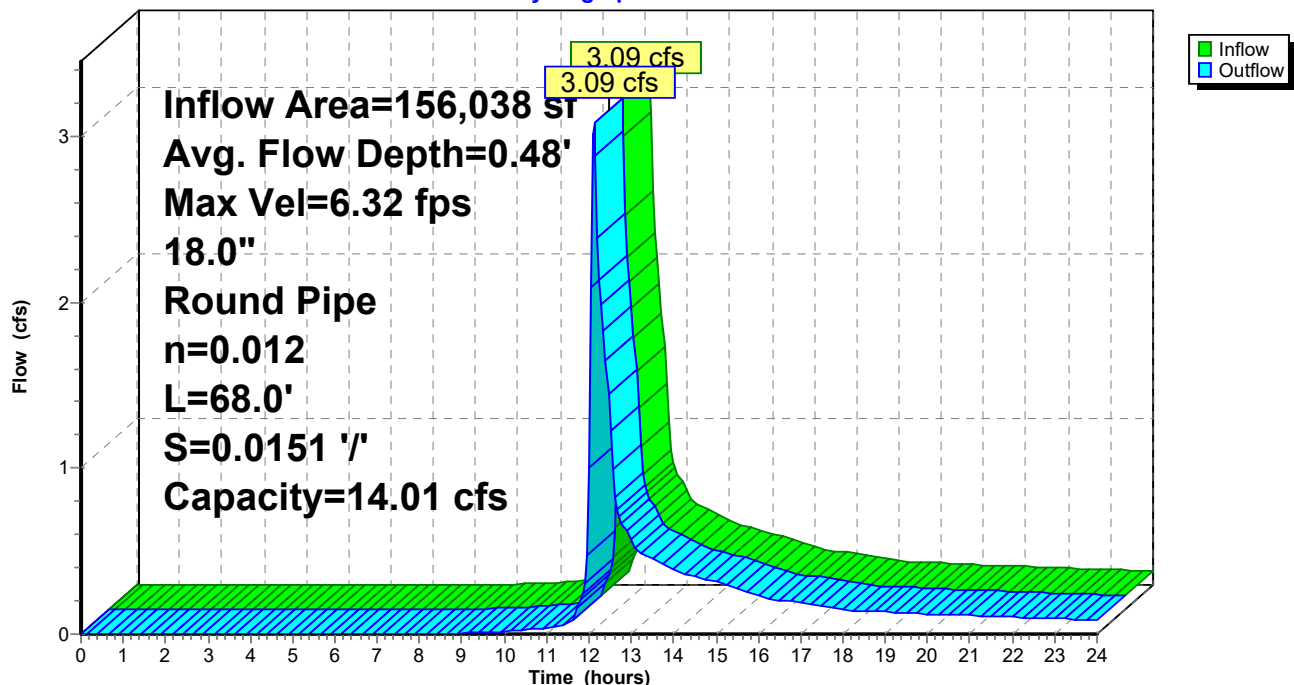
Peak Storage= 33 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.48' , Surface Width= 1.40'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.01 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 68.0' Slope= 0.0151 '/'
Inlet Invert= 438.80', Outlet Invert= 437.77'



Reach 3R: 12" PIPE

Hydrograph



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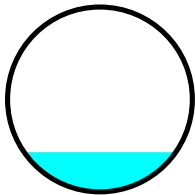
Summary for Reach 6R: 18" PIPE

Inflow Area = 146,037 sf, 22.10% Impervious, Inflow Depth > 0.87" for 50 YEAR event
Inflow = 2.26 cfs @ 12.12 hrs, Volume= 10,609 cf
Outflow = 2.27 cfs @ 12.12 hrs, Volume= 10,606 cf, Atten= 0%, Lag= 0.1 min
Routed to Reach 3R : 12" PIPE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.10 fps, Min. Travel Time= 0.2 min
Avg. Velocity= 3.86 fps, Avg. Travel Time= 0.4 min

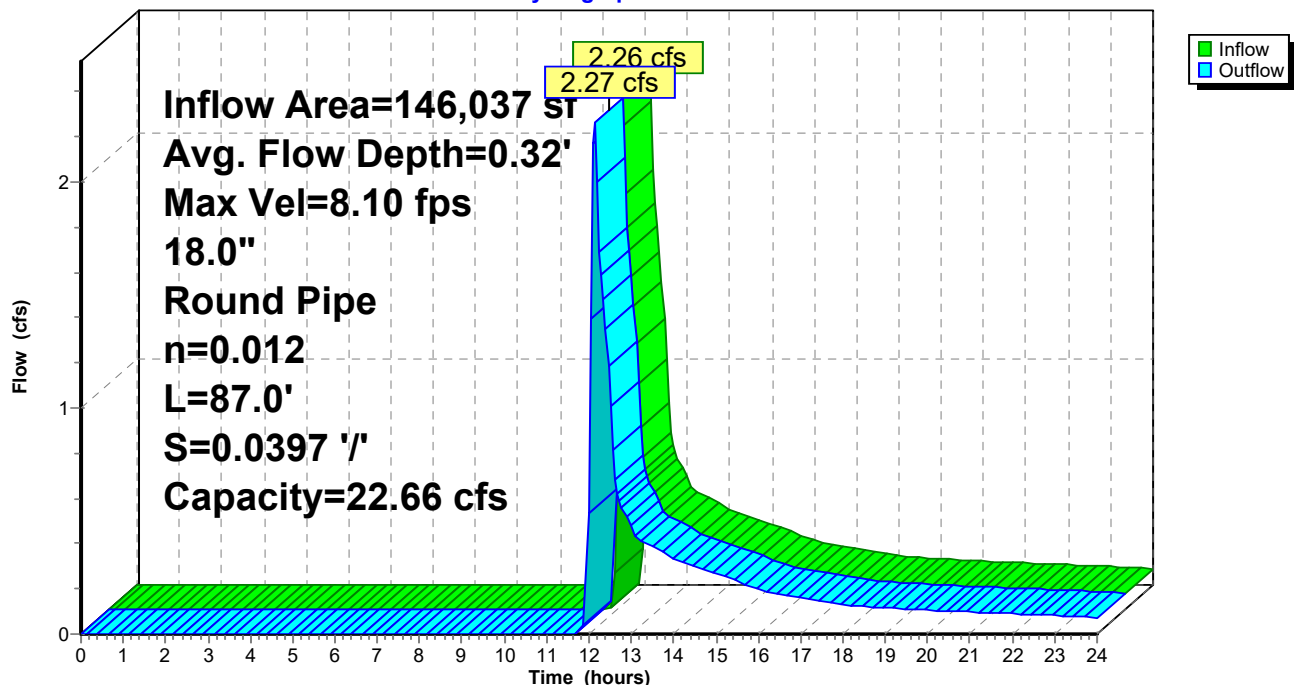
Peak Storage= 24 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 1.23'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 22.66 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 87.0' Slope= 0.0397 '/'
Inlet Invert= 441.30', Outlet Invert= 437.85'



Reach 6R: 18" PIPE

Hydrograph



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Pond CB1: CB1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 2.68" for 50 YEAR event
Inflow = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf
Outflow = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf
Routed to Pond MH1 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 434.52' @ 12.10 hrs

Flood Elev= 437.72'

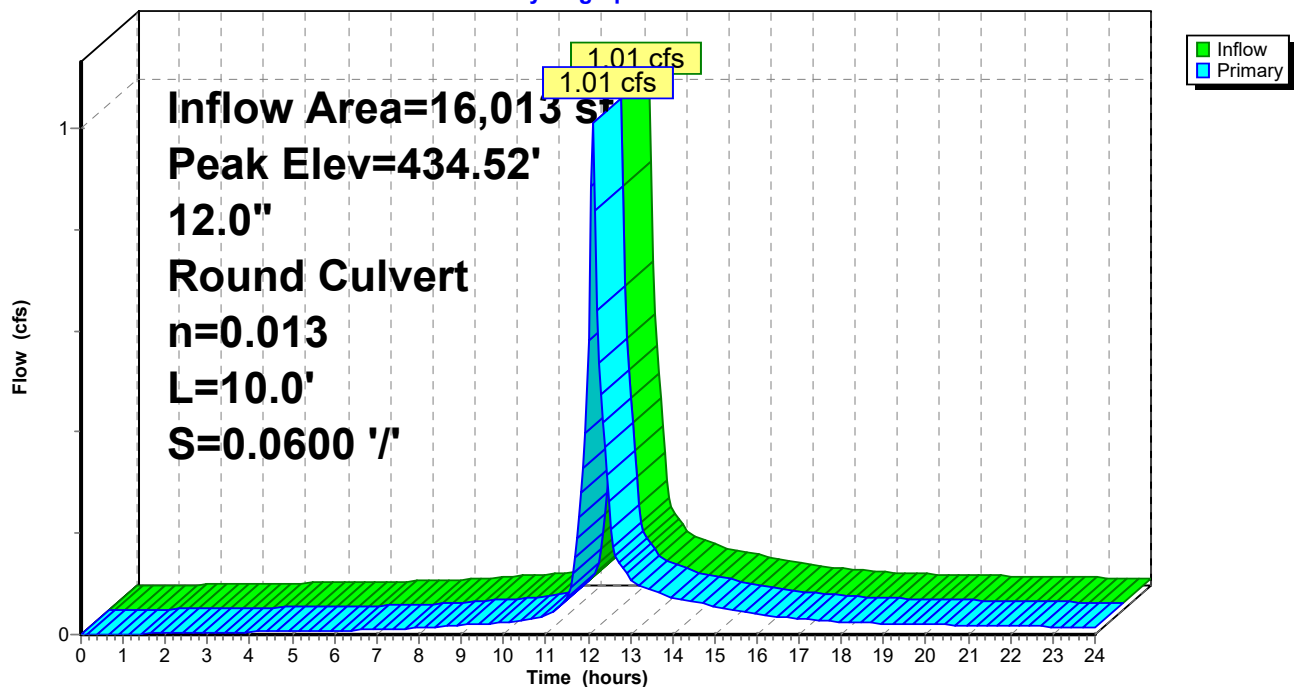
Device	Routing	Invert	Outlet Devices
#1	Primary	434.00'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 434.00' / 433.40' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.00 cfs @ 12.10 hrs HW=434.52' TW=433.82' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.00 cfs @ 2.45 fps)

Pond CB1: CB1

Hydrograph



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Summary for Pond CB2: CB2

Inflow Area = 3,467 sf, 100.00% Impervious, Inflow Depth > 5.62" for 50 YEAR event
Inflow = 0.45 cfs @ 12.09 hrs, Volume= 1,623 cf
Outflow = 0.45 cfs @ 12.09 hrs, Volume= 1,623 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 12.09 hrs, Volume= 1,623 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 428.33' @ 12.09 hrs

Flood Elev= 431.00'

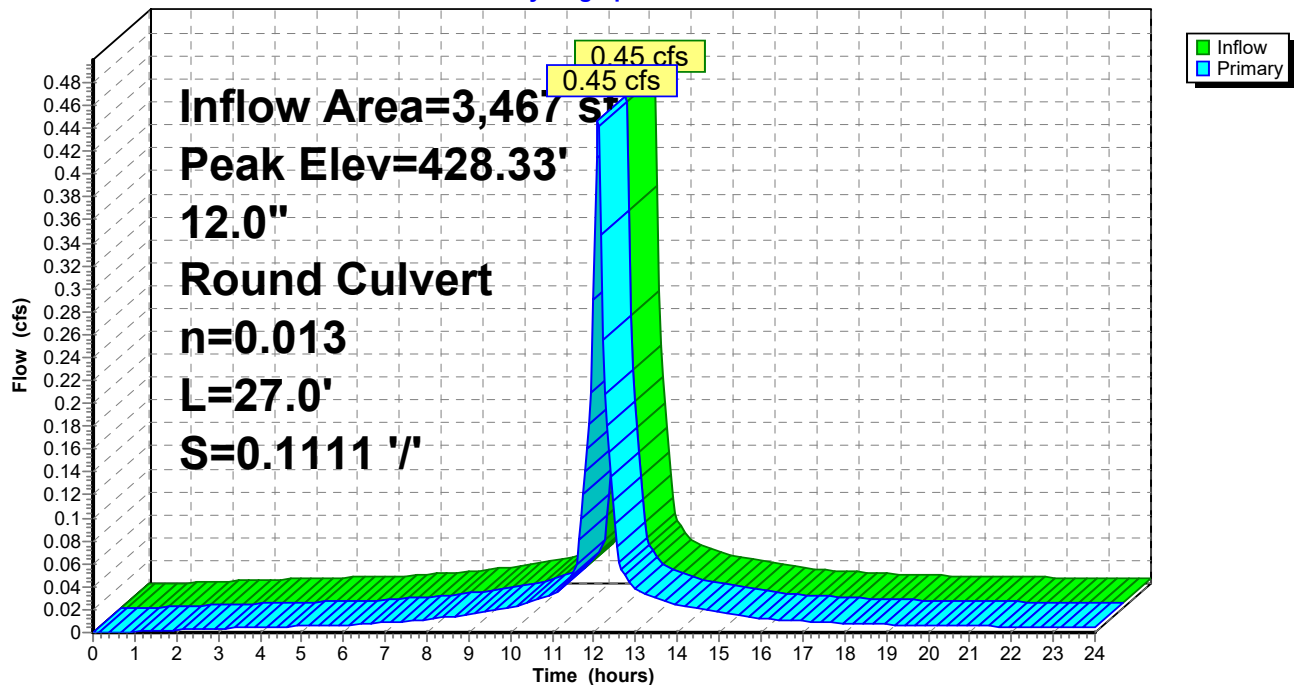
Device	Routing	Invert	Outlet Devices
#1	Primary	428.00'	12.0" Round Culvert L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 428.00' / 425.00' S= 0.1111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.43 cfs @ 12.09 hrs HW=428.33' TW=425.67' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.43 cfs @ 1.95 fps)

Pond CB2: CB2

Hydrograph



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Summary for Pond CB3: CB3

Inflow Area = 4,257 sf, 90.72% Impervious, Inflow Depth > 5.15" for 50 YEAR event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 1,829 cf
Outflow = 0.53 cfs @ 12.09 hrs, Volume= 1,829 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.53 cfs @ 12.09 hrs, Volume= 1,829 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.36' @ 12.09 hrs

Flood Elev= 433.00'

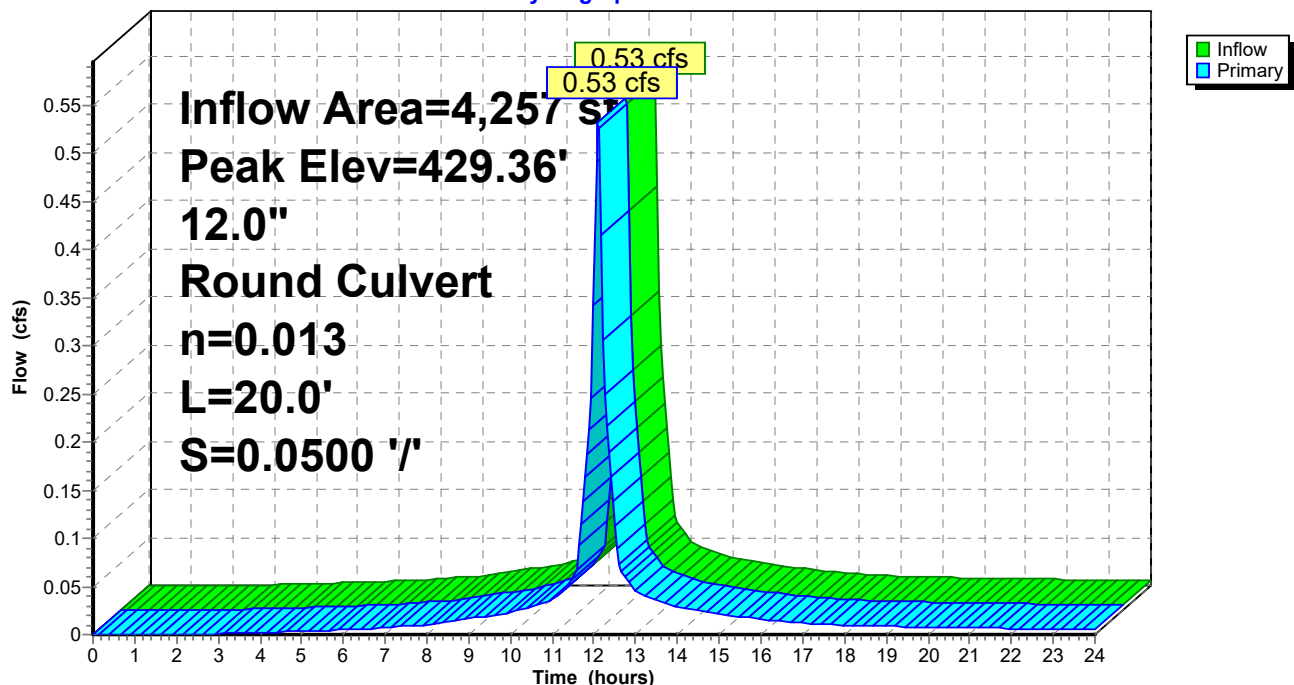
Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0500 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.09 hrs HW=429.36' TW=425.67' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.52 cfs @ 2.04 fps)

Pond CB3: CB3

Hydrograph



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Summary for Pond CB4: CB4

Inflow Area = 3,164 sf, 80.78% Impervious, Inflow Depth > 4.82" for 50 YEAR event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,270 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,270 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,270 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.80' @ 12.09 hrs

Flood Elev= 427.50'

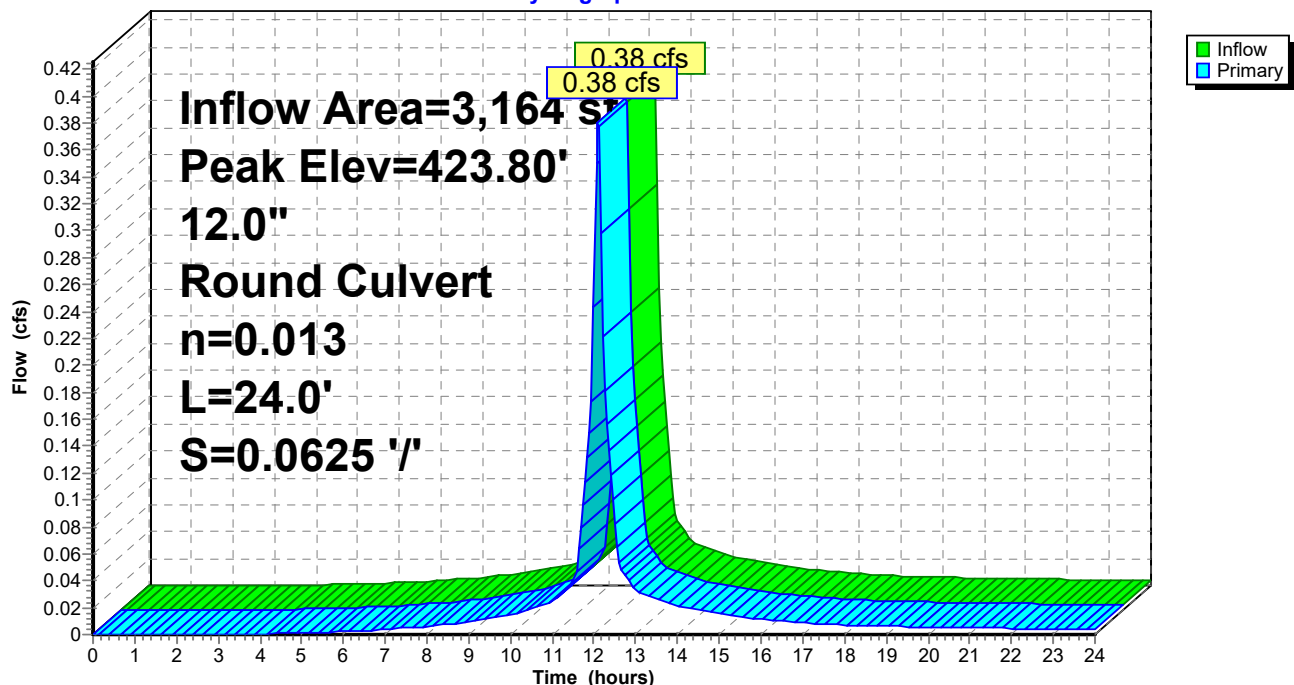
Device	Routing	Invert	Outlet Devices
#1	Primary	423.50'	12.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 423.50' / 422.00' S= 0.0625 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.09 hrs HW=423.80' TW=423.38' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.37 cfs @ 1.87 fps)

Pond CB4: CB4

Hydrograph



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Summary for Pond CB5: CB3

Inflow Area = 8,614 sf, 91.32% Impervious, Inflow Depth > 5.15" for 50 YEAR event
Inflow = 1.07 cfs @ 12.09 hrs, Volume= 3,700 cf
Outflow = 1.07 cfs @ 12.09 hrs, Volume= 3,700 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.09 hrs, Volume= 3,700 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 429.54' @ 12.09 hrs

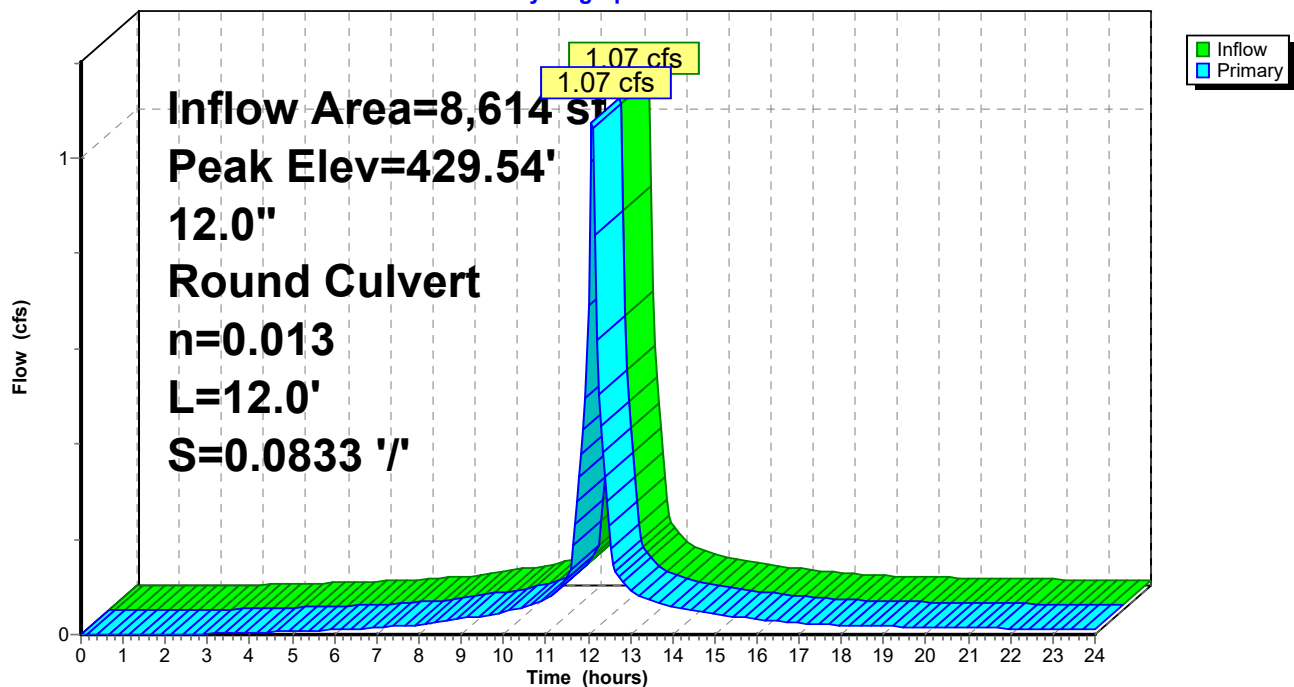
Flood Elev= 433.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	429.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.00' / 428.00' S= 0.0833 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.05 cfs @ 12.09 hrs HW=429.53' TW=425.84' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.05 cfs @ 2.48 fps)

Pond CB5: CB3

Hydrograph



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Summary for Pond CB6: DMH1

Inflow Area = 41,072 sf, 49.60% Impervious, Inflow Depth > 2.93" for 50 YEAR event
Inflow = 2.89 cfs @ 12.09 hrs, Volume= 10,039 cf
Outflow = 2.89 cfs @ 12.09 hrs, Volume= 10,039 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.89 cfs @ 12.09 hrs, Volume= 10,039 cf
Routed to Pond MH5 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 426.24' @ 12.13 hrs

Flood Elev= 437.72'

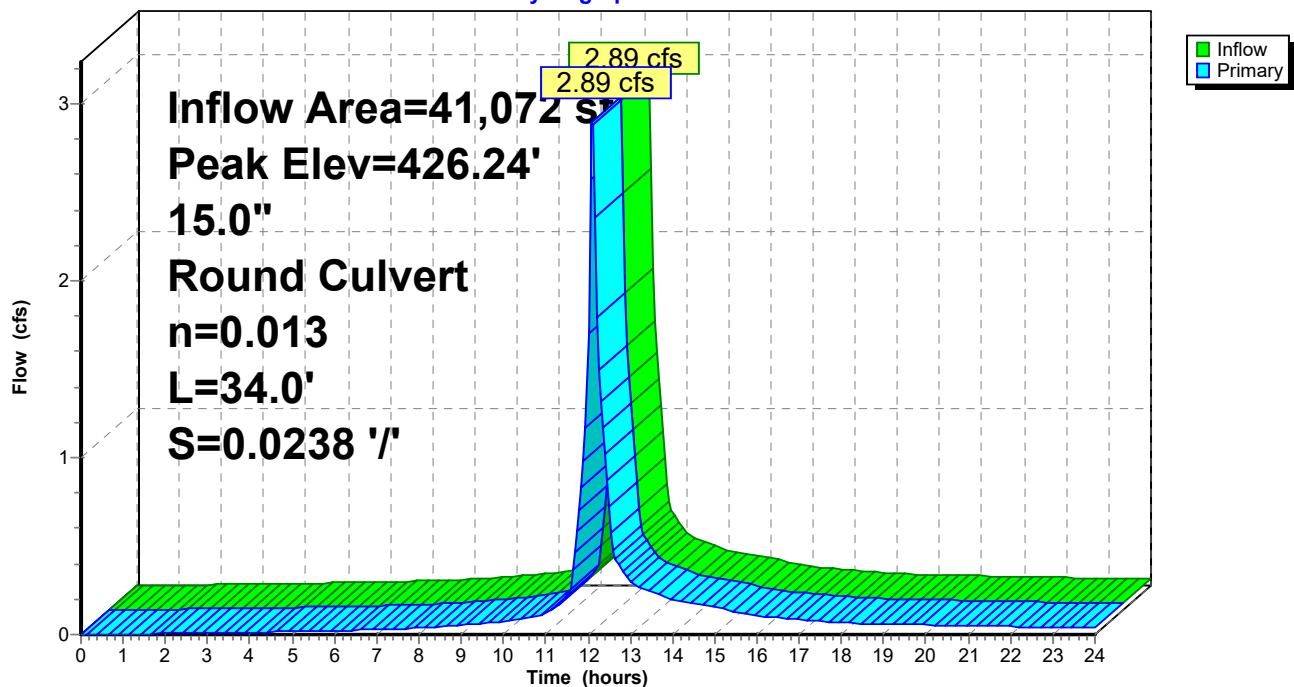
Device	Routing	Invert	Outlet Devices
#1	Primary	425.21'	15.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.21' / 424.40' S= 0.0238 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.18 cfs @ 12.09 hrs HW=426.17' TW=425.87' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 2.18 cfs @ 2.98 fps)

Pond CB6: DMH1

Hydrograph



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Summary for Pond CB7: CB7

Inflow Area = 13,675 sf, 77.19% Impervious, Inflow Depth > 4.71" for 50 YEAR event
Inflow = 1.62 cfs @ 12.09 hrs, Volume= 5,363 cf
Outflow = 1.62 cfs @ 12.09 hrs, Volume= 5,363 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.09 hrs, Volume= 5,363 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 424.25' @ 12.14 hrs

Flood Elev= 424.00'

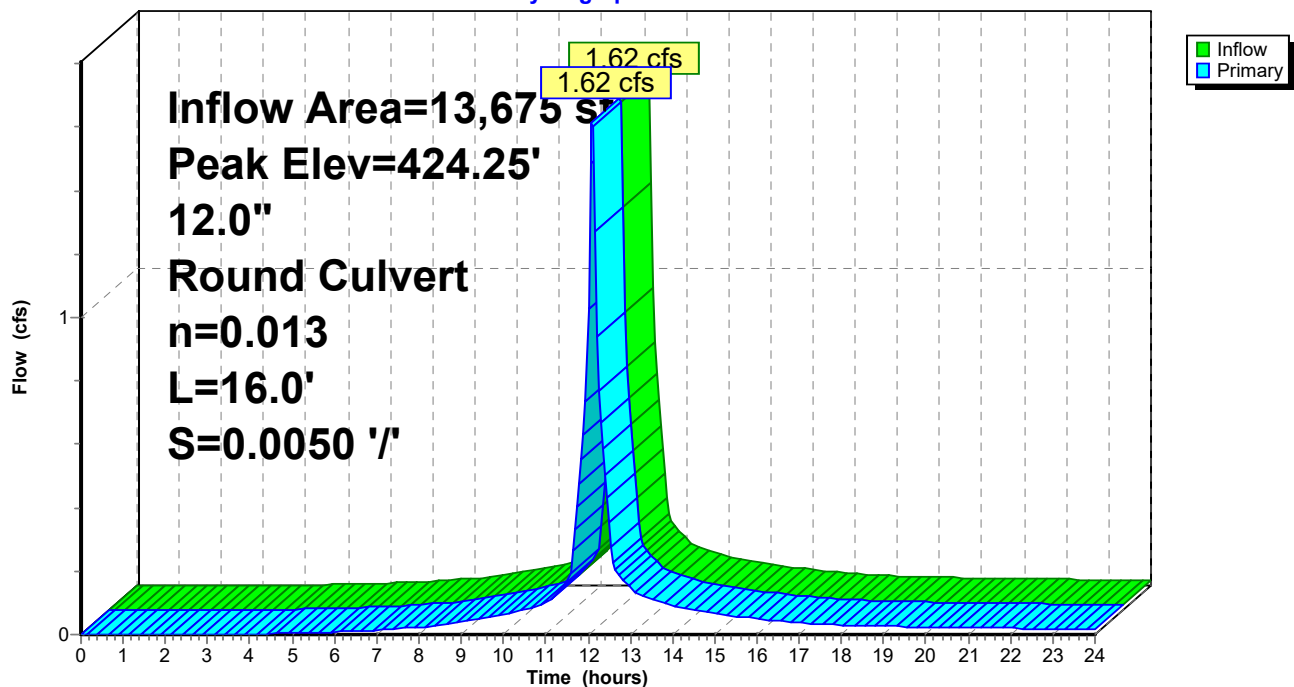
Device	Routing	Invert	Outlet Devices
#1	Primary	421.00'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.00' / 420.92' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=423.95' TW=424.07' (Dynamic Tailwater)

↑**1=Culvert** (Controls 0.00 cfs)

Pond CB7: CB7

Hydrograph



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Summary for Pond CB8: CB8

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 2.67" for 50 YEAR event
Inflow = 2.38 cfs @ 12.09 hrs, Volume= 8,222 cf
Outflow = 2.38 cfs @ 12.09 hrs, Volume= 8,222 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.38 cfs @ 12.09 hrs, Volume= 8,222 cf
Routed to Pond CB6 : DMH1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 426.79' @ 12.11 hrs

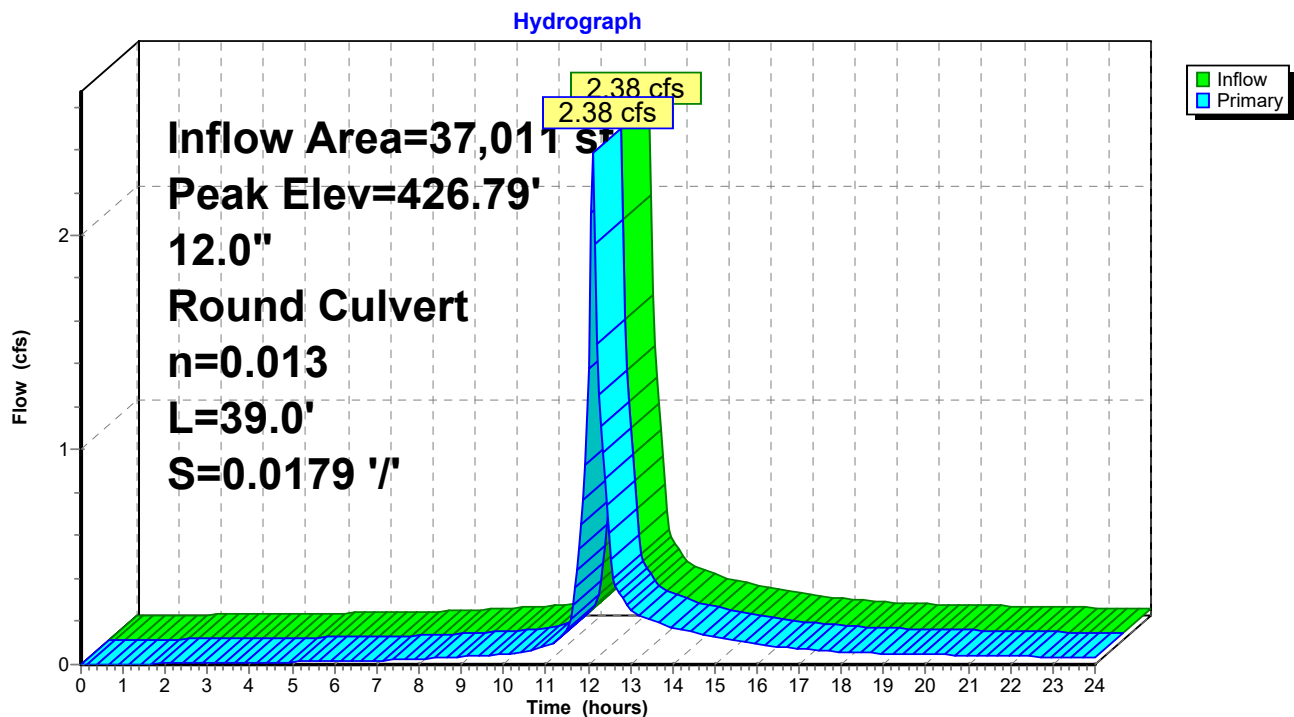
Flood Elev= 431.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	425.90'	12.0" Round Culvert L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.90' / 425.20' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.19 cfs @ 12.09 hrs HW=426.78' TW=426.18' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 2.19 cfs @ 3.96 fps)

Pond CB8: CB8



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Pond CB9: CB-9

Inflow Area = 37,011 sf, 44.65% Impervious, Inflow Depth > 2.67" for 50 YEAR event
Inflow = 2.38 cfs @ 12.09 hrs, Volume= 8,222 cf
Outflow = 2.38 cfs @ 12.09 hrs, Volume= 8,222 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.38 cfs @ 12.09 hrs, Volume= 8,222 cf
Routed to Pond CB8 : CB8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 428.39' @ 12.10 hrs

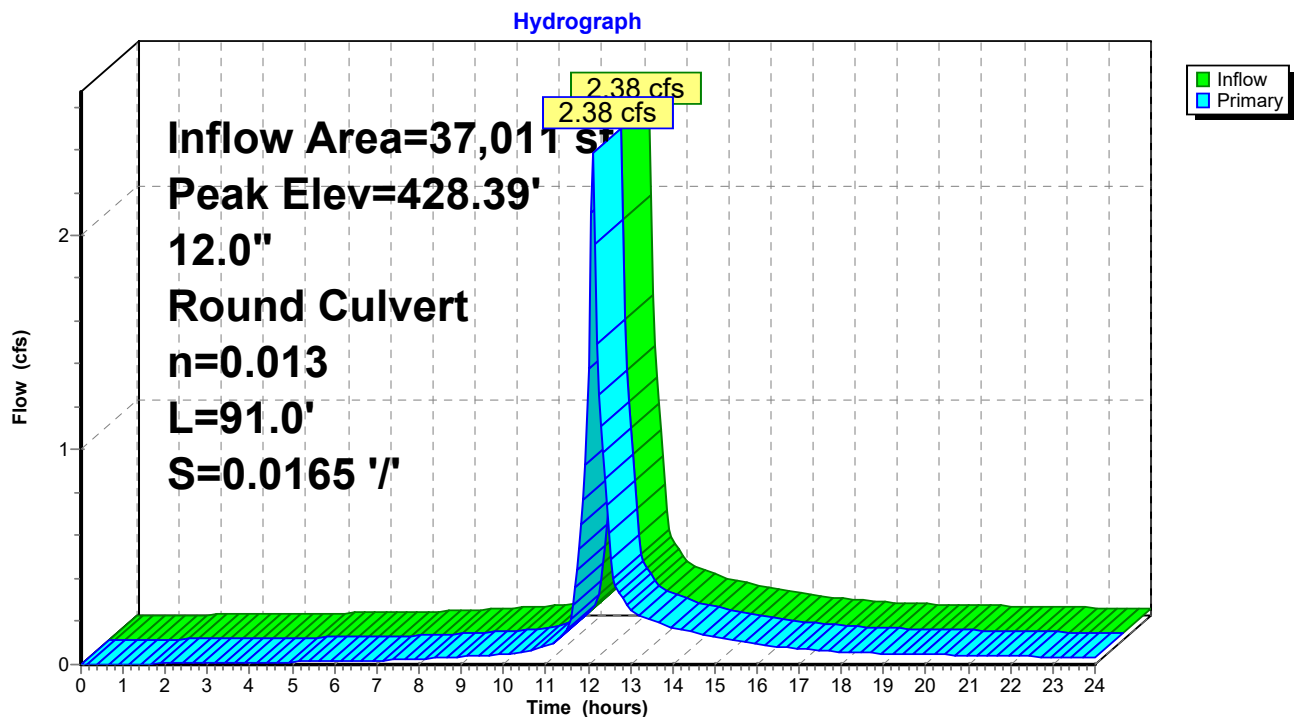
Flood Elev= 431.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	427.50'	12.0" Round Culvert L= 91.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 427.50' / 426.00' S= 0.0165 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.35 cfs @ 12.09 hrs HW=428.38' TW=426.78' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 2.35 cfs @ 3.20 fps)

Pond CB9: CB-9



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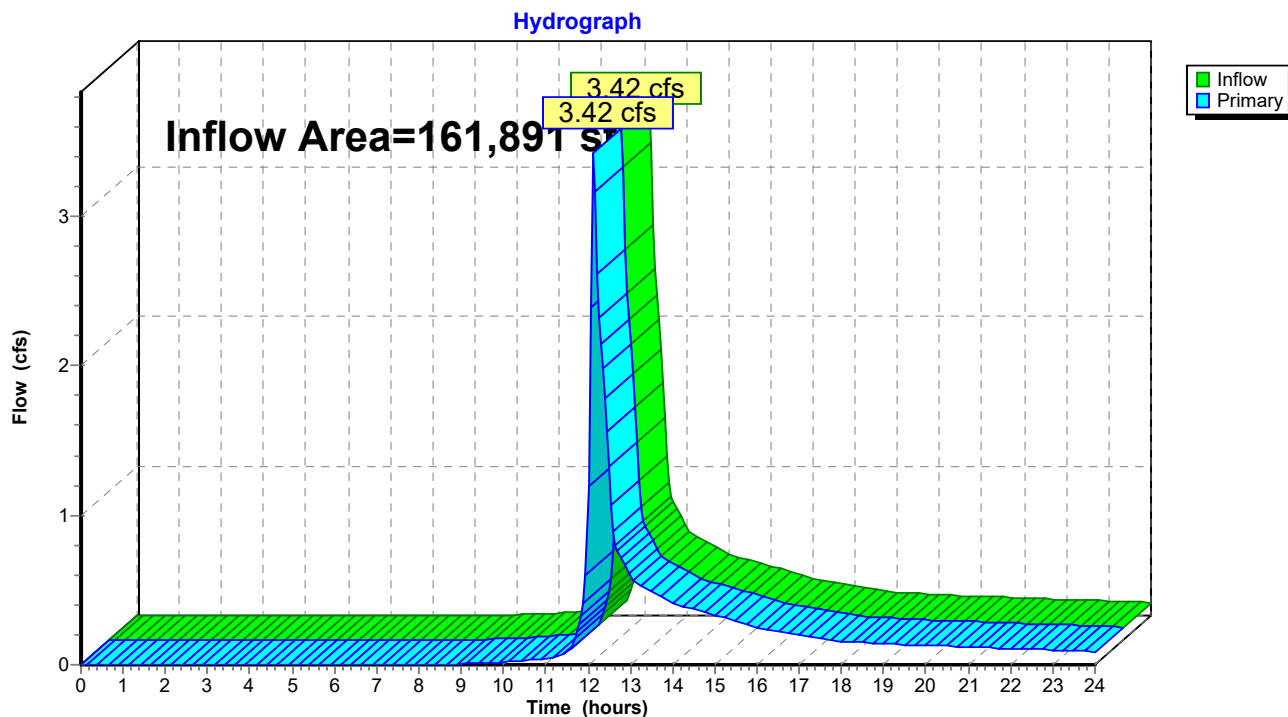
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Summary for Pond DP1: (new Pond)

Inflow Area = 161,891 sf, 24.20% Impervious, Inflow Depth > 1.07" for 50 YEAR event
Inflow = 3.42 cfs @ 12.12 hrs, Volume= 14,414 cf
Primary = 3.42 cfs @ 12.12 hrs, Volume= 14,414 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP1: (new Pond)



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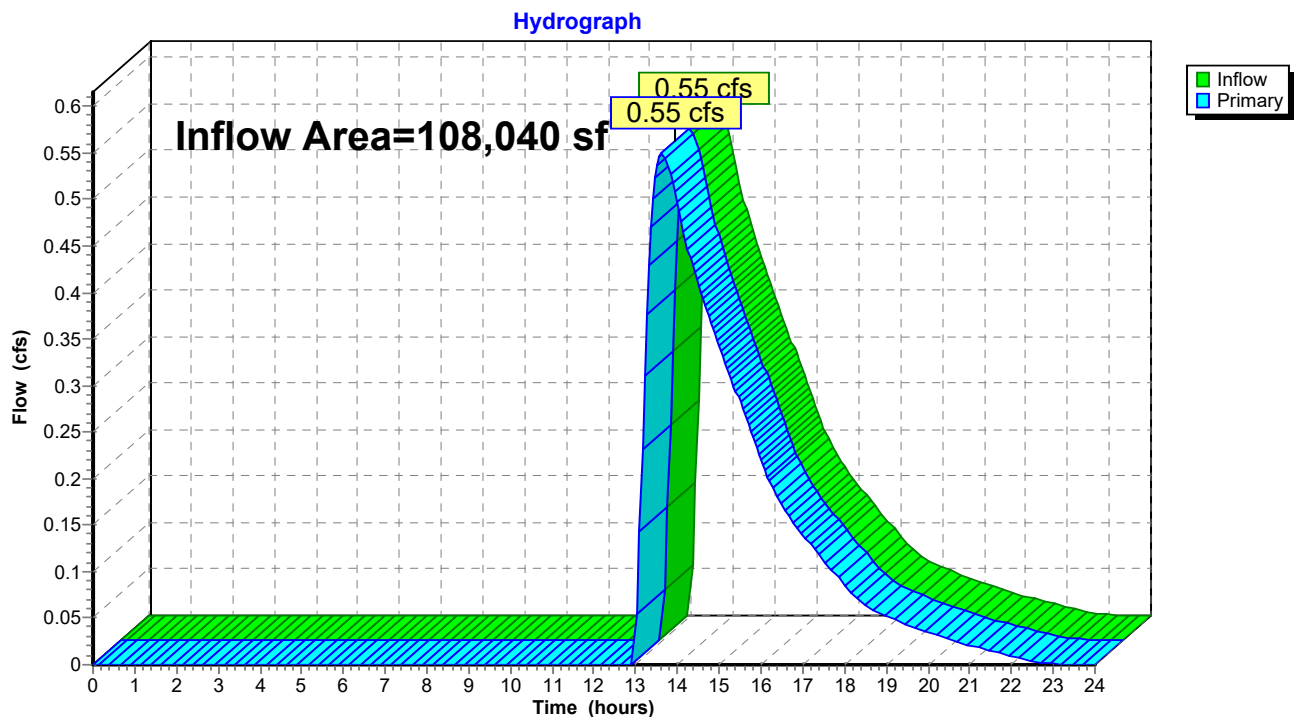
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Summary for Pond DP2: (new Pond)

Inflow Area = 108,040 sf, 55.16% Impervious, Inflow Depth > 0.63" for 50 YEAR event
Inflow = 0.55 cfs @ 13.63 hrs, Volume= 5,643 cf
Primary = 0.55 cfs @ 13.63 hrs, Volume= 5,643 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond DP2: (new Pond)



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Summary for Pond IP1: buried structure

Inflow Area = 90,262 sf, 58.44% Impervious, Inflow Depth > 3.64" for 50 YEAR event
 Inflow = 7.95 cfs @ 12.09 hrs, Volume= 27,394 cf
 Outflow = 7.98 cfs @ 12.09 hrs, Volume= 22,957 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 6.05 hrs, Volume= 3,149 cf
 Primary = 3.97 cfs @ 12.09 hrs, Volume= 9,904 cf
 Routed to Pond IP2 : OPEN POND
 Secondary = 3.97 cfs @ 12.09 hrs, Volume= 9,904 cf
 Routed to Pond IP2 : OPEN POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 423.28' @ 12.09 hrs Surf.Area= 2,997 sf Storage= 4,758 cf
 Flood Elev= 423.08' Surf.Area= 2,997 sf Storage= 4,754 cf

Plug-Flow detention time= 102.6 min calculated for 22,909 cf (84% of inflow)
 Center-of-Mass det. time= 33.9 min (821.8 - 787.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	420.00'	2,989 cf	39.75'W x 75.40'L x 3.08'H Field A 9,241 cf Overall - 1,769 cf Embedded = 7,472 cf x 40.0% Voids
#2A	420.50'	1,769 cf	ADS_StormTech SC-310 +Cap x 120 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 120 Chambers in 12 Rows
		4,758 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	420.00'	0.600 in/hr Exfiltration over Surface area
#2	Primary	420.80'	12.0" Round Culvert L= 57.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.80' / 420.00' S= 0.0140 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Secondary	421.90'	15.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.00' S= 0.0237 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#5	Device 4	422.80'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

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Type III 24-hr 50 YEAR Rainfall=5.86"

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Discarded OutFlow Max=0.04 cfs @ 6.05 hrs HW=420.03' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=3.88 cfs @ 12.09 hrs HW=423.27' TW=419.23' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 3.88 cfs of 5.24 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 3.88 cfs @ 2.05 fps)

Secondary OutFlow Max=3.88 cfs @ 12.09 hrs HW=423.27' TW=419.23' (Dynamic Tailwater)

↑ **4=Culvert** (Passes 3.88 cfs of 5.11 cfs potential flow)

↑ **5=Broad-Crested Rectangular Weir** (Weir Controls 3.88 cfs @ 2.05 fps)

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Type III 24-hr 50 YEAR Rainfall=5.86"

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Pond IP1: buried structure - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)

Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf

Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 3.0" Spacing = 37.0" C-C Row Spacing

10 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 72.40' Row Length +18.0" End Stone x 2 = 75.40' Base Length

12 Rows x 34.0" Wide + 3.0" Spacing x 11 + 18.0" Side Stone x 2 = 39.75' Base Width

6.0" Stone Base + 16.0" Chamber Height + 15.0" Stone Cover = 3.08' Field Height

120 Chambers x 14.7 cf = 1,769.0 cf Chamber Storage

9,241.2 cf Field - 1,769.0 cf Chambers = 7,472.2 cf Stone x 40.0% Voids = 2,988.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,757.9 cf = 0.109 af

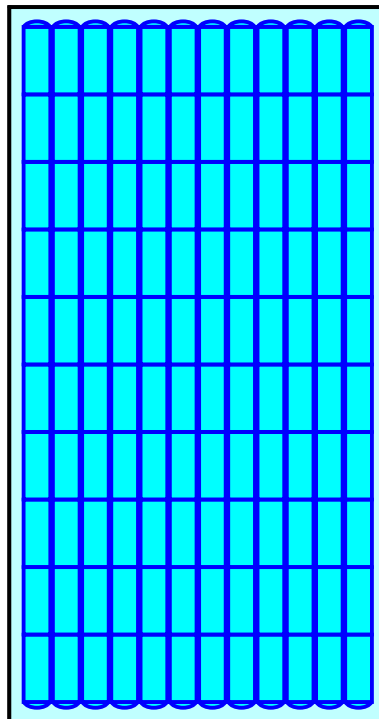
Overall Storage Efficiency = 51.5%

Overall System Size = 75.40' x 39.75' x 3.08'

120 Chambers

342.3 cy Field

276.7 cy Stone



COMET POST DEVELOPMENT

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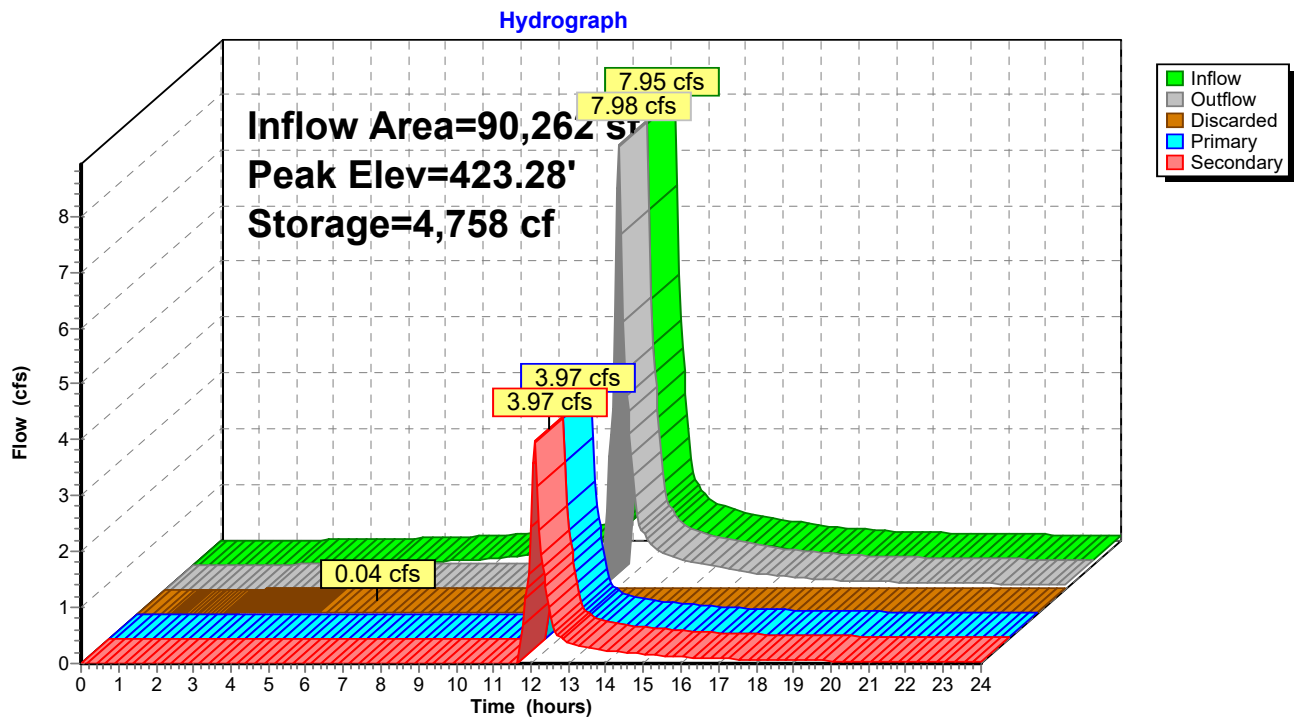
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Pond IP1: buried structure



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Pond IP2: OPEN POND

Inflow Area = 103,153 sf, 57.77% Impervious, Inflow Depth > 2.77" for 50 YEAR event
 Inflow = 9.20 cfs @ 12.09 hrs, Volume= 23,839 cf
 Outflow = 0.64 cfs @ 13.63 hrs, Volume= 9,829 cf, Atten= 93%, Lag= 92.1 min
 Discarded = 0.09 cfs @ 13.63 hrs, Volume= 4,232 cf
 Primary = 0.55 cfs @ 13.63 hrs, Volume= 5,597 cf
 Routed to Pond DP2 : (new Pond)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 420.94' @ 13.63 hrs Surf.Area= 6,345 sf Storage= 14,669 cf
 Flood Elev= 422.00' Surf.Area= 7,434 sf Storage= 21,946 cf

Plug-Flow detention time= 247.7 min calculated for 9,809 cf (41% of inflow)
 Center-of-Mass det. time= 145.5 min (967.3 - 821.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	418.00'	21,946 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)
418.00	3,724	260.0	0	0	3,724
420.00	5,447	311.0	9,117	9,117	6,111
422.00	7,434	351.0	12,830	21,946	8,319

Device	Routing	Invert	Outlet Devices											
#1	Primary	420.85'	8.0' long x 8.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64											
			2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74											
#2	Discarded	418.00'	0.600 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.09 cfs @ 13.63 hrs HW=420.94' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.55 cfs @ 13.63 hrs HW=420.94' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.55 cfs @ 0.74 fps)

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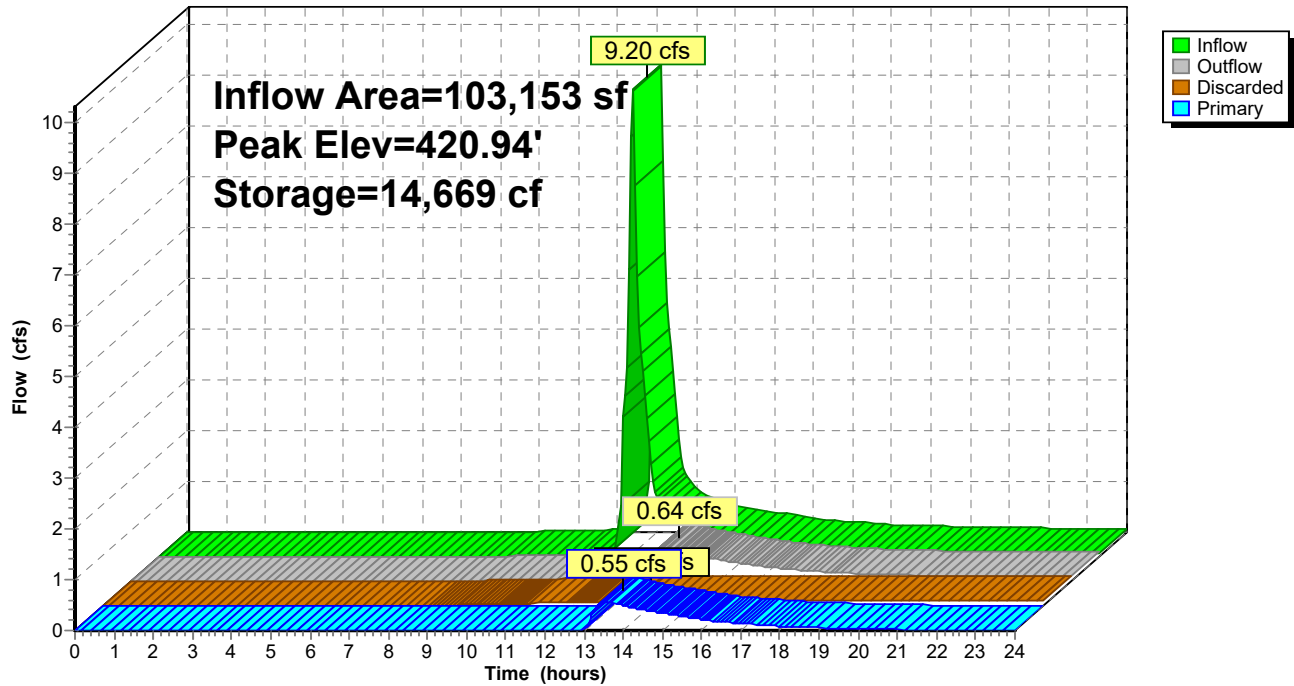
Type III 24-hr 50 YEAR Rainfall=5.86"

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Pond IP2: OPEN POND

Hydrograph



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Summary for Pond MH1: DMH1

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 2.68" for 50 YEAR event
Inflow = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf
Outflow = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf
Routed to Pond MH2 : MH2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 433.82' @ 12.10 hrs

Flood Elev= 437.72'

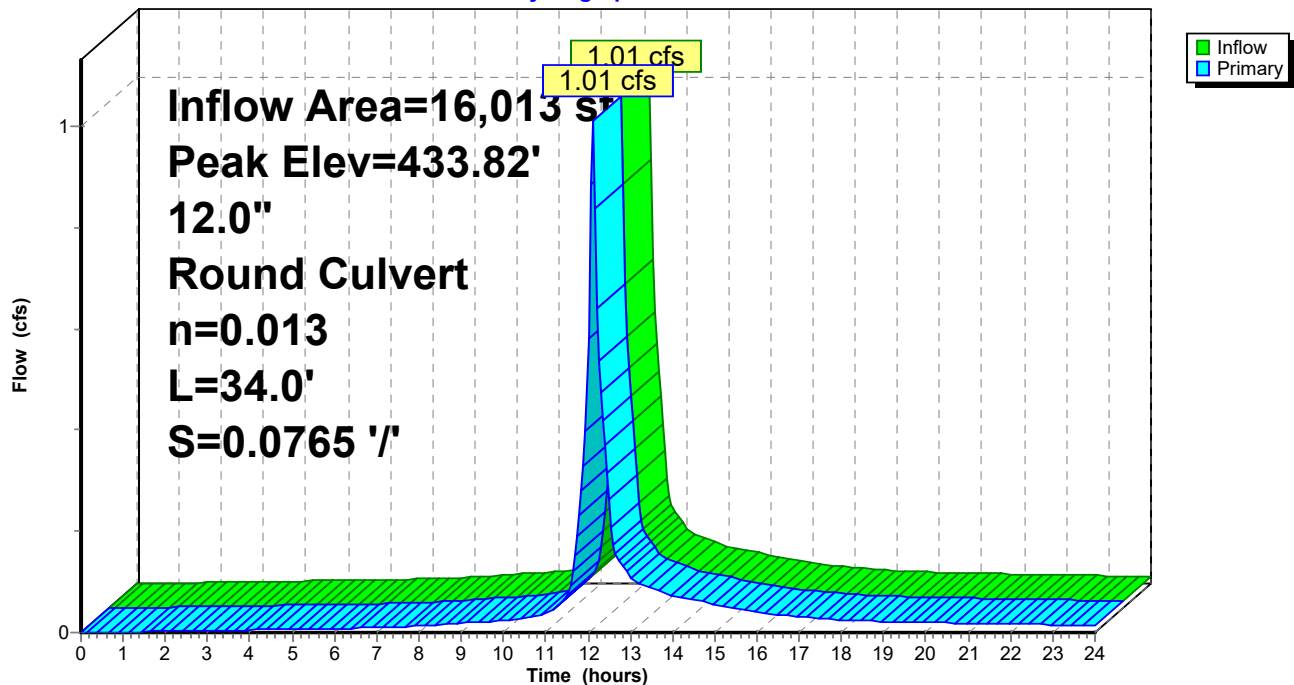
Device	Routing	Invert	Outlet Devices
#1	Primary	433.30'	12.0" Round Culvert L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 433.30' / 430.70' S= 0.0765 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.00 cfs @ 12.10 hrs HW=433.82' TW=431.12' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.00 cfs @ 2.45 fps)

Pond MH1: DMH1

Hydrograph



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Type III 24-hr 50 YEAR Rainfall=5.86"

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Summary for Pond MH2: MH2

Inflow Area = 16,013 sf, 25.42% Impervious, Inflow Depth > 2.68" for 50 YEAR event
Inflow = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf
Outflow = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.01 cfs @ 12.10 hrs, Volume= 3,570 cf
Routed to Pond MH3 : MH3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 431.12' @ 12.10 hrs

Flood Elev= 434.70'

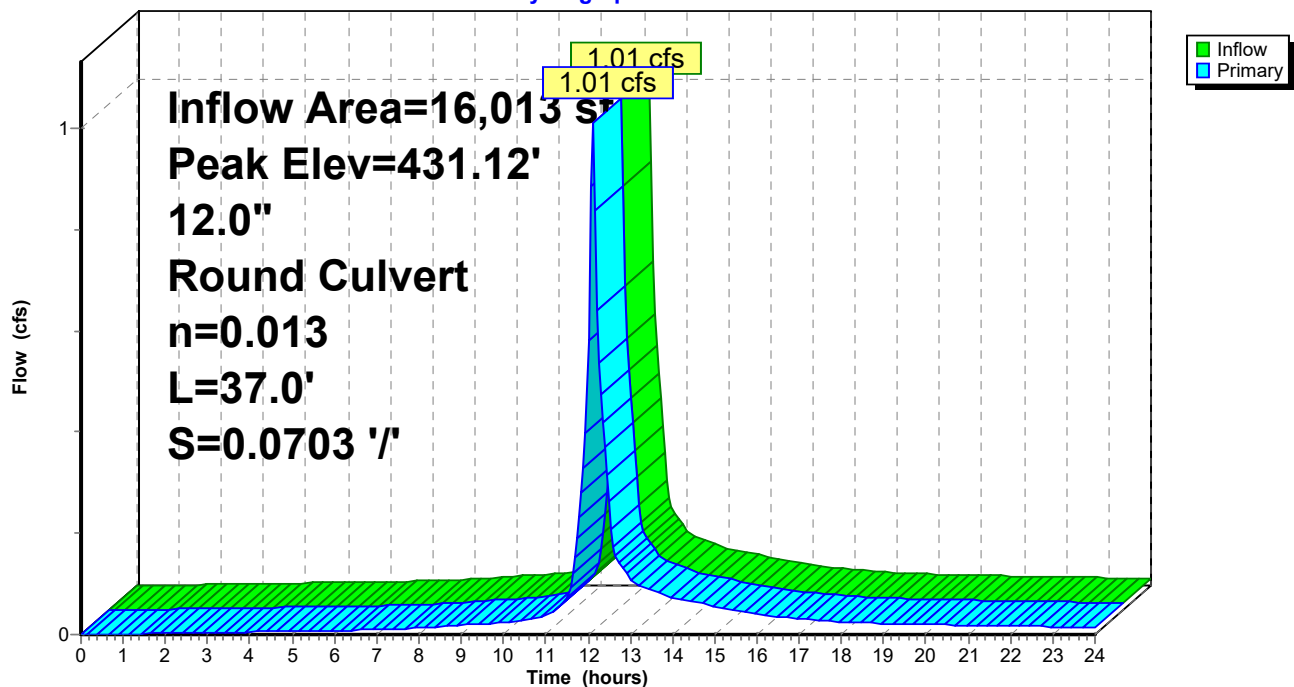
Device	Routing	Invert	Outlet Devices
#1	Primary	430.60'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 430.60' / 428.00' S= 0.0703 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.00 cfs @ 12.10 hrs HW=431.12' TW=425.68' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.00 cfs @ 2.45 fps)

Pond MH2: MH2

Hydrograph



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Summary for Pond MH3: MH3

Inflow Area = 23,737 sf, 48.03% Impervious, Inflow Depth > 3.55" for 50 YEAR event
Inflow = 1.99 cfs @ 12.09 hrs, Volume= 7,022 cf
Outflow = 1.99 cfs @ 12.09 hrs, Volume= 7,022 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.99 cfs @ 12.09 hrs, Volume= 7,022 cf
Routed to Pond MH4 : MH4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.68' @ 12.09 hrs

Flood Elev= 432.00'

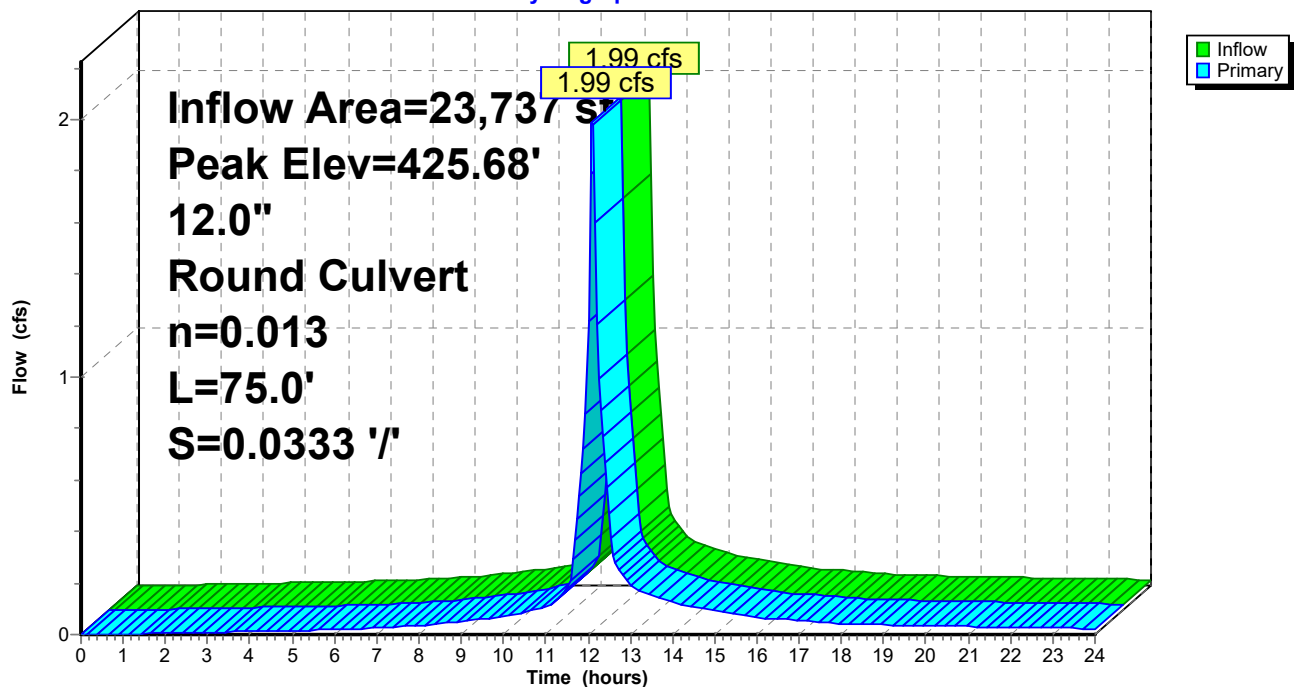
Device	Routing	Invert	Outlet Devices
#1	Primary	424.90'	12.0" Round Culvert L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.90' / 422.40' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.95 cfs @ 12.09 hrs HW=425.67' TW=423.39' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.95 cfs @ 2.99 fps)

Pond MH3: MH3

Hydrograph



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Summary for Pond MH4: MH4

Inflow Area = 26,901 sf, 51.88% Impervious, Inflow Depth > 3.70" for 50 YEAR event
Inflow = 2.37 cfs @ 12.09 hrs, Volume= 8,292 cf
Outflow = 2.37 cfs @ 12.09 hrs, Volume= 8,292 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.37 cfs @ 12.09 hrs, Volume= 8,292 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 423.42' @ 12.12 hrs

Flood Elev= 426.00'

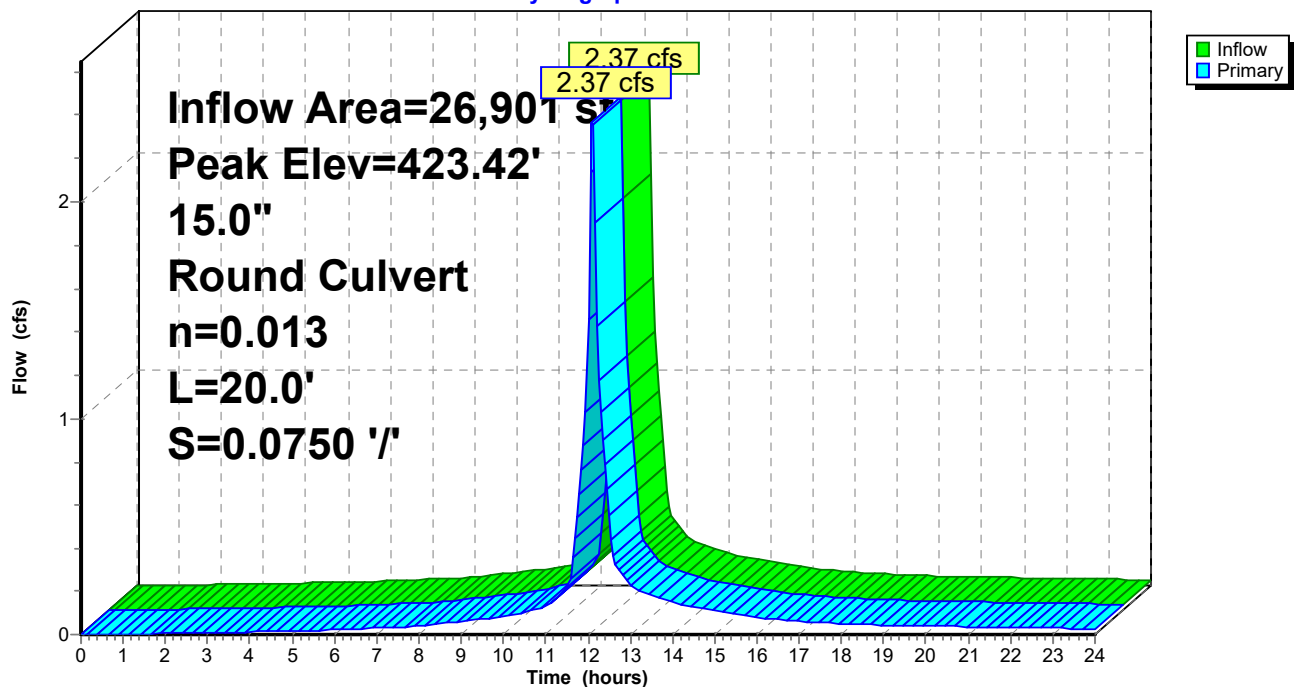
Device	Routing	Invert	Outlet Devices
#1	Primary	421.90'	15.0" Round Culvert L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 421.90' / 420.40' S= 0.0750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.99 cfs @ 12.09 hrs HW=423.39' TW=423.27' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 1.99 cfs @ 1.62 fps)

Pond MH4: MH4

Hydrograph



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Summary for Pond MH5: DMH1

Inflow Area = 49,686 sf, 56.83% Impervious, Inflow Depth > 3.32" for 50 YEAR event
Inflow = 3.97 cfs @ 12.09 hrs, Volume= 13,739 cf
Outflow = 3.97 cfs @ 12.09 hrs, Volume= 13,739 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.97 cfs @ 12.09 hrs, Volume= 13,739 cf
Routed to Pond MH6 : MH6

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 425.90' @ 12.09 hrs

Flood Elev= 430.00'

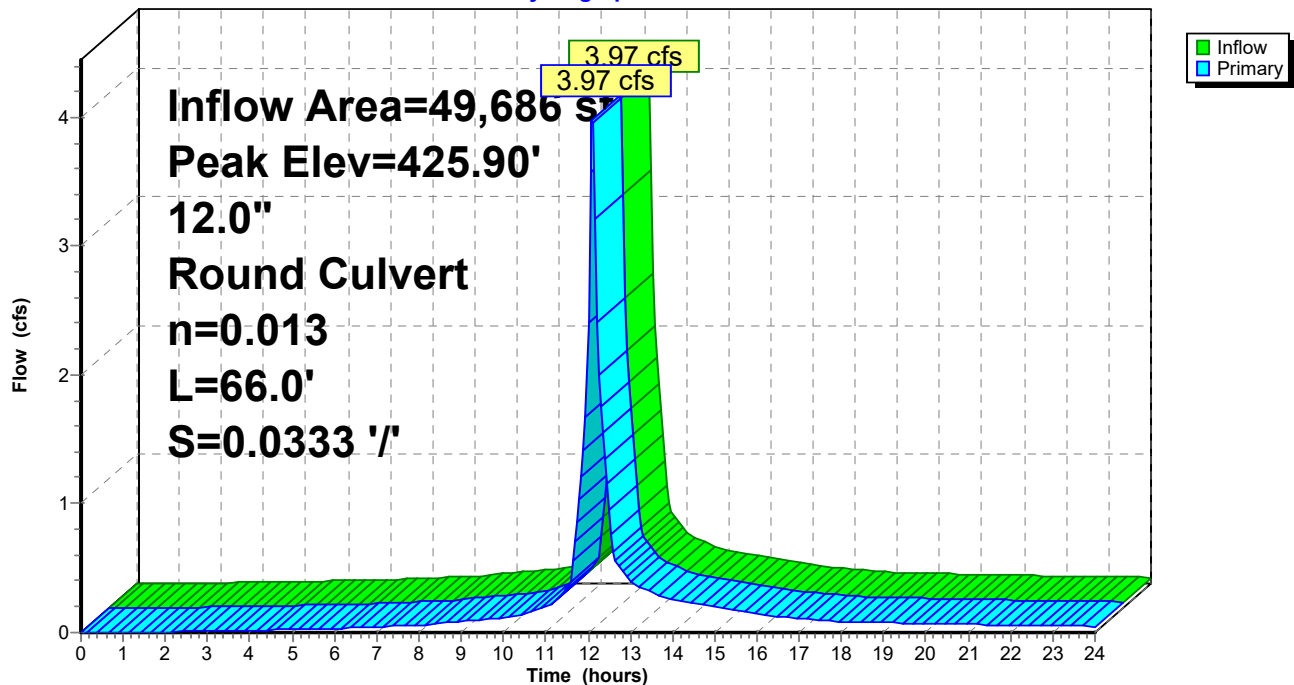
Device	Routing	Invert	Outlet Devices
#1	Primary	424.30'	12.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 424.30' / 422.10' S= 0.0333 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.89 cfs @ 12.09 hrs HW=425.86' TW=424.09' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 3.89 cfs @ 4.96 fps)

Pond MH5: DMH1

Hydrograph



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Summary for Pond MH6: MH6

Inflow Area = 63,361 sf, 61.23% Impervious, Inflow Depth > 3.62" for 50 YEAR event
Inflow = 5.58 cfs @ 12.09 hrs, Volume= 19,102 cf
Outflow = 5.58 cfs @ 12.09 hrs, Volume= 19,102 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.58 cfs @ 12.09 hrs, Volume= 19,102 cf
Routed to Pond IP1 : buried structure

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 424.13' @ 12.10 hrs

Flood Elev= 424.00'

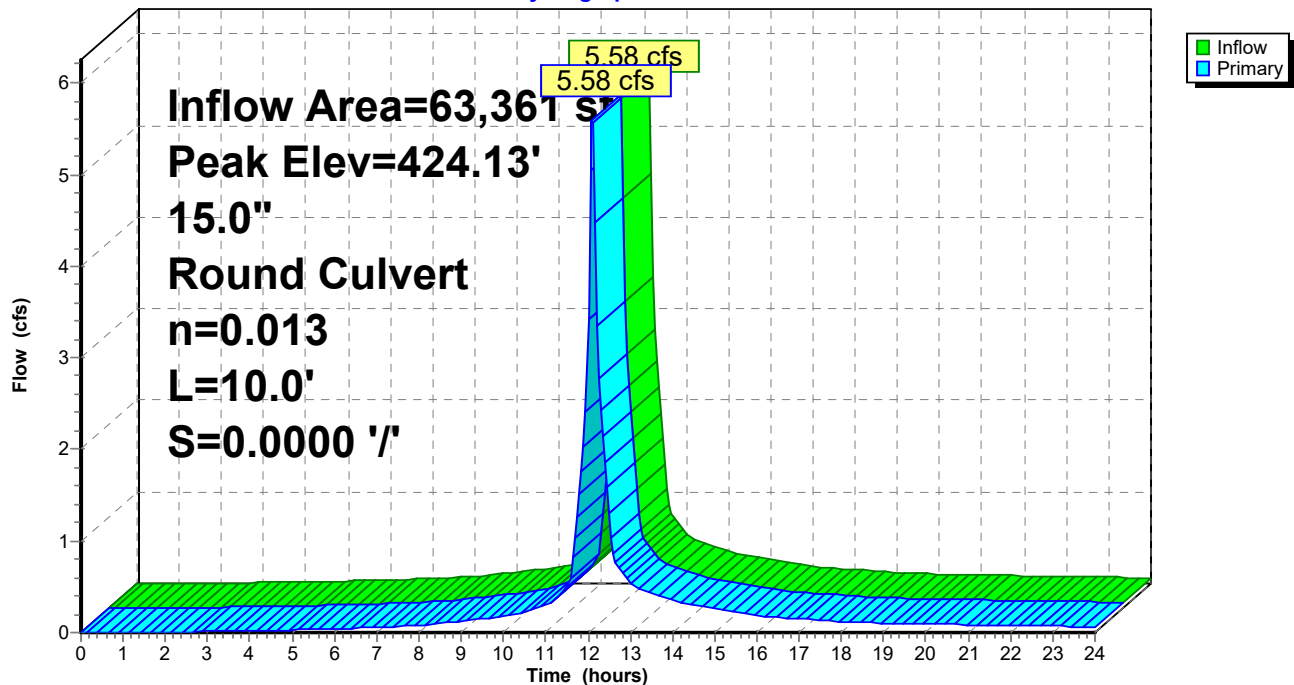
Device	Routing	Invert	Outlet Devices
#1	Primary	420.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 420.50' / 420.50' S= 0.0000 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.33 cfs @ 12.09 hrs HW=424.09' TW=423.27' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 5.33 cfs @ 4.35 fps)

Pond MH6: MH6

Hydrograph



STORMWATER MANAGEMENT REPORT

STAGE STORAGE TABLE

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Type III 24-hr 10 YEAR Rainfall=4.01"

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Stage-Area-Storage for Pond IP1: buried structure

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
420.00	2,997	0	422.65	2,997	4,238
420.05	2,997	60	422.70	2,997	4,298
420.10	2,997	120	422.75	2,997	4,358
420.15	2,997	180	422.80	2,997	4,418
420.20	2,997	240	422.85	2,997	4,478
420.25	2,997	300	422.90	2,997	4,538
420.30	2,997	360	422.95	2,997	4,598
420.35	2,997	420	423.00	2,997	4,658
420.40	2,997	480	423.05	2,997	4,718
420.45	2,997	539	423.10	2,997	4,758
420.50	2,997	599	423.15	2,997	4,758
420.55	2,997	721			
420.60	2,997	842			
420.65	2,997	963			
420.70	2,997	1,082			
420.75	2,997	1,201			
420.80	2,997	1,318			
420.85	2,997	1,435			
420.90	2,997	1,550			
420.95	2,997	1,663			
421.00	2,997	1,775			
421.05	2,997	1,885			
421.10	2,997	1,994			
421.15	2,997	2,101			
421.20	2,997	2,206			
421.25	2,997	2,309			
421.30	2,997	2,410			
421.35	2,997	2,508			
421.40	2,997	2,604			
421.45	2,997	2,696			
421.50	2,997	2,785			
421.55	2,997	2,869			
421.60	2,997	2,947			
421.65	2,997	3,021			
421.70	2,997	3,089			
421.75	2,997	3,155			
421.80	2,997	3,219			
421.85	2,997	3,279			
421.90	2,997	3,339			
421.95	2,997	3,399			
422.00	2,997	3,459			
422.05	2,997	3,519			
422.10	2,997	3,579			
422.15	2,997	3,639			
422.20	2,997	3,699			
422.25	2,997	3,759			
422.30	2,997	3,819			
422.35	2,997	3,879			
422.40	2,997	3,939			
422.45	2,997	3,999			
422.50	2,997	4,059			
422.55	2,997	4,119			
422.60	2,997	4,178			

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point									
Smoothing	Yes								
State									
Location	43.288 degrees North								
Latitude	71.832 degrees West								
Longitude	120 feet								
Elevation	Tue Jan 06 2026 15:08:26 GMT-0500 (Eastern Standard Time)								
Date/Time									

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day
1yr	0.26	0.40	0.49	0.65	0.81	1.02	1yr	0.70	0.96	1.17	1.47	1.85	2.33	2.57	1yr	2.06	2.47	2.90	3.59
2yr	0.31	0.48	0.60	0.79	0.99	1.25	2yr	0.86	1.14	1.44	1.79	2.22	2.76	3.10	2yr	2.44	2.98	3.47	4.15
5yr	0.37	0.58	0.72	0.97	1.24	1.57	5yr	1.07	1.44	1.81	2.25	2.77	3.41	3.91	5yr	3.02	3.76	4.36	5.13
10yr	0.42	0.66	0.83	1.13	1.46	1.87	10yr	1.26	1.71	2.16	2.68	3.29	4.01	4.67	10yr	3.55	4.49	5.19	6.02
25yr	0.49	0.79	1.00	1.38	1.83	2.35	25yr	1.58	2.16	2.72	3.37	4.12	4.98	5.90	25yr	4.40	5.68	6.53	7.46
50yr	0.56	0.90	1.15	1.61	2.17	2.80	50yr	1.87	2.58	3.25	4.01	4.88	5.86	7.05	50yr	5.19	6.78	7.77	8.77
100yr	0.64	1.03	1.33	1.89	2.57	3.34	100yr	2.22	3.08	3.88	4.79	5.79	6.91	8.43	100yr	6.11	8.10	9.26	10.32
200yr	0.73	1.20	1.55	2.21	3.05	3.97	200yr	2.63	3.68	4.62	5.69	6.85	8.14	10.08	200yr	7.20	9.69	11.03	12.12
500yr	0.88	1.44	1.88	2.73	3.83	5.01	500yr	3.30	4.66	5.83	7.15	8.58	10.12	12.77	500yr	8.96	12.28	13.91	15.07

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day
1yr	0.23	0.35	0.43	0.58	0.71	0.86	1yr	0.62	0.84	0.94	1.28	1.60	1.90	2.35	1yr	1.68	2.26	2.59	3.17
2yr	0.30	0.46	0.57	0.77	0.95	1.13	2yr	0.82	1.10	1.29	1.70	2.20	2.67	2.99	2yr	2.36	2.88	3.34	4.01
5yr	0.34	0.52	0.65	0.89	1.13	1.33	5yr	0.97	1.30	1.51	1.97	2.54	3.16	3.58	5yr	2.80	3.44	3.97	4.72
10yr	0.38	0.58	0.72	1.00	1.29	1.51	10yr	1.12	1.48	1.69	2.19	2.83	3.60	4.10	10yr	3.19	3.94	4.52	5.35

INFILTRATION PRACTICE DESIGN TABLE

Instructions	Value	Units	Criteria
Enter the node number corresponding to this system in the drainage analysis.	IP1		
Enter the runoff design depth (P). Default P = 1". If the project qualifies as redevelopment, as defined in Env-Wq 1502, use the design depth worksheet located at the end of this workbook to calculate P and attach the completed design depth worksheet when submitting this treatment practice worksheet.	1.0	inch	1 inch; or manually enter redevelopment runoff design depth
Have you reviewed Env-Wq 1507.02(c) and Env-Wq 1508.07(a) to ensure infiltration is allowed?	YES		Yes
Enter area draining to the practice (A).	2.070	ac	
Enter the impervious area draining to the practice (A _i).	1.210	ac	
Percent impervious area draining to the practice (I).	0.584541063	decimal	
Runoff coefficient Rv = 0.05 + (0.9 * I).	0.576086957	unitless	
WQV= P * Rv * A.	1.1925	ac-in	
WQV conversion from ac-in to cubic feet.	4329	cf	
25% x WQV.	1082	cf	
If a sediment forebay is used for pretreatment, enter volume. Attach stage-storage table.	NO - DEEP SUMP CATCH BASINS	cf	≥ 25% WQV
Enter volume below the lowest invert of the outlet structure (V), excluding the forebay volume. Attach stage-storage table.	4,418	cf	≥ WQV
Enter surface area of the bottom of the pond (A _{SA}).	2,997	sf	
Enter design infiltration rate (Ksat _{design}) which includes a factor of safety. See Env-Wq 1504.14 more information.	0.60	iph	
Drain time = V / (A _{SA} * Ksat _{design})	29.48281615	hours	≤ 72 hrs
Enter elevation of the bottom of the basin.	420.00	feet	
Enter elevation of SHWT. If none found, enter the lowest elevation of the test pit.	415.80	feet	
Enter elevation of bedrock. If none found, enter the lowest elevation of the test pit.	413.13	feet	
Separation from SHWT.	4.2	feet	≥ 4' for treatment in GPAs & WSIPAs; ≥ 3' in all other areas
Separation from bedrock.	6.87	feet	≥ 4' for treatment in GPAs & WSIPAs; & 3' in all other areas
Enter thickness of amended soil, if applicable due high infiltration rate.		ft	≥ 24 inches
Enter the depth of trench, if trench proposed.		ft	4 to 10 ft
If a trench or underground system is proposed, has observation well been provided?	Yes	Yes/No	Yes
If a trench is proposed, is the media clean, washed, and well-graded aggregate with a diameter of 1.5 to 3 inches?		Yes/No	Yes
If a basin is proposed, is the perimeter curvilinear and basin floor flat?		Yes/No	Yes
If a basin is proposed, enter the pond side slopes.		:1	≥3:1
Enter peak elevation of 10-yr storm event (infiltration may be used in analysis) (E ₁₀).	422.75	ft	
Enter peak elevation of 50-yr storm event (infiltration may be used in analysis) (E ₅₀).	423.00	ft	
Enter elevation of top of the practice (if a basin, this is the berm elevation) (E _{top}).	423.08	ft	
If a trench is proposed, E ₁₀ ≤ E _{top} .	Yes		Yes
If a basin is proposed, E ₅₀ ≤ E _{top} .	Yes		Yes

End of Table

Designer Notes

Designer Note Section



GEOTECHNICAL SERVICES INC.

▲ Geotechnical Engineering ▲ Environmental Studies ▲ Materials Testing ▲ Construction Monitoring ▲

April 9, 2026

Benjamin C. Osgood, Jr., PE
Senior Engineer
Ranger Engineering Group, Inc.
130 Main Street 202, Salem, NH 03079

**RE: Guelph Permeameter Testing
Route 103 Apartments
Lot 3 - NH Route 103 West
Warner, New Hampshire**

GSI Project No. 226146

Dear Mr. Osgood,

Geotechnical Services, Inc. (GSI) submits this report in connection with the April 8, 2026 site visit by GSI to observe test pits and conduct Guelph Permeameter testing at the Route 103 Apartments site located in Warner, New Hampshire

SITE AND PROJECT INFORMATION

The project involves the construction of the proposed residential development on New Hampshire Route 103 in Warner, New Hampshire. The property is located at an approximate address of 9 NH Route 103, and is abutted by Route 103 to the north, a commercial development to the west, residential property to the east, and woodland to the south with the Warner River beyond. Existing site topography slopes downward steeply from the roadway toward the river to the south. GSI was advised earthwork had taken place on the property in the past, and that the lower portion of the site had been partially filled. Historical aerial imagery appears to show extensive sitework in progress on an image from 1985 with a gravel roadway to the lower portion of the site which no longer exists. An image from 1981 depicts limited development close to the roadway, while imagery from 1956 appears to depict the site in an untouched state.

The proposed development consists of the construction of a large multi-unit residential structure with ground level parking and multiple stories above. Site development detail was obtained from the civil plan entitled "Site Plan – Lot 103 West – Warner, NH," prepared by Ranger Engineering Group, Inc. of Salem, NH dated August 8, 2022. The plan depicts a large "stormwater pond" immediately to the south of the proposed paved parking. The purpose of GSI's site visit was to observe test pits within the stormwater pond area and conduct infiltration testing to determine the hydraulic conductivity of the existing soils.

▲ **55 North Stark Highway Weare NH** ▲ **603/529/7766** ▲ **FAX 603/529/7080**

▲ **30 Newbury Street, Boston, MA** ▲ **617/861/2617**

TEST PITS WITHIN PROPOSED INFILTRATION PONDS

A series of three (3) test pits designated TP-1 through TP-3 were advanced within the proposed building area for the purpose of evaluating the geotechnical properties of the existing soils. The test pits were excavated to a depth of 4 feet below existing grade. The subsurface explorations classified the on-site soils according to their color, grain size, and other material properties. The test pit program was conducted utilizing a Kubota excavator. Field descriptions of the soils encountered, observed depth to groundwater when observed, and other pertinent observations are contained in the attached test pit logs. Test pit locations are illustrated below. GSI exploration logs attached.

SUBSURFACE CONDITIONS

Fill

As expected, fill was present at all three test pit locations to depths of 53 to 72 inches below the existing ground surface. The fill was variable in composition and consisted of brown, fine to medium Sand, some Gravel, with little to some Silt. Fragments of geotextile fabric, brick, and glass bottles were also observed.

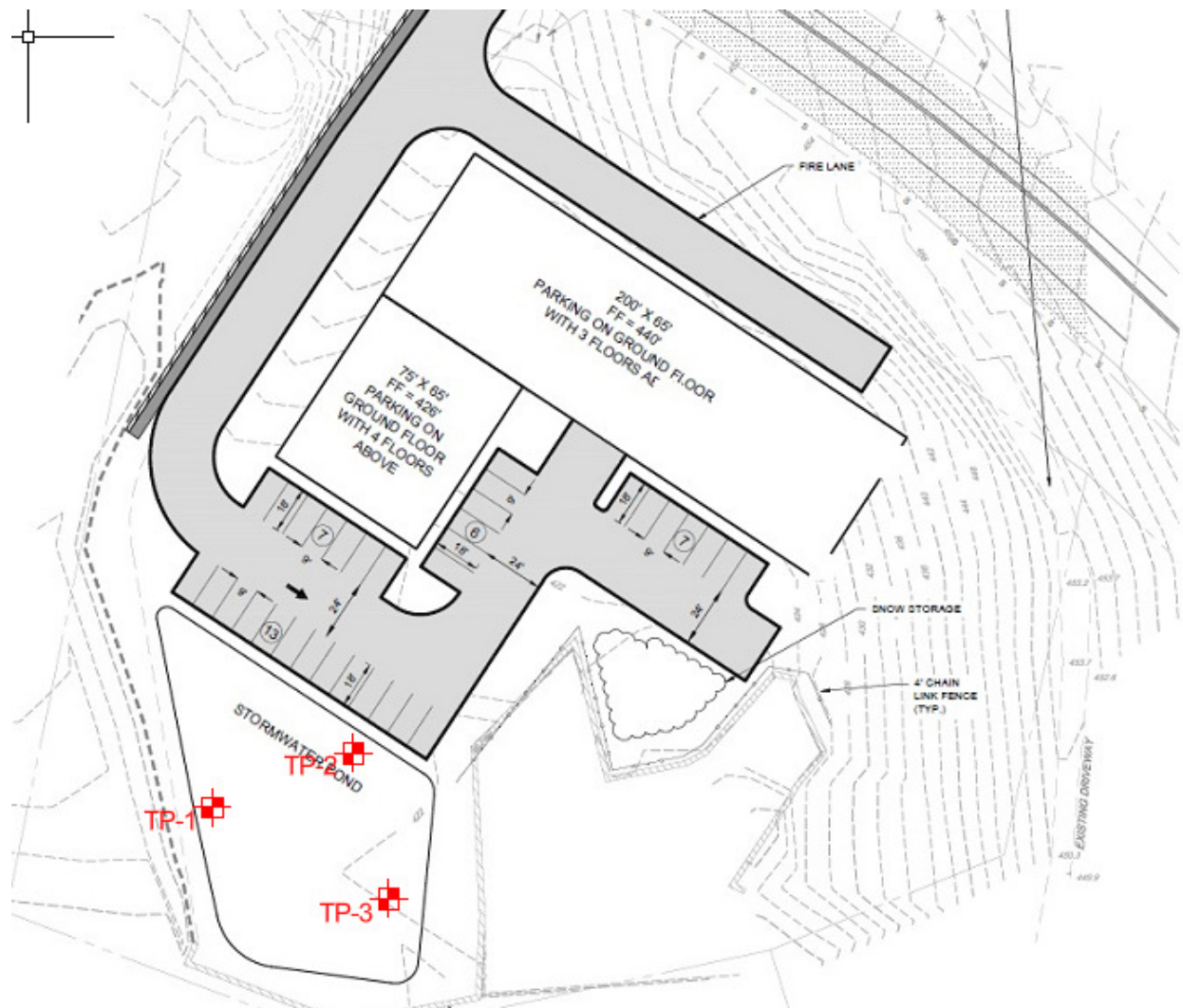
Sand and Gravel

The presumably native soils underlying the fill were visually classified as brown, fine to medium Sand, little to some Gravel, trace to little Silt. The Sand and Gravel continued beyond the test pit termination depth, typically 9 feet +/- from existing grade.

GROUNDWATER

Groundwater was observed at test pit TP-1 at approximately 72 inches below grade and identified as a seasonal high at the other test pit locations at a similar level via redoximorphic features. Groundwater observations should not be considered long-term, equilibrated groundwater levels, but rather an approximate indication of the likely groundwater elevation during construction. Groundwater levels should be anticipated to fluctuate from those measured during drilling operations in response to differences in equilibrated time, rainfall, snowmelt, and seasonal changes.





GUELPH PERMEAMETER TESTING

To measure the in-situ permeability of the existing soils within the stormwater pond area, the Guelph Permeameter test was employed. The test locations and depths were determined by Ben Osgood of Ranger Engineering. The Guelph Permeameter is a constant head permeameter that utilizes a siphon principle to measure in-situ hydraulic conductivity. The purpose of this testing was to evaluate the saturated hydraulic conductivity or K_{sat} of the infiltrating soils to determine the effect of soil infiltration and permeability upon the drainage characteristics of the in -situ soils.

The Guelph permeameter test each consists of one test run at 10cm and one at 5cm to determine a statistical average for the rate of hydraulic conductivity based on differing head heights. Tests were conducted at all six of the test holes. Due to the observed inconsistency in composition and density of the fill soils, the Guelph permeameter testing yielded field saturated hydraulic conductivity rates within a variable range of 1.2 to 4.9 inches per hour.

Location	Tested Depth (in.)	Ksat (in./hr.)
Test Pit 1	45	1.2
Test Pit 2	64	3.8
Test Pit 3	48	4.9

CLOSURE

We trust that you find this report consistent with your needs. Should you have any questions with regard to this report, please do not hesitate to contact our office.

Very truly yours,

GEOTECHNICAL SERVICES, INC.

Harry K. Wetherbee, P.E.
Principal Engineer

Attachments:
Test Pit Logs
Guelph Permeameter Testing Results





TEST PIT FIELD LOG

Test Pit

TP-1

Project	Route 103 Apartments	GSI Project No.	226146	Date Started	4/8/2026
Location	Warner, New Hampshire	Project Mgr.	HKW	Time Started	-
Client	Ranger Engineering, Inc.	Inspector	KJM	Time Finished	-
Contractor	A&A Excavation, Inc.	Checked By	HKW	Elevation	E.G.
Operator	Dylan Fedas	Equipment Used	Bobcat E55 Mini	Groundwater	72"

Test Pit Location	See Report				
Approx. Dimensions:	Length: 10 ft.	Width: 6 ft.	Depth: 9 ft.		
GPS Coordinates:	Lat.	Long:			

Depth	Soil Description	Excav. Effort	Boulder Class
0-53"	Brown, fine to medium Sand, some Gravel, little to some Silt (variable), roots (fill)	M	A/B
53"-108"	Brown, fine to medium Sand, some Gravel, trace to little Silt	E	A

Test Pit Photograph



Excavation Effort: E: Easy M: Moderate D: Difficult	Boulder Count: (Classification / Designation) 6"-18" - A 18"-36" - B Larger than 36" - C	TP-1
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TEST PIT FIELD LOG

Test Pit

TP-2

Project	Route 103 Apartments	GSI Project No.	226146	Date Started	4/8/2026
Location	Warner, New Hampshire	Project Mgr.	HKW	Time Started	-
Client	Ranger Engineering, Inc.	Inspector	KJM	Time Finished	-
Contractor	A&A Excavation, Inc.	Checked By	HKW	Elevation	E.G.
Operator	Dylan Fedas	Equipment Used	Bobcat E55 Mini	Groundwater	-

Test Pit Location	See Report				
Approx. Dimensions:	Length: 10 ft.	Width: 6 ft.	Depth: 9 ft.		
GPS Coordinates:	Lat.	Long:			

Depth	Soil Description	Excav. Effort	Boulder Class
0-72"	Brown, fine to medium Sand, some Gravel, little to some Silt (variable), roots (fill)	M	A/B
72"-90"	Brown, fine to medium Sand, little Gravel, trace to little Silt	E	A
90"-104"	Brown, fine to medium Sand, some Gravel, trace to little Silt	E	A/B

Test Pit Photograph



Excavation Effort: E: Easy M: Moderate D: Difficult	Boulder Count: (Classification / Designation) 6"-18" - A 18"-36" - B Larger than 36" - C	TP-2
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TEST PIT FIELD LOG

Test Pit

TP-3

Project	Route 103 Apartments	GSI Project No.	226146	Date Started	4/8/2026
Location	Warner, New Hampshire	Project Mgr.	HKW	Time Started	-
Client	Ranger Engineering, Inc.	Inspector	KJM	Time Finished	-
Contractor	A&A Excavation, Inc.	Checked By	HKW	Elevation	E.G.
Operator	Dylan Fedas	Equipment Used	Bobcat E55 Mini	Groundwater	-

Test Pit Location	See Report				
Approx. Dimensions:	Length: 10 ft.	Width: 6 ft.	Depth: 9 ft.		
GPS Coordinates:	Lat.	Long:			

Depth	Soil Description	Excav. Effort	Boulder Class
0-54"	Brown, fine to medium Sand, some Gravel, little to some Silt (variable), roots (fill)	M	A/B
54"-80"	Brown, fine to medium Sand, little Gravel, trace to little Silt	E	A
80"-100"	Brown, fine to medium Sand, some Gravel, trace to little Silt	E	A/B

Test Pit Photograph



Excavation Effort: E: Easy M: Moderate D: Difficult	Boulder Count: (Classification / Designation) 6"-18" - A 18"-36" - B Larger than 36" - C	TP-3
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Guelph Permeameter Worksheet

Project: Route 103 Apartments
Project #: 226146
Location: Warner, New Hampshire
Tested by: Kevin Maynard
Soil Description: Fill
Groundwater: 72"
Well Head Height = 5cm

Test Date: 4/8/2026
Location: TP-1
Test Depth: 45"
Reservoir: Combined
Reservoir Constant: 35.41

Reading Number	Time (m)	Time Interval (m)	Water Level (cm)	W Level Change (cm)	Rate of Water Level Change (cm/min)
1	-	-	50.0	-	-
2	1	1.00	52.8	2.8	2.8
3	2	1.00	55.6	2.8	2.8
4	3	1.00	58.7	3.1	3.1
5	4	1.00	61.8	3.1	3.1
6	5	1.00	64.9	3.1	3.1
7	6	1.00	68.0	3.1	3.1
8	7	1.00	71.1	3.1	3.1

Rate of Water Level
 Change/60 = R1
 R1 = 0.052 cm/sec

Well Head Height = 10cm

Reading Number	Time (m)	Time Interval (m)	Water Level (cm)	W Level Change (cm)	Rate of Water Level Change (cm/min)
1	-	-	10.0	-	-
2	1	1.00	13.2	3.2	3.2
3	2	1.00	17.0	3.8	3.8
4	3	1.00	21.5	4.5	4.5
5	4	1.00	25.6	4.1	4.1
6	5	1.00	29.7	4.1	4.1
7	6	1.00	33.8	4.1	4.1
8	7	1.00	37.9	4.1	4.1
9	8	1.00	42.0	4.1	4.1
10	9	1.00	46.1	4.1	4.1

Rate of Water Level
 Change/60 = R2
 R2 = 0.075 cm/sec

Field Saturated Conductivity:

$$K_{sat} \text{ (cm/sec)} = (.145 R_2 - .191 R_1) = 1.01E-03 \text{ cm/sec}$$

$$K_{sat} \text{ (in/hr)} = (202 R_2 - 270 R_1) = 1.2 \text{ in/hour}$$



Guelph Permeameter Worksheet

Project: Route 103 Apartments
Project #: 226146
Location: Warner, New Hampshire
Tested by: Kevin Maynard
Soil Description: Fill
Groundwater: Not encountered. Seasonal high at 72"
Well Head Height = 5cm

Test Date: 4/8/2026
Location: TP-2
Test Depth: 64"
Reservoir: Combined
Reservoir Constant: 35.41

Reading Number	Time (m)	Time Interval (m)	Water Level (cm)	W Level Change (cm)	Rate of Water Level Change (cm/min)
1	-	-	49.0	-	-
2	1	1.00	53.1	4.1	4.1
3	2	1.00	57.2	4.1	4.1
4	3	1.00	61.3	4.1	4.1
5	4	1.00	65.0	3.7	4.1
6	5	1.00	69.1	4.1	4.1

Rate of Water Level
 Change/60 = R1
 R1 = 0.068 cm/sec

Well Head Height = 10cm

Reading Number	Time (m)	Time Interval (m)	Water Level (cm)	W Level Change (cm)	Rate of Water Level Change (cm/min)
1	-	-	10.0	-	-
2	1	1.00	16.2	6.2	6.2
3	2	1.00	22.6	6.4	6.4
4	3	1.00	29.2	6.6	6.6
5	4	1.00	35.4	6.2	6.2
6	5	1.00	41.6	6.2	6.2
7	6	1.00	47.8	6.2	6.2

Rate of Water Level
 Change/60 = R2
 R2 = 0.110 cm/sec

Field Saturated Conductivity:

$$K_{sat} \text{ (cm/sec)} = (.145 R2 - .191 R1) = 2.90E-03 \text{ cm/sec}$$

$$K_{sat} \text{ (in/hr)} = (202 R2 - 270 R1) = 3.8 \text{ in/hour}$$



Guelph Permeameter Worksheet

Project: Route 103 Apartments
Project #: 226146
Location: Warner, New Hampshire
Tested by: Kevin Maynard
Soil Description: Fill
Groundwater: Not encountered. Seasonal high at 80"
Well Head Height = 5cm

Test Date: 4/8/2026
Location: TP-3
Test Depth: 48"
Reservoir: Combined
Reservoir Constant: 35.41

Reading Number	Time (m)	Time Interval (m)	Water Level (cm)	W Level Change (cm)	Rate of Water Level Change (cm/min)
1	-	-	10.0	-	-
2	1	1.00	15.5	5.5	5.5
3	2	1.00	21.2	5.7	5.7
4	3	1.00	26.7	5.5	5.5
5	4	1.00	32.2	5.5	5.5
6	5	1.00	37.7	5.5	5.5
7	6	1.00	43.2	5.5	5.5
8	7	1.00	48.7	5.5	5.5
9	8	1.00	54.2	5.5	5.5
10	9	1.00	59.7	5.5	5.5

Rate of Water Level
 Change/60 = R1
 R1 = 0.092 cm/sec

Well Head Height = 10cm

Reading Number	Time (m)	Time Interval (m)	Water Level (cm)	W Level Change (cm)	Rate of Water Level Change (cm/min)
1	-	-	10.0	-	-
2	1	1.00	19.5	9.5	9.5
3	2	1.00	28.3	8.8	8.8
4	3	1.00	37.3	9.0	9.0
5	4	1.00	46.1	8.8	8.8
6	5	1.00	54.9	8.8	8.8
7	6	1.00	63.7	8.8	8.8

Rate of Water Level
 Change/60 = R2
 R2 = 0.147 cm/sec

Field Saturated Conductivity:

$$K_{sat} \text{ (cm/sec)} = (.145 R2 - .191 R1) = 3.76E-03 \text{ cm/sec}$$

$$K_{sat} \text{ (in/hr)} = (202 R2 - 270 R1) = 4.9 \text{ in/hour}$$

STORMWATER MANAGEMENT REPORT

MAPS

USGS LOCUS

SCS SOILS

FEMA

CS 9201 PRE-DEVELOPMENT DRAINAGE

CS 9301 POST DEVELOPMENT DRAINAGE

Soil Map—Merrimack and Belknap Counties, New Hampshire



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire

Survey Area Data: Version 31, Sep 10, 2025

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

Date(s) aerial images were photographed: Oct 6, 2022—Oct 22, 2022

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

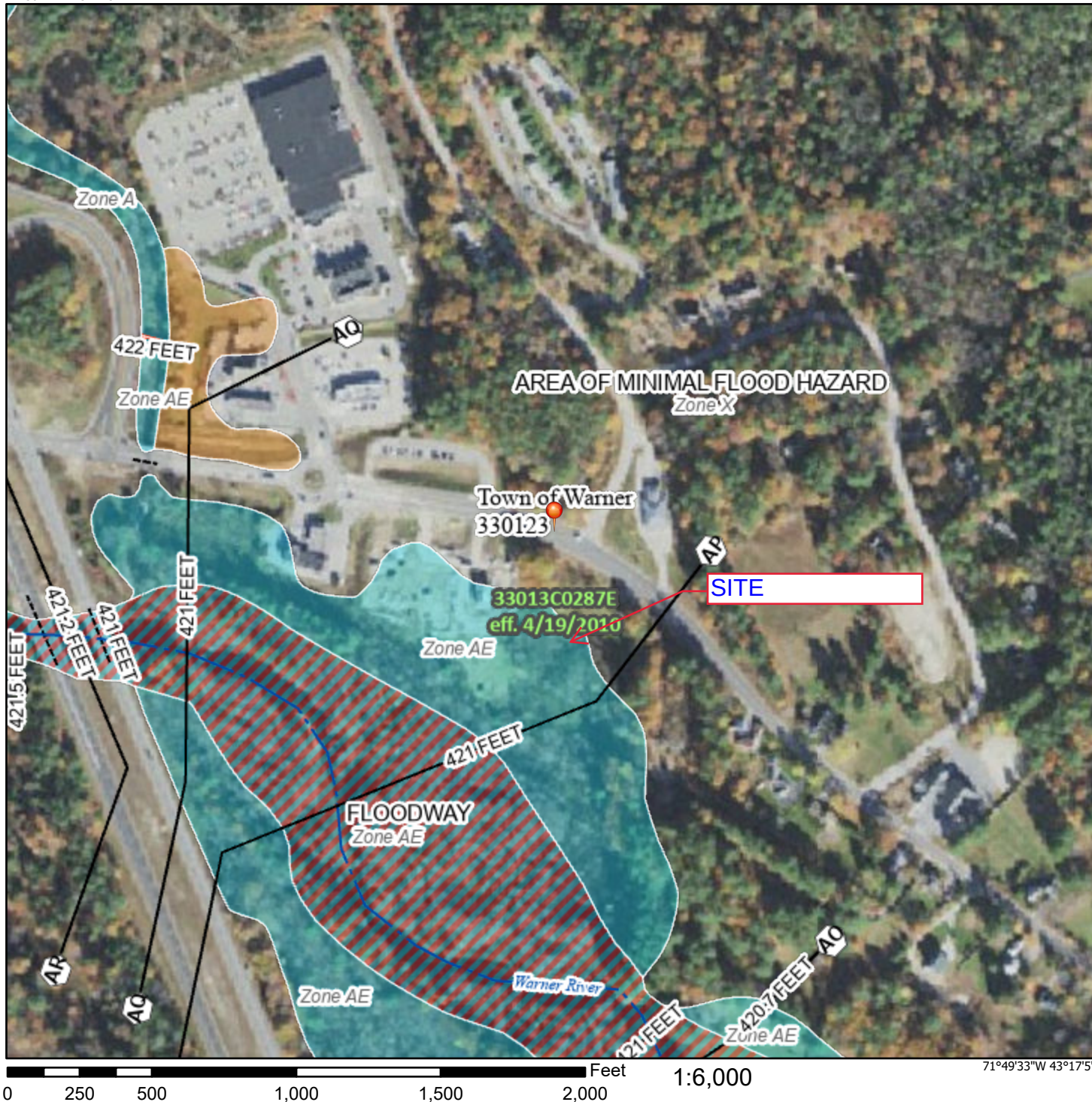
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
36B	Adams loamy sand, 3 to 8 percent slopes	1.2	7.0%
36E	Adams loamy sand, 15 to 60 percent slopes	5.6	32.7%
104A	Podunk fine sandy loam, 0 to 3 percent slopes, frequently flooded	4.6	27.1%
699B	Urban land, 0 to 8 percent slopes	5.6	33.2%
Totals for Area of Interest		17.0	100.0%

National Flood Hazard Layer FIRMette



71°50'11"W 43°17'32"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
OTHER FEATURES		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped



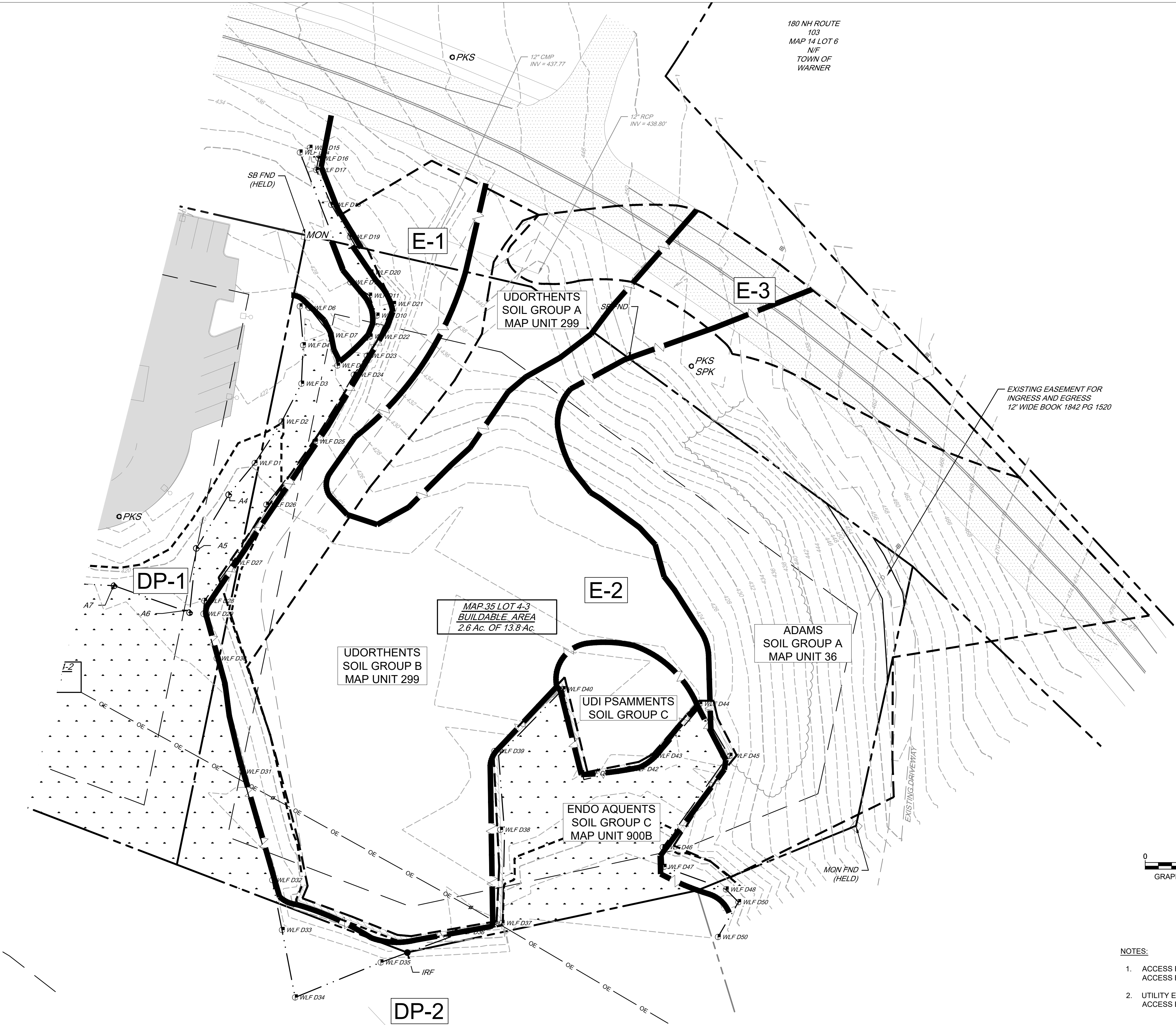
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **9/29/2026 at 8:03 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Basemap Imagery Source: USGS National Map 2023



PRE - DEVELOPMENT AREA E-1			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
PERVIOUS	UDORTHENTS	GROUP A	4121
PERVIOUS	UDORTHENTS	GROUP B	11001

PRE - DEVELOPMENT AREA E-2			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
PERVIOUS	UDORTHENTS	GROUP A	6528
PERVIOUS	UDORTHENTS	GROUP B	43637
PERVIOUS	ADAMS	GROUP A	46230
IMPERVIOUS	ADAMS	GROUP A	829
PERVIOUS	UDI PSAMMENTS	GROUP C	3929

PRE - DEVELOPMENT AREA E-3			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
PERVIOUS	UDORTHENTS	GROUP A	1941
IMPERVIOUS	UDORTHENTS	GROUP A	1517
PERVIOUS	UDORTHENTS	GROUP B	403
IMPERVIOUS	UDORTHENTS	GROUP B	3047
PERVIOUS	ADAMS	GROUP A	323
IMPERVIOUS	ADAMS	GROUP A	5333



9/23/2026	2	DRAINAGE CALCS		
9/10/2026	1	REVIEW COMMENTS		
DATE	NO.	REVISIONS		BY

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
84 RANGE ROAD, WINDHAM, NH 03087

PRE - DEVELOPMENT DRAINAGE
CS9201



RANGER ENGINEERING GROUP, INC.
130 Main Street, Suite 202
Salem, NH 03079
Tel: 978-208-1762
www.rangereng.com



POST - DEVELOPMENT AREA R-1			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	572
IMPERVIOUS	UDORTHENTS	GROUP B	1344
IMPERVIOUS	ADAMS	GROUP A	1922

POST - DEVELOPMENT AREA R-2			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	ADAMS	GROUP A	4073

POST - DEVELOPMENT AREA R-3			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	362
IMPERVIOUS	ADAMS	GROUP A	2447

POST - DEVELOPMENT AREA R-4			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	593
IMPERVIOUS	UDORTHENTS	GROUP B	2874

POST - DEVELOPMENT AREA R-5			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	996
IMPERVIOUS	ADAMS	GROUP A	175

POST - DEVELOPMENT AREA P-1			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	11
PERVIOUS	UDORTHENTS	GROUP A	66
IMPERVIOUS	UDORTHENTS	GROUP B	441
PERVIOUS	UDORTHENTS	GROUP B	5341

POST - DEVELOPMENT AREA P-2			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	3081
PERVIOUS	UDORTHENTS	GROUP A	185
IMPERVIOUS	UDORTHENTS	GROUP B	978
PERVIOUS	UDORTHENTS	GROUP B	218

POST - DEVELOPMENT AREA P-3			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	1170
IMPERVIOUS	UDORTHENTS	GROUP B	1286
PERVIOUS	UDORTHENTS	GROUP B	596

POST - DEVELOPMENT AREA P-4			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	964
PERVIOUS	UDORTHENTS	GROUP A	119
IMPERVIOUS	UDORTHENTS	GROUP B	6860
PERVIOUS	UDORTHENTS	GROUP B	629

POST - DEVELOPMENT AREA P-5			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	1630
PERVIOUS	UDORTHENTS	GROUP B	216
IMPERVIOUS	UDORTHENTS	GROUP C	1041

POST - DEVELOPMENT AREA P-6			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	10838
PERVIOUS	UDORTHENTS	GROUP B	2990

POST - DEVELOPMENT AREA P-7			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	411
PERVIOUS	UDORTHENTS	GROUP B	12431
IMPERVIOUS	UDI PSAMMENTS	GROUP C	21
PERVIOUS	UDI PSAMMENTS	GROUP C	30

POST - DEVELOPMENT AREA P-8			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	234
PERVIOUS	UDORTHENTS	GROUP A	3666
PERVIOUS	UDORTHENTS	GROUP B	2517
PERVIOUS	ADAMS	GROUP A	7199

POST - DEVELOPMENT AREA P-9			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP B	484
PERVIOUS	UDORTHENTS	GROUP B	760
IMPERVIOUS	UDI PSAMMENTS	GROUP C	252
PERVIOUS	UDI PSAMMENTS	GROUP C	1341
IMPERVIOUS	ADAMS	GROUP A	7768
PERVIOUS	ADAMS	GROUP A	23781

POST - DEVELOPMENT AREA P-10			
NAME	SOIL NAME	SOIL GROUP	AREA (SQ.FT)
IMPERVIOUS	UDORTHENTS	GROUP A	1887
PERVIOUS	UDORTHENTS	GROUP A	1556
IMPERVIOUS	UDORTHENTS	GROUP B	3058
PERVIOUS	UDORTHENTS	GROUP B	402
IMPERVIOUS	ADAMS	GROUP A	4819
PERVIOUS	ADAMS	GROUP A	409

9/23/2026	2	DRAINAGE CALCS		
9/10/2026	1	REVIEW COMMENTS		
DATE	NO.	REVISIONS		BY

PLAN OF LAND
LOT 3 - ROUTE 103 WEST, WARNER NH,
ASSESSOR'S MAP 35 LOTS 4-3

PROPERTY OWNER: COMET, LLC
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POST DRAINAGE PLAN
CS9301



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