Findings of Fact | Site Plan Review
City of Portsmouth Planning Board

Date: December 19, 2024
- Property Address: 2059 Lafayette Road

Application #: LU-23-191
Decision: □ Approve □ Deny □ Approve with Conditions

Findings of Fact:

Per RSA 676:3, I: The local land use board shall issue a final written decision which either approves or disapproves an application for a local permit and make a copy of the decision available to the applicant. **The decision shall include specific written findings of fact that support the decision. Failure of the board to make specific written findings of fact supporting a disapproval shall be grounds for automatic reversal and remand by the superior court upon appeal, in accordance with the time periods set forth in RSA 677:5 or RSA 677:15, unless the court determines that there are other factors warranting the disapproval.** If the application is not approved, the board shall provide the applicant with written reasons for the disapproval. If the application is approved with conditions, the board shall include in the written decision a detailed description of the all conditions necessary to obtain final approval.

Site Plan Regulations Section 2.9 Evaluation Criteria - in order to grant site plan review approval, the TAC and the Planning Board shall find that the application satisfies evaluation criteria pursuant to NH State Law and listed herein. In making a finding, the TAC and the Planning Board shall consider all standards provided in Articles 3 through 11 of these regulations.

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	**Finding (Meets Standard/Criteria)**	**Supporting Information**
1	Compliance with all City Ordinances and Codes and these regulations. Applicable standards:	**Meets** **Does Not Meet**	Applicable standards: The project meets all the applicable Ordinances, Codes, and Regulations.
2	Provision for the safe development, change or expansion of use of the site.	**Meets** **Does Not Meet**	The project has been vetted by the TAC which found no unsafe elements on the design proposal.
3	Adequate erosion control and stormwater management practices and other mitigative measures, if needed, to prevent adverse effects on downstream water quality and flooding of the property or that of another.	**Meets** **Does Not Meet**	The project includes provisions for adequate temporary and permanent erosion control measures for use during and post construction. The stormwater management design improves the off-site runoff by diverting runoff away from residential properties and providing improved treatment.
4	Adequate protection for the		The project does not propose any uses

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
	quality of groundwater.	**Meets** **Does Not Meet**	with high pollutant loads that could impact the groundwater supply
5	Adequate and reliable water supply sources.	**Meets** **Does Not Meet**	The project will be served with municipal water.
6	Adequate and reliable sewage disposal facilities, lines, and connections.	**Meets** **Does Not Meet**	The project will be connected to the municipal sanitary sewage collection system.
7	Absence of undesirable and preventable elements of pollution such as smoke, soot, particulates, odor, wastewater, stormwater, sedimentation or any other discharge into the environment which might prove harmful to persons, structures, or adjacent properties.	**Meets** **Does Not Meet**	The residential development will not create any undesirable and preventable elements of pollution such as smoke, soot, particulates, odor, wastewater, stormwater, sedimentation or any other discharge into the environment which might prove harmful to persons, structures, or adjacent properties.
8	Adequate provision for fire safety, prevention and control.	**Meets** **Does Not Meet**	As part of the TAC review, the Portsmouth Fire Department supported the project.
9	Adequate protection of natural features such as, but not limited to, wetlands.	**Meets** **Does Not Meet**	There are no wetlands on the site. A portion of the mature grove will be preserved as part of the project. Most of the site is fully developed.
10	Adequate protection of historical features on the site.	**Meets** **Does Not Meet**	The project will not impact any known historical resources.
11	Adequate management of the volume and flow of traffic on the site and adequate traffic controls to protect public safety and prevent traffic congestion.	**Meets** **Does Not Meet**	The project will generate a minimal amount of new traffic. Traffic will be diverted from Route 1 where vehicles back into the right-of-way to Hoover Drive where vehicles can safely access and exit the site.
12	Adequate traffic controls and traffic management measures to prevent an unacceptable increase in safety hazards and traffic congestion off-site.	**Meets** **Does Not Meet**	Traffic safety will be improved with a controlled, narrow driveway eliminating vehicles backing into the street. TAC supports the design. Adequate vehicular sight lines for exiting the site are provided.
13	Adequate insulation from external noise sources.	**Meets**	The proposed residential development will meet all applicable codes relating to noise during and post construction.

	Site Plan Review Regulations Section 2.9 Evaluation Criteria	Finding (Meets Standard/Criteria)	Supporting Information
		Does Not Meet	
14	Existing municipal solid waste disposal, police, emergency medical, and other municipal services and facilities adequate to handle any new demands on infrastructure or services created by the project.	**Meets** **Does Not Meet**	The project has been reviewed and approved by TAC which found that the project will not create an unreasonable demand on City infrastructure or services.
15	Provision of usable and functional open spaces of adequate proportions, including needed recreational facilities that can reasonably be provided on the site	**Meets** **Does Not Meet**	The project includes a small open space area at the rear of the lot to allow the residents to enjoy outdoor activities.
16	Adequate layout and coordination of on-site accessways and sidewalks in relationship to off-site existing or planned streets, accessways, bicycle paths, and sidewalks.	**Meets** **Does Not Meet**	A multi-use path is proposed along Lafayette Road. The sidewalk along Hoover Drive from Lafayette Road to Coolidge will be reconstructed.
17	Demonstration that the land indicated on plans submitted with the application shall be of such character that it can be used for building purposes without danger to health.	**Meets** **Does Not Meet**	No wetlands will be impacted. There are no wetland buffers. The development will improve stormwater quality and will not be a detriment to health.
18	Adequate quantities, type or arrangement of landscaping and open space for the provision of visual, noise and air pollution buffers.	**Meets** **Does Not Meet**	The proposed landscape design exceeds the minimum standards in the regulations. Adequate open space will be provided. No commercial noise or air pollution will be generated.
19	Compliance with applicable City approved design standards.	**Meets** **Does Not Meet**	The project meets or exceeds all applicable City design standards.
	Other Board Findings:		

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133 Court Street
Portsmouth, NH
03801-4413

November 26, 2024

Peter Stith, Planning Manager
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Site Plan Review
Assessor's Map 268, Lots 12 and 13
2059 Lafayette Road
Altus Project No. 5361

Dear Peter,

On behalf of Peter and Michael Labrie, Owners and Trustees of Go-Lo, Inc. and the James A. Labrie Revocable Trust of 1991 (Labrie), Altus Engineering, LLC (Altus) is pleased to submit an application for Site Plan Review to the City of Portsmouth Planning Board. On November 5, 2024, the Technical Advisory Committee voted to recommend approval of the 8-residential unit apartment building at 2059 Lafayette Road.

The site is comprised of two lots. The lots will be consolidated to create a single 27,451 SF parcel. The parcel lies within the Mixed Residential Business District. The direct abutting parcels to the north and east lie within the Single Resident B Zoning District.

In December of 2023, the Board of Adjustment granted two variances to allow the project to proceed. Variance from Section 10.1113.20 to allow parking to be located closer to the street than the principal building in the secondary front setback and a variance from Section 10.521 to allow 3,430 SF of lot area per dwelling unit where 7,500 SF is required.

The parcel was originally developed in the early 1970's and has undergone numerous expansions. As an "old style" development, the majority of the parking lined up between the building and Lafayette Road. In order to maneuver the parking field, the State right-of-way is utilized. The existing business sign is in the State right-of-way. Access to Lafayette Road will be eliminated. The encroachments will be removed. An 10-foot wide multi-use path will be constructed along the Route 1 frontage tying into the path that was constructed with the residential development to the south.

Access to the site will be from Hoover Drive. 5-exterior, visitor parking stalls are provided along with 16-interior parking stalls, 2 per dwelling unit.

8-residential dwelling units will have a significant reduction in traffic from the prior/existing uses on the property.

A group of mature trees, primarily oak, in the eastern corner of the site will be preserved as well as possible. A detailed landscaping plan is included in the application package that will enhance the site design, provide vegetative buffers to the abutting properties, and maintain the corner clearance visibility requirements.

Route 1 is superelevated along the street frontage and nearly all of the ±55-foot wide road drains onto the property. It flows across the driveway through a riprap swale, discharging at the eastern corner of the parcel. The runoff eventually connects into the closed drainage system in Coolidge Drive that flows into the Hoover Drive system.

The proposed stormwater management design intercepts the runoff in front of the building diverting the flow into two bio-retention basins and rerouting the flow into the Hoover Drive closed drainage system This allows for a substantial reduction in runoff towards the residential abutting properties to the east and provides treatment and attenuation of the flow. The new parking lot and the majority of the eastern side of the building discharges into a bio-retention basin on the east side of the building.

There are no wetlands on the parcel as determined by Joesph Noel, Certified Wetlands Scientist on September 25, 2023.

In summary, it is Altus' opinion that the redevelopment of this site will enhance the neighborhood with an attractive new building. It will improve stormwater quality, reduce the stormwater impacts to the abutting properties, reduce traffic congestion, improve traffic safety, and create needed housing stock in Portsmouth.

Altus offers the following in response to items identified by TAC and addressed prior to the Planning Board submission:

1. A CUP will need to be provided to provide 175% of the required parking. It was determined post TAC meeting, the requirement doe not apply to this site.

2. The Landscape Plan has been revised to depict all the existing vegetation that will be removed and remain. Additionally, the clearing limits are depicted on the Site Preparation Plan.

3. An Irrigation Note at the top of Sheet L-1 has been added to state that permanent irrigation will not be installed. Temporary irrigation will be provided to allow for the plantings to become established.

4. Notes and details have been revised to include the construction of the 5.5-foot wide asphalt sidewalk on Hoover Drive from Lafayette Road to Coolidge Drive.

5. The drainage connection point in Hoover Drive is now depicted as a catch basin.

6. Plan Note 24 has been added to the Utility Plan, Sheet C-4 to clarify that the MEP engineer will size both the fire suppression and domestic water services for the new building.

7. A "NO PARKING" sign has been added to the Site Plan, Sheet C-2 in front of the accessible aisle adjacent to the handicap accessible parking stall.

8. The tactile panel at the end of the multi-use path on the Site Plan, Sheet C-2 has been widened to extend the width of the path.

9. The multi-use path width has been increased from 8-feet to 10-feet as suggested.

10. The "wave" bike rack style detail on Sheet D-5 has been changed to a DuMor with two point of contact as suggested by TAC.

Additionally, plan notes have been added and/or clarified to address potential approval conditions including:

1. The Site Preparation Plan note has been clarified that the trees scheduled to remain shall be staked in the field prior to commencing construction.

2. Grading, Drainage and Erosion and Sediment Control note 23 on Sheet D-3 has been clarified to replicate the TAC comments regarding the oversight of the stormwater mitigation plan by the engineer during construction.

3. Note 27 has been added to the Utilities Plan requiring that the Department of Public Works shall have access to the utility room for water meter access.

4. The Landscape plan has been slightly modified to ensure that the driveway access sight lines are not encumbered. The proposed landscaping at the intersection of Hoover Drive and Lafayette Road does not encumber the sight lines.

Enclosed please find the following for consideration at the December 19, 2024 Planning Board hearing:

Application Plan Package including:

- Letter of Authorization
- Wetlands Report by Joseph Noel, CWS
- Traffic Impact Statement
- Green Statements
- Drainage Study and Stormwater Inspection and Maintenance Manual
- Site Plans
- Architectural elevations and floor plans

As always, Altus looks forward to working with City staff. Please feel free to call or email me directly should you have any questions or need any additional information in advance of the meeting.

Sincerely,

ALTUS ENGINEERING, LLC

Enclosures

eCopy: Mike Labrie
Pete Labrie
Mark Gianniny, Portsmouth Architects
Robbi Woodburn, Woodburn and Company

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Go-Lo, Inc. and James A. Labrie Revocable Trust of 1991, record owners of the properties located at 2059 Lafayette Road, Tax Map 268, Lot 12 and 13, Portsmouth, NH (the "Property"), hereby authorize **Durbin Law Offices, PLLC, Altus Engineering, Inc. and McHenry Architecture, PLLC** to file any zoning, planning or other municipal permit applications with the City of Portsmouth for said Property and to appear before its land use boards. This Letter of Authorization shall be valid until expressly revoked in writing.

Go-Lo, Inc.

Michael G. Labrie,
Duly Authorized Officer

July 19, 2023

James A. Labrie Revocable Trust of 1991

Michael G. Labrie, Trustee
Duly Authorized

July 19, 2023

JOSEPH W. NOEL
P.O. BOX 174
SOUTH BERWICK, MAINE 03908
(207) 384-5587

*CERTIFIED SOIL SCIENTIST * WETLAND SCIENTIST * LICENSED SITE EVALUATOR*

September 30, 2023

Mr. Eric Weinrieb, P.E.
Altus Engineering, Inc.
133 Court Street
Portsmouth, New Hampshire 03801

RE: Wetland Investigation, Map 268 – Lots 12 & 13, Lafayette Road & Hoover Drive, Portsmouth, New Hampshire, JWN #23-121

Dear Eric:

On September 25, 2023, an on-site was conducted at the above-referenced lots, per your request. The purpose of the visit was to determine if there were any wetlands on the two lots.

Wetland determinations were made based on the methodologies described in the U.S. Army Corps of Engineers document *Corps of Engineers Wetlands Delineation Manual* (1987) along with the required *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral Region,* (Version 2).

Together the lots are .63 acres and have frontage on both Hoover Drive and Lafayette Road. Lot 13 is developed with a building, driveway and associated parking. Lot 12 is paved along Lafayette Road for parking. The remainder of the lot contains both a yard and a wooded area. Lot 12 has a low area where some of the runoff from storm events from the road collects. The wooded portion is represented by northern red oak (*Quercus rubra*) and eastern white pine (*Pinus strobus*) with subordinate species that included: northern white oak (*Quercus alba*), red maple (*Acer rubrum*), and American hornbeam (*Carpinus caroliniana*). The plant community in this low area is dominated by upland plant species. Soil observations were also conducted where the runoff collects and found non-hydric soils (i.e., not wetland). Attached is a photo/description of the upland soils in this area. After walking the properties, it was apparent there are no wetlands on either of the lots. No off-site wetland investigation was conducted by the undersigned.

I hope this brief letter/report is sufficient for your planning purposes at this time. Please feel free to call with any questions or if you are in need of additional assistance.

Sincerely,

Joseph W. Noel
NH Certified Wetland Scientist #086
NH Certified Soil Scientist #017

PHOTO

Tax Map 268 – Lots 12 & 13 – Lafayette Road & Hoover Drive – Portsmouth, NH

(Photo taken by Joseph W. Noel on September 25, 2023)

The surface horizon (A layer) consists of a very dark grayish brown (10YR 3/2) fine sandy loam. The subsoil horizon (Bw layer) consists of a matrix color of dark yellowish brown (10YR 3/4 and 10YR 3/6) fine sandy loam. The Bw has evidence of a seasonal highwater table (i.e., redox features) but does not classify as a hydric soil (i.e., not wetland) due to the soil matrix color.

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TRAFFIC IMPACT STATEMENT

Date: November 22, 2023

Subject: 2059 Lafayette Road
Tax Map 268, Lots 12 and 13

Altus Engineering, LLC (Altus) respectfully submits a Traffic Impact Statement in order to determine the potential impacts on the transportation infrastructure associated with the redevelopment of 2059 Lafayette Road in Portsmouth, New Hampshire.

The existing mixed-use commercial-residential building is located at the intersection of Lafayette Road/US Route 1 and Hoover Drive. The existing building was originally constructed in the early 1970's and has undergone several expansions and renovations over the years. Historically, it had a retail convenience store on the first floor that generated a significant amount of traffic. Over time the convenience store model changed. Small standalone convenience stores are generally no longer viable without a gas service station component.

The existing developed area is comprised of two separate lots that are integrated and currently used as a single parcel. The total lot area is approximately 27,444 SF.

The site has over 150-feet of uncontrolled access from Route 1 with a small, raised island as a separator. With less than 40-feet between the head of the parking stalls and the State right-of-way, access and parking maneuverability extends into the right-of-way.

There are two additional points of access from Hoover Drive. One access point is less than 20-feet from the intersection with Route 1 which can impede the sight lines for traffic entering Route 1 from Hoover Drive.

The second point access point on Hoover Drive is over 120-feet from the Lafayette Road intersection and provides service to a couple of parking spaces and loading for the retail component of the property. This access point is generally safe and currently sees a very small volume of traffic.

The building uses have changed over the years. Up until the early 90's a portion of the building was a moderately high-volume convenience store. More recently it has been:

3 apartment dwelling units
1,500 SF of office space
3,400 SF of veterinary clinic

The owner proposes to raze the building and construct 8-apartment units with garage/covered parking.

The site will be reconfigured to eliminate all access onto Lafayette Road and create a single point of access on the lesser travelled Hoover Drive. The driveway is over 50-feet from the stop bar, providing ample separation to the intersection.

Altus reviewed available information on the NHDOT website regarding any improvements to the Route 1 corridor. NHDOT project 29640 which includes improvements to US Route 1 from Constitution Avenue north to Wilson Road is noted on the July 22, 2022, ten-year plan as being in the design phase. They also note that construction is expected to occur in the years 2025 and 2026. The improvements on the east side of Lafayette Road include a 5-foot-wide bike lane and a 5.5-foot-wide sidewalk. Per the City of Portsmouth Planning requirements, the design meets the DOT requirements by providing the 6-foot wide multiple-use path.

The following assessment is based on Trip Generation, 11th edition, prepared by the Institute of Transportation Engineers (ITE) and published September 2021. We examined the existing and proposed traffic projections for multiple scenarios, the average daily traffic for both a weekday and Saturday and the peak hour generator AM and PM for a weekday. We have defaulted to the AM and PM peak hour of generator versus the peak hour of adjacent street traffic as this resulted in a slightly higher number of trip ends.

EXISTING USES

We have characterized the existing uses from the ITE Land Use Code:

Affordable Housing – Income limits (223)
Unspecified office space (712)
Veterinary Clinic (640)

Existing uses
3 apartments
1,500 SF unspecified small office space
3,400 veterinary clinic

Weekday vehicle trip ends	
Apartments	11.49
Unspecified office space	21.59
Veterinary clinic	73.10
TOTAL	106.18

Saturday average daily vehicle trip ends	
Apartments	13.11
Unspecified office space	0.00
Veterinary clinic	0.00
	13.11

Weekday AM peak hour of generator	
Apartments	1.56
Unspecified office space	3.92
Veterinary clinic	12.68
	18.16

Weekday PM peak hour of generator	
Apartments	1.17
Unspecified office space	4.73
Veterinary clinic	13.02
	18.92

Historically the offices and veterinary clinic were open on Saturday's. ITE assumes that both uses only conduct business Monday through Friday. As such, the existing Saturday trips noted above underestimate recent conditions.

PROPOSED USE

We have characterized the proposed project in the ITE Land Use Code (LUC) 220, Multifamily housing (low rise) to develop the project traffic generation.

Proposed use
8 low rise apartment units

Weekday vehicle trip ends	
Apartments	53.92

Saturday average daily vehicle trip ends	
Apartments	36.40

Weekday AM peak hour of generator	
Apartments	3.76

Weekday PM peak hour of generator	
Apartments	4.56

COMPARISON

Weekday vehicle trip ends	
Existing	106.18
Proposed	53.92
	-52.26

Saturday average daily vehicle trip ends	
Existing	13.11
Proposed	36.40
	23.29
Weekday AM peak hour of generator	
Existing	18.16
Proposed	3.76
	-14.40
Weekday PM peak hour of generator	
Existing	18.92
Proposed	4.56
	-14.36

The study demonstrates that during all weekday conditions there is a significant decrease in the weekday traffic associated with converting the site from an office/retail/apartment complex to a residential use.

Because ITE identifies that veterinary clinics and offices are generally closed on Saturday's, it is assumed that no traffic will be generated. Thus, it is easy to conclude for a weekend that there will be a modest increase in the traffic generated when going from 3 apartments to 8 dwelling units. However, the veterinary clinic did operate on Saturdays to accommodate working pet owners. Thus, it is presumed that even if they had half the weekday average daily trip ends, then the proposed use will be a reduction on an average Saturday under current/recent conditions.

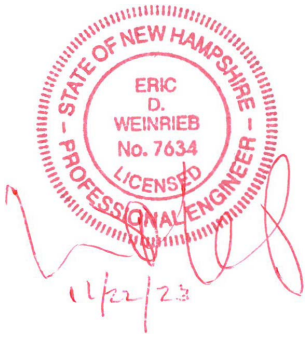
Historically, the veterinary clinic, 3,400 SF was a convenience store, ITE LUC 851. It is expected that if the clinic were converted back to the Chug-a-Lug market that we would expect to see up to 3,686 vehicle trip ends on a typical Saturday.

The NHDOT Transportation Data Management System maintains traffic counts on roads under their jurisdiction. They have data at the intersection of Ocean Road and Route 1 (6,200 feet south) as well as Route 1 and Greenleaf Avenue (5,100 feet north).

In 2021, the annual average daily traffic (AADT) counts on Route 1 at the Greenleaf intersection was 16,077 vehicles per day. In 2022, the counts dropped to 9,859 which in Altus' opinion appears to be an anomaly. The proposed weekday vehicle trip ends from the development is expected to be 54 vehicle trip ends per day, which is 0.5-percent of the annual average daily traffic on Route 1.

In conclusion, it is Altus' opinion that constructing 8-residential units on the property will reduce the traffic generated on weekdays, Saturday's and will have modest increase on Sundays. It will not have a detrimental impact on the adjacent traffic patterns or cause congestion on the roadway system.

Respectfully submitted,



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Eric D. Weinrieb, PE
President

Enclosure

wde/5361 traffic memo.DOCX

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133 Court Street
Portsmouth, NH
03801-4413

Site "Green" Statement
Assessor's Map 268, Lots 12 & 13
2059 Lafayette Road
Altus Project 5361
October 2024

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Altus Engineering, Inc. respectfully submits the following list of the project's "green" components for the re-development 2059 Lafayette Road.

- The was developed long before stormwater treatment and retention management and was a consideration.
- The existing impervious areas will be decreased. This will reduce the heat island effect, reduce runoff, and improve the surface water quality.
- Stormwater from the State right-of-way discharges across the property, untreated. The flow will be treated. The runoff discharging directly onto the abutters properties will be diverted into the closed drainage system in Hoover Drive.
- A robust landscape planting plant with shade trees will reduce the heat island effect.
- The proposed site lighting will have LED fixtures. The lights will be dark sky friendly and will exceed the minimum City requirements.
- The sea of pavement along the street frontage will be removed. The 16 parking spaces will be located in the building reducing the parking field requirements and consolidating the development footprint.

wde/5361 green statment.docx

PORTSMOUTH ARCHITECTS
Brought to you by McHENRY ARCHITECTURE

October 10, 2024

Technical Advisory Committee
c/o Peter Stith
City of Portsmouth
1 Junkins Avenue
Portsmouth, NH 03801

Re: Green Building Statement – Multi-family development at 2059 Lafayette, Portsmouth, NH

Dear TAC Members,

The following green building features and design principles are planned to be included in the project:

1. Foundation system to be cast in place concrete with continuous rigid insulation installed to depths required by the energy code. Continuous insulation to be provided under the concrete slab on grade for 2 feet along the exterior wall.
2. Exterior Envelope: Designed to meet or exceed the prescriptive method of the 2018 International Energy Code requirements, as adopted by the state of New Hampshire. Walls to have cavity filled with a combination of spray foam and batt insulation with a continuous air barrier. Composite siting materials to utilize post-consumer materials.
3. Exterior Windows to be aluminum clad wood windows, high-performance glazing to provide enhanced thermal performance and solar control. Residential unit windows will be operable for natural ventilation.
4. Roofing system: Lighter colored membrane roofing system over sloped ridged insulation for cool roof performance.
5. HVAC systems to consist of high-efficiency heat pumps. Meet ASHRAE ventilation code in all occupied spaces.
6. Plumbing: All fixtures in dwelling units to be water conserving low flow.
7. Lighting: Exterior lighting to be LED cutoff fixtures for energy efficiency and to minimize light pollution. All interior lighting to be LED throughout using less than 1 watt / sf and perimeter daylight sensors. Occupancy sensors to be utilized as required by code.
8. All dwelling units to be equipped with Energy Star-qualified or other equivalent high-performance appliances.
9. Living rooms and bedrooms will have direct natural lighting.
10. Materials & Resources: Minimize waste during construction and operations. Also incorporate the use of regional, renewable, and low carbon footprint materials.

Sincerely,

Mark Gianniny, AIA
Principal

DRAINAGE ANALYSIS AMENDMENT

FOR

Go-Lo, Inc.
&
James A. Labrie Revocable Trust of 1991

2059 Lafayette Road
Portsmouth, NH 03801

Tax Map 268 Lots 12 & 13

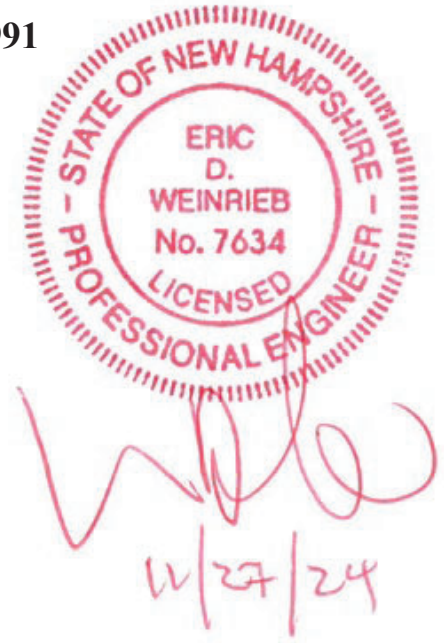
November 27, 2024

Prepared For:

Go-Lo, Inc.
&
James A. Labrie Revocable Trust of 1991
P.O. Box 300
Rye, NH 03870

Prepared By:

ALTUS ENGINEERING
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335



ALTUS ENGINEERING

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ALTUS ENGINEERING

Section 1

Narrative

ALTUS ENGINEERING

PROJECT DESCRIPTION

Go-Lo, Inc. & The James A. Labrie Rev. Trust of 1991 is proposing to redevelop two lots located at 2059 Lafayette Road in Portsmouth, New Hampshire. The combined 0.63-acre property is identified as Tax Map 268, Lots 12 & 13. Lot 12 currently has a two and a half-story building with grass areas and sparse trees. Lot 13 is primarily forested. Both lots are in the Mixed Residential Business District (MRB).

The proposed project will construct a new building with eight residential apartments serviced by municipal water and sewer together with associated stormwater infrastructure. Stormwater treatment measures include two bioretention ponds. The proposed stormwater management system will reduce peak flows as well as treat runoff from the site and off site impervious areas prior to discharging from the property.

Design Revisions Made Post November 5, 2024 TAC Meeting

- Changed proposed drain manhole on Hoover Drive to in-line catch basin with sump.
- Plans were updated to reflect the current preferred alternative route for the NH DOT Route 1 10-foot-wide multi use path along the site.
- Additional HydroCAD modeling is provided to demonstrate how the new stormwater infrastructure will not have a negative impact on the city's offsite system.
- Combined two stormwater treatment areas in front of the building.

Altus conducted an analysis of the stormwater infrastructure along Hoover Drive to Coolidge Drive. We determined that both the current and proposed drainage systems are adequate for conveying the ten-year storm frequency event. However, neither design can accommodate the twenty-five-year storm event. Overall, the proposed drainage design is expected to have a positive impact on the city's stormwater management system.

Site Soils

Based off data from the USDA National Resources Conservation Service Web Soil Survey, the site sits on 799 Urban land-Canton complex soils. 799 is classified as hydrologic soil group A (HSG A).

Pre-Development (Existing Conditions)

The site currently features a building with a parking lot and forested area which generally slope in an easterly direction away from Lafayette Road. Stormwater drains from the southern portion into a catch basin, discharging into the closed drainage system in Hoover Drive. Hydrology is characterized by two existing sub-catchments as delineated on the accompanying "Pre-Development Watershed Plan." Site runoff was analyzed at three points of analysis (POA). POA #1 represents the flow discharging into the Hoover Drive closed drainage system. POA #2 represents the flow at the eastern corner of the site which eventually discharges in the closed drainage system in Coolidge Drive which is a tributary to the Hoover Drive system. POA #3 represents the combined flow of the site from POA #1 and POA #2 to the city system. Delays regarding travel time are not included.

Post-Development (Proposed Conditions)

The post-development conditions were analyzed at the same discharge points as the pre-development conditions. The post-development watersheds are delineated on the accompanying "Post-Development Watershed Plan". Modifications to the delineated areas and associated ground cover were made to sub-catchments to account for the improvements to the property. As shown on the attached Post-Development Watershed Plan, the site was divided into five post-development sub-catchment areas. The same points of analysis in the Pre-Development model were used for comparison of the Pre- and Post-development conditions.

The Post-Development Watershed Plan illustrates the proposed stormwater management system. Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plans. Recommended erosion control measures are based upon the December 2008 edition of the "*New Hampshire Stormwater Manual Volumes 1 through 3*" prepared by NHDES and Comprehensive Environmental, Inc. as amended.

In addition to analyzing the watersheds, Altus conducted an assessment of the stormwater infrastructure along Hoover Drive extending toward Coolidge Drive to ensure that the proposed design would not overwhelm the existing system. This analysis involved evaluating the flood elevations of five catch basins and comparing them with the peak elevations under both existing and proposed conditions. The findings indicate that the proposed peak elevations remain below the flood elevations for all assessed catch basins for the 10 year storm event, confirming that the proposed design will not negatively impact the city's stormwater infrastructure. Under a 25-year storm event, the existing infrastructure is unable to adequately convey runoff, resulting in flooding at the catch basins in both the existing and proposed designs.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). As the project site lies within a Coastal and Great Bay Community identified by NHDES Alteration of Terrain, all rainfall amounts were increased by 15% to account for potential future increases in rainfall due to climate change. A time span of 0 to 30 hours was analyzed at 0.01-hour increments. Percolation rates in bioretention ponds are based on the rate through filter media.

Disclaimer

Altus Engineering notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Drainage Analysis

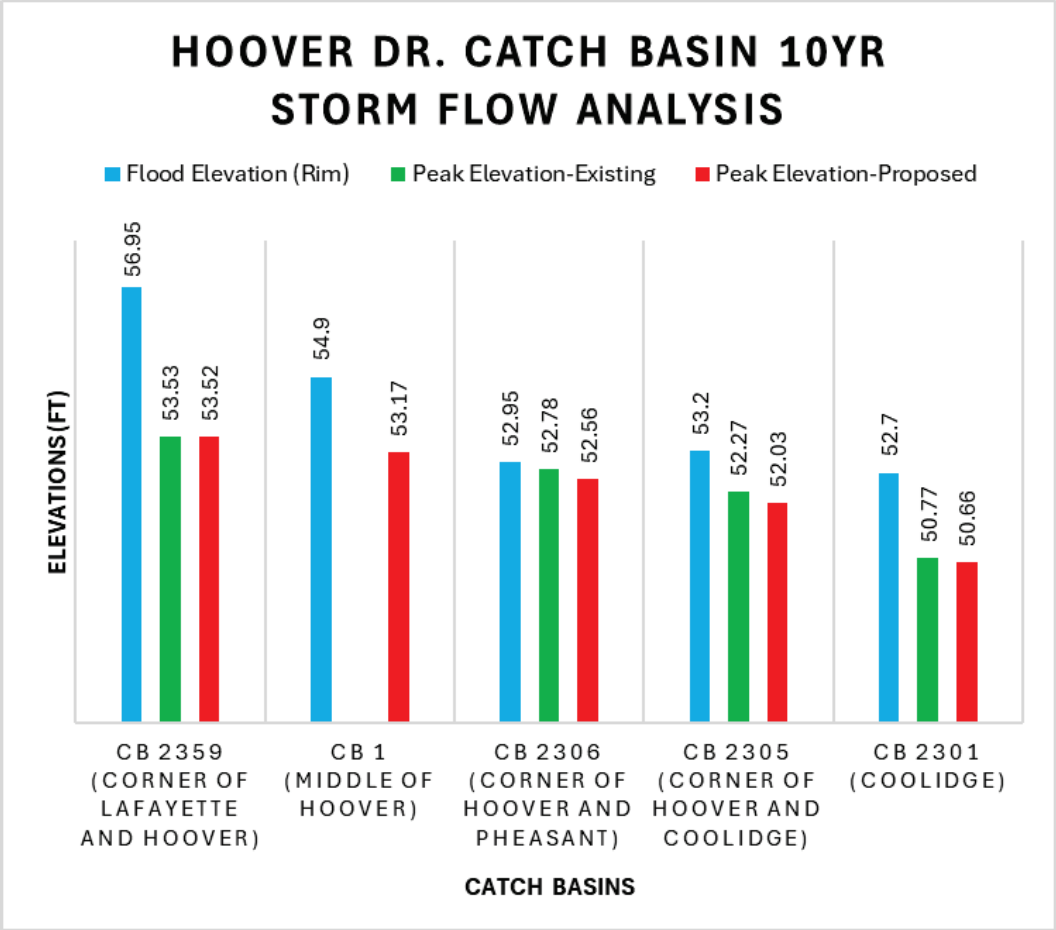
A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the Points of Analysis identified on the plans for the 2, 10, 25 and 50-year storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

	2-Yr Storm (3.71 inch)	10-Yr Storm (5.65 inch)	25-Yr Storm (7.16 inch)	50-Yr Storm (8.58 inch)
POA #1 (Hoover Drive)				
Pre	1.14	2.04	2.73	3.38
Post	0.93	1.62	3.61	4.95
Change	**-0.21**	**-0.42**	**0.88**	**1.57**
POA #2 (Northeast)				
Pre	0.41	1.16	1.85	2.54
Post	0.00	0.01	0.04	0.10
Change	**-0.41**	**-1.15**	**-1.81**	**-2.44**
POA #3 (Combined)				
Pre	1.55	3.20	4.58	5.92
Post	0.93	1.62	3.64	5.04
Change	**-0.62**	**-1.58**	**-0.94**	**-0.88**

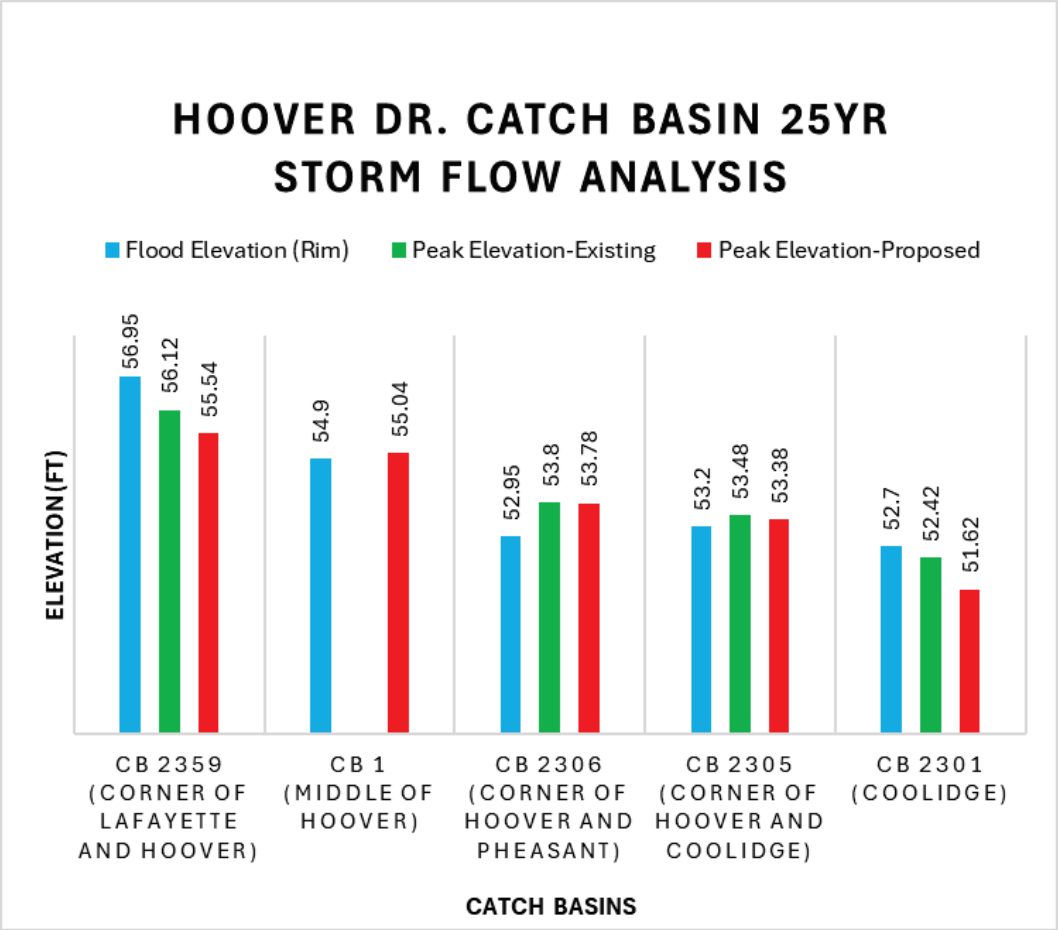
As the above table demonstrates, the proposed peak rates of runoff at the point of analysis will be decreased from the existing conditions for all storm events analyzed except for POA # 1 in the larger 25- and 50-year models. This has been determined to be acceptable as significant decreases are shown in POA #3 where all site runoff eventually combines in the city drainage system and because almost all the runoff to abutting properties downstream of POA #2 has been eliminated.

The chart below presents a comparative analysis of flood elevations, as well as existing and proposed peak elevations, for five catch basins located along Hoover Drive progressing towards Coolidge Drive. Catch basin 1 (CB 1) does not have an existing peak elevation because it is a new structure.



The analysis indicates a reduction in peak elevations in the 10-year frequency storm event for the proposed conditions, with the exception of catch basin 2359, which exhibits a minor increase. The peak elevations for both the existing and proposed conditions remain below the respective flood elevations (Rim) for each catch basin. Overall, the proposed design demonstrates no adverse impact on the city's drainage infrastructure.

The chart below presents a comparative analysis of flood elevations, as well as existing and proposed peak elevations, for five catch basins located along Hoover Drive progressing towards Coolidge Drive. Catch basin 1 (CB 1) does not have an existing peak elevation because it is a new structure.



This chart illustrates the impacts of a 25-year storm event, showing that three of the four evaluated existing catch basins are prone to overflow due to the system being undersized. As a result, the system lacks adequate conveyance capacity to manage the storm under both existing and proposed conditions. However, the proposed design does not introduce any additional adverse effects on the city's drainage infrastructure.

Pollutant Removal

Based on the New Hampshire Stormwater Manual – Appendix E, the following pollutant removal rates would be expected from the implementation of the infiltration practices:

Pollutant	Bioretention Raingarden Removal %	Projected Removal %
Total Suspended Solids (TSS)	80%	90%
Total Nitrogen (TN)	50%	65%
Total Phosphorus (TP)	50%	65%

The proposed project site will result in 11,614 sf of impervious area on site. The proposed bioretention ponds will treat 12,436 sf of impervious area, including offsite impervious from Lafayette Road.

CONCLUSION

This proposed site redevelopment of property located at 2059 Lafayette Road in Portsmouth, New Hampshire will have a positive impact on the direct downgradient abutters. By treating the runoff and diverting it to the Hoover Drive closed drainage system, the project is improving the quality and the quantity of runoff leaving the site and significantly reducing impacts to abutting properties. Post-construction combined peak rates of runoff from the site will be lower than the existing conditions with the exceptions discussed above. The proposed design also demonstrates no adverse impacts on the city's drainage system shown by the data from the existing catch basins analyzed along Hoover Drive. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control, including two bioretention ponds.

Section 2

Aerial Photo and USGS Map

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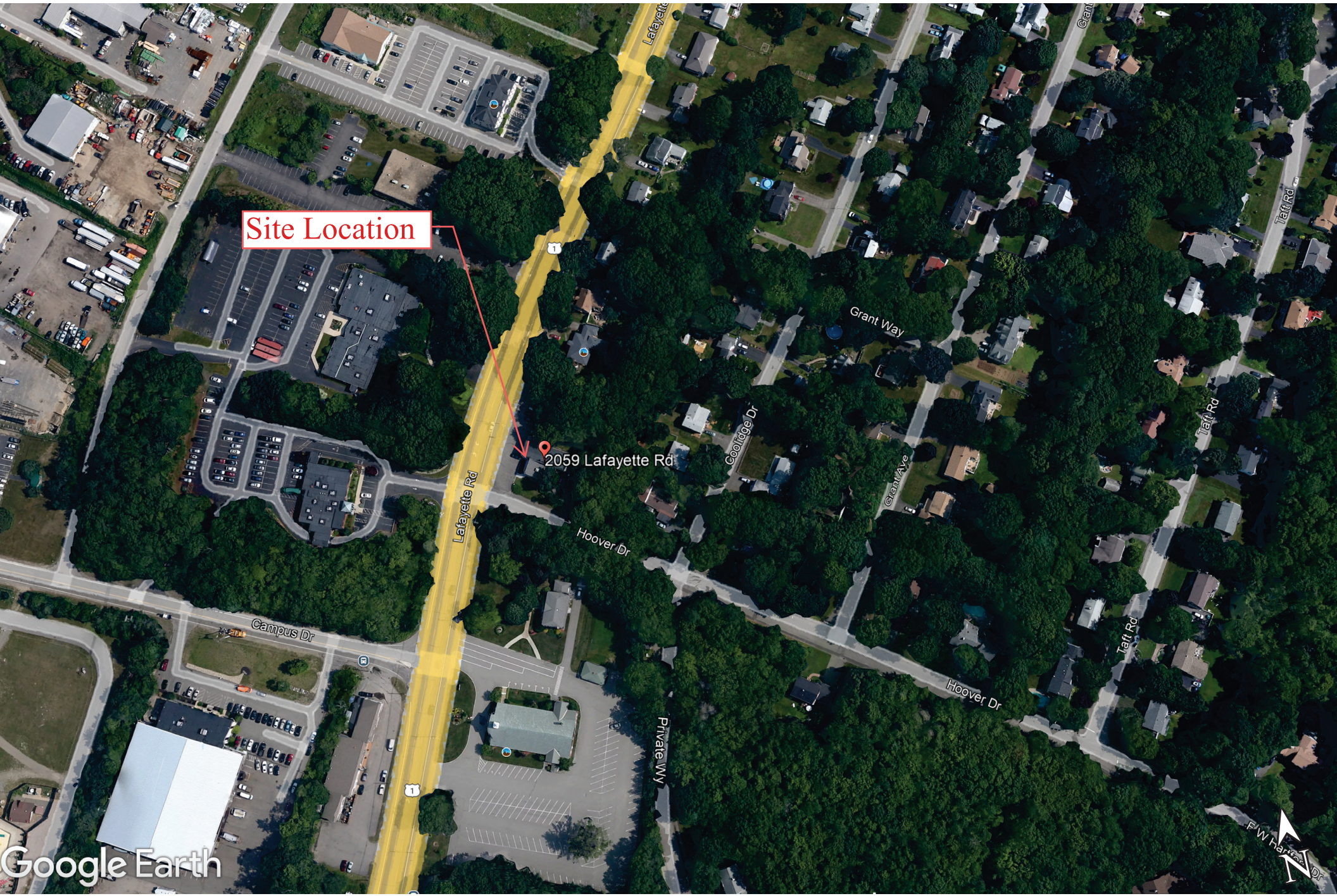
Site Location
2059 Lafayette Rd
Lafayette Rd
Grant Way
Coolidge Dr
Grant Ave
Taft Rd
Hoover Dr
Campus Dr
Private Wy
Google Earth


Site Location
NEW HAMPSHIRE
Saint Patrick Sch
WILSON RD
CLEVELAND DR
ARTHUR RD
GRANT AVE
TAYLOR LN
CAMPUS RD
WEST RD
LAFAYETTE RD
COOLIDGE DR
GARFIELD RD
DWIGHT AVE
FILLMORE RD
ROCKINGHAM CO
Elwyn Park
Mary C Dondero Elem Sch
TAFT RD
HOOVER DR
PHEASANT LN
T J GAMESTER AVE
1

Section 3

Drainage Calculations

Pre-Development, On Site
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

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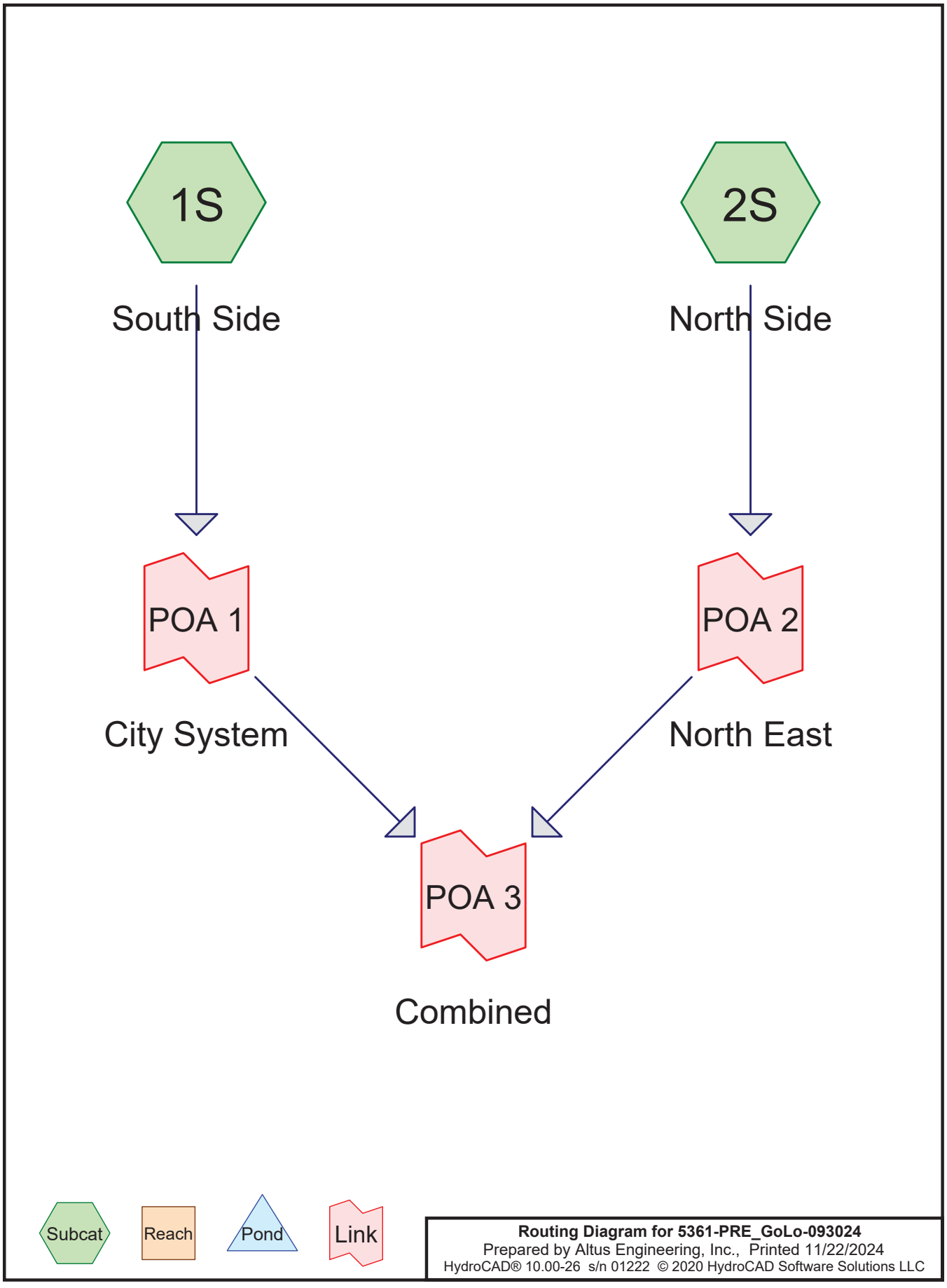


Routing Diagram for 5361-PRE_GoLo-093024
Prepared by Altus Engineering, Inc., Printed 11/22/2024

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: South Side Runoff Area=19,336 sf 78.72% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=85 Runoff=1.14 cfs 0.081 af

Subcatchment 2S: North Side Runoff Area=22,235 sf 48.04% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=64 Runoff=0.41 cfs 0.035 af

Link POA 1: City System Inflow=1.14 cfs 0.081 af
Primary=1.14 cfs 0.081 af

Link POA 2: North East Inflow=0.41 cfs 0.035 af
Primary=0.41 cfs 0.035 af

Link POA 3: Combined Inflow=1.55 cfs 0.116 af
Primary=1.55 cfs 0.116 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.116 af Average Runoff Depth = 1.46"
37.69% Pervious = 0.360 ac 62.31% Impervious = 0.595 ac

Summary for Subcatchment 1S: South Side

Runoff = 1.14 cfs @ 12.09 hrs, Volume= 0.081 af, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.71"

Area (sf)	CN	Description
2,378	98	Roofs, HSG A
12,844	98	Paved parking, HSG A
4,114	39	>75% Grass cover, Good, HSG A
19,336	85	Weighted Average
4,114		21.28% Pervious Area
15,222		78.72% Impervious Area

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

Summary for Subcatchment 2S: North Side

Runoff = 0.41 cfs @ 12.10 hrs, Volume= 0.035 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.71"

Area (sf)	CN	Description
283	98	Roofs, HSG A
10,398	98	Paved parking, HSG A
11,554	32	Woods/grass comb., Good, HSG A
22,235	64	Weighted Average
11,554		51.96% Pervious Area
10,681		48.04% Impervious Area

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

Summary for Link POA 1: City System

Inflow Area = 0.444 ac, 78.72% Impervious, Inflow Depth = 2.20" for 2 YEAR STORM event
Inflow = 1.14 cfs @ 12.09 hrs, Volume= 0.081 af
Primary = 1.14 cfs @ 12.09 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 2: North East

Inflow Area = 0.510 ac, 48.04% Impervious, Inflow Depth = 0.81" for 2 YEAR STORM event
Inflow = 0.41 cfs @ 12.10 hrs, Volume= 0.035 af
Primary = 0.41 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 62.31% Impervious, Inflow Depth = 1.46" for 2 YEAR STORM event
Inflow = 1.55 cfs @ 12.09 hrs, Volume= 0.116 af
Primary = 1.55 cfs @ 12.09 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: South Side Runoff Area=19,336 sf 78.72% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=85 Runoff=2.73 cfs 0.200 af

Subcatchment 2S: North Side Runoff Area=22,235 sf 48.04% Impervious Runoff Depth=3.12"
Tc=6.0 min CN=64 Runoff=1.85 cfs 0.133 af

Link POA 1: City System Inflow=2.73 cfs 0.200 af
Primary=2.73 cfs 0.200 af

Link POA 2: North East Inflow=1.85 cfs 0.133 af
Primary=1.85 cfs 0.133 af

Link POA 3: Combined Inflow=4.58 cfs 0.333 af
Primary=4.58 cfs 0.333 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.333 af Average Runoff Depth = 4.19"
37.69% Pervious = 0.360 ac 62.31% Impervious = 0.595 ac

Summary for Subcatchment 1S: South Side

Runoff = 2.73 cfs @ 12.09 hrs, Volume= 0.200 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
2,378	98	Roofs, HSG A
12,844	98	Paved parking, HSG A
4,114	39	>75% Grass cover, Good, HSG A
19,336	85	Weighted Average
4,114		21.28% Pervious Area
15,222		78.72% Impervious Area

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

Summary for Subcatchment 2S: North Side

Runoff = 1.85 cfs @ 12.09 hrs, Volume= 0.133 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
283	98	Roofs, HSG A
10,398	98	Paved parking, HSG A
11,554	32	Woods/grass comb., Good, HSG A
22,235	64	Weighted Average
11,554		51.96% Pervious Area
10,681		48.04% Impervious Area

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

Summary for Link POA 1: City System

Inflow Area = 0.444 ac, 78.72% Impervious, Inflow Depth = 5.41" for 25 YEAR STORM event
Inflow = 2.73 cfs @ 12.09 hrs, Volume= 0.200 af
Primary = 2.73 cfs @ 12.09 hrs, Volume= 0.200 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 2: North East

Inflow Area = 0.510 ac, 48.04% Impervious, Inflow Depth = 3.12" for 25 YEAR STORM event
Inflow = 1.85 cfs @ 12.09 hrs, Volume= 0.133 af
Primary = 1.85 cfs @ 12.09 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 62.31% Impervious, Inflow Depth = 4.19" for 25 YEAR STORM event
Inflow = 4.58 cfs @ 12.09 hrs, Volume= 0.333 af
Primary = 4.58 cfs @ 12.09 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: South Side Runoff Area=19,336 sf 78.72% Impervious Runoff Depth=6.77"
Tc=6.0 min CN=85 Runoff=3.38 cfs 0.251 af

Subcatchment 2S: North Side Runoff Area=22,235 sf 48.04% Impervious Runoff Depth=4.25"
Tc=6.0 min CN=64 Runoff=2.54 cfs 0.181 af

Link POA 1: City System Inflow=3.38 cfs 0.251 af
Primary=3.38 cfs 0.251 af

Link POA 2: North East Inflow=2.54 cfs 0.181 af
Primary=2.54 cfs 0.181 af

Link POA 3: Combined Inflow=5.92 cfs 0.431 af
Primary=5.92 cfs 0.431 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.431 af Average Runoff Depth = 5.42"
37.69% Pervious = 0.360 ac 62.31% Impervious = 0.595 ac

Summary for Subcatchment 1S: South Side

Runoff = 3.38 cfs @ 12.08 hrs, Volume= 0.251 af, Depth= 6.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YEAR STORM Rainfall=8.58"

Area (sf)	CN	Description
2,378	98	Roofs, HSG A
12,844	98	Paved parking, HSG A
4,114	39	>75% Grass cover, Good, HSG A
19,336	85	Weighted Average
4,114		21.28% Pervious Area
15,222		78.72% Impervious Area

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

Summary for Subcatchment 2S: North Side

Runoff = 2.54 cfs @ 12.09 hrs, Volume= 0.181 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YEAR STORM Rainfall=8.58"

Area (sf)	CN	Description
283	98	Roofs, HSG A
10,398	98	Paved parking, HSG A
11,554	32	Woods/grass comb., Good, HSG A
22,235	64	Weighted Average
11,554		51.96% Pervious Area
10,681		48.04% Impervious Area

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

Summary for Link POA 1: City System

Inflow Area = 0.444 ac, 78.72% Impervious, Inflow Depth = 6.77" for 50 YEAR STORM event
Inflow = 3.38 cfs @ 12.08 hrs, Volume= 0.251 af
Primary = 3.38 cfs @ 12.08 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 2: North East

Inflow Area = 0.510 ac, 48.04% Impervious, Inflow Depth = 4.25" for 50 YEAR STORM event
Inflow = 2.54 cfs @ 12.09 hrs, Volume= 0.181 af
Primary = 2.54 cfs @ 12.09 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 62.31% Impervious, Inflow Depth = 5.42" for 50 YEAR STORM event
Inflow = 5.92 cfs @ 12.09 hrs, Volume= 0.431 af
Primary = 5.92 cfs @ 12.09 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.094	39	>75% Grass cover, Good, HSG A (1S)
0.534	98	Paved parking, HSG A (1S, 2S)
0.061	98	Roofs, HSG A (1S, 2S)
0.265	32	Woods/grass comb., Good, HSG A (2S)
0.954	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.954	HSG A	1S, 2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.954		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.094	0.000	0.000	0.000	0.000	0.094	>75% Grass cover, Good	1S
0.534	0.000	0.000	0.000	0.000	0.534	Paved parking	1S, 2S
0.061	0.000	0.000	0.000	0.000	0.061	Roofs	1S, 2S
0.265	0.000	0.000	0.000	0.000	0.265	Woods/grass comb., Good	2S
0.954	**0.000**	**0.000**	**0.000**	**0.000**	**0.954**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: South Side Runoff Area=19,336 sf 78.72% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=85 Runoff=2.04 cfs 0.147 af

Subcatchment 2S: North Side Runoff Area=22,235 sf 48.04% Impervious Runoff Depth=2.02"
Tc=6.0 min CN=64 Runoff=1.16 cfs 0.086 af

Link POA 1: City System Inflow=2.04 cfs 0.147 af
Primary=2.04 cfs 0.147 af

Link POA 2: North East Inflow=1.16 cfs 0.086 af
Primary=1.16 cfs 0.086 af

Link POA 3: Combined Inflow=3.20 cfs 0.233 af
Primary=3.20 cfs 0.233 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.233 af Average Runoff Depth = 2.93"
37.69% Pervious = 0.360 ac 62.31% Impervious = 0.595 ac

Summary for Subcatchment 1S: South Side

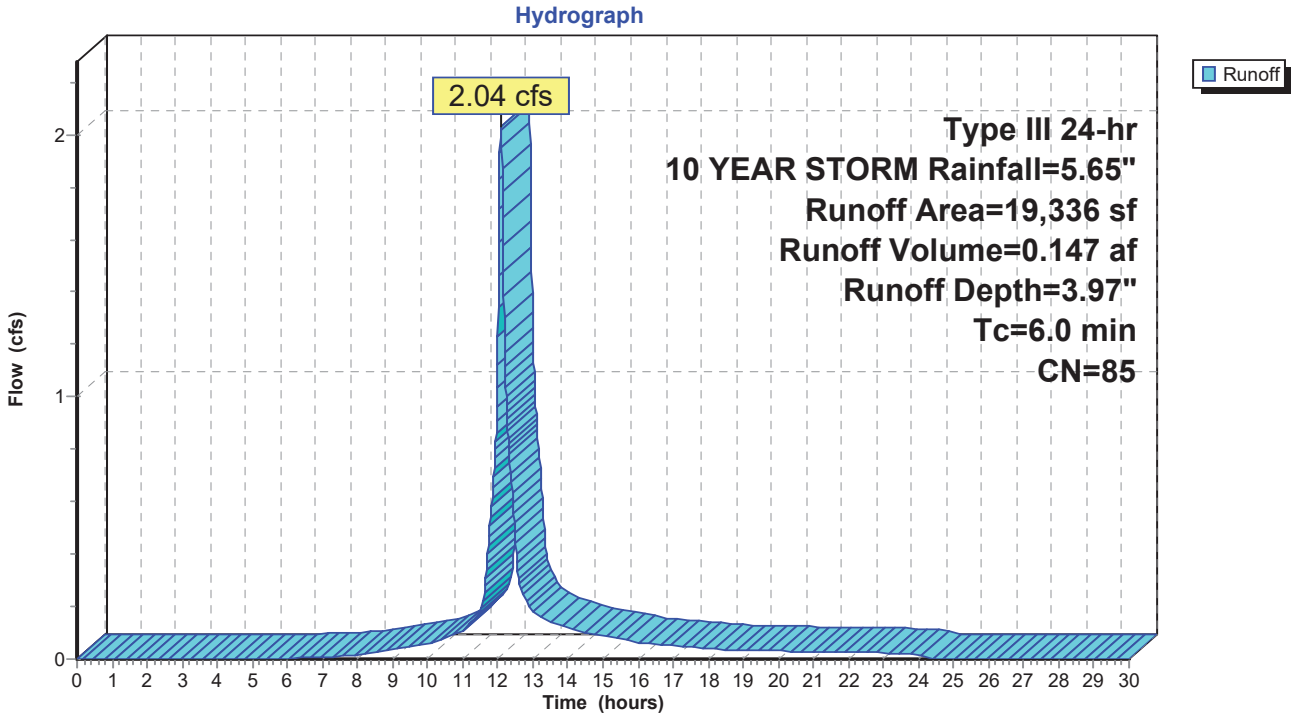
Runoff = 2.04 cfs @ 12.09 hrs, Volume= 0.147 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
2,378	98	Roofs, HSG A
12,844	98	Paved parking, HSG A
4,114	39	>75% Grass cover, Good, HSG A
19,336	85	Weighted Average
4,114		21.28% Pervious Area
15,222		78.72% Impervious Area

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

Subcatchment 1S: South Side



Summary for Subcatchment 2S: North Side

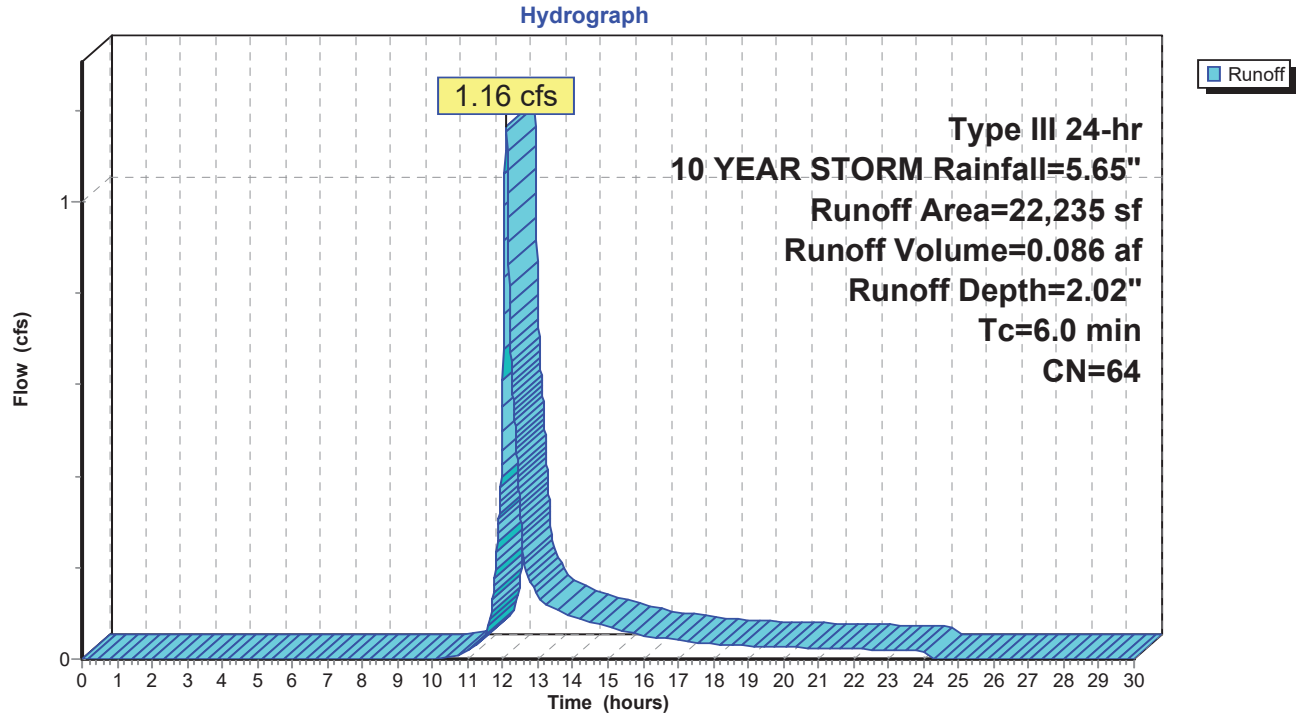
Runoff = 1.16 cfs @ 12.09 hrs, Volume= 0.086 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
283	98	Roofs, HSG A
10,398	98	Paved parking, HSG A
11,554	32	Woods/grass comb., Good, HSG A
22,235	64	Weighted Average
11,554		51.96% Pervious Area
10,681		48.04% Impervious Area

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

Subcatchment 2S: North Side

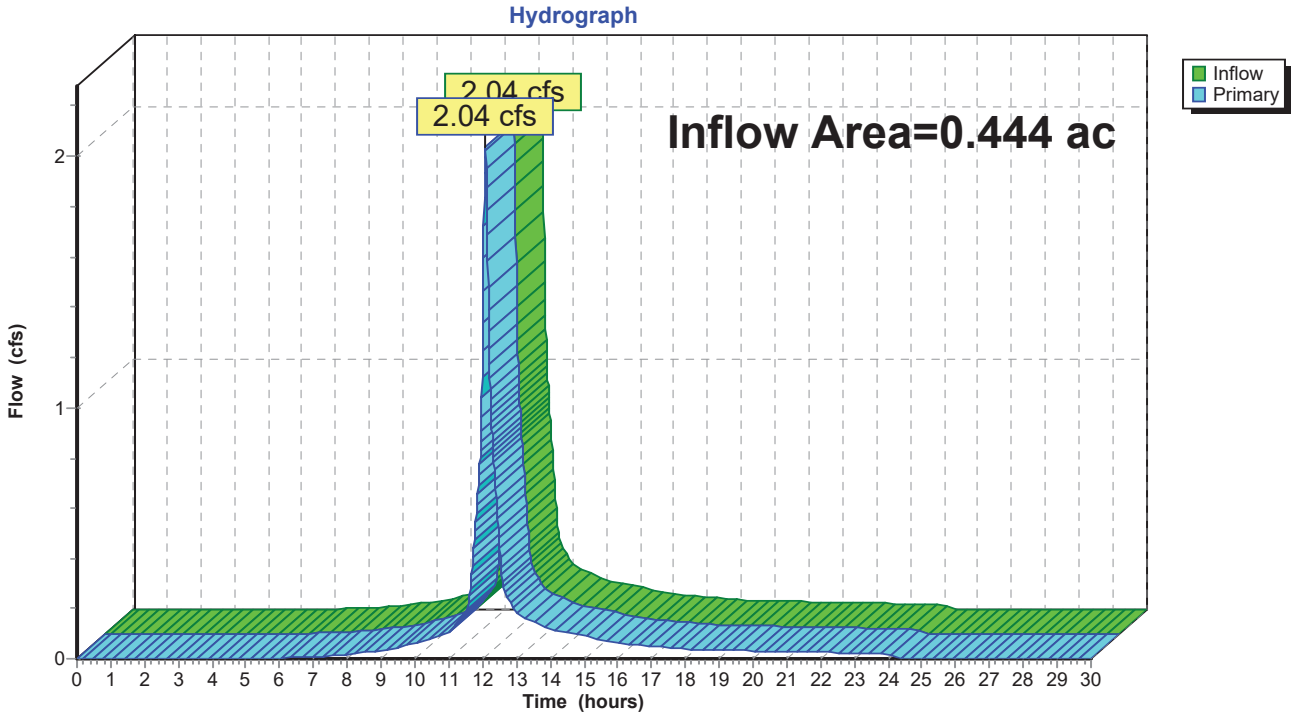


Summary for Link POA 1: City System

Inflow Area = 0.444 ac, 78.72% Impervious, Inflow Depth = 3.97" for 10 YEAR STORM event
Inflow = 2.04 cfs @ 12.09 hrs, Volume= 0.147 af
Primary = 2.04 cfs @ 12.09 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 1: City System

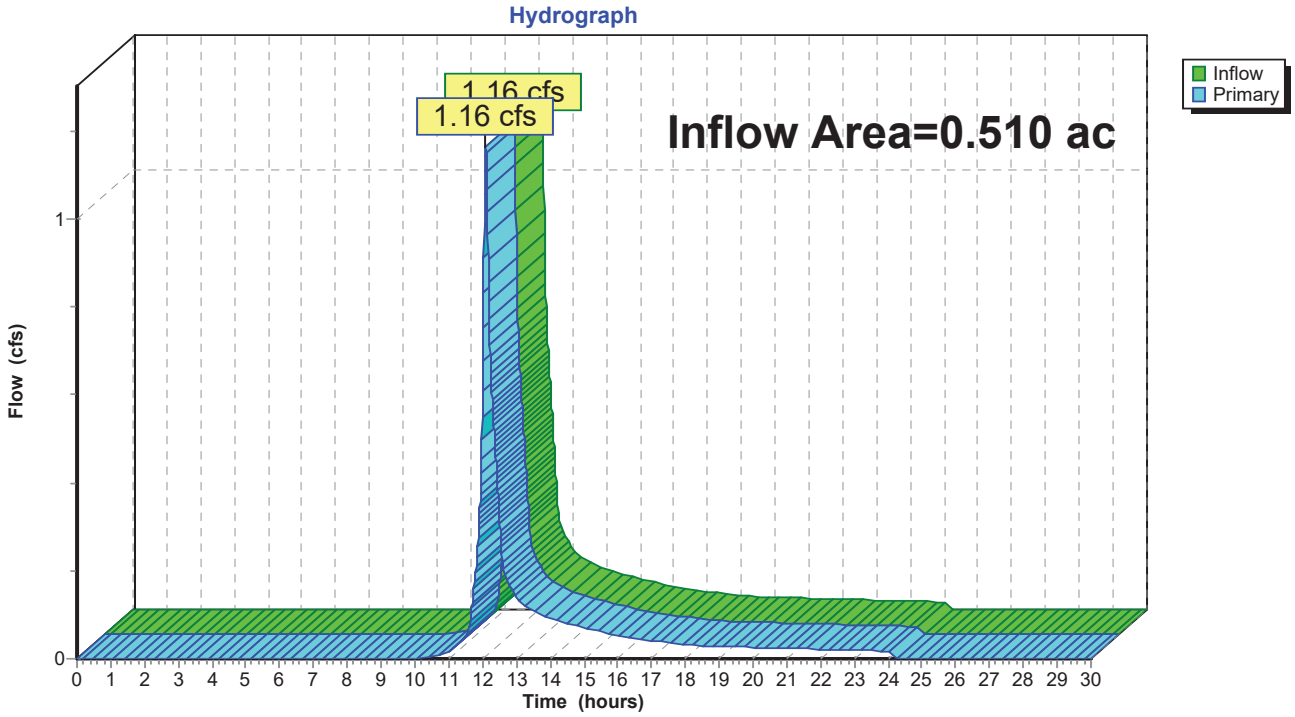


Summary for Link POA 2: North East

Inflow Area = 0.510 ac, 48.04% Impervious, Inflow Depth = 2.02" for 10 YEAR STORM event
Inflow = 1.16 cfs @ 12.09 hrs, Volume= 0.086 af
Primary = 1.16 cfs @ 12.09 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 2: North East

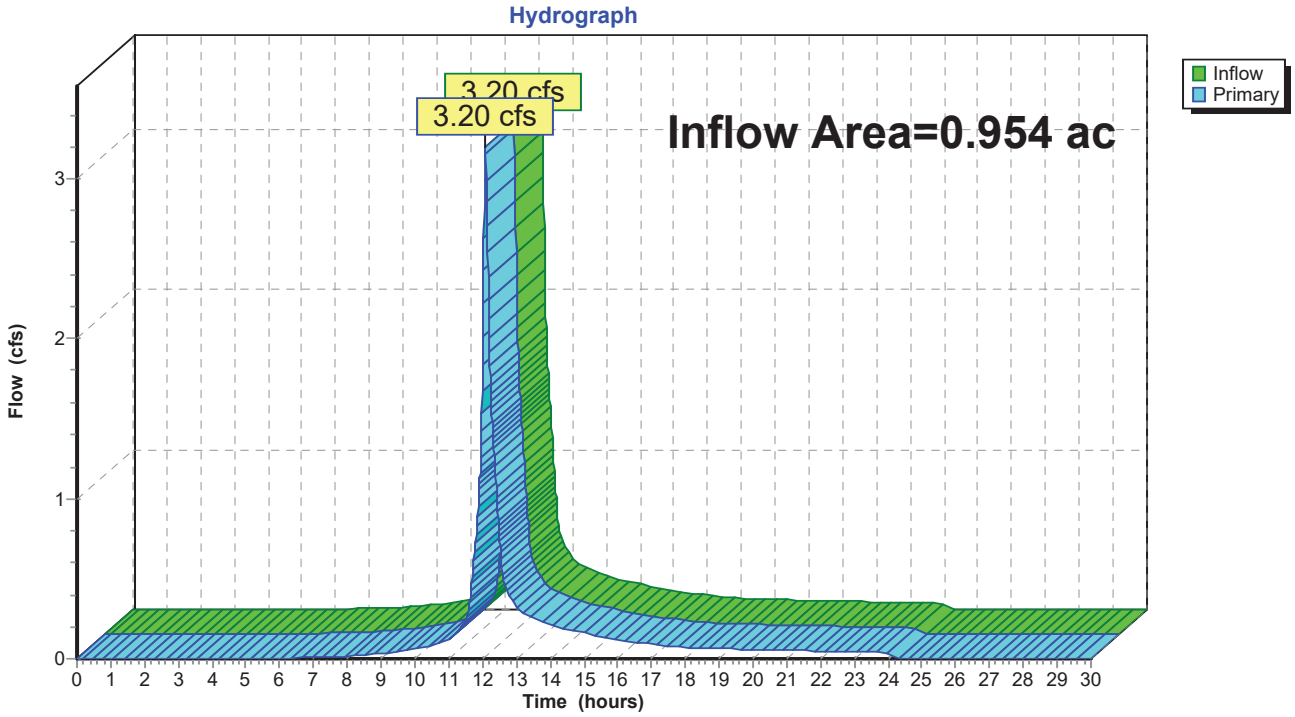


Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 62.31% Impervious, Inflow Depth = 2.93" for 10 YEAR STORM event
Inflow = 3.20 cfs @ 12.09 hrs, Volume= 0.233 af
Primary = 3.20 cfs @ 12.09 hrs, Volume= 0.233 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 3: Combined



Section 4

Drainage Calculations

Post-Development, On Site
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary
50-Year, 24-Hour Summary

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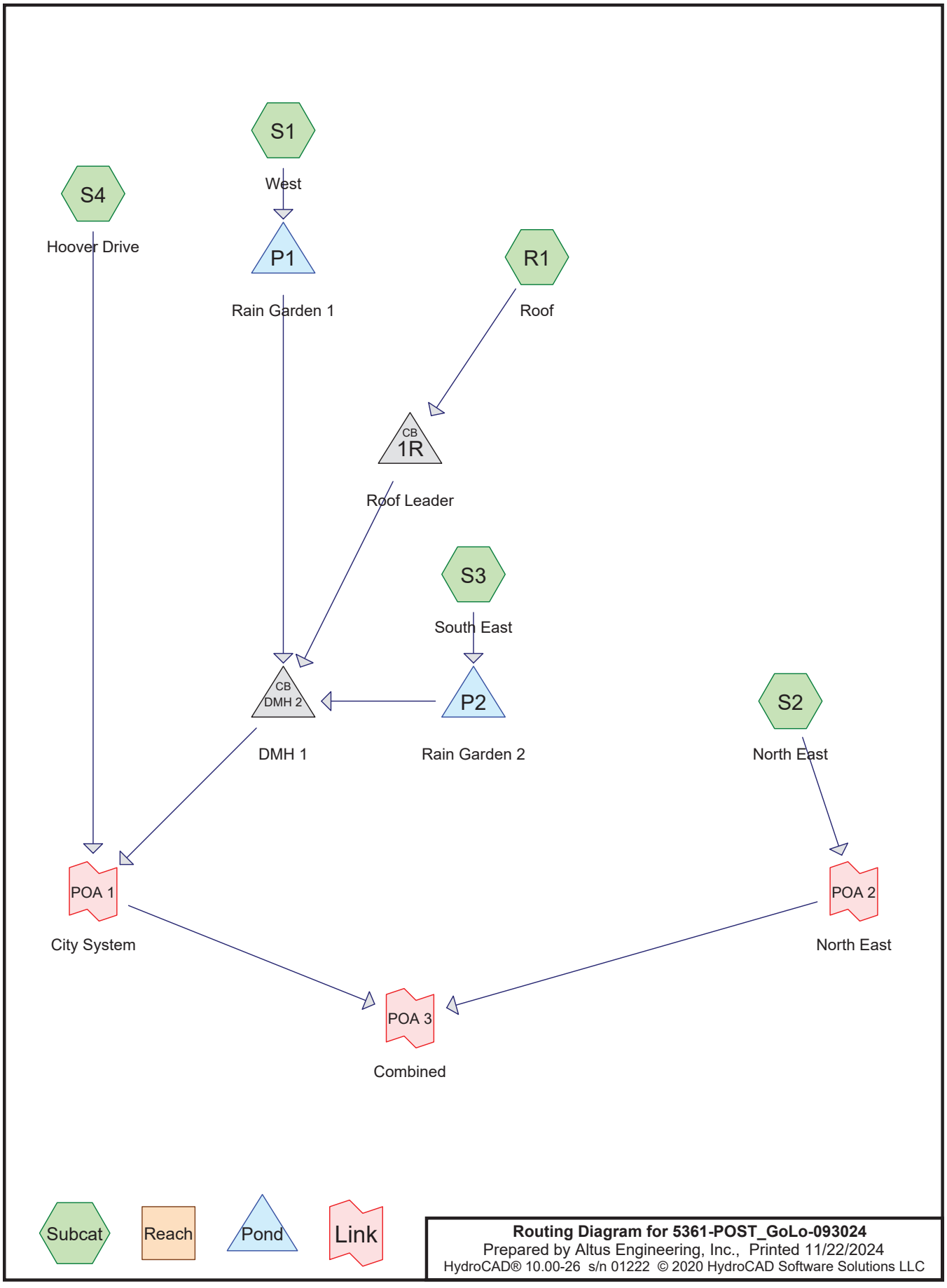


Routing Diagram for 5361-POST_GoLo-093024
Prepared by Altus Engineering, Inc., Printed 11/22/2024

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 R1: Roof Runoff Area=6,971 sf 100.00% Impervious Runoff Depth=3.48"
Tc=6.0 min CN=98 Runoff=0.58 cfs 0.046 af

Subcatchment S1: West Runoff Area=16,690 sf 57.87% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=73 Runoff=0.57 cfs 0.042 af

Subcatchment S2: North East Runoff Area=4,915 sf 0.00% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=37 Runoff=0.00 cfs 0.000 af

Subcatchment S3: South East Runoff Area=7,415 sf 37.45% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=61 Runoff=0.10 cfs 0.010 af

Subcatchment S4: Hoover Drive Runoff Area=5,580 sf 77.38% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=85 Runoff=0.33 cfs 0.023 af

Pond 1R: Roof Leader Peak Elev=53.34' Inflow=0.58 cfs 0.046 af
8.0" Round Culvert n=0.012 L=51.0' S=0.0098 '/' Outflow=0.58 cfs 0.046 af

Pond DMH 2: DMH 1 Peak Elev=52.35' Inflow=0.60 cfs 0.097 af
12.0" Round Culvert n=0.012 L=35.0' S=0.0389 '/' Outflow=0.60 cfs 0.097 af

Pond P1: Rain Garden 1 Peak Elev=57.45' Storage=1,541 cf Inflow=0.57 cfs 0.042 af
Outflow=0.05 cfs 0.041 af

Pond P2: Rain Garden 2 Peak Elev=54.79' Storage=301 cf Inflow=0.10 cfs 0.010 af
Outflow=0.01 cfs 0.009 af

Link POA 1: City System Inflow=0.93 cfs 0.120 af
Primary=0.93 cfs 0.120 af

Link POA 2: North East Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA 3: Combined Inflow=0.93 cfs 0.120 af
Primary=0.93 cfs 0.120 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.122 af Average Runoff Depth = 1.53"
42.93% Pervious = 0.410 ac 57.07% Impervious = 0.545 ac

Summary for Subcatchment R1: Roof

Runoff = 0.58 cfs @ 12.08 hrs, Volume= 0.046 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.71"

Area (sf)	CN	Description
6,971	98	Roofs, HSG A
6,971		100.00% Impervious Area

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

Summary for Subcatchment S1: West

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.71"

Area (sf)	CN	Description
9,659	98	Paved parking, HSG A
7,031	39	>75% Grass cover, Good, HSG A
16,690	73	Weighted Average
7,031		42.13% Pervious Area
9,659		57.87% Impervious Area

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

Summary for Subcatchment S2: North East

Runoff = 0.00 cfs @ 23.34 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.71"

Area (sf)	CN	Description
3,353	39	>75% Grass cover, Good, HSG A
1,562	32	Woods/grass comb., Good, HSG A
4,915	37	Weighted Average
4,915		100.00% Pervious Area

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

Summary for Subcatchment S3: South East

Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.010 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.71"

Area (sf)	CN	Description
2,777	98	Paved parking, HSG A
4,638	39	>75% Grass cover, Good, HSG A
7,415	61	Weighted Average
4,638		62.55% Pervious Area
2,777		37.45% Impervious Area

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

Summary for Subcatchment S4: Hoover Drive

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.71"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG A
1,262	39	>75% Grass cover, Good, HSG A
5,580	85	Weighted Average
1,262		22.62% Pervious Area
4,318		77.38% Impervious Area

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

Summary for Pond 1R: Roof Leader

Inflow Area = 0.160 ac,100.00% Impervious, Inflow Depth = 3.48" for 2 YEAR STORM event
Inflow = 0.58 cfs @ 12.08 hrs, Volume= 0.046 af
Outflow = 0.58 cfs @ 12.08 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
Primary = 0.58 cfs @ 12.08 hrs, Volume= 0.046 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 53.34' @ 12.08 hrs
Flood Elev= 56.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.89'	**8.0" Round Culvert** L= 51.0' Ke= 0.500 Inlet / Outlet Invert= 52.89' / 52.39' S= 0.0098 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.58 cfs @ 12.08 hrs HW=53.34' TW=52.35' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.58 cfs @ 3.22 fps)

Summary for Pond DMH 2: DMH 1

Inflow Area = 0.713 ac, 62.45% Impervious, Inflow Depth > 1.63" for 2 YEAR STORM event
Inflow = 0.60 cfs @ 12.09 hrs, Volume= 0.097 af
Outflow = 0.60 cfs @ 12.09 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
Primary = 0.60 cfs @ 12.09 hrs, Volume= 0.097 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 52.35' @ 12.09 hrs
Flood Elev= 55.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.96'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.96' / 50.60' S= 0.0389 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.09 hrs HW=52.35' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.60 cfs @ 2.13 fps)

Summary for Pond P1: Rain Garden 1

Inflow Area = 0.383 ac, 57.87% Impervious, Inflow Depth = 1.32" for 2 YEAR STORM event
Inflow = 0.57 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.05 cfs @ 13.73 hrs, Volume= 0.041 af, Atten= 91%, Lag= 98.3 min
Primary = 0.05 cfs @ 13.73 hrs, Volume= 0.041 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 57.00' Surf.Area= 1,462 sf Storage= 694 cf
Peak Elev= 57.45' @ 13.73 hrs Surf.Area= 2,328 sf Storage= 1,541 cf (847 cf above start)
Flood Elev= 58.00' Surf.Area= 3,400 sf Storage= 3,125 cf (2,431 cf above start)

Plug-Flow detention time= 510.1 min calculated for 0.025 af (59% of inflow)
Center-of-Mass det. time= 233.0 min (1,089.2 - 856.2)

Volume	Invert	Avail.Storage	Storage Description
#1	54.50'	3,125 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.50	1,462	0.0	0	0
55.50	1,462	40.0	585	585
57.00	1,462	5.0	110	694
58.00	3,400	100.0	2,431	3,125

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**12.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.0048 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	57.00'	**2.500 in/hr Exfiltration over Surface area above 57.00'** Excluded Surface area = 1,462 sf Phase-In= 0.01'
#4	Device 1	57.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 13.73 hrs HW=57.45' TW=52.11' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.05 cfs of 4.76 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.05 cfs of 0.70 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.05 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond P2: Rain Garden 2

Inflow Area = 0.170 ac, 37.45% Impervious, Inflow Depth = 0.67" for 2 YEAR STORM event
Inflow = 0.10 cfs @ 12.11 hrs, Volume= 0.010 af
Outflow = 0.01 cfs @ 13.61 hrs, Volume= 0.009 af, Atten= 86%, Lag= 90.1 min
Primary = 0.01 cfs @ 13.61 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 54.50' Surf.Area= 347 sf Storage= 165 cf
Peak Elev= 54.79' @ 13.61 hrs Surf.Area= 590 sf Storage= 301 cf (136 cf above start)
Flood Elev= 55.50' Surf.Area= 1,714 sf Storage= 1,064 cf (899 cf above start)

Plug-Flow detention time= 415.7 min calculated for 0.006 af (60% of inflow)
Center-of-Mass det. time= 143.8 min (1,041.6 - 897.8)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	1,064 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	347	0.0	0	0
53.00	347	40.0	139	139
54.50	347	5.0	26	165
55.00	767	100.0	279	443
55.50	1,714	100.0	620	1,064

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.00' / 51.96' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	52.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	54.50'	**2.500 in/hr Exfiltration over Surface area above 54.50'** Excluded Surface area = 347 sf Phase-In= 0.01'
#4	Device 1	55.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 13.61 hrs HW=54.79' TW=52.11' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.01 cfs of 5.72 cfs potential flow)
- **2=Orifice/Grate** (Passes 0.01 cfs of 0.68 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.01 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link POA 1: City System

Inflow Area = 0.842 ac, 64.72% Impervious, Inflow Depth > 1.71" for 2 YEAR STORM event
Inflow = 0.93 cfs @ 12.09 hrs, Volume= 0.120 af
Primary = 0.93 cfs @ 12.09 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 2: North East

Inflow Area = 0.113 ac, 0.00% Impervious, Inflow Depth = 0.01" for 2 YEAR STORM event
Inflow = 0.00 cfs @ 23.34 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 23.34 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 57.07% Impervious, Inflow Depth > 1.51" for 2 YEAR STORM event
Inflow = 0.93 cfs @ 12.09 hrs, Volume= 0.120 af
Primary = 0.93 cfs @ 12.09 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 R1: Roof Runoff Area=6,971 sf 100.00% Impervious Runoff Depth=6.92"
Tc=6.0 min CN=98 Runoff=1.12 cfs 0.092 af

Subcatchment S1: West Runoff Area=16,690 sf 57.87% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=73 Runoff=1.83 cfs 0.130 af

Subcatchment S2: North East Runoff Area=4,915 sf 0.00% Impervious Runoff Depth=0.68"
Tc=6.0 min CN=37 Runoff=0.04 cfs 0.006 af

Subcatchment S3: South East Runoff Area=7,415 sf 37.45% Impervious Runoff Depth=2.82"
Tc=6.0 min CN=61 Runoff=0.55 cfs 0.040 af

Subcatchment S4: Hoover Drive Runoff Area=5,580 sf 77.38% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=85 Runoff=0.79 cfs 0.058 af

Pond 1R: Roof Leader Peak Elev=53.67' Inflow=1.12 cfs 0.092 af
8.0" Round Culvert n=0.012 L=51.0' S=0.0098 '/' Outflow=1.12 cfs 0.092 af

Pond DMH 2: DMH 1 Peak Elev=53.04' Inflow=2.89 cfs 0.259 af
12.0" Round Culvert n=0.012 L=35.0' S=0.0389 '/' Outflow=2.89 cfs 0.259 af

Pond P1: Rain Garden 1 Peak Elev=57.67' Storage=2,099 cf Inflow=1.83 cfs 0.130 af
Outflow=1.47 cfs 0.127 af

Pond P2: Rain Garden 2 Peak Elev=55.08' Storage=509 cf Inflow=0.55 cfs 0.040 af
Outflow=0.48 cfs 0.040 af

Link POA 1: City System Inflow=3.61 cfs 0.317 af
Primary=3.61 cfs 0.317 af

Link POA 2: North East Inflow=0.04 cfs 0.006 af
Primary=0.04 cfs 0.006 af

Link POA 3: Combined Inflow=3.64 cfs 0.323 af
Primary=3.64 cfs 0.323 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.326 af Average Runoff Depth = 4.10"
42.93% Pervious = 0.410 ac 57.07% Impervious = 0.545 ac

Summary for Subcatchment R1: Roof

Runoff = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
6,971	98	Roofs, HSG A
6,971		100.00% Impervious Area

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

Summary for Subcatchment S1: West

Runoff = 1.83 cfs @ 12.09 hrs, Volume= 0.130 af, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
9,659	98	Paved parking, HSG A
7,031	39	>75% Grass cover, Good, HSG A
16,690	73	Weighted Average
7,031		42.13% Pervious Area
9,659		57.87% Impervious Area

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

Summary for Subcatchment S2: North East

Runoff = 0.04 cfs @ 12.29 hrs, Volume= 0.006 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
3,353	39	>75% Grass cover, Good, HSG A
1,562	32	Woods/grass comb., Good, HSG A
4,915	37	Weighted Average
4,915		100.00% Pervious Area

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

Summary for Subcatchment S3: South East

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
2,777	98	Paved parking, HSG A
4,638	39	>75% Grass cover, Good, HSG A
7,415	61	Weighted Average
4,638		62.55% Pervious Area
2,777		37.45% Impervious Area

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

Summary for Subcatchment S4: Hoover Drive

Runoff = 0.79 cfs @ 12.09 hrs, Volume= 0.058 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG A
1,262	39	>75% Grass cover, Good, HSG A
5,580	85	Weighted Average
1,262		22.62% Pervious Area
4,318		77.38% Impervious Area

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

Summary for Pond 1R: Roof Leader

Inflow Area = 0.160 ac,100.00% Impervious, Inflow Depth = 6.92" for 25 YEAR STORM event
Inflow = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af
Outflow = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Primary = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 53.67' @ 12.08 hrs
Flood Elev= 56.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.89'	**8.0" Round Culvert** L= 51.0' Ke= 0.500 Inlet / Outlet Invert= 52.89' / 52.39' S= 0.0098 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=1.12 cfs @ 12.08 hrs HW=53.67' TW=52.89' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.12 cfs @ 3.22 fps)

Summary for Pond DMH 2: DMH 1

Inflow Area = 0.713 ac, 62.45% Impervious, Inflow Depth > 4.36" for 25 YEAR STORM event
Inflow = 2.89 cfs @ 12.13 hrs, Volume= 0.259 af
Outflow = 2.89 cfs @ 12.13 hrs, Volume= 0.259 af, Atten= 0%, Lag= 0.0 min
Primary = 2.89 cfs @ 12.13 hrs, Volume= 0.259 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.04' @ 12.13 hrs
Flood Elev= 55.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.96'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.96' / 50.60' S= 0.0389 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.88 cfs @ 12.13 hrs HW=53.04' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.88 cfs @ 3.67 fps)

Summary for Pond P1: Rain Garden 1

Inflow Area = 0.383 ac, 57.87% Impervious, Inflow Depth = 4.07" for 25 YEAR STORM event
Inflow = 1.83 cfs @ 12.09 hrs, Volume= 0.130 af
Outflow = 1.47 cfs @ 12.15 hrs, Volume= 0.127 af, Atten= 20%, Lag= 3.6 min
Primary = 1.47 cfs @ 12.15 hrs, Volume= 0.127 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 57.00' Surf.Area= 1,462 sf Storage= 694 cf
Peak Elev= 57.67' @ 12.15 hrs Surf.Area= 2,754 sf Storage= 2,099 cf (1,405 cf above start)
Flood Elev= 58.00' Surf.Area= 3,400 sf Storage= 3,125 cf (2,431 cf above start)

Plug-Flow detention time= 217.0 min calculated for 0.111 af (85% of inflow)
Center-of-Mass det. time= 120.2 min (943.4 - 823.2)

Volume	Invert	Avail.Storage	Storage Description
#1	54.50'	3,125 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.50	1,462	0.0	0	0
55.50	1,462	40.0	585	585
57.00	1,462	5.0	110	694
58.00	3,400	100.0	2,431	3,125

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**12.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.0048 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	57.00'	**2.500 in/hr Exfiltration over Surface area above 57.00'** Excluded Surface area = 1,462 sf Phase-In= 0.01'
#4	Device 1	57.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.47 cfs @ 12.15 hrs HW=57.67' TW=53.01' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.47 cfs of 4.97 cfs potential flow)
- **2=Orifice/Grate** (Passes 0.07 cfs of 0.73 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.07 cfs)
- **4=Orifice/Grate** (Weir Controls 1.39 cfs @ 1.33 fps)

Summary for Pond P2: Rain Garden 2

Inflow Area = 0.170 ac, 37.45% Impervious, Inflow Depth = 2.82" for 25 YEAR STORM event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.040 af
Outflow = 0.48 cfs @ 12.14 hrs, Volume= 0.040 af, Atten= 13%, Lag= 2.9 min
Primary = 0.48 cfs @ 12.14 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 54.50' Surf.Area= 347 sf Storage= 165 cf
Peak Elev= 55.08' @ 12.14 hrs Surf.Area= 914 sf Storage= 509 cf (344 cf above start)
Flood Elev= 55.50' Surf.Area= 1,714 sf Storage= 1,064 cf (899 cf above start)

Plug-Flow detention time= 173.0 min calculated for 0.036 af (90% of inflow)
Center-of-Mass det. time= 100.5 min (950.4 - 849.9)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	1,064 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	347	0.0	0	0
53.00	347	40.0	139	139
54.50	347	5.0	26	165
55.00	767	100.0	279	443
55.50	1,714	100.0	620	1,064

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.00' / 51.96' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	52.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	54.50'	**2.500 in/hr Exfiltration over Surface area above 54.50'** Excluded Surface area = 347 sf Phase-In= 0.01'
#4	Device 1	55.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.48 cfs @ 12.14 hrs HW=55.08' TW=53.03' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.48 cfs of 5.41 cfs potential flow)
- **2=Orifice/Grate** (Passes 0.03 cfs of 0.60 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.03 cfs)
- **4=Orifice/Grate** (Weir Controls 0.44 cfs @ 0.91 fps)

Summary for Link POA 1: City System

Inflow Area = 0.842 ac, 64.72% Impervious, Inflow Depth > 4.52" for 25 YEAR STORM event
Inflow = 3.61 cfs @ 12.12 hrs, Volume= 0.317 af
Primary = 3.61 cfs @ 12.12 hrs, Volume= 0.317 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 2: North East

Inflow Area = 0.113 ac, 0.00% Impervious, Inflow Depth = 0.68" for 25 YEAR STORM event
Inflow = 0.04 cfs @ 12.29 hrs, Volume= 0.006 af
Primary = 0.04 cfs @ 12.29 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 57.07% Impervious, Inflow Depth > 4.06" for 25 YEAR STORM event
Inflow = 3.64 cfs @ 12.12 hrs, Volume= 0.323 af
Primary = 3.64 cfs @ 12.12 hrs, Volume= 0.323 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 R1: Roof Runoff Area=6,971 sf 100.00% Impervious Runoff Depth=8.34"
Tc=6.0 min CN=98 Runoff=1.35 cfs 0.111 af

Subcatchment S1: West Runoff Area=16,690 sf 57.87% Impervious Runoff Depth=5.33"
Tc=6.0 min CN=73 Runoff=2.39 cfs 0.170 af

Subcatchment S2: North East Runoff Area=4,915 sf 0.00% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=37 Runoff=0.10 cfs 0.011 af

Subcatchment S3: South East Runoff Area=7,415 sf 37.45% Impervious Runoff Depth=3.89"
Tc=6.0 min CN=61 Runoff=0.77 cfs 0.055 af

Subcatchment S4: Hoover Drive Runoff Area=5,580 sf 77.38% Impervious Runoff Depth=6.77"
Tc=6.0 min CN=85 Runoff=0.98 cfs 0.072 af

Pond 1R: Roof Leader Peak Elev=54.37' Inflow=1.35 cfs 0.111 af
8.0" Round Culvert n=0.012 L=51.0' S=0.0098 '/' Outflow=1.35 cfs 0.111 af

Pond DMH 2: DMH 1 Peak Elev=53.59' Inflow=4.01 cfs 0.333 af
12.0" Round Culvert n=0.012 L=35.0' S=0.0389 '/' Outflow=4.01 cfs 0.333 af

Pond P1: Rain Garden 1 Peak Elev=57.71' Storage=2,222 cf Inflow=2.39 cfs 0.170 af
Outflow=2.06 cfs 0.166 af

Pond P2: Rain Garden 2 Peak Elev=55.10' Storage=534 cf Inflow=0.77 cfs 0.055 af
Outflow=0.73 cfs 0.055 af

Link POA 1: City System Inflow=4.95 cfs 0.405 af
Primary=4.95 cfs 0.405 af

Link POA 2: North East Inflow=0.10 cfs 0.011 af
Primary=0.10 cfs 0.011 af

Link POA 3: Combined Inflow=5.04 cfs 0.416 af
Primary=5.04 cfs 0.416 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.420 af Average Runoff Depth = 5.28"
42.93% Pervious = 0.410 ac 57.07% Impervious = 0.545 ac

Summary for Subcatchment R1: Roof

Runoff = 1.35 cfs @ 12.08 hrs, Volume= 0.111 af, Depth= 8.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YEAR STORM Rainfall=8.58"

Area (sf)	CN	Description
6,971	98	Roofs, HSG A
6,971		100.00% Impervious Area

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

Summary for Subcatchment S1: West

Runoff = 2.39 cfs @ 12.09 hrs, Volume= 0.170 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YEAR STORM Rainfall=8.58"

Area (sf)	CN	Description
9,659	98	Paved parking, HSG A
7,031	39	>75% Grass cover, Good, HSG A
16,690	73	Weighted Average
7,031		42.13% Pervious Area
9,659		57.87% Impervious Area

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

Summary for Subcatchment S2: North East

Runoff = 0.10 cfs @ 12.12 hrs, Volume= 0.011 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YEAR STORM Rainfall=8.58"

Area (sf)	CN	Description
3,353	39	>75% Grass cover, Good, HSG A
1,562	32	Woods/grass comb., Good, HSG A
4,915	37	Weighted Average
4,915		100.00% Pervious Area

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

Summary for Subcatchment S3: South East

Runoff = 0.77 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YEAR STORM Rainfall=8.58"

Area (sf)	CN	Description
2,777	98	Paved parking, HSG A
4,638	39	>75% Grass cover, Good, HSG A
7,415	61	Weighted Average
4,638		62.55% Pervious Area
2,777		37.45% Impervious Area

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

Summary for Subcatchment S4: Hoover Drive

Runoff = 0.98 cfs @ 12.08 hrs, Volume= 0.072 af, Depth= 6.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YEAR STORM Rainfall=8.58"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG A
1,262	39	>75% Grass cover, Good, HSG A
5,580	85	Weighted Average
1,262		22.62% Pervious Area
4,318		77.38% Impervious Area

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

Summary for Pond 1R: Roof Leader

Inflow Area = 0.160 ac,100.00% Impervious, Inflow Depth = 8.34" for 50 YEAR STORM event
Inflow = 1.35 cfs @ 12.08 hrs, Volume= 0.111 af
Outflow = 1.35 cfs @ 12.08 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min
Primary = 1.35 cfs @ 12.08 hrs, Volume= 0.111 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Peak Elev= 54.37' @ 12.10 hrs
Flood Elev= 56.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.89'	**8.0" Round Culvert** L= 51.0' Ke= 0.500 Inlet / Outlet Invert= 52.89' / 52.39' S= 0.0098 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=1.28 cfs @ 12.08 hrs HW=54.28' TW=53.47' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.28 cfs @ 3.67 fps)

Summary for Pond DMH 2: DMH 1

Inflow Area = 0.713 ac, 62.45% Impervious, Inflow Depth > 5.59" for 50 YEAR STORM event
Inflow = 4.01 cfs @ 12.11 hrs, Volume= 0.333 af
Outflow = 4.01 cfs @ 12.11 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min
Primary = 4.01 cfs @ 12.11 hrs, Volume= 0.333 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.59' @ 12.11 hrs
Flood Elev= 55.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.96'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.96' / 50.60' S= 0.0389 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.01 cfs @ 12.11 hrs HW=53.58' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 4.01 cfs @ 5.10 fps)

Summary for Pond P1: Rain Garden 1

Inflow Area = 0.383 ac, 57.87% Impervious, Inflow Depth = 5.33" for 50 YEAR STORM event
Inflow = 2.39 cfs @ 12.09 hrs, Volume= 0.170 af
Outflow = 2.06 cfs @ 12.13 hrs, Volume= 0.166 af, Atten= 14%, Lag= 2.8 min
Primary = 2.06 cfs @ 12.13 hrs, Volume= 0.166 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 57.00' Surf.Area= 1,462 sf Storage= 694 cf
Peak Elev= 57.71' @ 12.13 hrs Surf.Area= 2,839 sf Storage= 2,222 cf (1,528 cf above start)
Flood Elev= 58.00' Surf.Area= 3,400 sf Storage= 3,125 cf (2,431 cf above start)

Plug-Flow detention time= 176.8 min calculated for 0.150 af (88% of inflow)
Center-of-Mass det. time= 99.6 min (915.1 - 815.5)

Volume	Invert	Avail.Storage	Storage Description
#1	54.50'	3,125 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.50	1,462	0.0	0	0
55.50	1,462	40.0	585	585
57.00	1,462	5.0	110	694
58.00	3,400	100.0	2,431	3,125

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**12.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.0048 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	57.00'	**2.500 in/hr Exfiltration over Surface area above 57.00'** Excluded Surface area = 1,462 sf Phase-In= 0.01'
#4	Device 1	57.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.06 cfs @ 12.13 hrs HW=57.71' TW=53.53' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.06 cfs of 5.01 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.08 cfs of 0.73 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.08 cfs)
  - **4=Orifice/Grate** (Weir Controls 1.98 cfs @ 1.50 fps)

Summary for Pond P2: Rain Garden 2

Inflow Area = 0.170 ac, 37.45% Impervious, Inflow Depth = 3.89" for 50 YEAR STORM event
Inflow = 0.77 cfs @ 12.09 hrs, Volume= 0.055 af
Outflow = 0.73 cfs @ 12.12 hrs, Volume= 0.055 af, Atten= 5%, Lag= 1.6 min
Primary = 0.73 cfs @ 12.12 hrs, Volume= 0.055 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 54.50' Surf.Area= 347 sf Storage= 165 cf
Peak Elev= 55.10' @ 12.12 hrs Surf.Area= 966 sf Storage= 534 cf (369 cf above start)
Flood Elev= 55.50' Surf.Area= 1,714 sf Storage= 1,064 cf (899 cf above start)

Plug-Flow detention time= 135.6 min calculated for 0.051 af (93% of inflow)
Center-of-Mass det. time= 82.2 min (922.6 - 840.4)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	1,064 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	347	0.0	0	0
53.00	347	40.0	139	139
54.50	347	5.0	26	165
55.00	767	100.0	279	443
55.50	1,714	100.0	620	1,064

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.00' / 51.96' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	52.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	54.50'	**2.500 in/hr Exfiltration over Surface area above 54.50'** Excluded Surface area = 347 sf Phase-In= 0.01'
#4	Device 1	55.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.73 cfs @ 12.12 hrs HW=55.10' TW=53.58' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.73 cfs of 4.67 cfs potential flow)
- **2=Orifice/Grate** (Passes 0.04 cfs of 0.52 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.04 cfs)
- **4=Orifice/Grate** (Weir Controls 0.70 cfs @ 1.06 fps)

Summary for Link POA 1: City System

Inflow Area = 0.842 ac, 64.72% Impervious, Inflow Depth > 5.77" for 50 YEAR STORM event
Inflow = 4.95 cfs @ 12.11 hrs, Volume= 0.405 af
Primary = 4.95 cfs @ 12.11 hrs, Volume= 0.405 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 2: North East

Inflow Area = 0.113 ac, 0.00% Impervious, Inflow Depth = 1.21" for 50 YEAR STORM event
Inflow = 0.10 cfs @ 12.12 hrs, Volume= 0.011 af
Primary = 0.10 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 57.07% Impervious, Inflow Depth > 5.23" for 50 YEAR STORM event
Inflow = 5.04 cfs @ 12.11 hrs, Volume= 0.416 af
Primary = 5.04 cfs @ 12.11 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.374	39	>75% Grass cover, Good, HSG A (S1, S2, S3, S4)
0.385	98	Paved parking, HSG A (S1, S3, S4)
0.160	98	Roofs, HSG A (R1)
0.036	32	Woods/grass comb., Good, HSG A (S2)
0.954	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.954	HSG A	R1, S1, S2, S3, S4
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.954		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.374	0.000	0.000	0.000	0.000	0.374	>75% Grass cover, Good	S1, S2, S3, S4
0.385	0.000	0.000	0.000	0.000	0.385	Paved parking	S1, S3, S4
0.160	0.000	0.000	0.000	0.000	0.160	Roofs	R1
0.036	0.000	0.000	0.000	0.000	0.036	Woods/grass comb., Good	S2
0.954	**0.000**	**0.000**	**0.000**	**0.000**	**0.954**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 R1: Roof Runoff Area=6,971 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.89 cfs 0.072 af

Subcatchment S1: West Runoff Area=16,690 sf 57.87% Impervious Runoff Depth=2.80"
Tc=6.0 min CN=73 Runoff=1.26 cfs 0.089 af

Subcatchment S2: North East Runoff Area=4,915 sf 0.00% Impervious Runoff Depth=0.26"
Tc=6.0 min CN=37 Runoff=0.01 cfs 0.002 af

Subcatchment S3: South East Runoff Area=7,415 sf 37.45% Impervious Runoff Depth=1.78"
Tc=6.0 min CN=61 Runoff=0.33 cfs 0.025 af

Subcatchment S4: Hoover Drive Runoff Area=5,580 sf 77.38% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=85 Runoff=0.59 cfs 0.042 af

Pond 1R: Roof Leader Peak Elev=53.50' Inflow=0.89 cfs 0.072 af
8.0" Round Culvert n=0.012 L=51.0' S=0.0098 '/' Outflow=0.89 cfs 0.072 af

Pond DMH 2: DMH 1 Peak Elev=52.53' Inflow=1.20 cfs 0.184 af
12.0" Round Culvert n=0.012 L=35.0' S=0.0389 '/' Outflow=1.20 cfs 0.184 af

Pond P1: Rain Garden 1 Peak Elev=57.60' Storage=1,907 cf Inflow=1.26 cfs 0.089 af
Outflow=0.67 cfs 0.087 af

Pond P2: Rain Garden 2 Peak Elev=55.03' Storage=471 cf Inflow=0.33 cfs 0.025 af
Outflow=0.16 cfs 0.025 af

Link POA 1: City System Inflow=1.62 cfs 0.227 af
Primary=1.62 cfs 0.227 af

Link POA 2: North East Inflow=0.01 cfs 0.002 af
Primary=0.01 cfs 0.002 af

Link POA 3: Combined Inflow=1.62 cfs 0.229 af
Primary=1.62 cfs 0.229 af

Total Runoff Area = 0.954 ac Runoff Volume = 0.232 af Average Runoff Depth = 2.91"
42.93% Pervious = 0.410 ac 57.07% Impervious = 0.545 ac

Summary for Subcatchment R1: Roof

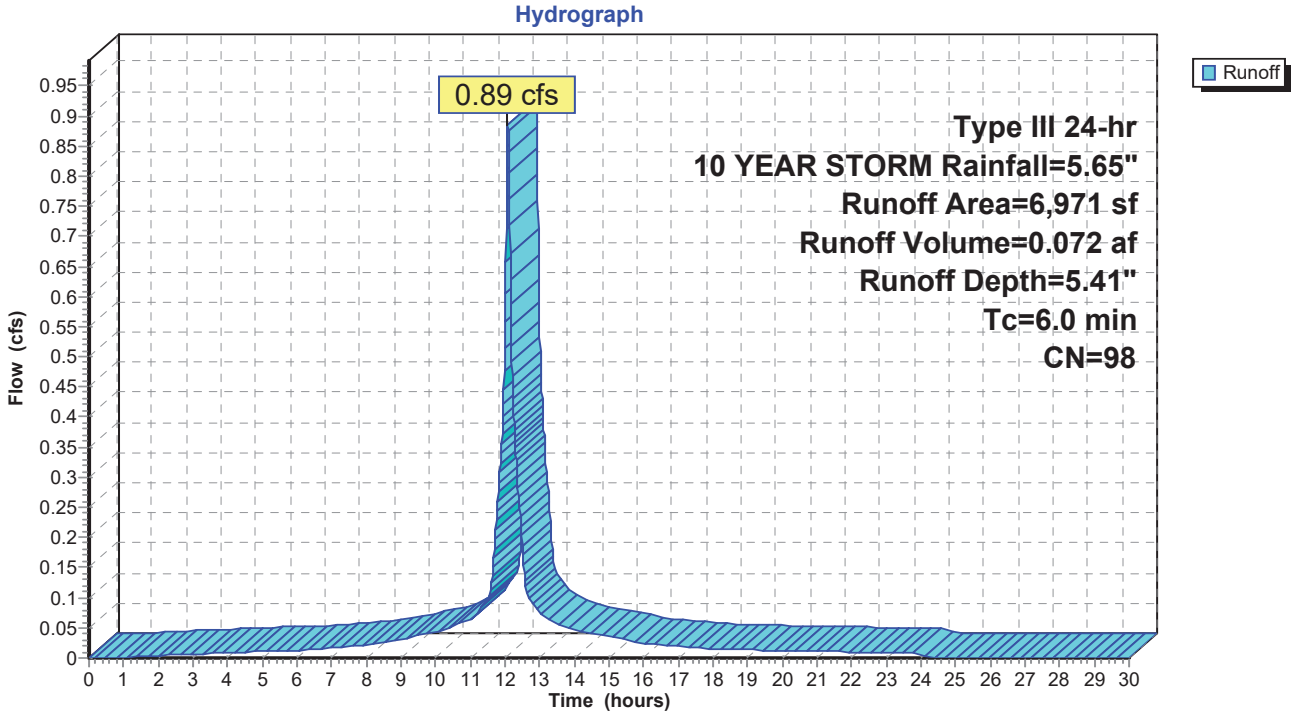
Runoff = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
6,971	98	Roofs, HSG A
6,971		100.00% Impervious Area

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

Subcatchment R1: Roof



Summary for Subcatchment S1: West

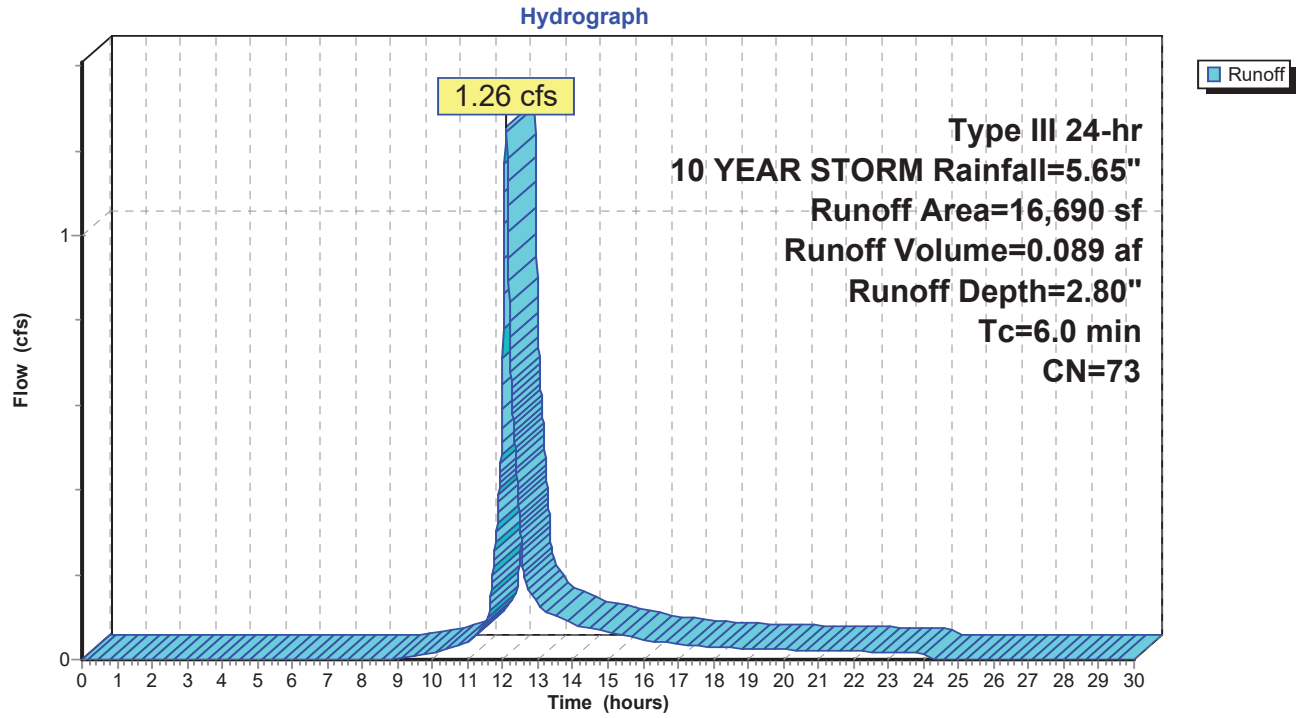
Runoff = 1.26 cfs @ 12.09 hrs, Volume= 0.089 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
9,659	98	Paved parking, HSG A
7,031	39	>75% Grass cover, Good, HSG A
16,690	73	Weighted Average
7,031		42.13% Pervious Area
9,659		57.87% Impervious Area

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

Subcatchment S1: West



Summary for Subcatchment S2: North East

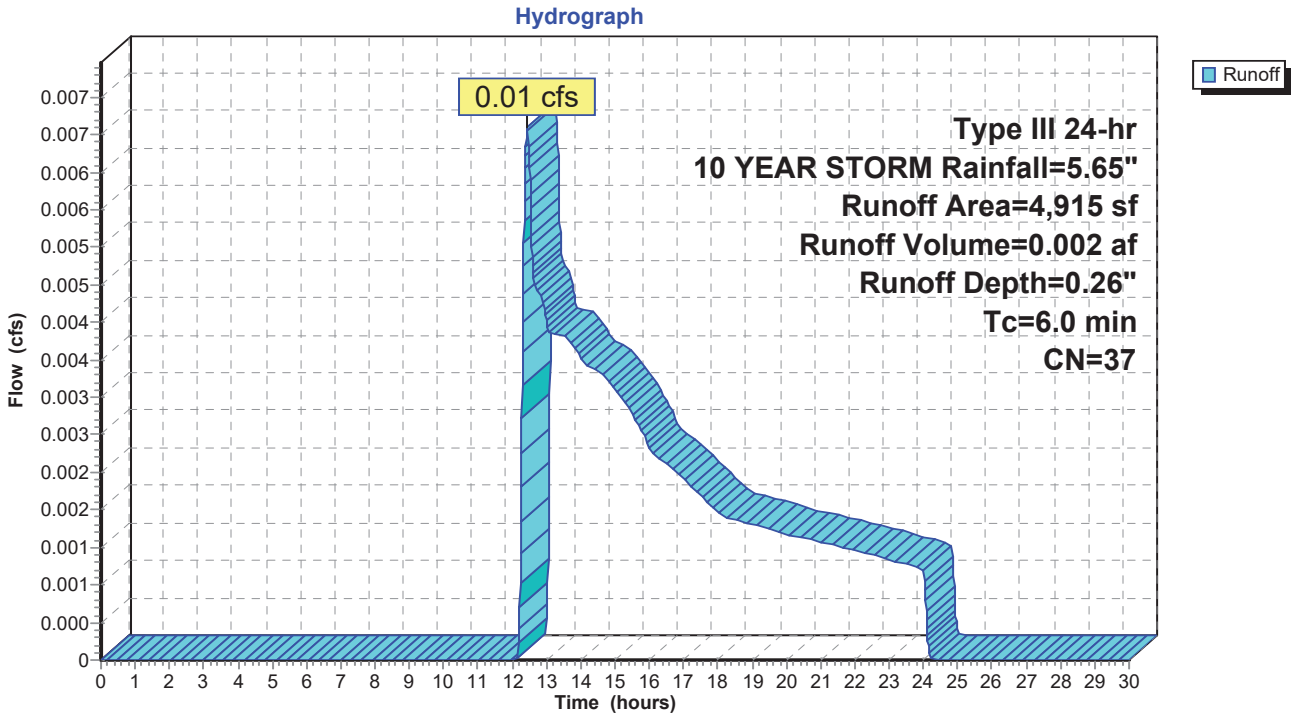
Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.002 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
3,353	39	>75% Grass cover, Good, HSG A
1,562	32	Woods/grass comb., Good, HSG A
4,915	37	Weighted Average
4,915		100.00% Pervious Area

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

Subcatchment S2: North East



Summary for Subcatchment S3: South East

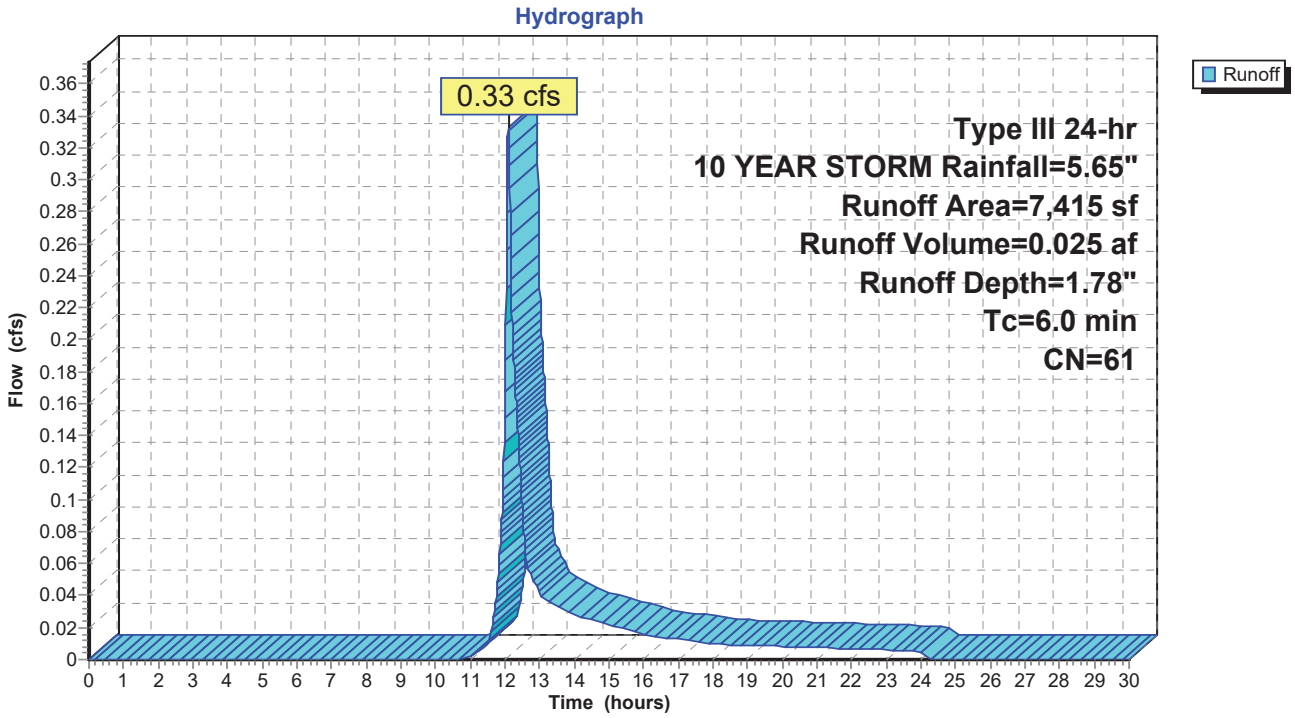
Runoff = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
2,777	98	Paved parking, HSG A
4,638	39	>75% Grass cover, Good, HSG A
7,415	61	Weighted Average
4,638		62.55% Pervious Area
2,777		37.45% Impervious Area

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

Subcatchment S3: South East



Summary for Subcatchment S4: Hoover Drive

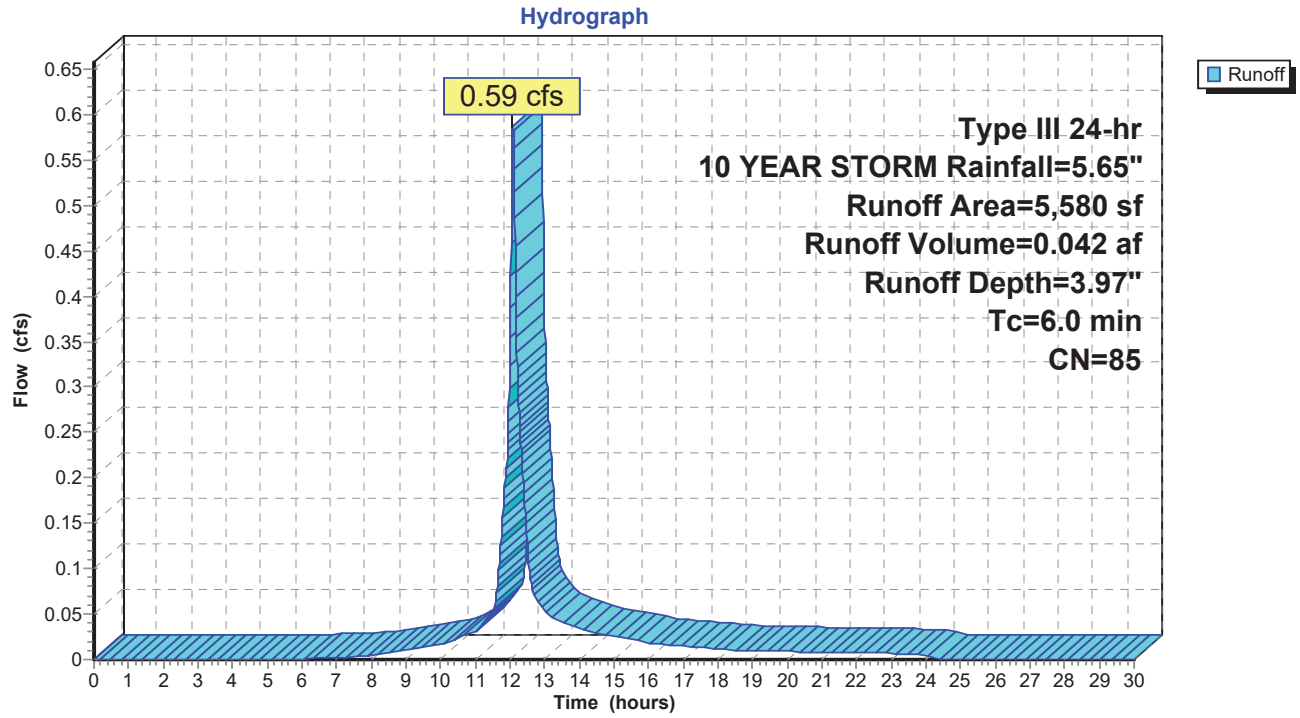
Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG A
1,262	39	>75% Grass cover, Good, HSG A
5,580	85	Weighted Average
1,262		22.62% Pervious Area
4,318		77.38% Impervious Area

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

Subcatchment S4: Hoover Drive



Summary for Pond 1R: Roof Leader

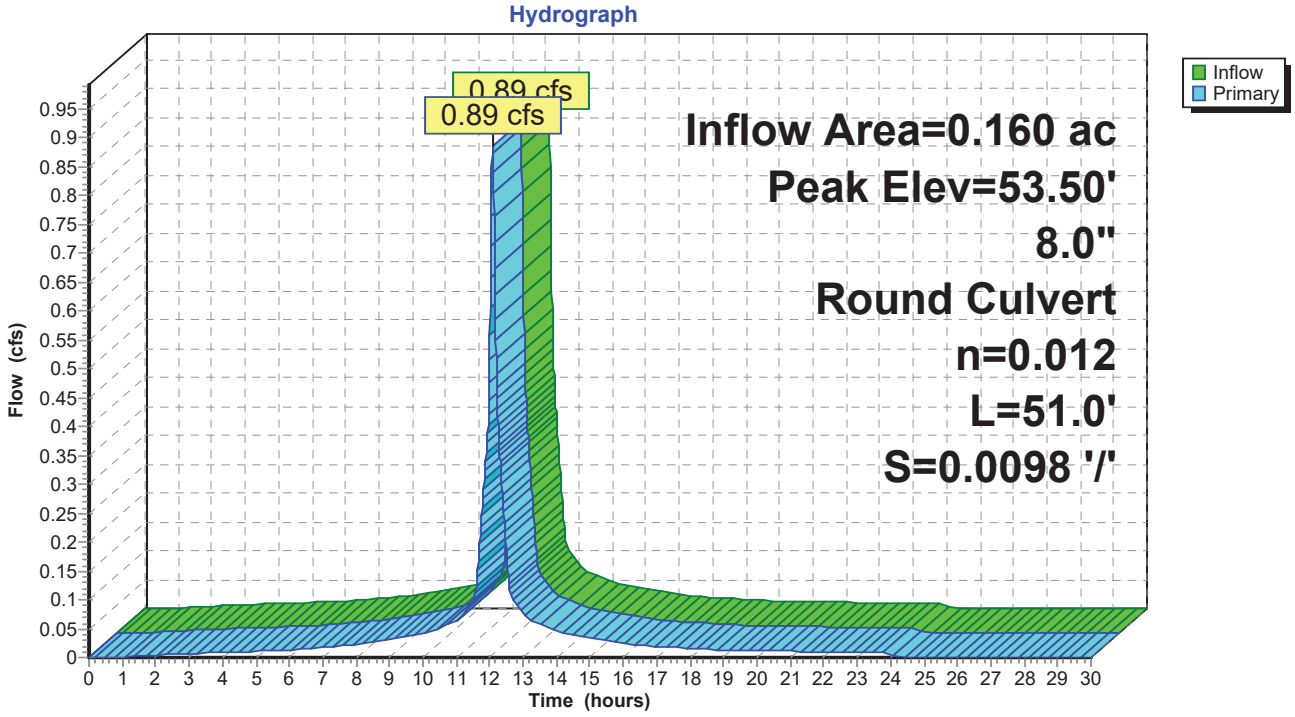
Inflow Area = 0.160 ac,100.00% Impervious, Inflow Depth = 5.41" for 10 YEAR STORM event
Inflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af
Outflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.50' @ 12.08 hrs
Flood Elev= 56.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.89'	**8.0" Round Culvert** L= 51.0' Ke= 0.500 Inlet / Outlet Invert= 52.89' / 52.39' S= 0.0098 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.88 cfs @ 12.08 hrs HW=53.50' TW=52.46' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.88 cfs @ 2.65 fps)

Pond 1R: Roof Leader



Summary for Pond DMH 2: DMH 1

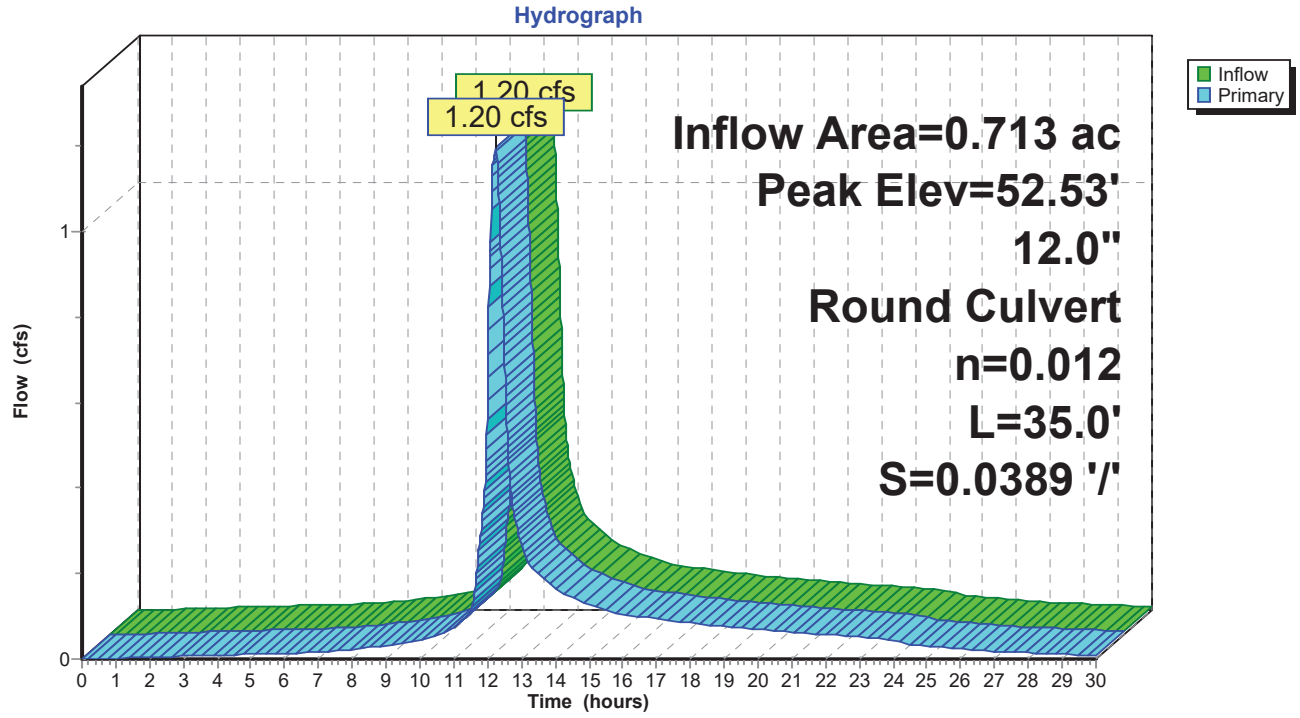
Inflow Area = 0.713 ac, 62.45% Impervious, Inflow Depth > 3.10" for 10 YEAR STORM event
Inflow = 1.20 cfs @ 12.25 hrs, Volume= 0.184 af
Outflow = 1.20 cfs @ 12.25 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.25 hrs, Volume= 0.184 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 52.53' @ 12.25 hrs
Flood Elev= 55.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.96'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.96' / 50.60' S= 0.0389 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.25 hrs HW=52.53' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.19 cfs @ 2.57 fps)

Pond DMH 2: DMH 1



Summary for Pond P1: Rain Garden 1

Inflow Area = 0.383 ac, 57.87% Impervious, Inflow Depth = 2.80" for 10 YEAR STORM event
Inflow = 1.26 cfs @ 12.09 hrs, Volume= 0.089 af
Outflow = 0.67 cfs @ 12.23 hrs, Volume= 0.087 af, Atten= 47%, Lag= 8.7 min
Primary = 0.67 cfs @ 12.23 hrs, Volume= 0.087 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 57.00' Surf.Area= 1,462 sf Storage= 694 cf
Peak Elev= 57.60' @ 12.23 hrs Surf.Area= 2,615 sf Storage= 1,907 cf (1,213 cf above start)
Flood Elev= 58.00' Surf.Area= 3,400 sf Storage= 3,125 cf (2,431 cf above start)

Plug-Flow detention time= 294.6 min calculated for 0.071 af (80% of inflow)
Center-of-Mass det. time= 156.4 min (990.4 - 834.0)

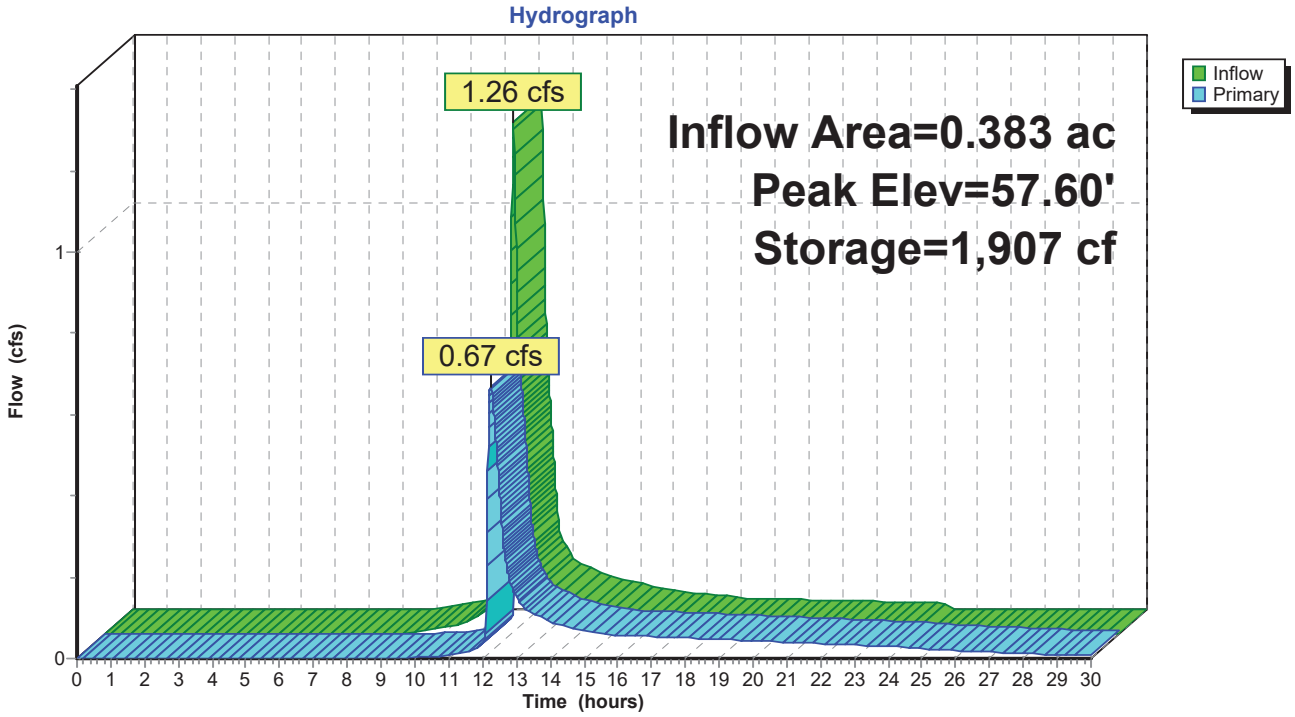
Volume	Invert	Avail.Storage	Storage Description
#1	54.50'	3,125 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.50	1,462	0.0	0	0
55.50	1,462	40.0	585	585
57.00	1,462	5.0	110	694
58.00	3,400	100.0	2,431	3,125

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**12.0" Round Culvert** L= 104.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.0048 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	57.00'	**2.500 in/hr Exfiltration over Surface area above 57.00'** Excluded Surface area = 1,462 sf Phase-In= 0.01'
#4	Device 1	57.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.67 cfs @ 12.23 hrs HW=57.60' TW=52.53' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.67 cfs of 4.91 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.07 cfs of 0.72 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.07 cfs)
  - **4=Orifice/Grate** (Weir Controls 0.60 cfs @ 1.01 fps)

Pond P1: Rain Garden 1



Summary for Pond P2: Rain Garden 2

Inflow Area = 0.170 ac, 37.45% Impervious, Inflow Depth = 1.78" for 10 YEAR STORM event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af
Outflow = 0.16 cfs @ 12.32 hrs, Volume= 0.025 af, Atten= 51%, Lag= 13.2 min
Primary = 0.16 cfs @ 12.32 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 54.50' Surf.Area= 347 sf Storage= 165 cf
Peak Elev= 55.03' @ 12.32 hrs Surf.Area= 833 sf Storage= 471 cf (306 cf above start)
Flood Elev= 55.50' Surf.Area= 1,714 sf Storage= 1,064 cf (899 cf above start)

Plug-Flow detention time= 248.0 min calculated for 0.021 af (85% of inflow)
Center-of-Mass det. time= 133.6 min (997.6 - 864.0)

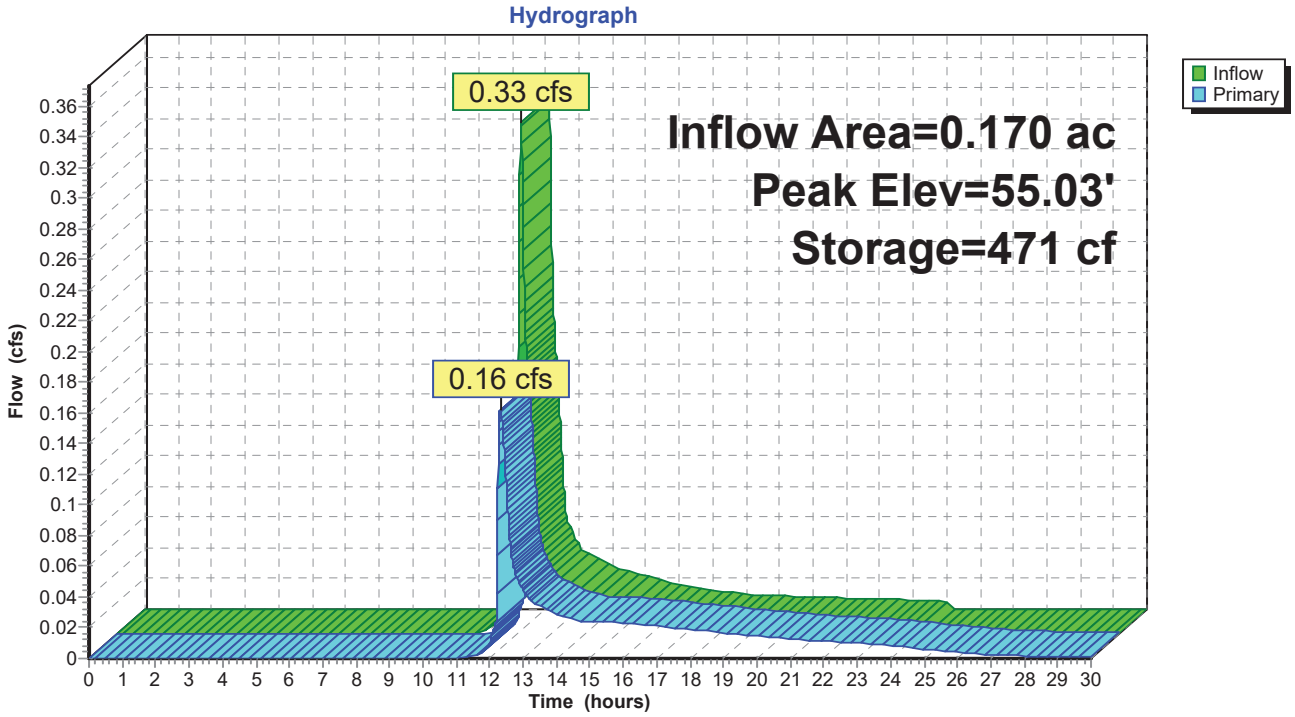
Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	1,064 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	347	0.0	0	0
53.00	347	40.0	139	139
54.50	347	5.0	26	165
55.00	767	100.0	279	443
55.50	1,714	100.0	620	1,064

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.00' / 51.96' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	52.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	54.50'	**2.500 in/hr Exfiltration over Surface area above 54.50'** Excluded Surface area = 347 sf Phase-In= 0.01'
#4	Device 1	55.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 12.32 hrs HW=55.03' TW=52.51' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.16 cfs of 6.01 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.03 cfs of 0.67 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.03 cfs)
  - **4=Orifice/Grate** (Weir Controls 0.13 cfs @ 0.61 fps)

Pond P2: Rain Garden 2

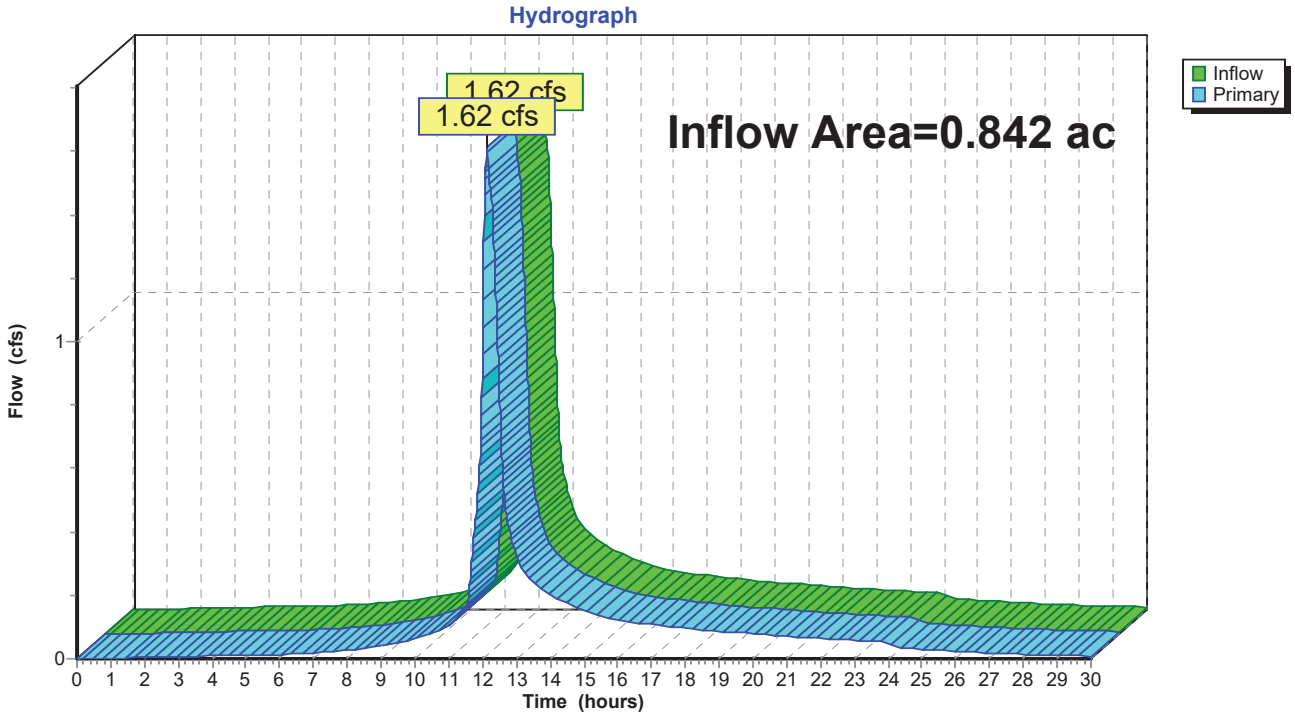


Summary for Link POA 1: City System

Inflow Area = 0.842 ac, 64.72% Impervious, Inflow Depth > 3.23" for 10 YEAR STORM event
Inflow = 1.62 cfs @ 12.14 hrs, Volume= 0.227 af
Primary = 1.62 cfs @ 12.14 hrs, Volume= 0.227 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 1: City System

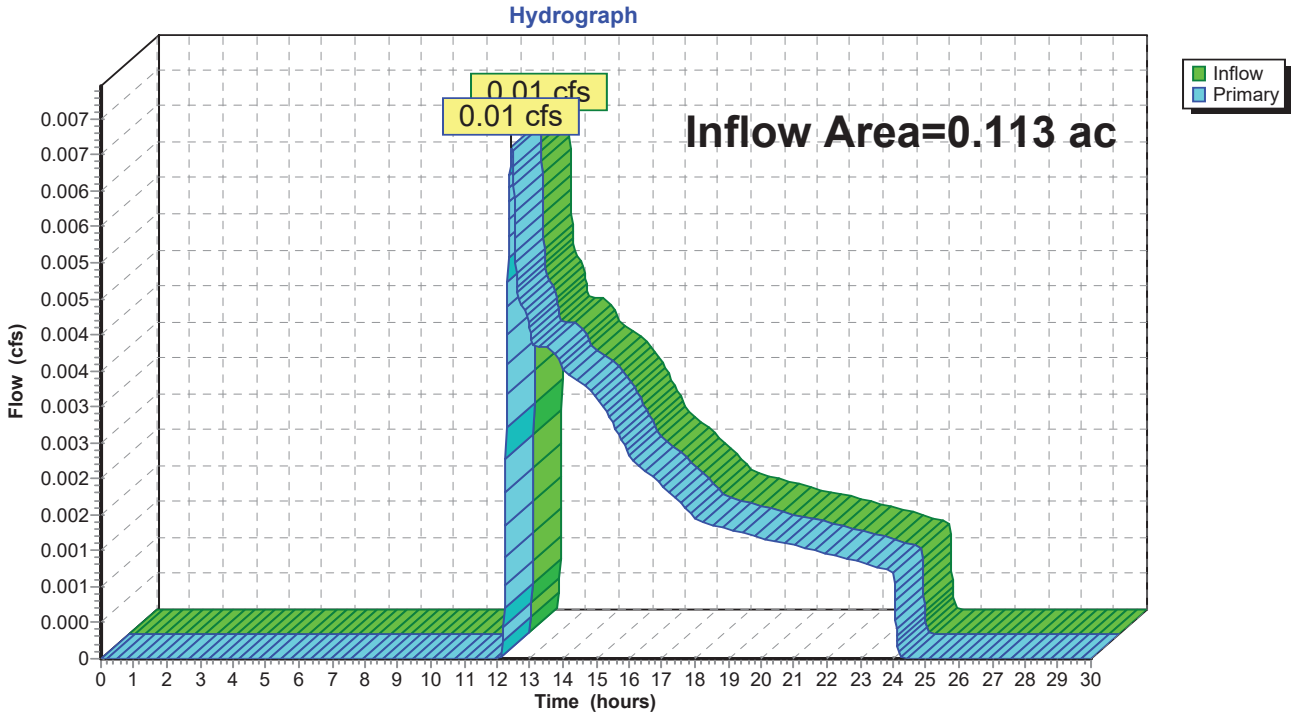


Summary for Link POA 2: North East

Inflow Area = 0.113 ac, 0.00% Impervious, Inflow Depth = 0.26" for 10 YEAR STORM event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.002 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 2: North East

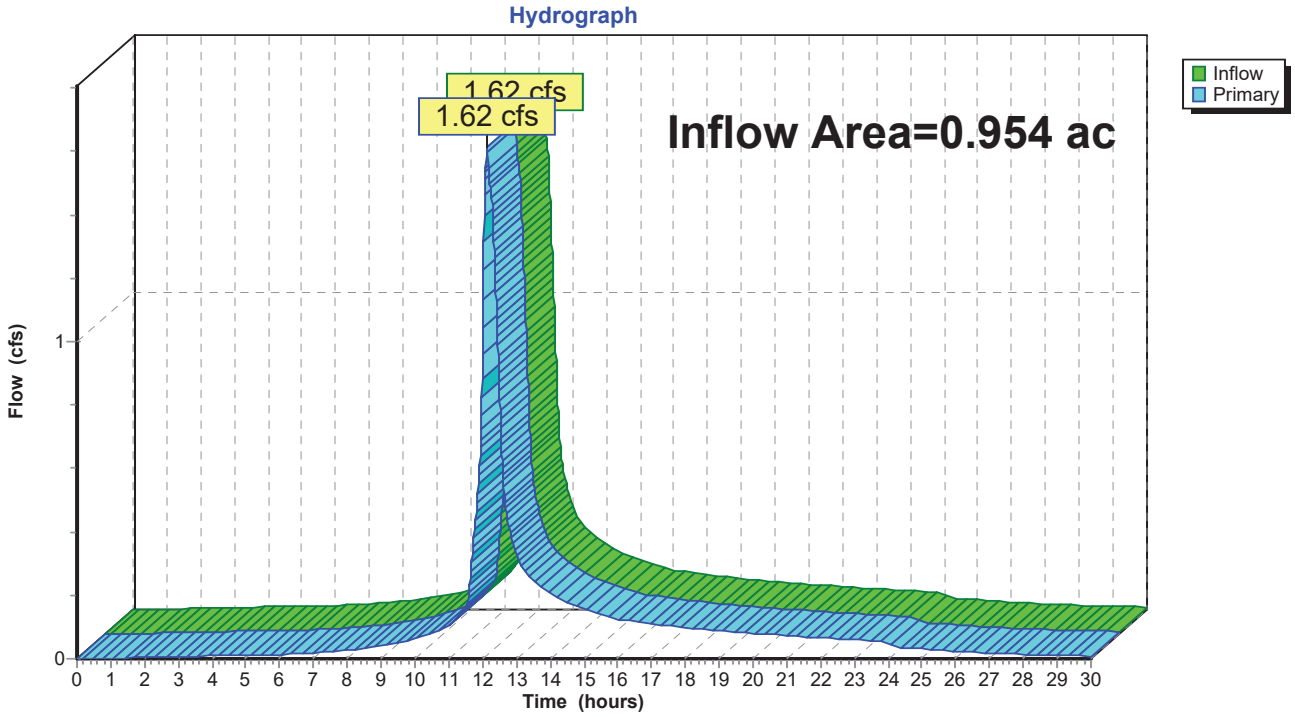


Summary for Link POA 3: Combined

Inflow Area = 0.954 ac, 57.07% Impervious, Inflow Depth > 2.88" for 10 YEAR STORM event
Inflow = 1.62 cfs @ 12.14 hrs, Volume= 0.229 af
Primary = 1.62 cfs @ 12.14 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 3: Combined



Section 5

Drainage Calculations

Pre-Development, Off Site
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary

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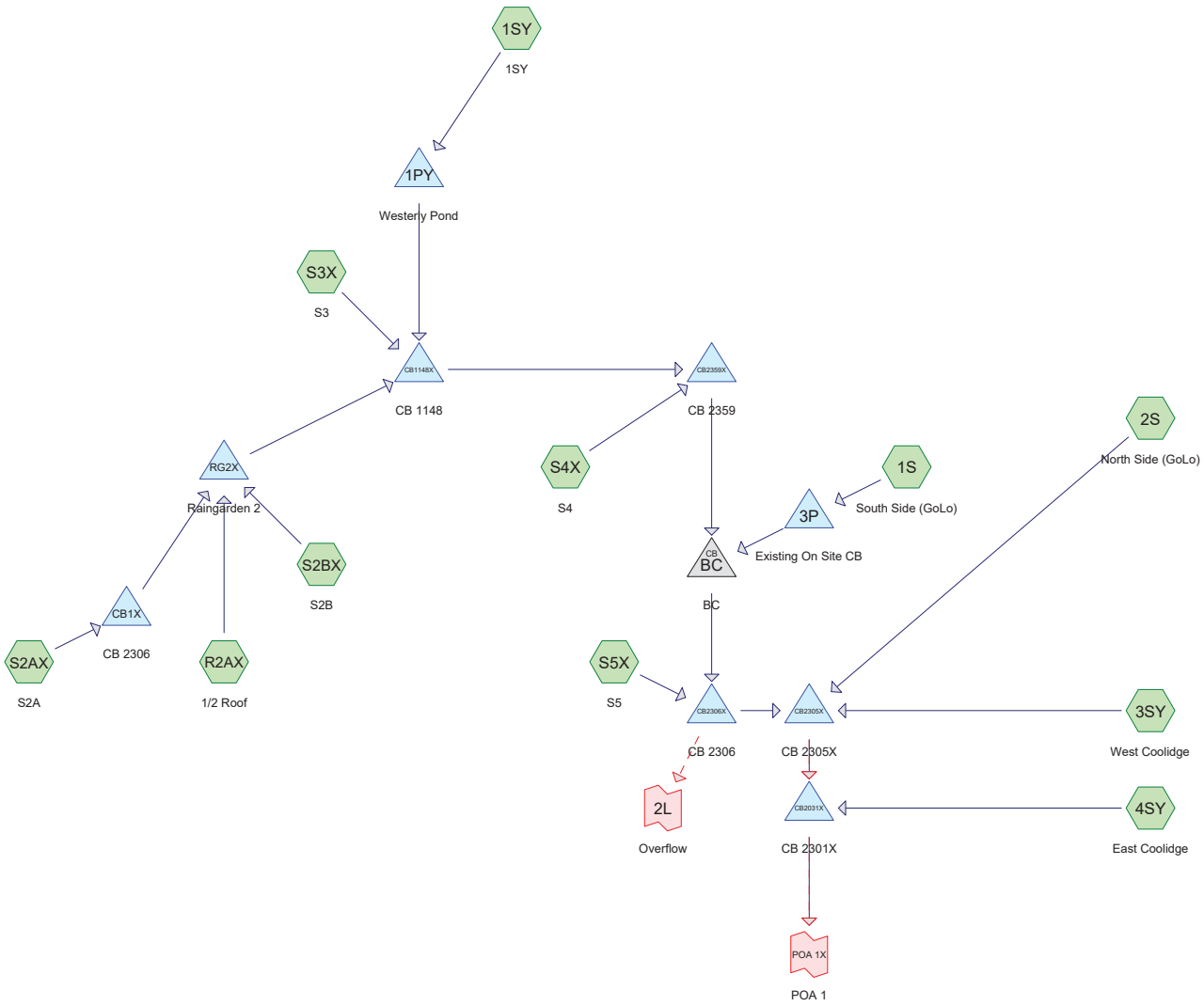


Subcat Reach Pond Link

Routing Diagram for 5361-PRE_FULL-110824
Prepared by Altus Engineering, Inc., Printed 11/22/2024
HydroCAD® 10.00-26 s/n 01222 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.088	54	1/2 acre lots, 25% imp, HSG A (3SY, 4SY)
0.094	39	>75% Grass cover, Good, HSG A (1S)
0.512	61	>75% Grass cover, Good, HSG B (S2AX, S2BX, S3X, S4X, S5X)
0.011	96	Gravel surface, HSG B (S5X)
0.021	98	Multi-Use Path, HSG B (S2BX, S3X)
0.020	98	Multi-Use path, HSG B (S4X)
3.017	98	Paved parking, HSG A (1S, 1SY, 2S)
0.075	98	Paved parking, HSG B (S2AX, S3X)
0.491	98	Paved roads w/curbs & sewers, HSG B (S3X, S4X, S5X)
0.061	98	Roofs, HSG A (1S, 2S)
0.184	98	Roofs, HSG B (R2AX)
0.041	98	Unconnected pavement, HSG B (S2AX, S2BX)
0.103	55	Woods, Good, HSG B (S5X)
3.192	32	Woods/grass comb., Good, HSG A (1SY, 2S)
11.909	**63**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
10.452	HSG A	1S, 1SY, 2S, 3SY, 4SY
1.457	HSG B	R2AX, S2AX, S2BX, S3X, S4X, S5X
0.000	HSG C	
0.000	HSG D	
0.000	Other	
11.909		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
4.088	0.000	0.000	0.000	0.000	4.088	1/2 acre lots, 25% imp	3SY, 4SY
0.094	0.512	0.000	0.000	0.000	0.606	>75% Grass cover, Good	1S, S2AX, S2BX, S3X, S4X, S5X
0.000	0.011	0.000	0.000	0.000	0.011	Gravel surface	S5X
0.000	0.021	0.000	0.000	0.000	0.021	Multi-Use Path	S2BX, S3X
0.000	0.020	0.000	0.000	0.000	0.020	Multi-Use path	S4X
3.017	0.075	0.000	0.000	0.000	3.091	Paved parking	1S, 1SY, 2S, S2AX, S3X
0.000	0.491	0.000	0.000	0.000	0.491	Paved roads w/curbs & sewers	S3X, S4X, S5X
0.061	0.184	0.000	0.000	0.000	0.245	Roofs	1S, 2S, R2AX
0.000	0.041	0.000	0.000	0.000	0.041	Unconnected pavement	S2AX, S2BX
0.000	0.103	0.000	0.000	0.000	0.103	Woods, Good	S5X
3.192	0.000	0.000	0.000	0.000	3.192	Woods/grass comb., Good	1SY, 2S
10.452	**1.457**	**0.000**	**0.000**	**0.000**	**11.909**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1S: South Side (GoLo) Runoff Area=19,336 sf 78.72% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=85 Runoff=2.04 cfs 0.147 af

Subcatchment 1SY: 1SY Runoff Area=235,657 sf 45.90% Impervious Runoff Depth=1.85"
Tc=15.0 min CN=62 Runoff=8.39 cfs 0.836 af

Subcatchment 2S: North Side (GoLo) Runoff Area=22,235 sf 48.04% Impervious Runoff Depth=2.02"
Tc=12.0 min CN=64 Runoff=0.95 cfs 0.086 af

Subcatchment 3SY: West Coolidge Runoff Area=146,723 sf 25.00% Impervious Runoff Depth=1.25"
Tc=12.0 min CN=54 Runoff=3.38 cfs 0.351 af

Subcatchment 4SY: East Coolidge Runoff Area=31,348 sf 25.00% Impervious Runoff Depth=1.25"
Tc=9.0 min CN=54 Runoff=0.80 cfs 0.075 af

Subcatchment R2AX: 1/2 Roof Runoff Area=8,030 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=1.02 cfs 0.083 af

Subcatchment S2AX: S2A Runoff Area=7,588 sf 53.31% Impervious Runoff Depth=3.57"
Tc=8.0 min CN=81 Runoff=0.68 cfs 0.052 af

Subcatchment S2BX: S2B Runoff Area=7,948 sf 8.30% Impervious Runoff Depth=2.02"
Flow Length=275' Tc=7.2 min CN=64 Runoff=0.40 cfs 0.031 af

Subcatchment S3X: S3 Runoff Area=12,718 sf 84.05% Impervious Runoff Depth=4.73"
Flow Length=485' Tc=9.2 min CN=92 Runoff=1.37 cfs 0.115 af

Subcatchment S4X: S4 Runoff Area=12,973 sf 58.88% Impervious Runoff Depth=3.77"
Flow Length=180' Slope=0.0200 '/' Tc=8.9 min CN=83 Runoff=1.18 cfs 0.094 af

Subcatchment S5X: S5 Runoff Area=14,205 sf 36.33% Impervious Runoff Depth=2.89"
Flow Length=270' Tc=8.4 min CN=74 Runoff=1.02 cfs 0.079 af

Pond 1PY: Westerly Pond Peak Elev=54.34' Storage=11,540 cf Inflow=8.39 cfs 0.836 af
18.0" Round Culvert n=0.012 L=70.0' S=0.0057 '/' Outflow=2.98 cfs 0.836 af

Pond 3P: Existing On Site CB Peak Elev=53.58' Storage=142 cf Inflow=2.04 cfs 0.147 af
12.0" Round Culvert n=0.025 L=60.0' S=0.0017 '/' Outflow=1.97 cfs 0.147 af

Pond BC: BC Peak Elev=53.28' Inflow=5.94 cfs 1.331 af
18.0" Round Culvert n=0.012 L=140.0' S=0.0108 '/' Outflow=5.94 cfs 1.331 af

Pond CB1148X: CB 1148 Peak Elev=53.98' Storage=14 cf Inflow=3.74 cfs 1.090 af
18.0" Round Culvert n=0.011 L=125.0' S=0.0070 '/' Outflow=3.74 cfs 1.090 af

Pond CB1X: CB 2306 Peak Elev=58.31' Storage=17 cf Inflow=0.68 cfs 0.052 af
12.0" Round Culvert n=0.011 L=40.0' S=0.0050 '/' Outflow=0.67 cfs 0.052 af

Pond CB2031X: CB 2301X Peak Elev=50.77' Storage=31 cf Inflow=11.18 cfs 1.921 af
Primary=11.17 cfs 1.921 af Secondary=0.00 cfs 0.000 af Outflow=11.17 cfs 1.921 af

Pond CB2305X: CB 2305X Peak Elev=52.27' Storage=44 cf Inflow=10.47 cfs 1.846 af
Primary=10.43 cfs 1.846 af Secondary=0.00 cfs 0.000 af Outflow=10.43 cfs 1.846 af

Pond CB2306X: CB 2306 Peak Elev=52.78' Storage=51 cf Inflow=6.93 cfs 1.409 af
Primary=6.82 cfs 1.409 af Secondary=0.00 cfs 0.000 af Outflow=6.82 cfs 1.409 af

Pond CB2359X: CB 2359 Peak Elev=53.53' Storage=19 cf Inflow=4.34 cfs 1.184 af
18.0" Round Culvert n=0.012 L=133.0' S=0.0108 '/' Outflow=4.31 cfs 1.184 af

Pond RG2X: Raingarden 2 Peak Elev=58.28' Storage=2,166 cf Inflow=2.06 cfs 0.165 af
Outflow=1.59 cfs 0.139 af

Link 2L: Overflow Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA 1X: POA 1 Inflow=11.17 cfs 1.921 af
Primary=11.17 cfs 1.921 af

Total Runoff Area = 11.909 ac Runoff Volume = 1.947 af Average Runoff Depth = 1.96"
58.59% Pervious = 6.978 ac 41.41% Impervious = 4.931 ac

Summary for Subcatchment 1S: South Side (GoLo)

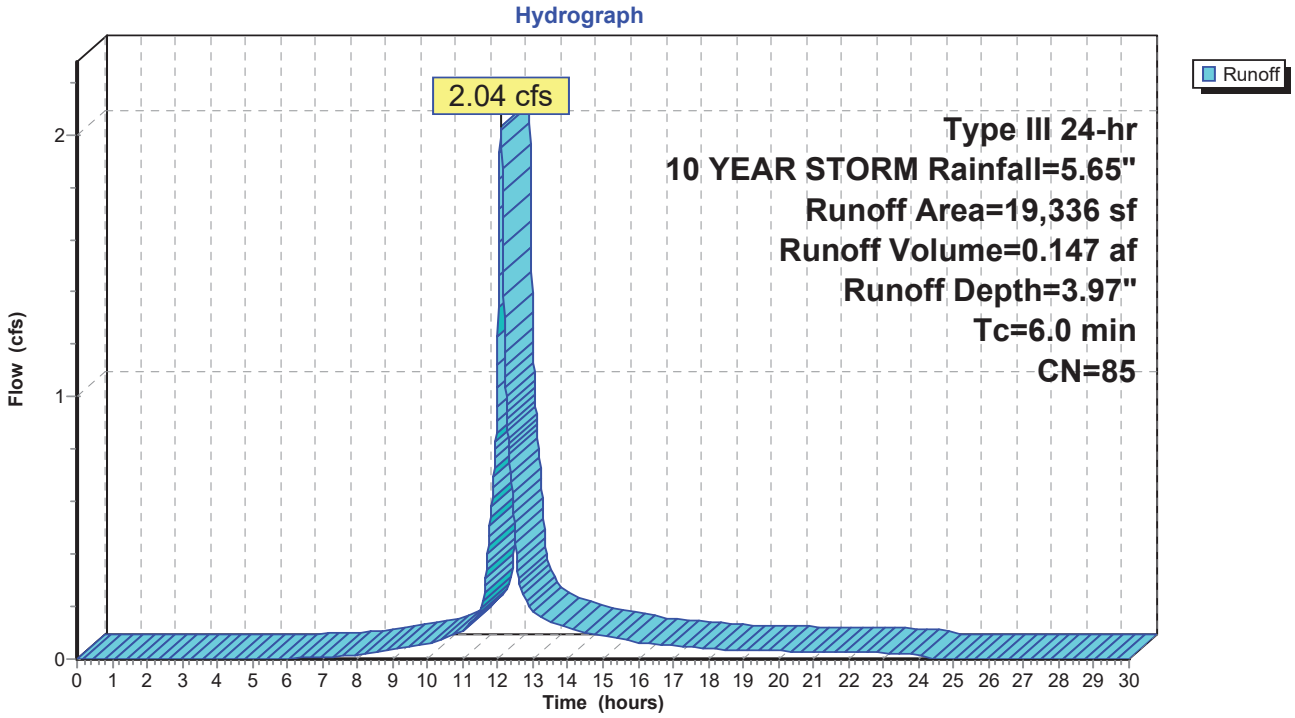
Runoff = 2.04 cfs @ 12.09 hrs, Volume= 0.147 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
2,378	98	Roofs, HSG A
12,844	98	Paved parking, HSG A
4,114	39	>75% Grass cover, Good, HSG A
19,336	85	Weighted Average
4,114		21.28% Pervious Area
15,222		78.72% Impervious Area

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

Subcatchment 1S: South Side (GoLo)



Summary for Subcatchment 1SY: 1SY

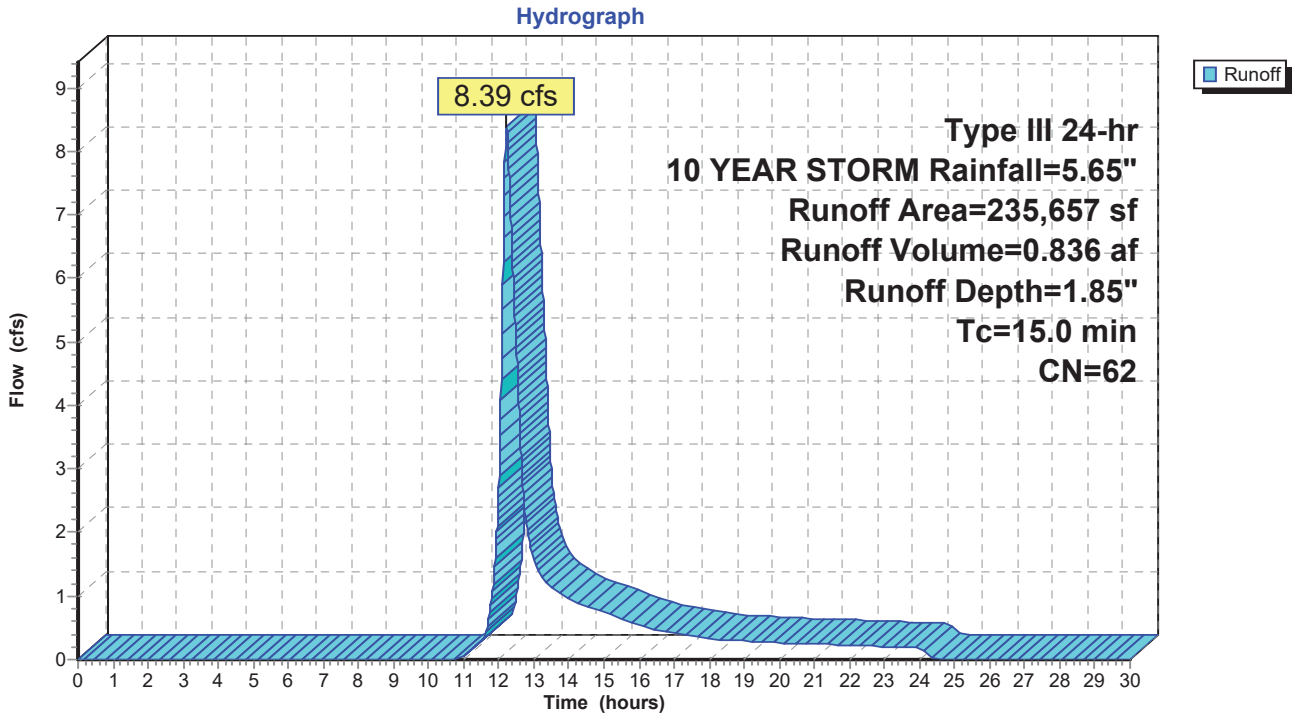
Runoff = 8.39 cfs @ 12.22 hrs, Volume= 0.836 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
127,492	32	Woods/grass comb., Good, HSG A
108,165	98	Paved parking, HSG A
235,657	62	Weighted Average
127,492		54.10% Pervious Area
108,165		45.90% Impervious Area

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

Subcatchment 1SY: 1SY



Summary for Subcatchment 2S: North Side (GoLo)

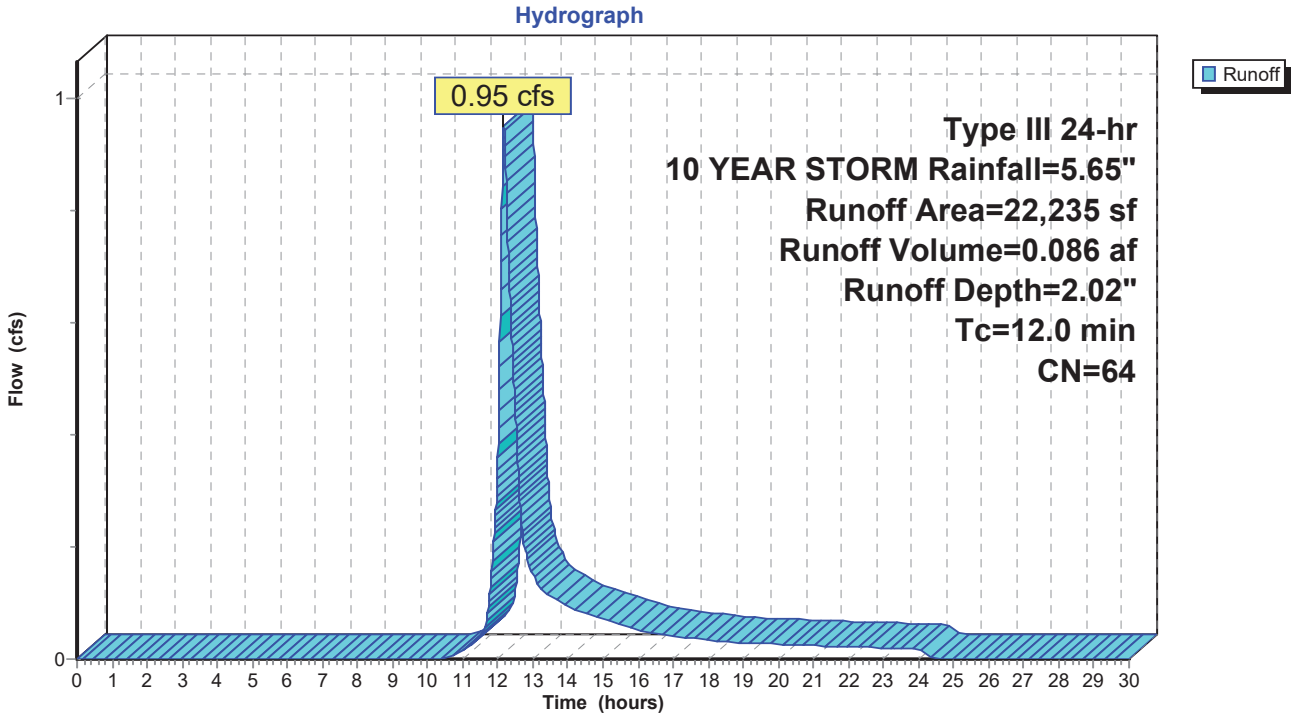
Runoff = 0.95 cfs @ 12.17 hrs, Volume= 0.086 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
283	98	Roofs, HSG A
10,398	98	Paved parking, HSG A
11,554	32	Woods/grass comb., Good, HSG A
22,235	64	Weighted Average
11,554		51.96% Pervious Area
10,681		48.04% Impervious Area

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

Subcatchment 2S: North Side (GoLo)



Summary for Subcatchment 3SY: West Coolidge

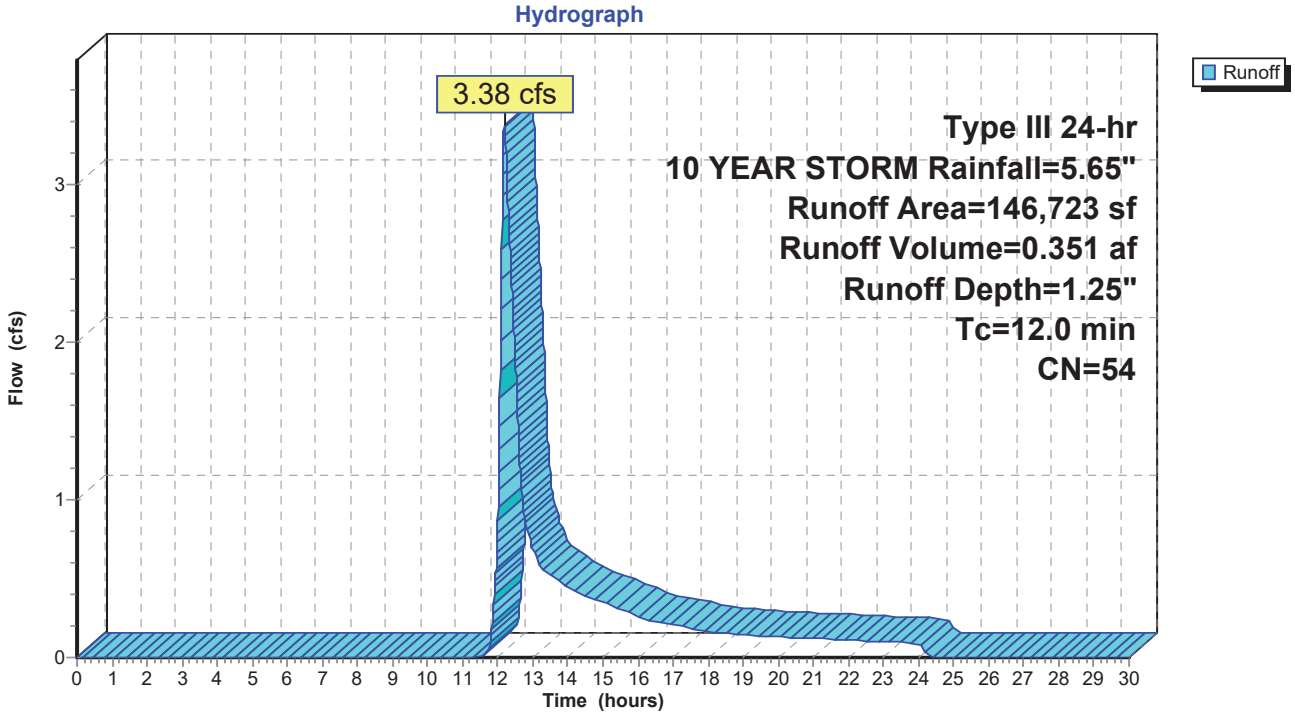
Runoff = 3.38 cfs @ 12.19 hrs, Volume= 0.351 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
146,723	54	1/2 acre lots, 25% imp, HSG A
110,042		75.00% Pervious Area
36,681		25.00% Impervious Area

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

Subcatchment 3SY: West Coolidge



Summary for Subcatchment 4SY: East Coolidge

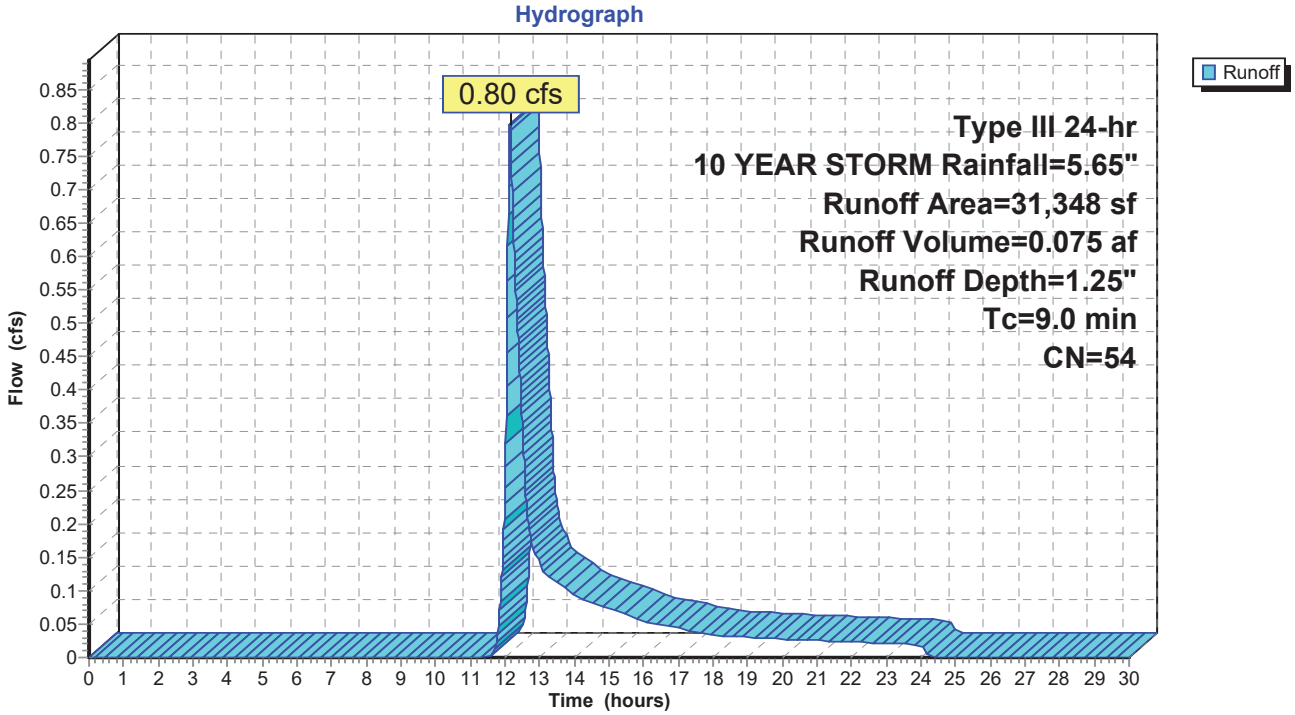
Runoff = 0.80 cfs @ 12.15 hrs, Volume= 0.075 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
31,348	54	1/2 acre lots, 25% imp, HSG A
23,511		75.00% Pervious Area
7,837		25.00% Impervious Area

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

Subcatchment 4SY: East Coolidge



Summary for Subcatchment R2AX: 1/2 Roof

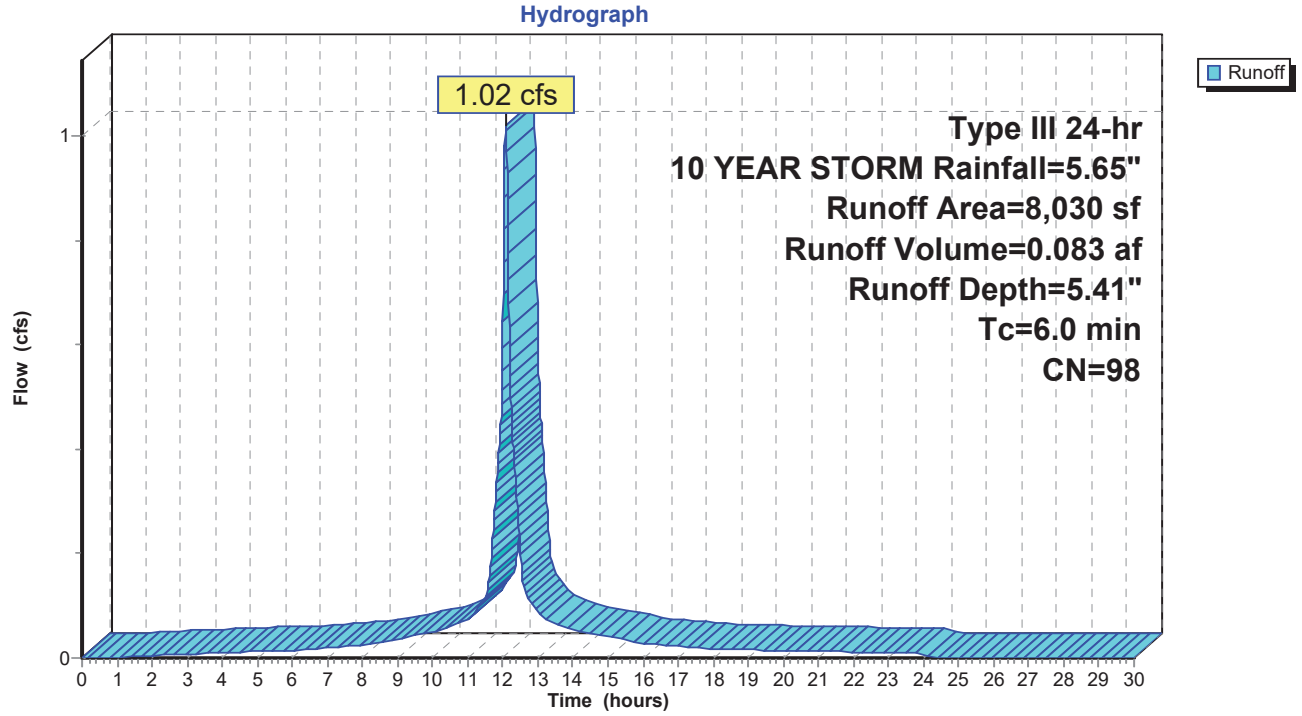
Runoff = 1.02 cfs @ 12.08 hrs, Volume= 0.083 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
8,030	98	Roofs, HSG B
8,030		100.00% Impervious Area

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

Subcatchment R2AX: 1/2 Roof



Summary for Subcatchment S2AX: S2A

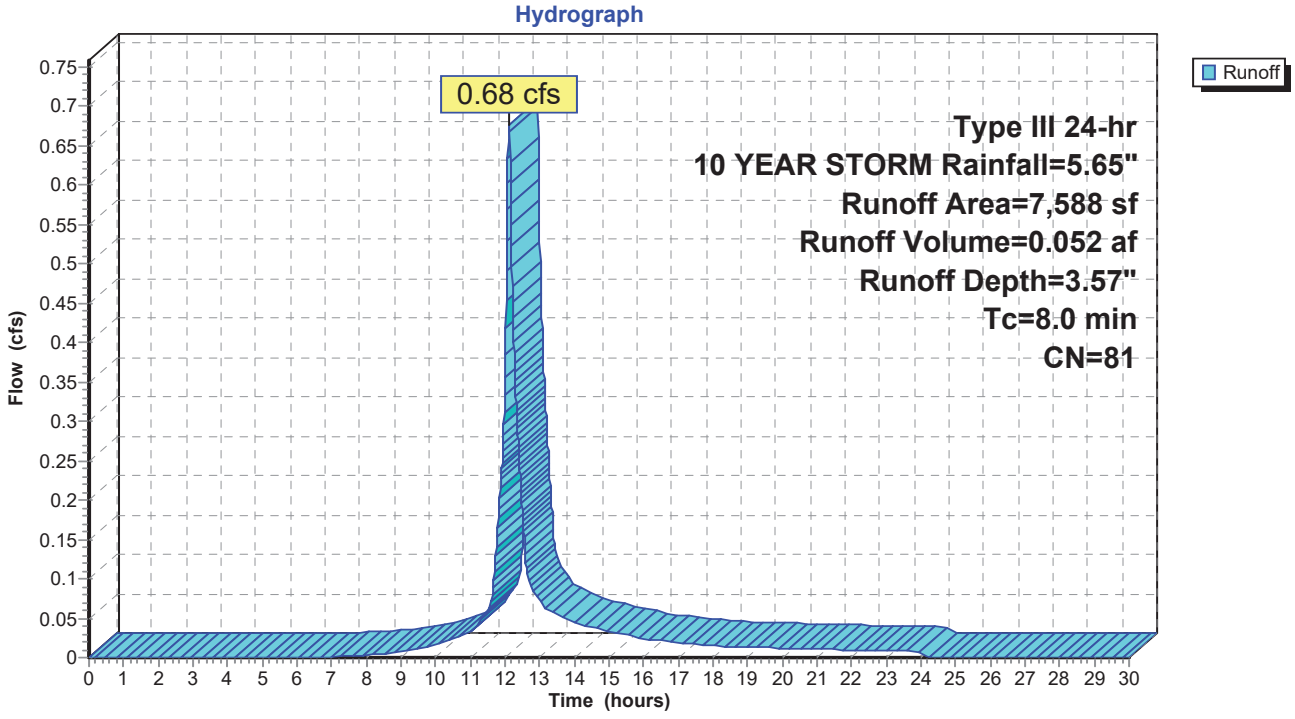
Runoff = 0.68 cfs @ 12.11 hrs, Volume= 0.052 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
2,353	98	Paved parking, HSG B
1,692	98	Unconnected pavement, HSG B
3,543	61	>75% Grass cover, Good, HSG B
7,588	81	Weighted Average
3,543		46.69% Pervious Area
4,045		53.31% Impervious Area
1,692		41.83% Unconnected

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

Subcatchment S2AX: S2A



Summary for Subcatchment S2BX: S2B

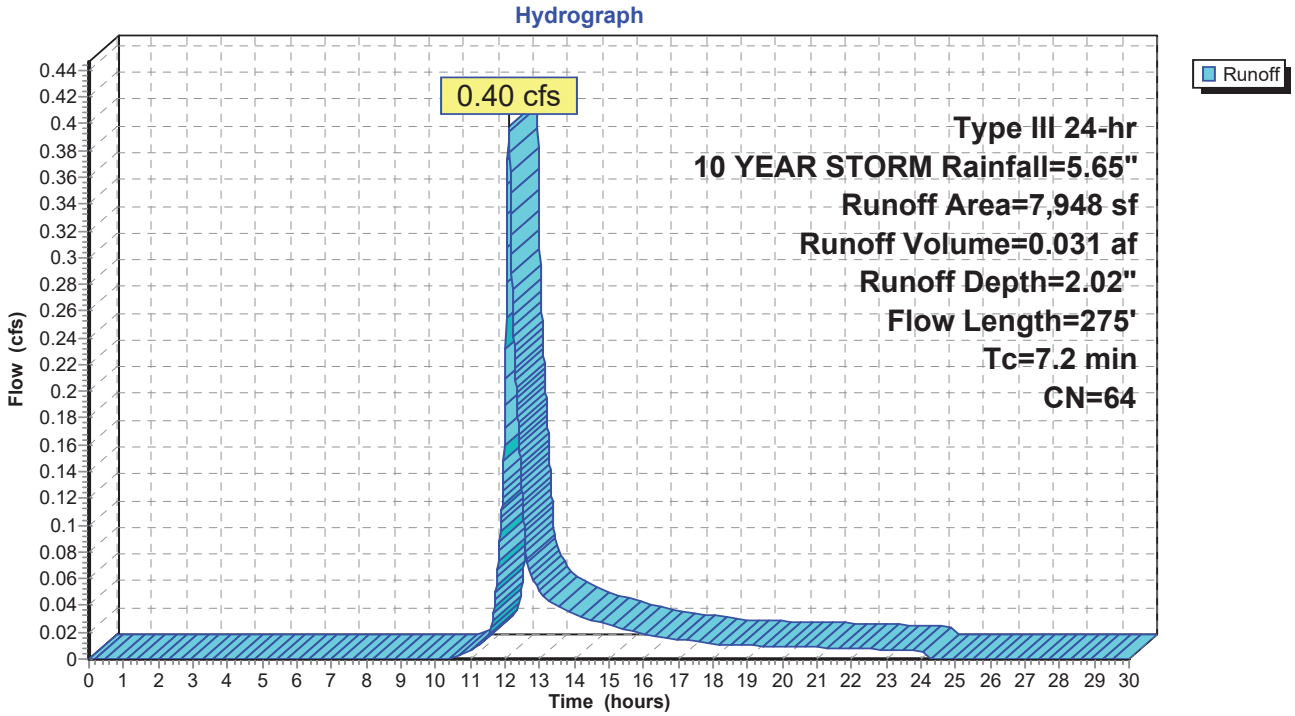
Runoff = 0.40 cfs @ 12.11 hrs, Volume= 0.031 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

	Area (sf)	CN	Description
	7,288	61	>75% Grass cover, Good, HSG B
	100	98	Unconnected pavement, HSG B
*	560	98	Multi-Use Path, HSG B
	7,948	64	Weighted Average
	7,288		91.70% Pervious Area
	660		8.30% Impervious Area
	100		15.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.2	275	Total			

Subcatchment S2BX: S2B



Summary for Subcatchment S3X: S3

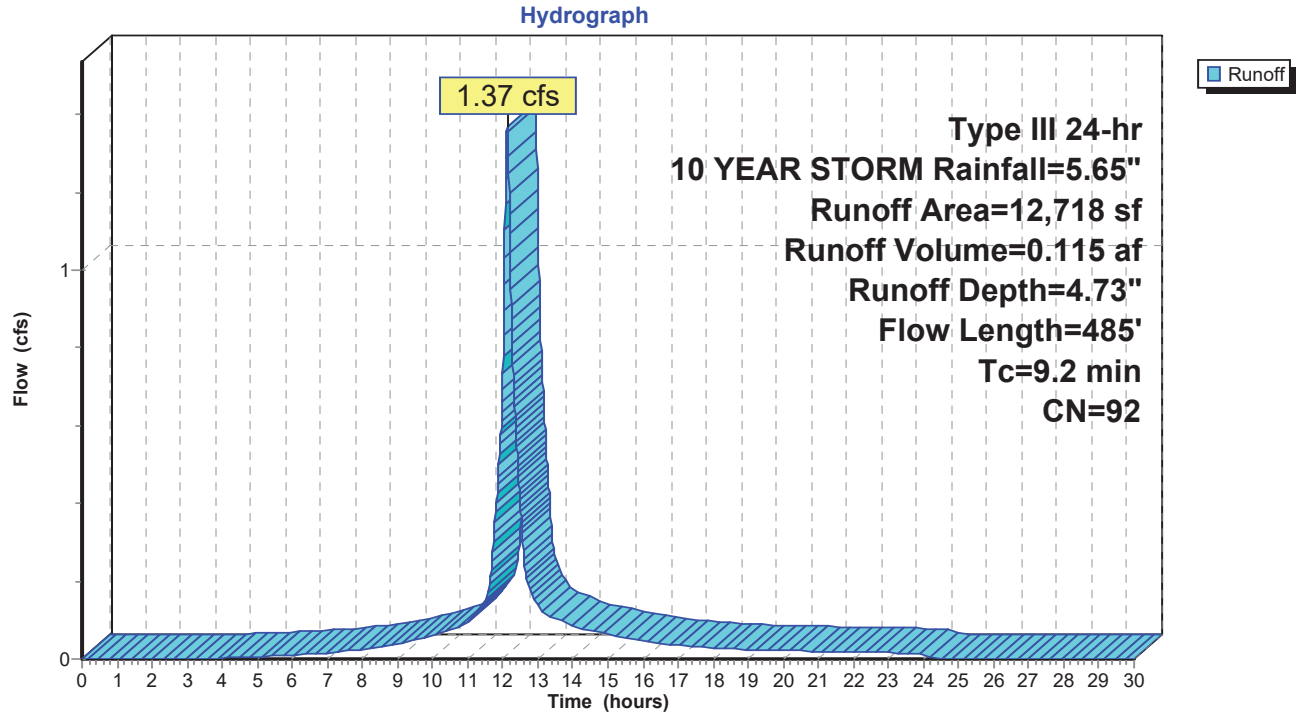
Runoff = 1.37 cfs @ 12.12 hrs, Volume= 0.115 af, Depth= 4.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

	Area (sf)	CN	Description
	2,028	61	>75% Grass cover, Good, HSG B
	9,432	98	Paved roads w/curbs & sewers, HSG B
	898	98	Paved parking, HSG B
*	360	98	Multi-Use Path, HSG B
	12,718	92	Weighted Average
	2,028		15.95% Pervious Area
	10,690		84.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	40	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.1	320	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.2	485	Total			

Subcatchment S3X: S3



Summary for Subcatchment S4X: S4

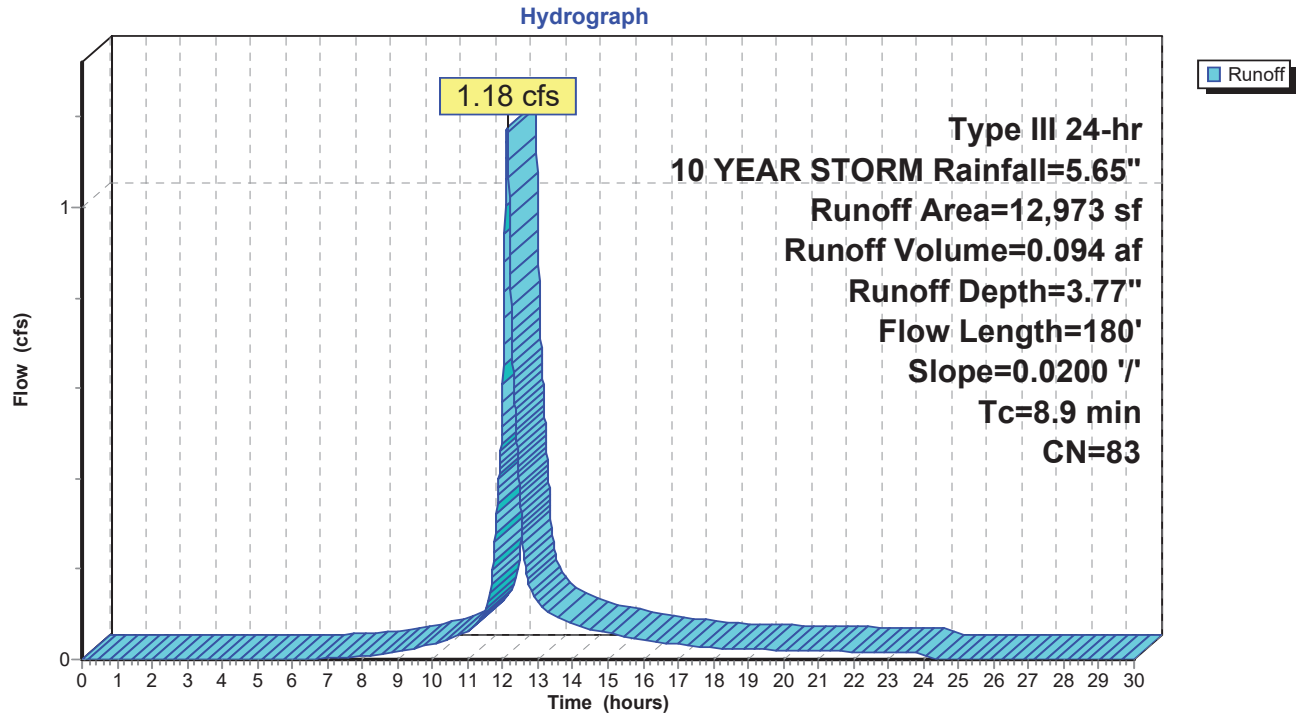
Runoff = 1.18 cfs @ 12.12 hrs, Volume= 0.094 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

	Area (sf)	CN	Description
	5,335	61	>75% Grass cover, Good, HSG B
	6,778	98	Paved roads w/curbs & sewers, HSG B
*	860	98	Multi-Use path, HSG B
	12,973	83	Weighted Average
	5,335		41.12% Pervious Area
	7,638		58.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.6	80	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.9	180	Total			

Subcatchment S4X: S4



Summary for Subcatchment S5X: S5

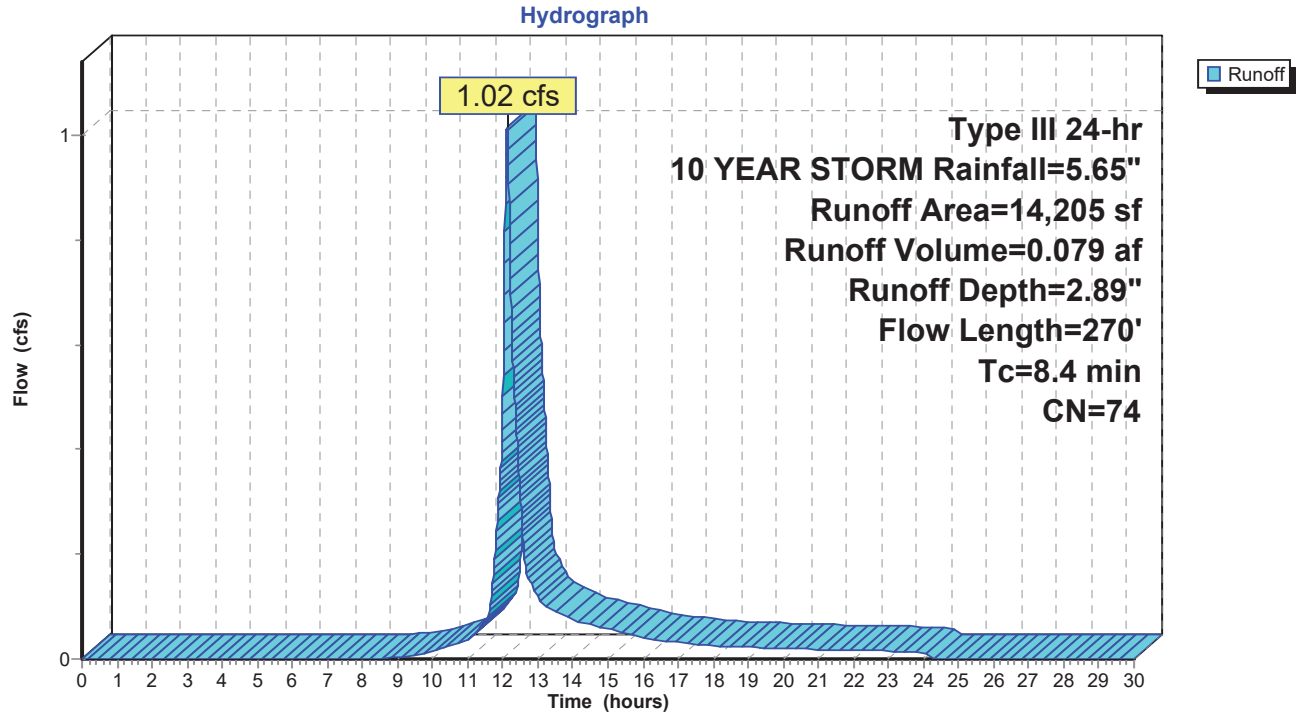
Runoff = 1.02 cfs @ 12.12 hrs, Volume= 0.079 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
4,095	61	>75% Grass cover, Good, HSG B
4,470	55	Woods, Good, HSG B
5,160	98	Paved roads w/curbs & sewers, HSG B
480	96	Gravel surface, HSG B
14,205	74	Weighted Average
9,045		63.67% Pervious Area
5,160		36.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	35	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
1.2	135	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.4	270	Total			

Subcatchment S5X: S5



Summary for Pond 1PY: Westerly Pond

Inflow Area = 5.410 ac, 45.90% Impervious, Inflow Depth = 1.85" for 10 YEAR STORM event
Inflow = 8.39 cfs @ 12.22 hrs, Volume= 0.836 af
Outflow = 2.98 cfs @ 12.70 hrs, Volume= 0.836 af, Atten= 64%, Lag= 28.9 min
Primary = 2.98 cfs @ 12.70 hrs, Volume= 0.836 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.34' @ 12.66 hrs Surf.Area= 18,873 sf Storage= 11,540 cf

Plug-Flow detention time= 62.4 min calculated for 0.836 af (100% of inflow)
Center-of-Mass det. time= 62.4 min (932.1 - 869.7)

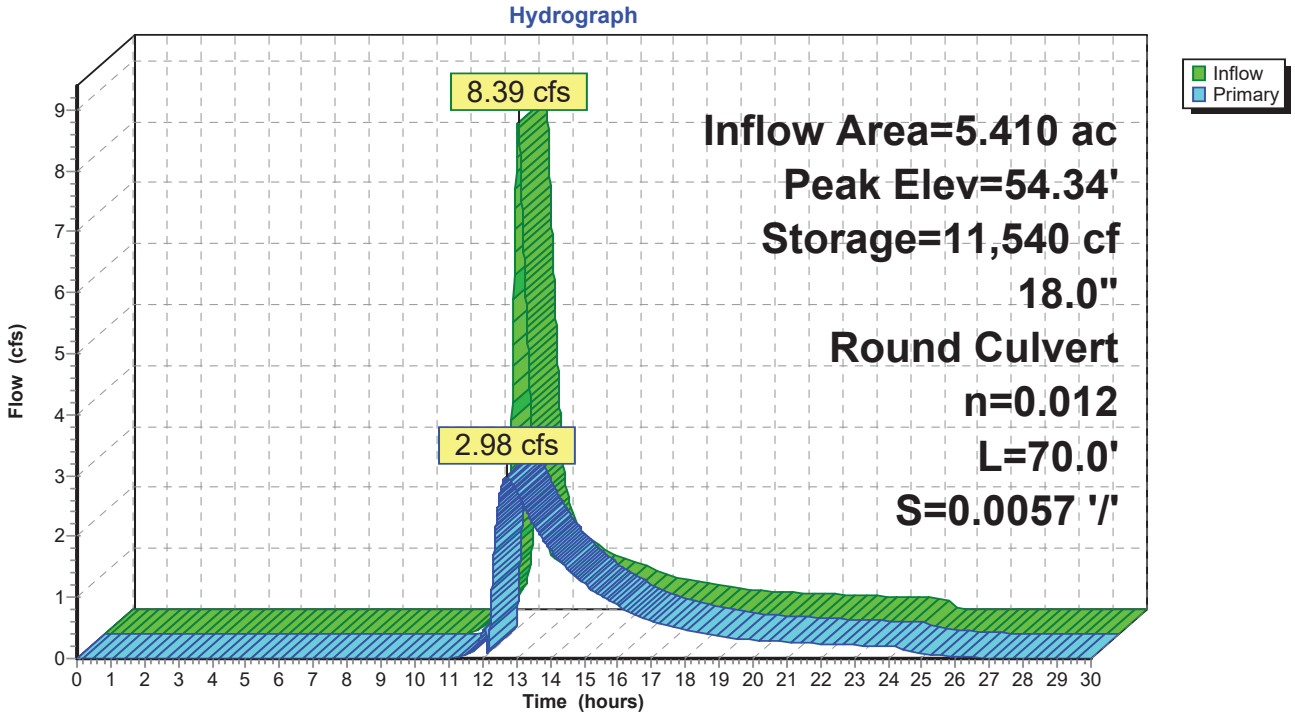
Volume	Invert	Avail.Storage	Storage Description
#1	53.40'	110,492 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.40	10	0	0
54.00	17,553	5,269	5,269
56.00	25,221	42,774	48,043
58.00	37,228	62,449	110,492

Device	Routing	Invert	Outlet Devices
#1	Primary	53.40'	**18.0" Round Culvert** L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.40' / 53.00' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.99 cfs @ 12.70 hrs HW=54.34' TW=53.80' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.99 cfs @ 3.65 fps)

Pond 1PY: Westerly Pond



Summary for Pond 3P: Existing On Site CB

Inflow Area = 0.444 ac, 78.72% Impervious, Inflow Depth = 3.97" for 10 YEAR STORM event
Inflow = 2.04 cfs @ 12.09 hrs, Volume= 0.147 af
Outflow = 1.97 cfs @ 12.08 hrs, Volume= 0.147 af, Atten= 3%, Lag= 0.0 min
Primary = 1.97 cfs @ 12.08 hrs, Volume= 0.147 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.58' @ 12.19 hrs Surf.Area= 326 sf Storage= 142 cf
Flood Elev= 52.90' Surf.Area= 23 sf Storage= 32 cf

Plug-Flow detention time= 1.0 min calculated for 0.147 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (803.8 - 802.9)

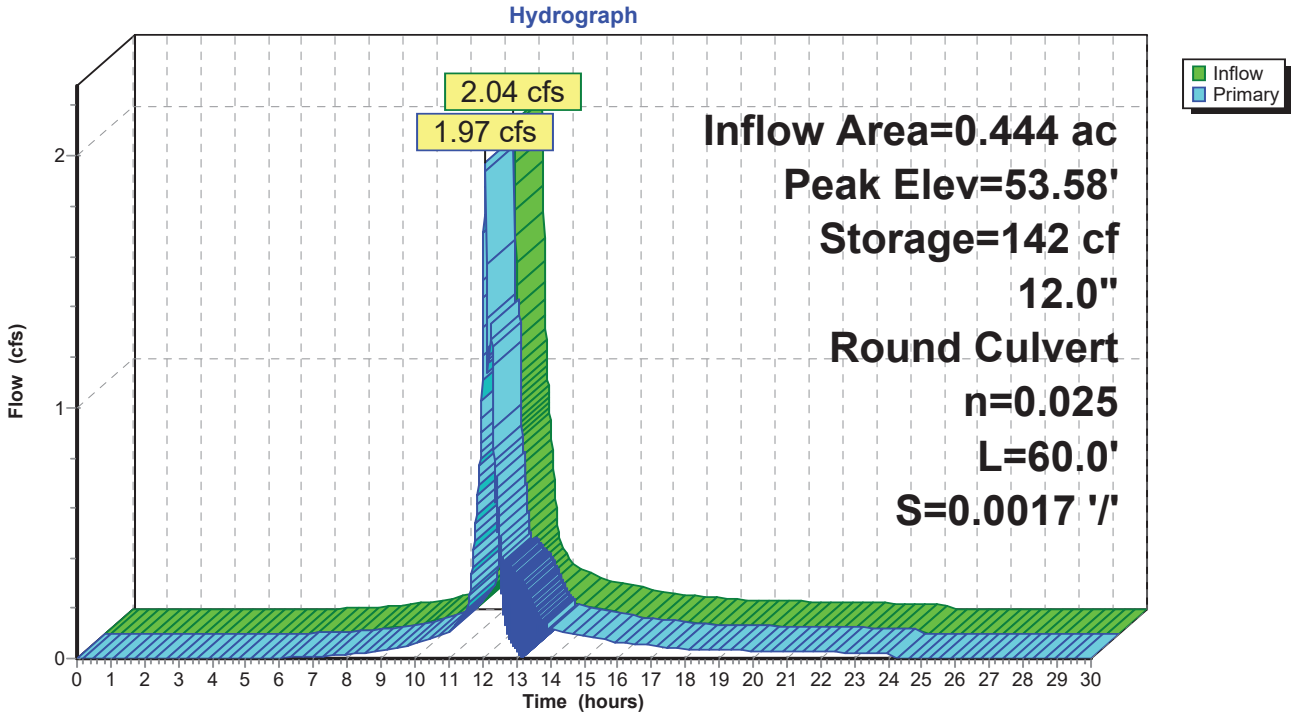
Volume	Invert	Avail.Storage	Storage Description
#1	50.35'	32 cf	**4.00'D x 2.55'H Vertical Cone/Cylinder**
#2	52.90'	281 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		313 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.90	10	0	0
54.00	500	281	281

Device	Routing	Invert	Outlet Devices
#1	Primary	50.35'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 50.35' / 50.25' S= 0.0017 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.69 cfs @ 12.08 hrs HW=52.58' TW=51.97' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.69 cfs @ 2.16 fps)

Pond 3P: Existing On Site CB



Summary for Pond BC: BC

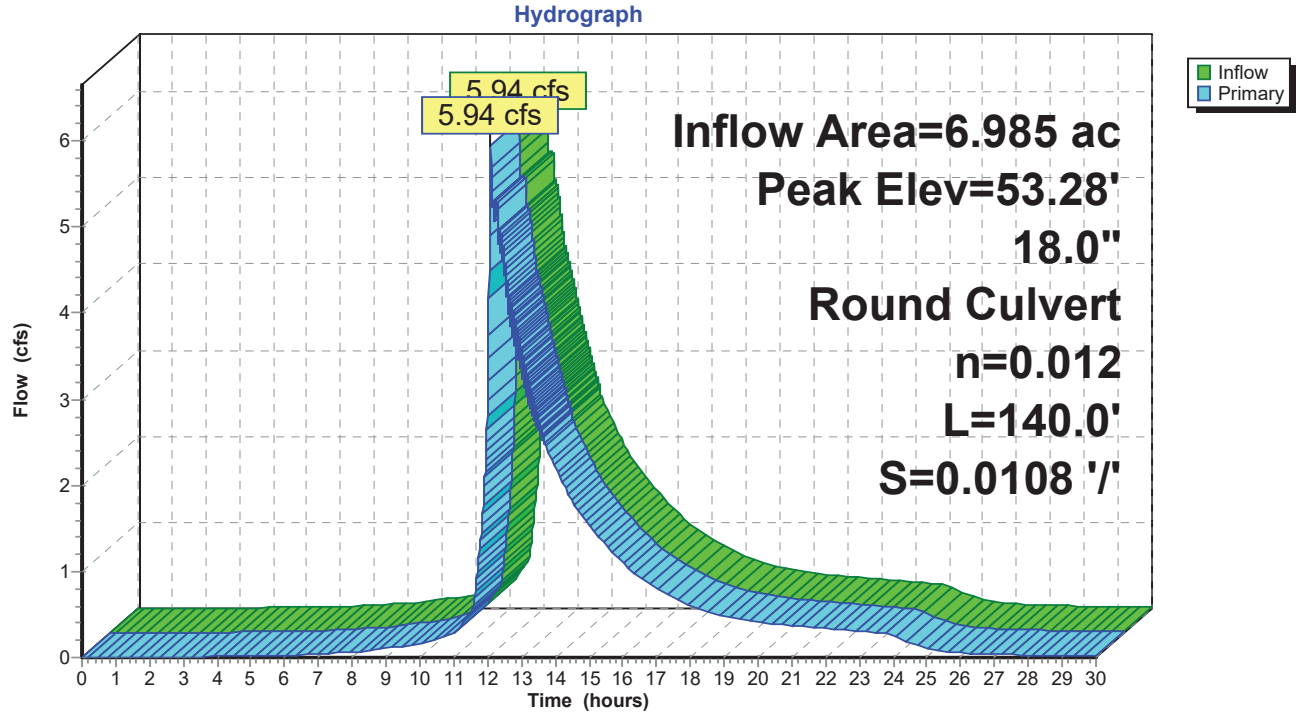
Inflow Area = 6.985 ac, 50.76% Impervious, Inflow Depth > 2.29" for 10 YEAR STORM event
Inflow = 5.94 cfs @ 12.10 hrs, Volume= 1.331 af
Outflow = 5.94 cfs @ 12.10 hrs, Volume= 1.331 af, Atten= 0%, Lag= 0.0 min
Primary = 5.94 cfs @ 12.10 hrs, Volume= 1.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.28' @ 12.18 hrs
Flood Elev= 54.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.25'	**18.0" Round Culvert** L= 140.0' Ke= 0.500 Inlet / Outlet Invert= 50.25' / 48.74' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.16 cfs @ 12.10 hrs HW=52.52' TW=52.20' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 4.16 cfs @ 2.35 fps)

Pond BC: BC



Summary for Pond CB1148X: CB 1148

Inflow Area = 6.243 ac, 48.39% Impervious, Inflow Depth > 2.10" for 10 YEAR STORM event
Inflow = 3.74 cfs @ 12.50 hrs, Volume= 1.090 af
Outflow = 3.74 cfs @ 12.50 hrs, Volume= 1.090 af, Atten= 0%, Lag= 0.0 min
Primary = 3.74 cfs @ 12.50 hrs, Volume= 1.090 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.98' @ 12.21 hrs Surf.Area= 13 sf Storage= 14 cf
Flood Elev= 58.70' Surf.Area= 18 sf Storage= 73 cf

Plug-Flow detention time= 0.1 min calculated for 1.090 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (912.3 - 912.2)

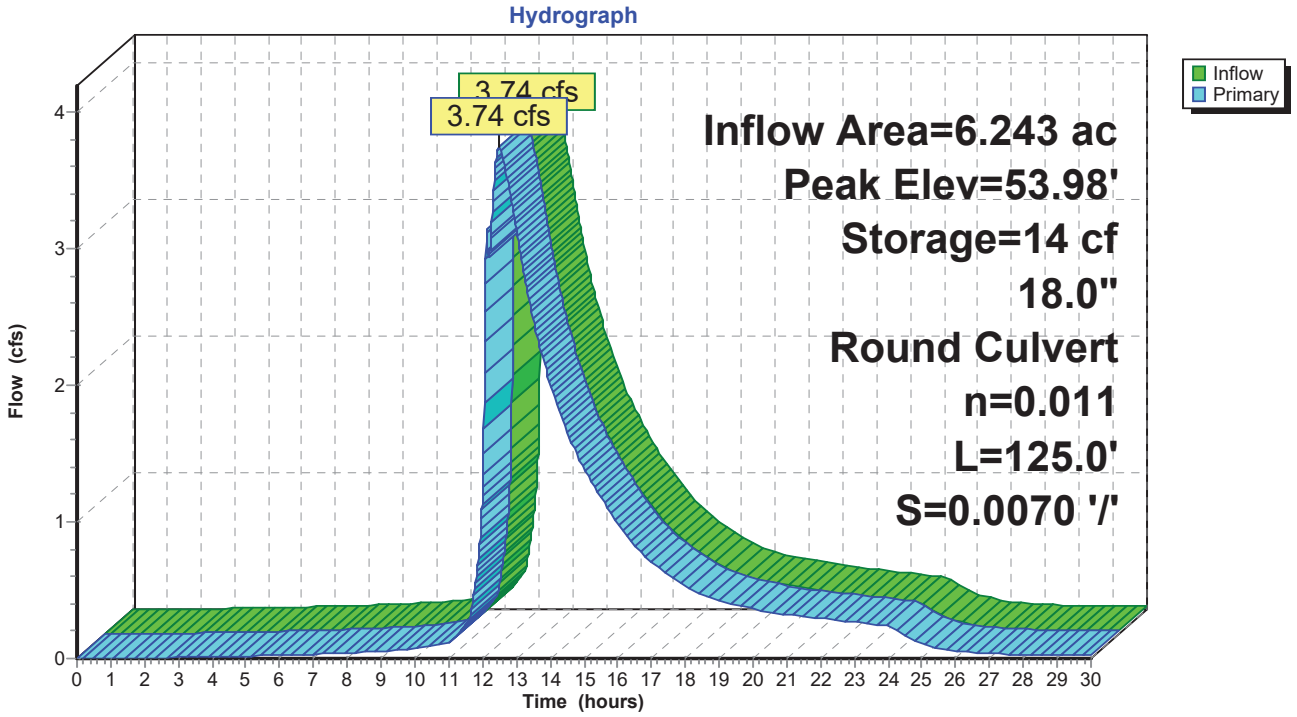
Volume	Invert	Avail.Storage	Storage Description
#1	52.90'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**
#2	58.69'	14 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		87 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.69	5	0	0
59.20	50	14	14

Device	Routing	Invert	Outlet Devices
#1	Primary	52.90'	**18.0" Round Culvert** L= 125.0' Ke= 0.500 Inlet / Outlet Invert= 52.90' / 52.03' S= 0.0070 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=3.76 cfs @ 12.50 hrs HW=53.83' TW=52.73' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 3.76 cfs @ 4.67 fps)

Pond CB1148X: CB 1148



Summary for Pond CB1X: CB 2306

Inflow Area = 0.174 ac, 53.31% Impervious, Inflow Depth = 3.57" for 10 YEAR STORM event
Inflow = 0.68 cfs @ 12.11 hrs, Volume= 0.052 af
Outflow = 0.67 cfs @ 12.11 hrs, Volume= 0.052 af, Atten= 1%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.11 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.31' @ 12.17 hrs Surf.Area= 13 sf Storage= 17 cf

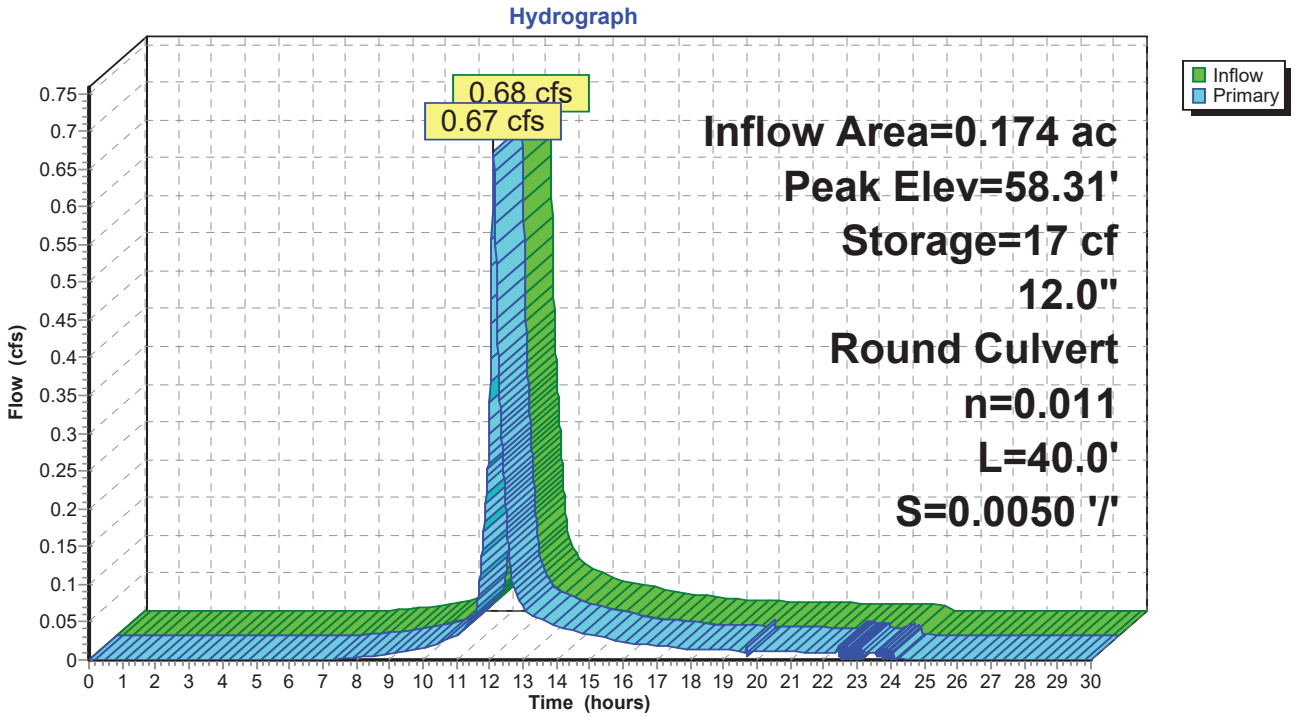
Plug-Flow detention time= 5.2 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (819.0 - 815.8)

Volume	Invert	Avail.Storage	Storage Description
#1	56.95'	35 cf	**4.00'D x 2.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	56.95'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.95' / 56.75' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.11 hrs HW=58.26' TW=58.25' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.46 cfs @ 0.59 fps)

Pond CB1X: CB 2306



Summary for Pond CB2031X: CB 2301X

Inflow Area = 11.909 ac, 41.41% Impervious, Inflow Depth > 1.94" for 10 YEAR STORM event
Inflow = 11.18 cfs @ 12.18 hrs, Volume= 1.921 af
Outflow = 11.17 cfs @ 12.18 hrs, Volume= 1.921 af, Atten= 0%, Lag= 0.0 min
Primary = 11.17 cfs @ 12.18 hrs, Volume= 1.921 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.77' @ 12.18 hrs Surf.Area= 13 sf Storage= 31 cf
Flood Elev= 52.70' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= 0.1 min calculated for 1.921 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (889.0 - 888.9)

Volume	Invert	Avail.Storage	Storage Description
#1	48.30'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	52.70'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

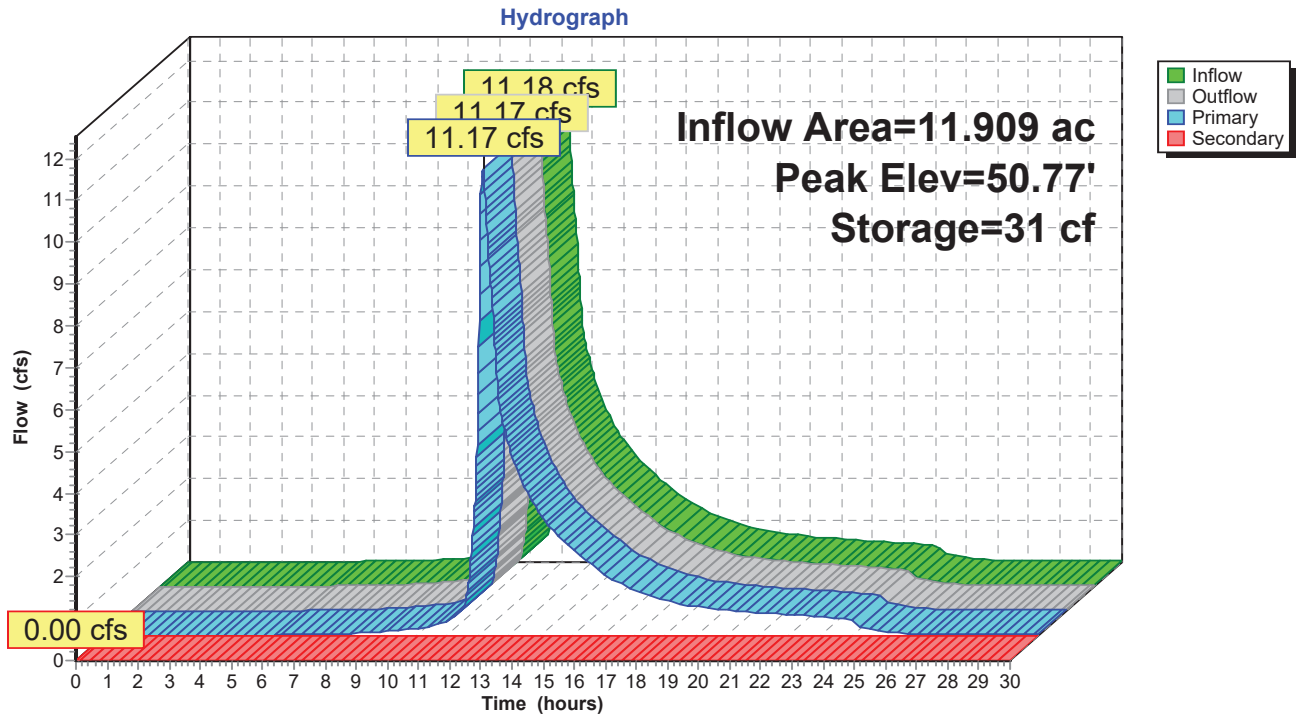
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.70	5	0	0
53.20	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	**18.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.12' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.70'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=11.17 cfs @ 12.18 hrs HW=50.77' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 11.17 cfs @ 6.32 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.30' TW=0.00' (Dynamic Tailwater)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB2031X: CB 2301X



Summary for Pond CB2305X: CB 2305X

Inflow Area = 11.189 ac, 42.46% Impervious, Inflow Depth > 1.98" for 10 YEAR STORM event
Inflow = 10.47 cfs @ 12.18 hrs, Volume= 1.846 af
Outflow = 10.43 cfs @ 12.18 hrs, Volume= 1.846 af, Atten= 0%, Lag= 0.0 min
Primary = 10.43 cfs @ 12.18 hrs, Volume= 1.846 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 52.27' @ 12.18 hrs Surf.Area= 13 sf Storage= 44 cf
Flood Elev= 53.20' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= 0.1 min calculated for 1.846 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (889.0 - 888.9)

Volume	Invert	Avail.Storage	Storage Description
#1	48.80'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	53.20'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

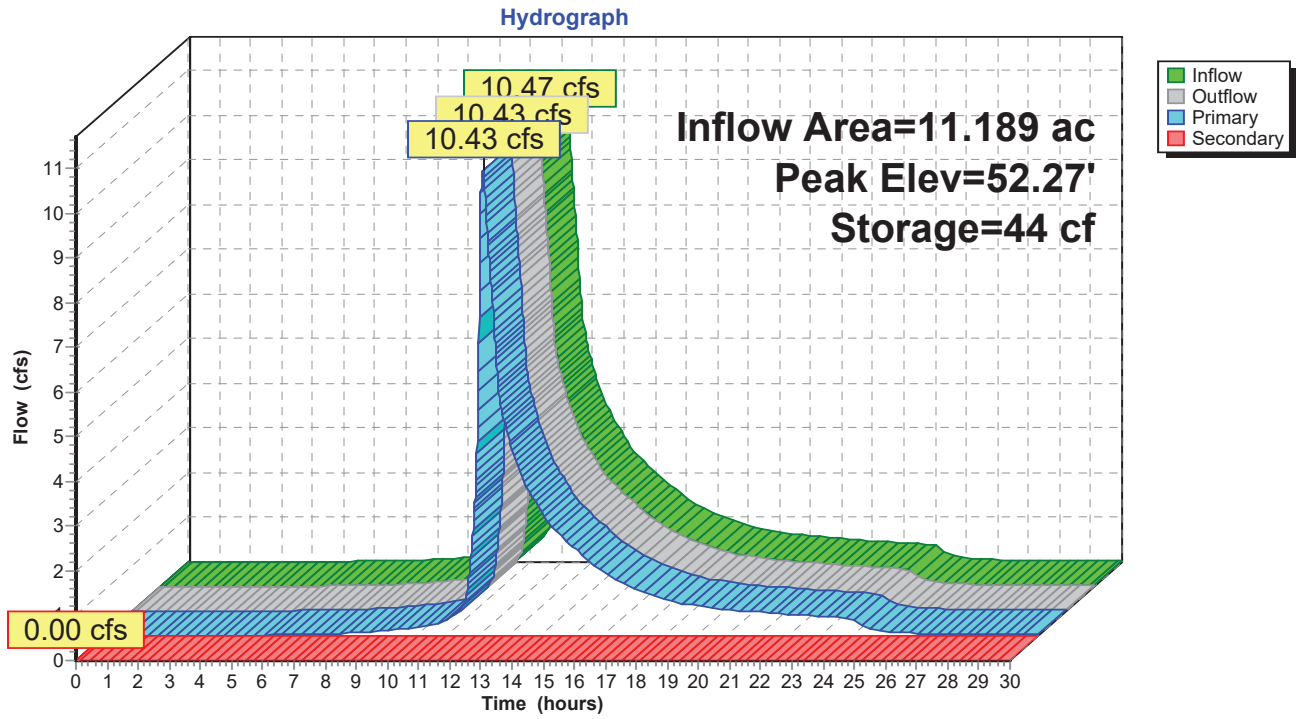
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	5	0	0
53.70	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.80'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.80' / 48.32' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	53.20'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=10.41 cfs @ 12.18 hrs HW=52.27' TW=50.77' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 10.41 cfs @ 5.89 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.80' TW=48.30' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond CB2305X: CB 2305X



Summary for Pond CB2306X: CB 2306

Inflow Area = 7.311 ac, 50.12% Impervious, Inflow Depth > 2.31" for 10 YEAR STORM event
Inflow = 6.93 cfs @ 12.10 hrs, Volume= 1.409 af
Outflow = 6.82 cfs @ 12.10 hrs, Volume= 1.409 af, Atten= 2%, Lag= 0.1 min
Primary = 6.82 cfs @ 12.10 hrs, Volume= 1.409 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 52.78' @ 12.18 hrs Surf.Area= 13 sf Storage= 51 cf
Flood Elev= 52.95' Surf.Area= 18 sf Storage= 53 cf

Plug-Flow detention time= 0.2 min calculated for 1.409 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (890.1 - 889.9)

Volume	Invert	Avail.Storage	Storage Description
#1	48.74'	53 cf	**4.00'D x 4.21'H Vertical Cone/Cylinder**
#2	52.95'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		179 cf	Total Available Storage

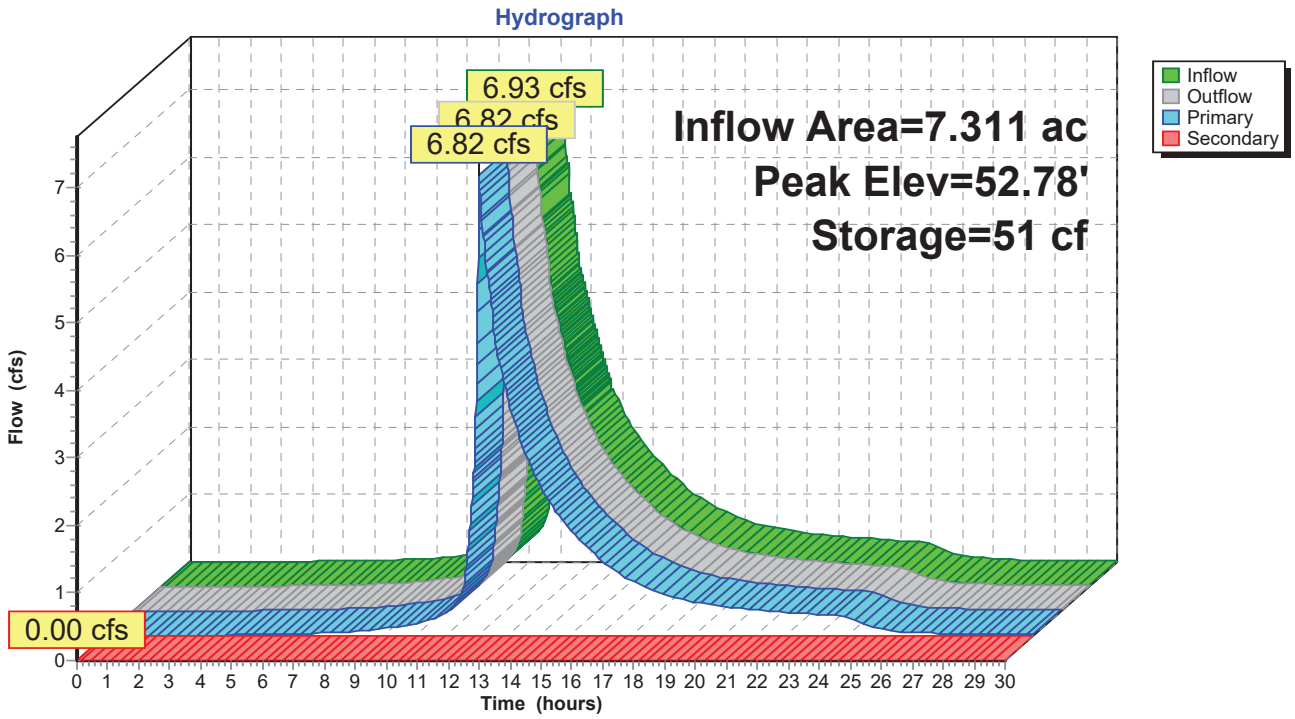
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.95	5	0	0
53.45	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.97'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 48.43' / 48.97' S= -0.0159 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.95'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=5.52 cfs @ 12.10 hrs HW=52.25' TW=51.83' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.52 cfs @ 3.12 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.74' TW=0.00' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond CB2306X: CB 2306



Summary for Pond CB2359X: CB 2359

Inflow Area = 6.541 ac, 48.87% Impervious, Inflow Depth > 2.17" for 10 YEAR STORM event
Inflow = 4.34 cfs @ 12.13 hrs, Volume= 1.184 af
Outflow = 4.31 cfs @ 12.12 hrs, Volume= 1.184 af, Atten= 1%, Lag= 0.0 min
Primary = 4.31 cfs @ 12.12 hrs, Volume= 1.184 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.53' @ 12.19 hrs Surf.Area= 13 sf Storage= 19 cf
Flood Elev= 56.95' Surf.Area= 13 sf Storage= 62 cf

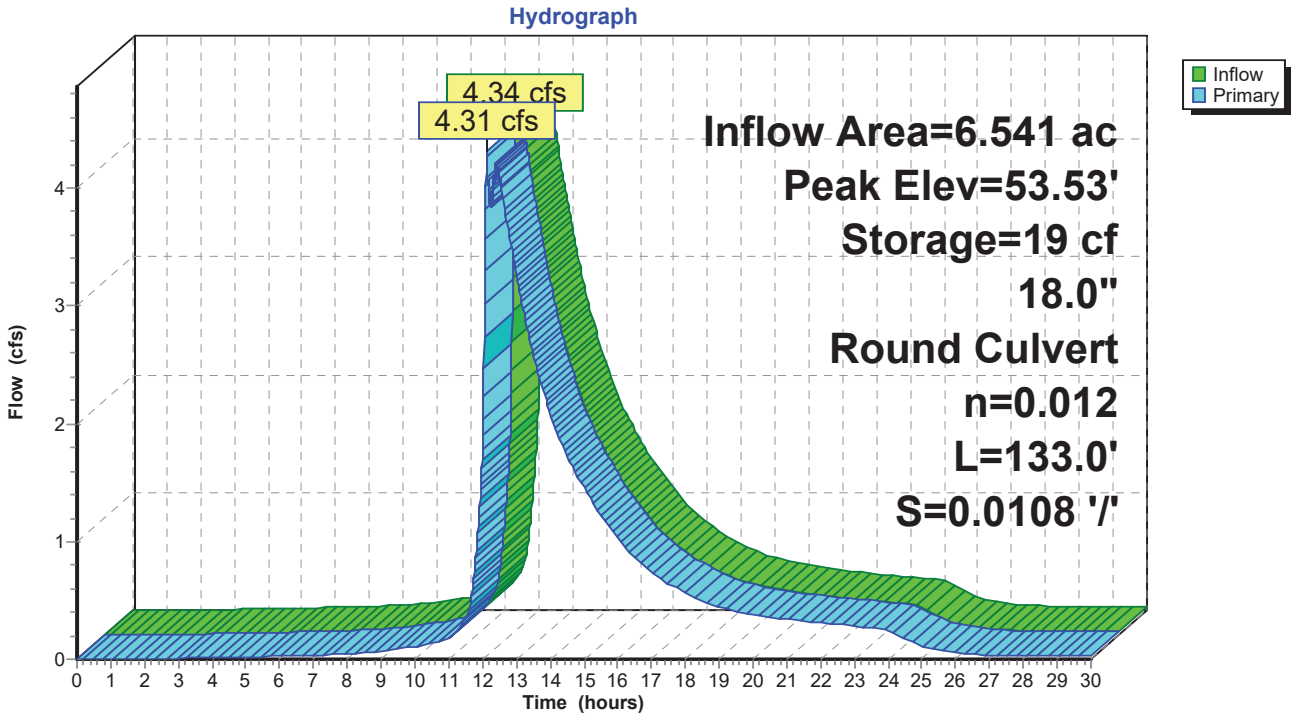
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (904.4 - 904.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.03'	62 cf	**4.00'D x 4.92'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	51.68'	**18.0" Round RCP_Round 18"** L= 133.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.68' / 50.25' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.32 cfs @ 12.12 hrs HW=53.29' TW=53.06' (Dynamic Tailwater)
↑—**1=RCP_Round 18"** (Outlet Controls 3.32 cfs @ 2.18 fps)

Pond CB2359X: CB 2359



Summary for Pond RG2X: Raingarden 2

Inflow Area = 0.541 ac, 54.04% Impervious, Inflow Depth = 3.67" for 10 YEAR STORM event
Inflow = 2.06 cfs @ 12.10 hrs, Volume= 0.165 af
Outflow = 1.59 cfs @ 12.17 hrs, Volume= 0.139 af, Atten= 23%, Lag= 4.3 min
Primary = 1.59 cfs @ 12.17 hrs, Volume= 0.139 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.28' @ 12.17 hrs Surf.Area= 1,301 sf Storage= 2,166 cf

Plug-Flow detention time= 180.3 min calculated for 0.139 af (84% of inflow)
Center-of-Mass det. time= 111.2 min (900.6 - 789.4)

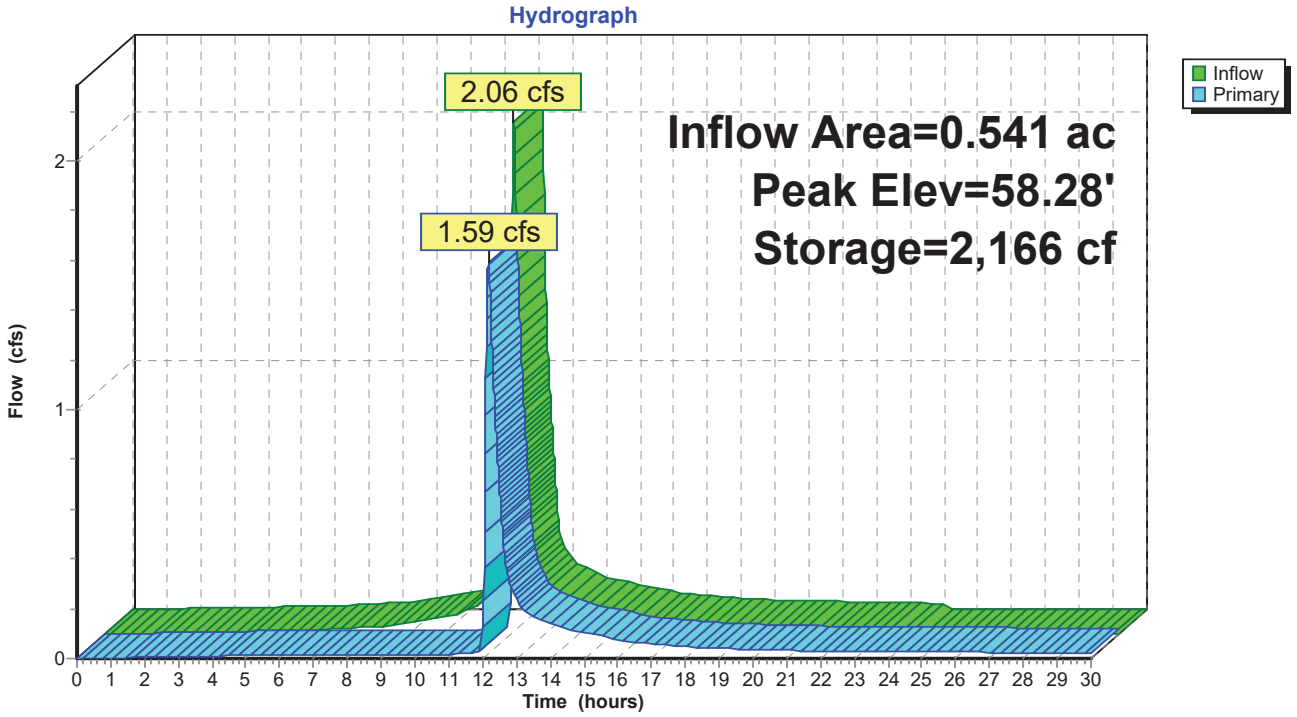
Volume	Invert	Avail.Storage	Storage Description
#1	53.75'	5,219 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.75	630	0.0	0	0
54.75	630	33.0	208	208
56.25	630	10.0	95	302
56.50	630	33.0	52	354
58.00	1,110	100.0	1,305	1,659
60.00	2,450	100.0	3,560	5,219

Device	Routing	Invert	Outlet Devices
#1	Primary	53.65'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.65' / 53.15' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	58.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	53.75'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=1.59 cfs @ 12.17 hrs HW=58.28' TW=53.96' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.59 cfs of 7.69 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 1.56 cfs @ 1.75 fps)
  └─**3=Exfiltration** (Controls 0.03 cfs)

Pond RG2X: Raingarden 2

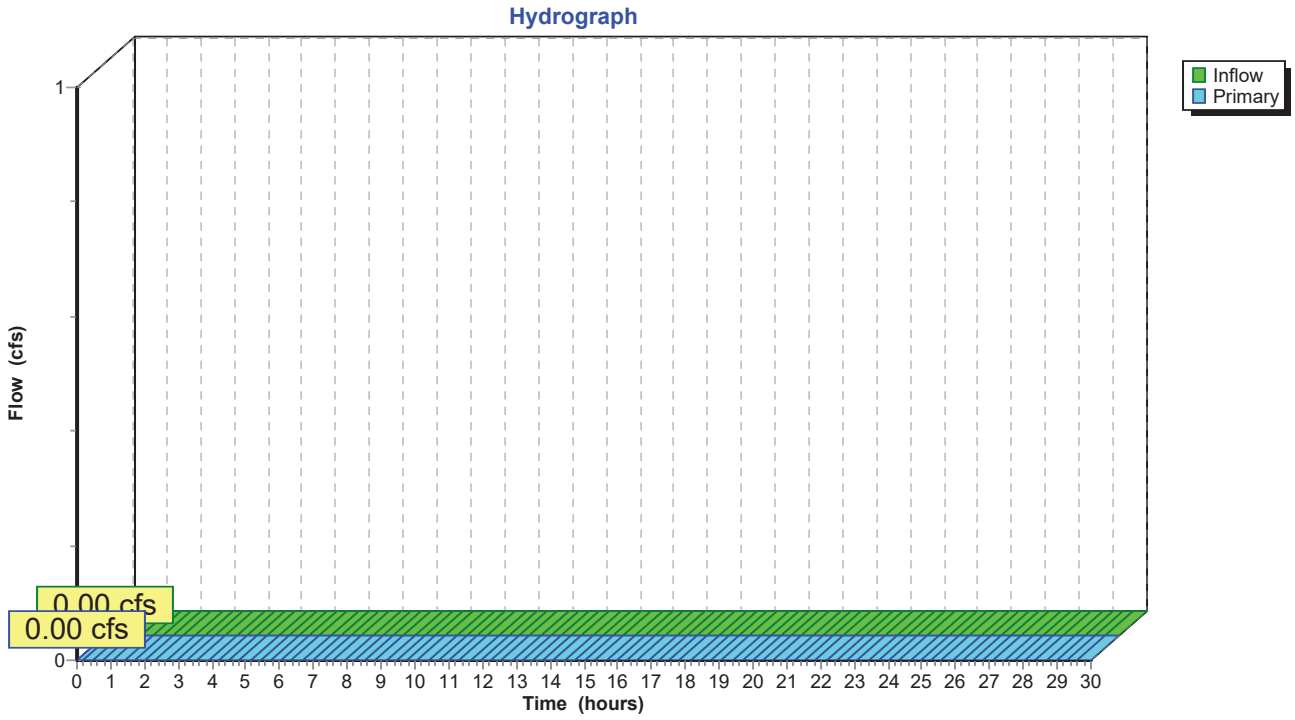


Summary for Link 2L: Overflow

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 2L: Overflow

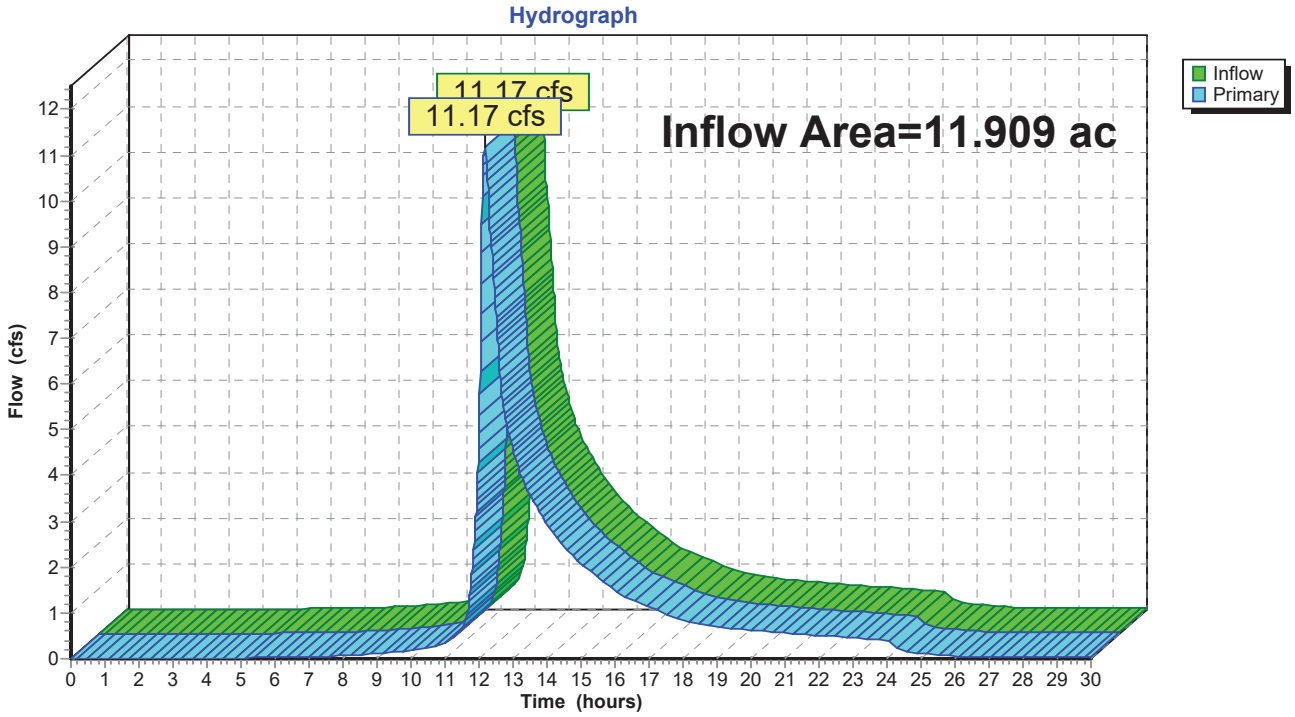


Summary for Link POA 1X: POA 1

Inflow Area = 11.909 ac, 41.41% Impervious, Inflow Depth > 1.94" for 10 YEAR STORM event
Inflow = 11.17 cfs @ 12.18 hrs, Volume= 1.921 af
Primary = 11.17 cfs @ 12.18 hrs, Volume= 1.921 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 1X: POA 1



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1S: South Side (GoLo) Runoff Area=19,336 sf 78.72% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=85 Runoff=2.73 cfs 0.200 af

Subcatchment 1SY: 1SY Runoff Area=235,657 sf 45.90% Impervious Runoff Depth=2.92"
Tc=15.0 min CN=62 Runoff=13.70 cfs 1.316 af

Subcatchment 2S: North Side (GoLo) Runoff Area=22,235 sf 48.04% Impervious Runoff Depth=3.12"
Tc=12.0 min CN=64 Runoff=1.52 cfs 0.133 af

Subcatchment 3SY: West Coolidge Runoff Area=146,723 sf 25.00% Impervious Runoff Depth=2.13"
Tc=12.0 min CN=54 Runoff=6.37 cfs 0.598 af

Subcatchment 4SY: East Coolidge Runoff Area=31,348 sf 25.00% Impervious Runoff Depth=2.13"
Tc=9.0 min CN=54 Runoff=1.50 cfs 0.128 af

Subcatchment R2AX: 1/2 Roof Runoff Area=8,030 sf 100.00% Impervious Runoff Depth=6.92"
Tc=6.0 min CN=98 Runoff=1.30 cfs 0.106 af

Subcatchment S2AX: S2A Runoff Area=7,588 sf 53.31% Impervious Runoff Depth=4.95"
Tc=8.0 min CN=81 Runoff=0.93 cfs 0.072 af

Subcatchment S2BX: S2B Runoff Area=7,948 sf 8.30% Impervious Runoff Depth=3.12"
Flow Length=275' Tc=7.2 min CN=64 Runoff=0.63 cfs 0.047 af

Subcatchment S3X: S3 Runoff Area=12,718 sf 84.05% Impervious Runoff Depth=6.21"
Flow Length=485' Tc=9.2 min CN=92 Runoff=1.77 cfs 0.151 af

Subcatchment S4X: S4 Runoff Area=12,973 sf 58.88% Impervious Runoff Depth=5.18"
Flow Length=180' Slope=0.0200 '/' Tc=8.9 min CN=83 Runoff=1.61 cfs 0.129 af

Subcatchment S5X: S5 Runoff Area=14,205 sf 36.33% Impervious Runoff Depth=4.18"
Flow Length=270' Tc=8.4 min CN=74 Runoff=1.47 cfs 0.114 af

Pond 1PY: Westerly Pond Peak Elev=54.87' Storage=21,995 cf Inflow=13.70 cfs 1.316 af
18.0" Round Culvert n=0.012 L=70.0' S=0.0057 '/' Outflow=6.93 cfs 1.316 af

Pond 3P: Existing On Site CB Peak Elev=56.92' Storage=313 cf Inflow=2.73 cfs 0.200 af
12.0" Round Culvert n=0.025 L=60.0' S=0.0017 '/' Outflow=3.64 cfs 0.200 af

Pond BC: BC Peak Elev=56.03' Inflow=13.09 cfs 1.996 af
18.0" Round Culvert n=0.012 L=140.0' S=0.0108 '/' Outflow=13.09 cfs 1.996 af

Pond CB1148X: CB 1148 Peak Elev=56.21' Storage=42 cf Inflow=7.94 cfs 1.666 af
18.0" Round Culvert n=0.011 L=125.0' S=0.0070 '/' Outflow=9.02 cfs 1.666 af

Pond CB1X: CB 2306 Peak Elev=58.44' Storage=19 cf Inflow=0.93 cfs 0.072 af
12.0" Round Culvert n=0.011 L=40.0' S=0.0050 '/' Outflow=0.93 cfs 0.072 af

Pond CB2031X: CB 2301X Peak Elev=51.99' Storage=46 cf Inflow=15.33 cfs 2.899 af
Primary=14.60 cfs 2.899 af Secondary=0.00 cfs 0.000 af Outflow=14.60 cfs 2.899 af

Pond CB2305X: CB 2305X Peak Elev=53.48' Storage=95 cf Inflow=14.77 cfs 2.771 af
Primary=14.52 cfs 2.764 af Secondary=0.94 cfs 0.007 af Outflow=14.52 cfs 2.771 af

Pond CB2306X: CB 2306 Peak Elev=53.80' Storage=179 cf Inflow=13.62 cfs 2.109 af
Primary=11.32 cfs 2.040 af Secondary=4.70 cfs 0.069 af Outflow=11.32 cfs 2.109 af

Pond CB2359X: CB 2359 Peak Elev=56.12' Storage=51 cf Inflow=9.28 cfs 1.795 af
18.0" Round Culvert n=0.012 L=133.0' S=0.0108 '/' Outflow=10.97 cfs 1.796 af

Pond RG2X: Raingarden 2 Peak Elev=58.39' Storage=2,358 cf Inflow=2.82 cfs 0.226 af
Outflow=2.40 cfs 0.199 af

Link 2L: Overflow Inflow=4.70 cfs 0.069 af
Primary=4.70 cfs 0.069 af

Link POA 1X: POA 1 Inflow=14.60 cfs 2.899 af
Primary=14.60 cfs 2.899 af

Total Runoff Area = 11.909 ac Runoff Volume = 2.994 af Average Runoff Depth = 3.02"
58.59% Pervious = 6.978 ac 41.41% Impervious = 4.931 ac

Summary for Subcatchment 1S: South Side (GoLo)

Runoff = 2.73 cfs @ 12.09 hrs, Volume= 0.200 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
2,378	98	Roofs, HSG A
12,844	98	Paved parking, HSG A
4,114	39	>75% Grass cover, Good, HSG A
19,336	85	Weighted Average
4,114		21.28% Pervious Area
15,222		78.72% Impervious Area

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

Summary for Subcatchment 1SY: 1SY

Runoff = 13.70 cfs @ 12.22 hrs, Volume= 1.316 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
127,492	32	Woods/grass comb., Good, HSG A
108,165	98	Paved parking, HSG A
235,657	62	Weighted Average
127,492		54.10% Pervious Area
108,165		45.90% Impervious Area

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

Summary for Subcatchment 2S: North Side (GoLo)

Runoff = 1.52 cfs @ 12.17 hrs, Volume= 0.133 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
283	98	Roofs, HSG A
10,398	98	Paved parking, HSG A
11,554	32	Woods/grass comb., Good, HSG A
22,235	64	Weighted Average
11,554		51.96% Pervious Area
10,681		48.04% Impervious Area

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

Summary for Subcatchment 3SY: West Coolidge

Runoff = 6.37 cfs @ 12.18 hrs, Volume= 0.598 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
146,723	54	1/2 acre lots, 25% imp, HSG A
110,042		75.00% Pervious Area
36,681		25.00% Impervious Area

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

Summary for Subcatchment 4SY: East Coolidge

Runoff = 1.50 cfs @ 12.14 hrs, Volume= 0.128 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
31,348	54	1/2 acre lots, 25% imp, HSG A
23,511		75.00% Pervious Area
7,837		25.00% Impervious Area

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

Summary for Subcatchment R2AX: 1/2 Roof

Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.106 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
8,030	98	Roofs, HSG B
8,030		100.00% Impervious Area

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

Summary for Subcatchment S2AX: S2A

Runoff = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af, Depth= 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
2,353	98	Paved parking, HSG B
1,692	98	Unconnected pavement, HSG B
3,543	61	>75% Grass cover, Good, HSG B
7,588	81	Weighted Average
3,543		46.69% Pervious Area
4,045		53.31% Impervious Area
1,692		41.83% Unconnected

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

Summary for Subcatchment S2BX: S2B

Runoff = 0.63 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

	Area (sf)	CN	Description
	7,288	61	>75% Grass cover, Good, HSG B
	100	98	Unconnected pavement, HSG B
*	560	98	Multi-Use Path, HSG B
	7,948	64	Weighted Average
	7,288		91.70% Pervious Area
	660		8.30% Impervious Area
	100		15.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.2	275	Total			

Summary for Subcatchment S3X: S3

Runoff = 1.77 cfs @ 12.12 hrs, Volume= 0.151 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

	Area (sf)	CN	Description
	2,028	61	>75% Grass cover, Good, HSG B
	9,432	98	Paved roads w/curbs & sewers, HSG B
	898	98	Paved parking, HSG B
*	360	98	Multi-Use Path, HSG B
	12,718	92	Weighted Average
	2,028		15.95% Pervious Area
	10,690		84.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	40	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.1	320	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.2	485	Total			

Summary for Subcatchment S4X: S4

Runoff = 1.61 cfs @ 12.12 hrs, Volume= 0.129 af, Depth= 5.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

	Area (sf)	CN	Description
	5,335	61	>75% Grass cover, Good, HSG B
	6,778	98	Paved roads w/curbs & sewers, HSG B
*	860	98	Multi-Use path, HSG B
	12,973	83	Weighted Average
	5,335		41.12% Pervious Area
	7,638		58.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.6	80	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.9	180	Total			

Summary for Subcatchment S5X: S5

Runoff = 1.47 cfs @ 12.12 hrs, Volume= 0.114 af, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
4,095	61	>75% Grass cover, Good, HSG B
4,470	55	Woods, Good, HSG B
5,160	98	Paved roads w/curbs & sewers, HSG B
480	96	Gravel surface, HSG B
14,205	74	Weighted Average
9,045		63.67% Pervious Area
5,160		36.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	35	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
1.2	135	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.4	270	Total			

Summary for Pond 1PY: Westerly Pond

Inflow Area = 5.410 ac, 45.90% Impervious, Inflow Depth = 2.92" for 25 YEAR STORM event
Inflow = 13.70 cfs @ 12.22 hrs, Volume= 1.316 af
Outflow = 6.93 cfs @ 12.64 hrs, Volume= 1.316 af, Atten= 49%, Lag= 25.7 min
Primary = 6.93 cfs @ 12.64 hrs, Volume= 1.316 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.87' @ 12.67 hrs Surf.Area= 20,889 sf Storage= 21,995 cf

Plug-Flow detention time= 67.9 min calculated for 1.316 af (100% of inflow)
Center-of-Mass det. time= 67.9 min (923.9 - 855.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.40'	110,492 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.40	10	0	0
54.00	17,553	5,269	5,269
56.00	25,221	42,774	48,043
58.00	37,228	62,449	110,492

Device	Routing	Invert	Outlet Devices
#1	Primary	53.40'	**18.0" Round Culvert** L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.40' / 53.00' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.71 cfs @ 12.64 hrs HW=54.87' TW=54.45' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 4.71 cfs @ 3.39 fps)

Summary for Pond 3P: Existing On Site CB

Inflow Area = 0.444 ac, 78.72% Impervious, Inflow Depth = 5.41" for 25 YEAR STORM event
Inflow = 2.73 cfs @ 12.09 hrs, Volume= 0.200 af
Outflow = 3.64 cfs @ 12.10 hrs, Volume= 0.200 af, Atten= 0%, Lag= 0.9 min
Primary = 3.64 cfs @ 12.10 hrs, Volume= 0.200 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 56.92' @ 12.12 hrs Surf.Area= 513 sf Storage= 313 cf
Flood Elev= 52.90' Surf.Area= 23 sf Storage= 32 cf

Plug-Flow detention time= 1.6 min calculated for 0.200 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (795.9 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	50.35'	32 cf	**4.00'D x 2.55'H Vertical Cone/Cylinder**
#2	52.90'	281 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		313 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.90	10	0	0
54.00	500	281	281

Device	Routing	Invert	Outlet Devices
#1	Primary	50.35'	**12.0" Round Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 50.35' / 50.25' S= 0.0017 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=3.14 cfs @ 12.10 hrs HW=56.88' TW=54.78' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 3.14 cfs @ 4.00 fps)

Summary for Pond BC: BC

Inflow Area = 6.985 ac, 50.76% Impervious, Inflow Depth > 3.43" for 25 YEAR STORM event
Inflow = 13.09 cfs @ 12.44 hrs, Volume= 1.996 af
Outflow = 13.09 cfs @ 12.44 hrs, Volume= 1.996 af, Atten= 0%, Lag= 0.0 min
Primary = 13.09 cfs @ 12.44 hrs, Volume= 1.996 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 56.03' @ 12.44 hrs
Flood Elev= 54.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.25'	**18.0" Round Culvert** L= 140.0' Ke= 0.500 Inlet / Outlet Invert= 50.25' / 48.74' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=11.84 cfs @ 12.44 hrs HW=55.70' TW=53.13' (Dynamic Tailwater)
1=Culvert (Outlet Controls 11.84 cfs @ 6.70 fps)

Summary for Pond CB1148X: CB 1148

Inflow Area = 6.243 ac, 48.39% Impervious, Inflow Depth > 3.20" for 25 YEAR STORM event
Inflow = 7.94 cfs @ 12.53 hrs, Volume= 1.666 af
Outflow = 9.02 cfs @ 12.65 hrs, Volume= 1.666 af, Atten= 0%, Lag= 6.9 min
Primary = 9.02 cfs @ 12.65 hrs, Volume= 1.666 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 56.21' @ 12.46 hrs Surf.Area= 13 sf Storage= 42 cf
Flood Elev= 58.70' Surf.Area= 18 sf Storage= 73 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (904.1 - 904.0)

Volume	Invert	Avail.Storage	Storage Description
#1	52.90'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**
#2	58.69'	14 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		87 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.69	5	0	0
59.20	50	14	14

Device	Routing	Invert	Outlet Devices
#1	Primary	52.90'	**18.0" Round Culvert** L= 125.0' Ke= 0.500 Inlet / Outlet Invert= 52.90' / 52.03' S= 0.0070 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=5.25 cfs @ 12.65 hrs HW=54.69' TW=54.27' (Dynamic Tailwater)
1=Culvert (Outlet Controls 5.25 cfs @ 3.14 fps)

Summary for Pond CB1X: CB 2306

Inflow Area = 0.174 ac, 53.31% Impervious, Inflow Depth = 4.95" for 25 YEAR STORM event
Inflow = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af
Outflow = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.44' @ 12.15 hrs Surf.Area= 13 sf Storage= 19 cf

Plug-Flow detention time= 3.8 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 2.7 min (809.2 - 806.5)

Volume	Invert	Avail.Storage	Storage Description
#1	56.95'	35 cf	**4.00'D x 2.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	56.95'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.95' / 56.75' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.11 hrs HW=58.43' TW=58.37' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.85 cfs @ 1.08 fps)

Summary for Pond CB2031X: CB 2301X

Inflow Area = 11.909 ac, 41.41% Impervious, Inflow Depth > 2.92" for 25 YEAR STORM event
Inflow = 15.33 cfs @ 12.36 hrs, Volume= 2.899 af
Outflow = 14.60 cfs @ 12.54 hrs, Volume= 2.899 af, Atten= 5%, Lag= 10.7 min
Primary = 14.60 cfs @ 12.54 hrs, Volume= 2.899 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 51.99' @ 12.54 hrs Surf.Area= 13 sf Storage= 46 cf
Flood Elev= 52.70' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (882.7 - 882.7)

Volume	Invert	Avail.Storage	Storage Description
#1	48.30'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	52.70'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.70	5	0	0
53.20	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	**18.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.12' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.70'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=14.22 cfs @ 12.54 hrs HW=51.84' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 14.22 cfs @ 8.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.30' TW=0.00' (Dynamic Tailwater)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB2305X: CB 2305X

Inflow Area = 11.189 ac, 42.46% Impervious, Inflow Depth > 2.97" for 25 YEAR STORM event
Inflow = 14.77 cfs @ 12.40 hrs, Volume= 2.771 af
Outflow = 14.52 cfs @ 12.47 hrs, Volume= 2.771 af, Atten= 2%, Lag= 4.2 min
Primary = 14.52 cfs @ 12.47 hrs, Volume= 2.764 af
Secondary = 0.94 cfs @ 12.16 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.48' @ 12.16 hrs Surf.Area= 294 sf Storage= 95 cf
Flood Elev= 53.20' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (883.3 - 883.2)

Volume	Invert	Avail.Storage	Storage Description
#1	48.80'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	53.20'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	5	0	0
53.70	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.80'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.80' / 48.32' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	53.20'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=10.43 cfs @ 12.47 hrs HW=52.71' TW=51.21' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 10.43 cfs @ 5.90 fps)

Secondary OutFlow Max=0.93 cfs @ 12.16 hrs HW=53.48' TW=51.71' (Dynamic Tailwater)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.93 cfs @ 1.72 fps)

Summary for Pond CB2306X: CB 2306

Inflow Area = 7.311 ac, 50.12% Impervious, Inflow Depth > 3.46" for 25 YEAR STORM event
Inflow = 13.62 cfs @ 12.44 hrs, Volume= 2.109 af
Outflow = 11.32 cfs @ 12.53 hrs, Volume= 2.109 af, Atten= 17%, Lag= 5.5 min
Primary = 11.32 cfs @ 12.53 hrs, Volume= 2.040 af
Secondary = 4.70 cfs @ 12.13 hrs, Volume= 0.069 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.80' @ 12.13 hrs Surf.Area= 513 sf Storage= 179 cf
Flood Elev= 52.95' Surf.Area= 18 sf Storage= 53 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (883.4 - 883.2)

Volume	Invert	Avail.Storage	Storage Description
#1	48.74'	53 cf	**4.00'D x 4.21'H Vertical Cone/Cylinder**
#2	52.95'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		179 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.95	5	0	0
53.45	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.97'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 48.43' / 48.97' S= -0.0159 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.95'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=6.27 cfs @ 12.53 hrs HW=52.64' TW=52.09' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.27 cfs @ 3.55 fps)

Secondary OutFlow Max=4.63 cfs @ 12.13 hrs HW=53.79' TW=0.00' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 4.63 cfs @ 3.00 fps)

Summary for Pond CB2359X: CB 2359

Inflow Area = 6.541 ac, 48.87% Impervious, Inflow Depth > 3.29" for 25 YEAR STORM event
Inflow = 9.28 cfs @ 12.65 hrs, Volume= 1.795 af
Outflow = 10.97 cfs @ 12.50 hrs, Volume= 1.796 af, Atten= 0%, Lag= 0.0 min
Primary = 10.97 cfs @ 12.50 hrs, Volume= 1.796 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 56.12' @ 12.45 hrs Surf.Area= 13 sf Storage= 51 cf
Flood Elev= 56.95' Surf.Area= 13 sf Storage= 62 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	52.03'	62 cf	**4.00'D x 4.92'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	51.68'	**18.0" Round RCP_Round 18"** L= 133.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.68' / 50.25' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.50 hrs HW=55.02' TW=55.70' (Dynamic Tailwater)
└─**1=RCP_Round 18"** (Controls 0.00 cfs)

Summary for Pond RG2X: Raingarden 2

Inflow Area = 0.541 ac, 54.04% Impervious, Inflow Depth > 5.00" for 25 YEAR STORM event
Inflow = 2.82 cfs @ 12.10 hrs, Volume= 0.226 af
Outflow = 2.40 cfs @ 12.15 hrs, Volume= 0.199 af, Atten= 15%, Lag= 3.2 min
Primary = 2.40 cfs @ 12.15 hrs, Volume= 0.199 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.39' @ 12.15 hrs Surf.Area= 1,373 sf Storage= 2,358 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 85.4 min (870.6 - 785.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.75'	5,219 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.75	630	0.0	0	0
54.75	630	33.0	208	208
56.25	630	10.0	95	302
56.50	630	33.0	52	354
58.00	1,110	100.0	1,305	1,659
60.00	2,450	100.0	3,560	5,219

Device	Routing	Invert	Outlet Devices
#1	Primary	53.65'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.65' / 53.15' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	58.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	53.75'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=2.40 cfs @ 12.15 hrs HW=58.39' TW=55.67' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.40 cfs of 6.24 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 2.37 cfs @ 3.02 fps)
  └─**3=Exfiltration** (Controls 0.03 cfs)

Summary for Link 2L: Overflow

Inflow = 4.70 cfs @ 12.13 hrs, Volume= 0.069 af
Primary = 4.70 cfs @ 12.13 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 1X: POA 1

Inflow Area = 11.909 ac, 41.41% Impervious, Inflow Depth > 2.92" for 25 YEAR STORM event
Inflow = 14.60 cfs @ 12.54 hrs, Volume= 2.899 af
Primary = 14.60 cfs @ 12.54 hrs, Volume= 2.899 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Section 6

Drainage Calculations

Post-Development, Off Site
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary

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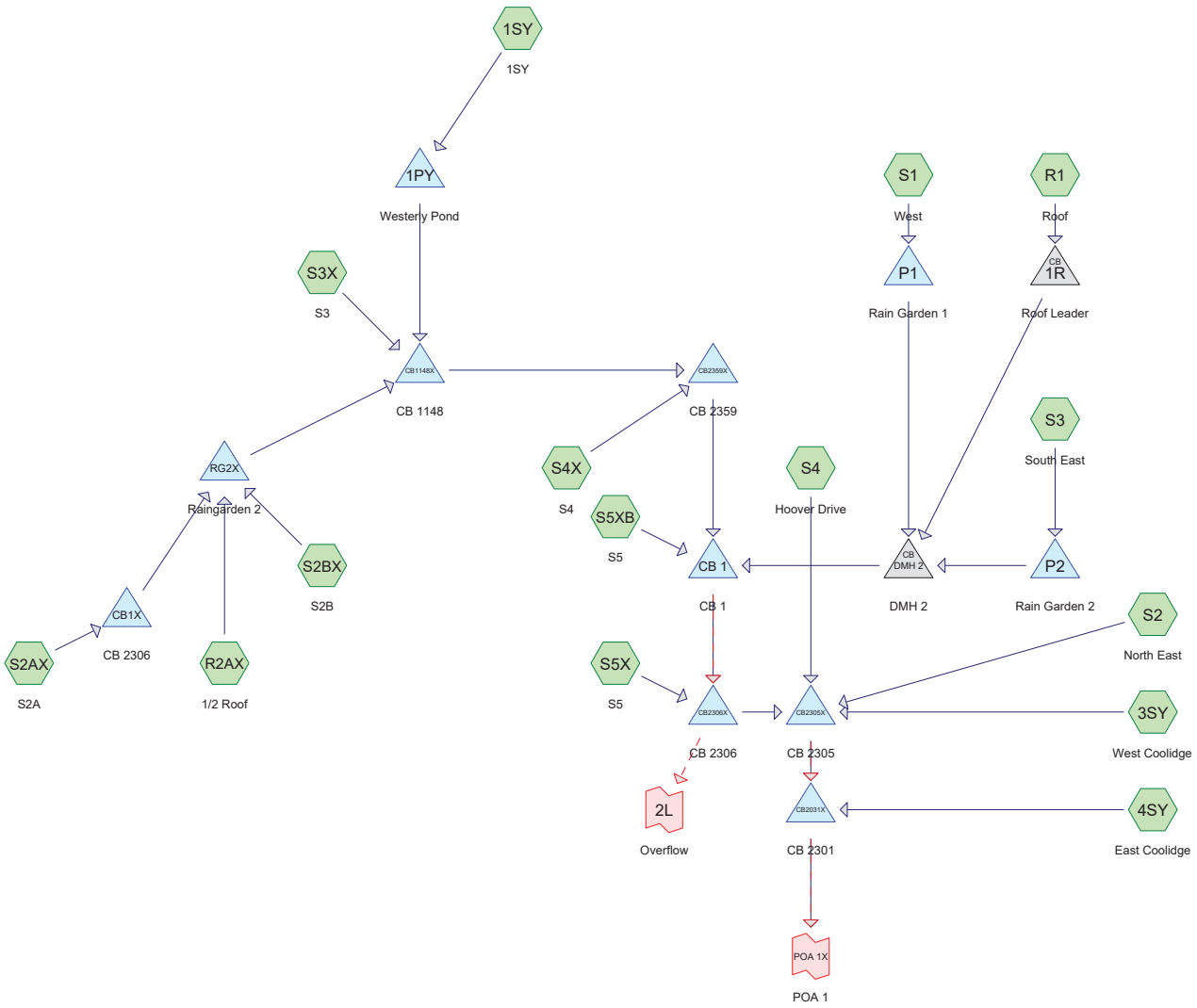


Subcat Reach Pond Link

Routing Diagram for 5361-POST_FULL-110824
Prepared by Altus Engineering, Inc., Printed 11/22/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.088	54	1/2 acre lots, 25% imp, HSG A (3SY, 4SY)
0.374	39	>75% Grass cover, Good, HSG A (S1, S2, S3, S4)
0.512	61	>75% Grass cover, Good, HSG B (S2AX, S2BX, S3X, S4X, S5X)
0.011	96	Gravel surface, HSG B (S5X)
0.021	98	Multi-Use Path, HSG B (S2BX, S3X)
0.020	98	Multi-Use path, HSG B (S4X)
2.868	98	Paved parking, HSG A (1SY, S1, S3, S4)
0.075	98	Paved parking, HSG B (S2AX, S3X)
0.491	98	Paved roads w/curbs & sewers, HSG B (S3X, S4X, S5X, S5XB)
0.160	98	Roofs, HSG A (R1)
0.184	98	Roofs, HSG B (R2AX)
0.041	98	Unconnected pavement, HSG B (S2AX, S2BX)
0.103	55	Woods, Good, HSG B (S5X, S5XB)
2.963	32	Woods/grass comb., Good, HSG A (1SY, S2)
11.909	**63**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
10.452	HSG A	1SY, 3SY, 4SY, R1, S1, S2, S3, S4
1.457	HSG B	R2AX, S2AX, S2BX, S3X, S4X, S5X, S5XB
0.000	HSG C	
0.000	HSG D	
0.000	Other	
11.909		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
4.088	0.000	0.000	0.000	0.000	4.088	1/2 acre lots, 25% imp	3SY, 4SY
0.374	0.512	0.000	0.000	0.000	0.886	>75% Grass cover, Good	S1, S2, S2AX, S2BX, S3, S3X, S4, S4X, S5X
0.000	0.011	0.000	0.000	0.000	0.011	Gravel surface	S5X
0.000	0.021	0.000	0.000	0.000	0.021	Multi-Use Path	S2BX, S3X
0.000	0.020	0.000	0.000	0.000	0.020	Multi-Use path	S4X
2.868	0.075	0.000	0.000	0.000	2.942	Paved parking	1SY, S1, S2AX, S3, S3X, S4
0.000	0.491	0.000	0.000	0.000	0.491	Paved roads w/curbs & sewers	S3X, S4X, S5X, S5XB
0.160	0.184	0.000	0.000	0.000	0.344	Roofs	R1, R2AX
0.000	0.041	0.000	0.000	0.000	0.041	Unconnected pavement	S2AX, S2BX
0.000	0.103	0.000	0.000	0.000	0.103	Woods, Good	S5X, S5XB

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
2.963	0.000	0.000	0.000	0.000	2.963	Woods/grass comb., Good	1SY, S2
10.452	**1.457**	**0.000**	**0.000**	**0.000**	**11.909**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1SY: 1SY Runoff Area=235,657 sf 45.90% Impervious Runoff Depth=1.85"
Tc=15.0 min CN=62 Runoff=8.39 cfs 0.836 af

Subcatchment 3SY: West Coolidge Runoff Area=146,723 sf 25.00% Impervious Runoff Depth=1.25"
Tc=12.0 min CN=54 Runoff=3.38 cfs 0.351 af

Subcatchment 4SY: East Coolidge Runoff Area=31,348 sf 25.00% Impervious Runoff Depth=1.25"
Tc=9.0 min CN=54 Runoff=0.80 cfs 0.075 af

Subcatchment R1: Roof Runoff Area=6,971 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.89 cfs 0.072 af

Subcatchment R2AX: 1/2 Roof Runoff Area=8,030 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=1.02 cfs 0.083 af

Subcatchment S1: West Runoff Area=16,690 sf 57.87% Impervious Runoff Depth=2.80"
Tc=6.0 min CN=73 Runoff=1.26 cfs 0.089 af

Subcatchment S2: North East Runoff Area=4,915 sf 0.00% Impervious Runoff Depth=0.26"
Tc=12.0 min CN=37 Runoff=0.01 cfs 0.002 af

Subcatchment S2AX: S2A Runoff Area=7,588 sf 53.31% Impervious Runoff Depth=3.57"
Tc=8.0 min CN=81 Runoff=0.68 cfs 0.052 af

Subcatchment S2BX: S2B Runoff Area=7,948 sf 8.30% Impervious Runoff Depth=2.02"
Flow Length=275' Tc=7.2 min CN=64 Runoff=0.40 cfs 0.031 af

Subcatchment S3: South East Runoff Area=7,415 sf 37.45% Impervious Runoff Depth=1.78"
Tc=6.0 min CN=61 Runoff=0.33 cfs 0.025 af

Subcatchment S3X: S3 Runoff Area=12,718 sf 84.05% Impervious Runoff Depth=4.73"
Flow Length=485' Tc=9.2 min CN=92 Runoff=1.37 cfs 0.115 af

Subcatchment S4: Hoover Drive Runoff Area=5,580 sf 77.38% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=85 Runoff=0.59 cfs 0.042 af

Subcatchment S4X: S4 Runoff Area=12,973 sf 58.88% Impervious Runoff Depth=3.77"
Flow Length=180' Slope=0.0200 '/' Tc=8.9 min CN=83 Runoff=1.18 cfs 0.094 af

Subcatchment S5X: S5 Runoff Area=10,965 sf 35.75% Impervious Runoff Depth=2.89"
Flow Length=270' Tc=8.4 min CN=74 Runoff=0.78 cfs 0.061 af

Subcatchment S5XB: S5 Runoff Area=3,240 sf 38.27% Impervious Runoff Depth=2.62"
Flow Length=135' Tc=7.2 min CN=71 Runoff=0.22 cfs 0.016 af

Pond 1PY: Westerly Pond Peak Elev=54.35' Storage=11,643 cf Inflow=8.39 cfs 0.836 af
18.0" Round Culvert n=0.012 L=70.0' S=0.0057 '/' Outflow=2.90 cfs 0.836 af

Pond 1R: Roof Leader Peak Elev=53.50' Inflow=0.89 cfs 0.072 af
8.0" Round Culvert n=0.012 L=50.0' S=0.0100 '/' Outflow=0.89 cfs 0.072 af

Pond CB 1: CB 1 Peak Elev=53.17' Storage=20 cf Inflow=5.70 cfs 1.384 af
Primary=5.66 cfs 1.384 af Secondary=0.00 cfs 0.000 af Outflow=5.66 cfs 1.384 af

Pond CB1148X: CB 1148 Peak Elev=53.97' Storage=13 cf Inflow=3.62 cfs 1.090 af
18.0" Round Culvert n=0.011 L=125.0' S=0.0070 '/' Outflow=3.62 cfs 1.090 af

Pond CB1X: CB 2306 Peak Elev=58.31' Storage=17 cf Inflow=0.68 cfs 0.052 af
12.0" Round Culvert n=0.011 L=40.0' S=0.0050 '/' Outflow=0.67 cfs 0.052 af

Pond CB2031X: CB 2301 Peak Elev=50.66' Storage=30 cf Inflow=10.79 cfs 1.915 af
Primary=10.79 cfs 1.915 af Secondary=0.00 cfs 0.000 af Outflow=10.79 cfs 1.915 af

Pond CB2305X: CB 2305 Peak Elev=52.03' Storage=41 cf Inflow=10.01 cfs 1.841 af
Primary=10.00 cfs 1.841 af Secondary=0.00 cfs 0.000 af Outflow=10.00 cfs 1.841 af

Pond CB2306X: CB 2306 Peak Elev=52.56' Storage=48 cf Inflow=6.43 cfs 1.445 af
Primary=6.37 cfs 1.445 af Secondary=0.00 cfs 0.000 af Outflow=6.37 cfs 1.445 af

Pond CB2359X: CB 2359 Peak Elev=53.52' Storage=19 cf Inflow=4.40 cfs 1.184 af
18.0" Round Culvert n=0.012 L=103.0' S=0.0142 '/' Outflow=4.35 cfs 1.184 af

Pond DMH 2: DMH 2 Peak Elev=53.27' Inflow=1.20 cfs 0.184 af
12.0" Round Culvert n=0.012 L=35.0' S=0.0326 '/' Outflow=1.20 cfs 0.184 af

Pond P1: Rain Garden 1 Peak Elev=57.60' Storage=2,200 cf Inflow=1.26 cfs 0.089 af
Outflow=0.67 cfs 0.087 af

Pond P2: Rain Garden 2 Peak Elev=55.03' Storage=471 cf Inflow=0.33 cfs 0.025 af
Outflow=0.16 cfs 0.025 af

Pond RG2X: Raingarden 2 Peak Elev=58.28' Storage=2,166 cf Inflow=2.06 cfs 0.165 af
Outflow=1.59 cfs 0.139 af

Link 2L: Overflow Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA 1X: POA 1 Inflow=10.79 cfs 1.915 af
Primary=10.79 cfs 1.915 af

Total Runoff Area = 11.909 ac Runoff Volume = 1.944 af Average Runoff Depth = 1.96"
59.01% Pervious = 7.028 ac 40.99% Impervious = 4.881 ac

Summary for Subcatchment 1SY: 1SY

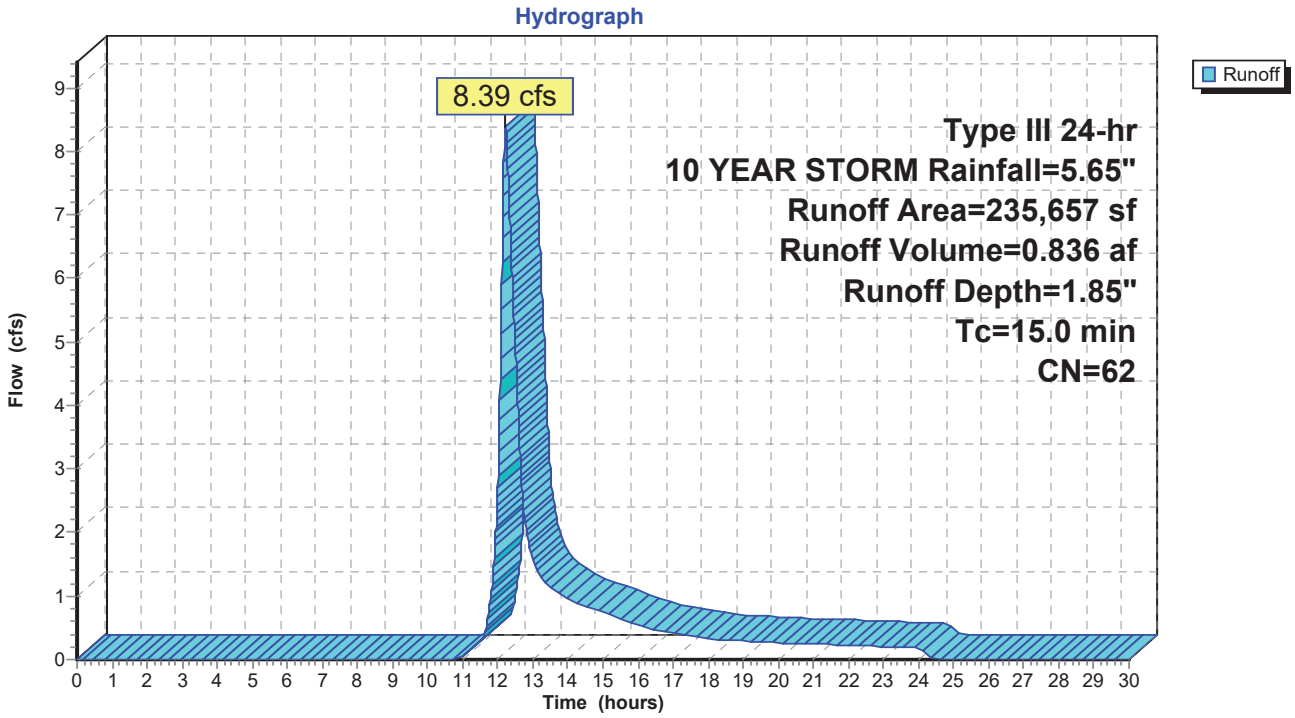
Runoff = 8.39 cfs @ 12.22 hrs, Volume= 0.836 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
127,492	32	Woods/grass comb., Good, HSG A
108,165	98	Paved parking, HSG A
235,657	62	Weighted Average
127,492		54.10% Pervious Area
108,165		45.90% Impervious Area

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

Subcatchment 1SY: 1SY



Summary for Subcatchment 3SY: West Coolidge

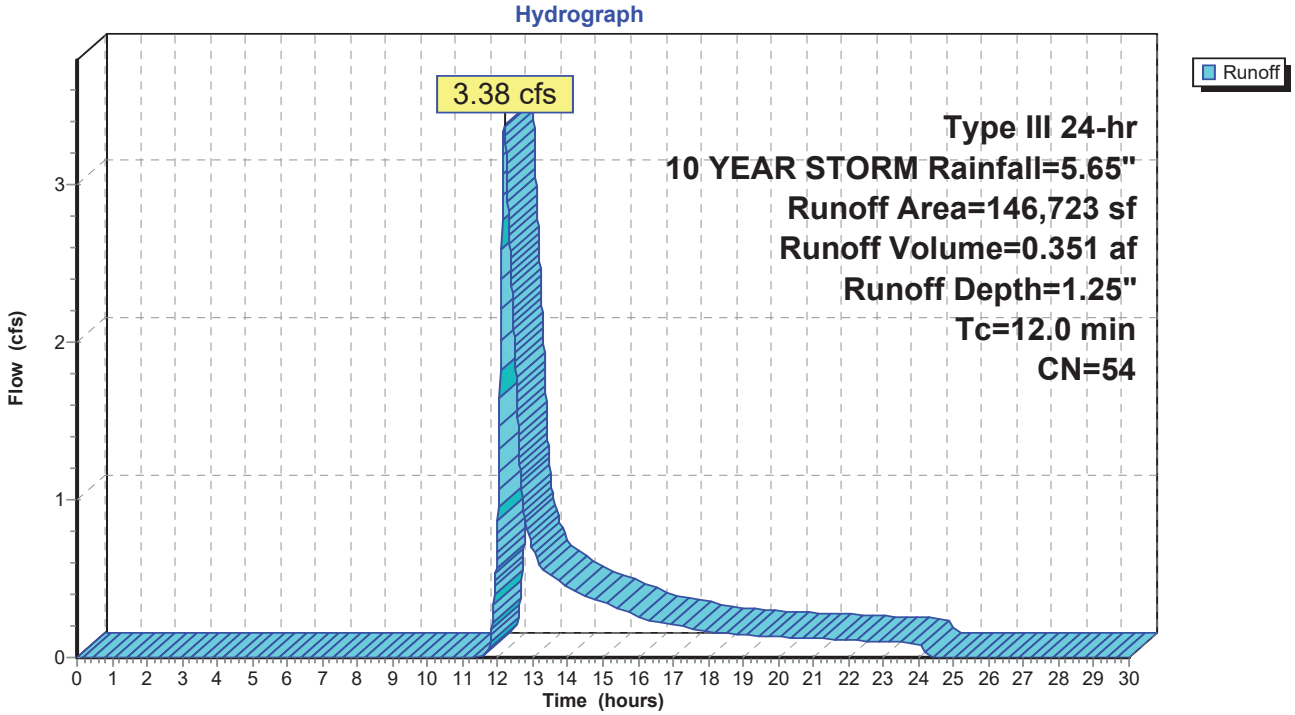
Runoff = 3.38 cfs @ 12.19 hrs, Volume= 0.351 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
146,723	54	1/2 acre lots, 25% imp, HSG A
110,042		75.00% Pervious Area
36,681		25.00% Impervious Area

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

Subcatchment 3SY: West Coolidge



Summary for Subcatchment 4SY: East Coolidge

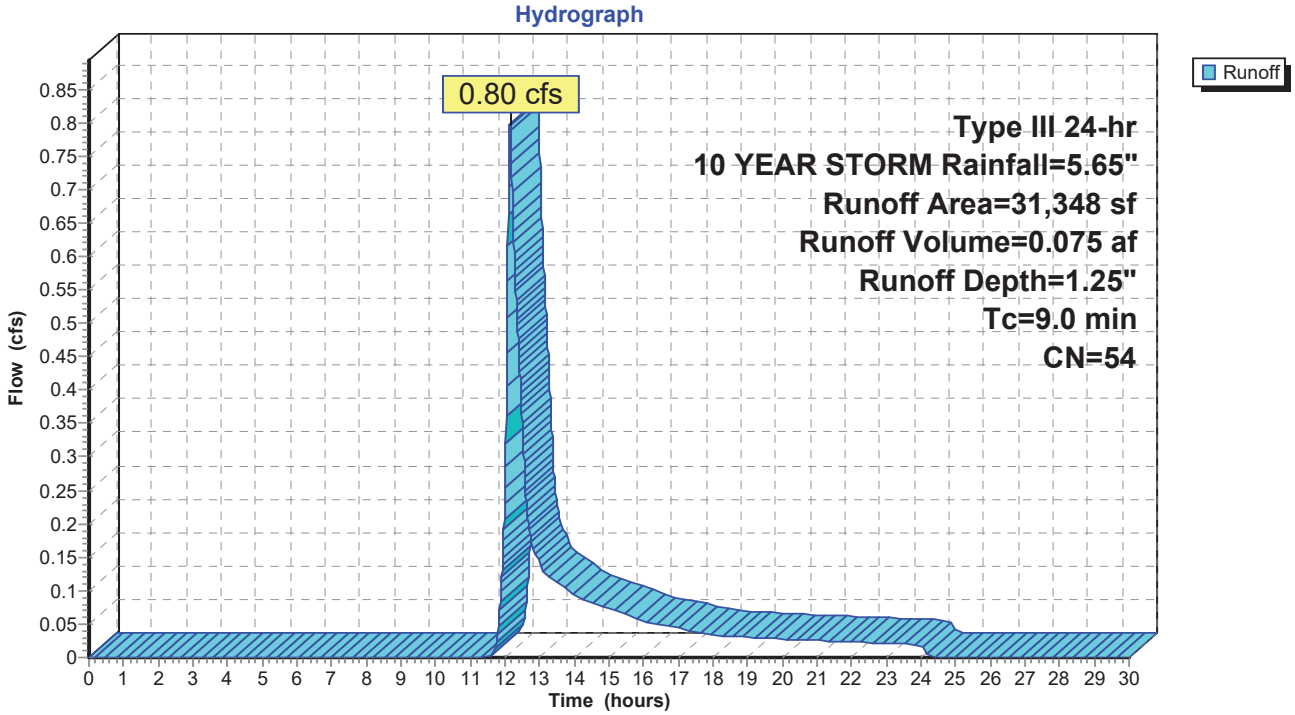
Runoff = 0.80 cfs @ 12.15 hrs, Volume= 0.075 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
31,348	54	1/2 acre lots, 25% imp, HSG A
23,511		75.00% Pervious Area
7,837		25.00% Impervious Area

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

Subcatchment 4SY: East Coolidge



Summary for Subcatchment R1: Roof

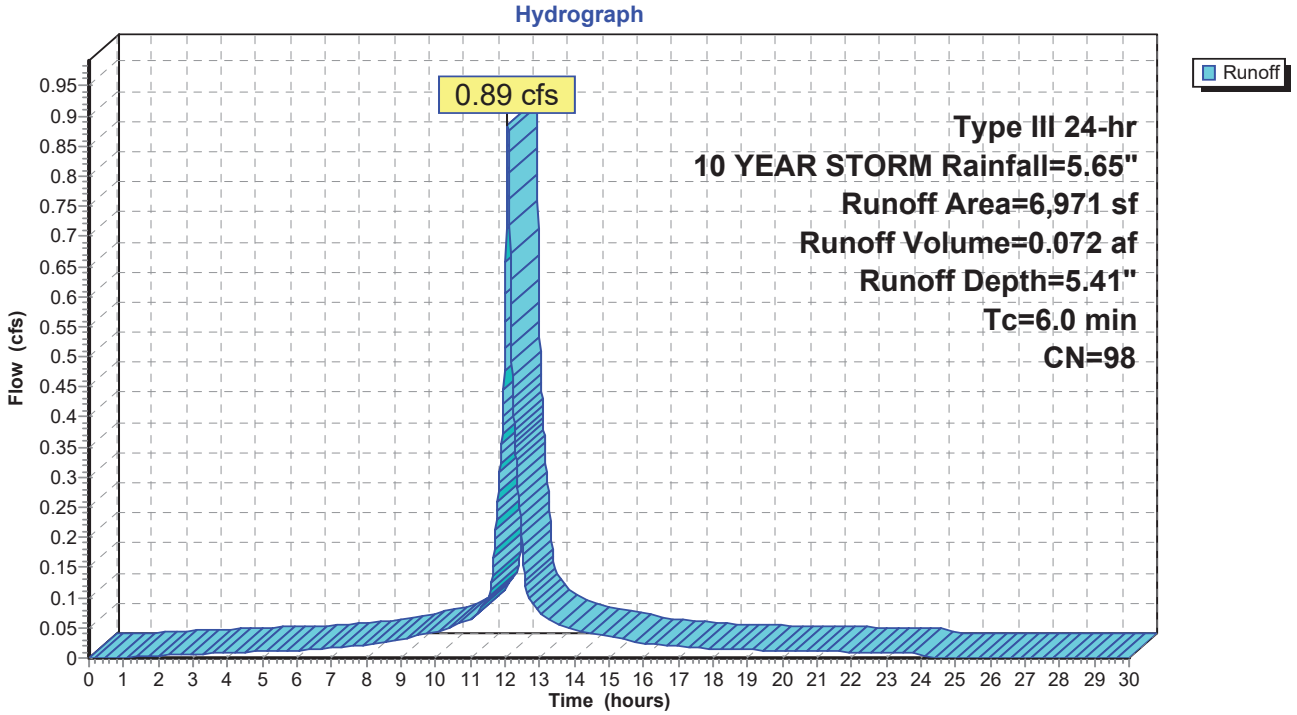
Runoff = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
6,971	98	Roofs, HSG A
6,971		100.00% Impervious Area

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

Subcatchment R1: Roof



Summary for Subcatchment R2AX: 1/2 Roof

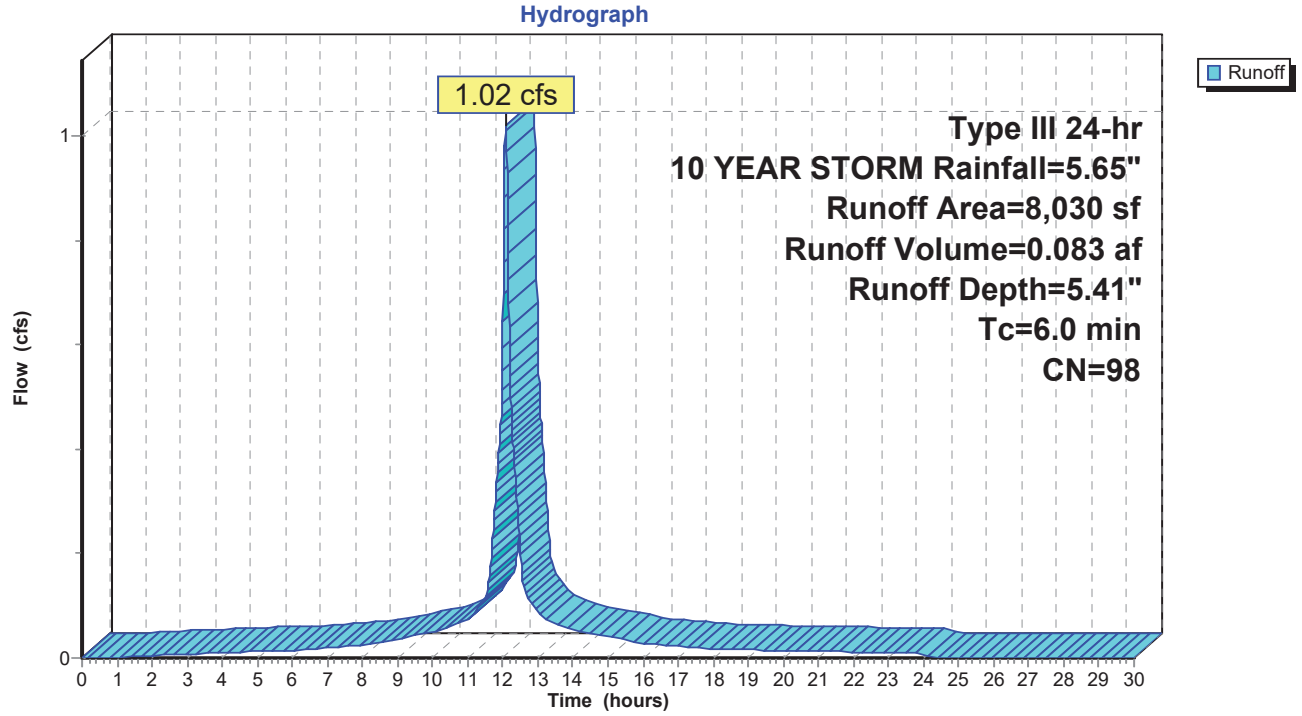
Runoff = 1.02 cfs @ 12.08 hrs, Volume= 0.083 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
8,030	98	Roofs, HSG B
8,030		100.00% Impervious Area

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

Subcatchment R2AX: 1/2 Roof



Summary for Subcatchment S1: West

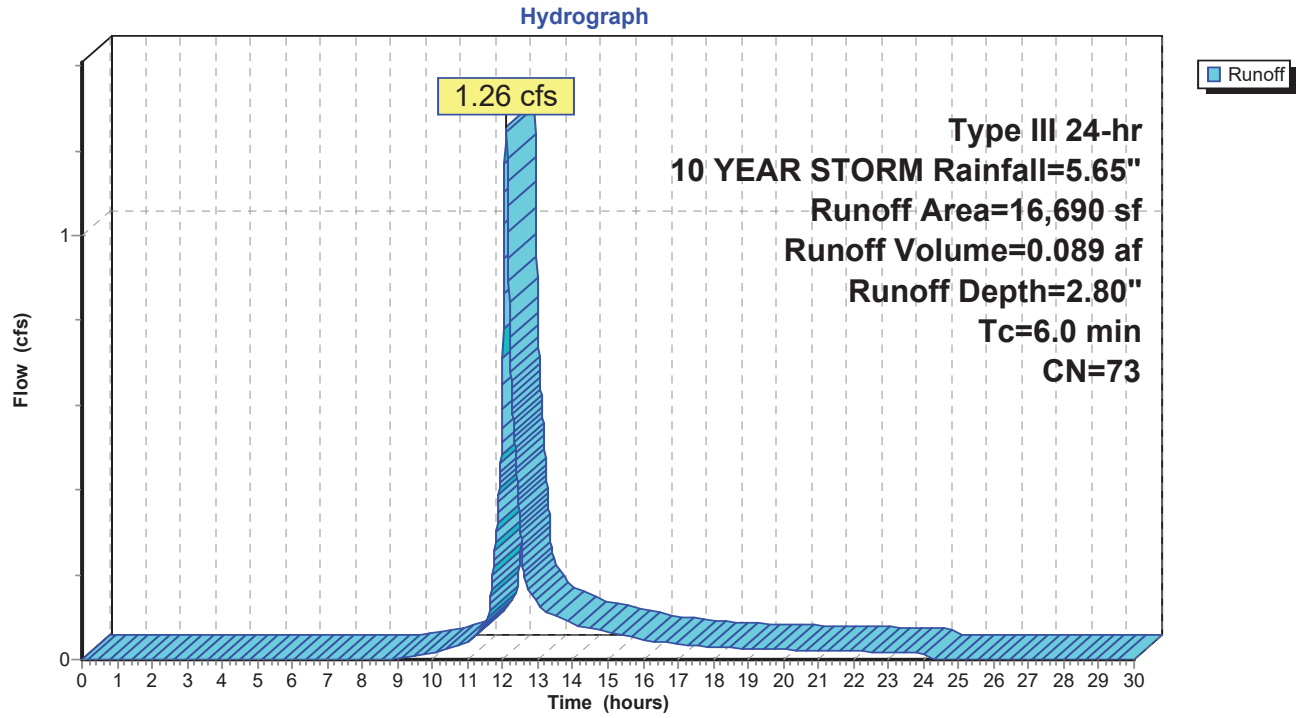
Runoff = 1.26 cfs @ 12.09 hrs, Volume= 0.089 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
9,659	98	Paved parking, HSG A
7,031	39	>75% Grass cover, Good, HSG A
16,690	73	Weighted Average
7,031		42.13% Pervious Area
9,659		57.87% Impervious Area

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

Subcatchment S1: West



Summary for Subcatchment S2: North East

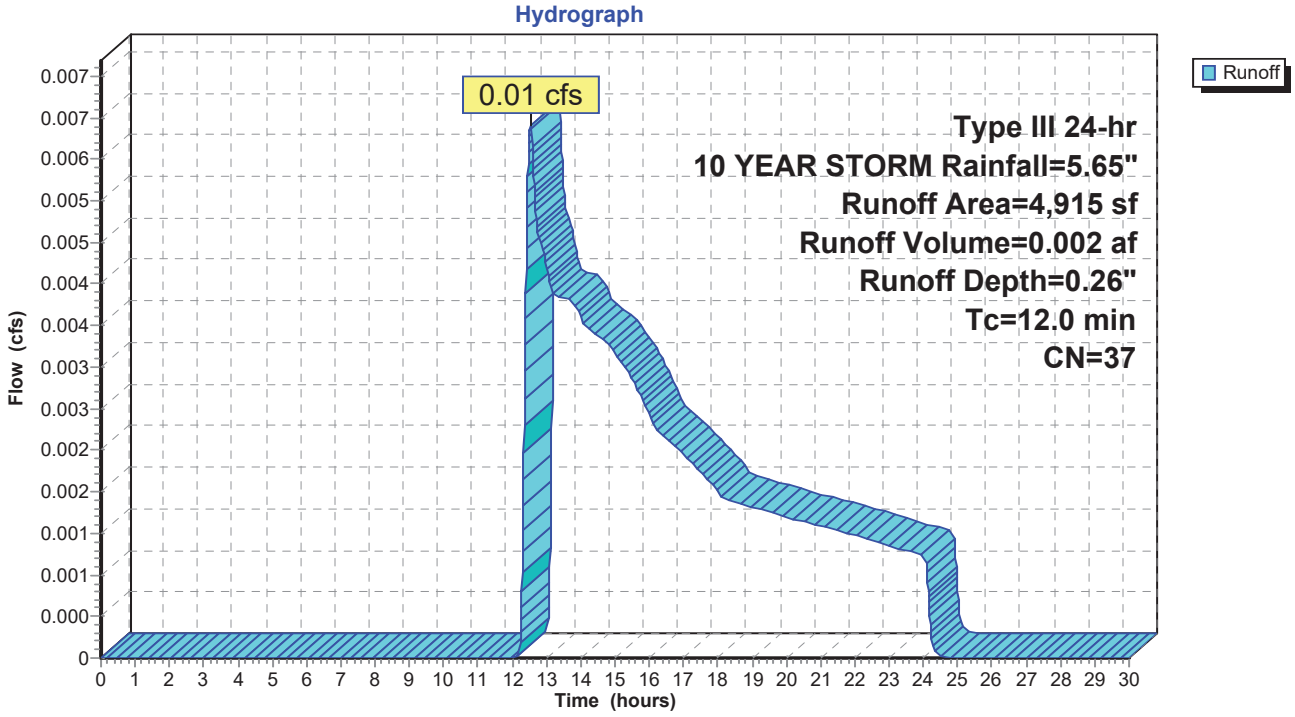
Runoff = 0.01 cfs @ 12.54 hrs, Volume= 0.002 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
3,353	39	>75% Grass cover, Good, HSG A
1,562	32	Woods/grass comb., Good, HSG A
4,915	37	Weighted Average
4,915		100.00% Pervious Area

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

Subcatchment S2: North East



Summary for Subcatchment S2AX: S2A

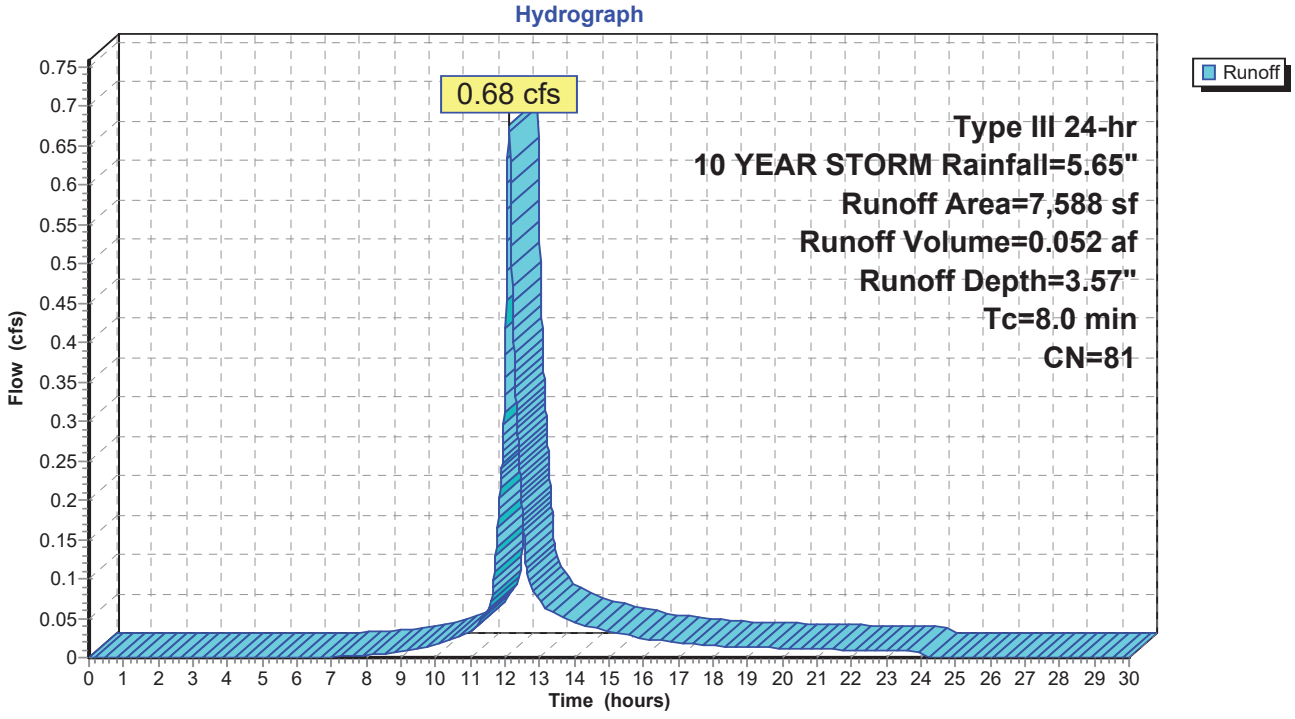
Runoff = 0.68 cfs @ 12.11 hrs, Volume= 0.052 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
2,353	98	Paved parking, HSG B
1,692	98	Unconnected pavement, HSG B
3,543	61	>75% Grass cover, Good, HSG B
7,588	81	Weighted Average
3,543		46.69% Pervious Area
4,045		53.31% Impervious Area
1,692		41.83% Unconnected

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

Subcatchment S2AX: S2A



Summary for Subcatchment S2BX: S2B

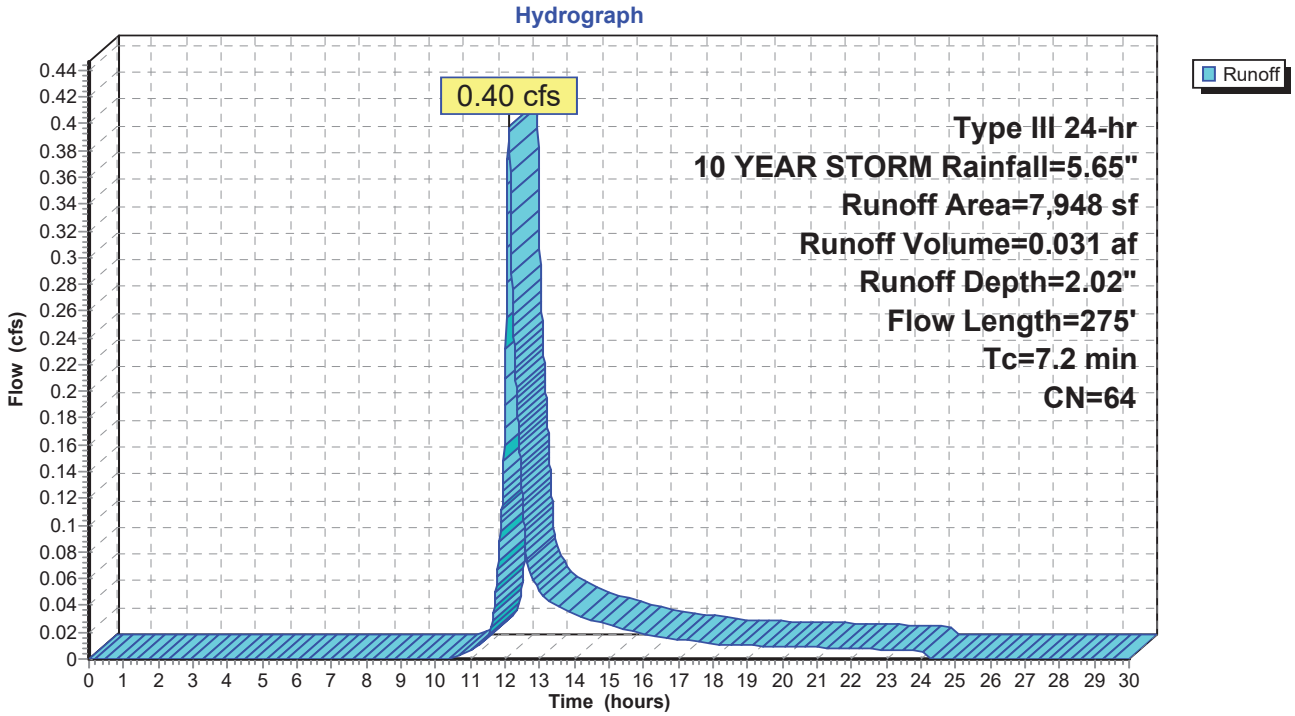
Runoff = 0.40 cfs @ 12.11 hrs, Volume= 0.031 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

	Area (sf)	CN	Description
	7,288	61	>75% Grass cover, Good, HSG B
	100	98	Unconnected pavement, HSG B
*	560	98	Multi-Use Path, HSG B
	7,948	64	Weighted Average
	7,288		91.70% Pervious Area
	660		8.30% Impervious Area
	100		15.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.2	275	Total			

Subcatchment S2BX: S2B



Summary for Subcatchment S3: South East

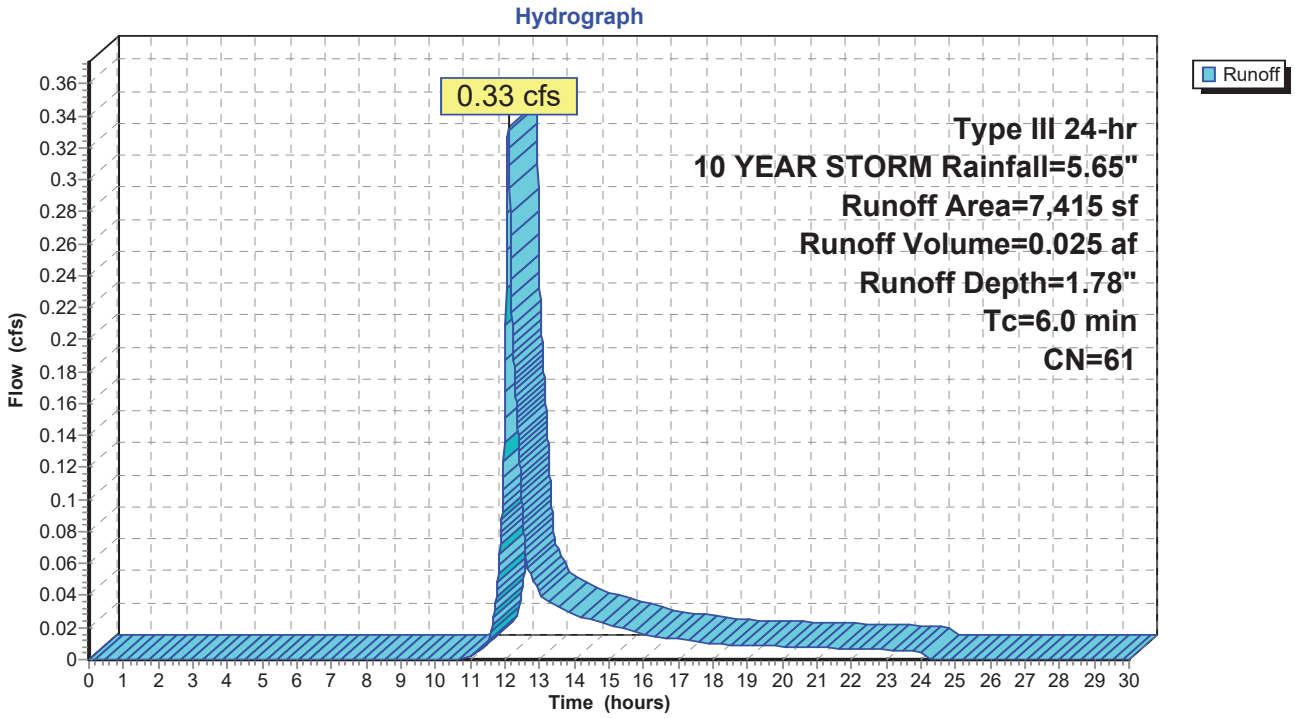
Runoff = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
2,777	98	Paved parking, HSG A
4,638	39	>75% Grass cover, Good, HSG A
7,415	61	Weighted Average
4,638		62.55% Pervious Area
2,777		37.45% Impervious Area

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

Subcatchment S3: South East



Summary for Subcatchment S3X: S3

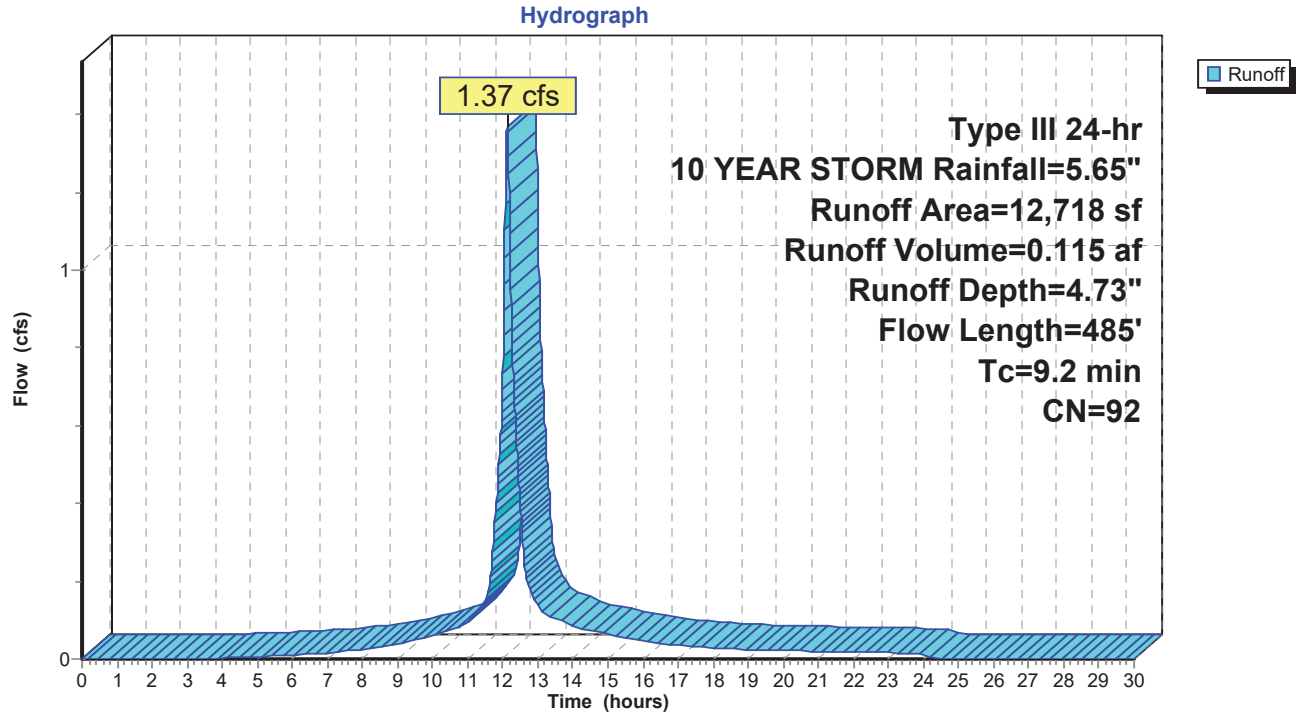
Runoff = 1.37 cfs @ 12.12 hrs, Volume= 0.115 af, Depth= 4.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

	Area (sf)	CN	Description
	2,028	61	>75% Grass cover, Good, HSG B
	9,432	98	Paved roads w/curbs & sewers, HSG B
	898	98	Paved parking, HSG B
*	360	98	Multi-Use Path, HSG B
	12,718	92	Weighted Average
	2,028		15.95% Pervious Area
	10,690		84.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	40	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.1	320	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.2	485	Total			

Subcatchment S3X: S3



Summary for Subcatchment S4: Hoover Drive

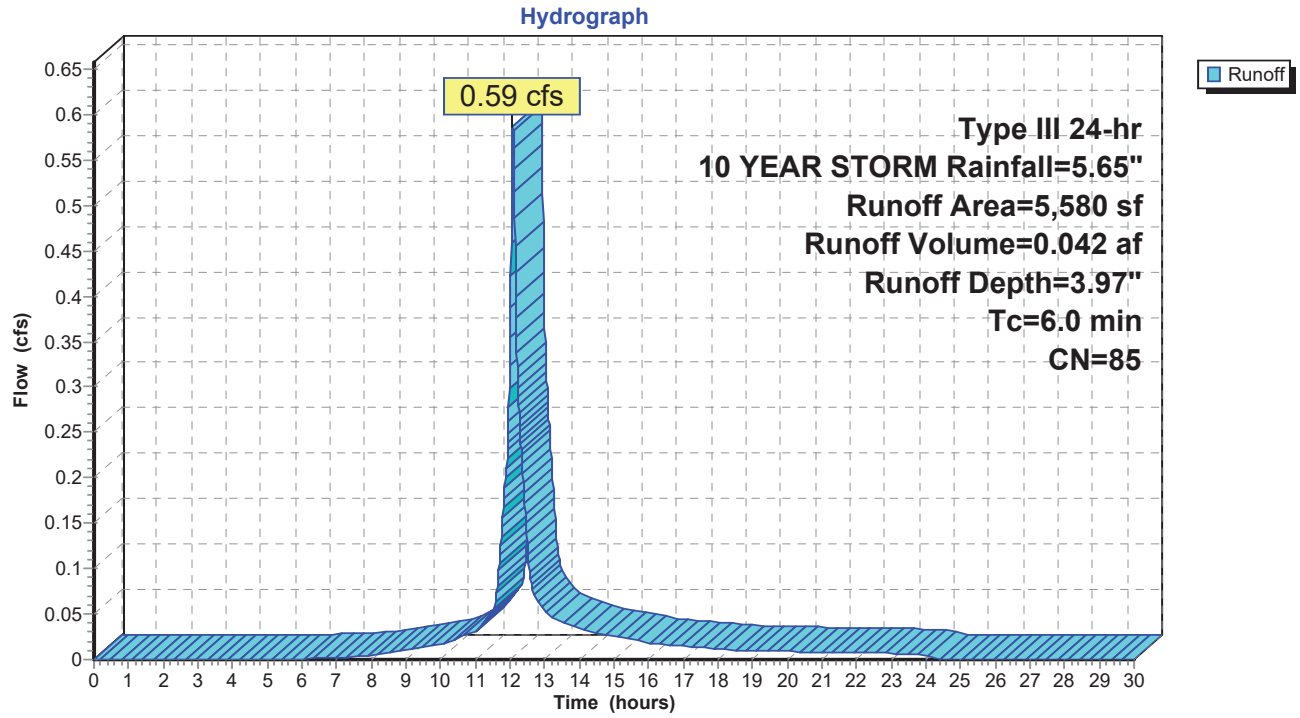
Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG A
1,262	39	>75% Grass cover, Good, HSG A
5,580	85	Weighted Average
1,262		22.62% Pervious Area
4,318		77.38% Impervious Area

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

Subcatchment S4: Hoover Drive



Summary for Subcatchment S4X: S4

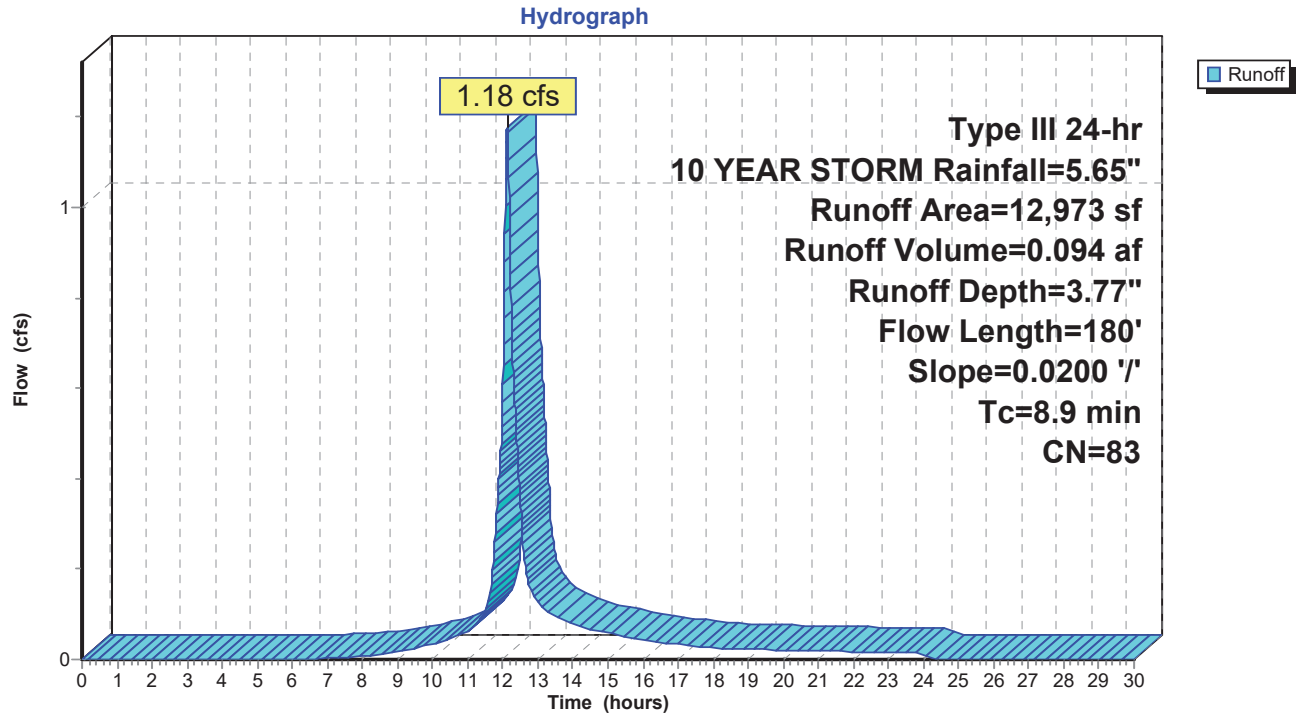
Runoff = 1.18 cfs @ 12.12 hrs, Volume= 0.094 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

	Area (sf)	CN	Description
	5,335	61	>75% Grass cover, Good, HSG B
	6,778	98	Paved roads w/curbs & sewers, HSG B
*	860	98	Multi-Use path, HSG B
	12,973	83	Weighted Average
	5,335		41.12% Pervious Area
	7,638		58.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.6	80	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.9	180	Total			

Subcatchment S4X: S4



Summary for Subcatchment S5X: S5

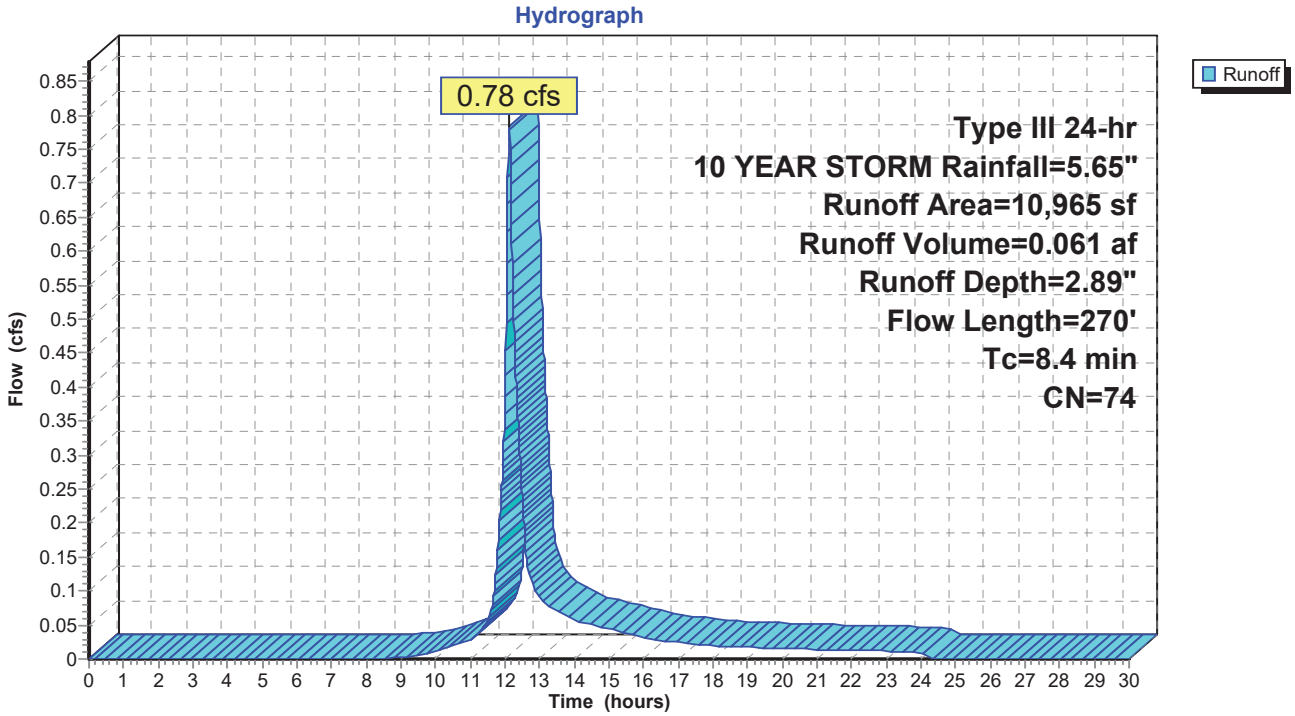
Runoff = 0.78 cfs @ 12.12 hrs, Volume= 0.061 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
4,095	61	>75% Grass cover, Good, HSG B
2,470	55	Woods, Good, HSG B
3,920	98	Paved roads w/curbs & sewers, HSG B
480	96	Gravel surface, HSG B
10,965	74	Weighted Average
7,045		64.25% Pervious Area
3,920		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	35	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
1.2	135	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.4	270	Total			

Subcatchment S5X: S5



Summary for Subcatchment S5XB: S5

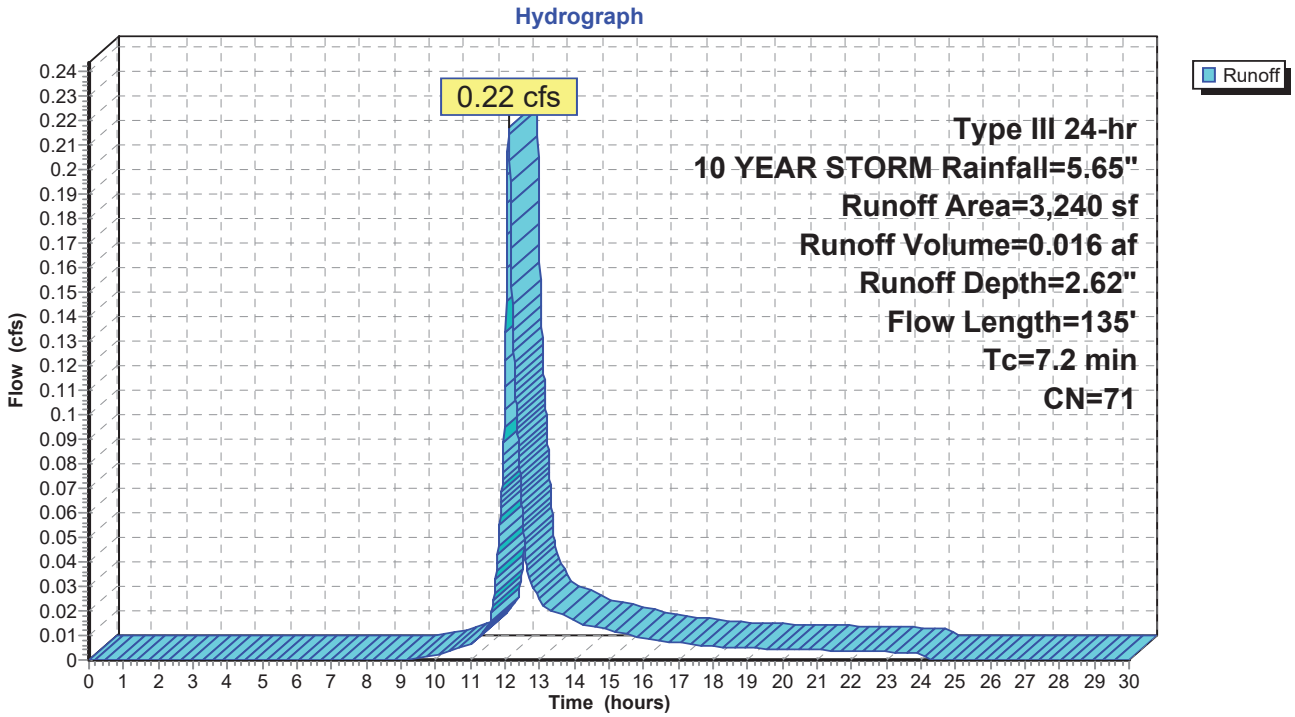
Runoff = 0.22 cfs @ 12.11 hrs, Volume= 0.016 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR STORM Rainfall=5.65"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
2,000	55	Woods, Good, HSG B
1,240	98	Paved roads w/curbs & sewers, HSG B
0	96	Gravel surface, HSG B
3,240	71	Weighted Average
2,000		61.73% Pervious Area
1,240		38.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	35	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.2	135	Total			

Subcatchment S5XB: S5



Summary for Pond 1PY: Westerly Pond

Inflow Area = 5.410 ac, 45.90% Impervious, Inflow Depth = 1.85" for 10 YEAR STORM event
Inflow = 8.39 cfs @ 12.22 hrs, Volume= 0.836 af
Outflow = 2.90 cfs @ 12.72 hrs, Volume= 0.836 af, Atten= 65%, Lag= 29.9 min
Primary = 2.90 cfs @ 12.72 hrs, Volume= 0.836 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.35' @ 12.67 hrs Surf.Area= 18,894 sf Storage= 11,643 cf

Plug-Flow detention time= 63.5 min calculated for 0.836 af (100% of inflow)
Center-of-Mass det. time= 63.5 min (933.1 - 869.7)

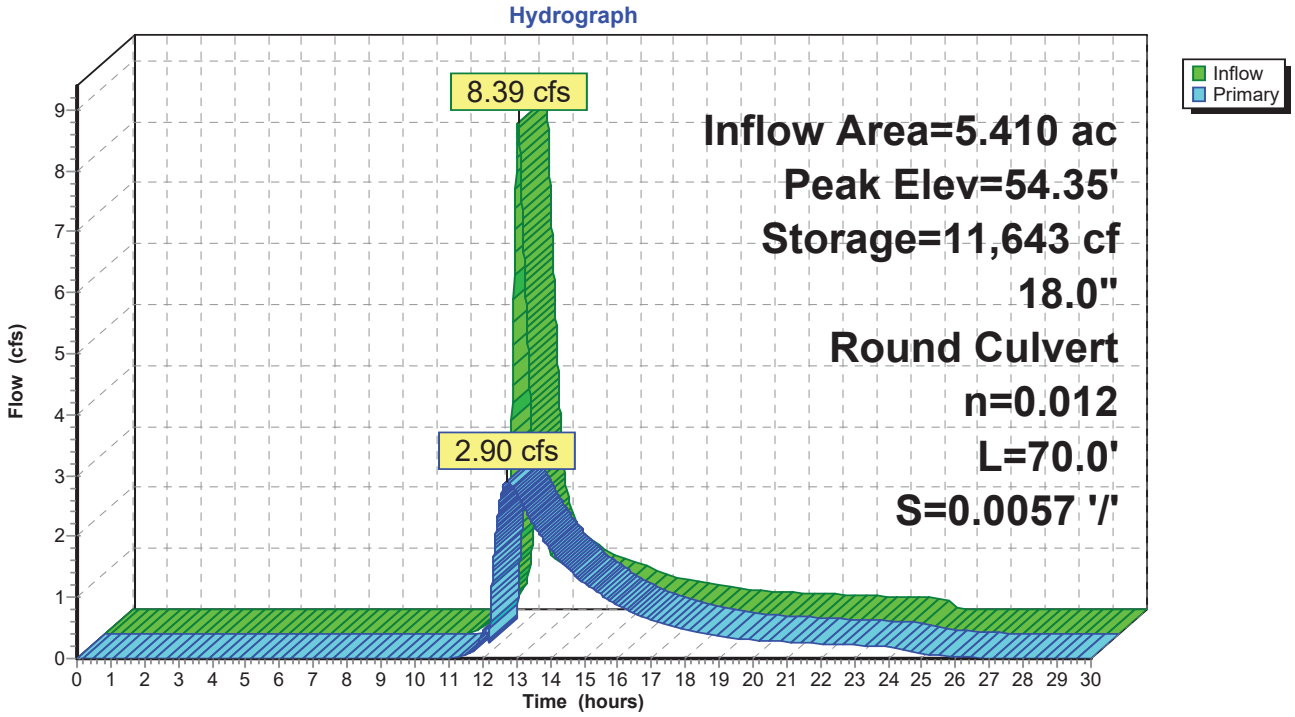
Volume	Invert	Avail.Storage	Storage Description
#1	53.40'	110,492 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.40	10	0	0
54.00	17,553	5,269	5,269
56.00	25,221	42,774	48,043
58.00	37,228	62,449	110,492

Device	Routing	Invert	Outlet Devices
#1	Primary	53.40'	**18.0" Round Culvert** L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.40' / 53.00' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.91 cfs @ 12.72 hrs HW=54.35' TW=53.84' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 2.91 cfs @ 3.53 fps)

Pond 1PY: Westerly Pond



Summary for Pond 1R: Roof Leader

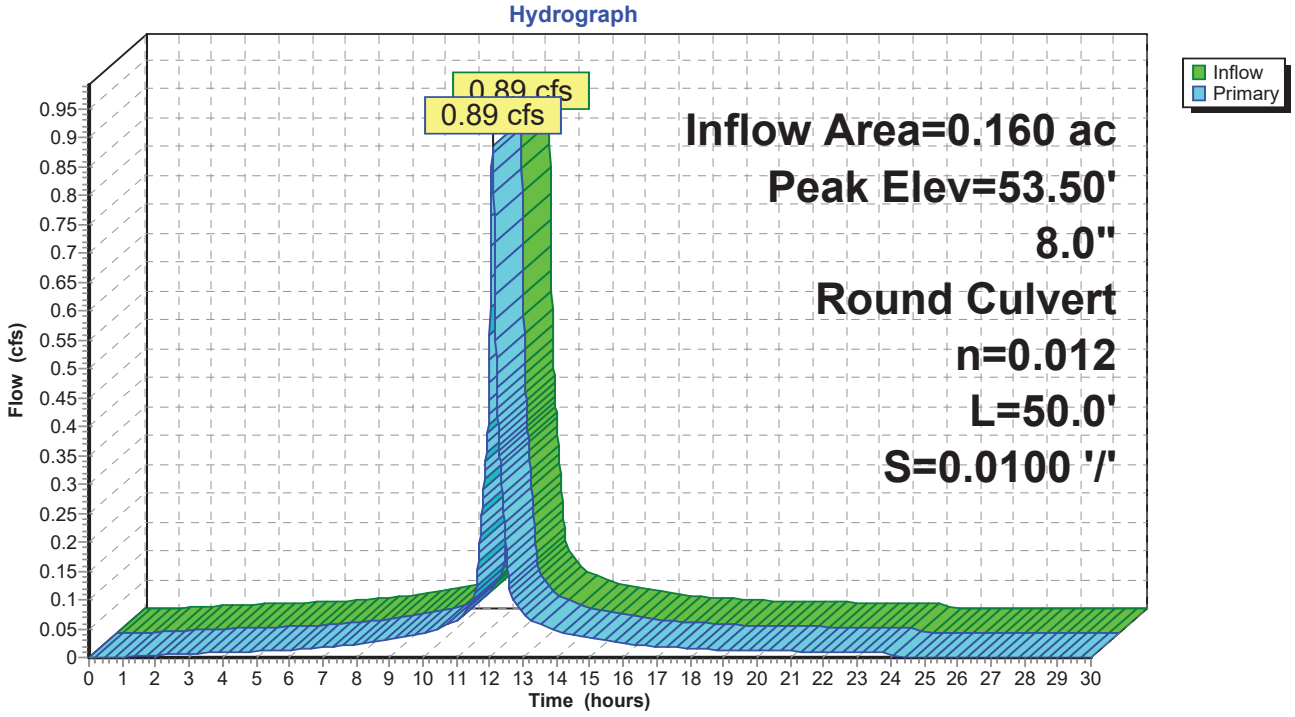
Inflow Area = 0.160 ac,100.00% Impervious, Inflow Depth = 5.41" for 10 YEAR STORM event
Inflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af
Outflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.50' @ 12.08 hrs
Flood Elev= 56.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.89'	**8.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 52.89' / 52.39' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.88 cfs @ 12.08 hrs HW=53.50' TW=52.46' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.88 cfs @ 2.65 fps)

Pond 1R: Roof Leader



Summary for Pond CB 1: CB 1

Inflow Area = 7.329 ac, 50.08% Impervious, Inflow Depth > 2.27" for 10 YEAR STORM event
Inflow = 5.70 cfs @ 12.15 hrs, Volume= 1.384 af
Outflow = 5.66 cfs @ 12.14 hrs, Volume= 1.384 af, Atten= 1%, Lag= 0.0 min
Primary = 5.66 cfs @ 12.14 hrs, Volume= 1.384 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.17' @ 12.18 hrs Surf.Area= 13 sf Storage= 20 cf
Flood Elev= 54.90' Surf.Area= 18 sf Storage= 42 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (903.1 - 903.1)

Volume	Invert	Avail.Storage	Storage Description
#1	51.58'	42 cf	**4.00'D x 3.32'H Vertical Cone/Cylinder**
#2	54.90'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		168 cf	Total Available Storage

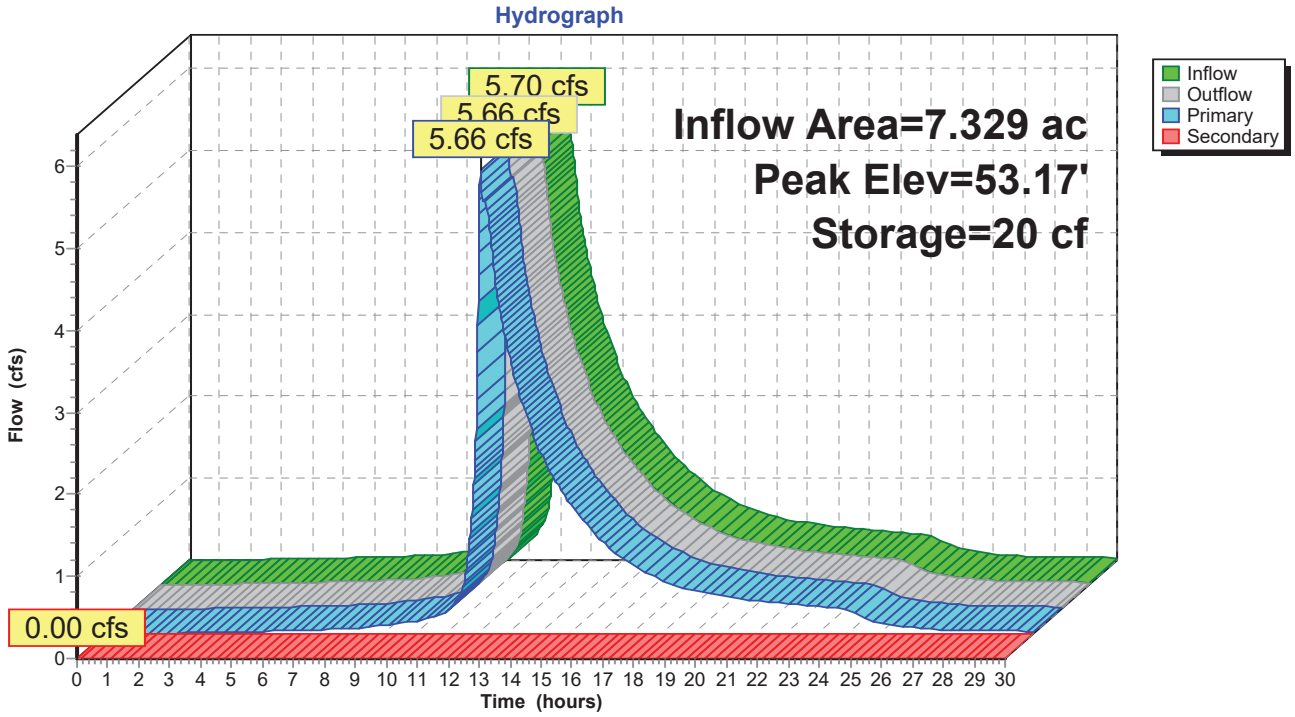
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.90	5	0	0
55.40	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	50.57'	**18.0" Round Culvert** L= 170.0' Ke= 0.500 Inlet / Outlet Invert= 50.57' / 48.74' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	54.90'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=5.03 cfs @ 12.14 hrs HW=52.90' TW=52.38' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 5.03 cfs @ 2.85 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.58' TW=48.74' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond CB 1: CB 1


Hydrograph
5.70 cfs
5.66 cfs
5.66 cfs
Inflow Area=7.329 ac
Peak Elev=53.17'
Storage=20 cf
Inflow
Outflow
Primary
Secondary
0.00 cfs
Flow (cfs)
0 1 2 3 4 5 6
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Summary for Pond CB1148X: CB 1148

Inflow Area = 6.243 ac, 48.39% Impervious, Inflow Depth > 2.10" for 10 YEAR STORM event
Inflow = 3.62 cfs @ 12.51 hrs, Volume= 1.090 af
Outflow = 3.62 cfs @ 12.51 hrs, Volume= 1.090 af, Atten= 0%, Lag= 0.0 min
Primary = 3.62 cfs @ 12.51 hrs, Volume= 1.090 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.97' @ 12.19 hrs Surf.Area= 13 sf Storage= 13 cf
Flood Elev= 58.70' Surf.Area= 18 sf Storage= 73 cf

Plug-Flow detention time= 0.1 min calculated for 1.090 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (913.1 - 913.0)

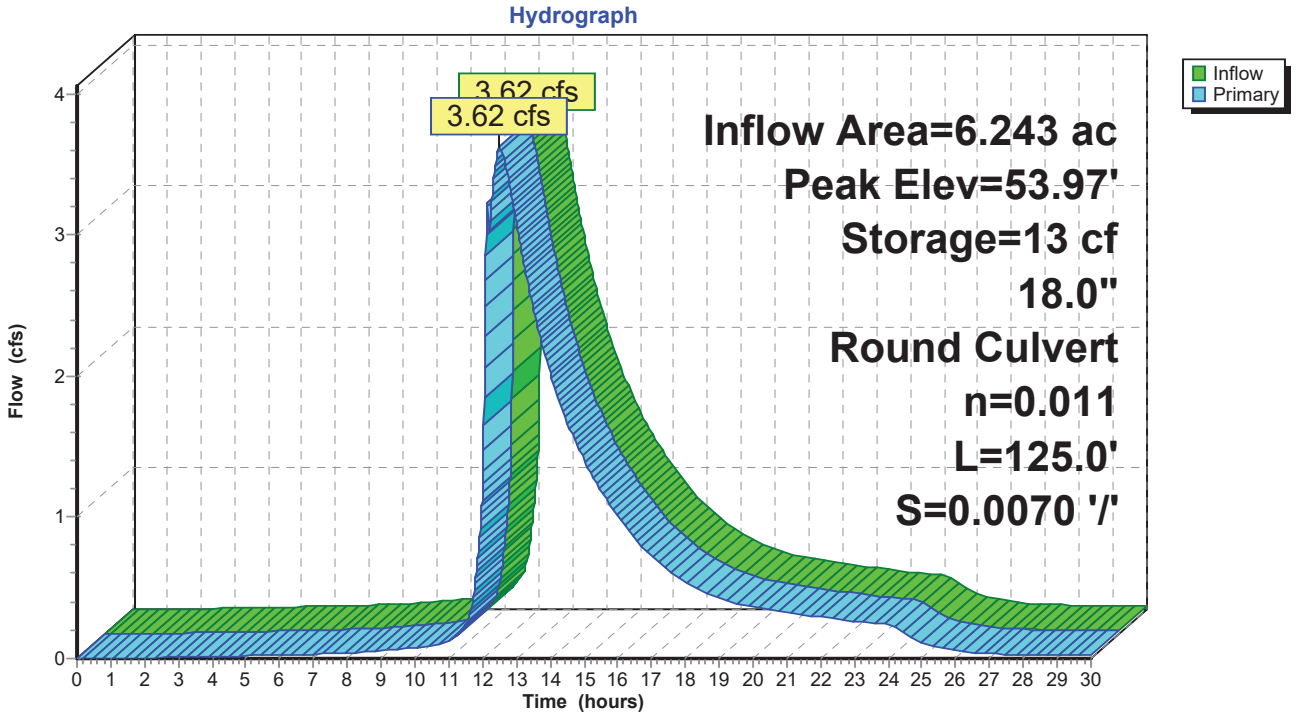
Volume	Invert	Avail.Storage	Storage Description
#1	52.90'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**
#2	58.69'	14 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		87 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.69	5	0	0
59.20	50	14	14

Device	Routing	Invert	Outlet Devices
#1	Primary	52.90'	**18.0" Round Culvert** L= 125.0' Ke= 0.500 Inlet / Outlet Invert= 52.90' / 52.03' S= 0.0070 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=3.63 cfs @ 12.51 hrs HW=53.88' TW=52.99' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 3.63 cfs @ 4.24 fps)

Pond CB1148X: CB 1148



Summary for Pond CB1X: CB 2306

Inflow Area = 0.174 ac, 53.31% Impervious, Inflow Depth = 3.57" for 10 YEAR STORM event
Inflow = 0.68 cfs @ 12.11 hrs, Volume= 0.052 af
Outflow = 0.67 cfs @ 12.11 hrs, Volume= 0.052 af, Atten= 1%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.11 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.31' @ 12.17 hrs Surf.Area= 13 sf Storage= 17 cf

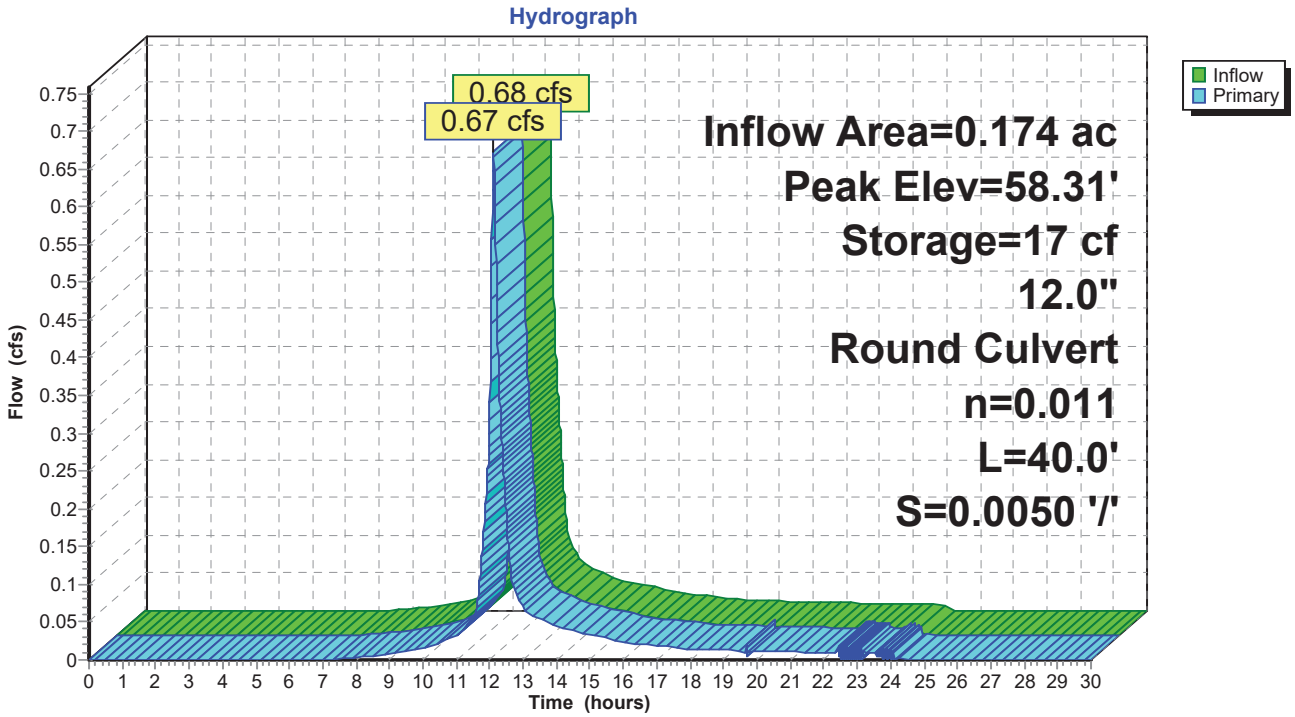
Plug-Flow detention time= 5.2 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (819.0 - 815.8)

Volume	Invert	Avail.Storage	Storage Description
#1	56.95'	35 cf	**4.00'D x 2.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	56.95'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.95' / 56.75' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.11 hrs HW=58.26' TW=58.25' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.46 cfs @ 0.59 fps)

Pond CB1X: CB 2306



Summary for Pond CB2031X: CB 2301

Inflow Area = 11.909 ac, 40.99% Impervious, Inflow Depth > 1.93" for 10 YEAR STORM event
Inflow = 10.79 cfs @ 12.16 hrs, Volume= 1.915 af
Outflow = 10.79 cfs @ 12.15 hrs, Volume= 1.915 af, Atten= 0%, Lag= 0.0 min
Primary = 10.79 cfs @ 12.15 hrs, Volume= 1.915 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 50.66' @ 12.15 hrs Surf.Area= 13 sf Storage= 30 cf
Flood Elev= 52.70' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= 0.1 min calculated for 1.915 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (896.3 - 896.2)

Volume	Invert	Avail.Storage	Storage Description
#1	48.30'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	52.70'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

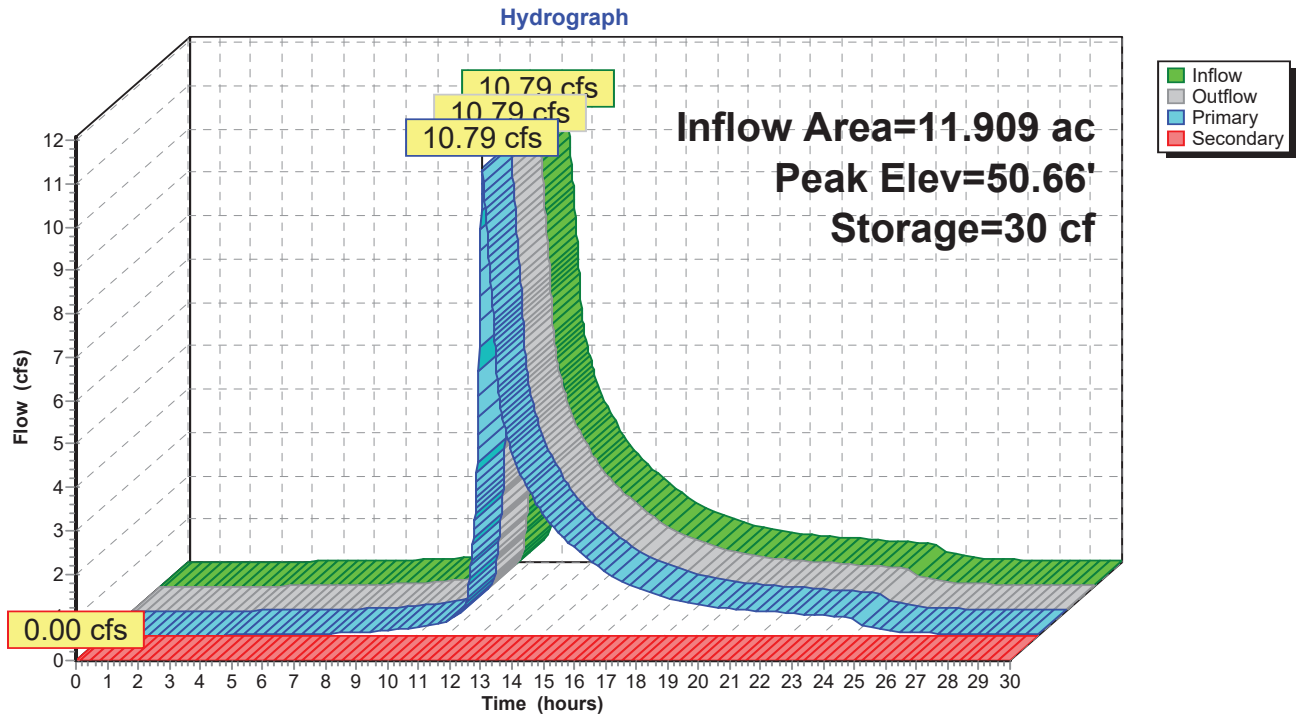
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.70	5	0	0
53.20	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	**18.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.12' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.70'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=10.77 cfs @ 12.15 hrs HW=50.65' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 10.77 cfs @ 6.10 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.30' TW=0.00' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond CB2031X: CB 2301



Summary for Pond CB2305X: CB 2305

Inflow Area = 11.189 ac, 42.02% Impervious, Inflow Depth > 1.97" for 10 YEAR STORM event
Inflow = 10.01 cfs @ 12.16 hrs, Volume= 1.841 af
Outflow = 10.00 cfs @ 12.16 hrs, Volume= 1.841 af, Atten= 0%, Lag= 0.1 min
Primary = 10.00 cfs @ 12.16 hrs, Volume= 1.841 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 52.03' @ 12.16 hrs Surf.Area= 13 sf Storage= 41 cf
Flood Elev= 53.20' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= 0.1 min calculated for 1.841 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (896.5 - 896.4)

Volume	Invert	Avail.Storage	Storage Description
#1	48.80'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	53.20'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

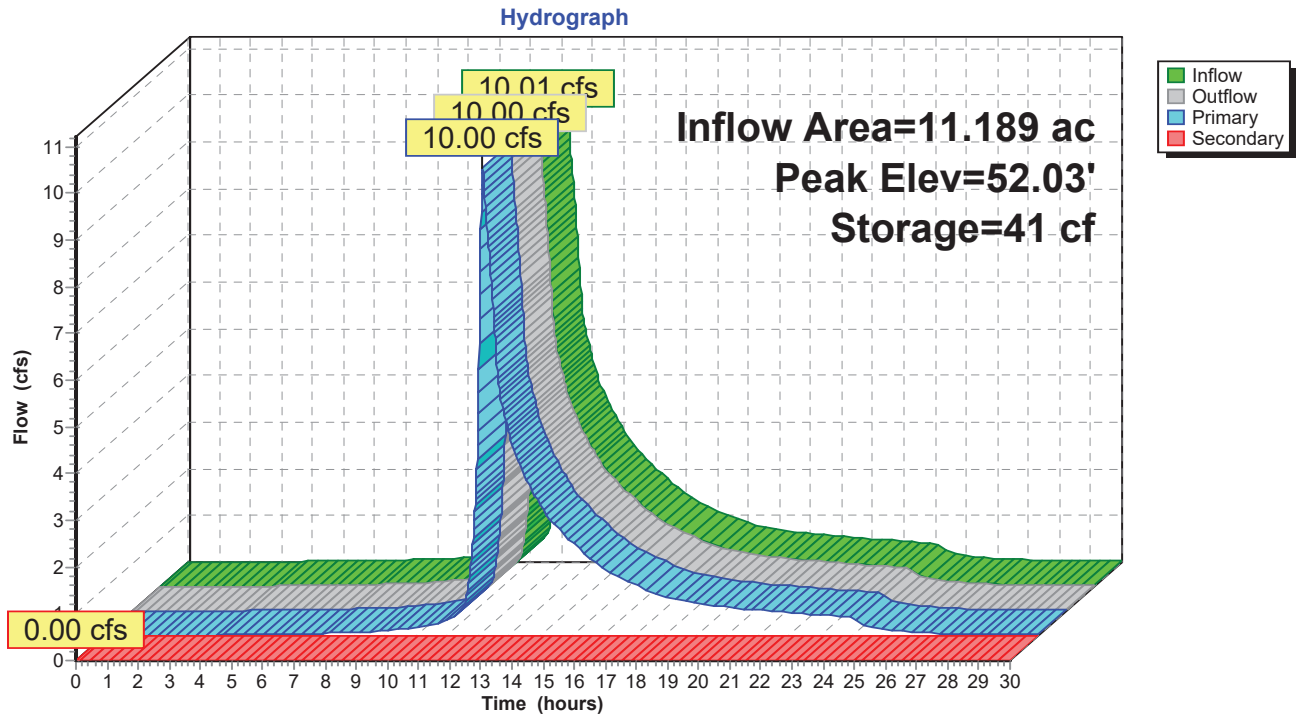
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	5	0	0
53.70	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.80'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.80' / 48.32' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	53.20'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=9.96 cfs @ 12.16 hrs HW=52.02' TW=50.65' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 9.96 cfs @ 5.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.80' TW=48.30' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond CB2305X: CB 2305



Summary for Pond CB2306X: CB 2306

Inflow Area = 7.580 ac, 49.61% Impervious, Inflow Depth > 2.29" for 10 YEAR STORM event
Inflow = 6.43 cfs @ 12.14 hrs, Volume= 1.445 af
Outflow = 6.37 cfs @ 12.14 hrs, Volume= 1.445 af, Atten= 1%, Lag= 0.1 min
Primary = 6.37 cfs @ 12.14 hrs, Volume= 1.445 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 52.56' @ 12.17 hrs Surf.Area= 13 sf Storage= 48 cf
Flood Elev= 52.95' Surf.Area= 18 sf Storage= 53 cf

Plug-Flow detention time= 0.2 min calculated for 1.445 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (900.4 - 900.2)

Volume	Invert	Avail.Storage	Storage Description
#1	48.74'	53 cf	**4.00'D x 4.21'H Vertical Cone/Cylinder**
#2	52.95'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		179 cf	Total Available Storage

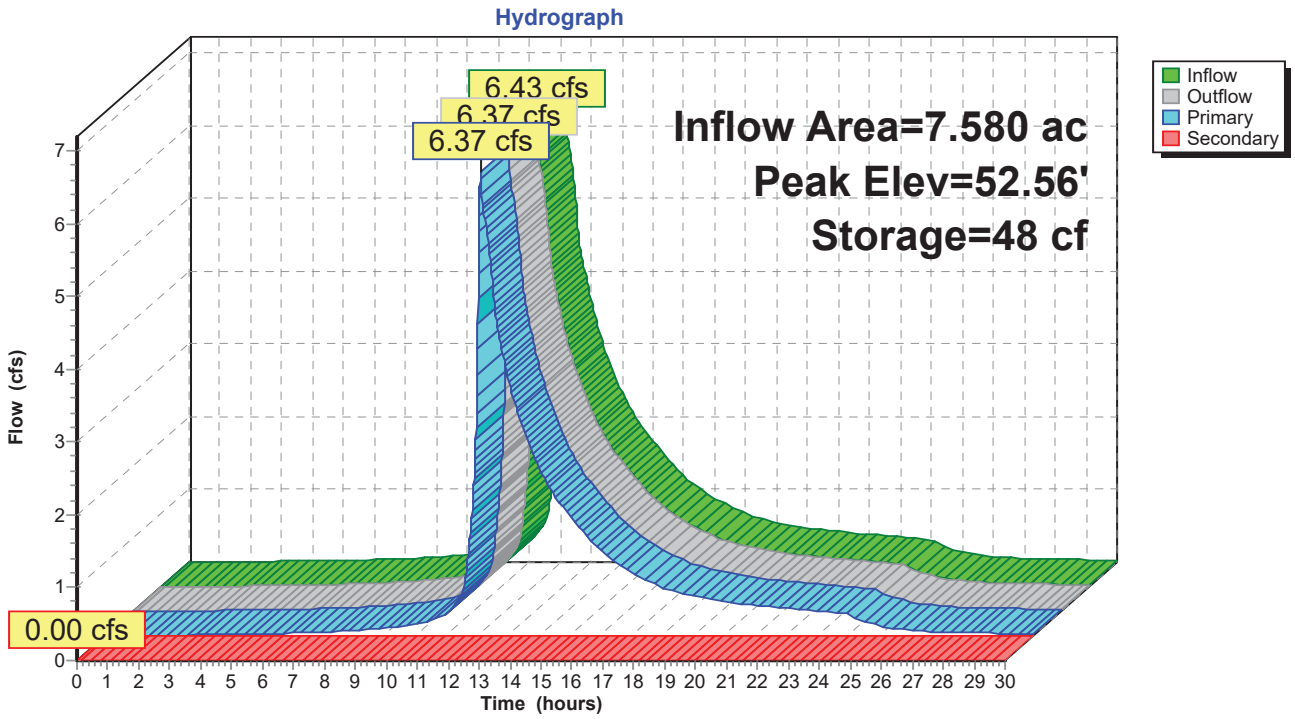
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.95	5	0	0
53.45	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.97'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 48.43' / 48.97' S= -0.0159 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.95'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=5.65 cfs @ 12.14 hrs HW=52.37' TW=51.93' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.65 cfs @ 3.20 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.74' TW=0.00' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond CB2306X: CB 2306



Summary for Pond CB2359X: CB 2359

Inflow Area = 6.541 ac, 48.87% Impervious, Inflow Depth > 2.17" for 10 YEAR STORM event
Inflow = 4.40 cfs @ 12.14 hrs, Volume= 1.184 af
Outflow = 4.35 cfs @ 12.14 hrs, Volume= 1.184 af, Atten= 1%, Lag= 0.1 min
Primary = 4.35 cfs @ 12.14 hrs, Volume= 1.184 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.52' @ 12.18 hrs Surf.Area= 13 sf Storage= 19 cf
Flood Elev= 56.95' Surf.Area= 13 sf Storage= 62 cf

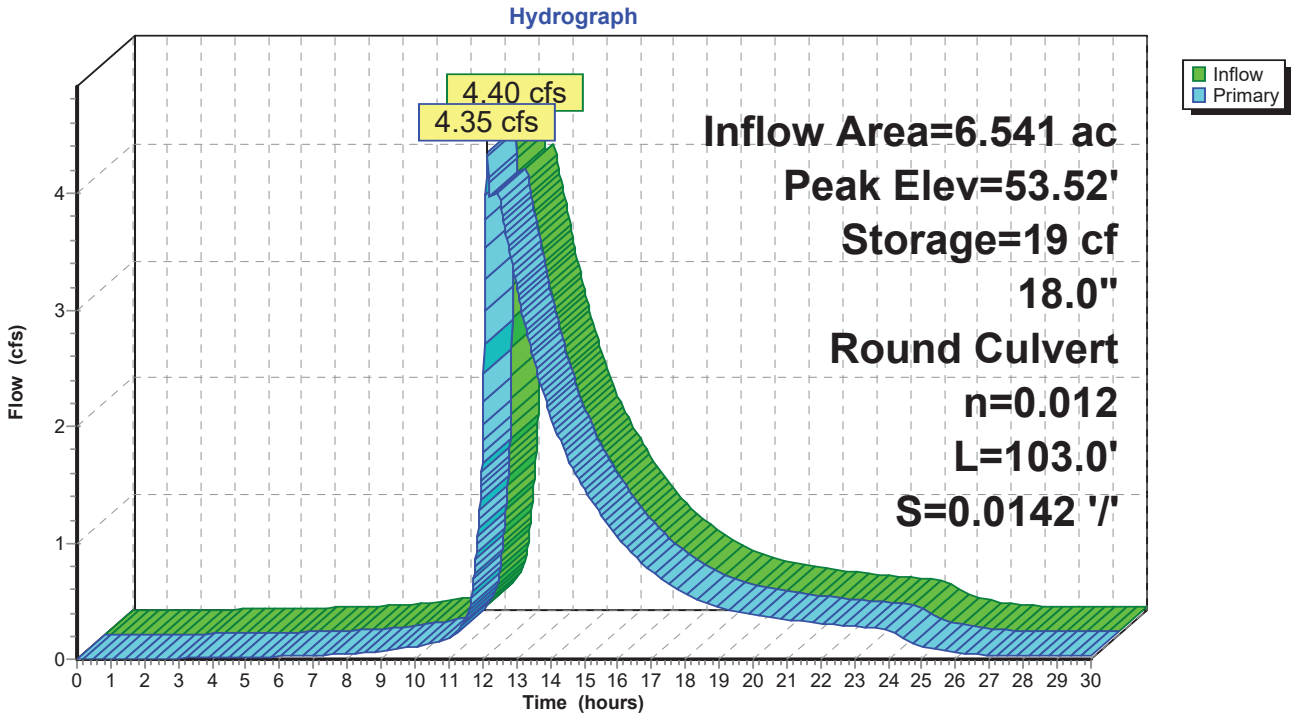
Plug-Flow detention time= 0.1 min calculated for 1.183 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (905.2 - 905.1)

Volume	Invert	Avail.Storage	Storage Description
#1	52.03'	62 cf	**4.00'D x 4.92'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	52.03'	**18.0" Round RCP_Round 18"** L= 103.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.03' / 50.57' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.60 cfs @ 12.14 hrs HW=53.30' TW=52.88' (Dynamic Tailwater)
↑—**1=RCP_Round 18"** (Outlet Controls 3.60 cfs @ 3.05 fps)

Pond CB2359X: CB 2359



Summary for Pond DMH 2: DMH 2

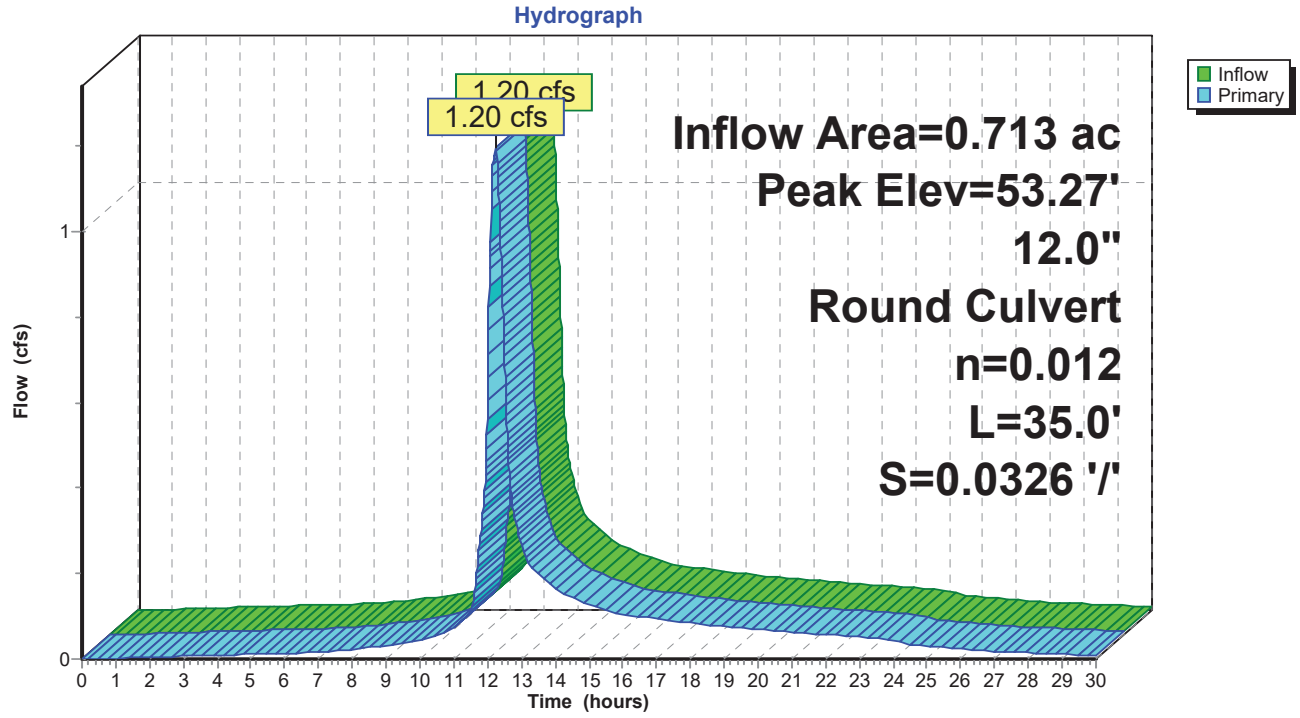
Inflow Area = 0.713 ac, 62.45% Impervious, Inflow Depth > 3.10" for 10 YEAR STORM event
Inflow = 1.20 cfs @ 12.25 hrs, Volume= 0.184 af
Outflow = 1.20 cfs @ 12.25 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.25 hrs, Volume= 0.184 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.27' @ 12.19 hrs
Flood Elev= 55.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.96'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.96' / 50.82' S= 0.0326 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.43 cfs @ 12.25 hrs HW=52.96' TW=52.78' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.43 cfs @ 2.26 fps)

Pond DMH 2: DMH 2



Summary for Pond P1: Rain Garden 1

Inflow Area = 0.383 ac, 57.87% Impervious, Inflow Depth = 2.80" for 10 YEAR STORM event
Inflow = 1.26 cfs @ 12.09 hrs, Volume= 0.089 af
Outflow = 0.67 cfs @ 12.23 hrs, Volume= 0.087 af, Atten= 47%, Lag= 8.7 min
Primary = 0.67 cfs @ 12.23 hrs, Volume= 0.087 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 57.00' Surf.Area= 1,462 sf Storage= 987 cf
Peak Elev= 57.60' @ 12.23 hrs Surf.Area= 2,615 sf Storage= 2,200 cf (1,213 cf above start)
Flood Elev= 58.00' Surf.Area= 3,400 sf Storage= 3,418 cf (2,431 cf above start)

Plug-Flow detention time= 340.8 min calculated for 0.064 af (72% of inflow)
Center-of-Mass det. time= 156.4 min (990.4 - 834.0)

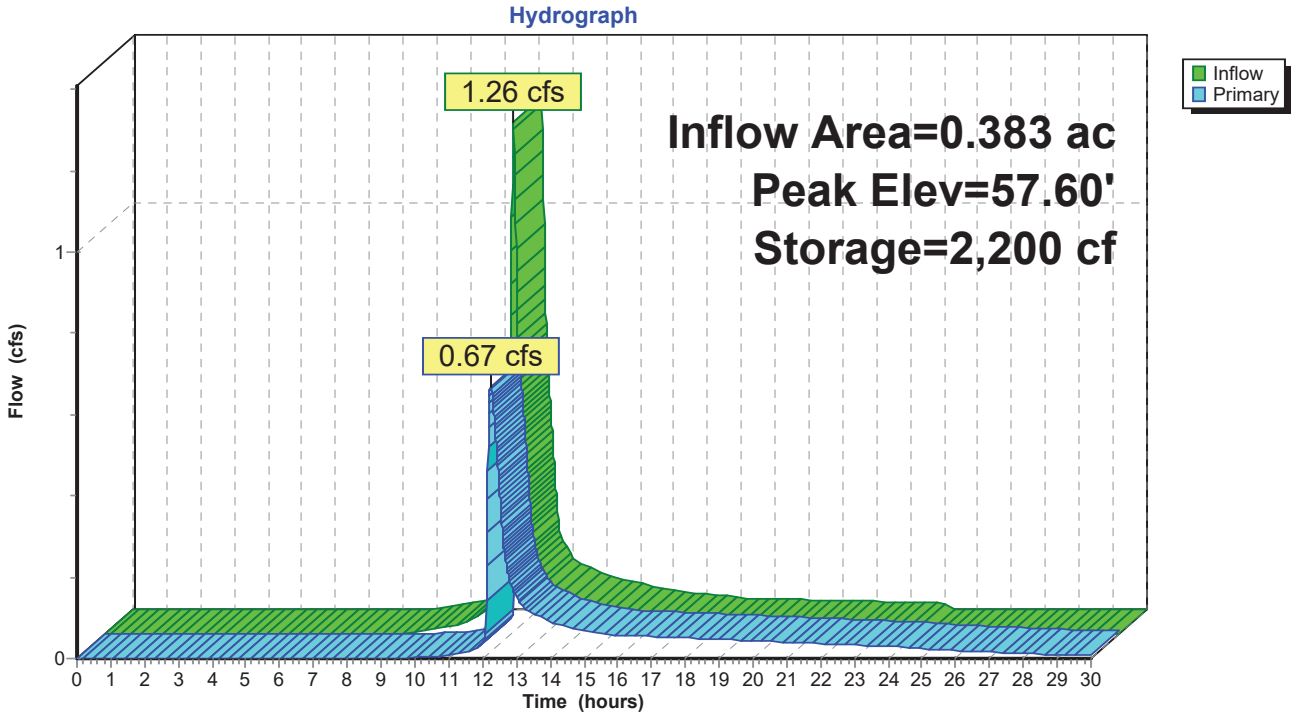
Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	3,418 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	1,462	0.0	0	0
55.50	1,462	40.0	877	877
57.00	1,462	5.0	110	987
58.00	3,400	100.0	2,431	3,418

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**12.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.0076 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	57.00'	**2.500 in/hr Exfiltration over Surface area above 57.00'** Excluded Surface area = 1,462 sf Phase-In= 0.01'
#4	Device 1	57.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.67 cfs @ 12.23 hrs HW=57.60' TW=53.01' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.67 cfs of 5.62 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.07 cfs of 0.72 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.07 cfs)
  - **4=Orifice/Grate** (Weir Controls 0.60 cfs @ 1.01 fps)

Pond P1: Rain Garden 1



Summary for Pond P2: Rain Garden 2

Inflow Area = 0.170 ac, 37.45% Impervious, Inflow Depth = 1.78" for 10 YEAR STORM event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af
Outflow = 0.16 cfs @ 12.32 hrs, Volume= 0.025 af, Atten= 51%, Lag= 13.2 min
Primary = 0.16 cfs @ 12.32 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 54.50' Surf.Area= 347 sf Storage= 165 cf
Peak Elev= 55.03' @ 12.32 hrs Surf.Area= 833 sf Storage= 471 cf (306 cf above start)
Flood Elev= 55.50' Surf.Area= 1,714 sf Storage= 1,064 cf (899 cf above start)

Plug-Flow detention time= 248.0 min calculated for 0.021 af (85% of inflow)
Center-of-Mass det. time= 133.6 min (997.6 - 864.0)

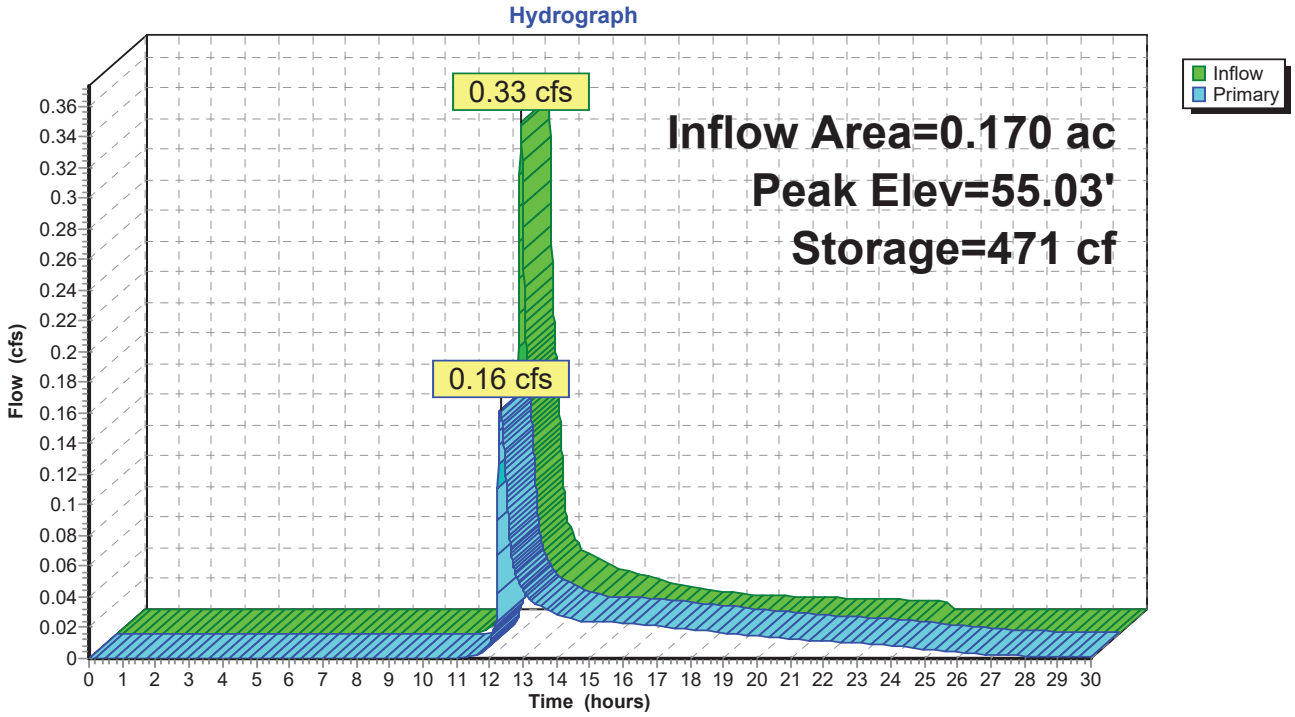
Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	1,064 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	347	0.0	0	0
53.00	347	40.0	139	139
54.50	347	5.0	26	165
55.00	767	100.0	279	443
55.50	1,714	100.0	620	1,064

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.00' / 51.96' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	52.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	54.50'	**2.500 in/hr Exfiltration over Surface area above 54.50'** Excluded Surface area = 347 sf Phase-In= 0.01'
#4	Device 1	55.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 12.32 hrs HW=55.03' TW=52.68' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.16 cfs of 5.80 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.03 cfs of 0.64 cfs potential flow)
    - **3=Exfiltration** (Exfiltration Controls 0.03 cfs)
  - **4=Orifice/Grate** (Weir Controls 0.13 cfs @ 0.61 fps)

Pond P2: Rain Garden 2



Summary for Pond RG2X: Raingarden 2

Inflow Area = 0.541 ac, 54.04% Impervious, Inflow Depth = 3.67" for 10 YEAR STORM event
Inflow = 2.06 cfs @ 12.10 hrs, Volume= 0.165 af
Outflow = 1.59 cfs @ 12.17 hrs, Volume= 0.139 af, Atten= 23%, Lag= 4.3 min
Primary = 1.59 cfs @ 12.17 hrs, Volume= 0.139 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.28' @ 12.17 hrs Surf.Area= 1,301 sf Storage= 2,166 cf

Plug-Flow detention time= 180.3 min calculated for 0.139 af (84% of inflow)
Center-of-Mass det. time= 111.2 min (900.6 - 789.4)

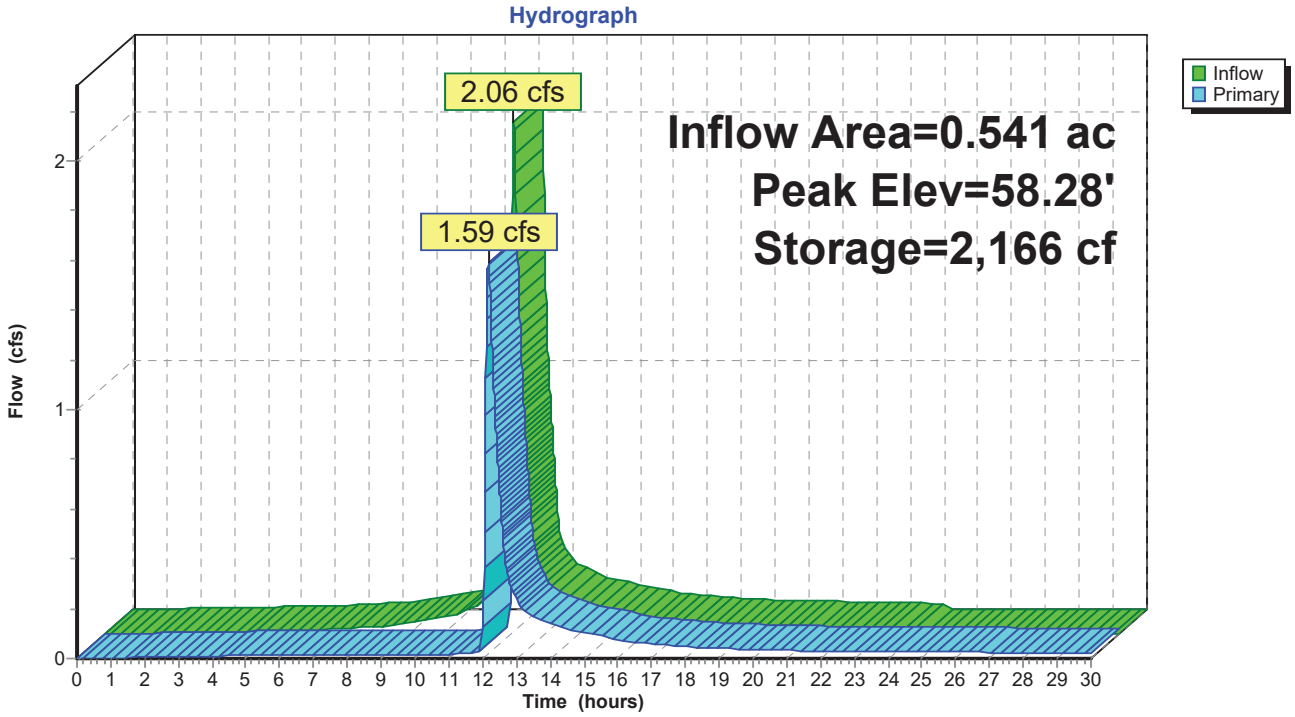
Volume	Invert	Avail.Storage	Storage Description
#1	53.75'	5,219 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.75	630	0.0	0	0
54.75	630	33.0	208	208
56.25	630	10.0	95	302
56.50	630	33.0	52	354
58.00	1,110	100.0	1,305	1,659
60.00	2,450	100.0	3,560	5,219

Device	Routing	Invert	Outlet Devices
#1	Primary	53.65'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.65' / 53.15' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	58.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	53.75'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=1.59 cfs @ 12.17 hrs HW=58.28' TW=53.95' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.59 cfs of 7.69 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 1.56 cfs @ 1.75 fps)
  └─**3=Exfiltration** (Controls 0.03 cfs)

Pond RG2X: Raingarden 2

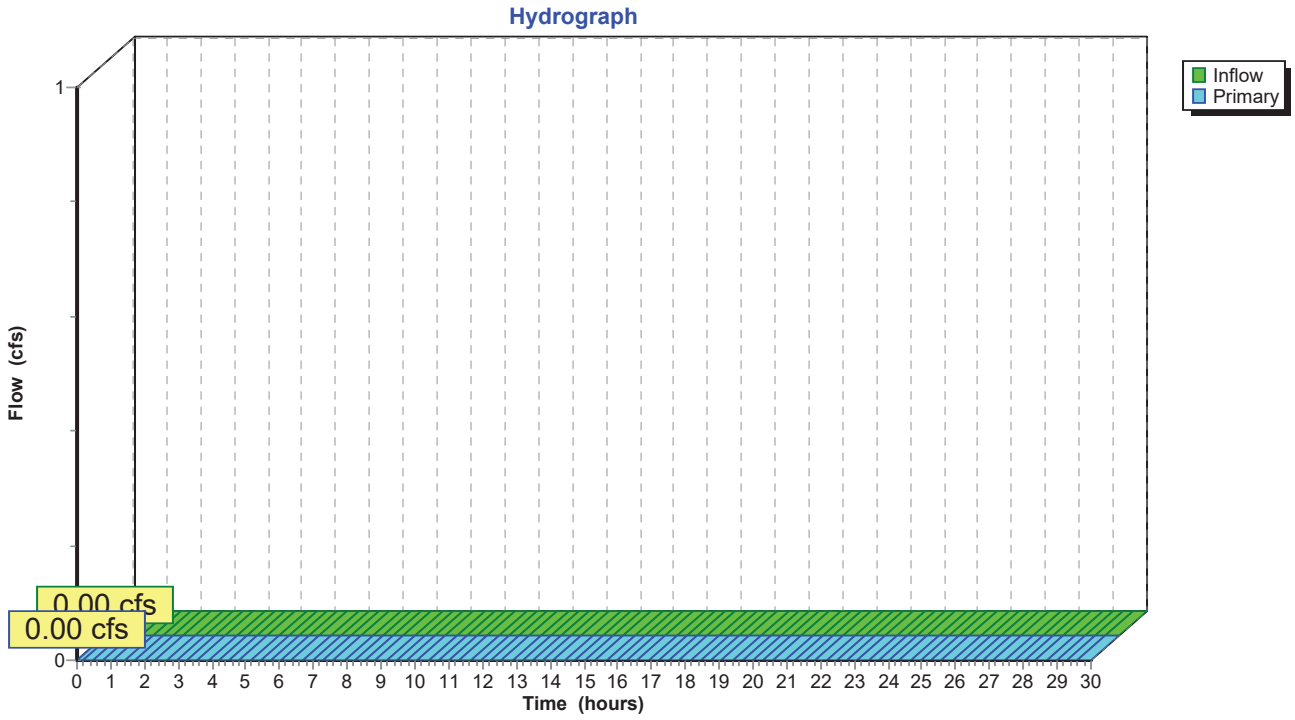


Summary for Link 2L: Overflow

Inflow	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af
Primary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 2L: Overflow

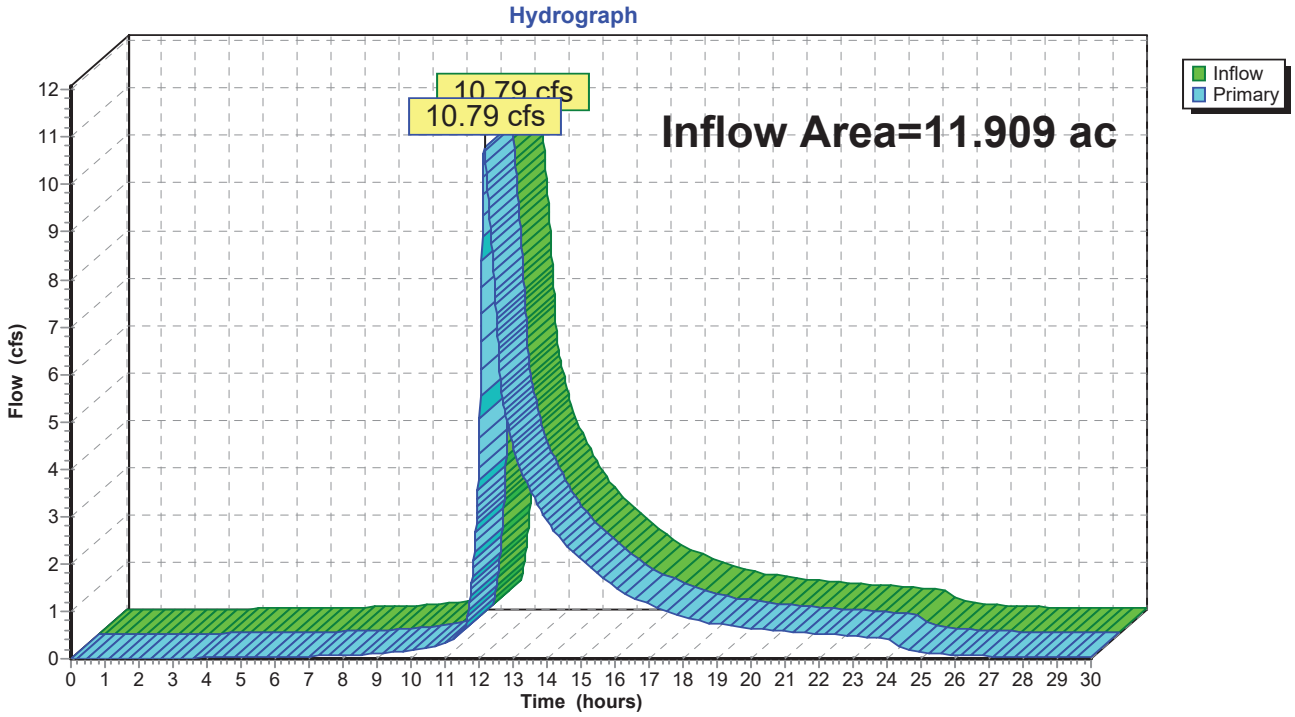


Summary for Link POA 1X: POA 1

Inflow Area = 11.909 ac, 40.99% Impervious, Inflow Depth > 1.93" for 10 YEAR STORM event
Inflow = 10.79 cfs @ 12.15 hrs, Volume= 1.915 af
Primary = 10.79 cfs @ 12.15 hrs, Volume= 1.915 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link POA 1X: POA 1



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 1SY: 1SY Runoff Area=235,657 sf 45.90% Impervious Runoff Depth=2.92"
Tc=15.0 min CN=62 Runoff=13.70 cfs 1.316 af

Subcatchment 3SY: West Coolidge Runoff Area=146,723 sf 25.00% Impervious Runoff Depth=2.13"
Tc=12.0 min CN=54 Runoff=6.37 cfs 0.598 af

Subcatchment 4SY: East Coolidge Runoff Area=31,348 sf 25.00% Impervious Runoff Depth=2.13"
Tc=9.0 min CN=54 Runoff=1.50 cfs 0.128 af

Subcatchment R1: Roof Runoff Area=6,971 sf 100.00% Impervious Runoff Depth=6.92"
Tc=6.0 min CN=98 Runoff=1.12 cfs 0.092 af

Subcatchment R2AX: 1/2 Roof Runoff Area=8,030 sf 100.00% Impervious Runoff Depth=6.92"
Tc=6.0 min CN=98 Runoff=1.30 cfs 0.106 af

Subcatchment S1: West Runoff Area=16,690 sf 57.87% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=73 Runoff=1.83 cfs 0.130 af

Subcatchment S2: North East Runoff Area=4,915 sf 0.00% Impervious Runoff Depth=0.68"
Tc=12.0 min CN=37 Runoff=0.03 cfs 0.006 af

Subcatchment S2AX: S2A Runoff Area=7,588 sf 53.31% Impervious Runoff Depth=4.95"
Tc=8.0 min CN=81 Runoff=0.93 cfs 0.072 af

Subcatchment S2BX: S2B Runoff Area=7,948 sf 8.30% Impervious Runoff Depth=3.12"
Flow Length=275' Tc=7.2 min CN=64 Runoff=0.63 cfs 0.047 af

Subcatchment S3: South East Runoff Area=7,415 sf 37.45% Impervious Runoff Depth=2.82"
Tc=6.0 min CN=61 Runoff=0.55 cfs 0.040 af

Subcatchment S3X: S3 Runoff Area=12,718 sf 84.05% Impervious Runoff Depth=6.21"
Flow Length=485' Tc=9.2 min CN=92 Runoff=1.77 cfs 0.151 af

Subcatchment S4: Hoover Drive Runoff Area=5,580 sf 77.38% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=85 Runoff=0.79 cfs 0.058 af

Subcatchment S4X: S4 Runoff Area=12,973 sf 58.88% Impervious Runoff Depth=5.18"
Flow Length=180' Slope=0.0200 '/' Tc=8.9 min CN=83 Runoff=1.61 cfs 0.129 af

Subcatchment S5X: S5 Runoff Area=10,965 sf 35.75% Impervious Runoff Depth=4.18"
Flow Length=270' Tc=8.4 min CN=74 Runoff=1.14 cfs 0.088 af

Subcatchment S5XB: S5 Runoff Area=3,240 sf 38.27% Impervious Runoff Depth=3.86"
Flow Length=135' Tc=7.2 min CN=71 Runoff=0.32 cfs 0.024 af

Pond 1PY: Westerly Pond Peak Elev=54.86' Storage=21,684 cf Inflow=13.70 cfs 1.316 af
18.0" Round Culvert n=0.012 L=70.0' S=0.0057 '/' Outflow=5.22 cfs 1.316 af

Pond 1R: Roof Leader Peak Elev=55.82' Inflow=1.12 cfs 0.092 af
8.0" Round Culvert n=0.012 L=50.0' S=0.0100 '/' Outflow=1.12 cfs 0.092 af

Pond CB 1: CB 1 Peak Elev=55.04' Storage=52 cf Inflow=8.43 cfs 2.078 af
Primary=8.40 cfs 2.076 af Secondary=0.34 cfs 0.001 af Outflow=8.52 cfs 2.078 af

Pond CB1148X: CB 1148 Peak Elev=55.80' Storage=36 cf Inflow=5.99 cfs 1.666 af
18.0" Round Culvert n=0.011 L=125.0' S=0.0070 '/' Outflow=6.08 cfs 1.666 af

Pond CB1X: CB 2306 Peak Elev=58.44' Storage=19 cf Inflow=0.93 cfs 0.072 af
12.0" Round Culvert n=0.011 L=40.0' S=0.0050 '/' Outflow=0.93 cfs 0.072 af

Pond CB2031X: CB 2301 Peak Elev=51.62' Storage=42 cf Inflow=13.62 cfs 2.892 af
Primary=13.63 cfs 2.892 af Secondary=0.00 cfs 0.000 af Outflow=13.63 cfs 2.892 af

Pond CB2305X: CB 2305 Peak Elev=53.38' Storage=72 cf Inflow=12.43 cfs 2.764 af
Primary=11.99 cfs 2.762 af Secondary=0.49 cfs 0.003 af Outflow=12.14 cfs 2.764 af

Pond CB2306X: CB 2306 Peak Elev=53.78' Storage=179 cf Inflow=9.65 cfs 2.165 af
Primary=8.11 cfs 2.102 af Secondary=4.54 cfs 0.063 af Outflow=10.28 cfs 2.165 af

Pond CB2359X: CB 2359 Peak Elev=55.54' Storage=44 cf Inflow=6.33 cfs 1.795 af
18.0" Round Culvert n=0.012 L=103.0' S=0.0142 '/' Outflow=6.35 cfs 1.795 af

Pond DMH 2: DMH 2 Peak Elev=55.42' Inflow=3.06 cfs 0.259 af
12.0" Round Culvert n=0.012 L=35.0' S=0.0326 '/' Outflow=3.06 cfs 0.259 af

Pond P1: Rain Garden 1 Peak Elev=57.67' Storage=2,392 cf Inflow=1.83 cfs 0.130 af
Outflow=1.47 cfs 0.127 af

Pond P2: Rain Garden 2 Peak Elev=55.22' Storage=653 cf Inflow=0.55 cfs 0.040 af
Outflow=1.17 cfs 0.040 af

Pond RG2X: Raingarden 2 Peak Elev=58.39' Storage=2,358 cf Inflow=2.82 cfs 0.226 af
Outflow=2.40 cfs 0.199 af

Link 2L: Overflow Inflow=4.54 cfs 0.063 af
Primary=4.54 cfs 0.063 af

Link POA 1X: POA 1 Inflow=13.63 cfs 2.892 af
Primary=13.63 cfs 2.892 af

Total Runoff Area = 11.909 ac Runoff Volume = 2.985 af Average Runoff Depth = 3.01"
59.01% Pervious = 7.028 ac 40.99% Impervious = 4.881 ac

Summary for Subcatchment 1SY: 1SY

Runoff = 13.70 cfs @ 12.22 hrs, Volume= 1.316 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
127,492	32	Woods/grass comb., Good, HSG A
108,165	98	Paved parking, HSG A
235,657	62	Weighted Average
127,492		54.10% Pervious Area
108,165		45.90% Impervious Area

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

Summary for Subcatchment 3SY: West Coolidge

Runoff = 6.37 cfs @ 12.18 hrs, Volume= 0.598 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
146,723	54	1/2 acre lots, 25% imp, HSG A
110,042		75.00% Pervious Area
36,681		25.00% Impervious Area

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

Summary for Subcatchment 4SY: East Coolidge

Runoff = 1.50 cfs @ 12.14 hrs, Volume= 0.128 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
31,348	54	1/2 acre lots, 25% imp, HSG A
23,511		75.00% Pervious Area
7,837		25.00% Impervious Area

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

Summary for Subcatchment R1: Roof

Runoff = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
6,971	98	Roofs, HSG A
6,971		100.00% Impervious Area

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

Summary for Subcatchment R2AX: 1/2 Roof

Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.106 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
8,030	98	Roofs, HSG B
8,030		100.00% Impervious Area

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

Summary for Subcatchment S1: West

Runoff = 1.83 cfs @ 12.09 hrs, Volume= 0.130 af, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
9,659	98	Paved parking, HSG A
7,031	39	>75% Grass cover, Good, HSG A
16,690	73	Weighted Average
7,031		42.13% Pervious Area
9,659		57.87% Impervious Area

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

Summary for Subcatchment S2: North East

Runoff = 0.03 cfs @ 12.39 hrs, Volume= 0.006 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
3,353	39	>75% Grass cover, Good, HSG A
1,562	32	Woods/grass comb., Good, HSG A
4,915	37	Weighted Average
4,915		100.00% Pervious Area

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

Summary for Subcatchment S2AX: S2A

Runoff = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af, Depth= 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
2,353	98	Paved parking, HSG B
1,692	98	Unconnected pavement, HSG B
3,543	61	>75% Grass cover, Good, HSG B
7,588	81	Weighted Average
3,543		46.69% Pervious Area
4,045		53.31% Impervious Area
1,692		41.83% Unconnected

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

Summary for Subcatchment S2BX: S2B

Runoff = 0.63 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

	Area (sf)	CN	Description
	7,288	61	>75% Grass cover, Good, HSG B
	100	98	Unconnected pavement, HSG B
*	560	98	Multi-Use Path, HSG B
	7,948	64	Weighted Average
	7,288		91.70% Pervious Area
	660		8.30% Impervious Area
	100		15.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.2	275	Total			

Summary for Subcatchment S3: South East

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
2,777	98	Paved parking, HSG A
4,638	39	>75% Grass cover, Good, HSG A
7,415	61	Weighted Average
4,638		62.55% Pervious Area
2,777		37.45% Impervious Area

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

Summary for Subcatchment S3X: S3

Runoff = 1.77 cfs @ 12.12 hrs, Volume= 0.151 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

	Area (sf)	CN	Description
	2,028	61	>75% Grass cover, Good, HSG B
	9,432	98	Paved roads w/curbs & sewers, HSG B
	898	98	Paved parking, HSG B
*	360	98	Multi-Use Path, HSG B
	12,718	92	Weighted Average
	2,028		15.95% Pervious Area
	10,690		84.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	40	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.9	125	0.0240	2.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.1	320	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.2	485	Total			

Summary for Subcatchment S4: Hoover Drive

Runoff = 0.79 cfs @ 12.09 hrs, Volume= 0.058 af, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

	Area (sf)	CN	Description
	4,318	98	Paved parking, HSG A
	1,262	39	>75% Grass cover, Good, HSG A
	5,580	85	Weighted Average
	1,262		22.62% Pervious Area
	4,318		77.38% Impervious Area

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

Summary for Subcatchment S4X: S4

Runoff = 1.61 cfs @ 12.12 hrs, Volume= 0.129 af, Depth= 5.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

	Area (sf)	CN	Description
	5,335	61	>75% Grass cover, Good, HSG B
	6,778	98	Paved roads w/curbs & sewers, HSG B
*	860	98	Multi-Use path, HSG B
	12,973	83	Weighted Average
	5,335		41.12% Pervious Area
	7,638		58.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.23"
0.6	80	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.9	180	Total			

Summary for Subcatchment S5X: S5

Runoff = 1.14 cfs @ 12.12 hrs, Volume= 0.088 af, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
4,095	61	>75% Grass cover, Good, HSG B
2,470	55	Woods, Good, HSG B
3,920	98	Paved roads w/curbs & sewers, HSG B
480	96	Gravel surface, HSG B
10,965	74	Weighted Average
7,045		64.25% Pervious Area
3,920		35.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	35	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
1.2	135	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
8.4	270	Total			

Summary for Subcatchment S5XB: S5

Runoff = 0.32 cfs @ 12.10 hrs, Volume= 0.024 af, Depth= 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YEAR STORM Rainfall=7.16"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
2,000	55	Woods, Good, HSG B
1,240	98	Paved roads w/curbs & sewers, HSG B
0	96	Gravel surface, HSG B
3,240	71	Weighted Average
2,000		61.73% Pervious Area
1,240		38.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	35	0.0500	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.23"
0.8	100	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.2	135	Total			

Summary for Pond 1PY: Westerly Pond

Inflow Area = 5.410 ac, 45.90% Impervious, Inflow Depth = 2.92" for 25 YEAR STORM event
Inflow = 13.70 cfs @ 12.22 hrs, Volume= 1.316 af
Outflow = 5.22 cfs @ 12.68 hrs, Volume= 1.316 af, Atten= 62%, Lag= 27.9 min
Primary = 5.22 cfs @ 12.68 hrs, Volume= 1.316 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 54.86' @ 12.64 hrs Surf.Area= 20,832 sf Storage= 21,684 cf

Plug-Flow detention time= 68.4 min calculated for 1.316 af (100% of inflow)
Center-of-Mass det. time= 68.3 min (924.3 - 855.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.40'	110,492 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.40	10	0	0
54.00	17,553	5,269	5,269
56.00	25,221	42,774	48,043
58.00	37,228	62,449	110,492

Device	Routing	Invert	Outlet Devices
#1	Primary	53.40'	**18.0" Round Culvert** L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.40' / 53.00' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.76 cfs @ 12.68 hrs HW=54.85' TW=54.41' (Dynamic Tailwater)
1=Culvert (Outlet Controls 4.76 cfs @ 3.46 fps)

Summary for Pond 1R: Roof Leader

Inflow Area = 0.160 ac,100.00% Impervious, Inflow Depth = 6.92" for 25 YEAR STORM event
Inflow = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af
Outflow = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Primary = 1.12 cfs @ 12.08 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 55.82' @ 12.14 hrs
Flood Elev= 56.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.89'	**8.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 52.89' / 52.39' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.54 cfs @ 12.08 hrs HW=54.81' TW=54.66' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.54 cfs @ 1.55 fps)

Summary for Pond CB 1: CB 1

Inflow Area = 7.329 ac, 50.08% Impervious, Inflow Depth > 3.40" for 25 YEAR STORM event
Inflow = 8.43 cfs @ 12.13 hrs, Volume= 2.078 af
Outflow = 8.52 cfs @ 12.13 hrs, Volume= 2.078 af, Atten= 0%, Lag= 0.1 min
Primary = 8.40 cfs @ 12.10 hrs, Volume= 2.076 af
Secondary = 0.34 cfs @ 12.14 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 55.04' @ 12.14 hrs Surf.Area= 156 sf Storage= 52 cf
Flood Elev= 54.90' Surf.Area= 18 sf Storage= 42 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (893.4 - 893.4)

Volume	Invert	Avail.Storage	Storage Description
#1	51.58'	42 cf	**4.00'D x 3.32'H Vertical Cone/Cylinder**
#2	54.90'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		168 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.90	5	0	0
55.40	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	50.57'	**18.0" Round Culvert** L= 170.0' Ke= 0.500 Inlet / Outlet Invert= 50.57' / 48.74' S= 0.0108 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	54.90'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=7.84 cfs @ 12.10 hrs HW=54.86' TW=53.59' (Dynamic Tailwater)
1=Culvert (Outlet Controls 7.84 cfs @ 4.44 fps)

Secondary OutFlow Max=0.33 cfs @ 12.14 hrs HW=55.04' TW=53.70' (Dynamic Tailwater)
2=Sharp-Crested Rectangular Weir (Weir Controls 0.33 cfs @ 1.22 fps)

Summary for Pond CB1148X: CB 1148

Inflow Area = 6.243 ac, 48.39% Impervious, Inflow Depth > 3.20" for 25 YEAR STORM event
Inflow = 5.99 cfs @ 12.68 hrs, Volume= 1.666 af
Outflow = 6.08 cfs @ 12.66 hrs, Volume= 1.666 af, Atten= 0%, Lag= 0.0 min
Primary = 6.08 cfs @ 12.66 hrs, Volume= 1.666 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 55.80' @ 12.15 hrs Surf.Area= 13 sf Storage= 36 cf
Flood Elev= 58.70' Surf.Area= 18 sf Storage= 73 cf

Plug-Flow detention time= 0.1 min calculated for 1.666 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (904.4 - 904.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.90'	73 cf	**4.00'D x 5.80'H Vertical Cone/Cylinder**
#2	58.69'	14 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		87 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.69	5	0	0
59.20	50	14	14

Device	Routing	Invert	Outlet Devices
#1	Primary	52.90'	**18.0" Round Culvert** L= 125.0' Ke= 0.500 Inlet / Outlet Invert= 52.90' / 52.03' S= 0.0070 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=6.16 cfs @ 12.66 hrs HW=54.42' TW=53.64' (Dynamic Tailwater)
1=Culvert (Outlet Controls 6.16 cfs @ 4.27 fps)

Summary for Pond CB1X: CB 2306

Inflow Area = 0.174 ac, 53.31% Impervious, Inflow Depth = 4.95" for 25 YEAR STORM event
Inflow = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af
Outflow = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Primary = 0.93 cfs @ 12.11 hrs, Volume= 0.072 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.44' @ 12.15 hrs Surf.Area= 13 sf Storage= 19 cf

Plug-Flow detention time= 3.8 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 2.7 min (809.2 - 806.5)

Volume	Invert	Avail.Storage	Storage Description
#1	56.95'	35 cf	**4.00'D x 2.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	56.95'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 56.95' / 56.75' S= 0.0050 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.11 hrs HW=58.43' TW=58.37' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.85 cfs @ 1.08 fps)

Summary for Pond CB2031X: CB 2301

Inflow Area = 11.909 ac, 40.99% Impervious, Inflow Depth > 2.91" for 25 YEAR STORM event
Inflow = 13.62 cfs @ 12.13 hrs, Volume= 2.892 af
Outflow = 13.63 cfs @ 12.16 hrs, Volume= 2.892 af, Atten= 0%, Lag= 1.6 min
Primary = 13.63 cfs @ 12.16 hrs, Volume= 2.892 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 51.62' @ 12.16 hrs Surf.Area= 13 sf Storage= 42 cf
Flood Elev= 52.70' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= 0.1 min calculated for 2.891 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (887.9 - 887.8)

Volume	Invert	Avail.Storage	Storage Description
#1	48.30'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	52.70'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.70	5	0	0
53.20	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	**18.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.12' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.70'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=13.61 cfs @ 12.16 hrs HW=51.61' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 13.61 cfs @ 7.70 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.30' TW=0.00' (Dynamic Tailwater)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond CB2305X: CB 2305

Inflow Area = 11.189 ac, 42.02% Impervious, Inflow Depth > 2.96" for 25 YEAR STORM event
Inflow = 12.43 cfs @ 12.15 hrs, Volume= 2.764 af
Outflow = 12.14 cfs @ 12.16 hrs, Volume= 2.764 af, Atten= 2%, Lag= 0.5 min
Primary = 11.99 cfs @ 12.24 hrs, Volume= 2.762 af
Secondary = 0.49 cfs @ 12.15 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.38' @ 12.15 hrs Surf.Area= 196 sf Storage= 72 cf
Flood Elev= 53.20' Surf.Area= 18 sf Storage= 55 cf

Plug-Flow detention time= 0.1 min calculated for 2.763 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (888.7 - 888.6)

Volume	Invert	Avail.Storage	Storage Description
#1	48.80'	55 cf	**4.00'D x 4.40'H Vertical Cone/Cylinder**
#2	53.20'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		182 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.20	5	0	0
53.70	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.80'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.80' / 48.32' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	53.20'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=11.42 cfs @ 12.24 hrs HW=53.16' TW=51.36' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 11.42 cfs @ 6.46 fps)

Secondary OutFlow Max=0.47 cfs @ 12.15 hrs HW=53.38' TW=51.52' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.47 cfs @ 1.37 fps)

Summary for Pond CB2306X: CB 2306

Inflow Area = 7.580 ac, 49.61% Impervious, Inflow Depth > 3.43" for 25 YEAR STORM event
Inflow = 9.65 cfs @ 12.13 hrs, Volume= 2.165 af
Outflow = 10.28 cfs @ 12.13 hrs, Volume= 2.165 af, Atten= 0%, Lag= 0.0 min
Primary = 8.11 cfs @ 12.41 hrs, Volume= 2.102 af
Secondary = 4.54 cfs @ 12.15 hrs, Volume= 0.063 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 53.78' @ 12.15 hrs Surf.Area= 513 sf Storage= 179 cf
Flood Elev= 52.95' Surf.Area= 18 sf Storage= 53 cf

Plug-Flow detention time= 0.2 min calculated for 2.165 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (890.7 - 890.5)

Volume	Invert	Avail.Storage	Storage Description
#1	48.74'	53 cf	**4.00'D x 4.21'H Vertical Cone/Cylinder**
#2	52.95'	126 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		179 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.95	5	0	0
53.45	500	126	126

Device	Routing	Invert	Outlet Devices
#1	Primary	48.97'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 48.43' / 48.97' S= -0.0159 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	52.95'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=5.55 cfs @ 12.41 hrs HW=53.13' TW=52.70' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.55 cfs @ 3.14 fps)

Secondary OutFlow Max=4.53 cfs @ 12.15 hrs HW=53.78' TW=0.00' (Dynamic Tailwater)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 4.53 cfs @ 2.98 fps)

Summary for Pond CB2359X: CB 2359

Inflow Area = 6.541 ac, 48.87% Impervious, Inflow Depth > 3.29" for 25 YEAR STORM event
Inflow = 6.33 cfs @ 12.66 hrs, Volume= 1.795 af
Outflow = 6.35 cfs @ 12.52 hrs, Volume= 1.795 af, Atten= 0%, Lag= 0.0 min
Primary = 6.35 cfs @ 12.52 hrs, Volume= 1.795 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 55.54' @ 12.15 hrs Surf.Area= 13 sf Storage= 44 cf
Flood Elev= 56.95' Surf.Area= 13 sf Storage= 62 cf

Plug-Flow detention time= 0.1 min calculated for 1.794 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (897.2 - 897.1)

Volume	Invert	Avail.Storage	Storage Description
#1	52.03'	62 cf	**4.00'D x 4.92'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	52.03'	**18.0" Round RCP_Round 18"** L= 103.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.03' / 50.57' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.93 cfs @ 12.52 hrs HW=54.06' TW=53.82' (Dynamic Tailwater)
└**1=RCP_Round 18"** (Outlet Controls 3.93 cfs @ 2.23 fps)

Summary for Pond DMH 2: DMH 2

Inflow Area = 0.713 ac, 62.45% Impervious, Inflow Depth > 4.36" for 25 YEAR STORM event
Inflow = 3.06 cfs @ 12.21 hrs, Volume= 0.259 af
Outflow = 3.06 cfs @ 12.21 hrs, Volume= 0.259 af, Atten= 0%, Lag= 0.0 min
Primary = 3.06 cfs @ 12.21 hrs, Volume= 0.259 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 55.42' @ 12.14 hrs
Flood Elev= 55.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.96'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.96' / 50.82' S= 0.0326 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.65 cfs @ 12.21 hrs HW=55.41' TW=54.92' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.65 cfs @ 3.37 fps)

Summary for Pond P1: Rain Garden 1

Inflow Area = 0.383 ac, 57.87% Impervious, Inflow Depth = 4.07" for 25 YEAR STORM event
Inflow = 1.83 cfs @ 12.09 hrs, Volume= 0.130 af
Outflow = 1.47 cfs @ 12.15 hrs, Volume= 0.127 af, Atten= 20%, Lag= 3.6 min
Primary = 1.47 cfs @ 12.15 hrs, Volume= 0.127 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 57.00' Surf.Area= 1,462 sf Storage= 987 cf
Peak Elev= 57.67' @ 12.15 hrs Surf.Area= 2,754 sf Storage= 2,392 cf (1,405 cf above start)
Flood Elev= 58.00' Surf.Area= 3,400 sf Storage= 3,418 cf (2,431 cf above start)

Plug-Flow detention time= 246.2 min calculated for 0.104 af (80% of inflow)
Center-of-Mass det. time= 120.2 min (943.4 - 823.2)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	3,418 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	1,462	0.0	0	0
55.50	1,462	40.0	877	877
57.00	1,462	5.0	110	987
58.00	3,400	100.0	2,431	3,418

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**12.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.50' / 54.00' S= 0.0076 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	54.50'	**4.0" Vert. Orifice/Grate** C= 0.600

#3	Device 2	57.00'	**2.500 in/hr Exfiltration over Surface area above 57.00'** Excluded Surface area = 1,462 sf Phase-In= 0.01'
#4	Device 1	57.50'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.47 cfs @ 12.15 hrs HW=57.67' TW=55.42' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.47 cfs of 5.23 cfs potential flow)
- **2=Orifice/Grate** (Passes 0.07 cfs of 0.63 cfs potential flow)
  - **3=Exfiltration** (Exfiltration Controls 0.07 cfs)
- **4=Orifice/Grate** (Weir Controls 1.39 cfs @ 1.33 fps)

Summary for Pond P2: Rain Garden 2

Inflow Area = 0.170 ac, 37.45% Impervious, Inflow Depth = 2.82" for 25 YEAR STORM event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.040 af
Outflow = 1.17 cfs @ 12.21 hrs, Volume= 0.040 af, Atten= 0%, Lag= 7.0 min
Primary = 1.17 cfs @ 12.21 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Starting Elev= 54.50' Surf.Area= 347 sf Storage= 165 cf
Peak Elev= 55.22' @ 12.20 hrs Surf.Area= 1,176 sf Storage= 653 cf (488 cf above start)
Flood Elev= 55.50' Surf.Area= 1,714 sf Storage= 1,064 cf (899 cf above start)

Plug-Flow detention time= 173.4 min calculated for 0.036 af (90% of inflow)
Center-of-Mass det. time= 101.1 min (951.0 - 849.9)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	1,064 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	347	0.0	0	0
53.00	347	40.0	139	139
54.50	347	5.0	26	165
55.00	767	100.0	279	443
55.50	1,714	100.0	620	1,064

Device	Routing	Invert	Outlet Devices
#1	Primary	52.00'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.00' / 51.96' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	52.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	54.50'	**2.500 in/hr Exfiltration over Surface area above 54.50'** Excluded Surface area = 347 sf Phase-In= 0.01'
#4	Device 1	55.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=55.21' TW=55.42' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)
    └─**3=Exfiltration** (Passes 0.00 cfs of 0.05 cfs potential flow)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond RG2X: Raingarden 2

Inflow Area = 0.541 ac, 54.04% Impervious, Inflow Depth > 5.00" for 25 YEAR STORM event
Inflow = 2.82 cfs @ 12.10 hrs, Volume= 0.226 af
Outflow = 2.40 cfs @ 12.15 hrs, Volume= 0.199 af, Atten= 15%, Lag= 3.2 min
Primary = 2.40 cfs @ 12.15 hrs, Volume= 0.199 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 58.39' @ 12.15 hrs Surf.Area= 1,373 sf Storage= 2,358 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 85.4 min (870.6 - 785.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.75'	5,219 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.75	630	0.0	0	0
54.75	630	33.0	208	208
56.25	630	10.0	95	302
56.50	630	33.0	52	354
58.00	1,110	100.0	1,305	1,659
60.00	2,450	100.0	3,560	5,219

Device	Routing	Invert	Outlet Devices
#1	Primary	53.65'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.65' / 53.15' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	58.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	53.75'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=2.40 cfs @ 12.15 hrs HW=58.39' TW=55.80' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.40 cfs of 6.09 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 2.37 cfs @ 3.02 fps)
  └─**3=Exfiltration** (Controls 0.03 cfs)

Summary for Link 2L: Overflow

Inflow = 4.54 cfs @ 12.15 hrs, Volume= 0.063 af
Primary = 4.54 cfs @ 12.15 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link POA 1X: POA 1

Inflow Area = 11.909 ac, 40.99% Impervious, Inflow Depth > 2.91" for 25 YEAR STORM event
Inflow = 13.63 cfs @ 12.16 hrs, Volume= 2.892 af
Primary = 13.63 cfs @ 12.16 hrs, Volume= 2.892 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Section 7

Precipitation Table

ALTUS ENGINEERING

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	
Latitude	43.038 degrees North
Longitude	70.776 degrees West
Elevation	10 feet
Date/Time	Mon Sep 30 2024 15:43:28 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48h
1yr	0.26	0.40	0.50	0.66	0.82	1.04	**1yr**	0.71	0.98	1.22	1.57	2.04	2.68	2.9
2yr	0.32	0.50	0.62	0.82	1.03	1.30	**2yr**	0.89	1.18	1.52	1.95	2.50	3.23	3.6
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.16	4.10	4.6
10yr	0.41	0.65	0.82	1.12	1.46	1.90	**10yr**	1.26	1.73	2.24	2.91	3.78	4.91	5.5
25yr	0.48	0.77	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.79	3.65	4.78	6.23	7.1
50yr	0.54	0.86	1.11	1.55	2.08	2.77	**50yr**	1.80	2.54	3.31	4.36	5.71	7.46	8.6
100yr	0.60	0.97	1.25	1.78	2.43	3.28	**100yr**	2.10	2.99	3.93	5.20	6.83	8.94	10.4
200yr	0.68	1.11	1.44	2.06	2.85	3.86	**200yr**	2.46	3.54	4.65	6.18	8.16	10.71	12.(
500yr	0.81	1.33	1.73	2.51	3.51	4.81	**500yr**	3.03	4.41	5.82	7.78	10.32	13.62	16.1

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48h
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.62	0.87	0.92	1.33	1.68	2.26	2.5
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.87	1.16	1.37	1.82	2.33	3.08	3.4
5yr	0.35	0.54	0.67	0.92	1.18	1.41	**5yr**	1.01	1.38	1.61	2.12	2.73	3.83	4.2
10yr	0.39	0.60	0.74	1.03	1.33	1.61	**10yr**	1.15	1.57	1.81	2.38	3.05	4.42	4.9
25yr	0.44	0.67	0.84	1.20	1.58	1.91	**25yr**	1.36	1.87	2.10	2.75	3.53	4.78	6.0
50yr	0.49	0.74	0.92	1.33	1.78	2.18	**50yr**	1.54	2.13	2.35	3.06	3.93	5.41	6.9
100yr	0.54	0.82	1.03	1.48	2.04	2.48	**100yr**	1.76	2.43	2.63	3.40	4.34	6.09	8.0
200yr	0.60	0.90	1.15	1.66	2.31	2.83	**200yr**	2.00	2.77	2.94	3.77	4.79	6.84	9.3
500yr	0.70	1.04	1.34	1.94	2.76	3.39	**500yr**	2.39	3.31	3.42	4.29	5.45	7.99	11.1

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48h
1yr	0.29	0.44	0.54	0.72	0.89	1.09	**1yr**	0.77	1.06	1.26	1.74	2.20	3.01	3.1

Section 8

NRCS Soils Report

ALTUS ENGINEERING

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire

September 30, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,180 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

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

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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
799	Urban land-Canton complex, 3 to 15 percent slopes	2.7	100.0%
Totals for Area of Interest		**2.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

799—Urban land-Canton complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cq0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Canton and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 5 percent
Hydric soil rating: No

Boxford and eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

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Section 9

BMP Sizing Calculations

ALTUS
ENGINEERING

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention (Raingarden) HydroCAD Node P1**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.38	ac	A = Area draining to the practice	
0.22	ac	A_I = Impervious area draining to the practice	
0.58	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.57	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.22	ac-in	WQV= 1" x Rv x A	
792	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
198	cf	25% x WQV (check calc for sediment forebay volume)	
594	cf	75% x WQV (check calc for surface sand filter volume)	
		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
57.38	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.04	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
10.99	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
55.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
54.50	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
55.50	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
55.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
57.66	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
58.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
1,083	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D-4	Note what sheet in the plan set contains the filter course specification	
4.0	:1	Pond side slopes	**≥ 3:1**
Sheet	D-1	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: Test pits not performed.

Stage-Area-Storage for Pond P1: Rain Garden 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
54.00	1,462	0
54.05	1,462	0
54.10	1,462	0
54.15	1,462	0
54.20	1,462	0
54.25	1,462	0
54.30	1,462	0
54.35	1,462	0
54.40	1,462	0
54.45	1,462	0
54.50	1,462	0
54.55	1,462	29
54.60	1,462	58
54.65	1,462	88
54.70	1,462	117
54.75	1,462	146
54.80	1,462	175
54.85	1,462	205
54.90	1,462	234
54.95	1,462	263
55.00	1,462	292
55.05	1,462	322
55.10	1,462	351
55.15	1,462	380
55.20	1,462	409
55.25	1,462	439
55.30	1,462	468
55.35	1,462	497
55.40	1,462	526
55.45	1,462	556
55.50	1,462	585
55.55	1,462	588
55.60	1,462	592
55.65	1,462	596
55.70	1,462	599
55.75	1,462	603
55.80	1,462	607
55.85	1,462	610
55.90	1,462	614
55.95	1,462	618
56.00	1,462	621
56.05	1,462	625
56.10	1,462	629
56.15	1,462	632
56.20	1,462	636
56.25	1,462	640
56.30	1,462	643
56.35	1,462	647
56.40	1,462	651
56.45	1,462	654
56.50	1,462	658
56.55	1,462	662
56.60	1,462	665
56.65	1,462	669
56.70	1,462	673
56.75	1,462	676
56.80	1,462	680
56.85	1,462	683
56.90	1,462	687
56.95	1,462	691
57.00	1,462	694
57.05	1,559	770
57.10	1,656	850
57.15	1,753	936
57.20	1,850	1,026
57.25	1,947	1,121
57.30	2,043	1,220
57.35	2,140	1,325
57.40	2,237	1,434
57.45	2,334	1,549
57.50	2,431	1,668
57.55	2,528	1,792
57.60	2,625	1,920
57.65	2,722	2,054
57.70	2,819	2,193
57.75	2,916	2,336
57.80	3,012	2,484
57.85	3,109	2,637
57.90	3,206	2,795
57.95	3,303	2,958
58.00	**3,400**	**3,125**

792+585 = 1377
Ewqv = 57.38 ft

1668-585 = 1083 cf
V = 1083 cf

Volume below media discarded

Stage-Discharge for Pond P1: Rain Garden 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
54.50	0.00	55.56	0.00	56.62	0.00	57.68	1.65
54.52	0.00	55.58	0.00	56.64	0.00	57.70	1.92
54.54	0.00	55.60	0.00	56.66	0.00	57.72	2.20
54.56	0.00	55.62	0.00	56.68	0.00	57.74	2.50
54.58	0.00	55.64	0.00	56.70	0.00	57.76	2.81
54.60	0.00	55.66	0.00	56.72	0.00	57.78	3.13
54.62	0.00	55.68	0.00	56.74	0.00	57.80	3.47
54.64	0.00	55.70	0.00	56.76	0.00	57.82	3.81
54.66	0.00	55.72	0.00	56.78	0.00	57.84	4.17
54.68	0.00	55.74	0.00	56.80	0.00	57.86	4.53
54.70	0.00	55.76	0.00	56.82	0.00	57.88	4.91
54.72	0.00	55.78	0.00	56.84	0.00	57.90	5.30
54.74	0.00	55.80	0.00	56.86	0.00	57.92	5.70
54.76	0.00	55.82	0.00	56.88	0.00	57.94	5.98
54.78	0.00	55.84	0.00	56.90	0.00	57.96	6.00
54.80	0.00	55.86	0.00	56.92	0.00	57.98	6.02
54.82	0.00	55.88	0.00	56.94	0.00	58.00	**6.04**
54.84	0.00	55.90	0.00	56.96	0.00		
54.86	0.00	55.92	0.00	56.98	0.00		
54.88	0.00	55.94	0.00	57.00	0.00		
54.90	0.00	55.96	0.00	57.02	0.00		
54.92	0.00	55.98	0.00	57.04	0.00		
54.94	0.00	56.00	0.00	57.06	0.01		
54.96	0.00	56.02	0.00	57.08	0.01		
54.98	0.00	56.04	0.00	57.10	0.01		
55.00	0.00	56.06	0.00	57.12	0.01		
55.02	0.00	56.08	0.00	57.14	0.02		
55.04	0.00	56.10	0.00	57.16	0.02		
55.06	0.00	56.12	0.00	57.18	0.02		
55.08	0.00	56.14	0.00	57.20	0.02		
55.10	0.00	56.16	0.00	57.22	0.02		
55.12	0.00	56.18	0.00	57.24	0.03		
55.14	0.00	56.20	0.00	57.26	0.03		
55.16	0.00	56.22	0.00	57.28	0.03		
55.18	0.00	56.24	0.00	57.30	0.03		
55.20	0.00	56.26	0.00	57.32	0.04		
55.22	0.00	56.28	0.00	57.34	0.04		
55.24	0.00	56.30	0.00	57.36	0.04		
55.26	0.00	56.32	0.00	57.38	0.04		
55.28	0.00	56.34	0.00	57.40	0.04		
55.30	0.00	56.36	0.00	57.42	0.05		
55.32	0.00	56.38	0.00	57.44	0.05		
55.34	0.00	56.40	0.00	57.46	0.05		
55.36	0.00	56.42	0.00	57.48	0.05		
55.38	0.00	56.44	0.00	57.50	0.06		
55.40	0.00	56.46	0.00	57.52	0.12		
55.42	0.00	56.48	0.00	57.54	0.22		
55.44	0.00	56.50	0.00	57.56	0.36		
55.46	0.00	56.52	0.00	57.58	0.53		
55.48	0.00	56.54	0.00	57.60	0.72		
55.50	0.00	56.56	0.00	57.62	0.92		
55.52	0.00	56.58	0.00	57.64	1.15		
55.54	0.00	56.60	0.00	57.66	1.39		

Qwqv = 0.04 cfs

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention (Raingarden #2) HydroCAD Node P2**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.17	ac	A = Area draining to the practice	
0.06	ac	A_I = Impervious area draining to the practice	
0.35	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.37	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.06	ac-in	WQV= 1" x Rv x A	
227	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
57	cf	25% x WQV (check calc for sediment forebay volume)	
170	cf	75% x WQV (check calc for surface sand filter volume)	
na		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
54.90	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.02	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
6.30	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
53.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
52.00	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
53.00	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
53.00	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
55.11	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
55.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
304	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D4	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	D1	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	**mod. 304.1 (see spec)**

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: Test pits not performed.

Stage-Area-Storage for Pond P2: Rain Garden 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
52.00	347	0
52.05	347	7
52.10	347	14
52.15	347	21
52.20	347	28
52.25	347	35
52.30	347	42
52.35	347	49
52.40	347	56
52.45	347	62
52.50	347	69
52.55	347	76
52.60	347	83
52.65	347	90
52.70	347	97
52.75	347	104
52.80	347	111
52.85	347	118
52.90	347	125
52.95	347	132
53.00	347	139
53.05	347	140
53.10	347	141
53.15	347	141
53.20	347	142
53.25	347	143
53.30	347	144
53.35	347	145
53.40	347	146
53.45	347	147
53.50	347	147
53.55	347	148
53.60	347	149
53.65	347	150
53.70	347	151
53.75	347	152
53.80	347	153
53.85	347	154
53.90	347	154
53.95	347	155
54.00	347	156
54.05	347	157
54.10	347	158
54.15	347	159
54.20	347	160
54.25	347	160
54.30	347	161
54.35	347	162
54.40	347	163
54.45	347	164
54.50	347	165
54.55	389	183
54.60	431	204
54.65	473	226
54.70	515	251
54.75	557	278
54.80	599	307
54.85	641	338
54.90	683	371
54.95	725	406
55.00	767	443
55.05	862	484
55.10	956	529
55.15	1,051	580
55.20	1,146	635
55.25	1,241	694
55.30	1,335	759
55.35	1,430	828
55.40	1,525	902
55.45	1,619	980
55.50	**1,714**	**1,064**

227+139 = 366
Ewqv = 54.90 ft

55.0 = the elavation outlet structure
443-139 = 304 cf
V = 304 cf

Volume below media discarded

Stage-Discharge for Pond P2: Rain Garden 2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
52.00	0.00	53.06	0.00	54.12	0.00	55.18	1.61
52.02	0.00	53.08	0.00	54.14	0.00	55.20	1.88
52.04	0.00	53.10	0.00	54.16	0.00	55.22	2.17
52.06	0.00	53.12	0.00	54.18	0.00	55.24	2.47
52.08	0.00	53.14	0.00	54.20	0.00	55.26	2.78
52.10	0.00	53.16	0.00	54.22	0.00	55.28	3.10
52.12	0.00	53.18	0.00	54.24	0.00	55.30	3.43
52.14	0.00	53.20	0.00	54.26	0.00	55.32	3.78
52.16	0.00	53.22	0.00	54.28	0.00	55.34	4.13
52.18	0.00	53.24	0.00	54.30	0.00	55.36	4.50
52.20	0.00	53.26	0.00	54.32	0.00	55.38	4.88
52.22	0.00	53.28	0.00	54.34	0.00	55.40	5.27
52.24	0.00	53.30	0.00	54.36	0.00	55.42	5.66
52.26	0.00	53.32	0.00	54.38	0.00	55.44	6.07
52.28	0.00	53.34	0.00	54.40	0.00	55.46	6.48
52.30	0.00	53.36	0.00	54.42	0.00	55.48	6.53
52.32	0.00	53.38	0.00	54.44	0.00	55.50	**6.55**
52.34	0.00	53.40	0.00	54.46	0.00		
52.36	0.00	53.42	0.00	54.48	0.00		
52.38	0.00	53.44	0.00	54.50	0.00		
52.40	0.00	53.46	0.00	54.52	0.00		
52.42	0.00	53.48	0.00	54.54	0.00		
52.44	0.00	53.50	0.00	54.56	0.00		
52.46	0.00	53.52	0.00	54.58	0.00		
52.48	0.00	53.54	0.00	54.60	0.00		
52.50	0.00	53.56	0.00	54.62	0.01		
52.52	0.00	53.58	0.00	54.64	0.01		
52.54	0.00	53.60	0.00	54.66	0.01		
52.56	0.00	53.62	0.00	54.68	0.01		
52.58	0.00	53.64	0.00	54.70	0.01		
52.60	0.00	53.66	0.00	54.72	0.01		
52.62	0.00	53.68	0.00	54.74	0.01		
52.64	0.00	53.70	0.00	54.76	0.01		
52.66	0.00	53.72	0.00	54.78	0.01		
52.68	0.00	53.74	0.00	54.80	0.01		
52.70	0.00	53.76	0.00	54.82	0.02		
52.72	0.00	53.78	0.00	54.84	0.02		
52.74	0.00	53.80	0.00	54.86	0.02		
52.76	0.00	53.82	0.00	54.88	0.02		
52.78	0.00	53.84	0.00	54.90	0.02		
52.80	0.00	53.86	0.00	54.92	0.02		
52.82	0.00	53.88	0.00	54.94	0.02		
52.84	0.00	53.90	0.00	54.96	0.02		
52.86	0.00	53.92	0.00	54.98	0.02		
52.88	0.00	53.94	0.00	55.00	0.02		
52.90	0.00	53.96	0.00	55.02	0.08		
52.92	0.00	53.98	0.00	55.04	0.19		
52.94	0.00	54.00	0.00	55.06	0.33		
52.96	0.00	54.02	0.00	55.08	0.50		
52.98	0.00	54.04	0.00	55.10	0.68		
53.00	0.00	54.06	0.00	55.12	0.89		
53.02	0.00	54.08	0.00	55.14	1.12		
53.04	0.00	54.10	0.00	55.16	1.36		

Qwqv = 0.02 cfs

Section 10

Stormwater Operations & Maintenance Plan

ALTUS
ENGINEERING

STORMWATER INSPECTION AND MAINTENANCE MANUAL

2059 Lafayette Road
Portsmouth, NH 03801

OWNER:
Go-Lo, Inc.
P.O. Box 300
Rye, NH 03870

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner:	Go-Lo, Inc.		603-661-6633
	Name	*Company*	*Phone*
Inspection:	Go-Lo, Inc.		603-661-6633
	Name	*Company*	*Phone*
Maintenance:	Go-Lo, Inc.		603-661-6633
	Name	*Company*	*Phone*

NOTES:

Written inspection forms and maintenance logs shall be completed yearly by a qualified inspector retained the owner or assigns.

Photographs of each stormwater BMP are to be taken at each inspection and submitted with the annual inspection reports.

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to another entity

ALTUS ENGINEERING

BIORETENTION PONDS (AKA RAINGARDENS)

Function – Bioretention ponds and tree box filters provide treatment to runoff prior to directing it to stormwater systems by filtering sediment and suspended solids, trapping them in the bottom of the facility and in the filter media itself. Additional treatment is provided by the native water-tolerant vegetation which removes nutrients and other pollutants through bio-uptake. Stormwater detention and infiltration can also be provided as the filtering process slows runoff, decreases the peak rate of discharge and promotes groundwater recharge.

Bioretention ponds and tree box filters shall be managed (Per AGR 3800 and RSA 430:53) to: prevent and control the spread of invasive plant, insect, and fungal species; minimize the adverse environmental and economic effects invasive species cause to agriculture, forests, wetlands, wildlife, and other natural resources of the state; and protect the public from potential health problems attributed to certain invasive species.

Maintenance

- Inspect bi-annually and after significant rainfall events.
- If a raingarden or tree box filter does not completely drain within 72-hours following a rainfall event, then a qualified professional shall be retained to assess the condition of the facility to determine measures required to restore its filtration and/or infiltration function(s), including but not limited to removal of accumulated sediments and/or replacement or reconstruction of the filter media. Filter media shall be replaced with material matching the specification on the design drawings or the NHDES Stormwater Manual.
- Replace any riprap dislodged from spillways, inlets and outlets.
- Remove any obstructions, litter and accumulated sediment or debris as warranted but no less than once a year.
- Mowing of any grassed area in or adjacent to a raingarden or tree box filter, including any berms, shall be performed at least twice per year (when areas are not inundated) to keep the vegetation in vigorous condition. The cut grass shall be removed to prevent the decaying organic litter from clogging the filter media or choking other vegetation.
- Select vegetation should be maintained in healthy condition. This may include pruning, removal and replacement of dead or diseased vegetation.
- Remove any invasive species, Per AGR 3800 and RSA 430:53.
- Remove any hard wood growth aside from trees in tree box filters.
- Replace media in tree box filters when replacing tree.

CULVERTS AND DRAINAGE PIPES

Function – Culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.
- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or creek erosion is identified, the outlet owner shall take appropriate means to prevent further erosion. Increased lengths of riprap may require a NHDES Permit and/or local permit.

CATCH BASINS

Function – Catch basins and field drains collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned annually and any removed sediment and debris shall be disposed of at a solid waste disposal facility.

RIP RAP OUTLETS, SWALES AND PLUNGE POOLS

Function – Rip rap outlets slow the velocity of runoff, minimizing erosion and maximizing the treatment capabilities of associated buffers. Vegetated buffers, either forested or meadow, slow runoff which promotes and reduces peak rates of runoff. The reduced velocities and the presence of vegetation encourage the filtration of sediment and the limited bio-uptake of nutrients.

Maintenance

- Inspect riprap, level spreaders and buffers at least annually for signs of erosion, sediment buildup, or vegetation loss.
- Inspect level for signs of condensed flows. Level spreader and rip rap shall be maintained to disperse flows evenly over level spreader.
- If a meadow buffer, provide periodic mowing as needed to maintain a healthy stand of herbaceous vegetation.
- If a forested buffer, then the buffer should be maintained in an undisturbed condition, unless erosion occurs.
- If erosion of the buffer (forested or meadow) occurs, eroded areas should be repaired and replanted with vegetation similar to the remaining buffer. Corrective action should include eliminating the source of the erosion problem and may require retrofit or reconstruction of the level spreader.
- Remove debris and accumulated sediment and dispose of properly.

LANDSCAPED AREAS – ORGANIC FERTILIZER MANAGEMENT

Function – All fertilizer used on site shall be certified organic. Organic fertilizer management involves controlling the rate, timing and method of organic fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Organic fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply organic fertilizer to frozen ground.
- Clean up any organic fertilizer spills.
- Do not allow organic fertilizer to be broadcast into water bodies.
- When organically fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

VEGETATIVE SWALES

Function – Vegetative swales filter sediment from stormwater, promote infiltration, and the uptake of contaminates. They are designed to treat runoff and dispose of it safely into the natural drainage system.

Maintenance

- Timely maintenance is important to keep a swale in good working condition. Mowing of grassed swales shall be monthly to keep the vegetation in vigorous condition. The cut vegetation shall be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale.
- Fertilizing shall be bi-annual or as recommended from soil testing.
- Inspect swales following significant rainfall events.
- Woody vegetation shall not be allowed to become established in the swales or rock riprap outlet protection and if present shall be removed.
- Accumulated debris disrupts flow and leads to clogging and erosion. Remove debris and litter as necessary.
- Inspect for eroded areas. Determine cause of erosion and correct deficiency as required. Monitor repaired areas.

CONTROL OF INVASIVE PLANTS

Function – Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Maintenance

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described in the attached "Methods for Disposing Non-Native Invasive Plants" prepared by the UNH Cooperative Extension.

GENERAL CLEAN UP

- Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet filter, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated during construction.
- Once in operation, all paved areas of the site should be swept at least once annually at the end of winter/early spring prior to significant spring rains.

SNOW MANANGEMENT

Snow should never be stored in any stormwater practice as it may affect functionality by blocking drains and reducing the storage volume available for runoff. The Owner/Applicant and any maintenance personnel should take great care to ensure that snow is stored only in areas depicted on the site plan and away from locations that could negatively impact drainage infrastructure or flow paths.

APPPENDIX

A. Stormwater System Operations and Maintenance Report
B. Site Grading and Drainage Plan

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information			
Project Name			
Owner			
Inspector's Name(s)			
Inspector's Contact Information			
Date of Inspection		**Start Time:**	**End Time:**
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment			
Notes:			

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject		**Status**	**Notes**
A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:			*Notes/ Action taken:*
1	Do the current site conditions reflect the attached site plan?	❑Yes ❑No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	❑Yes ❑No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	❑Yes ❑No	

Permit Coverage and Plans				
#	**BMP/Facility**	**Inspected**	**Corrective Action Needed and Notes**	**Date Corrected**
	Bioretention Ponds	❑Yes ❑No		
	Catch Basins	❑Yes ❑No		
	Drainage Pipes	❑Yes ❑No		
	Riprap Aprons/Plunge Pools	❑Yes ❑No		
	Site Vegetation	❑Yes ❑No		
		❑Yes ❑No		
		❑Yes ❑No		

- INSPECTOR TO TAKE REPRESENTATIVE PHOTOGRAPHS OF EACH BMP INSPECTED AND INCLUDE THEM IN THE ANNUAL INPECTION REPORT.

Section 11

Watershed Plans

Pre-Development On Site Watershed Plan
Post-Development On Site Watershed Plan
Pre-Development Off Site Watershed Plan
Post-Development Off Site Watershed Plan
Post-Development Westerly Watershed Plan

ALTUS
ENGINEERING

PLAN REFERENCE:
1. "EXISTING CONDITIONS PLAN, 2059 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE", DATED 09/17/24, BY JAMES VERRA & ASSOCIATES, INC.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

LEGEND
- WATERSHED BOUNDARY
- PROPOSED GROUND SLOPE DIRECTION
- SCS SOIL BOUNDARY
- 779 SCS SOIL DESIGNATION
- SOILS – HSG A
- SOILS – IMPERVIOUS
- 1 / 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

P5361

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINER NO. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
10/21/24

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24
1	PB SUBMISSION	EDW	11/27/24

DRAWN BY: JMC
APPROVED BY: EDW
DRAWING FILE: 5361-2024.DWG

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO-LO, INC. c/o LABRIE
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

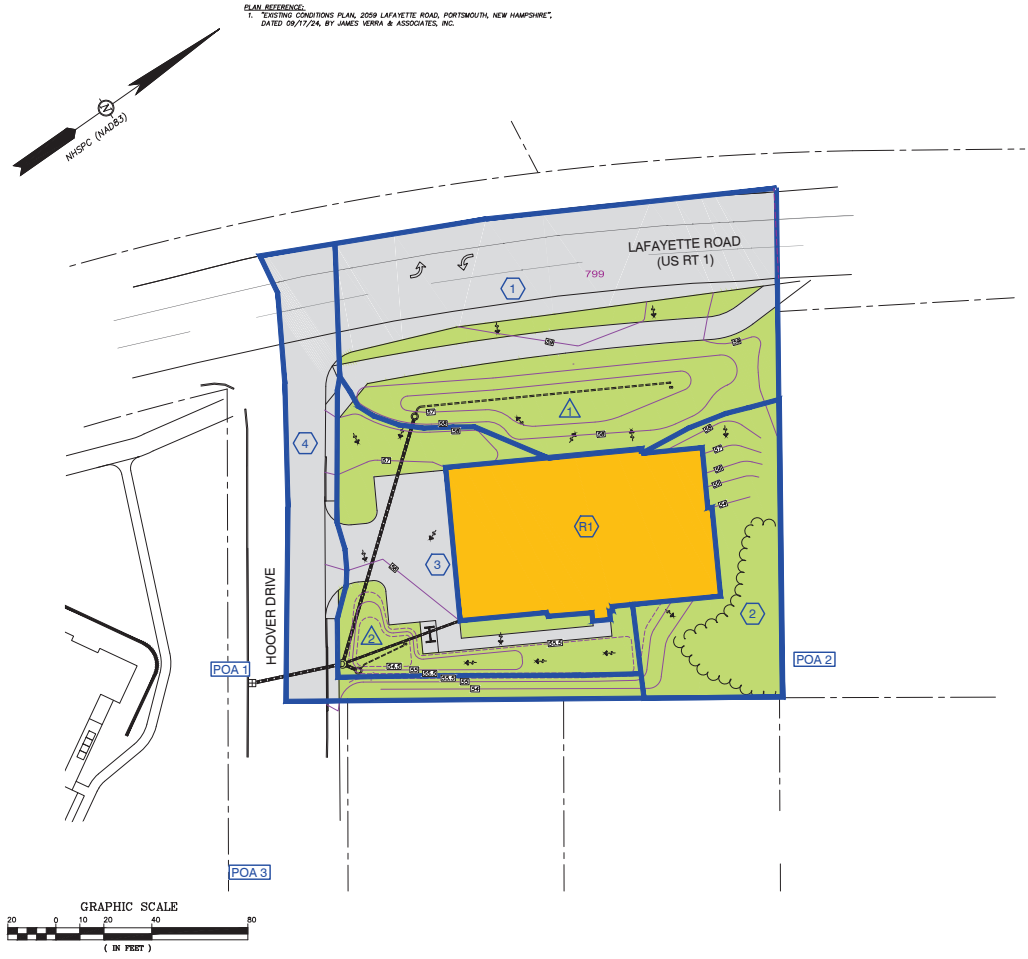
OWNER:
TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:
SITE REDEVELOPMENT
TAX MAP 268
LOTS 12 & 13
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-1

PLAN REFERENCE:
1. "EXISTING CONDITIONS PLAN, 2059 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE", DATED 09/17/24, BY JAMES VERRA & ASSOCIATES, INC.



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

LEGEND
- WATERSHED BOUNDARY
- TC PATH
- SCS SOIL BOUNDARY
- 799 SCS SOIL DESIGNATION
- PROPOSED GROUND SLOPE DIRECTION
- SOILS – HSG A
- SOILS – IMPERVIOUS
- PROPOSED BUILDING
- 1 / 1 / 1 SUBCATCHMENT/POND/REACH
- POA POINT OF ANALYSIS

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
11/27/24

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24
1	PB SUBMISSION	EDW	11/27/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5361-2024.DWG

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO-LO, INC. c/o LABRIE
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:
TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:
SITE REDEVELOPMENT
TAX MAP 268 LOTS 12 & 13
2059 LAFAYETTE ROAD PORTSMOUTH, NH

TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-2

P5361

GRAPHIC SCALE

-100 0 100 200 400

(IN FEET)

NOTES

1. 1SY, 3SY, AND 4SY SUBCATCHMENT DATA ACQUIRED FROM TAFT ROAD WATERSHED ANALYSIS. SUBCATCHMENTS FROM TAFT ROAD WERE GIVEN A "Y" SUFFIX.
2. S2AX, R2AX, S2BX, S3X, S4X, AND S5X SUBCATCHMENT DATA ACQUIRED FROM WESTERLY WATERSHED ANALYSIS. SUBCATCHMENTS FROM WESTERLY WERE GIVEN A "X" SUFFIX. SEE ATTACHED WESTERLY WATERSHED PLAN FOR WESTERLY SUBCATCHMENT DATA.
3. 1S AND 2S SUBCATCHMENT DATA ACQUIRED FROM GOLO SITE WATERSHED ANALYSIS.
4. PLAN CREATED USING GIS DATA FROM 2018, SITE OBSERVATIONS, AND FIELD SURVEY.

LEGEND

- WATERSHED BOUNDARY
- WEST WESTERLY
- EAST WESTERLY
- GOLO SITE
- WEST COOLIDGE
- EAST COOLIDGE
- 1 / 1 — SUBCATCHMENT\POND
- POA — POINT OF ANALYSIS

P:\5361

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	11/27/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5361-2024.DWG

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO-LO, INC. c/o LABRIE
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:
TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:
SITE REDEVELOPMENT
TAX MAP 268
LOTS 12 & 13
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-3

GRAPHIC SCALE
-100 0 100 200 400
(IN FEET)

NOTES

1. 1SY, 3SY, AND 4SY SUBCATCHMENT DATA ACQUIRED FROM TAFT ROAD WATERSHED ANALYSIS. SUBCATCHMENTS FROM TAFT ROAD WERE GIVEN A "Y" SUFFIX.
2. S2AX, R2AX, S2BX, S3X, S4X, AND S5X SUBCATCHMENT DATA ACQUIRED FROM WESTERLY WATERSHED ANALYSIS. SUBCATCHMENTS FROM WESTERLY WERE GIVEN A "X" SUFFIX. SEE ATTACHED WESTERLY WATERSHED PLAN FOR WESTERLY SUBCATCHEMT DATA.
3. S1, S2, S3, S4, AND R1 SUBCATCHMENT DATA ACQUIRED FROM GOLO SITE WATERSHED ANALYSIS.
4. PLAN CREATED USING GIS DATA FROM 2018, SITE OBSERVATIONS, AND FIELD SURVEY.

LEGEND

- WATERSHED BOUNDARY
- WEST WESTERLY
- EAST WESTERLY
- GOLO SITE
- WEST COOLIDGE
- EAST COOLIDGE
- 1 / 1 — SUBCATCHMENT\POND
- POA — POINT OF ANALYSIS

P:\5361

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC MICHNER No. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

12/27/24

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	11/27/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5361-2024.DWG

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

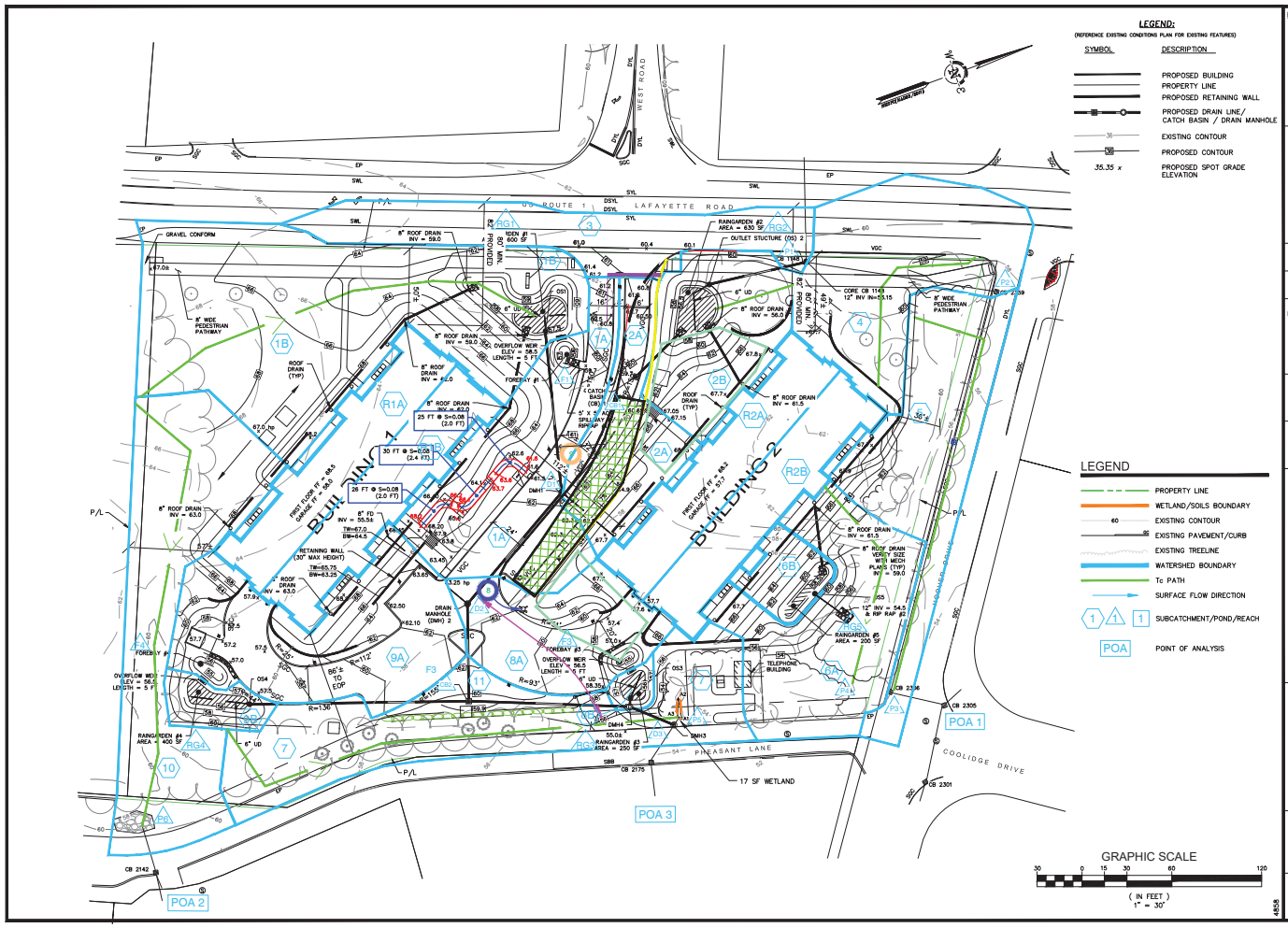
OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO-LO, INC. c/o LABRIE
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:
TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:
SITE REDEVELOPMENT
TAX MAP 268 LOTS 12 & 13
2059 LAFAYETTE ROAD PORTSMOUTH, NH

TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
WS-4



ENGINEER:

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2359 www.ALTUS-ENG.com

ISSUED FOR:
DRAINAGE STUDY

ISSUE DATE:
DECEMBER 15, 2017

REVISIONS:

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	9/25/17
1	AOT COMMENTS	EDW	12/15/17

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4856.DWG

SCALE:
22" x 34" - 1" = 30'
11" x 17" - 1" = 60'

OWNER:
ROMAN CATHOLIC BISHOP OF MANCHESTER
PO BOX 310
MANCHESTER, NH 03105

APPLICANT:
STONEGATE NH CONSTRUCTION, LLC
273 CORPORATE DRIVE
PORTSMOUTH, NH 03801

PROJECT:
THE WESTERLY
2075 LAFAYETTE ROAD
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE
ASSESSOR'S PARCEL 268-97

TITLE:
POST DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
W-2

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

PROPOSED SITE REDEVELOPMENT PLANS

2059 Lafayette Road
Portsmouth, New Hampshire

Assessor's Parcel 268, Lots 12 & 13

Owner/Applicant:

GO–LO, INC.

C/O MICHAEL LABRIE
&/OR PETER LABRIE
P.O. BOX 300
RYE, NH 03870
TEL. (603) 661–6633

Owner:

JAMES A. LABRIE
REV. TRUST OF 1991

C/O MICHAEL LABRIE, TRUSTEE &
PETER LABRIE, TRUSTEE

P.O. BOX 300
RYE, NH 03870

Plan Issue Date:

October 21, 2024 Initial TAC Submission
November 27, 2024 Planning Board Submission

Surveyor:

JVA
JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8,
NEWINGTON, N.H., 03801–7876
603–436–3557

JOB NO: 24–2060

Civil Engineer:

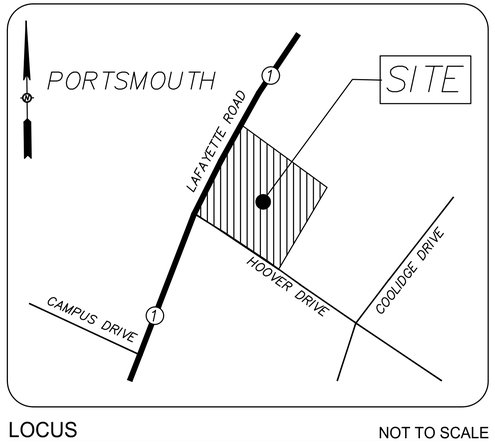
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Architect:

PORTSMOUTH ARCHITECTS
brought to you by McHENRY ARCHITECTURE
4 MARKET STREET
PORTSMOUTH, NEW HAMPSHIRE
603.430.0274

Landscape Architect:

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949



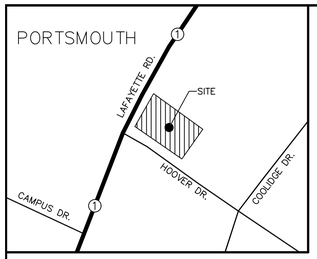
LOCUS NOT TO SCALE

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Plan (by JVA)	S–1	1	11/26/24
Site Preparation Plan	C–1	1	11/27/24
Site Plan	C–2	1	11/27/24
Grading, Drainage & Erosion Control Plan	C–3	1	11/27/24
Utilities Plan	C–4	1	11/27/24
Landscape Plan (by Woodburn)	L–1	1	11/27/24
Landscape Plan – Details (by Woodburn)	L–2	1	11/27/24
Site Lighting Layout	1 of 1	0	11/20/24
Detail Sheet	D–1	0	10/21/24
Detail Sheet	D–2	0	10/21/24
Detail Sheet	D–3	1	11/27/24
Detail Sheet	D–4	0	10/21/24
Detail Sheet	D–5	1	11/27/24
First Floor Plan by McHenry Architecture	A2	0	11/27/24
Second & Third Floor Plan by McHenry	A3	0	11/27/24
Elevations (Lafayette) by McHenry	A5	0	11/27/24
Elevations (Hoover) by McHenry	A6	0	11/27/24

Permit Summary:	*Approval:*
Portsmouth Zoning Board of Adjustment	12/27/23
Portsmouth Site Plan Review	Pending

5361–DETAILS.DWG

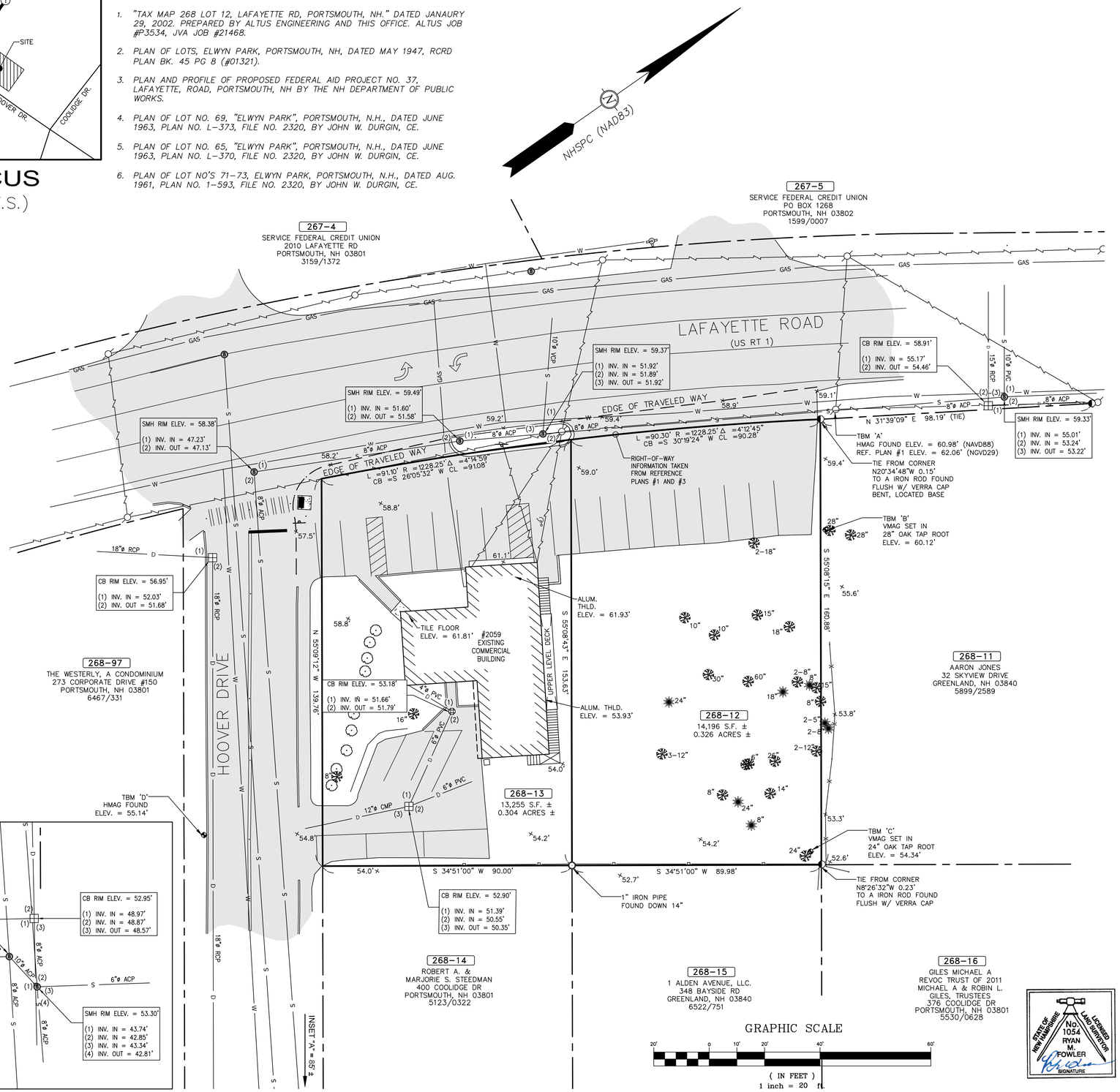
P5361



LOCUS
(N.T.S.)

REFERENCE PLANS:

1. *"TAX MAP 268 LOT 12, LAFAYETTE RD, PORTSMOUTH, NH." DATED JANAURY 29, 2002. PREPARED BY ALTUS ENGINEERING AND THIS OFFICE. ALTUS JOB #P3534, JVA JOB #21468.*
2. *PLAN OF LOTS, ELWYN PARK, PORTSMOUTH, NH, DATED MAY 1947, RCRD PLAN BK. 45 PG 8 (#01321).*
3. *PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. 37, LAFAYETTE, ROAD, PORTSMOUTH, NH BY THE NH DEPARTMENT OF PUBLIC WORKS.*
4. *PLAN OF LOT NO. 69, "ELWYN PARK", PORTSMOUTH, N.H., DATED JUNE 1963, PLAN NO. L–373, FILE NO. 2320, BY JOHN W. DURGIN, CE.*
5. *PLAN OF LOT NO. 65, "ELWYN PARK", PORTSMOUTH, N.H., DATED JUNE 1963, PLAN NO. L–370, FILE NO. 2320, BY JOHN W. DURGIN, CE.*
6. *PLAN OF LOT NO'S 71–73, ELWYN PARK, PORTSMOUTH, N.H., DATED AUG. 1961, PLAN NO. 1–593, FILE NO. 2320, BY JOHN W. DURGIN, CE.*



NOTES:

1. OWNER OF RECORD: JAMES A. LABRIE REVOC. TRUST OF 1991, JAMES A. LABRIE, TRUSTEE
   ADDRESS: PO BOX 300, RYE, NH 03870–0300
   DEED REFERENCE: BK. 5378 PG. 2236
   TAX MAP: 268
   LOT: 12

   OWNER OF RECORD: GO–LO INC C/O LABRIE
   ADDRESS: PO BOX 300, RYE, NH 03870–0300
   DEED REFERENCE: BK. 1486 PG. 0393
   TAX MAP: 268
   LOT: 13
2. ZONED: MRB DISTRICT (MIXED RESIDENTIAL BUSINESS)

MIN.LOT AREA:	7,500 S/.F. (0.17 ACRES)
MIN. FRONTAGE:	100' (ON LAFAYETTE ROAD)
MIN. LOT DEPTH	80'
FRONT SETBACK	> 80' TO LAFAYETTE ROAD CENTERLINE OR 30' TO R.O.W.
SIDE SETBACK:	10'
REAR SETBACK:	15'
MAX. BUILDING HEIGHT:	40' (SLOPED), 30' (FLAT)
MAX. BUILDING LENGTH:	160' (MULTI–FAMILY)
MAX. BUILDING FOOTPRINT:	N/A
MAX. COVERAGE:	40%
LOT AREA/DWELLING UNIT:	7,500 S.F.
MIN. OPEN SPACE:	25%

3. THE INTENT OF THIS PLAN IS TO UPDATE REFERENCE PLAN #1 TO BE ON NEW HAMPSHIRE STATE PLANE NAD 83, AND NORTH AMERICAN VERTICAL DATUM OF 1988 TO CONFORM WITH THE CITY OF PORTSMOUTH SITE PLAN REGULATIONS. THIS OFFICE DID NOT PERFORM AN ENTIRELY NEW SURVEY OF THE PARCEL, FEATURES ON THE PARCEL WERE TAKEN FROM THE REFERENCE PLANS, AND UPDATED ACCORDINGLY. BOUNDARY INFORMATION TAKEN FROM REFERENCE PLAN #1.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG–SAFE @ 1–888–DIG–SAFE.
5. HORIZONTAL DATUM: NAD83, VERTICAL DATUM: NAVD88, UNITS: U.S. SURVEY FOOT. ESTABLISHED BY SURVEY GRADE GPS OBSERVATION AND PROCESSED BY OPUS.
6. THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0270F, EFFECTIVE DATE 1/29/2021 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
7. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC.

LEGEND:

◐	IRON ROD (AS NOTED)
o	IRON PIPE (AS NOTED)
—x—	WOVEN WIRE FENCE
—▫—	WOODEN FENCE
⌀	UTILITY POLE
———	OVERHEAD WIRES
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
101–03	TAX SHEET / LOT NO.
EOP	EDGE OF PAVEMENT
⊕ ⊞	CATCH BASIN
Ⓢ	SEWER MANHOLE
— W —	WATER LINE
— S —	SEWER LINE
—D—	DRAIN LINE
	WATER SHUT OFF VALVE
	HYDRANT
	DECIDUOUS TREE
	CONIFEROUS TREE
	TEMPORY BENCHMARK
♿	HANDICAP PARKING SPACE

SURVEYOR'S CERTIFICATION

"I HEREBY CERTIFY THAT THIS SURVEY AND PLAT WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS AN ERROR OF CLOSURE OF GREATER ACCURACY THAN ONE PART IN FIFTEEN THOUSAND (1:15,000)."

STATE OF NEW HAMPSHIRE No. 1054 RYAN W. FOWLER LICENSED LAND SURVEYOR SIGNATURE

LICENSED LAND SURVEYOR — 11/26/24 DATE

ALTUS JOB#P5361

SURVEYOR:
JVA
JAMES VERRA & ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8,
NEWINGTON, N.H., 03801–7876
603–436–3557
JOB NO: 24–2060

ENGINEER:
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ISSUED FOR:
PERMITTING

ISSUE DATE:
OCTOBER 21, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	INITIAL SUBMISSION	RMF	11/26/24

DRAWN BY: RMF/REL
APPROVED BY: RMF
DRAWING FILE: 24–2060_EXCON.DWG

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

TAX MAP 268, LOT 13
GO–LO, INC. c/o MICHAEL LABRIE
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

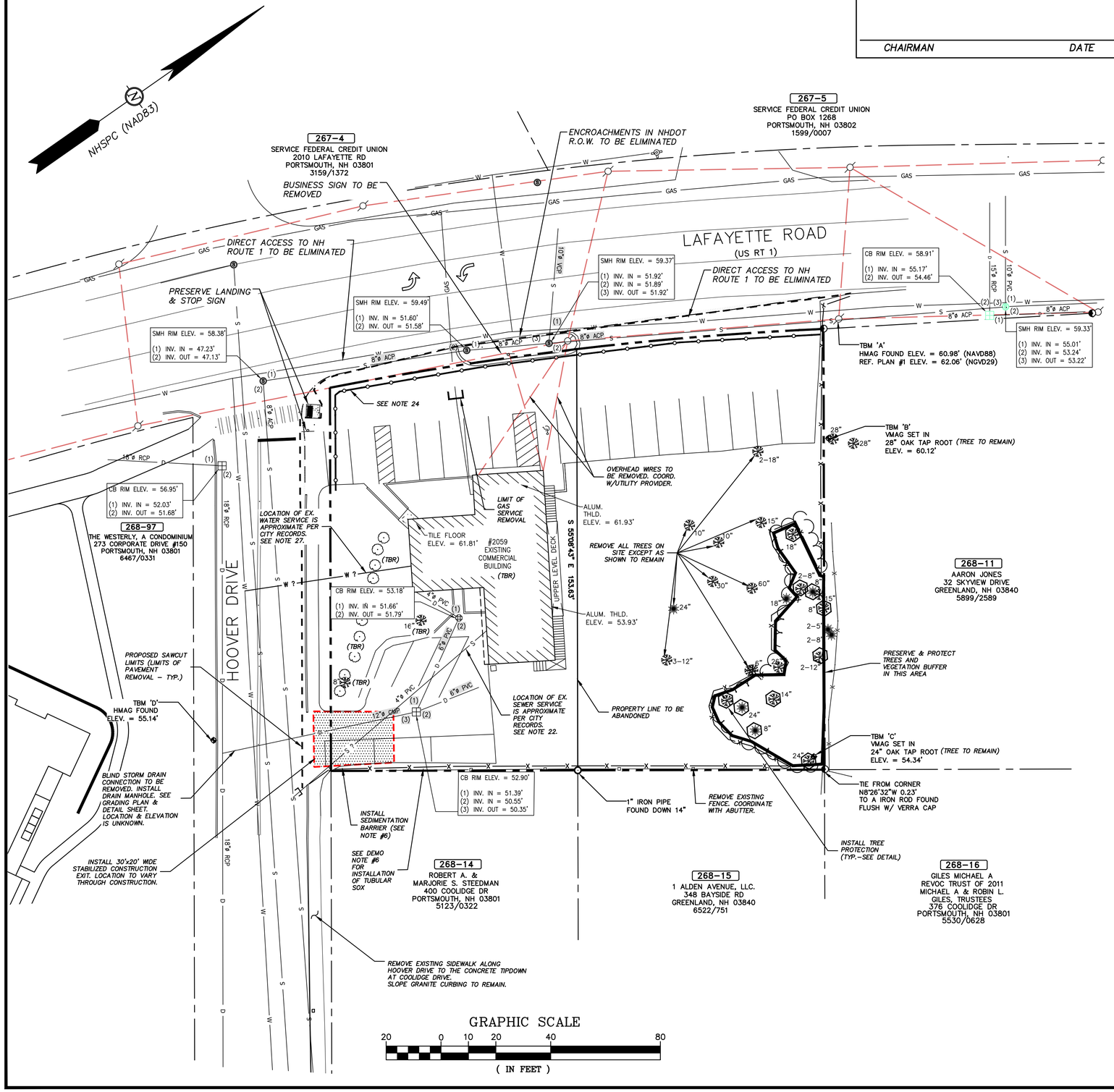
PROJECT:
SITE REDEVELOPMENT
TAX MAP 268 LOT 12 & 13
2059 LAFAYETTE ROAD PORTSMOUTH, NH

TITLE:
EXISTING CONDITIONS PLAN

SHEET NUMBER:
S-1

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE



DEMOLITION NOTES

1. CITY DEMOLITION PERMIT REQUIRED PRIOR TO ANY DEMOLITION ACTIVITIES. CONTRACTOR IS NOTIFIED THAT THIS PERMIT PROCESS MAY REQUIRE A 30–DAY LEAD TIME.
2. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES SCHEDULED TO REMAIN.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
4. ALL UTILITY DISCONNECTIONS/DEMOLITIONS/RELOCATIONS SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES, PORTSMOUTH DPW AND ABUTTING PROPERTY OWNERS. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
5. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATCH BASIN GRATES, VALVE COVERS, HANDHOLES, ETC. SHALL BE ADJUSTED TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
6. SEE EROSION CONTROL PLANS FOR EROSION AND SEDIMENT CONTROL MEASURES THAT SHALL BE IN PLACE PRIOR TO DEMOLITION ACTIVITIES. SEE GRADING PLAN & DETAIL SHEETS FOR ADDITIONAL NOTES ON EROSION CONTROL.
7. ALL MATERIALS SCHEDULED FOR DEMOLITION OR REMOVAL ON PRIVATE PROPERTY SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
8. ALL MATERIAL SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS/CODES.
9. WATER: PORTSMOUTH DPW WATER DIVISION, JAMES V. TOW, (603) 427–1530.
10. SEWER: PORTSMOUTH DPW SEWER DIVISION, JAMES V. TOW, (603) 427–1530.
11. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427–5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679–5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, JOSHUA LAHAIE, (603) 332–7551.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294–5144.
15. CONTRACTOR TO CONTACT PORTSMOUTH DPW A MINIMUM OF TWO WEEKS PRIOR TO ANY DEMOLITION TO COORDINATE ALL WORK CONCERNING DISCONNECTION OF ANY EXISTING WATER AND SEWER SERVICES.
16. ALL WATER AND SEWER SERVICE DISCONNECTIONS SHALL CONFORM TO PORTSMOUTH DPW STANDARDS.
17. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
18. HAZARDOUS MATERIALS ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
19. AT NO TIME SHALL ANY UTILITY SERVICE OR VEHICULAR ACCESS TO ADJOINING PROPERTIES BE COMPLETELY INTERRUPTED UNLESS A FULL SHUTDOWN IS COORDINATED WITH ALL AFFECTED PARTIES AND UTILITY PROVIDER(S).
20. SHOULD GROUNDWATER BE ENCOUNTERED DURING EXCAVATION, APPROPRIATE BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO ENSURE SEDIMENT LADEN WATER IS NOT DISCHARGED INTO THE CITY DRAINAGE SYSTEM. A DISCHARGE PERMIT SHALL BE OBTAINED PRIOR TO DISCHARGING GROUNDWATER IF GROUNDWATER IS ENCOUNTERED.
21. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. UNLESS OTHERWISE NOTED TO REMAIN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL BUILDINGS, PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES AS NECESSARY TO FULLY CONSTRUCT THE PROJECT.
22. EXISTING SEWER SERVICE LOCATION IS APPROXIMATE PER CITY RECORDS. CONTRACTOR SHALL INVESTIGATE THE EXISTING BUILDING DISCHARGE AND PERFORM TEST PITS AND OTHER WORK AS NECESSARY TO LOCATE THE LINE. ONCE LOCATED, THE SERVICE SHALL BE REMOVED TO THE MAIN IN ACCORDANCE WITH DPW STANDARDS AND THE NEW SEWER SERVICE INSTALLED. COORD. WITH ENGINEER & CITY.
23. NHDOT EXCAVATION PERMIT SHALL BE OBTAINED PRIOR TO ANY WORK IN THE STATE RIGHT OF WAY.
24. PRIOR TO DEMOLITION, CONTRACTOR SHALL INSTALL CONSTRUCTION BARRICADES TO PREVENT CONSTRUCTION ACCESS TO THE END OF HOOVER DRIVE & LAFAYETTE ROAD.
25. LOCATION OF EXISTING SEWER SERVICE IS UNKNOWN. CONTRACTOR SHALL LOCATE EXISTING SERVICE AS PART OF BUILDING DEMOLITION & REPORT LOCATION, ELEVATION, PIPE SIZE & MATERIAL TO ENGINEER. IT IS LIKELY THAT EXISTING SERVICE WILL NEED TO BE REPLACED.
26. CONTRACTOR SHALL SAFELY SECURE THE SITE AND WORK LIMITS WITH SECURITY FENCING WHICH SHALL BE LOCKED DURING NON–WORK HOURS.
27. LOCATION & SIZE OF EXISTING WATER SERVICE IS UNKNOWN. CONTRACTOR SHALL REMOVE SERVICE TO MAIN & REPORT LOCATION TO ENGINEER SO THAT NEW SERVICES CAN BE INSTALLED IN THE SAME TRENCH.
28. TREES TO REMAIN SHALL BE CLEARLY MARKED TO BE PROTECTED PRIOR TO COMMENCING SITEWORK.

LEGEND

- PROPERTY LINE
- BUILDING SETBACK
- VGC SGC — EXISTING PAVEMENT/CURB
- VGC SGC — PROP. PAVEMENT/VERTICAL OR SLOPED GRANITE CURB
- EXISTING/PROPOSED GUARDRAIL
- EXISTING/PROPOSED STOCKADE FENCE
- EXISTING/PROPOSED CHAINLINK FENCE
- x 60.1 (e.g.) — EXISTING SPOT GRADE ELEVATION
- 60 — PROPOSED CONTOUR/INTERMEDIATE CONTOUR
- +60.00 — PROPOSED SPOT GRADE/TOP & BOTTOM OF WALL
- W — WV — EXISTING WATER/CURB STOP/VALVE/HYDRANT
- S — (S) — EXISTING SEWER/MANHOLE
- G — GV — EXISTING GAS/VALVE
- OHW — UGU — EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE
- D — D — EXISTING DRAINAGE/CB/DMH
- W — PROPOSED THRUST BLOCK/CURB STOP/VALVE/HYDRANT
- PW — F — PROPOSED DOMESTIC/FIRE WATER SERVICE LINE
- W — W — PROPOSED WATERLINE/WELL
- S — S — PROPOSED SEWER/MANHOLE/CLEANOUT
- SET IRON ROD
- SET GRANITE BOUND
- TP# — TESTPIT OR BORING/PERC. TEST/BENCHMARK
- OHW — PROPOSED OVERHEAD UTILITIES/UTILITY POLE
- PUGE — PROPOSED UNDERGROUND ELECTRIC/PHONE/TV
- PROPOSED DRAINAGE (HARD PIPE)/CB/DCB/DMH/FES
- PROPOSED CATCH BASIN INLET PROTECTION
- PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- PROPOSED GROUND SLOPE/APPROX. GRADE/STONE CHECK DAM
- x — x — SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
- STABILIZED CONSTRUCTION EXIT
- PG — PROPOSED NATURAL GAS SERVICE

P5361

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE –

11/27/24

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24
1	PB SUBMISSION	EDW	11/27/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5361–2024.DWG

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER & APPLICANT:

TAX MAP 268, LOT 13
GO–LO, INC.
c/o MICHAEL LABRIE
(603) 661–6633
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:

TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:

SITE REDEVELOPMENT

TAX MAP 268
LOTS 12 & 13

2059 LAFAYETTE ROAD
PORTSMOUTH, NH

TITLE:

SITE PREPARATION PLAN

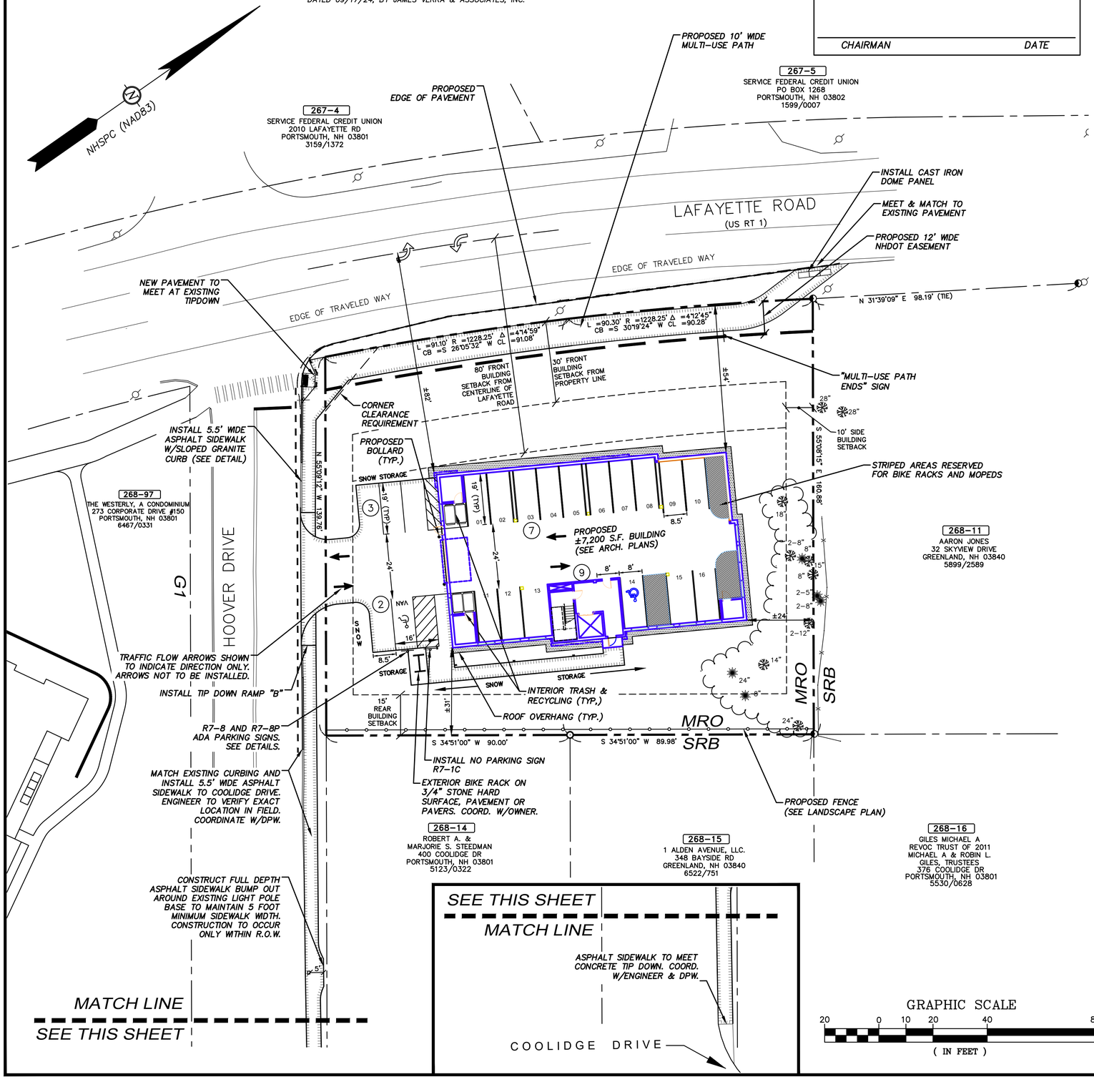
SHEET NUMBER:

C-1

PLAN REFERENCE:
1. "EXISTING CONDITIONS PLAN, 2059 LAFAYETTE ROAD, PORTSMOUTH, NEW HAMPSHIRE", DATED 09/17/24, BY JAMES VERRA & ASSOCIATES, INC.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

SITE NOTES

1. DESIGN INTENT – THIS PLAN SET IS INTENDED TO DEPICT THE REDEVELOPMENT OF THE SITE FOR AN 8-UNIT RESIDENTIAL BUILDING TOGETHER WITH ASSOCIATED PARKING ON GROUND LEVEL, 2 FLOORS ABOVE, ACCESS & SITE IMPROVEMENTS.
2. THERE ARE NO WETLANDS OR WETLAND BUFFERS ON THIS SITE AS DETERMINED ON SEPTEMBER 25, 2023 BY JOSEPH W. NOEL, NEW HAMPSHIRE CERTIFIED SOIL SCIENTIST #17 AND NEW HAMPSHIRE WETLAND SCIENTIST #86.
3. LOT AREA: ±27,451 S.F. (±0.63 ACRES)
4. ZONE: MRB (MIXED RESIDENTIAL BUSINESS)
5. DIMENSIONAL REQUIREMENTS:

	REQUIRED	EXISTING	PROPOSED
MIN. LOT AREA:	7,500 S.F. (0.17 ACRE)	±27,451 S.F. (±0.63 AC.)	±27,451 S.F.(±0.63 AC.)
MIN. STREET FRONTAGE:	100' (ON LAFAYETTE ROAD)	181.36' (EXISTING)	181.36' (EXISTING)
MIN. LOT DEPTH:	80'	139.72' (EXISTING)	139.72' (EXISTING)
FRONT SETBACK: *	>80' TO LAFAYETTE RD. CL OR 30' TO R.O.W.	0' TO R.O.W.	±82' TO CL OF R.O.W.
SIDE SETBACK: **	10'	±95'	±24'
REAR SETBACK: **	15'	±39'	±31'
MAX. BUILDING HEIGHT:	40' (SLOPED), 30' (FLAT)	<40' SLOPED	<40' SLOPED
MAX. BUILDING LENGTH:	160' (MULTI-FAMILY)	±70'	±109'
MAX. BUILDING FTPRINT:	N/A		
MAX. BLDG COVERAGE:	40%	9.3% (±2,560 S.F.)	26.2% (±7,200 S.F.)
LOT AREA/DW. UNIT:	7,500 SF	±4,418 SF /UNIT ****	±3,430 SF/UNIT
MIN. OPEN SPACE:	25%	55.0% (±15,089 S.F.)	±66.8% (±18,329 S.F.)

* FRONT SETBACK IS FROM BOTH STREET ADDRESS STREET AND ACCESS STREET
** SIDE & REAR SETBACKS IN RELATION TO FRONT STREET ADDRESS STREET
*** OPEN SPACE INCLUDES WALKS
**** LOT 268-13 EXISTING DENSITY

6. VARIANCES APPROVED ON DECEMBER 19, 2023:
   SECTION 10.521 TO ALLOW 3,430 S.F. PER DWELLING UNIT WHERE 7,500 S.F. ARE REQUIRED
   SECTION 10.1113.20 TO ALLOW PARKING LOCATED CLOSER TO THE STREET THAN THE PRINCIPAL BUILDING IN THE SECONDARY FRONT YARD (HOOVER)
7. DENSITY CALCULATIONS:
   0.63 ACRES (27,461 S.F.)
   27,461 S.F. / 7,500 S.F. = 3.7 UNITS ALLOWED
   8 UNITS PROPOSED (±3,432 S.F./UNIT)
8. BOARD OF ADJUSTMENT CONDITION OF APPROVAL: LANDSCAPING BUFFER & PRIVACY FENCE SHALL BE INSTALLED AS APPROVED BY THE PLANNING BOARD.
9. PARKING REQUIREMENTS:
   DWELLING UNITS: 1.3 SPACES PER DWELLING UNIT >750 S.F.
   8 UNITS x 1.3 = 10.4 SPACES REQUIRED PLUS
   VISITOR PARKING: 1 SPACE PER 5 D.U. OR PORTION = 1.6 SPACES REQUIRED = 12 SPACES REQUIRED,
   21 SPACES PROVIDED
10. THERE SHALL BE NO VISION OBSTRUCTIONS LOCATED IN THE AREA CREATED BY MEASURING 20' IN EACH DIRECTION FROM A CORNER LOT STREET PROPERTY LINE CORNER.
11. IMPERVIOUS AREA COVERAGE NOTE:
    EXISTING BUILDING & DECK (±2,560 SF) + EXISTING PVMNT/CONCRETE (±9,700 SF) + EXISTING WALK (±95 SF) =±12,355 SF (45.0%)
    PROP. BUILDING (±7,200 SF) + PR. PAVEMENT (±1,915 SF) + PR. WALKS (±2,175 SF) =±11,290 SF (41.1%)
12. SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN AREAS SHOWN HEREON, AND/OR TRUCKED OFF SITE AS APPROPRIATE.
13. NO SAND SHALL BE USED FOR WINTER PARKING AREA MAINTENANCE. WINTER MAINTENANCE CONTRACTOR SHALL BE NHDES GREEN SNOWPRO CERTIFIED.
14. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINES WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
15. PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING WHITE, YELLOW OR BLUE TRAFFIC PAINT (WHERE SPECIFIED) MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F OR EQUAL. PAINTED ISLANDS AND LOADING ZONES SHALL BE 4"-WIDE DIAGONAL WHITE LINES 3'-0" O.C. BORDERED BY 4"-WIDE WHITE LINES. PARKING STALLS SHALL BE SEPARATED BY 4"-WIDE WHITE LINES. SEE DETAILS FOR HANDICAP SYMBOLS, SIGNS AND SIGN DETAILS.
16. PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC DEVICES," "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AND THE AMERICANS WITH DISABILITIES ACT (ADA), LATEST EDITIONS.
17. ALL CONSTRUCTION SHALL MEET THE MINIMUM STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATION FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITIONS. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
18. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
19. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
20. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
21. ALL PARKING LOT LIGHTS SHALL BE BUILDING MOUNTED & "DARK SKY COMPLIANT". WALKWAYS WILL BE ILLUMINATED WITH BOLLARD LIGHTS.
22. VERIFY LATEST ARCHITECTURAL DRAWINGS PRIOR TO ANY CONSTRUCTION ACTIVITIES.
23. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
24. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRICTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
25. SEE SHEET C-1 FOR LEGEND.
26. TRASH & RECYCLING TOTES SHALL BE STORED INSIDE THE BUILDING.
27. PARCEL IS NOT IN A FLOOD HAZARD ZONE.
28. EXTERIOR SALT STORAGE IS PROHIBITED.
29. THE CONTRACTOR SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATION CARRIER APPROVED BY THE FIRE DEPARTMENT. THE RADIO COMMUNICATION CARRIER MUST BE FAMILIAR WITH THE POLICE & FIRE DEPARTMENT'S RADIO CONFIGURATION. IF SURVEY DETERMINES SIGNAL REPEATERS ARE NECESSARY, THE CONTRACTOR SHALL INSTALL REPEATERS AS NEEDED.

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SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO-LO, INC.
c/o MICHAEL LABRIE
(603) 661-6633
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:
TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
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PROJECT:
SITE REDEVELOPMENT
TAX MAP 268
LOTS 12 & 13
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

TITLE:
SITE PLAN

SHEET NUMBER:
C-2

DRAINAGE SCHEDULE

CB 1
RIM: 54.90
THRU: ±50.57 (18" EXISTING)(VIF)
IN: 50.82 (12" DMH 2)

DMH 2
RIM: 55.60
IN: 52.06 (12" OS 2–1
IN: 51.96 (12" OS 2–2)
IN: 52.39 (8" ROOF)
OUT: 51.96
12" CPP
L= ±35' S=0.005

OS 2–2
RIM: 55.00
IN: 52.00 (4" UD)
OUT: 52.00
12" CPP
L= ±4' S=0.01

OS 2–1
RIM: 57.50
IN: 54.50 (4" UD)
OUT: 54.50
12" CPP
L= ±104' S=0.018

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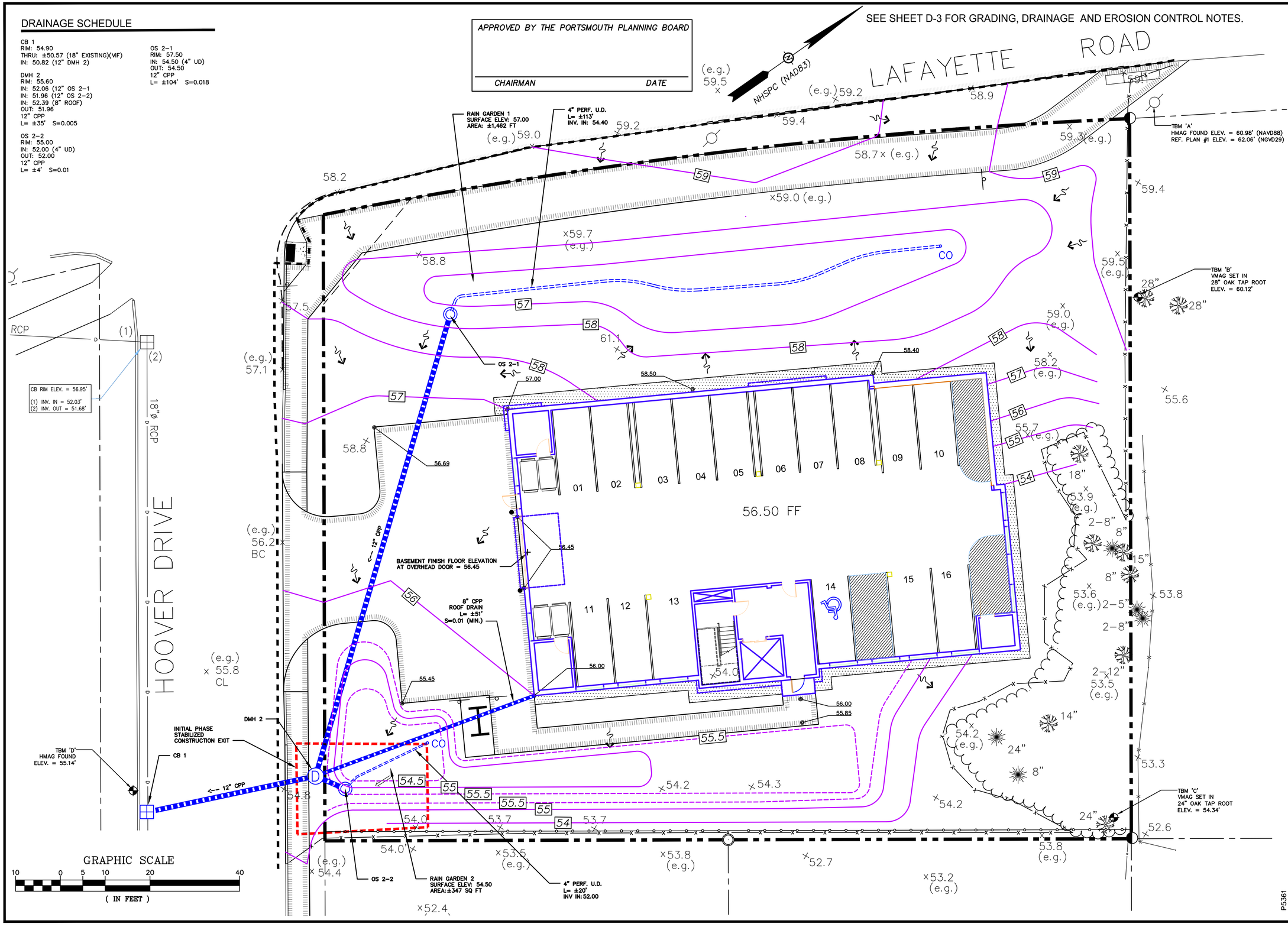
SEE SHEET D-3 FOR GRADING, DRAINAGE AND EROSION CONTROL NOTES.



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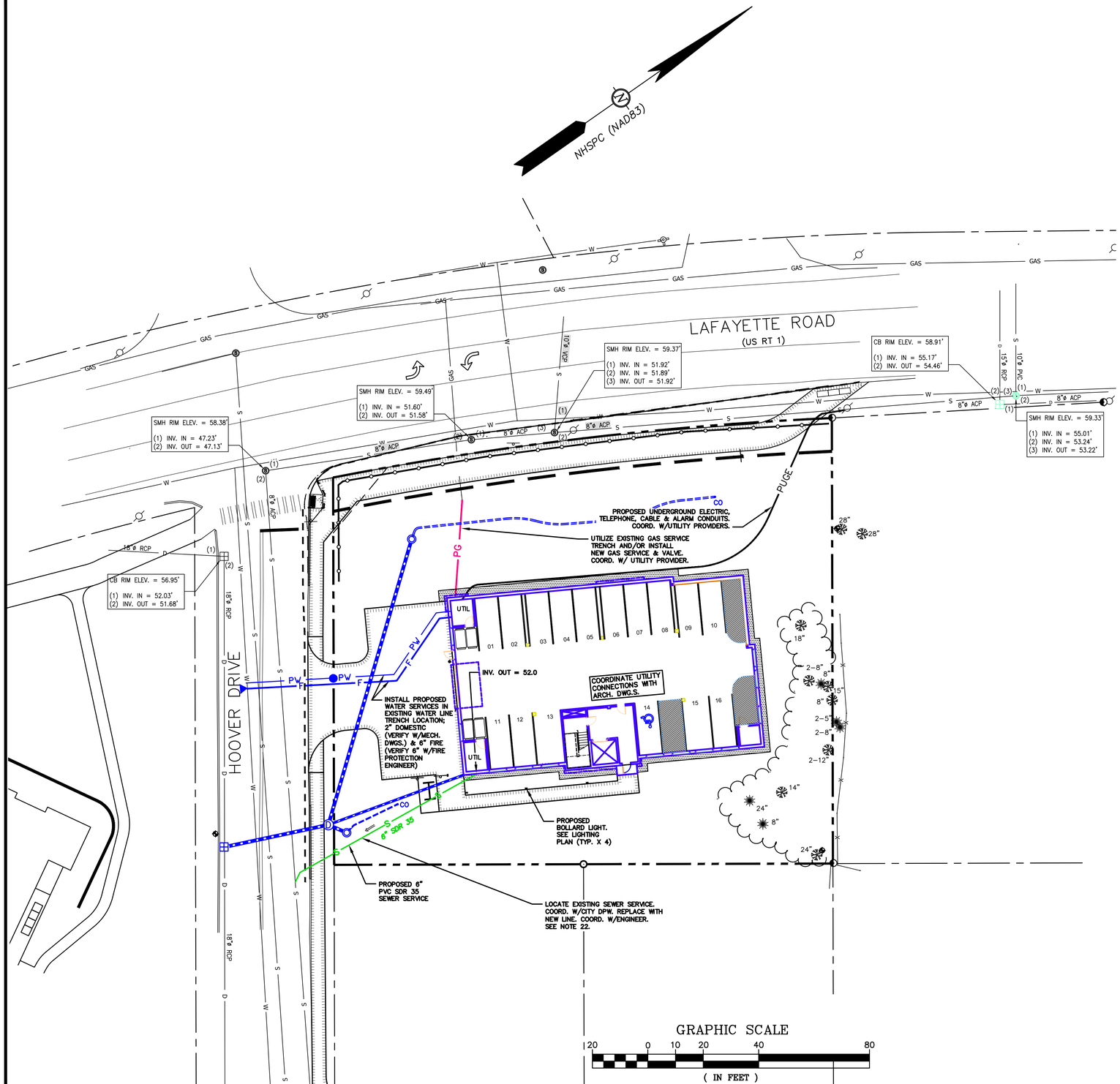
LOTS 12 & 13
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

TITLE:
GRADING, DRAINAGE & EROSION CONTROL PLAN

SHEET NUMBER:
C-3

P5361



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UTILITY NOTES

1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE. CATCH BASINS, MANHOLES, WATER GATES, ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, CITY OF PORTSMOUTH DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG–SAFE AT LEAST SEVENTY–TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, DPW AND APPROPRIATE UTILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE–IN AND CONNECTION FEES.
4. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS SHALL BE COORDINATED WITH THE PORTSMOUTH POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
5. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
7. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
8. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR, APPROPRIATE UTILITY COMPANIES AND THE PORTSMOUTH DPW.
9. WATER: PORTSMOUTH DPW WATER DIVISION, JAMES V. TOW, (603) 427–1530.
10. SEWER: PORTSMOUTH DPW SEWER DIVISION, JAMES V. TOW, (603) 427–1530.
11. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427–5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679–5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, JOSHUA LAHAIE, (603)–332–7551. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48–HOUR MINIMUM NOTICE REQUIRED.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294–5144.
15. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
16. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
17. WHERE WATER LINES CROSS, RUN ADJACENT TO OR ARE WITHIN 5' OF STORM DRAINAGE PIPES OR STRUCTURES, 2"–THICK CLOSED CELL RIGID BOARD INSULATION SHALL BE INSTALLED FOR FROST PROTECTION.
18. PER PORTSMOUTH DPW SPECIFICATIONS, ALL NEW DUCTILE IRON WATERLINES SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING FOR THEIR FULL LENGTH, ALL DOMESTIC WATER SERVICES SHALL BE PROVIDED WITH BACKFLOW PREVENTERS AND ALL JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
19. WATER AND SANITARY SEWER LINES SHALL BE LOCATED AT LEAST 10' HORIZONTALLY FROM EACH OTHER. WHERE CROSSING, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER INSTALLED OVER SEWER.
20. CONTRACTOR SHALL PROVIDE DPW WITH DETAILS OF TEMPORARY & PERMANENT GROUNDWATER DEWATERING DESIGN IF NECESSARY.
21. THE APPLICANT OR ASSIGNS SHALL AGREE TO PAY FOR THE SERVICES OF A THIRD–PARTY OVERSIGHT ENGINEER, TO BE SELECTED BY THE CITY, TO MONITOR THE INSTALLATION OF UTILITIES INCLUDING SEWER, WATER AND DRAINAGE, IF REQUIRED.
22. CONTRACTOR SHALL INSPECT EXISTING SEWER SERVICE TO EXISTING BUILDING WITH PORTSMOUTH DPW. PROPOSED SERVICE TO BE INSTALLED IN EXISTING TRENCH. COORDINATE W/ENGINEER TO VERIFY LOCATION & ELEVATIONS ARE ACCEPTABLE. INSTALL PER CITY OF PORTSMOUTH STANDARDS.
23. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDING. COORDINATE ALL WORK WITHIN FIVE (5) FEET OF BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL/MECHANICAL DRAWINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND PRIOR TO COMMENCING RELATED WORK.
24. THE CONTRACTOR SHALL CONFIRM ALL WATERLINE SIZES WITH THE MEP PLANS PRIOR TO INSTALLATION. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
25. SEE SHEET C–1 FOR LEGEND.
26. SANITARY FLOW COMPUTATIONS:

    3, 2–BEDROOM APARTMENTS (ASSUME 2.0 PEOPLE PER APARTMENT) – 6 PEOPLE (54 GPD/RESIDENT) = 324 GPD
    EXISTING COMMERCIAL SPACE 4900 SF (10 GPD/EMPLOYEE) – ASSUME 10 EMPLOYEES = 100 GPD
    TOTAL EXISTING FLOW = 424 GPD

    NEW RESIDENTS @ 54 GPD/PERSON PER METCALF & EDDY (2 PEOPLE PER HOUSEHOLD)

    PROPOSED 8, 2–BEDROOM APARTMENTS, 16 PEOPLE (54 GPD/PERSON) = 864 GPD
    TOTAL NEW FLOW = 440 GPD
27. THE DEPARTMENT OF PUBLIC WORKS WILL HAVE ACCESS TO THE UTILITY ROOM FOR WATER METER ACCESS.

P5361

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
11/27/24

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24
1	PB SUBMISSION	EDW	11/27/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5361–2024.DWG

SCALE:
22" x 34" – 1" = 20'
11" x 17" – 1" = 40'

OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO–LO, INC.
c/o MICHAEL LABRIE
(603) 661–6633
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:
TAX MAP 269, LOT 12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:
SITE REDEVELOPMENT
TAX MAP 268
LOTS 12 & 13
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

TITLE:
UTILITIES PLAN

SHEET NUMBER:
C-4

Landscape Notes

1. Design is based on drawings by Altus Engineering dated October 2, 2024 and may require adjustment due to actual field conditions.
2. The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
3. Erosion Control shall be in place prior to construction.
4. Erosion Control shall be as specified in the engineering drawings.
5. The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
6. It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
7. Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line at a minimum and shall include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
8. This plan is for review purposes only, NOT for Construction. Construction Documents will be provided upon request.
9. Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
10. The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 811 or 888-DIG-SAFE.
11. The Contractor shall procure any required permits prior to construction.
12. Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micronutrients, texture, soluble salts, and organic matter. Contractor shall provide Landscape Architect with test results and recommendations from the testing facility along with soil amendment plans as necessary for the proposed plantings to thrive. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
13. Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a Contractor is aware of a potential issue and does not bring it to the attention of the Landscape Architect or Owner's Representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
14. The Contractor shall furnish and plant all plants shown on the drawings and listed thereon. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
15. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
16. All plants shall be legibly tagged with proper botanical name.
17. The Contractor shall guarantee all plants including seeding, for not less than one year from time of acceptance.
18. Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at the place of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
19. No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
20. All landscaping shall be provided with the following:
    a. Outside hose attachments spaced a maximum of 150 feet apart, and
    b. An underground irrigation system, or
    c. A temporary irrigation system designed for a two-year period of plant establishment.
21. If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas only.
22. The contractor is responsible for all plant material and seeding from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, watering of plants, including seeding and weeding. Plants shall be appropriately watered prior to, during, and after planting. It is the Contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
23. All disturbed areas will be dressed with 6" of loam and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
24. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be natural brown or black.
25. Drip strip shall be 4" of 1-2" riverstone over landscape fabric, extend to 6" beyond roof overhang and shall be edged with 3/16" thick metal edger.
26. In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
27. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 6' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Within the sight distance triangles at vehicle intersections the canopies shall be raised to 8' min.
28. Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
29. Landscape Architect is not responsible for the means and methods of the Contractor.

Plant List

TREES

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Am	Amelanchier x grandiflora 'Robin Hill'	Robin Hill Serviceberry	2	2-2.5" cal	BB
Bn	Betula nigra 'Dura Heat'	Dura Heat River Birch	2	12-14' ht	BB
Ns	Nyssa sylvatica	Black Tupelo	5	2.5-3" cal.	BB
Qa	Quercus bicolor	Swamp White Oak	1	2.5-3" cal	BB
ThP	Thuja plicata 'Green Giant'	Green Giant Western Red Cedar	8	8-10' ht.	BB
ThPJ	Thuja plicata 'Junior Giant'	Junior Giant Western Red Cedar	13	7-8' ht.	BB
ThW	Thuja occidentalis 'Wintergreen'	Wintergreen Arborvitae	4	7-8' htt.	BB

SHRUBS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Im	Ilex meserve 'Blue Maid'	Blue Maid Holly	2	4-5' ht	BB
Hyl	Hydrangea a. 'Incrediball'	Incrediball Hydrangea	17		
HyQL	Hydrangea paniculata 'Little Quickfire'	Little Quickfire Hydrangea	4	3 ga.	
Ros	Rosa 'Apricot Drift'	Apricot Drift Rose	3	3 gal.	
Rh	Rhododendron 'Scintillation'	Scintillation Rhododendron	3	5 gal	
Rhus	Rhus aromatica 'Grow-Low'	Grow Low Sumac	35	3 gal.	
Sp	Spirea japonica 'Double Play Doozie'	Double Play Doozie Spirea	48	3 gal.	
Syr	Syringa bloomerang	Bloomerang Lilac	5	2.5'-3' ht	BB

PERENNIALS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
Dp	Dennstaedia punctiloba	Hayscented Fern	40	1 gal	
Hem	Hemerocallis 'Big Time Happy'	Big Time Happy Daylily	12	1 gal	
Heu	Heuchera americana 'Green Spice'	Green Spice Coral Bell	20	2 qt	
Ms	Matteuccia struthiopteris	Ostrich Fern	20	1 gal	

Irrigation Note:

Plantings to be irrigated with a temporary irrigation system or by hand for a period of two years or until establishment.

PLAN

0 2 5 10 20

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

2059 Lafayette Road

LANDSCAPE PLAN

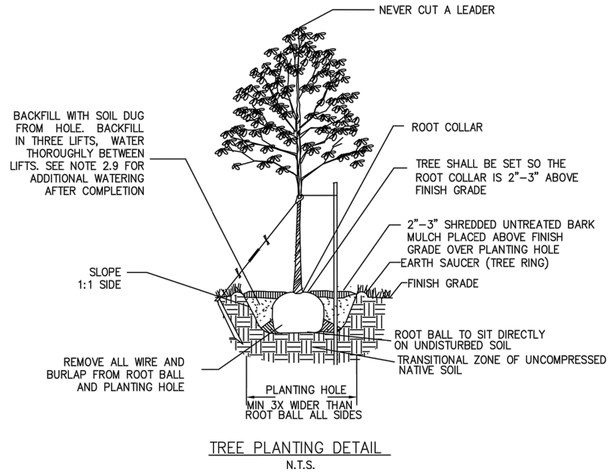
Portsmouth, New Hampshire

ROBERTA N. WOODBURN 002 LICENSED LANDSCAPE ARCHITECT STATE OF NEW HAMPSHIRE

Drawn By:	RW
Checked By:	RW
Scale:	1"=10'-0"
Date:	2024-10-21 issued for TAC
Revisions:	2024-11-27 Issued to Planning Board

L-1

Sheet 1 of 2



TREE PLANTING DETAIL

N.T.S.

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

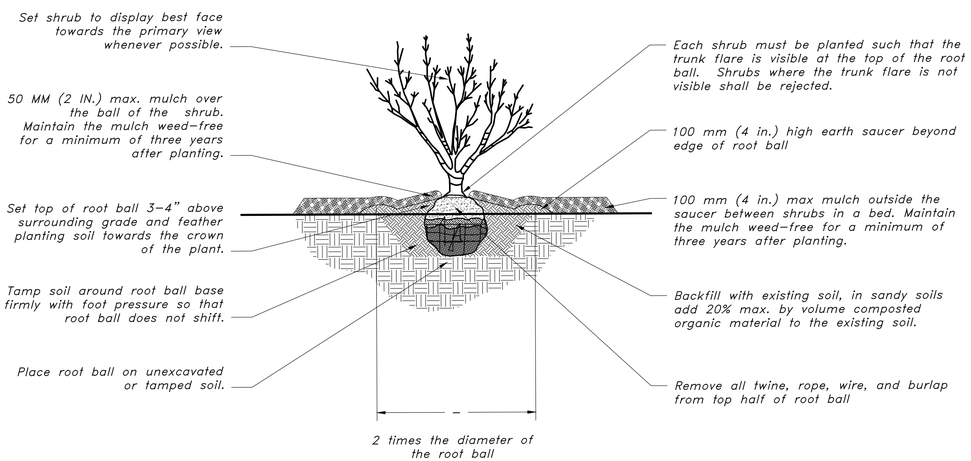
2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON–DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

City of Portsmouth
Standard Tree Planting Detail



Shrub Planting Detail - NTS

woodburn & company
LANDSCAPE ARCHITECTURE
103 Kent Place Newmarket, New Hampshire Phone: 603.659.5949

2059 Lafayette Road

LANDSCAPE PLAN - DETAILS

Portsmouth, New Hampshire

LICENSED LANDSCAPE ARCHITECT
ROBERTA N. WOODBURN
002
STATE OF NEW HAMPSHIRE

Drawn By:	RW
Checked By:	RW
Scale:	1"=10'-0"
Date:	2024-10- 21 issued for TAC
Revisions:	2024-11-27 Issued for Planning Board

L-2

Sheet 2 of 2

Schedule

Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Filename	Lumens per Lamp	LLF	Wattage	Distribution	Polar Plot	Wattage
	BOL	4	Lumenpulse	BLDB TM1 120/277 3FT CSL N07 30K CRI80 3 BK DIM	Lumenblade Bollard; mounted at 3ft	LED	BLDB-TM1-120_277-CSL-N07-30K-CRI80-3.ies	627	0.9	9			9
	D	16	Visual Comfort	E3RFF-LO WD4DI with E3RFB-HW	Element 3in Round Downlight, Dim to Warm; mounted at 10ft above deck	LED	Element 3 Round LED 12W, 90 CRI, WD 3000K-1800K, 40°, Bevel Trim, Lensed, 0° Tilt.ies	791	0.9	12.01			12.01
	W1	1	Lithonia Lighting	ARC2 LED P3 30K	ARC2 LED WITH P3 - PERFORMANCE PACKAGE, 3000K; mounted at 10ft	LED	ARC2_LED_P3_30K.ies	3206	0.9	23.7345	TYPE III, VERY SHORT, BUG RATING: B0 - U0 - G1		23.7345
	W2	2	Brownlee Lighting Inc	7178 L45 BL H25 30K	Beam V2 Wall Sconce; mounted at 3ft	LED	7178-45-H25-40K.ies	2444	0.9	24.675			24.675
	WS	6	Sistemalux	S5033 W UNV XX D10	Lift Sconce - 2 Windows; mounted at 18ft	LED	S5033W-down.ies	203	0.9	18.2			18.2

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Deck	+	9 fc	18 fc	3 fc	6.0:1	3.0:1
Outside of Parking Lot	+	0.2 fc	9.3 fc	0.0 fc	N/A	N/A
Parking Lot	+	1.4 fc	9.6 fc	0.0 fc	N/A	N/A

VISUAL

2059 LAFAYETTE RD PORTSMOUTH, NH
Site Lighting Layout

Designer
Heidi G. Connors
Visible Light, Inc.
24 Stickney Terrace
Suite 6
Hampton, NH 03842

Date
11/20/2024

Scale
1"=16'

Drawing No.

Summary

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

REDEVELOPMENT – MULTI UNIT RESIDENTIAL
2059 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 268 LOTS 12 & 13

LATITUDE: 043° 02' 35" N
LONGITUDE: 070° 46' 12" W

OWNER/APPLICANT (LOT 13):

GO–LO, INC. C/O MICHAEL LABRIE (PETER LABRIE IS A CO–OWNER)
P.O. BOX 300
RYE, NH 03870

OWNER (LOT 12):

JAMES A. LABRIE REV. TRUST OF 1991 (PETER & MICHAEL LABRIE, TRUSTEES)
P.O. BOX 300
RYE, NH 03870

DESCRIPTION

The project consists of the redevelopment of the existing lots for an 8–unit residential building along with associated site improvements.

DISTURBED AREA

The total area to be disturbed for the redevelopment is approximately ±28,500 S.F. (±0.65 acres) including off–site improvements. USEPA NPDES Phase II compliance not required.

PROJECT PHASING

The proposed project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains via an existing municipal closed drainage system and eventually to Berry's Brook.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including silt fences, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Demolish existing building, pavement areas and utilities as shown on Site Preparation Plan and reclaim pavement.
3. Rough grade site including placement of borrow materials.
4. Construct proposed building and associated improvements.
5. Construct drainage structures, culverts, utilities, swales & pavement base course materials.
6. Install base course paving & curbing. Install landscaping.
7. Install top course paving.
8. Install pavement markings and signs.
9. Loam (6" min) and seed all disturbed areas not paved or otherwise stabilized.
10. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, & level spreaders prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built–up sediment shall be removed from silt fence or other barriers when it has reached one–third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
   a. Base coarse gravels have been installed in areas to be paved;
   b. A minimum of 85% vegetated growth as been established;
   c. A minimum of 3 inches of non–erosive material such as stone of riprap has been installed; – or –
   d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
   a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
   b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 % maximum of 85% passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. FILTERS

1. Silt Fence
   a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/in in (min) Standard Strength 30 lb/in in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

   * Requirements reduced by 50 percent after six (6) months of installation.

   Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

   b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

   c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.

   d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.

   e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

   f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.

   g. The trench shall be backfilled and the soil compacted over the filter fabric.

   h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

2. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

3. Maintenance –
   a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.

   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.

   c. Sediment deposits must be removed when deposits reach approximately one–third (1/3) the height of the barrier.

   d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.

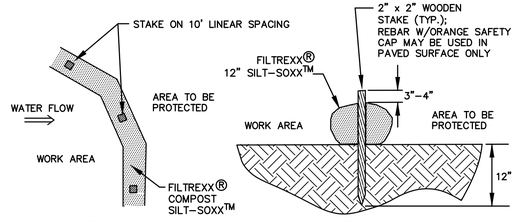
   e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. 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;

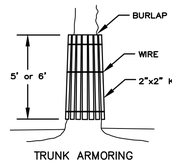
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and

3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.



NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER — NOT TO SCALE

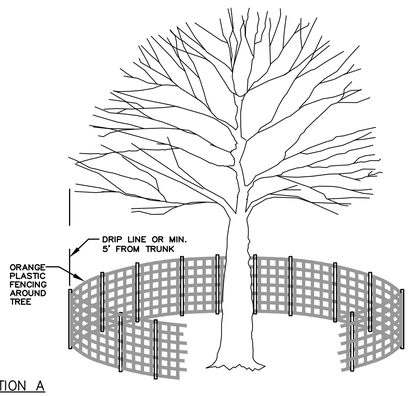


OPTION B

NOTE:
IF SOIL BECOMES COMPACTED OVER THE ROOT ZONE OF ANY TREE, THE GROUND SHOULD BE AERATED BY PUNCHING SMALL HOLES IN IT WITH SUITABLE AERATING EQUIPMENT.

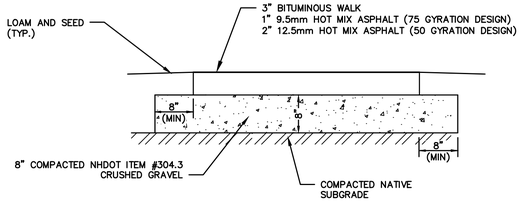
ANY DAMAGE TO THE CROWN, TRUNK OR ROOT SYSTEM OF ANY TREE RETAINED ON SITE SHOULD BE REPAIRED IMMEDIATELY. CONSULT A FORESTER OR TREE SPECIALIST FOR MORE SERIOUS DAMAGE OF TREES.

CONTRACTOR TO USE OPTION A OR B WHERE SUITABLE AND/OR AS DIRECTED BY THE ENGINEER.

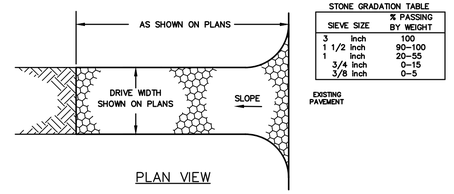


OPTION A

TREE PROTECTION DETAILS — NOT TO SCALE

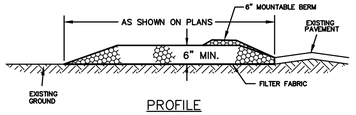


ASPHALT MULTI-USE PATH DETAIL — NOT TO SCALE



STONE GRADATION TABLE	
SIEVE SIZE	% PASSING BY WEIGHT
3 Inch	100
1 1/2 Inch	90–100
1 Inch	20–55
3/4 Inch	0–15
3/8 Inch	0–5

PLAN VIEW

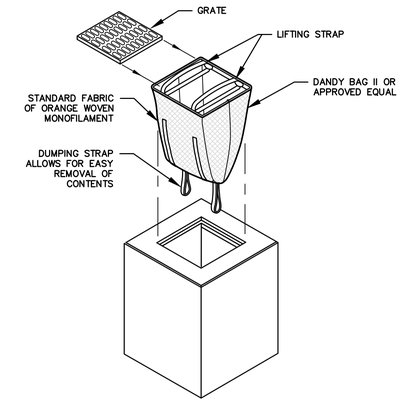


PROFILE

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/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.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS–OF–WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT — NOT TO SCALE



INSTALLATION AND MAINTENANCE:

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION — NOT TO SCALE

5361

ENGINEER:
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
10/21/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: OCTOBER 21, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5361DETAILS.DWG

SCALE:
22" x 34" – NOT TO SCALE
11" x 17" – NOT TO SCALE

OWNER & APPLICANT:

TAX MAP 268, LOT 13
GO–LO, INC.
c/o MICHAEL LABRIE
(603) 661–6633

P.O. BOX 300
RYE, NH 03870

RCRD BOOK: 1486 PAGE: 393

OWNER:

TAX MAP 269, LOT12
JAMES A. LABRIE REV. TRUST OF 1991

P.O. BOX 300
RYE, NH 03870

RCRD BOOK: 5378 PAGE: 2236

PROJECT:

SITE REDEVELOPMENT

TAX MAP 268
LOTS 12 & 13

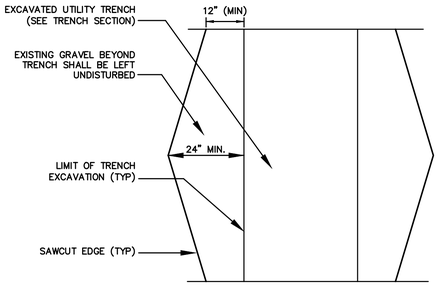
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

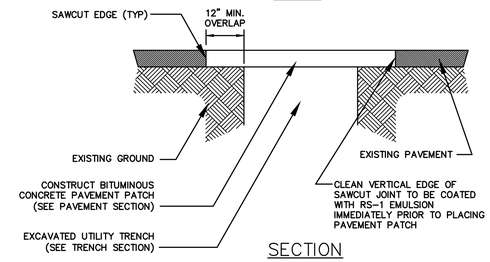
TITLE:

DETAIL SHEET

SHEET NUMBER:

D - 1

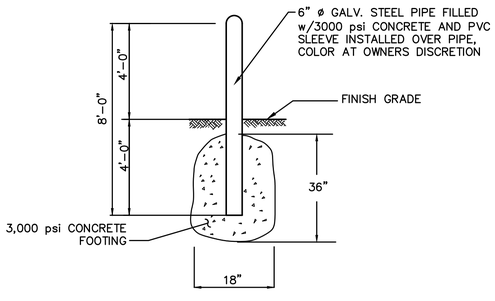




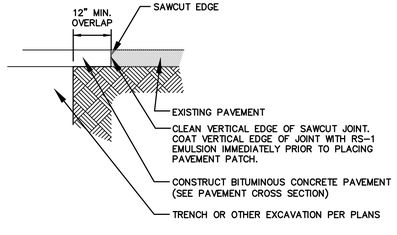
NOTES

1. MACHINE CUT EXISTING PAVEMENT.
2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

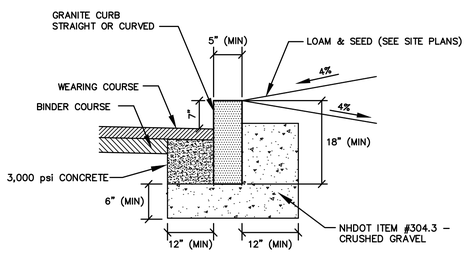
TYPICAL TRENCH PATCH — NOT TO SCALE



BOLLARD — NOT TO SCALE



TYPICAL PAVEMENT SAWCUT — NOT TO SCALE

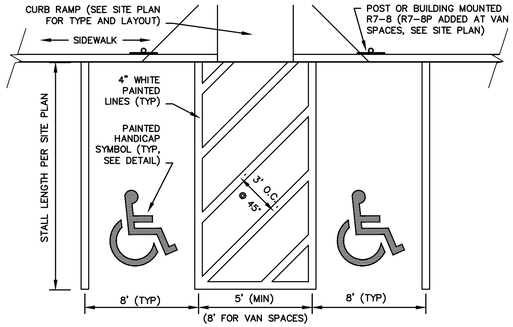


NOTES

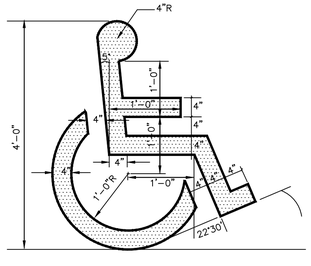
1. SEE PLANS FOR CURB LOCATION.
2. SEE PLANS FOR PAVEMENT CROSS SECTION.
3. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
4. MINIMUM LENGTH OF CURB STONES = 4'.
5. MAXIMUM LENGTH OF CURB STONES = 10'.
6. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES - SEE CHART.
7. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALLED FOR ON THE PLANS.
8. CURB SHALL BE INSTALLED PRIOR TO PLACEMENT OF TOP PAVEMENT COURSE.
9. JOINTS BETWEEN CURB STONES SHALL BE MORTARED.

RADIUS	MAX. LENGTH
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
OVER 60'	10'

VERTICAL GRANITE CURB — NOT TO SCALE



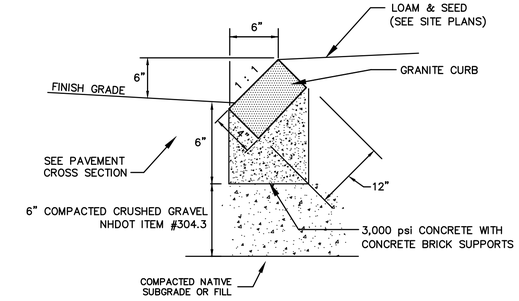
HANDICAP PARKING STALL LAYOUT — NOT TO SCALE



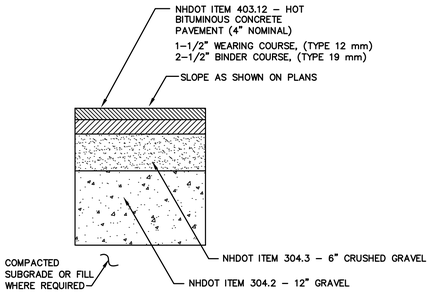
NOTES

1. SYMBOL TO BE PAINTED IN ALL HANDICAPPED ACCESSIBLE SPACES IN WHITE PAINT (BLUE-PAINTED SQUARE BACKGROUND OPTIONAL).

PAINTED HANDICAP SYMBOL — NOT TO SCALE



SLOPED GRANITE CURB — NOT TO SCALE



NOTES

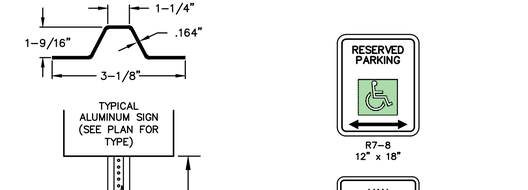
1. PROJECT GEOTECHNICAL REPORT MAY REQUIRE A DIFFERENT PAVEMENT CROSS SECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND FOLLOWING ALL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT. IN THE EVENT THAT THE REPORT AND CIVIL PLANS DIFFER, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. ALL EXISTING FILL, BURIED ORGANIC MATTER, CLAY, LOAM, MUCK, AND/OR OTHER QUESTIONABLE MATERIAL SHALL BE REMOVED FROM BELOW ALL PAVEMENT, SHOULDERS AND UNDERGROUND PIPING/UTILITIES TO DEPTHS RECOMMENDED IN GEOTECHNICAL REPORT.
3. SUBGRADE SHALL BE PROOFROLLED A MINIMUM OF 6 PASSES WITH A 10-TON VIBRATORY COMPACTOR OPERATING AT PEAK RATED FREQUENCY OR BY MEANS APPROVED BY THE ENGINEER.
4. FILL BELOW PAVEMENT GRADES SHALL BE GRANULAR BORROW COMPACTED PER NHDOT REQUIREMENTS.
5. SITEWORK CONTRACTOR SHALL COORDINATE GEOTECHNICAL ENGINEERING INSPECTIONS WITH THE CONSTRUCTION MANAGER PRIOR TO PLACING GRAVELS.
6. TACK COAT SHALL BE APPLIED BETWEEN SUCCESSIVE LIFTS OF ASPHALT.
7. THE BITUMINOUS PAVEMENT SHALL BE COMPACTED TO 92 TO 97 PERCENT OF ITS THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D-2041. THE BASE AND SUBBASE MATERIALS SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THEIR MAXIMUM DRY DENSITIES AS DETERMINED BY ASTM D-1557.

PAVEMENT CROSS SECTION — NOT TO SCALE

NOTES APPLICABLE TO ALL CURB RAMPS AND SIDEWALKS:

1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8%.
4. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
5. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
6. SEE TYPICAL SIDEWALK SECTION FOR RAMP CONSTRUCTION.
7. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA) AND ALL APPLICABLE CODES.
8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/2" AT THE EDGE OF PAVEMENT.
9. EDGES OF SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
10. NO RAMP SHALL BE LESS THAN 4' IN WIDTH.

CURB RAMP & SIDEWALK NOTES — NOT TO SCALE



LENGTH: AS REQUIRED

WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)

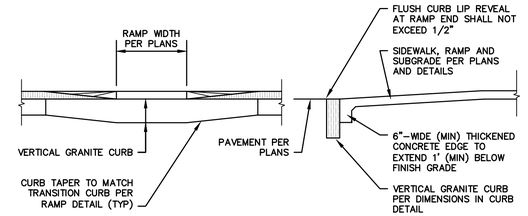
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH

STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)

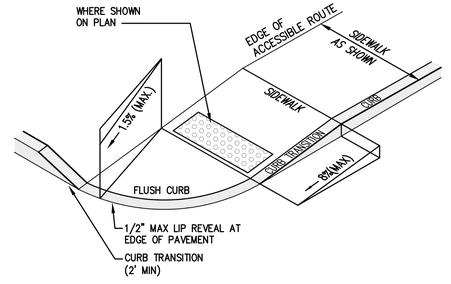
NOTES

1. ALL SIGNS SHALL MEET THE REQUIREMENTS OF AND BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN DETAILS — NOT TO SCALE



FLUSH CURB AT RAMP DETAIL — NOT TO SCALE



CURB RAMP (TYPE 'B') — NOT TO SCALE

ENGINEER:
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
10/21/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: OCTOBER 21, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5361DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO-LO, INC.
c/o MICHAEL LABRIE
(603) 661-6633
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:
TAX MAP 269, LOT12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:
SITE REDEVELOPMENT
TAX MAP 268
LOTS 12 & 13
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

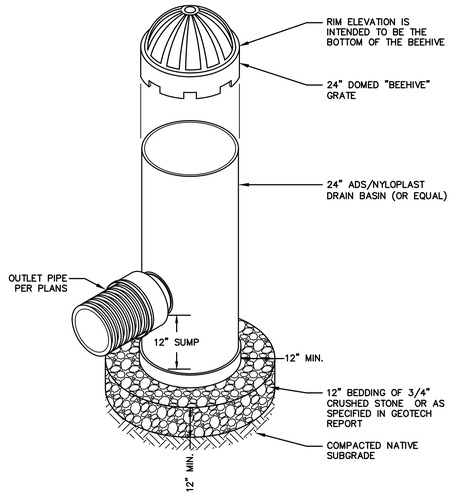
TITLE:
DETAIL SHEET

SHEET NUMBER:
D - 2

5361

GRADING, DRAINAGE AND EROSION AND SEDIMENT CONTROL NOTES

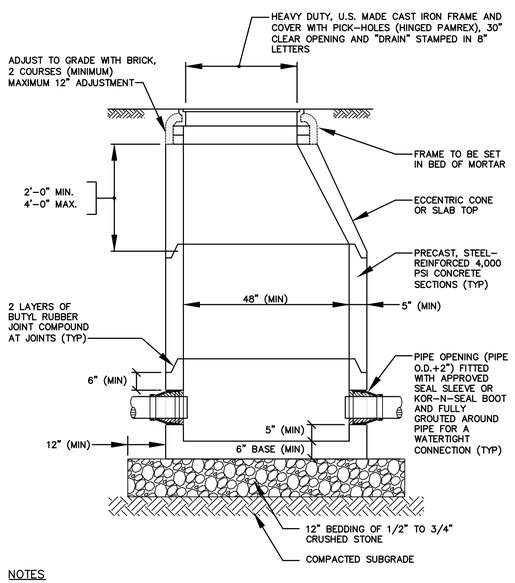
1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
5. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBM) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
6. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
7. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
8. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
9. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
10. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
11. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
12. ALL CPP PIPE SHALL BE ADS N-12 OR APPROVED EQUAL.
13. NO EARTHWORK, STUMPING OR GRUBBING SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
14. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
15. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH IN THE NHDES NH STORMWATER MANUALS, VOL. 1-3, DATED DECEMBER 2008 AS AMENDED.
17. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
18. THE CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENSURE PERMANENT SOIL STABILIZATION.
19. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIODEGRADEABLE.
20. ALL SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
21. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF COMPACTED LOAM, LIMESTONE, ORGANIC FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES.
22. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT AND ALL TEMPORARY EROSION AND SEDIMENT CONTROLS REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
23. THE ENGINEER OF RECORD SHALL SUBMIT A WRITTEN REPORT WITH PHOTOGRAPHS AND ENGINEER'S STAMP CERTIFYING THAT THE STORMWATER INFRASTRUCTURE WAS CONSTRUCTED TO THE APPROVED PLANS AND WILL MEET THE DESIGN PERFORMANCE.
24. ALL ROADWAY CATCH BASINS SHALL BE CLEANED ANNUALLY AND THE ROADWAY SWEPT EVERY SPRING. SEDIMENT AND DEBRIS REMOVED FROM CATCH BASIN SUMPS SHALL BE DISPOSED OF AT A SOLID WASTE FACILITY.
25. THE PROPOSED BUILDING IN THIS DEVELOPMENT SHALL BE CONSTRUCTED WITH STONE DRIP EDGES, WHERE APPROPRIATE. DRIP EDGE UNDERDRAINS SHALL BE DIRECTED TO A STORMWATER PIPE OR DAYLIGHT.
26. PROPOSED TREE CLEARING LIMITS SHOWN ON PLAN ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY VARY DEPENDING ON CLEARING NEEDED FOR CONSTRUCTION AND DRAINAGE OF THE SITE.
27. ALL ROOF DRAIN RISERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH GUTTER DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 1' (MIN.).
28. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. SYMBOLS MAY NOT BE INDICATIVE OF THE CENTER OF A STRUCTURE, PARTICULARLY WHEN SHOWN ADJACENT TO A CURB LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
29. A STORMWATER INSPECTION AND MAINTENANCE REPORT SHALL BE COMPLETED ANNUALLY AND COPIED TO THE CITY PLANNING AND PUBLIC WORKS DEPARTMENTS.
30. SEE SHEET C-1 FOR LEGEND.
31. THE APPLICANT SHALL SUBMIT A COPY OF A COMPLETED LAND USE DEVELOPMENT TRACKING FORM USING THE POLLUTANT TRACKING AND ACCOUNTABILITY PROGRAM (PTAP) ONLINE PORTAL CURRENTLY MANAGED BY THE UNH STORMWATER CENTER OR SIMILAR FORM APPROVED BY THE CITY.



NOTES:

1. FRAMES AND GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN AND DETAILS.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE, N-12HP AND PVC SEWER.
4. INLINE DRAIN TO BE PVC DIAMETER AS SPECIFIED AND AS MANUFACTURED BY ADS OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL INSTALL THE DRAIN BASIN PER THE MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.
6. INLET AND OUTLET GEOMETRY MAY NOT BE SYMMETRICAL. ALL INLETS AND OUTLET LOCATIONS SHALL CONFORM TO THE LINES AND ANGLES SHOWN ON THE PLANS.

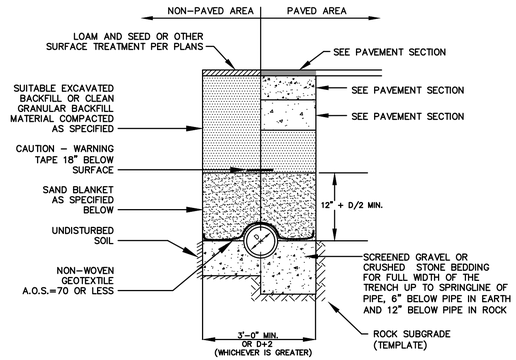
OUTLET STRUCTURE #1 NOT TO SCALE



NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. ALL MANHOLE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H-20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4 FT OF GRADE.
7. MANHOLE STEPS ARE NOT PERMITTED.

DRAIN MANHOLE DETAIL (PDMH) NOT TO SCALE



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET/BARRIER

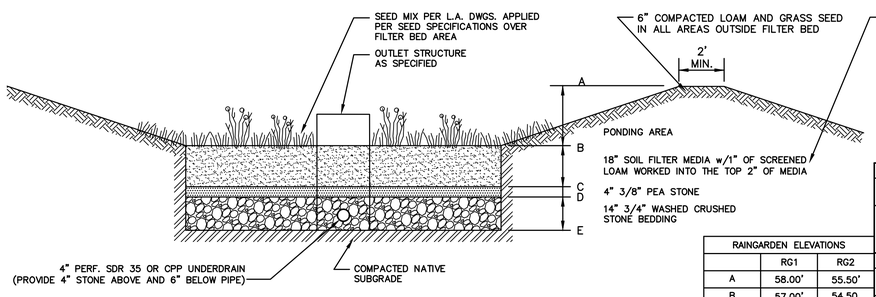
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 - 100
3/8"	20 - 55
# 4	0 - 10
# 8	0 - 5

* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

DRAINAGE TRENCH SECTION NOT TO SCALE



NOTES

1. WHEN CONTRACTOR EXCAVATES BIORETENTION POND AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL EITHER OPTION A OR OPTION B AT CONTRACTOR'S DISCRETION.
3. DO NOT PLACE BIORETENTION POND INTO SERVICE UNTIL ITS SIDE SLOPES AND CONTRIBUTING AREAS HAVE BEEN STABILIZED.
4. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES TO THE BIORETENTION POND DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SURFACES OF BIORETENTION POND WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION ACTIVITIES WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.
6. POND BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POND BERM DETAIL.

MAINTENANCE REQUIREMENTS

- SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS A WARRANTED BY SUCH INSPECTION.
- PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
- AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, WEED WHACKING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES. BERM AREAS ARE TO BE MOWED TWICE ANNUALLY.

DESIGN REFERENCES

- UNH STORMWATER CENTER
- EPA (1999A)
- NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 2, DECEMBER 2008 AS AMENDED.

RAINGARDEN ELEVATIONS

	RG1	RG2
A	58.00'	55.50'
B	57.00'	54.50,
C	55.50'	53.00'
D	55.16'	52.67'
E	54.00'	51.50'

BERM GRANULAR FILL GRADATION

Sieve size	Embankment Material % Passing sieve
4	90 - 100%
40	50 - 80%
100	29 - 43%
200	15 - 30%

CRUSHED STONE BEDDING *

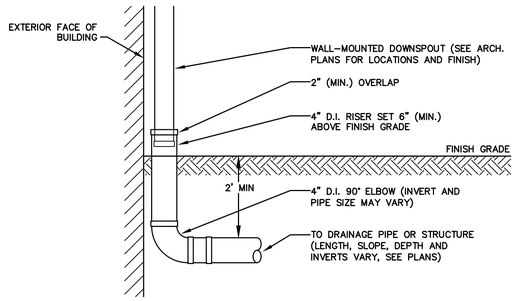
Sieve size	% Passing by weight
1"	100%
3/4"	90 - 100%
3/8"	20 - 55%
#4	0 - 10%
#8	0 - 5%

* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 NHDOT STANDARD SPECIFICATIONS

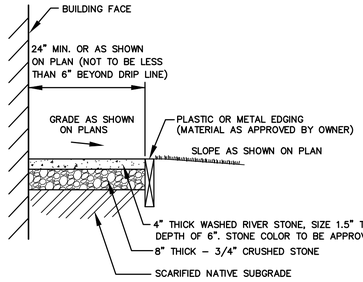
FILTER MEDIA MIXTURES

Component Material	Percent of Mixture by Volume	Gradation of material: Sieve No.	Gradation of material: Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C-33 concrete sand	50 - 55%		
Loamy sand topsoil, with fines as indicated	20 - 30%	200	15 to 25%
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 - 30%	200	< 5%
Filter Media Option B			
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 - 30%	200	< 5%
Loamy coarse sand	70 - 80%	10	85 - 100%
		20	70 - 100%
		60	15 - 40%
		200	8 - 15%

BIORETENTION POND / RAINGARDEN NOT TO SCALE



EXTERIOR ROOF DRAIN CONNECTION NOT TO SCALE



DRIP EDGE DETAIL NOT TO SCALE

STONE DRIP EDGE CLEANING AND MAINENANCE

Function - Stone drip edges are designed to capture rainwater runoff containing suspended solids, nutrients and pollutants. These systems require periodic maintenance to insure infiltration and storage capacity.

Maintenance - Stone drip edge surfaces should be observed periodically during rain events for proper water infiltration into the system and inspected at least once per year to verify water flow and exfiltration. Sediment, vegetation and debris should be removed from the joint/void opening to increase infiltration on a semi-annual basis.

ENGINEER:

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

11/27/24

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24
1	PB SUBMISSION	EDW	11/27/24

DRAWN BY: JMG
APPROVED BY: EDW
DRAWING FILE: 5361DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

OWNER & APPLICANT:

TAX MAP 268, LOT 13
GO-LO, INC.
c/o MICHAEL LABRIE
(603) 661-6633
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:

TAX MAP 269, LOT12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:

SITE REDEVELOPMENT

TAX MAP 268
LOTS 12 & 13

2059 LAFAYETTE ROAD
PORTSMOUTH, NH

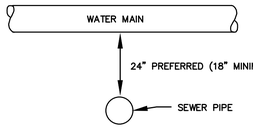
TITLE:

DETAIL SHEET

SHEET NUMBER:

D - 3

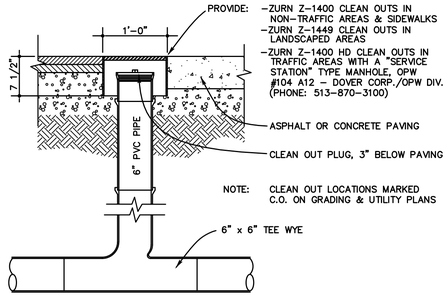
P5361



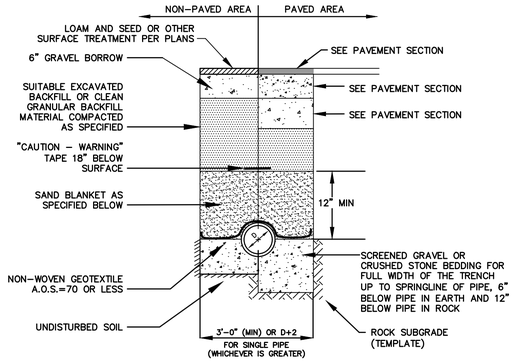
NOTES

1. A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN WATER AND SEWER MAINS. A MINIMUM VERTICAL DISTANCE WITH WATER ABOVE SEWER SHALL BE MAINTAINED.
2. SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM OF 6 FEET HORIZONTALLY FROM WATER MAIN.
3. IF THE REQUIRED CONFIGURATION CANNOT BE MET, THE SEWER MAIN SHALL BE CONSTRUCTED TO MEET THE NHDES REQUIREMENTS FOR FORCE MAIN CONSTRUCTION.

WATER MAIN / SEWER CROSSING NOT TO SCALE



SEWER CLEANOUT NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'-0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

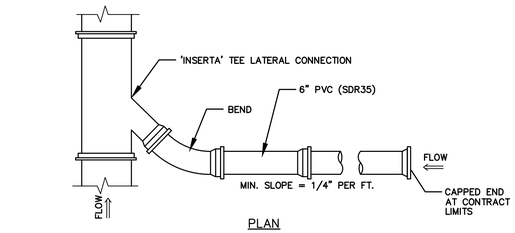
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 - 100
3/8"	20 - 55
# 4	0 - 10
# 8	0 - 5

* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

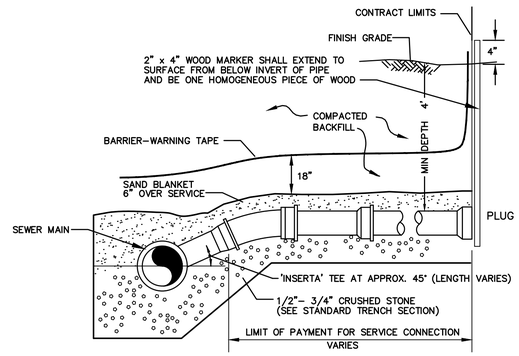
STANDARD TRENCH NOTES

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. BLANKET MAY BE REPLACED WITH BEDDING MATERIAL FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE AND THE GEOTEXTILE IS RELOCATED ACCORDINGLY.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT ONLY IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION WILL BE PRESERVED.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.
6. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
7. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
8. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG
   CEMENT MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
9. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
10. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO TOWN'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.
11. THE CONTRACTOR SHALL INSTALL TRENCH DAMS IN ACCORDANCE WITH NHDES REGULATIONS.
12. ALL GRAVITY SEWER INSTALLATIONS SHALL BE TESTED IN ACCORDANCE WITH NHDES ENV-WQ 704.06.

SEWER TRENCH NOT TO SCALE



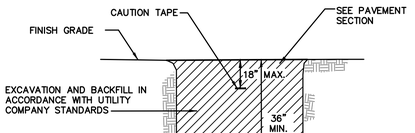
PLAN



NOTE: SERVICE CONNECTION SHALL BE INSTALLED BELOW WATER MAIN WHERE POSSIBLE.

ELEVATION

SEWER SERVICE CONNECTION NOT TO SCALE



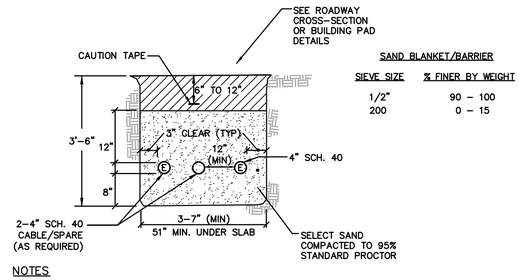
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

NOTES

1. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND PROVIDE ALL EXCAVATION, COMPACTION AND BACKFILL FOR PIPE INSTALLATION WITHIN THE PROJECT SITE.
2. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

GAS TRENCH NOT TO SCALE



SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6-INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY-FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

ELECTRIC / COMMUNICATION TRENCH NOT TO SCALE

P5361

ENGINEER:
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
10/21/24

NOT FOR CONSTRUCTION

ISSUED FOR: TAC APPLICATION

ISSUE DATE: OCTOBER 21, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5361DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

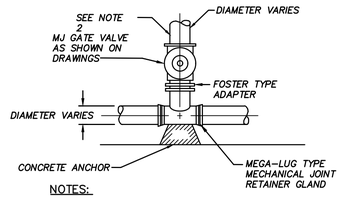
OWNER & APPLICANT:
TAX MAP 268, LOT 13
GO-LO, INC.
c/o MICHAEL LABRIE
(603) 661-6633
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:
TAX MAP 269, LOT12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 5378 PAGE: 2236

PROJECT:
SITE REDEVELOPMENT
TAX MAP 268
LOTS 12 & 13
2059 LAFAYETTE ROAD
PORTSMOUTH, NH

TITLE:
DETAIL SHEET

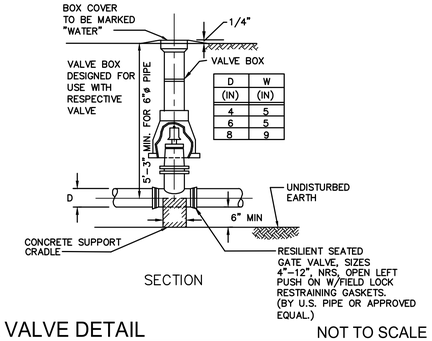
SHEET NUMBER:
D - 4



NOTES:

1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED AS NOTED UNDER THRUST BLOCK DETAIL REQUIREMENTS.

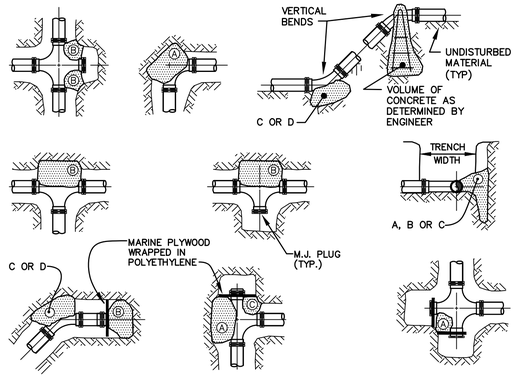
TEE & GATE VALVE ASSEMBLY DETAIL NOT TO SCALE



D (IN)	W (IN)
4	5
6	5
8	9

SECTION

WATER VALVE DETAIL NOT TO SCALE



TEST PRESSURE = 150 psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE 4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

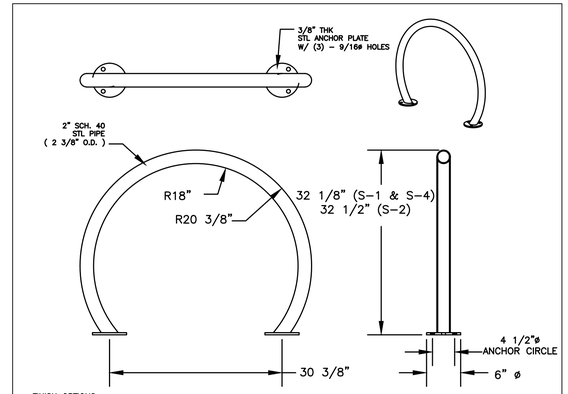
NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
2. NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
3. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
4. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. X
6. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND ALL FITTINGS PRIOR TO CONCRETE PLACEMENT.

THRUST BLOCKING NOT TO SCALE

Long Term Inspection & Maintenance Schedule

	Spring	Fall or Yearly	After Major Storm	Every 2-5 Years
Vegetated Areas				
Inspect all slopes and embankments	x		x	
Replant bare areas or areas with sparse growth	x		x	
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	x		x	
Stormwater Channels				
Inspect ditches, swales and other open stormwater channels	x	x	x	
Remove any obstructions and accumulated sediments or debris	x	x		
Control vegetated growth and woody vegetation		x		
Repair any erosion of the ditch lining		x		
Mow vegetated ditches		x		
Remove woody vegetation growing through riprap		x		
Repair any slumping side slopes		x		
Replace riprap where underlying filter fabric or underdrain gravel is exposed or where stones have been dislodged		x		
Culverts				
Remove accumulated sediments and debris at inlet, outlet and within the conduit	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet	x	x	x	
Remove woody vegetation growing through riprap		x		
Roadways and Parking Surfaces				
Remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand either manually or by a front-end loader	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment contained in water bars or open-top culverts	x			
Ensure that stormwater is not impeded by accumulations of material or false ditches in the roadway shoulder	x			
Runoff Infiltration Facilities				
Remove dead vegetation and any accumulated sediment (normally at the entrance to the garden) to allow for new growth	x			
Weed; add additional hardwood mulch to suppress weeds	x	x		
Mow turf three (3) times a growing season				
Aerate area with deep tines, if water ponds on the surface for more than 24 hours during the first year or for a length of 72 hours		x		
Vegetative Swale				
Mow grass swales monthly				
Inspect swale following significant rainfall event	x	x	x	
Control vegetated growth and woody vegetation	x	x		
Repair any erosion of the ditch	x	x		
Remove debris and liter as necessary				

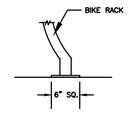


FINISH OPTIONS

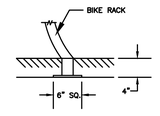
- ☐ HOT DIPPED GALVANIZED (VISIBLE VENT HOLES)
- ☐ COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.

MOUNTING OPTIONS

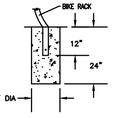
☐ S-2 SURFACE MOUNT (SHOWN ABOVE)



☐ S-4 SUB FLOOR



☐ S-1 EMBEDMENT



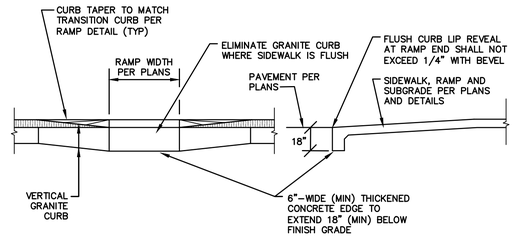
NOTES

1.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED FOR S-2 & S-4 OPTIONS.
2.) PLUGS PROVIDED FOR VISIBLE VENT HOLES. (HOT DIPPED GALV. ONLY)

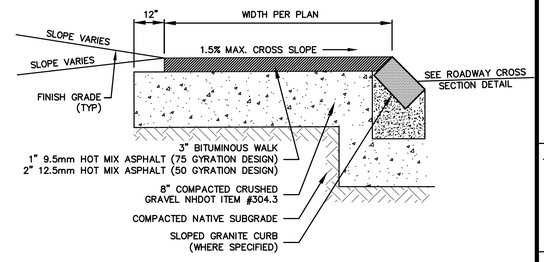
138 Industrial Circle
Mifflintown, PA 17059
800-598-4018
www.dumor.com

TITLE: BIKE RACK
DRAWING NUMBER: 292 SERIES
Rev. 2/2021

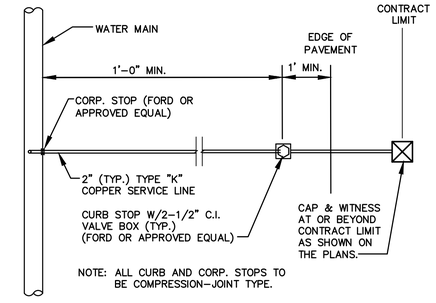
BIKE RACK (IN-GROUND) NOT TO SCALE



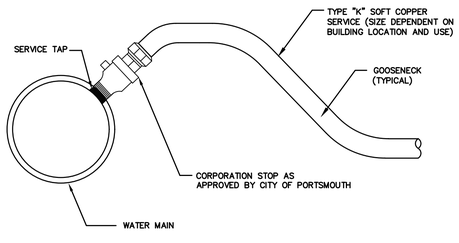
FLUSH CURB AT RAMP DETAIL NOT TO SCALE



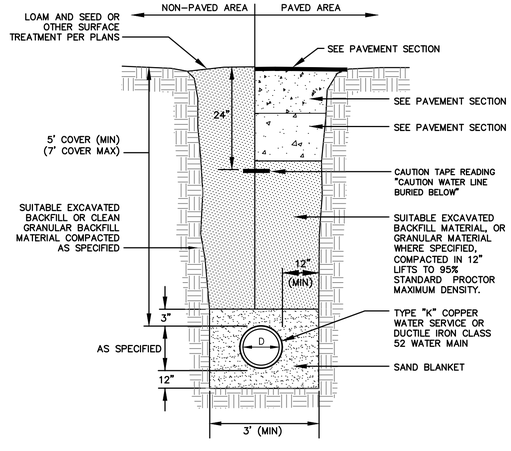
BITUMINOUS SIDEWALK NOT TO SCALE



NOTE: ALL MATERIALS AND SPECIFICATIONS SHALL CONFORM TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS AND REQUIREMENTS. VERIFY PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.



WATER SERVICE CONNECTION NOT TO SCALE



SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 - 100
200	0 - 15

NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

WATER MAIN TRENCH NOT TO SCALE

ENGINEER:

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE — ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
11/27/24

NOT FOR CONSTRUCTION

ISSUED FOR: PB SUBMISSION

ISSUE DATE: NOVEMBER 27, 2024

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	10/21/24
1	PB SUBMISSION	EDW	11/27/24

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 5361DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

OWNER & APPLICANT:

TAX MAP 268, LOT 13
GO-LO, INC.
c/o MICHAEL LABRIE
(603) 661-6633
P.O. BOX 300
RYE, NH 03870
RCRD BOOK: 1486 PAGE: 393

OWNER:

TAX MAP 269, LOT12
JAMES A. LABRIE REV. TRUST OF 1991
P.O. BOX 300
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PROJECT:

SITE REDEVELOPMENT
TAX MAP 268 LOTS 12 & 13
2059 LAFAYETTE ROAD PORTSMOUTH, NH

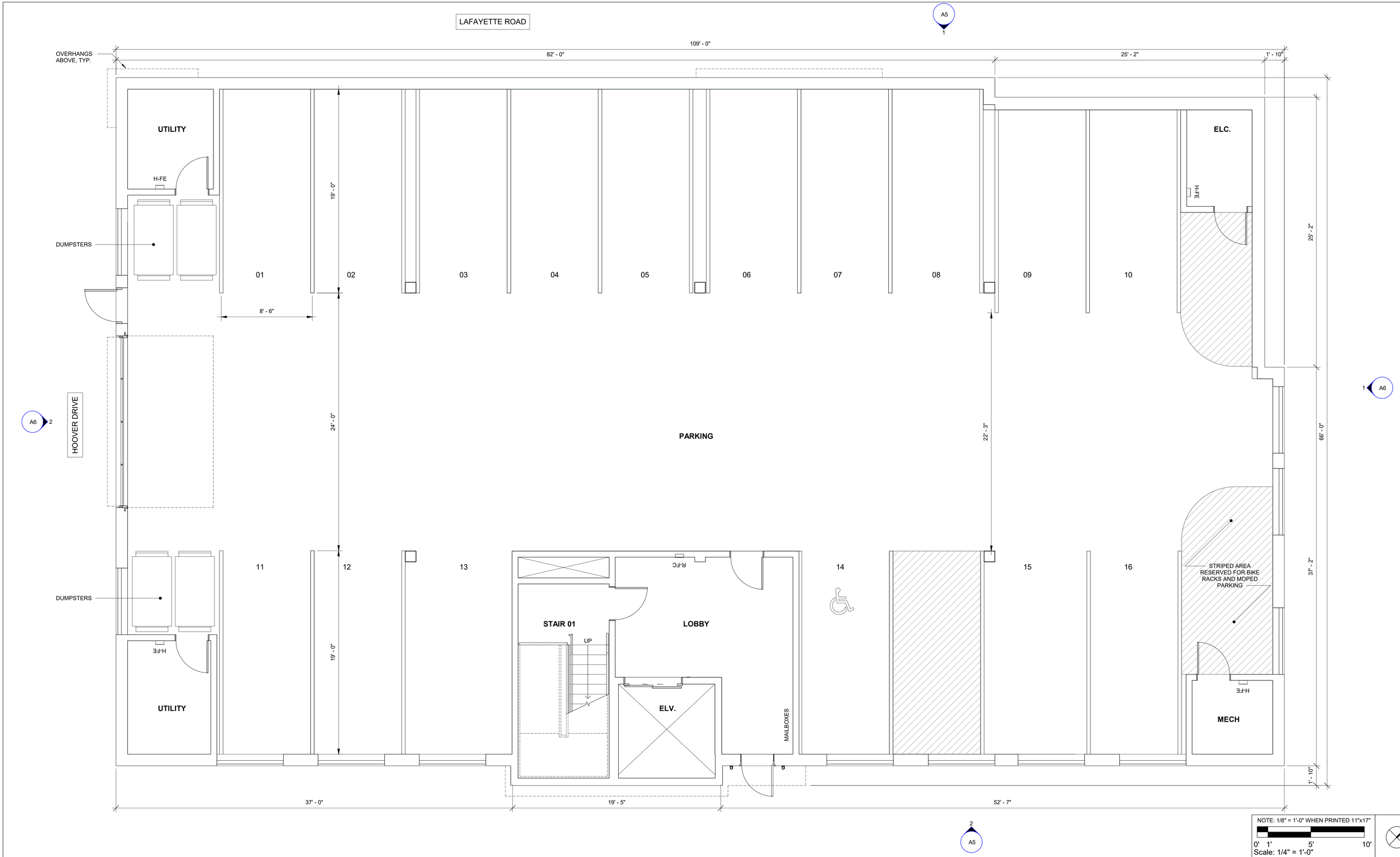
TITLE:

DETAIL SHEET

SHEET NUMBER:

D - 5

P5361



NOTE: 1/8" = 1'-0" WHEN PRINTED 11"x17"

0' 1' 5' 10'

Scale: 1/4" = 1'-0"

LAFAYETTE MULTI-FAMILY

2059 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

FIRST FLOOR PLAN

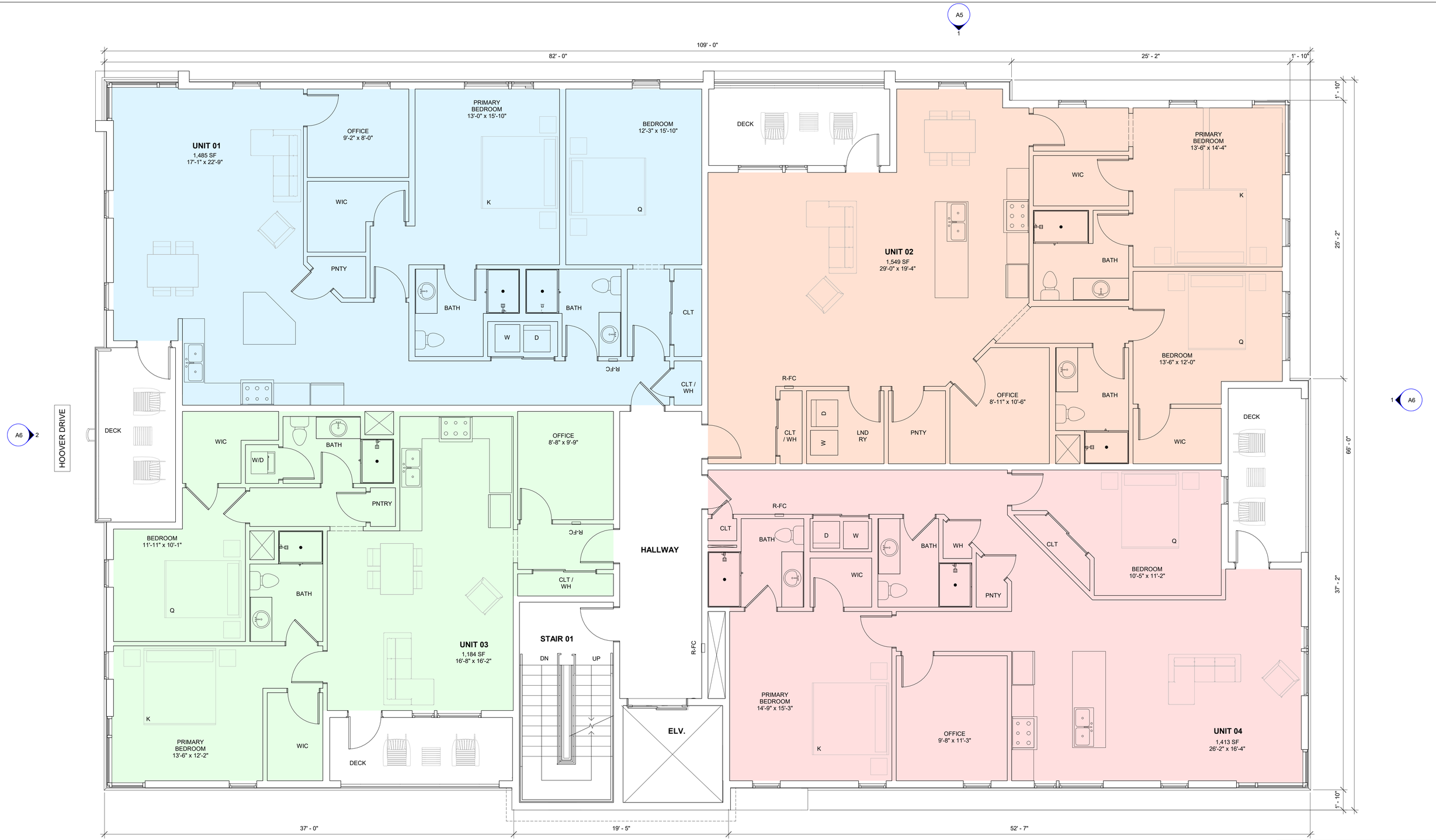
4 Market Street
Portsmouth, New Hampshire
603.430.0274

brought to you by McHENRY ARCHITECTURE

PORTSMOUTH ARCHITECTS

A2

11/27/2024
Scale: 1/4" = 1'-0"
Drawn By: RD / MG



NOTE: 1/8" = 1'-0" WHEN PRINTED 11"x17"

0' 1' 5' 10'

Scale: 1/4" = 1'-0"

LAFAYETTE MULTI-FAMILY

2059 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

2ND & 3RD FLOOR PLAN

4 Market Street
Portsmouth, New Hampshire
603.430.0274

brought to you by McHENRY ARCHITECTURE

PORTSMOUTH ARCHITECTS

A3

11/27/2024
Scale: 1/4" = 1'-0"
Drawn By: RD / MG

1 NORTH ELEVATION (LAFAYETTE)
1/4" = 1'-0"

2 SOUTH ELEVATION (REAR)
1/4" = 1'-0"

NOTE: 1/8" = 1'-0" WHEN PRINTED 11"x17"

0' 1' 5' 10'
Scale: 1/4" = 1'-0"

LAFAYETTE MULTI-FAMILY
2059 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

ELEVATIONS

4 Market Street
Portsmouth, New Hampshire
603.430.0274
brought to you by McHENRY ARCHITECTURE
PORTSMOUTH ARCHITECTS

A5

11/27/2024
Scale: 1/4" = 1'-0"
Drawn By: RD / MG

2 WEST ELEVATION (HOOVER)
1/4" = 1'-0"

1 EAST ELEVATION
1/4" = 1'-0"

NOTE: 1/8" = 1'-0" WHEN PRINTED 11"x17"

0' 1' 5' 10'
Scale: 1/4" = 1'-0"

LAFAYETTE MULTI-FAMILY
2059 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

ELEVATIONS

4 Market Street
Portsmouth, New Hampshire
603.430.0274
brought to you by McHENRY ARCHITECTURE
PORTSMOUTH ARCHITECTS

A6

11/27/2024
Scale: 1/4" = 1'-0"
Drawn By: RD / MG

Z:\Active Project Files\23052-2059 LAFAYETTE LABRIE\Dwgs\3-DD\23052-2059 LAFAYETTE - DD.rvt

LAFAYETTE MULTI-FAMILY
2059 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

RENDERING FROM LAFAYETTE ROAD

4 Market Street
Portsmouth, New Hampshire
603.430.0274
brought to you by
McHENRY ARCHITECTURE
PORTSMOUTH ARCHITECTS

A1

11/27/2024
Scale:
Drawn By: RD / MG

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