

September 4, 2020

Mr. Robert Luongo, Planning Dept. Director
Town of Weymouth
Department of Planning & Community Development
Town Hall
75 Middle Street
Weymouth, MA 02189

Subject: Engineering Response to Comments Letter
Board of Zoning Appeals Case No. 3416
The Overlook - 44 Wharf Street, Weymouth, Massachusetts
CEC Project 193-187

Dear Mr. Luongo:

On behalf of the Applicant for the proposed redevelopment project located at 44 Wharf Street in Weymouth, Massachusetts, Civil & Environmental Consultants, Inc. ("CEC") has prepared this memorandum in response to comments noted in a memorandum from the Town of Weymouth Conservation Commission ("CONCOM"), dated August 17, 2020, along with comments in a memorandum from the Town of Weymouth Department of Public Works – Engineering Division ("DPW") dated August 17, 2020. District 3 City Councilor Ken DiFazio ("KD") provided a letter to the Town of Weymouth Department of Planning & Community Development on August 18, 2020, addressing citizens' concerns regarding the HMOD and the current project application process. Responses to the citizens' concerns are included within this response to comments.

KD's, DPW's and CONCOM's comments are summarized below in italics, followed by CEC's responses.

LETTER FROM CITY COUNCILOR KEN DEFAZIO (KD)

1. *KD: ...there are no sidewalks on Wharf Street, there is inadequate street lighting, there are no underground utilities and there is no safety precautions for residents to cross on a daily basis the abutting railroad crossing... Therefore, what I am suggesting is that the Planning Dept. and Board of Appeals may require the applicant to be subjected to accomplishing improvements to not only the building site but also the surrounding land area based upon its long history of an industrial use only.*

CEC Response: New improvements in the public realm are proposed as part of this project including new vertical granite curbs with accessible sidewalks along the project frontage. The landscaping along the project frontage will also be significantly improved creating a more aesthetically pleasing connection to the adjacent Osprey Overlook Park. There is existing street lighting on the utility poles on the southerly side of Wharf Street that provides lighting in the existing roadway.

The Applicant is also working the Town Planning and Traffic departments to review and coordinate improvements to the pedestrian crossing of the railroad tracks in order to create an improved pedestrian connection from the MBTA station, the Site and Osprey Overlook Park.

Additionally, we are studying improvements to the pedestrian crossings at the intersection of East Street and Commercial Street and will be re-constructing & striping new accessible pedestrian crossings in order to improve the safety and utilization of the pedestrian movements at this intersection.

Additionally, McMahon associates performed a traffic signal warrant analysis for the intersection of East Street and Commercial Street to confirm if a traffic signal is warranted in this location, and provided this analysis to the Town Traffic Engineer. Based on this analysis and preliminary discussions with the Town Traffic Engineer, the intersection of East Street and Commercial Street does not rise to the level of requiring a traffic signal.

2. *KD: A second item which I would like to remind the Planning Dept. and the Board of Appeals is that from the very beginning of the process of changing the zoning in this area and providing for a residential overlay district, it was always done so with the explicit agreement that before any residential development would take place in this area the incinerator (not the stack) would be completely demolished and the site environmentally cleaned. I request that this issue be discussed and formally addressed how we would insure that this is completed to provide protection to prospective residents before anyone obtains an occupancy permit on the site.*

CEC Response: The Applicant agrees that it would be beneficial to remove the incinerator as soon as possible.

3. ***KD:** Traffic concerns of residents who reside on East Street, and Off Station Street. Any re-direction of traffic from Wharf Street to North on East Street will have an impact on the residents who reside on the southern end of East Street and Off Station Street. Further, consideration of the employment of a stop sign facing Wharf Street before one proceeds onto East Street should be considered along with a crosswalk across East Street and Wharf Street.*

CEC Response: A stop sign currently exists in this location. However, there was additional discussion about installing a “No Right Turn” sign or a variation of this sign with restricted hours. The Applicant has no objection to this sign, but defers to the Town Traffic Engineer for new signage within the public rights-of-way.

4. ***KD:** Parking on Wharf Street: I suggest that there should be no parking on Wharf Street if possible. That being said, any overflow of parking from this project will land possibly in the Osprey Park Parking Lot. If subsequent to the operation and full tenancy to this project, we experience a parking problem due to this project the applicant must be required to remedy the situation.*

CEC Response: Due to the current approximately 24-ft width of Wharf Street which is conducive to two-way traffic, the Applicant has no objection restricted parking, but defers to the Town Traffic Engineer for parking restrictions within the public rights-of-way.

The Site has been designed to provide the required number of parking spaces required by the zoning ordinance and does not anticipate that there will be any parking problems at the Site. It is assumed that any illegal parking at Osprey Overlook Park or within the right-of-way is currently and will continue to be monitored by the Police Department and illegally parked vehicles will be ticketed or towed.

5. ***KD:** Insure that at least 10% of the units are low-income units. This requirement is consistent with the proactive approach outlined in the Weymouth Housing Production Plan to increase and preserve affordable units in order for Weymouth to maintain a diverse housing stock, which is key to economic stability and growth.*

CEC Response: The Applicant’s proposal includes 10% of the housing units to be allocated to low-income tenants.

6. *KD: The number of units: The conventional wisdom of all abutting local residents is to keep the number of units to a minimum. I request that all Board members insure that the number of units complies with the current ordinance and to take into consideration the citizens who address the board at the hearing.*

CEC Response: The project includes an appropriate number of housing units for the Site and surrounding area and meets the dimensional, density and parking requirements outlined in the zoning ordinance.

7. *KD: Lastly, I would make a request that if the Board were to approve the project that they urge the developer to pay special attention to concerns of all abutting residential citizens during construction and adhere to any requests to curtail disturbances in the neighborhood.*

CEC Response: Noted.

DEPARTMENT OF PUBLIC WORKS (DPW) COMMENTS

WATER / SEWER DIVISION:

1. *DPW: A new sewer service will be required. Cut and cap the existing sewer service at the property line.*

CEC Response: Noted. The Plans have been revised to include a new sewer service to the Mill Building and the existing sewer service to the Mill Building will be cut and capped at the main and replaced with a new service with saddle connection.

2. *DPW: Cut and cap all old water services at the main.*

CEC Response: Noted. The old water service to the meter pit is shown to be cut, capped, and abandoned at the main. The existing 8-inch service to the building will be maintained per DPW Comment 5 below.

3. *DPW: Payment of water/sewer mitigation fees will be required when filing for a building permit and the Building Permit Plot Plan is submitted to the Engineering Division for review/approval. Contact the Water Division regarding the mitigation fees.*

CEC Response: The Applicant respectfully requests the water/sewer mitigation fees to be required at time of Certificate of Occupancy and not at time of Building Permit.

4. DPW: *Contact the Water & Sewer Division to discuss metering requirements.*

CEC Response: Noted. The Water & Sewer Division will be contacted to confirm metering requirements, which will be coordinated with the Site and Architectural Plans as required.

5. DPW: *Water Services for Existing Building to Remain — Connect to the existing 12" x 8" tap, add an 8" x 4" tee with valve for domestic, reduce 8" nipple to 6" with reducer and add 6" gate valve for fire line to eliminate the need for 2 new taps.*

CEC Response: The water service design has been revised as requested. Refer to the revised Utility Plans for the updated water service configuration.

6. DPW: *Water Services for Proposed Residential Building — Connect to 12" main with a 12" x 8" tapping sleeve & valve, run an 8" main to the building, cut in a 2" line with valve for domestic, add 8" x 6" reducer with 6" valve to isolate fire line. Provide a yard/blow-off hydrant at the end of the new 8" main.*

CEC Response: Refer to the revised Utility Plans for the updated water service configuration.

ENGINEERING DIVISION COMMENTS:

1. DPW: *Soil evaluations performed by a MA DEP Approved Soil Evaluator will be required to confirm on-site soil conditions and establish depth to the seasonal high groundwater in the areas of proposed infiltration.*

CEC Response: Soil Evaluations were performed on August 26, 2020 by a licensed soil evaluator. Members of the Department of Public Works and Conservation Commission agent were notified and witnessed the test pits. The location of the test pits have been included on the Sheet C300 and the test pit logs are included on C804.

The soil investigations documented estimated seasonal high groundwater (ESHWG) elevations that were similar to the previously estimated groundwater elevations based on boring data; however were slightly higher in some locations. Accordingly, the stormwater infiltration chambers in the westerly portion of the site beneath the parking lot were consolidated into a single area and raised slightly in order to provide the required vertical separation from the ESHWG elevations. The drainage infrastructure was reconfigured to convey the stormwater runoff through the deep

sump hooded catch basins and through a single water quality unit (Stormceptor STC900) to the infiltration chambers. The infiltration chambers along the driveway entry into the Site were also raised slightly.

Based on the soil investigations, the soil within the infiltration horizon was also determined to consist of a Coarse Sand, which has a greater infiltration rate than originally assumed for the drainage analysis. Accordingly, the drainage analysis was revised to utilize an infiltration rate of 8.27 inches/hour for the corresponding Rawl's Rate in accordance with the Massachusetts Stormwater Handbook guidelines.

A summary of the peak stormwater runoff from the revised analysis (Table 3.3 from the original Stormwater Report) is provided below.

| TABLE 3.3 PROJECT STORMWATER RUNOFF RATES | | | | | | | | |
|--|------------|------------|-------------|-------------|-------------|-------------|--------------|--------------|
| Peak Runoff Rate (cfs*) | | | | | | | | |
| Design Point | 2- Year | 2- Year | 10- Year | 10- Year | 25- Year | 25- Year | 100- Year | 100- Year |
| | Ex. | Prop. | Ex. | Prop. | Ex. | Prop. | Ex. | Prop. |
| A (Wharf Street) | 2.15 | 1.92 | 6.51 | 4.40 | 9.30 | 7.04 | 13.83 | 11.34 |

*cfs = cubic feet per second

As shown in Table 3.3 above, post-development runoff rates for the 2-year to 100-year storm events do not exceed existing runoff rates. The Project will also continue to meet the 10 Stormwater Standards as previously identified in the original Stormwater Management Report. See Attachment A for the revised Proposed Conditions Drainage Area Map, HydroCAD analysis and supporting calculations.

2. *DPW: The existing drain line from Sumner Road is proposed to be cut/capped at the property line and connected to the proposed drainage system located on the project site. The Engineering Division prefers the drain line from Sumner Road to be located in an easement and remain separate from the proposed on-site drainage system. Revise the plans to show the Sumner Road drain line routed around the north side of the proposed four story residential building and in a 20' wide drainage easement. A CO (Certificate of Occupancy) will not be approved by the DPW until a plan showing the easement and the grant of*

easement (or a deed containing language that grants the easement to the town) are recorded at the Registry of Deeds. Engineering Division recommends waiting until after the drain line has been installed to review and approve the easement. This will allow us to verify that the system was installed where it was proposed and, as such, that the originally laid out easement is good. If it gets installed otherwise, the easement might need to be modified to properly contain the system and provide maintenance access.

CEC Response: Noted. The Applicant has no objection to granting an easement to the Town of Weymouth for the existing drain line that currently passes through the Site. The design has been revised to re-route the drainage around the proposed new building, which will be placed within a 20-ft wide easement as requested.

3. *DPW: The site is located within a FEMA Zone AE (100-year) floodplain, base flood elevation 11.2 (NAVD88) or 17.8 (Town of Weymouth Datum). The existing building's basement floor elevation is at elevation 8.9 (NAVD88) or 15.5 (TOW datum). The drainage system located within the courtyard is connected to an existing drain manhole in Wharf Street, which discharges to the Back River. Engineering is concerned any tide greater than elevation 8.9 (NAVD88) will flood the basement.*

CEC Response: The Site has been designed to provide protection from the Zone AE flood event and/or high tides that may be experienced in the Back River by grading the site in order to providing a berm at a minimum of 12-inches above the 100-year BFE that will keep surface flooding from encroaching into the Site near the building. Backflow valves have been added to the site drainage systems to eliminate the potential for high tides to encroach into the Site drainage infrastructure and associated courtyard.

We also reviewed the site drainage design against a number of recorded tide elevations based on the NOAA data in the vicinity of the project. The data was based on the City of Boston gauge, which has a number of recorded elevations under various scenarios and was cross checked against information provided by the Town of Weymouth (TOW) that indicated a very close correlation to the Town of Weymouth accepted MHW elevation of 11.06 (TOW Datum) compared to the City of Boston documented MHW elevation of 10.99.

The highest recorded astronomical (i.e. non-sea surge) tide seen in the area was documented to be elevation 13.6-ft (TOW Datum) in 2008 based on the NOAA records, and the highest observed tide (including sea surge) occurred at roughly elevation 16.0-ft (TOW Datum) in January 2018.

All of our drainage inlets are located above the TOW accepted MHW and the highest astronomical sea surge elevations, and it is not expected that high tides associated with these events would should not materially impact the ability of our system to convey the stormwater from the Site. The grades within the Site rise quickly, so the vast majority of the Site infrastructure is located above not only the MHW and astronomical high tide elevations, but also the Sea Surge and 100-year FEMA BFE elevations. Additionally, the Site grading has been designed in order to allow stormwater to overflow from the rear parking area toward Wharf Street without rising to the level of the first floor building elevations should drainage system experience any limiting downstream tail water conditions.

As noted by DPW, the courtyard area between the existing mill building and Wharf Street is designed with grades between elevations 15.3-ft and 15.5-ft and could potentially be influenced by the storm surge tides that would create tail water conditions in downstream reaches of the municipal system. Accordingly, the courtyard area has been designed with flood resistant materials, and the building will be designed to include dry-flood proofing measures at the building entries within the courtyard including removable flood barriers or flood-proof doors. Additionally, although the basement level of the building will be dry-flood proofed, the interior of the building at the basement level does not include any habitable residential units or spaces.

Additionally, a drainage holding tank has been proposed to be installed upstream of the backflow valves that would allow the courtyard areas to continue draining even if the downstream areas are influenced by high tides in downstream reaches. The stored runoff would be released via gravity flow as the tides receded following the storm event. This tank has been sized to contain the approximate stormwater volume from the 2-year storm event to provide an additional measure of protection for the courtyard areas.

4. *DPW: The Engineering Division is currently assisting the Conservation Commission with a review of the proposed drainage system. Additional Engineering Division comments related to the design of the drainage system and compliance with DEP Stormwater Standards will be forwarded to the Commission prior to the scheduled public hearing. We anticipate any concerns related to the proposed drainage system will be addressed prior to the submittal of Plot Plans to the DPW when applying for a building permit.*

CEC Response: Noted. See responses to the Conservation Commission comments below.

5. *DPW: Weymouth Town Ordinance 8-408 restricts the opening of a road for a period of 5 years after a road has been reconstructed. Wharf Street was paved by the Town in 2017, therefore the 5-year moratorium will be applicable to this project. The DPW will require the section of Wharf Street disturbed by utility cuts to be repaved curb to curb.*

CEC Response: Noted. The roadway will be reconstructed from curb to curb where utility services are proposed, as requested.

CONSERVATION COMMISSION (CONCOM) COMMENTS

1. *CONCOM: The site contains wetland resource areas (Riverfront, Land Subject to Coastal Storm Flowage) and buffer zones and so requires approval from the Weymouth Conservation Commission. The applicant has filed a Notice of Intent with the Conservation Commission. A public hearing has been scheduled for Tuesday, August 25. A site visit with the applicant and the Commission was conducted today.*

CEC Response: Noted.

2. *CONCOM: Stormwater from the project will discharge to the Back River Area of Critical Environmental Concern (an Outstanding Resource Water that includes shellfish beds) and to a stream that is known to be a smelt spawning site. Previous studies have identified concerns about pollutant loads (particularly sediments) in the brook that adversely impact spawning habitat. The stormwater system should be designed to protect these sensitive receiving waters.*

CEC Response: The stormwater system includes water quality improvements that will exceed the MassDEP stormwater management standards. Additionally, the majority of the site stormwater will be routed through infiltration BMPs that provide improved water quality treatment for phosphorous and other nutrients beyond TSS removal.

3. *CONCOM: I refer you to the Engineering Division's comment memo of August 18; The Engineering Division is reviewing the drainage design for Conservation. The review has not yet been completed.*

CEC Response: Noted.

4. *CONCOM: The proposed project is partially located within the 100-year floodplain. The proposed courtyard and basement floor are located below the 100-year floodplain elevation. Engineering's comment memo notes that, as designed, it appears that the basement will*

flood during tides greater than elevation 8.9 (NAVD 88). That elevation is 4.5 feet above the Mean High Water Elevation (and would be experienced during higher high tides).

CEC Response: See Response to DPW Engineering Comment 3.

5. CONCOM: *Other issues that must be addressed before the Conservation Commission can close the public hearing and issue a decision include:*

a) Review stormwater comments and resolve all issues relative to the stormwater design.

CEC Response: Noted. See responses to comments above.

b) The stormwater outfall for the project may need to be relocated due to concerns about tidal inflow and about the age and condition of the pipe.

CEC Response: We have reviewed the potential location for stormwater outfalls and have relocated the drainage outfalls to the higher drainage infrastructure in Wharf Street. These segments of the drainage infrastructure are not as susceptible to tidal influences.

c) More information is needed on proposed work and consequential impacts in the FEMA 100-year flood zone.

CEC Response: See Response to DPW Engineering Comment 3.

d) The drainage channel that carries stormwater runoff into the site from the southeast (underneath the MBTA railroad tracks) may be jurisdictional under the Weymouth Wetlands Protection Ordinance and regulations. Additional work is needed to review how best to handle this flow.

CEC Response: This drainage ditch, although identified to be regulated under the local Wetlands Projection Ordinance is overgrown and subject to buildup of sediment from the flows from offsite areas. Through the proposed activities, a portion of this degraded drainage ditch will be impacted as a result of the Project. Accordingly, the design has been revised to include stormwater improvements in order to provide improved sediment control prior to entering the Site drainage system as mitigation for the impacts to the drainage ditch. These improvements include a riprap-lined outfall, a graded drainage swale with non-erosive velocities and a secondary riprap-lined

depression prior to entering the Site drainage system.

- e) Mapping of drainage information on the existing conditions plan is not complete and needs to be updated. Riverfront Area designation also needs to be revised.*

CEC Response: As discussed during the site walk, the MHW elevation has been revised based on information provided by the Conservation Agent and Department of Public Works. This includes adjusting the MHW elevation from elevation 4.33 to 4.39 (NAVD 88) and performing additional topographic survey of the lower reaches of the intermittent stream to better confirm the extent of MHW. See the revised site plans for the updated MHW and Riverfront Area designation along with revised layout of the existing drainage system.

- f) Mass. Wetlands Protection Act Riverfront Area regulations require mitigation for impacts to Riverfront Area. The applicant and Commission need to identify the desired mitigation for the project.*

CEC Response: Noted. We will continue to work with the Conservation Commission regarding potential mitigation.

6. *CONCOM: Given the work needed to address the above comments, the applicant has made clear that, following their presentation and discussion at the 8/25 hearing, they will be requesting a continuance of the Conservation Commission public hearing. Because it is possible that design elements may change that would also affect the Board of Zoning Appeal's decision, it would seem sensible for the BZA to also keep its hearing open in case plan changes need to made.*

CEC Response: Noted.

Mr. Robert Luongo – Town of Weymouth
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We hope that you find these responses helpful in your evaluation of the Site Plan Review Application before the Planning Board. Please feel free to contact us with any questions at kskulte@cecinc.com or via phone at (508) 386-8049.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



Karlís P. Skulte, P.E.
Principal



Thomas Rosborough
Staff Consultant

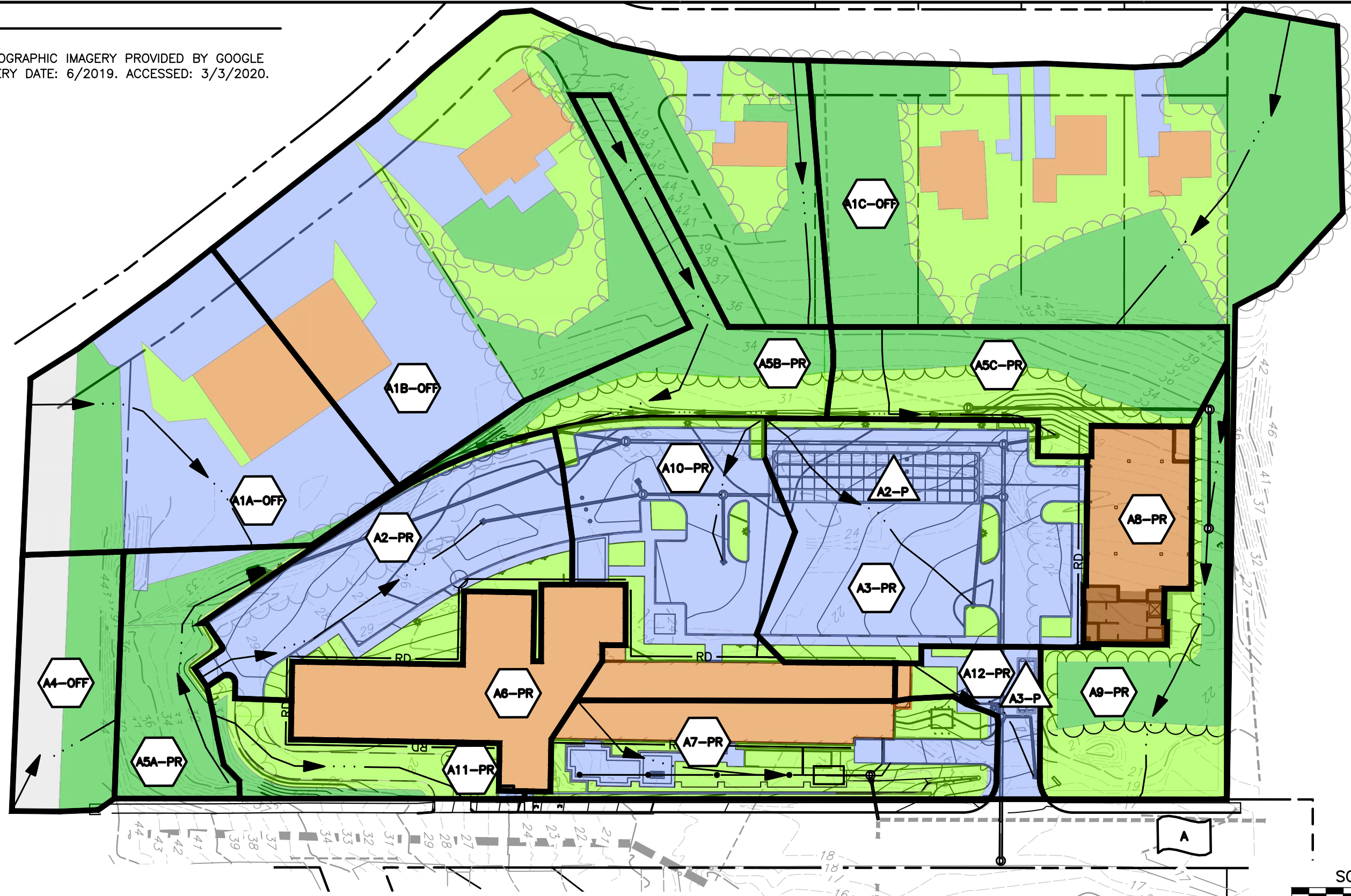
Attachments: Appendix A – Supporting Calculations
Appendix B – Revised Plans



APPENDIX A
Supporting Calculations

REFERENCE

1. AERIAL ORTHOGRAPHIC IMAGERY PROVIDED BY GOOGLE EARTH, IMAGERY DATE: 6/2019. ACCESSED: 3/3/2020.



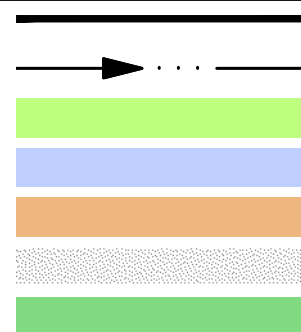
LEGEND



PROPOSED DESIGN POINT

PROPOSED SUBCATCHMENT AREA

PROPOSED POND/DETENTION AREA



SUBCATCHMENT BOUNDARY

PROPOSED TIME OF CONCENTRATION PATH

PROPOSED VEGETATED AREA

PROPOSED PAVED AREA

PROPOSED ROOF AREA

PROPOSED PAVEMENT/GRAVEL AREA

PROPOSED WOODED AREA



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DRAWN BY:

DWP

CHECKED BY:

DRAFT

APPROVED BY:

DRAFT

FIGURE NO:

DATE:

SEPTEMBER 2020

DWG SCALE:

1"=60'

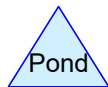
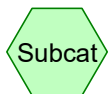
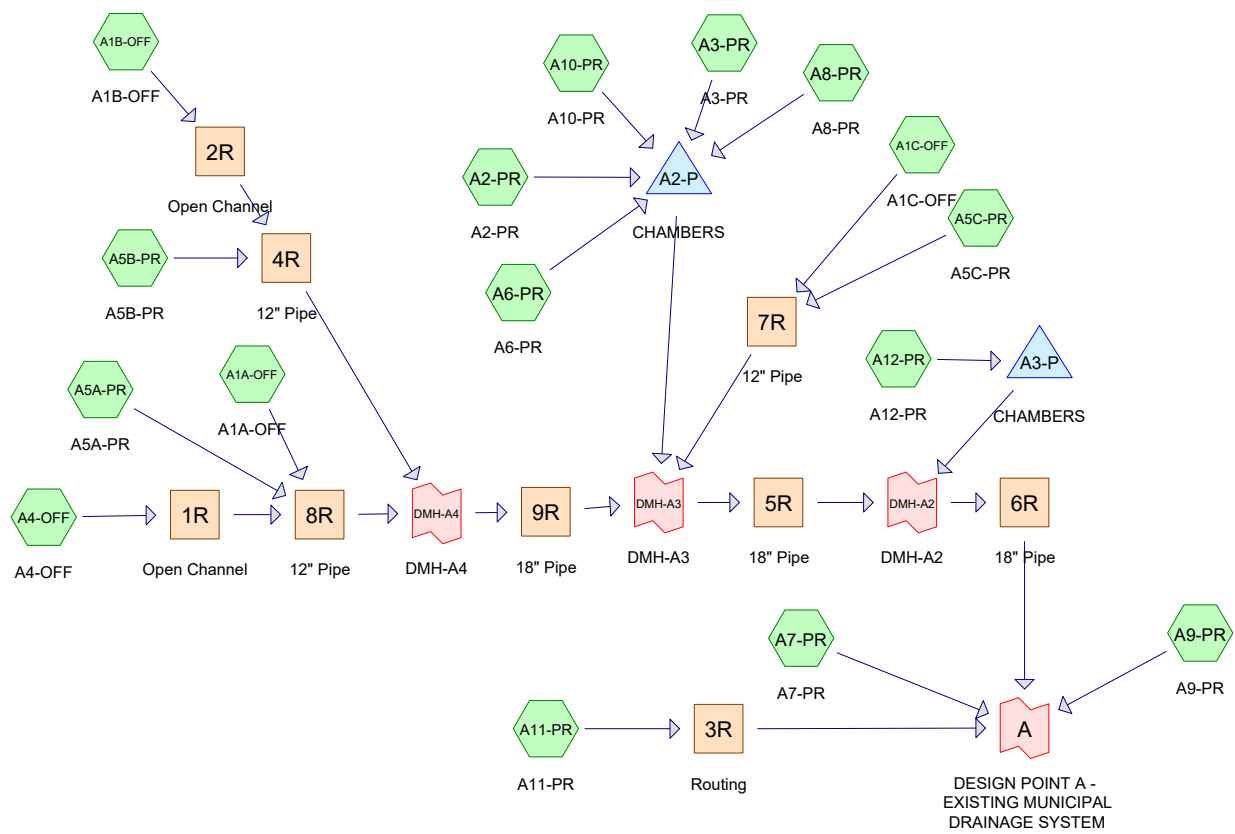
PROJECT NO:

193-187

HYD-PR

HERITAGE COMPANIES
WHARF STREET REDEVELOPMENT
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS

DRAINAGE AREA MAP
PROPOSED CONDITIONS



Area Listing (all nodes)

| Area (sq-ft) | CN | Description (subcatchment-numbers) |
|-----------------|-----------|---|
| 68,834 | 49 | 50-75% Grass cover, Fair, HSG A (A10-PR, A11-PR, A12-PR, A1A-OFF, A1B-OFF, A1C-OFF, A2-PR, A3-PR, A5A-PR, A5B-PR, A5C-PR, A7-PR, A9-PR) |
| 7,055 | 96 | Gravel surface, HSG A (A1A-OFF, A4-OFF) |
| 88,590 | 98 | Paved parking, HSG A (A10-PR, A11-PR, A12-PR, A1A-OFF, A1B-OFF, A1C-OFF, A2-PR, A3-PR, A5A-PR, A7-PR) |
| 41,744 | 98 | Roofs, HSG A (A10-PR, A12-PR, A1A-OFF, A1B-OFF, A1C-OFF, A6-PR, A7-PR, A8-PR) |
| 34,560 | 36 | Woods, Fair, HSG A (A11-PR, A4-OFF, A5A-PR, A5B-PR, A5C-PR, A9-PR) |
| 49,447 | 43 | Woods/grass comb., Fair, HSG A (A1A-OFF, A1B-OFF, A1C-OFF) |
| 290,230 | 70 | TOTAL AREA |

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Soil Listing (all nodes)

| Area (sq-ft) | Soil Group | Subcatchment Numbers |
|-----------------|---------------|--|
| 290,230 | HSG A | A10-PR, A11-PR, A12-PR, A1A-OFF, A1B-OFF, A1C-OFF, A2-PR, A3-PR, A4-OFF, A5A-PR, A5B-PR, A5C-PR, A6-PR, A7-PR, A8-PR, A9-PR |
| 0 | HSG B | |
| 0 | HSG C | |
| 0 | HSG D | |
| 0 | Other | |
| 290,230 | | TOTAL AREA |

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Pipe Listing (all nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Diam/Width (inches) | Height (inches) | Inside-Fill (inches) |
|-------|----------------|---------------------|----------------------|------------------|------------------|-------|------------------------|--------------------|-------------------------|
| 1 | 4R | 18.65 | 18.20 | 44.0 | 0.0102 | 0.012 | 12.0 | 0.0 | 0.0 |
| 2 | 5R | 14.55 | 11.70 | 157.0 | 0.0182 | 0.012 | 18.0 | 0.0 | 0.0 |
| 3 | 6R | 11.70 | 10.75 | 48.0 | 0.0198 | 0.012 | 18.0 | 0.0 | 0.0 |
| 4 | 7R | 18.00 | 17.55 | 37.0 | 0.0122 | 0.012 | 12.0 | 0.0 | 0.0 |
| 5 | 8R | 25.00 | 20.50 | 221.0 | 0.0204 | 0.012 | 12.0 | 0.0 | 0.0 |
| 6 | 9R | 16.75 | 14.55 | 220.0 | 0.0100 | 0.012 | 18.0 | 0.0 | 0.0 |
| 7 | A2-P | 15.25 | 15.15 | 12.0 | 0.0083 | 0.012 | 12.0 | 0.0 | 0.0 |
| 8 | A3-P | 15.00 | 14.90 | 12.0 | 0.0083 | 0.012 | 12.0 | 0.0 | 0.0 |

Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| | |
|-------------------------------------|--|
| SubcatchmentA10-PR: A10-PR | Runoff Area=19,704 sf 83.87% Impervious Runoff Depth>2.17" Tc=6.0 min CN=90 Runoff=1.13 cfs 3,558 cf |
| SubcatchmentA11-PR: A11-PR | Runoff Area=6,592 sf 1.05% Impervious Runoff Depth>0.07" Tc=6.0 min CN=47 Runoff=0.00 cfs 40 cf |
| SubcatchmentA12-PR: A12-PR | Runoff Area=4,023 sf 82.53% Impervious Runoff Depth>2.08" Tc=6.0 min CN=89 Runoff=0.22 cfs 697 cf |
| SubcatchmentA1A-OFF: A1A-OFF | Runoff Area=25,162 sf 69.35% Impervious Runoff Depth>1.99" Flow Length=167' Slope=0.0500 '/' Tc=11.1 min CN=88 Runoff=1.13 cfs 4,179 cf |
| SubcatchmentA1B-OFF: A1B-OFF | Runoff Area=56,019 sf 42.72% Impervious Runoff Depth>0.73" Flow Length=155' Tc=16.0 min CN=68 Runoff=0.69 cfs 3,404 cf |
| SubcatchmentA1C-OFF: A1C-OFF | Runoff Area=46,934 sf 12.59% Impervious Runoff Depth>0.17" Flow Length=210' Slope=0.0500 '/' Tc=17.3 min CN=52 Runoff=0.05 cfs 671 cf |
| SubcatchmentA2-PR: A2-PR | Runoff Area=17,456 sf 78.92% Impervious Runoff Depth>2.00" Tc=6.0 min CN=88 Runoff=0.93 cfs 2,902 cf |
| SubcatchmentA3-PR: A3-PR | Runoff Area=24,201 sf 86.59% Impervious Runoff Depth>2.26" Tc=6.0 min CN=91 Runoff=1.43 cfs 4,551 cf |
| SubcatchmentA4-OFF: A4-OFF | Runoff Area=8,837 sf 0.00% Impervious Runoff Depth>0.56" Flow Length=50' Slope=0.0300 '/' Tc=12.0 min CN=64 Runoff=0.08 cfs 410 cf |
| SubcatchmentA5A-PR: A5A-PR | Runoff Area=9,403 sf 9.70% Impervious Runoff Depth>0.02" Flow Length=150' Tc=15.7 min CN=43 Runoff=0.00 cfs 17 cf |
| SubcatchmentA5B-PR: A5B-PR | Runoff Area=11,418 sf 0.00% Impervious Runoff Depth>0.01" Flow Length=266' Tc=11.7 min CN=41 Runoff=0.00 cfs 7 cf |
| SubcatchmentA5C-PR: A5C-PR | Runoff Area=13,025 sf 0.00% Impervious Runoff Depth>0.01" Flow Length=150' Tc=9.0 min CN=42 Runoff=0.00 cfs 14 cf |
| SubcatchmentA6-PR: A6-PR | Runoff Area=12,206 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=0.86 cfs 3,016 cf |
| SubcatchmentA7-PR: A7-PR | Runoff Area=14,737 sf 54.20% Impervious Runoff Depth>1.15" Tc=6.0 min CN=76 Runoff=0.44 cfs 1,413 cf |
| SubcatchmentA8-PR: A8-PR | Runoff Area=7,290 sf 100.00% Impervious Runoff Depth>2.97" Tc=6.0 min CN=98 Runoff=0.52 cfs 1,802 cf |
| SubcatchmentA9-PR: A9-PR | Runoff Area=13,223 sf 0.00% Impervious Runoff Depth>0.02" Flow Length=295' Tc=20.4 min CN=43 Runoff=0.00 cfs 23 cf |

Reach 1R: Open Channel Avg. Flow Depth=0.01' Max Vel=1.39 fps Inflow=0.08 cfs 410 cf
n=0.016 L=90.0' S=0.1111 '/' Capacity=1,239.89 cfs Outflow=0.08 cfs 410 cf

Reach 2R: Open Channel Avg. Flow Depth=0.07' Max Vel=2.13 fps Inflow=0.69 cfs 3,404 cf
n=0.016 L=153.0' S=0.0386 '/' Capacity=589.74 cfs Outflow=0.68 cfs 3,399 cf

Reach 3R: Routing Avg. Flow Depth=0.01' Max Vel=0.54 fps Inflow=0.00 cfs 40 cf
n=0.016 L=400.0' S=0.0500 '/' Capacity=102.34 cfs Outflow=0.00 cfs 39 cf

Reach 4R: 12" Pipe Avg. Flow Depth=0.28' Max Vel=3.73 fps Inflow=0.68 cfs 3,406 cf
12.0" Round Pipe n=0.012 L=44.0' S=0.0102 '/' Capacity=3.90 cfs Outflow=0.68 cfs 3,405 cf

Reach 5R: 18" Pipe Avg. Flow Depth=0.34' Max Vel=5.71 fps Inflow=1.70 cfs 8,685 cf
18.0" Round Pipe n=0.012 L=157.0' S=0.0182 '/' Capacity=15.33 cfs Outflow=1.69 cfs 8,680 cf

Reach 6R: 18" Pipe Avg. Flow Depth=0.33' Max Vel=5.87 fps Inflow=1.69 cfs 8,680 cf
18.0" Round Pipe n=0.012 L=48.0' S=0.0198 '/' Capacity=16.01 cfs Outflow=1.68 cfs 8,679 cf

Reach 7R: 12" Pipe Avg. Flow Depth=0.07' Max Vel=1.79 fps Inflow=0.05 cfs 685 cf
12.0" Round Pipe n=0.012 L=37.0' S=0.0122 '/' Capacity=4.26 cfs Outflow=0.05 cfs 685 cf

Reach 8R: 12" Pipe Avg. Flow Depth=0.32' Max Vel=5.59 fps Inflow=1.19 cfs 4,606 cf
12.0" Round Pipe n=0.012 L=221.0' S=0.0204 '/' Capacity=5.51 cfs Outflow=1.18 cfs 4,603 cf

Reach 9R: 18" Pipe Avg. Flow Depth=0.39' Max Vel=4.63 fps Inflow=1.71 cfs 8,008 cf
18.0" Round Pipe n=0.012 L=220.0' S=0.0100 '/' Capacity=11.38 cfs Outflow=1.69 cfs 8,000 cf

Pond A2-P: CHAMBERS Peak Elev=16.49' Storage=4,814 cf Inflow=4.86 cfs 15,829 cf
Discarded=0.69 cfs 15,823 cf Primary=0.00 cfs 0 cf Outflow=0.69 cfs 15,823 cf

Pond A3-P: CHAMBERS Peak Elev=15.19' Storage=121 cf Inflow=0.22 cfs 697 cf
Discarded=0.07 cfs 697 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 697 cf

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM Inflow=1.92 cfs 10,154 cf
Primary=1.92 cfs 10,154 cf

Link DMH-A2: DMH-A2 Inflow=1.69 cfs 8,680 cf
Primary=1.69 cfs 8,680 cf

Link DMH-A3: DMH-A3 Inflow=1.70 cfs 8,685 cf
Primary=1.70 cfs 8,685 cf

Link DMH-A4: DMH-A4 Inflow=1.71 cfs 8,008 cf
Primary=1.71 cfs 8,008 cf

Total Runoff Area = 290,230 sf Runoff Volume = 26,704 cf Average Runoff Depth = 1.10"
55.09% Pervious = 159,896 sf 44.91% Impervious = 130,334 sf

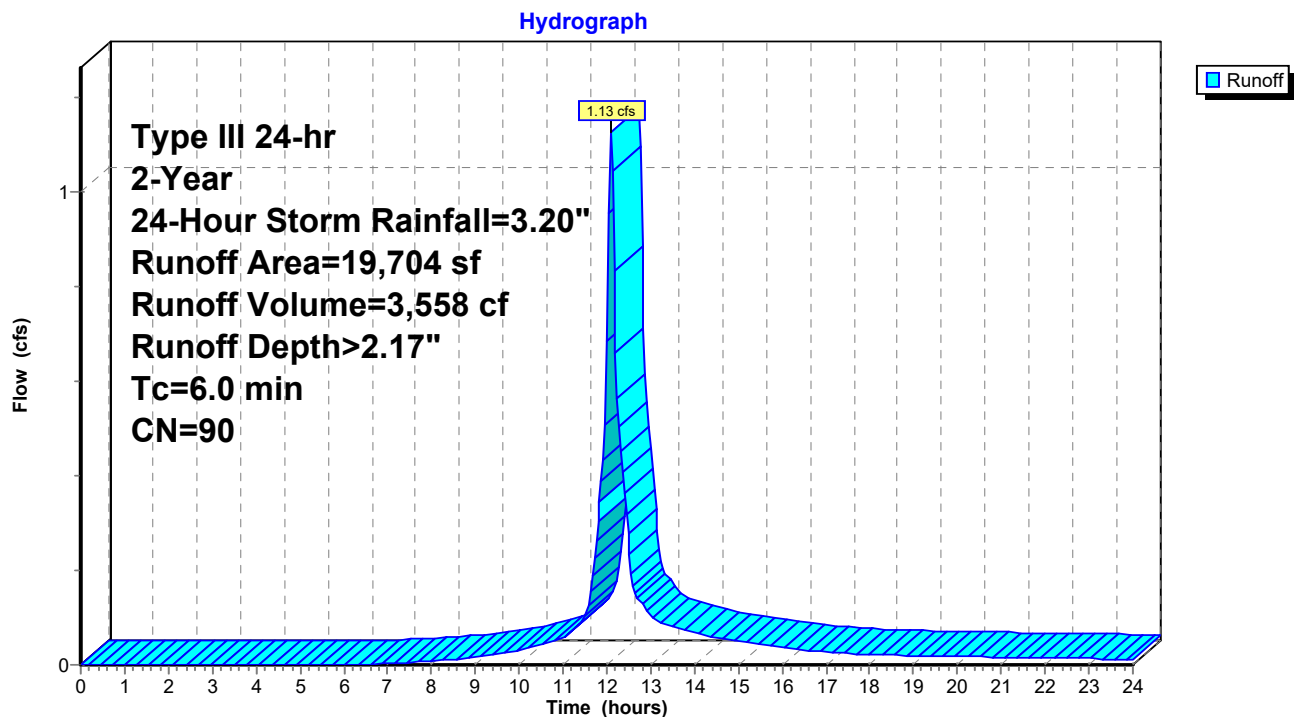
Summary for Subcatchment A10-PR: A10-PR

Runoff = 1.13 cfs @ 12.09 hrs, Volume= 3,558 cf, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,128 | 98 | Roofs, HSG A |
| 12,397 | 98 | Paved parking, HSG A |
| 3,179 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 19,704 | 90 | Weighted Average |
| 3,179 | | 16.13% Pervious Area |
| 16,525 | | 83.87% Impervious Area |

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

Subcatchment A10-PR: A10-PR

Summary for Subcatchment A11-PR: A11-PR

Runoff = 0.00 cfs @ 14.79 hrs, Volume= 40 cf, Depth> 0.07"

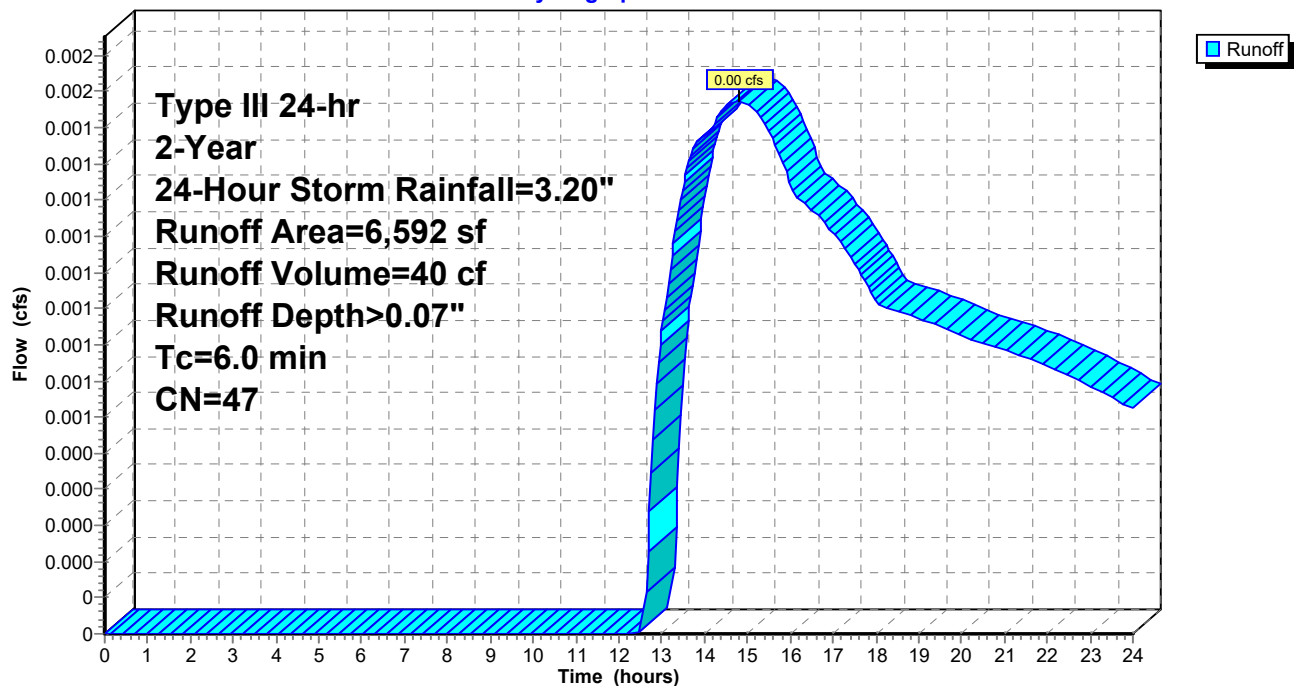
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 69 | 98 | Paved parking, HSG A |
| 5,348 | 49 | 50-75% Grass cover, Fair, HSG A |
| 1,175 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 6,592 | 47 | Weighted Average |
| 6,523 | | 98.95% Pervious Area |
| 69 | | 1.05% Impervious Area |

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

Subcatchment A11-PR: A11-PR

Hydrograph



Summary for Subcatchment A12-PR: A12-PR

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 697 cf, Depth> 2.08"

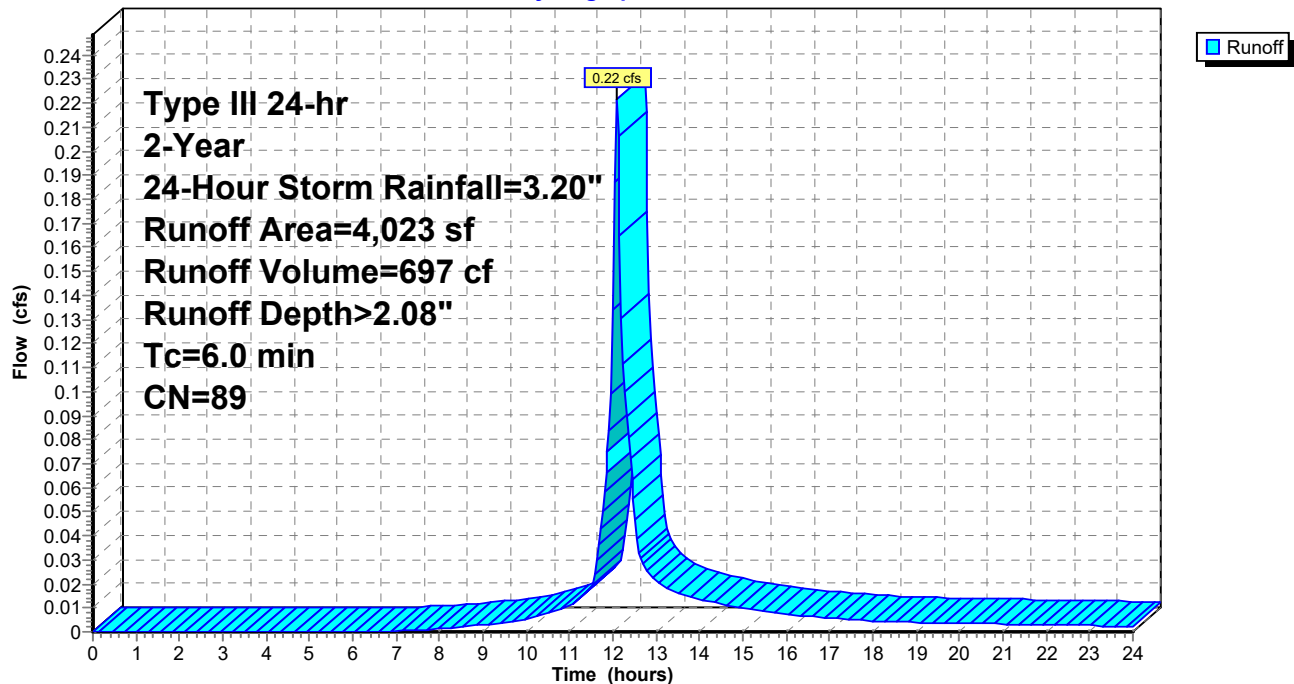
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 208 | 98 | Roofs, HSG A |
| 3,112 | 98 | Paved parking, HSG A |
| 703 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 4,023 | 89 | Weighted Average |
| 703 | | 17.47% Pervious Area |
| 3,320 | | 82.53% Impervious Area |

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

Subcatchment A12-PR: A12-PR

Hydrograph



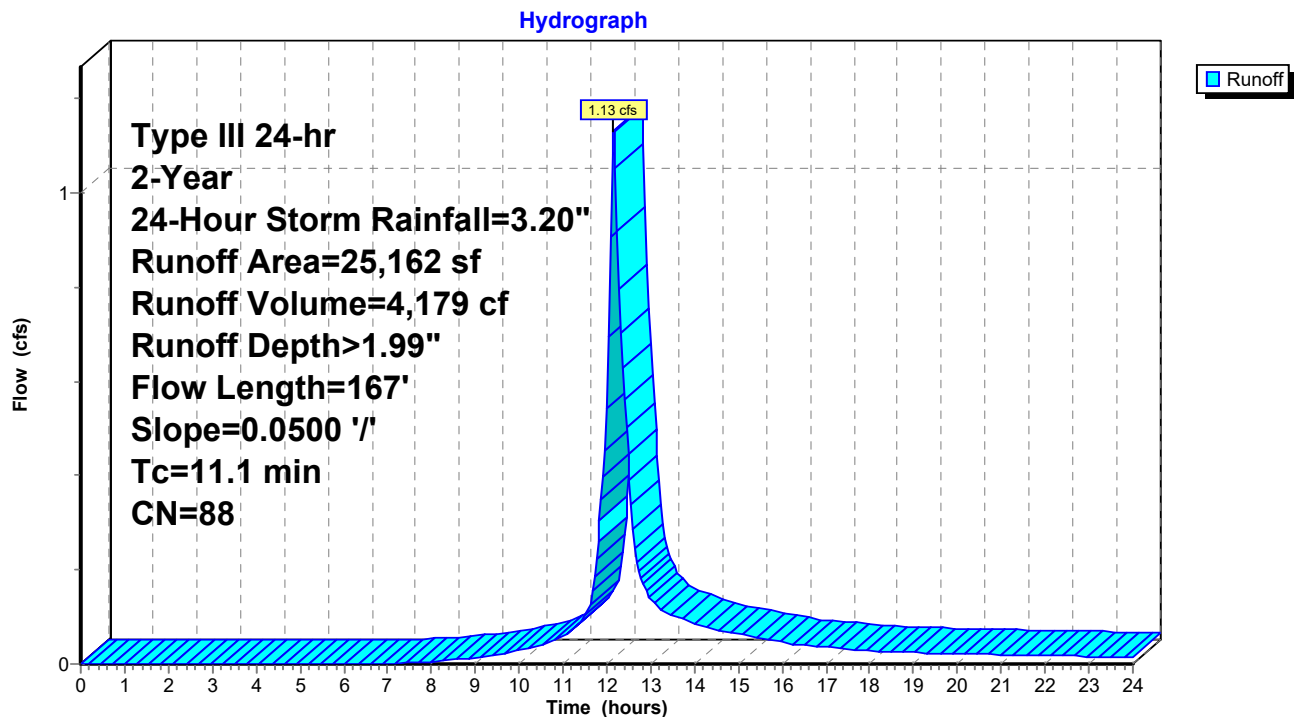
Summary for Subcatchment A1A-OFF: A1A-OFF

Runoff = 1.13 cfs @ 12.16 hrs, Volume= 4,179 cf, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 3,405 | 98 | Roofs, HSG A |
| 14,045 | 98 | Paved parking, HSG A |
| 1,238 | 49 | 50-75% Grass cover, Fair, HSG A |
| 3,513 | 43 | Woods/grass comb., Fair, HSG A |
| 2,961 | 96 | Gravel surface, HSG A |
| 25,162 | 88 | Weighted Average |
| 7,712 | | 30.65% Pervious Area |
| 17,450 | | 69.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.2 | 25 | 0.0500 | 0.19 | | Sheet Flow, SHEET FLOW Grass: Short n= 0.150 P2= 3.20" |
| 8.5 | 25 | 0.0500 | 0.05 | | Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.4 | 117 | 0.0500 | 4.54 | | Shallow Concentrated Flow, shallow conc. flow Paved Kv= 20.3 fps |
| 11.1 | 167 | Total | | | |

Subcatchment A1A-OFF: A1A-OFF

Summary for Subcatchment A1B-OFF: A1B-OFF

Runoff = 0.69 cfs @ 12.26 hrs, Volume= 3,404 cf, Depth> 0.73"

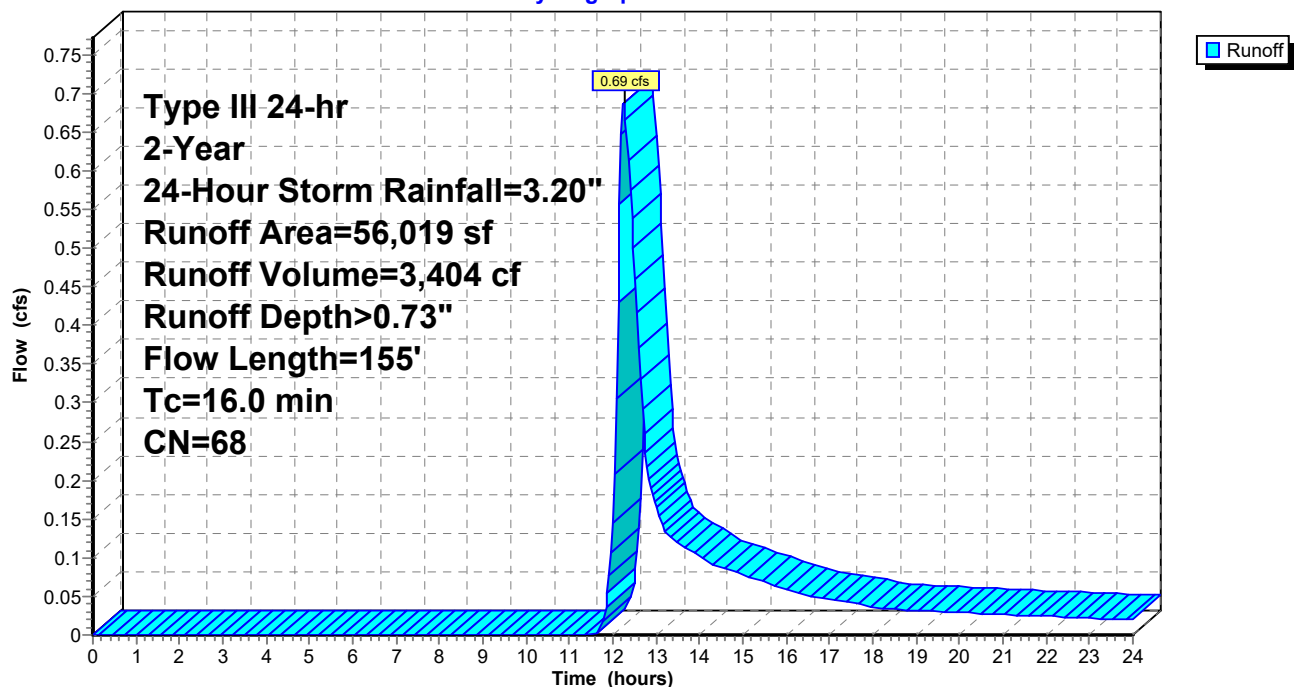
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 5,821 | 98 | Roofs, HSG A |
| 18,112 | 98 | Paved parking, HSG A |
| 13,113 | 49 | 50-75% Grass cover, Fair, HSG A |
| 18,973 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 56,019 | 68 | Weighted Average |
| 32,086 | | 57.28% Pervious Area |
| 23,933 | | 42.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.1 | 105 | 0.1090 | 1.65 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 16.0 | 155 | Total | | | |

Subcatchment A1B-OFF: A1B-OFF

Hydrograph



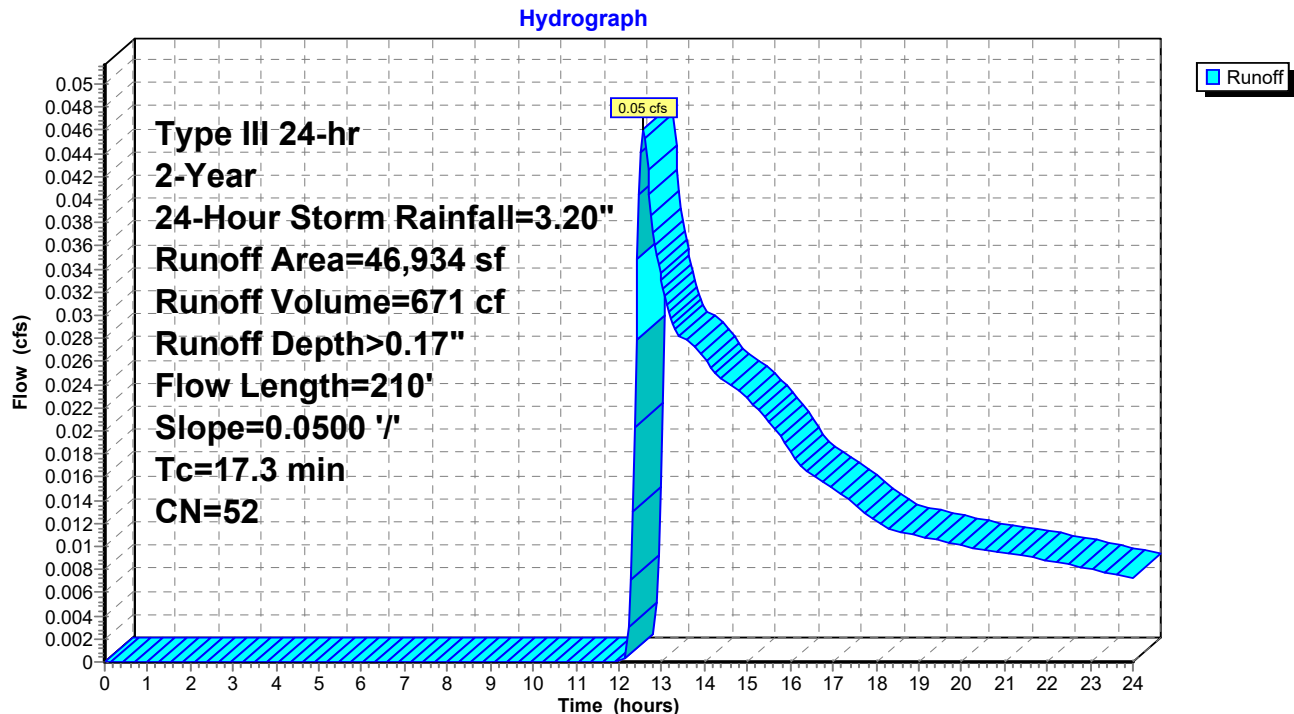
Summary for Subcatchment A1C-OFF: A1C-OFF

Runoff = 0.05 cfs @ 12.58 hrs, Volume= 671 cf, Depth> 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,043 | 98 | Roofs, HSG A |
| 1,867 | 98 | Paved parking, HSG A |
| 14,063 | 49 | 50-75% Grass cover, Fair, HSG A |
| 26,961 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 46,934 | 52 | Weighted Average |
| 41,024 | | 87.41% Pervious Area |
| 5,910 | | 12.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 2.4 | 160 | 0.0500 | 1.12 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 17.3 | 210 | Total | | | |

Subcatchment A1C-OFF: A1C-OFF

Summary for Subcatchment A2-PR: A2-PR

Runoff = 0.93 cfs @ 12.09 hrs, Volume= 2,902 cf, Depth> 2.00"

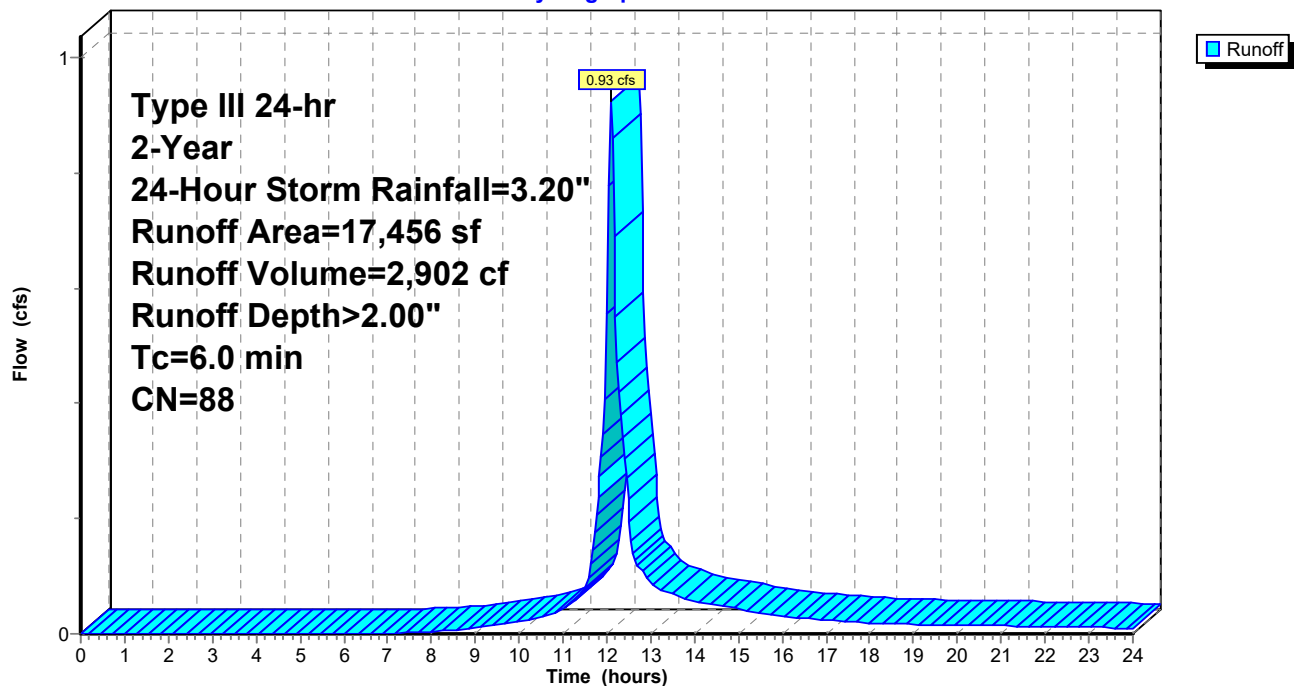
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 13,777 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,679 | 49 | 50-75% Grass cover, Fair, HSG A |
| 17,456 | 88 | Weighted Average |
| 3,679 | | 21.08% Pervious Area |
| 13,777 | | 78.92% Impervious Area |

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

Subcatchment A2-PR: A2-PR

Hydrograph



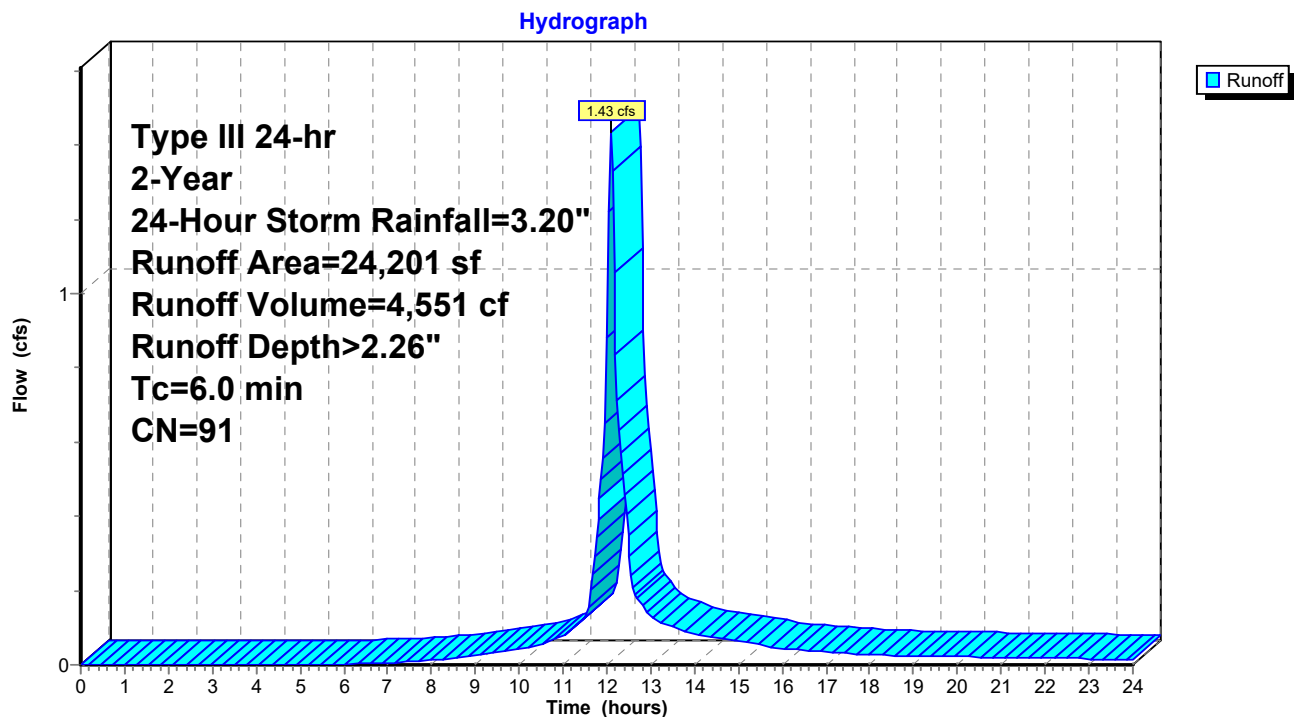
Summary for Subcatchment A3-PR: A3-PR

Runoff = 1.43 cfs @ 12.09 hrs, Volume= 4,551 cf, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 20,955 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,246 | 49 | 50-75% Grass cover, Fair, HSG A |
| 24,201 | 91 | Weighted Average |
| 3,246 | | 13.41% Pervious Area |
| 20,955 | | 86.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A3-PR: A3-PR

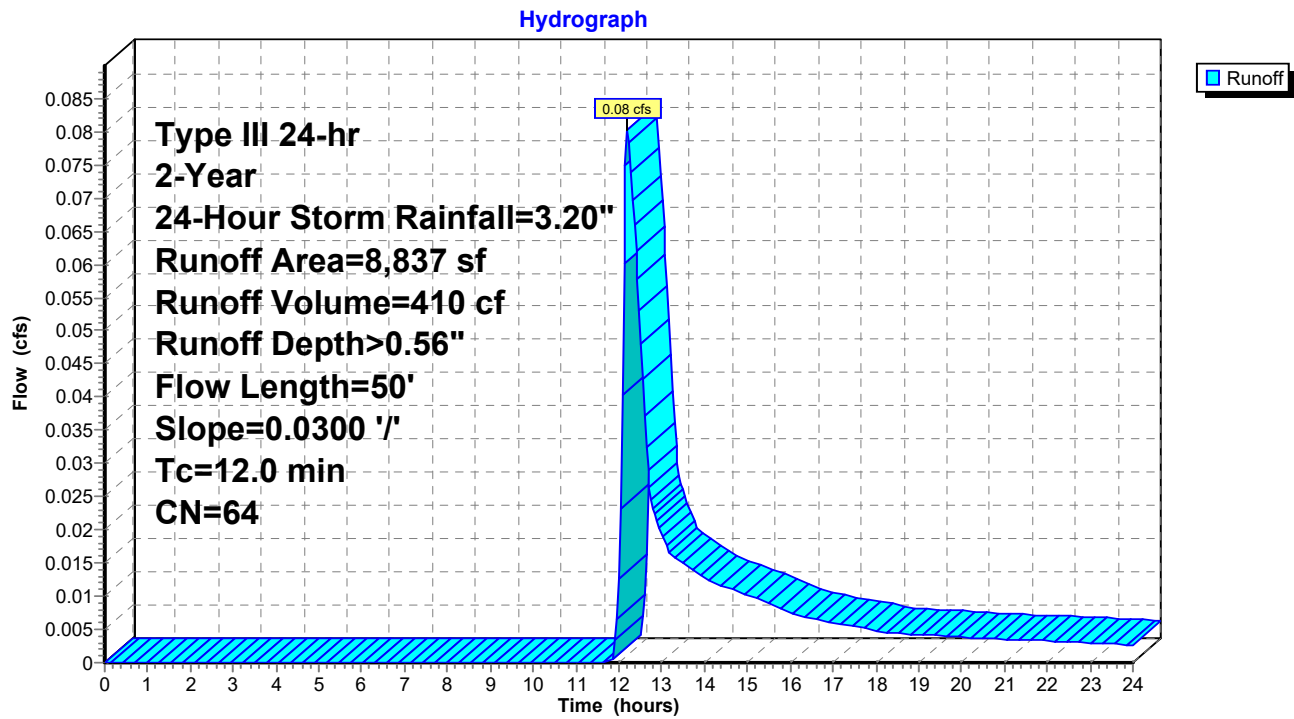
Summary for Subcatchment A4-OFF: A4-OFF

Runoff = 0.08 cfs @ 12.21 hrs, Volume= 410 cf, Depth> 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 4,743 | 36 | Woods, Fair, HSG A |
| 4,094 | 96 | Gravel surface, HSG A |
| 8,837 | 64 | Weighted Average |
| 8,837 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 3.2 | 30 | 0.0300 | 0.16 | | Sheet Flow, SHEET FLOW |
| | | | | | Grass: Short n= 0.150 P2= 3.20" |
| 8.8 | 20 | 0.0300 | 0.04 | | Sheet Flow, |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 12.0 | 50 | Total | | | |

Subcatchment A4-OFF: A4-OFF

Summary for Subcatchment A5A-PR: A5A-PR

Runoff = 0.00 cfs @ 17.31 hrs, Volume= 17 cf, Depth> 0.02"

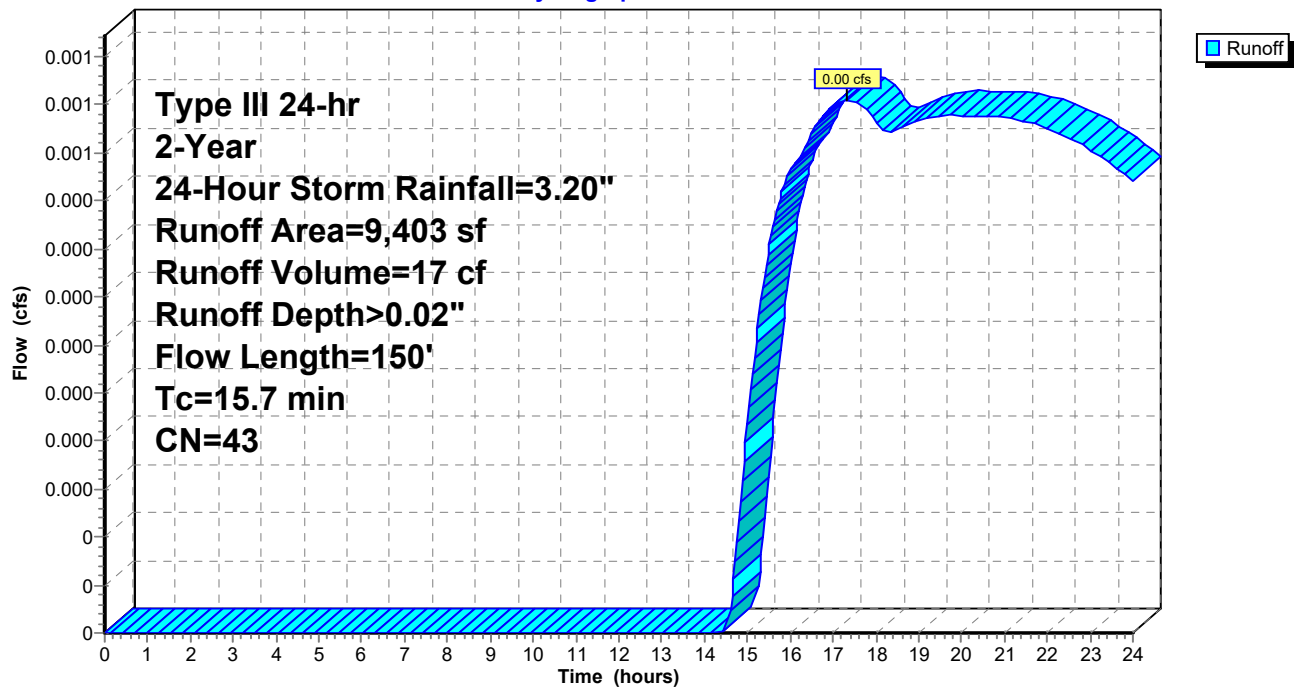
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 912 | 98 | Paved parking, HSG A |
| 587 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,904 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 9,403 | 43 | Weighted Average |
| 8,491 | | 90.30% Pervious Area |
| 912 | | 9.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 15.7 | 150 | Total | | | |

Subcatchment A5A-PR: A5A-PR

Hydrograph



Summary for Subcatchment A5B-PR: A5B-PR

Runoff = 0.00 cfs @ 22.80 hrs, Volume= 7 cf, Depth> 0.01"

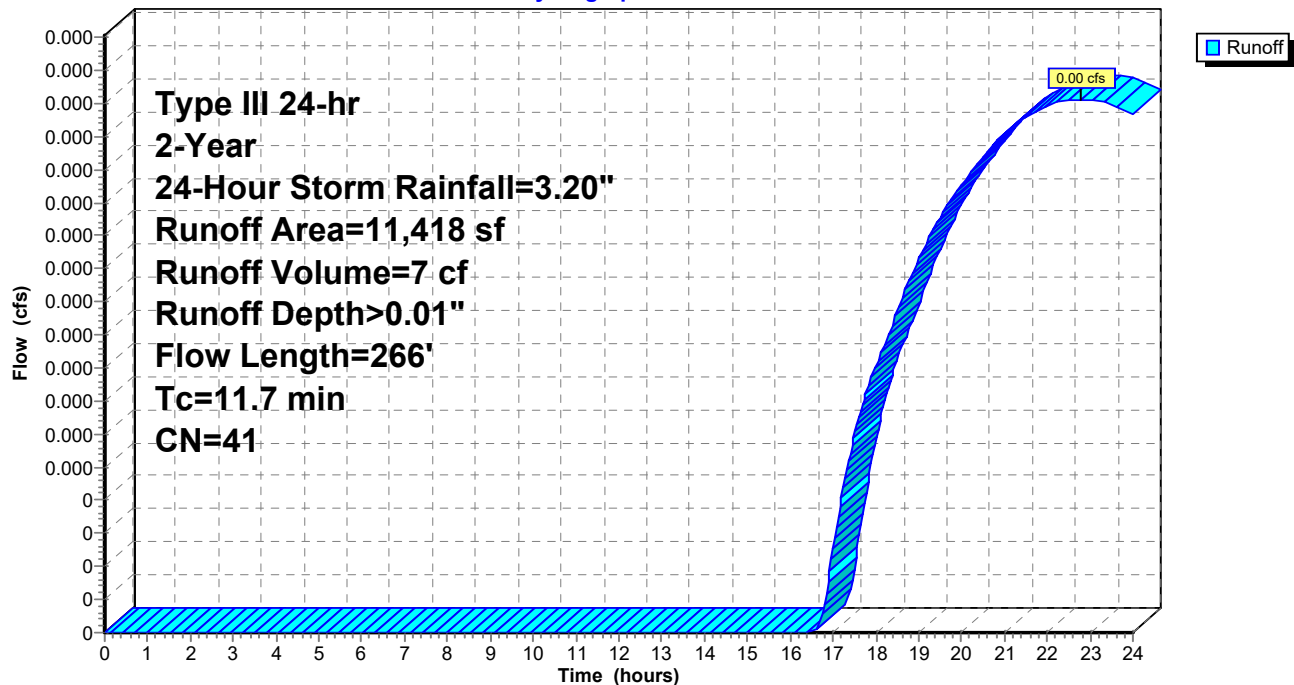
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

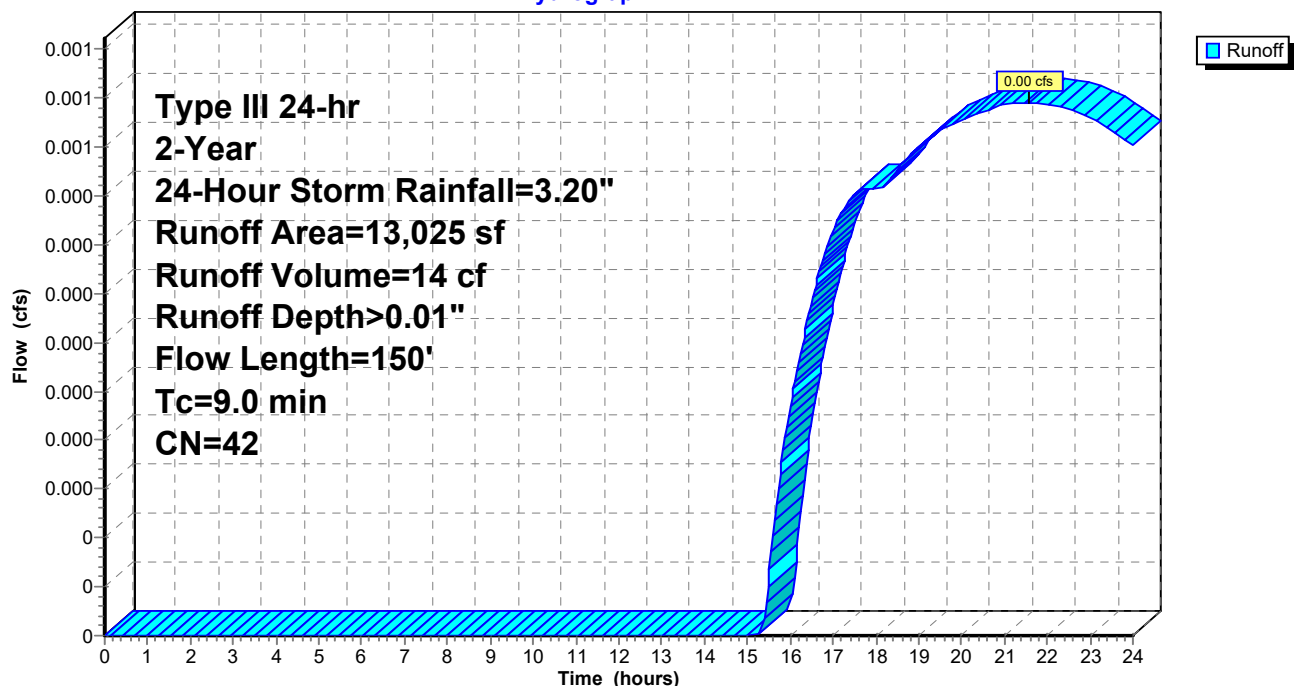
| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 4,051 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,367 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 11,418 | 41 | Weighted Average |
| 11,418 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.6 | 50 | 0.1500 | 0.09 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.4 | 133 | 0.1060 | 1.63 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 0.7 | 83 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 11.7 | 266 | Total | | | |

Subcatchment A5B-PR: A5B-PR

Hydrograph





Summary for Subcatchment A6-PR: A6-PR

Runoff = 0.86 cfs @ 12.08 hrs, Volume= 3,016 cf, Depth> 2.97"

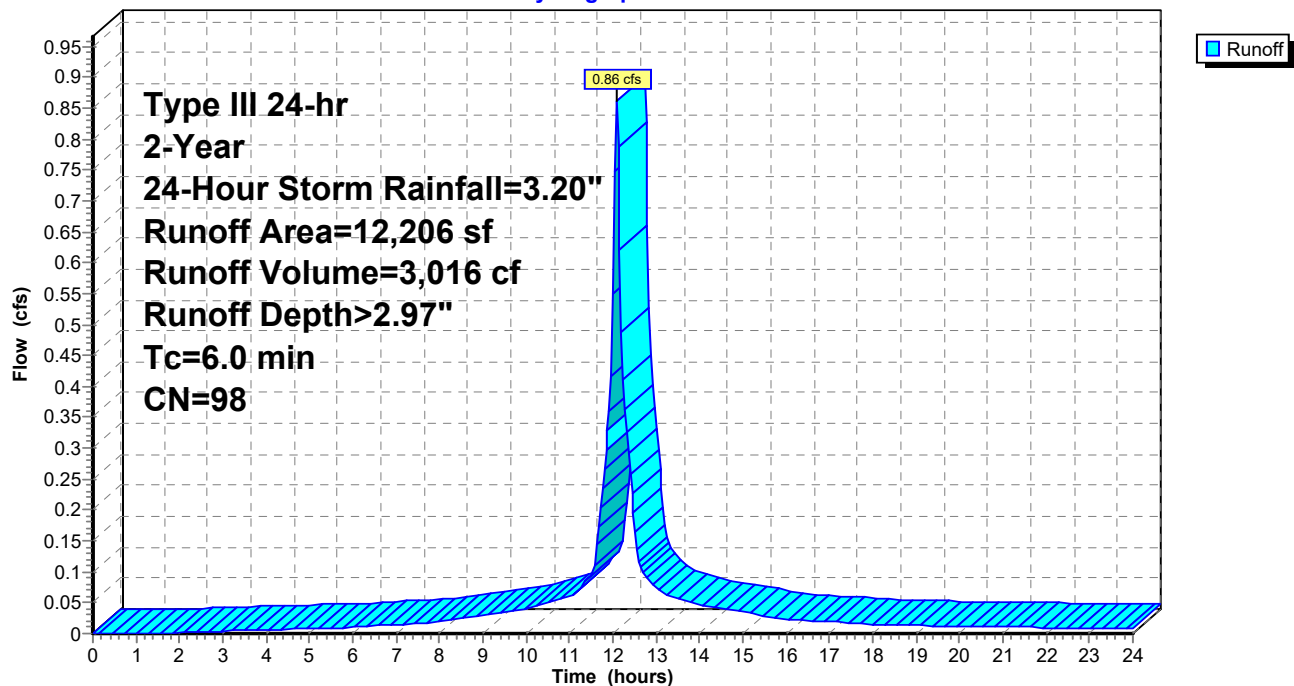
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Paved parking, HSG A |
| 12,206 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 12,206 | 98 | Weighted Average |
| 12,206 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A6-PR: A6-PR

Hydrograph



Summary for Subcatchment A7-PR: A7-PR

Runoff = 0.44 cfs @ 12.10 hrs, Volume= 1,413 cf, Depth> 1.15"

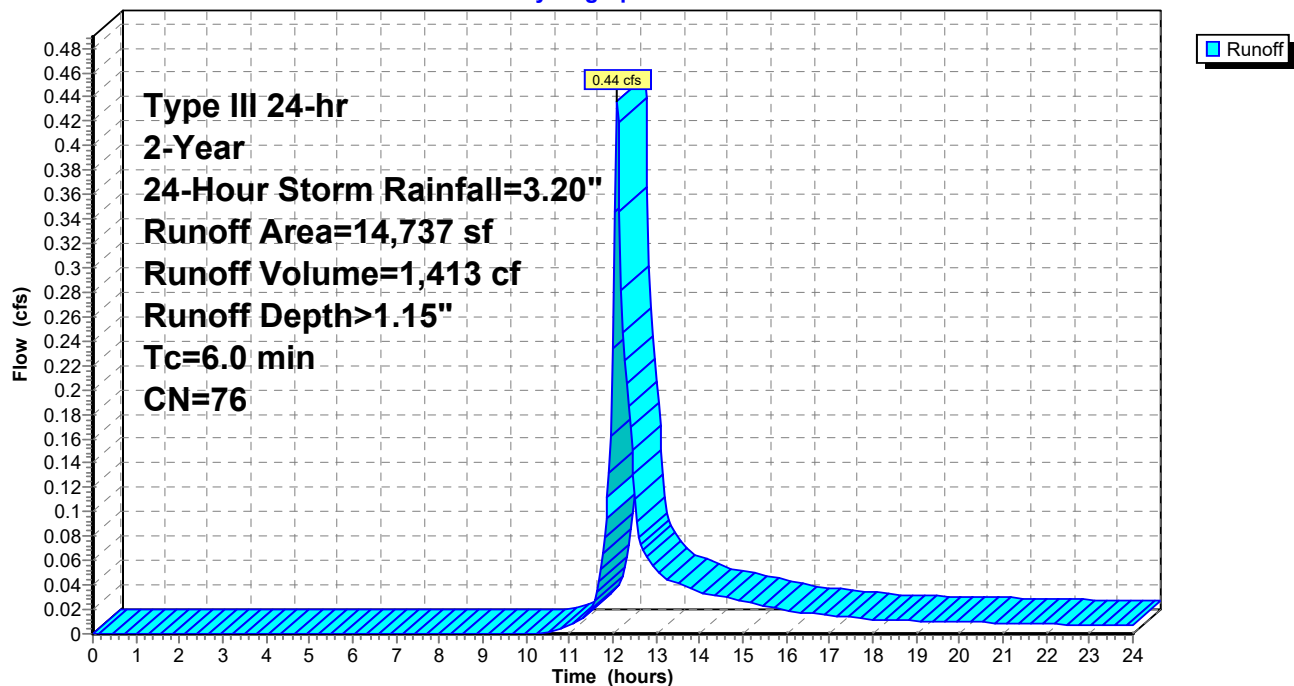
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,643 | 98 | Roofs, HSG A |
| 3,344 | 98 | Paved parking, HSG A |
| 6,750 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 14,737 | 76 | Weighted Average |
| 6,750 | | 45.80% Pervious Area |
| 7,987 | | 54.20% Impervious Area |

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

Subcatchment A7-PR: A7-PR

Hydrograph



Summary for Subcatchment A8-PR: A8-PR

Runoff = 0.52 cfs @ 12.08 hrs, Volume= 1,802 cf, Depth> 2.97"

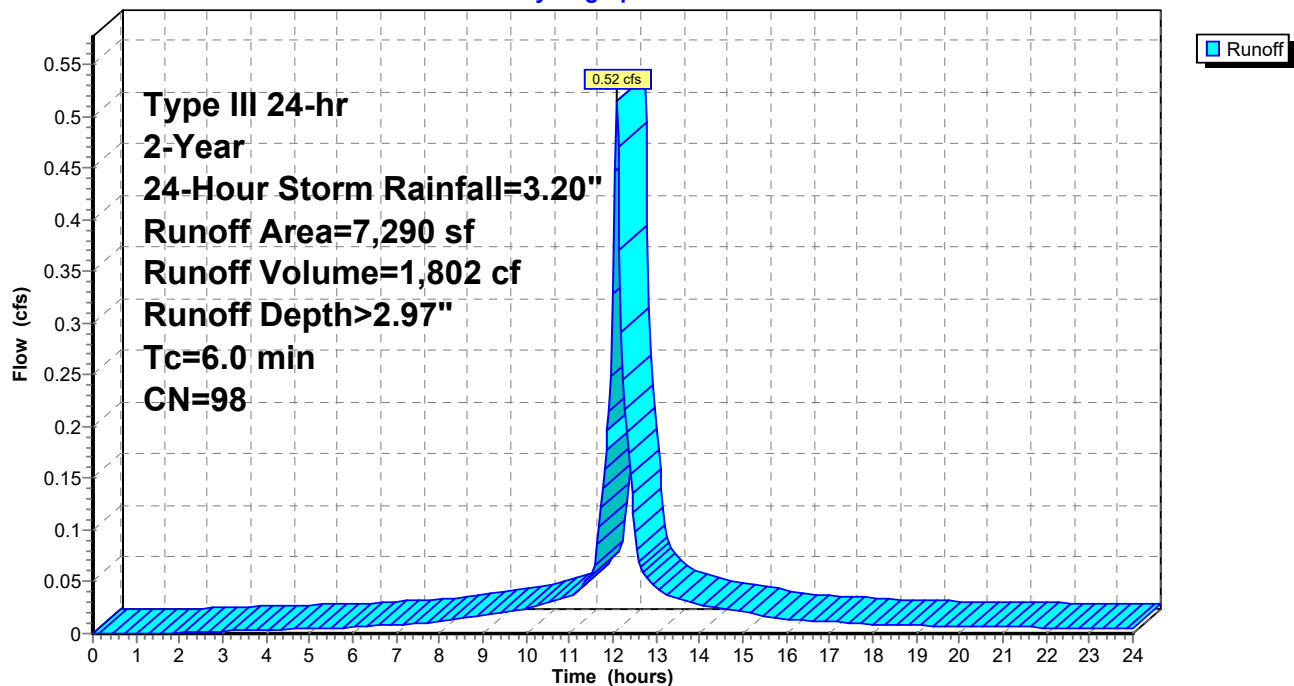
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 7,290 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 7,290 | 98 | Weighted Average |
| 7,290 | | 100.00% Impervious Area |

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

Subcatchment A8-PR: A8-PR

Hydrograph



Summary for Subcatchment A9-PR: A9-PR

Runoff = 0.00 cfs @ 17.40 hrs, Volume= 23 cf, Depth> 0.02"

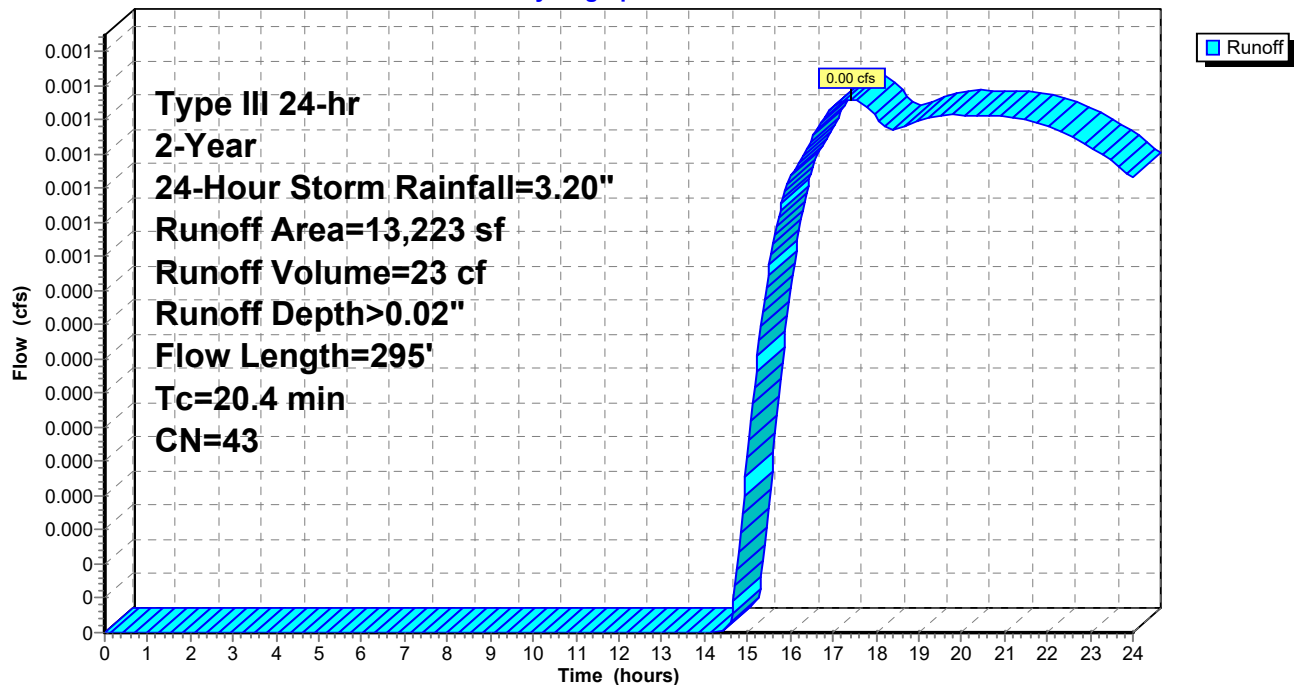
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Year, 24-Hour Storm Rainfall=3.20"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 7,203 | 49 | 50-75% Grass cover, Fair, HSG A |
| 6,020 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 13,223 | 43 | Weighted Average |
| 13,223 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 18.3 | 50 | 0.0300 | 0.05 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 1.3 | 145 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 20.4 | 295 | Total | | | |

Subcatchment A9-PR: A9-PR

Hydrograph



Summary for Reach 1R: Open Channel

Inflow Area = 8,837 sf, 0.00% Impervious, Inflow Depth > 0.56" for 2-Year, 24-Hour Storm event
 Inflow = 0.08 cfs @ 12.21 hrs, Volume= 410 cf
 Outflow = 0.08 cfs @ 12.25 hrs, Volume= 410 cf, Atten= 2%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 1.39 fps, Min. Travel Time= 1.1 min

Avg. Velocity= 1.39 fps, Avg. Travel Time= 1.1 min

Peak Storage= 5 cf @ 12.23 hrs

Average Depth at Peak Storage= 0.01'

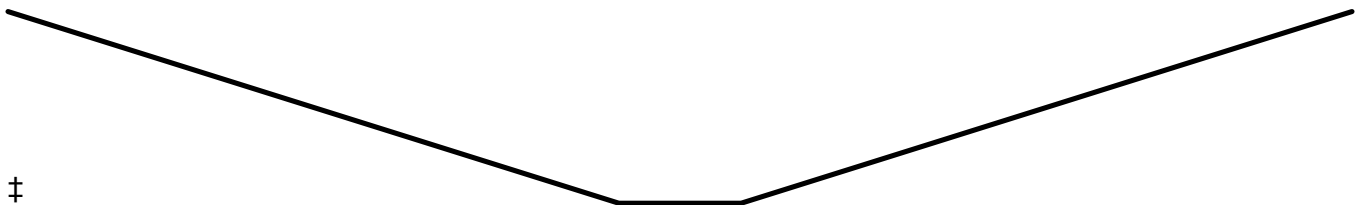
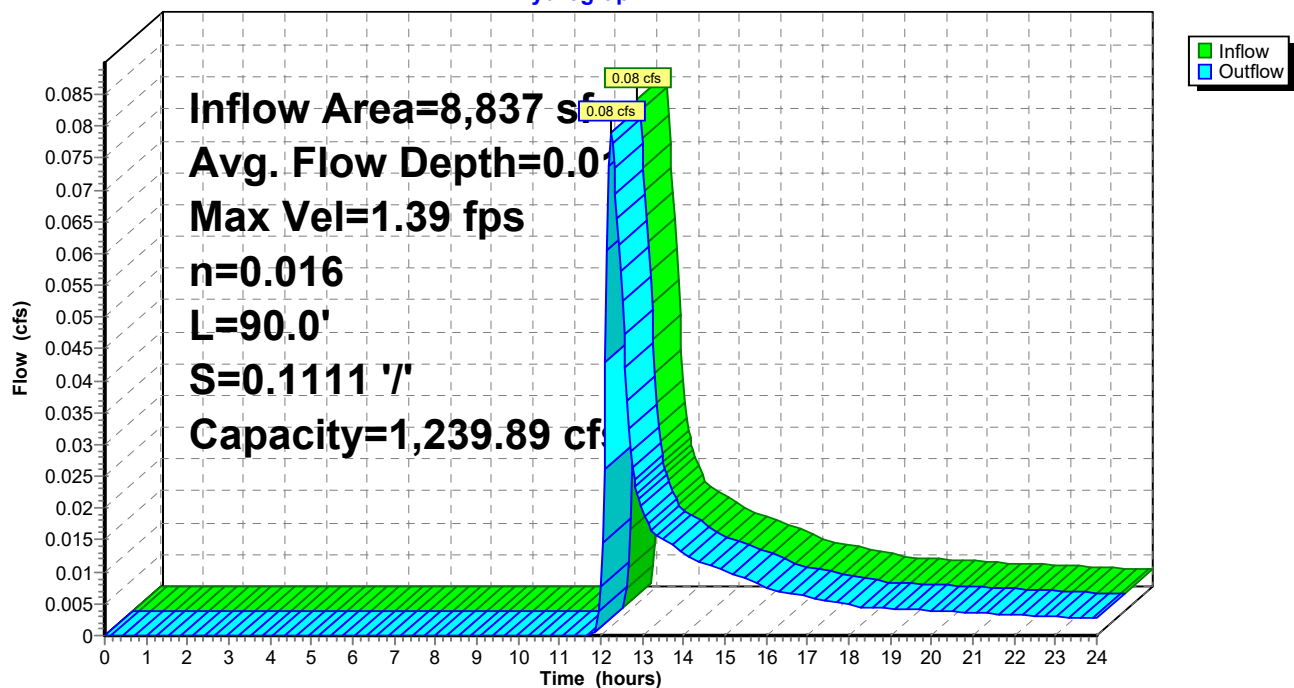
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 1,239.89 cfs

10.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 ' ' Top Width= 110.00'

Length= 90.0' Slope= 0.1111 ' '

Inlet Invert= 35.00', Outlet Invert= 25.00'

**Reach 1R: Open Channel****Hydrograph**

Summary for Reach 2R: Open Channel

Inflow Area = 56,019 sf, 42.72% Impervious, Inflow Depth > 0.73" for 2-Year, 24-Hour Storm event
 Inflow = 0.69 cfs @ 12.26 hrs, Volume= 3,404 cf
 Outflow = 0.68 cfs @ 12.30 hrs, Volume= 3,399 cf, Atten= 1%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 2.13 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 1.11 fps, Avg. Travel Time= 2.3 min

Peak Storage= 49 cf @ 12.27 hrs

Average Depth at Peak Storage= 0.07'

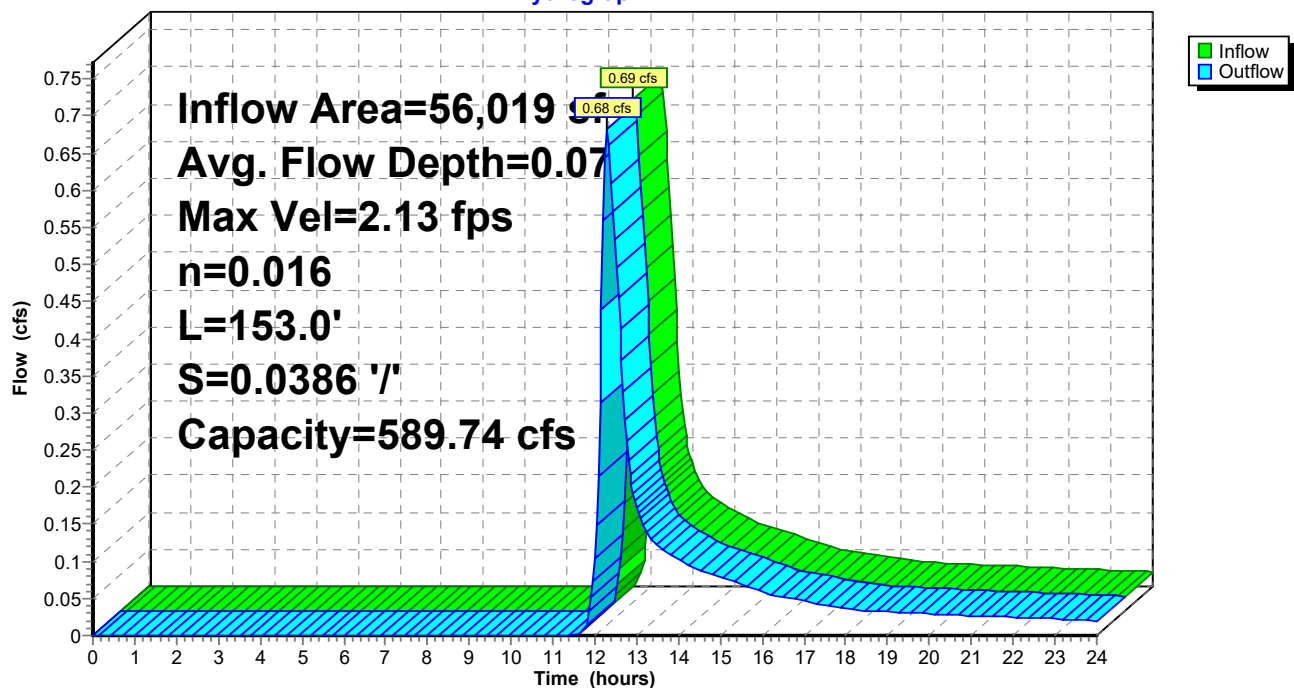
Bank-Full Depth= 1.00' Flow Area= 51.0 sf, Capacity= 589.74 cfs

1.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 '/' Top Width= 101.00'

Length= 153.0' Slope= 0.0386 '/'

Inlet Invert= 30.90', Outlet Invert= 25.00'

**Reach 2R: Open Channel****Hydrograph**

Summary for Reach 3R: Routing

Inflow Area = 6,592 sf, 1.05% Impervious, Inflow Depth > 0.07" for 2-Year, 24-Hour Storm event
 Inflow = 0.00 cfs @ 14.79 hrs, Volume= 40 cf
 Outflow = 0.00 cfs @ 15.16 hrs, Volume= 39 cf, Atten= 0%, Lag= 22.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 0.54 fps, Min. Travel Time= 12.3 min

Avg. Velocity= 0.48 fps, Avg. Travel Time= 13.8 min

Peak Storage= 1 cf @ 14.96 hrs

Average Depth at Peak Storage= 0.01'

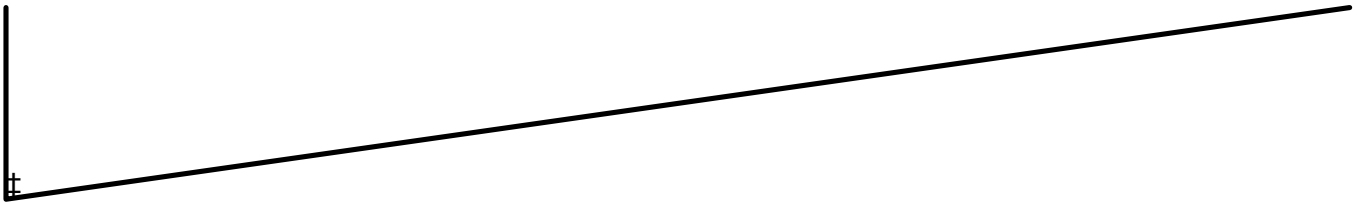
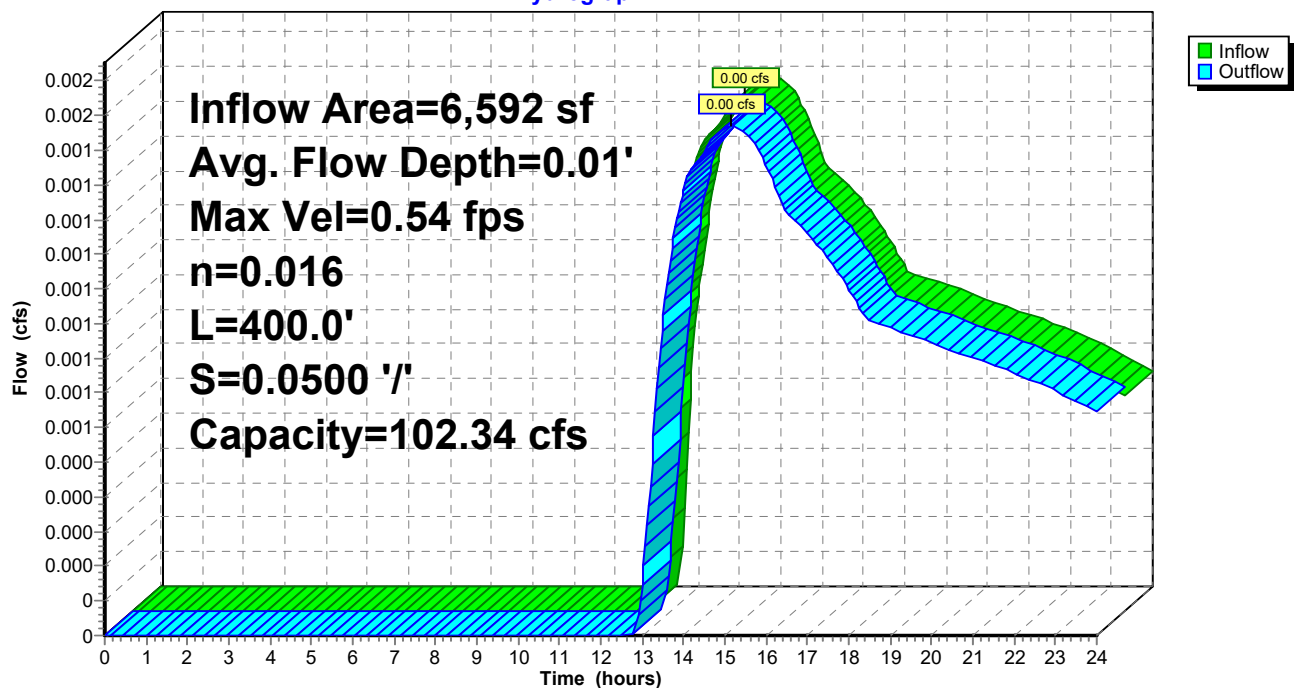
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 102.34 cfs

0.00' x 0.50' deep channel, n= 0.016

Side Slope Z-value= 0.0 100.0 '/' Top Width= 50.00'

Length= 400.0' Slope= 0.0500 '/'

Inlet Invert= 20.00', Outlet Invert= 0.00'

**Reach 3R: Routing****Hydrograph**

Summary for Reach 4R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 67,437 sf, 35.49% Impervious, Inflow Depth > 0.61" for 2-Year, 24-Hour Storm event
 Inflow = 0.68 cfs @ 12.30 hrs, Volume= 3,406 cf
 Outflow = 0.68 cfs @ 12.30 hrs, Volume= 3,405 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 3.73 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 1.75 fps, Avg. Travel Time= 0.4 min

Peak Storage= 8 cf @ 12.30 hrs

Average Depth at Peak Storage= 0.28'

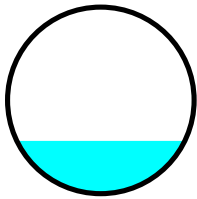
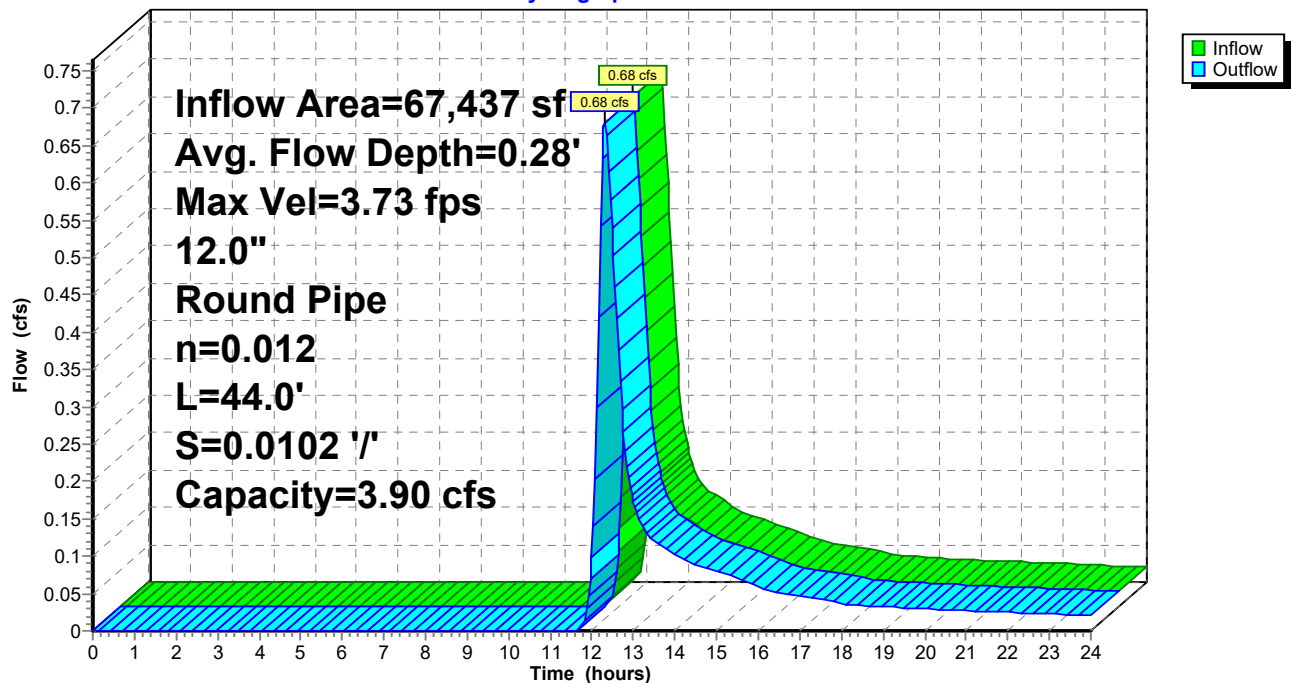
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.90 cfs

12.0" Round Pipe

n= 0.012

Length= 44.0' Slope= 0.0102 '/'

Inlet Invert= 18.65', Outlet Invert= 18.20'

**Reach 4R: 12" Pipe****Hydrograph**

Summary for Reach 5R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 0.41" for 2-Year, 24-Hour Storm event
 Inflow = 1.70 cfs @ 12.25 hrs, Volume= 8,685 cf
 Outflow = 1.69 cfs @ 12.26 hrs, Volume= 8,680 cf, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 5.71 fps, Min. Travel Time= 0.5 min

Avg. Velocity = 2.33 fps, Avg. Travel Time= 1.1 min

Peak Storage= 47 cf @ 12.25 hrs

Average Depth at Peak Storage= 0.34'

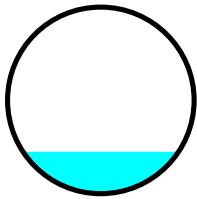
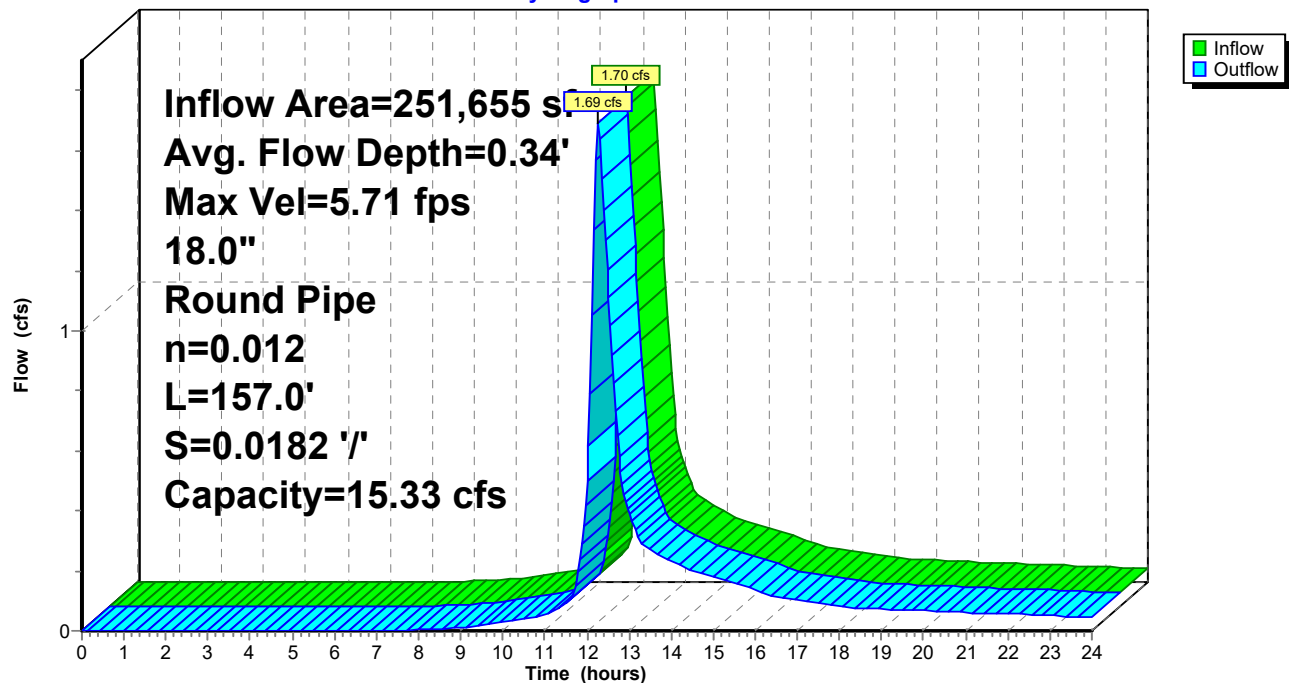
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.33 cfs

18.0" Round Pipe

n= 0.012

Length= 157.0' Slope= 0.0182 1/100

Inlet Invert= 14.55', Outlet Invert= 11.70'

**Reach 5R: 18" Pipe****Hydrograph**

Summary for Reach 6R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 0.41" for 2-Year, 24-Hour Storm event
 Inflow = 1.69 cfs @ 12.26 hrs, Volume= 8,680 cf
 Outflow = 1.68 cfs @ 12.26 hrs, Volume= 8,679 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 5.87 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.41 fps, Avg. Travel Time= 0.3 min

Peak Storage= 14 cf @ 12.26 hrs

Average Depth at Peak Storage= 0.33'

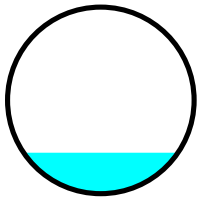
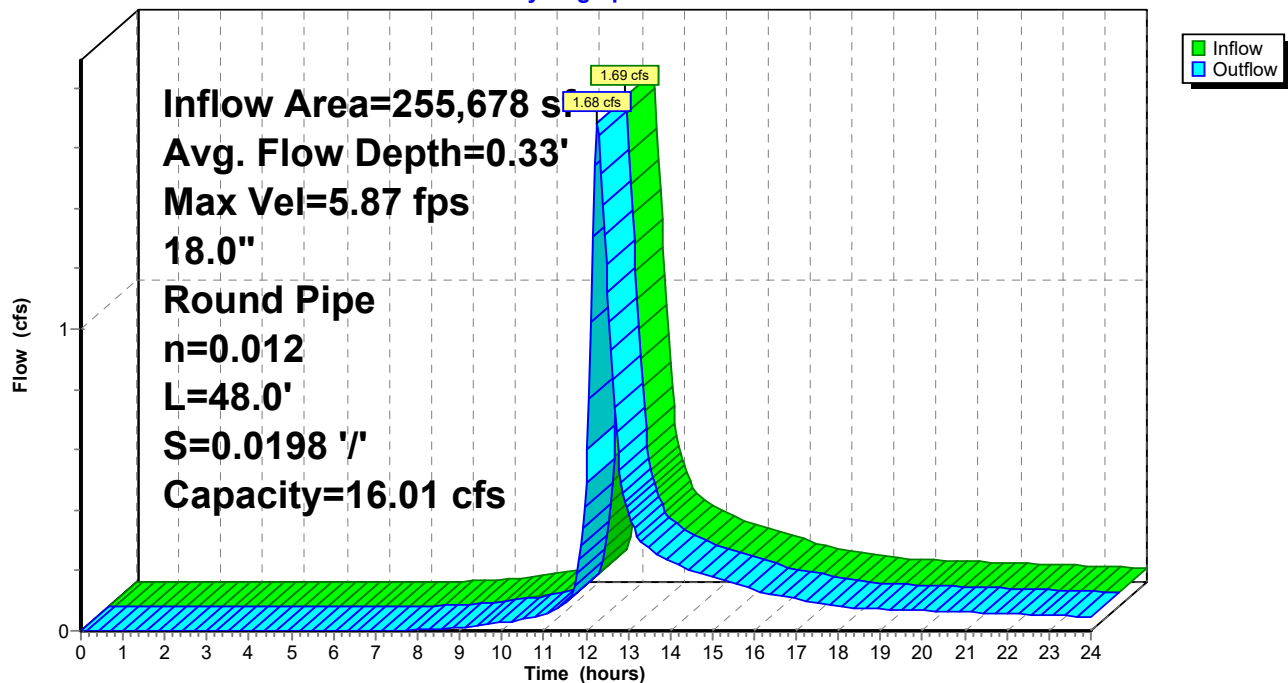
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 16.01 cfs

18.0" Round Pipe

n= 0.012

Length= 48.0' Slope= 0.0198 '/'

Inlet Invert= 11.70', Outlet Invert= 10.75'

**Reach 6R: 18" Pipe****Hydrograph**

Summary for Reach 7R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 59,959 sf, 9.86% Impervious, Inflow Depth > 0.14" for 2-Year, 24-Hour Storm event
 Inflow = 0.05 cfs @ 12.58 hrs, Volume= 685 cf
 Outflow = 0.05 cfs @ 12.59 hrs, Volume= 685 cf, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 1.79 fps, Min. Travel Time= 0.3 min

Avg. Velocity= 1.26 fps, Avg. Travel Time= 0.5 min

Peak Storage= 1 cf @ 12.58 hrs

Average Depth at Peak Storage= 0.07'

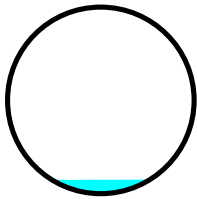
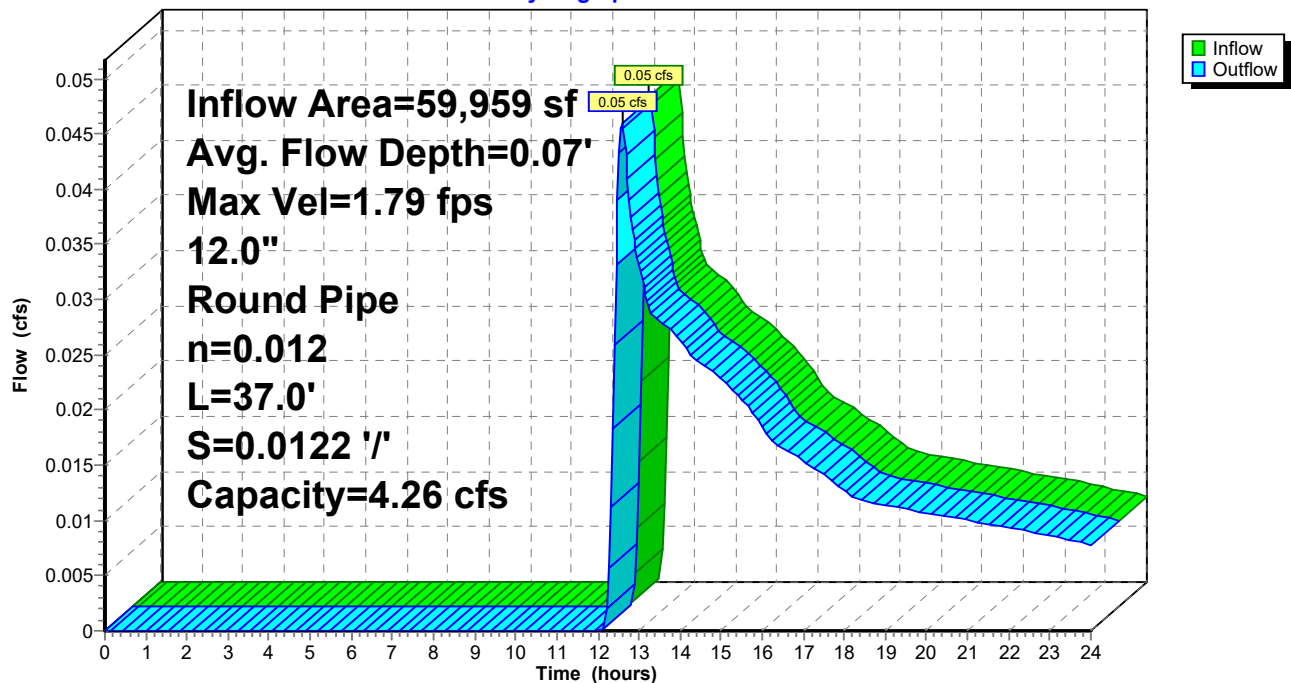
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe

n= 0.012

Length= 37.0' Slope= 0.0122 '/'

Inlet Invert= 18.00', Outlet Invert= 17.55'

**Reach 7R: 12" Pipe****Hydrograph**

Summary for Reach 8R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.31' @ 12.16 hrs

Inflow Area = 43,402 sf, 42.31% Impervious, Inflow Depth > 1.27" for 2-Year, 24-Hour Storm event
Inflow = 1.19 cfs @ 12.16 hrs, Volume= 4,606 cf
Outflow = 1.18 cfs @ 12.18 hrs, Volume= 4,603 cf, Atten= 1%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 5.59 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 2.09 fps, Avg. Travel Time= 1.8 min

Peak Storage= 47 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.32'

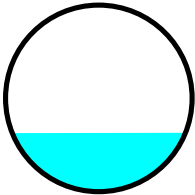
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.51 cfs

12.0" Round Pipe

n= 0.012

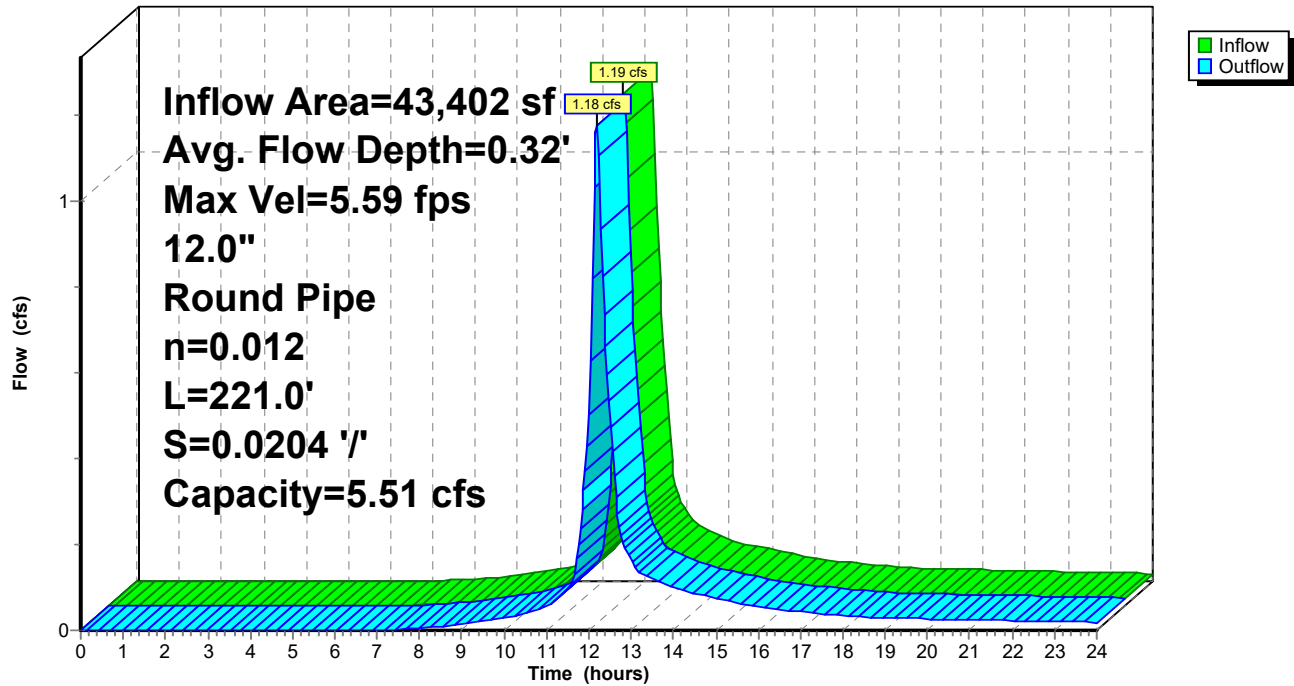
Length= 221.0' Slope= 0.0204 '/'

Inlet Invert= 25.00', Outlet Invert= 20.50'



Reach 8R: 12" Pipe

Hydrograph



Summary for Reach 9R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 0.87" for 2-Year, 24-Hour Storm event
 Inflow = 1.71 cfs @ 12.22 hrs, Volume= 8,008 cf
 Outflow = 1.69 cfs @ 12.24 hrs, Volume= 8,000 cf, Atten= 1%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 4.63 fps, Min. Travel Time= 0.8 min

Avg. Velocity= 1.83 fps, Avg. Travel Time= 2.0 min

Peak Storage= 81 cf @ 12.23 hrs

Average Depth at Peak Storage= 0.39'

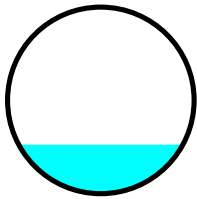
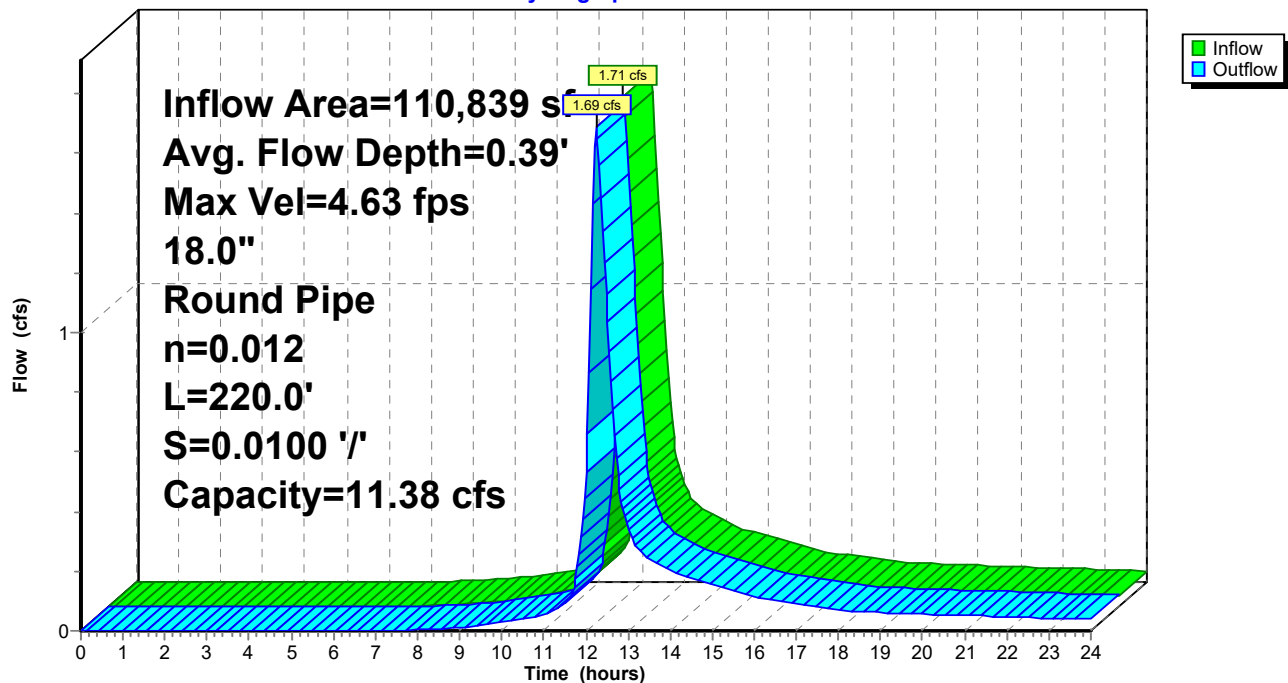
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.38 cfs

18.0" Round Pipe

n= 0.012

Length= 220.0' Slope= 0.0100 '/'

Inlet Invert= 16.75', Outlet Invert= 14.55'

**Reach 9R: 18" Pipe****Hydrograph**

Summary for Pond A2-P: CHAMBERS

Inflow Area = 80,857 sf, 87.50% Impervious, Inflow Depth > 2.35" for 2-Year, 24-Hour Storm event
 Inflow = 4.86 cfs @ 12.09 hrs, Volume= 15,829 cf
 Outflow = 0.69 cfs @ 11.68 hrs, Volume= 15,823 cf, Atten= 86%, Lag= 0.0 min
 Discarded = 0.69 cfs @ 11.68 hrs, Volume= 15,823 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 16.49' @ 12.61 hrs Surf.Area= 3,603 sf Storage= 4,814 cf

Plug-Flow detention time= 45.4 min calculated for 15,797 cf (100% of inflow)
 Center-of-Mass det. time= 45.1 min (836.4 - 791.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1A | 14.50' | 5,063 cf | 29.92'W x 120.42'L x 5.50'H Field A 19,814 cf Overall - 7,156 cf Embedded = 12,658 cf x 40.0% Voids |
| #2A | 15.25' | 7,156 cf | ADS_StormTech MC-3500 d +Capx 64 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 64 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf |
| | | 12,219 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

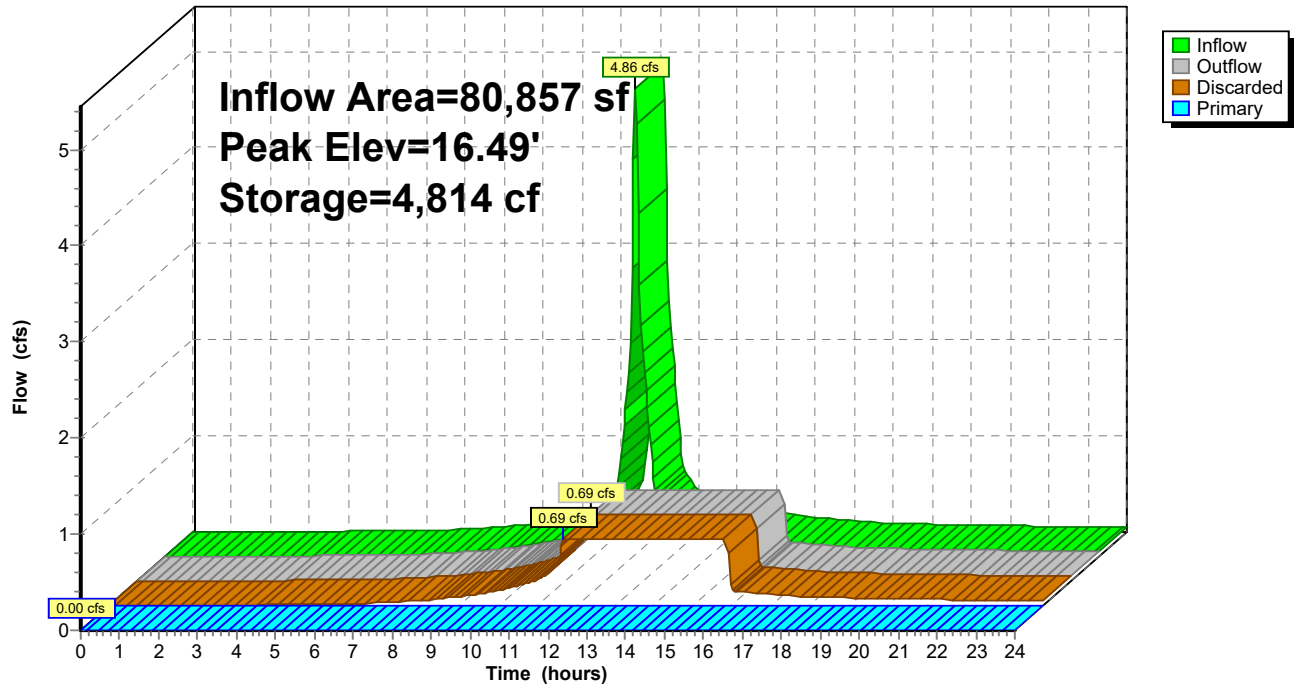
| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.25' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.25' / 15.15' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 19.50' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |
| #4 | Device 1 | 17.40' | 8.0" Vert. Orifice/Grate C= 0.600 |

Discarded OutFlow Max=0.69 cfs @ 11.68 hrs HW=14.56' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.69 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.50' (Free Discharge)
 ↑ **1=Culvert** (Controls 0.00 cfs)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **4=Orifice/Grate** (Controls 0.00 cfs)

Pond A2-P: CHAMBERS

Hydrograph



Summary for Pond A3-P: CHAMBERS

Inflow Area = 4,023 sf, 82.53% Impervious, Inflow Depth > 2.08" for 2-Year, 24-Hour Storm event
 Inflow = 0.22 cfs @ 12.09 hrs, Volume= 697 cf
 Outflow = 0.07 cfs @ 11.88 hrs, Volume= 697 cf, Atten= 70%, Lag= 0.0 min
 Discarded = 0.07 cfs @ 11.88 hrs, Volume= 697 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2

Peak Elev= 15.19' @ 12.42 hrs Surf.Area= 353 sf Storage= 121 cf

Plug-Flow detention time= 9.5 min calculated for 696 cf (100% of inflow)

Center-of-Mass det. time= 9.0 min (819.5 - 810.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1A | 14.50' | 347 cf | 11.00'W x 32.10'L x 3.50'H Field A 1,236 cf Overall - 368 cf Embedded = 868 cf x 40.0% Voids |
| #2A | 15.00' | 368 cf | ADS_StormTech SC-740 +Cap x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 8 Chambers in 2 Rows |
| | | 715 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.00' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.00' / 14.90' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 16.90' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Device 1 | 16.15' | 6.0" Vert. Orifice/Grate C= 0.600 |
| #4 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |

Discarded OutFlow Max=0.07 cfs @ 11.88 hrs HW=14.54' (Free Discharge)

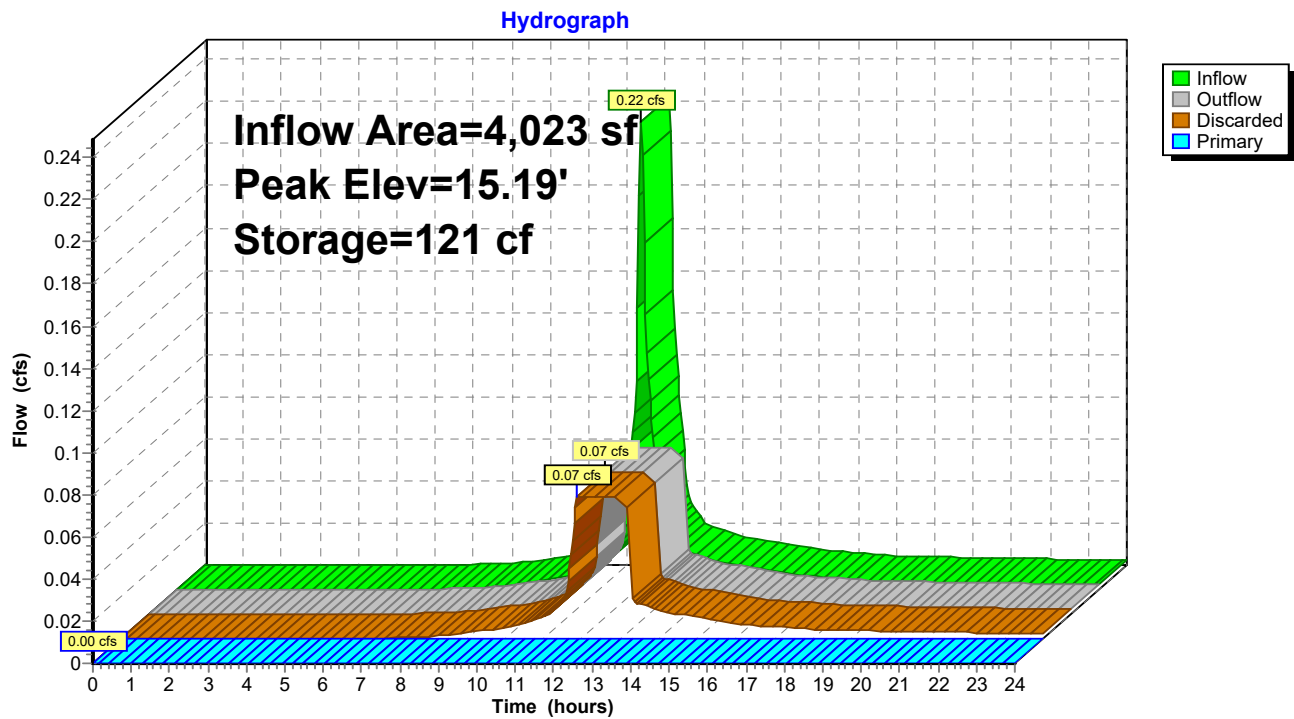
↑ **4=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.50' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

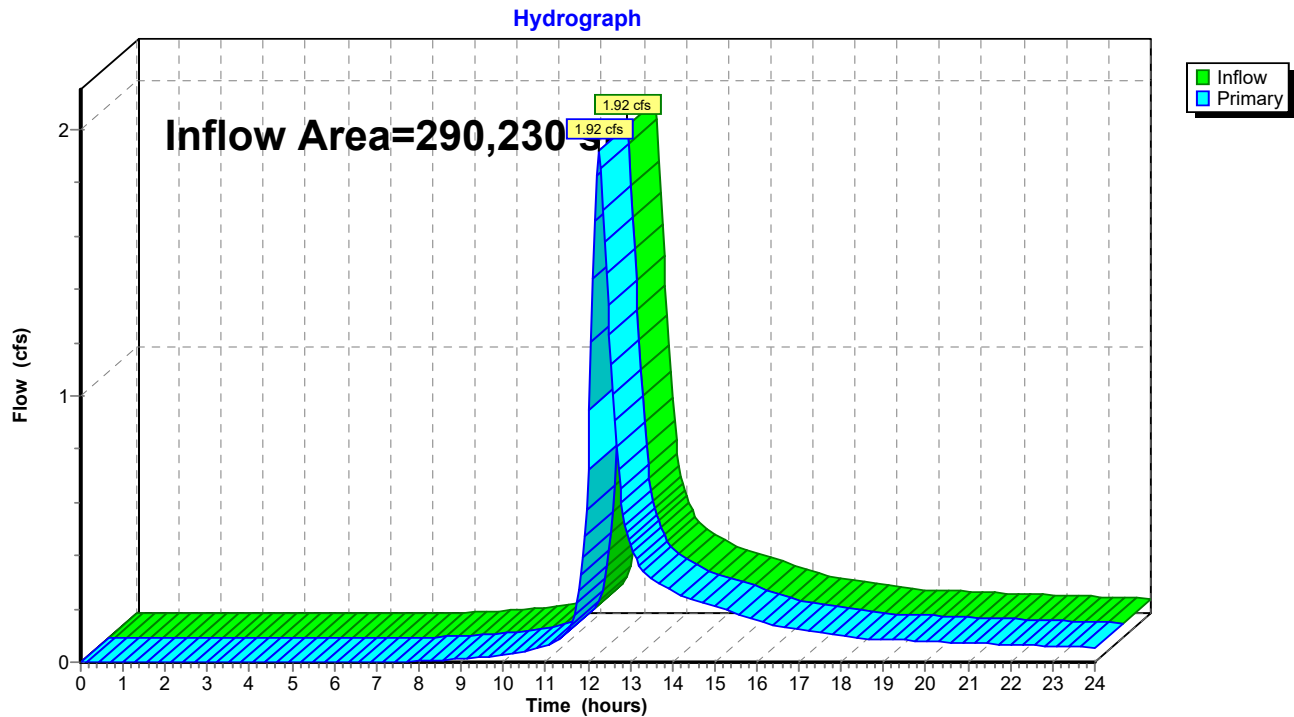
↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Pond A3-P: CHAMBERS

Summary for Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Inflow Area = 290,230 sf, 44.91% Impervious, Inflow Depth > 0.42" for 2-Year, 24-Hour Storm event
Inflow = 1.92 cfs @ 12.25 hrs, Volume= 10,154 cf
Primary = 1.92 cfs @ 12.25 hrs, Volume= 10,154 cf, Atten= 0%, Lag= 0.0 min

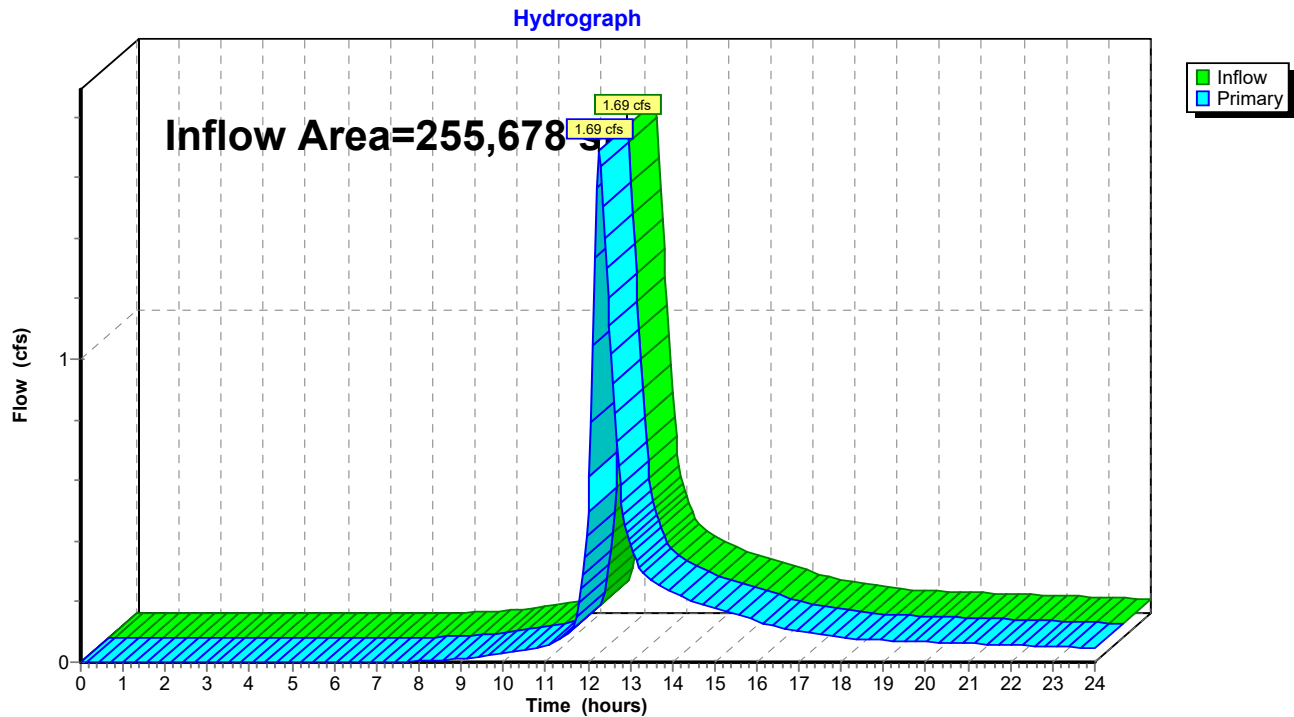
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Summary for Link DMH-A2: DMH-A2

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 0.41" for 2-Year, 24-Hour Storm event
Inflow = 1.69 cfs @ 12.26 hrs, Volume= 8,680 cf
Primary = 1.69 cfs @ 12.26 hrs, Volume= 8,680 cf, Atten= 0%, Lag= 0.0 min

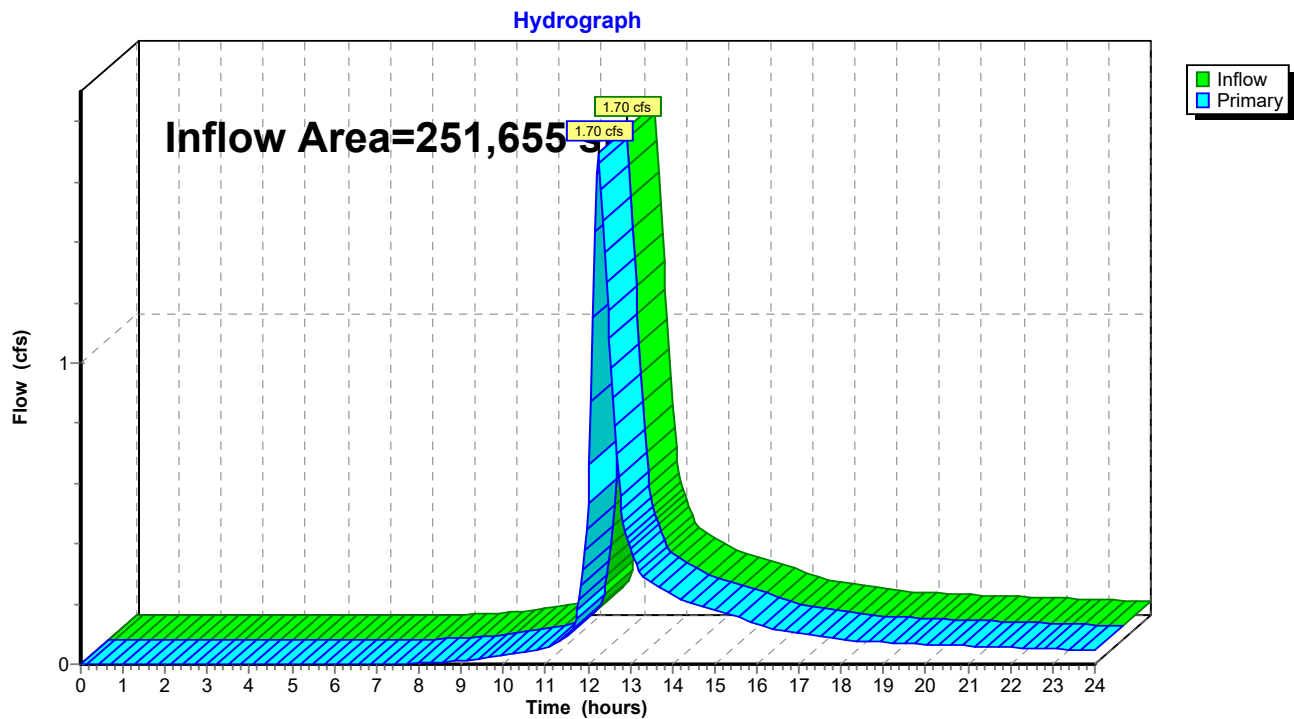
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A2: DMH-A2

Summary for Link DMH-A3: DMH-A3

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 0.41" for 2-Year, 24-Hour Storm event
Inflow = 1.70 cfs @ 12.25 hrs, Volume= 8,685 cf
Primary = 1.70 cfs @ 12.25 hrs, Volume= 8,685 cf, Atten= 0%, Lag= 0.0 min

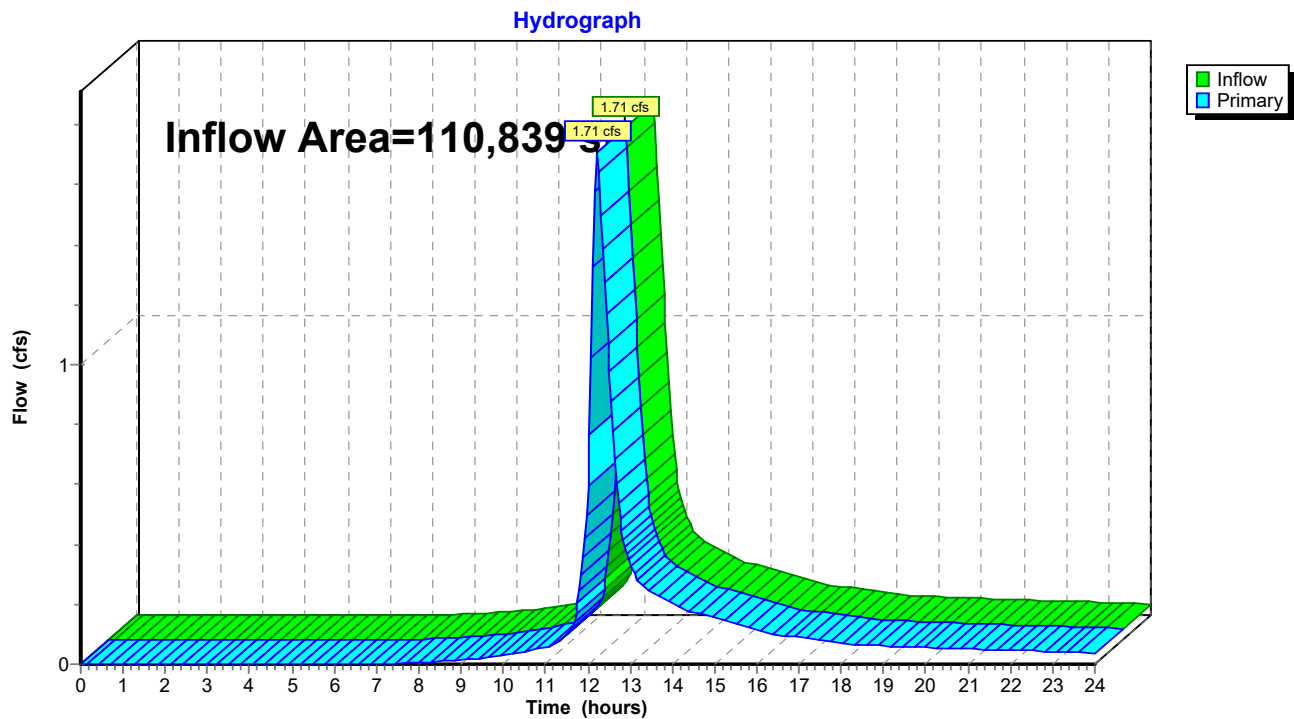
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A3: DMH-A3

Summary for Link DMH-A4: DMH-A4

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 0.87" for 2-Year, 24-Hour Storm event
Inflow = 1.71 cfs @ 12.22 hrs, Volume= 8,008 cf
Primary = 1.71 cfs @ 12.22 hrs, Volume= 8,008 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A4: DMH-A4

Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| | |
|-------------------------------------|--|
| SubcatchmentA10-PR: A10-PR | Runoff Area=19,704 sf 83.87% Impervious Runoff Depth>3.58" Tc=6.0 min CN=90 Runoff=1.83 cfs 5,886 cf |
| SubcatchmentA11-PR: A11-PR | Runoff Area=6,592 sf 1.05% Impervious Runoff Depth>0.43" Tc=6.0 min CN=47 Runoff=0.03 cfs 239 cf |
| SubcatchmentA12-PR: A12-PR | Runoff Area=4,023 sf 82.53% Impervious Runoff Depth>3.48" Tc=6.0 min CN=89 Runoff=0.36 cfs 1,168 cf |
| SubcatchmentA1A-OFF: A1A-OFF | Runoff Area=25,162 sf 69.35% Impervious Runoff Depth>3.38" Flow Length=167' Slope=0.0500 ' ' Tc=11.1 min CN=88 Runoff=1.89 cfs 7,085 cf |
| SubcatchmentA1B-OFF: A1B-OFF | Runoff Area=56,019 sf 42.72% Impervious Runoff Depth>1.66" Flow Length=155' Tc=16.0 min CN=68 Runoff=1.77 cfs 7,762 cf |
| SubcatchmentA1C-OFF: A1C-OFF | Runoff Area=46,934 sf 12.59% Impervious Runoff Depth>0.67" Flow Length=210' Slope=0.0500 ' ' Tc=17.3 min CN=52 Runoff=0.40 cfs 2,620 cf |
| SubcatchmentA2-PR: A2-PR | Runoff Area=17,456 sf 78.92% Impervious Runoff Depth>3.38" Tc=6.0 min CN=88 Runoff=1.54 cfs 4,920 cf |
| SubcatchmentA3-PR: A3-PR | Runoff Area=24,201 sf 86.59% Impervious Runoff Depth>3.69" Tc=6.0 min CN=91 Runoff=2.29 cfs 7,439 cf |
| SubcatchmentA4-OFF: A4-OFF | Runoff Area=8,837 sf 0.00% Impervious Runoff Depth>1.39" Flow Length=50' Slope=0.0300 ' ' Tc=12.0 min CN=64 Runoff=0.25 cfs 1,020 cf |
| SubcatchmentA5A-PR: A5A-PR | Runoff Area=9,403 sf 9.70% Impervious Runoff Depth>0.27" Flow Length=150' Tc=15.7 min CN=43 Runoff=0.02 cfs 213 cf |
| SubcatchmentA5B-PR: A5B-PR | Runoff Area=11,418 sf 0.00% Impervious Runoff Depth>0.20" Flow Length=266' Tc=11.7 min CN=41 Runoff=0.01 cfs 194 cf |
| SubcatchmentA5C-PR: A5C-PR | Runoff Area=13,025 sf 0.00% Impervious Runoff Depth>0.24" Flow Length=150' Tc=9.0 min CN=42 Runoff=0.02 cfs 258 cf |
| SubcatchmentA6-PR: A6-PR | Runoff Area=12,206 sf 100.00% Impervious Runoff Depth>4.46" Tc=6.0 min CN=98 Runoff=1.28 cfs 4,537 cf |
| SubcatchmentA7-PR: A7-PR | Runoff Area=14,737 sf 54.20% Impervious Runoff Depth>2.29" Tc=6.0 min CN=76 Runoff=0.90 cfs 2,810 cf |
| SubcatchmentA8-PR: A8-PR | Runoff Area=7,290 sf 100.00% Impervious Runoff Depth>4.46" Tc=6.0 min CN=98 Runoff=0.76 cfs 2,710 cf |
| SubcatchmentA9-PR: A9-PR | Runoff Area=13,223 sf 0.00% Impervious Runoff Depth>0.27" Flow Length=295' Tc=20.4 min CN=43 Runoff=0.02 cfs 299 cf |

Reach 1R: Open Channel Avg. Flow Depth=0.01' Max Vel=1.76 fps Inflow=0.25 cfs 1,020 cf
n=0.016 L=90.0' S=0.1111 '/' Capacity=1,239.89 cfs Outflow=0.25 cfs 1,019 cf

Reach 2R: Open Channel Avg. Flow Depth=0.10' Max Vel=2.70 fps Inflow=1.77 cfs 7,762 cf
n=0.016 L=153.0' S=0.0386 '/' Capacity=589.74 cfs Outflow=1.75 cfs 7,754 cf

Reach 3R: Routing Avg. Flow Depth=0.02' Max Vel=1.06 fps Inflow=0.03 cfs 239 cf
n=0.016 L=400.0' S=0.0500 '/' Capacity=102.34 cfs Outflow=0.03 cfs 237 cf

Reach 4R: 12" Pipe Avg. Flow Depth=0.47' Max Vel=4.83 fps Inflow=1.75 cfs 7,948 cf
12.0" Round Pipe n=0.012 L=44.0' S=0.0102 '/' Capacity=3.90 cfs Outflow=1.75 cfs 7,946 cf

Reach 5R: 18" Pipe Avg. Flow Depth=0.52' Max Vel=7.27 fps Inflow=3.94 cfs 20,643 cf
18.0" Round Pipe n=0.012 L=157.0' S=0.0182 '/' Capacity=15.33 cfs Outflow=3.93 cfs 20,635 cf

Reach 6R: 18" Pipe Avg. Flow Depth=0.51' Max Vel=7.48 fps Inflow=3.93 cfs 20,635 cf
18.0" Round Pipe n=0.012 L=48.0' S=0.0198 '/' Capacity=16.01 cfs Outflow=3.93 cfs 20,632 cf

Reach 7R: 12" Pipe Avg. Flow Depth=0.21' Max Vel=3.44 fps Inflow=0.41 cfs 2,877 cf
12.0" Round Pipe n=0.012 L=37.0' S=0.0122 '/' Capacity=4.26 cfs Outflow=0.41 cfs 2,876 cf

Reach 8R: 12" Pipe Avg. Flow Depth=0.43' Max Vel=6.55 fps Inflow=2.11 cfs 8,318 cf
12.0" Round Pipe n=0.012 L=221.0' S=0.0204 '/' Capacity=5.51 cfs Outflow=2.09 cfs 8,313 cf

Reach 9R: 18" Pipe Avg. Flow Depth=0.58' Max Vel=5.71 fps Inflow=3.63 cfs 16,260 cf
18.0" Round Pipe n=0.012 L=220.0' S=0.0100 '/' Capacity=11.38 cfs Outflow=3.60 cfs 16,248 cf

Pond A2-P: CHAMBERS Peak Elev=17.90' Storage=8,621 cf Inflow=7.70 cfs 25,492 cf
Discarded=0.69 cfs 23,965 cf Primary=0.68 cfs 1,518 cf Outflow=1.37 cfs 25,483 cf

Pond A3-P: CHAMBERS Peak Elev=15.91' Storage=308 cf Inflow=0.36 cfs 1,168 cf
Discarded=0.07 cfs 1,168 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 1,168 cf

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM Inflow=4.40 cfs 23,978 cf
Primary=4.40 cfs 23,978 cf

Link DMH-A2: DMH-A2 Inflow=3.93 cfs 20,635 cf
Primary=3.93 cfs 20,635 cf

Link DMH-A3: DMH-A3 Inflow=3.94 cfs 20,643 cf
Primary=3.94 cfs 20,643 cf

Link DMH-A4: DMH-A4 Inflow=3.63 cfs 16,260 cf
Primary=3.63 cfs 16,260 cf

Total Runoff Area = 290,230 sf Runoff Volume = 49,158 cf Average Runoff Depth = 2.03"
55.09% Pervious = 159,896 sf 44.91% Impervious = 130,334 sf

Summary for Subcatchment A10-PR: A10-PR

Runoff = 1.83 cfs @ 12.09 hrs, Volume= 5,886 cf, Depth> 3.58"

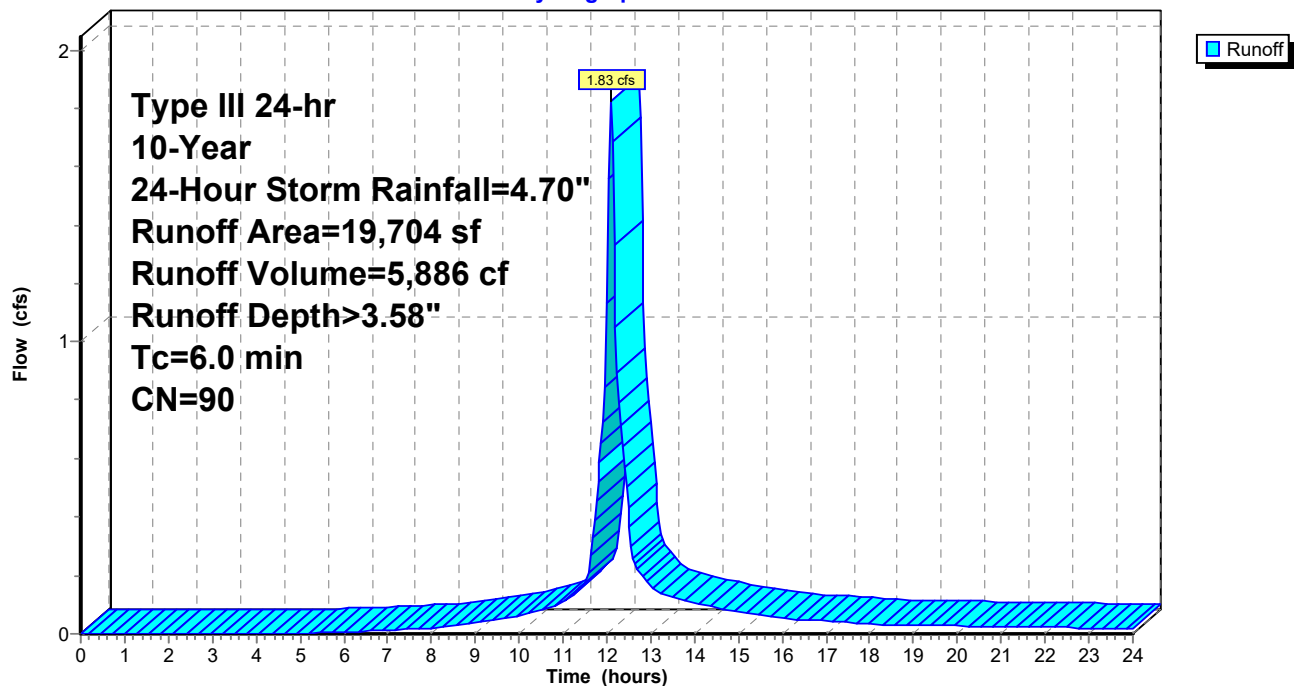
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,128 | 98 | Roofs, HSG A |
| 12,397 | 98 | Paved parking, HSG A |
| 3,179 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 19,704 | 90 | Weighted Average |
| 3,179 | | 16.13% Pervious Area |
| 16,525 | | 83.87% Impervious Area |

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

Subcatchment A10-PR: A10-PR

Hydrograph



Summary for Subcatchment A11-PR: A11-PR

Runoff = 0.03 cfs @ 12.29 hrs, Volume= 239 cf, Depth> 0.43"

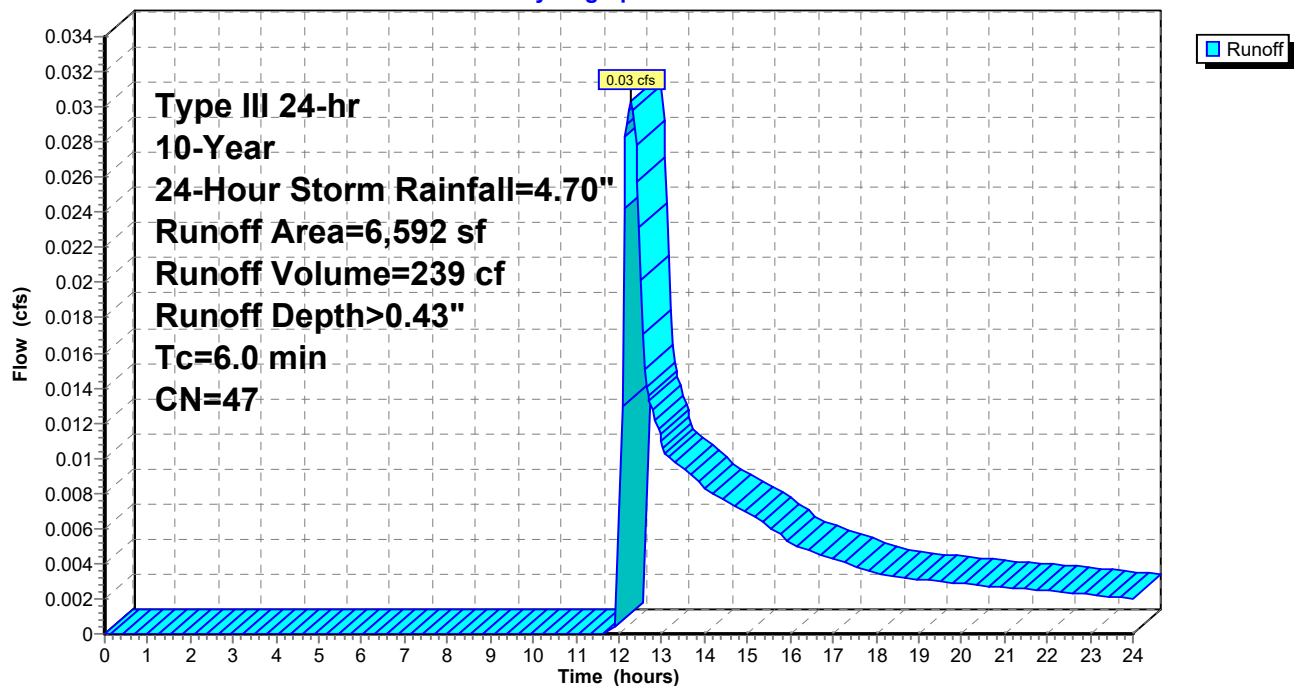
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 69 | 98 | Paved parking, HSG A |
| 5,348 | 49 | 50-75% Grass cover, Fair, HSG A |
| 1,175 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 6,592 | 47 | Weighted Average |
| 6,523 | | 98.95% Pervious Area |
| 69 | | 1.05% Impervious Area |

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

Subcatchment A11-PR: A11-PR

Hydrograph



Summary for Subcatchment A12-PR: A12-PR

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 1,168 cf, Depth> 3.48"

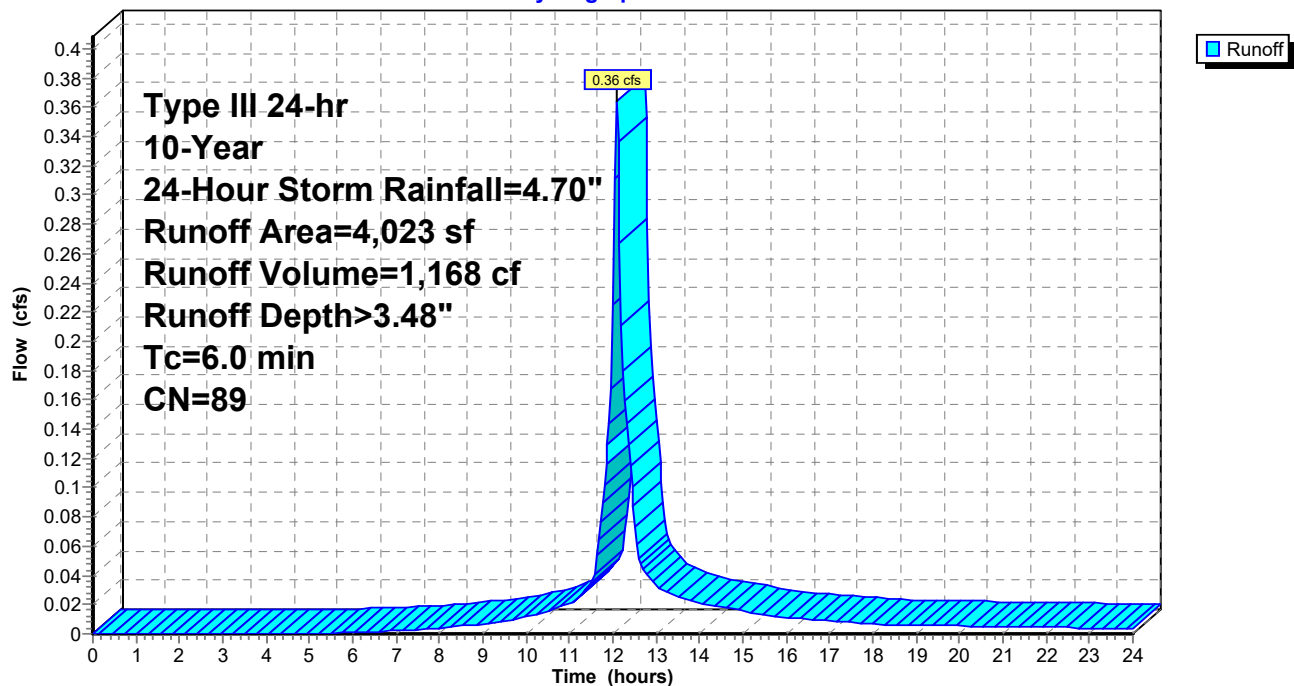
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 208 | 98 | Roofs, HSG A |
| 3,112 | 98 | Paved parking, HSG A |
| 703 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 4,023 | 89 | Weighted Average |
| 703 | | 17.47% Pervious Area |
| 3,320 | | 82.53% Impervious Area |

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

Subcatchment A12-PR: A12-PR

Hydrograph



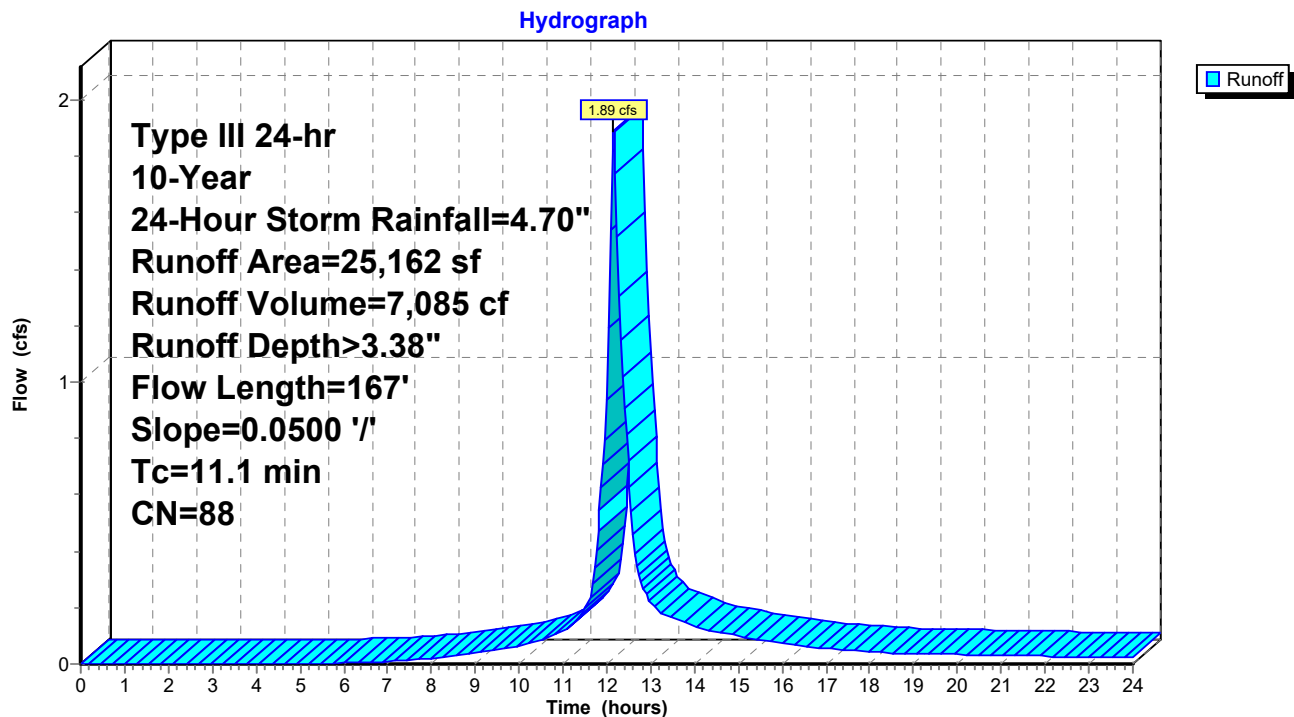
Summary for Subcatchment A1A-OFF: A1A-OFF

Runoff = 1.89 cfs @ 12.15 hrs, Volume= 7,085 cf, Depth> 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 3,405 | 98 | Roofs, HSG A |
| 14,045 | 98 | Paved parking, HSG A |
| 1,238 | 49 | 50-75% Grass cover, Fair, HSG A |
| 3,513 | 43 | Woods/grass comb., Fair, HSG A |
| 2,961 | 96 | Gravel surface, HSG A |
| 25,162 | 88 | Weighted Average |
| 7,712 | | 30.65% Pervious Area |
| 17,450 | | 69.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.2 | 25 | 0.0500 | 0.19 | | Sheet Flow, SHEET FLOW Grass: Short n= 0.150 P2= 3.20" |
| 8.5 | 25 | 0.0500 | 0.05 | | Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.4 | 117 | 0.0500 | 4.54 | | Shallow Concentrated Flow, shallow conc. flow Paved Kv= 20.3 fps |
| 11.1 | 167 | Total | | | |

Subcatchment A1A-OFF: A1A-OFF

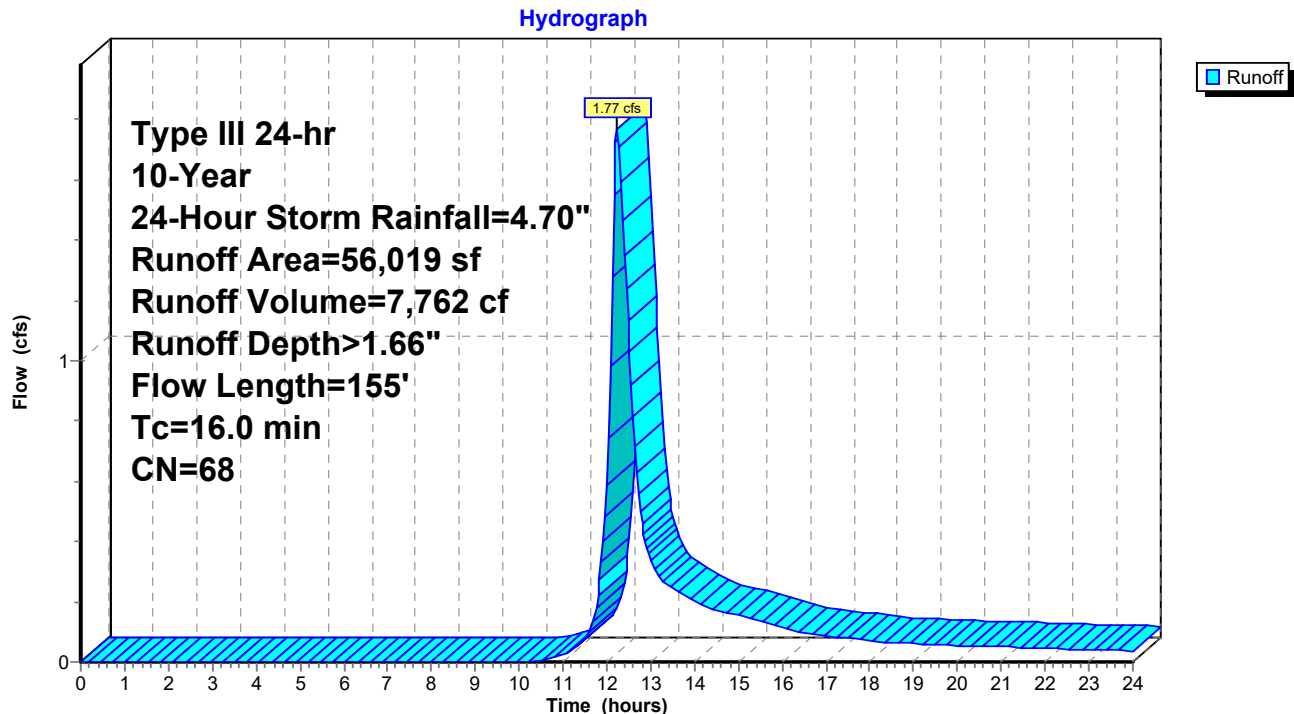
Summary for Subcatchment A1B-OFF: A1B-OFF

Runoff = 1.77 cfs @ 12.24 hrs, Volume= 7,762 cf, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 5,821 | 98 | Roofs, HSG A |
| 18,112 | 98 | Paved parking, HSG A |
| 13,113 | 49 | 50-75% Grass cover, Fair, HSG A |
| 18,973 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 56,019 | 68 | Weighted Average |
| 32,086 | | 57.28% Pervious Area |
| 23,933 | | 42.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.1 | 105 | 0.1090 | 1.65 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 16.0 | 155 | Total | | | |

Subcatchment A1B-OFF: A1B-OFF

Summary for Subcatchment A1C-OFF: A1C-OFF

Runoff = 0.40 cfs @ 12.34 hrs, Volume= 2,620 cf, Depth> 0.67"

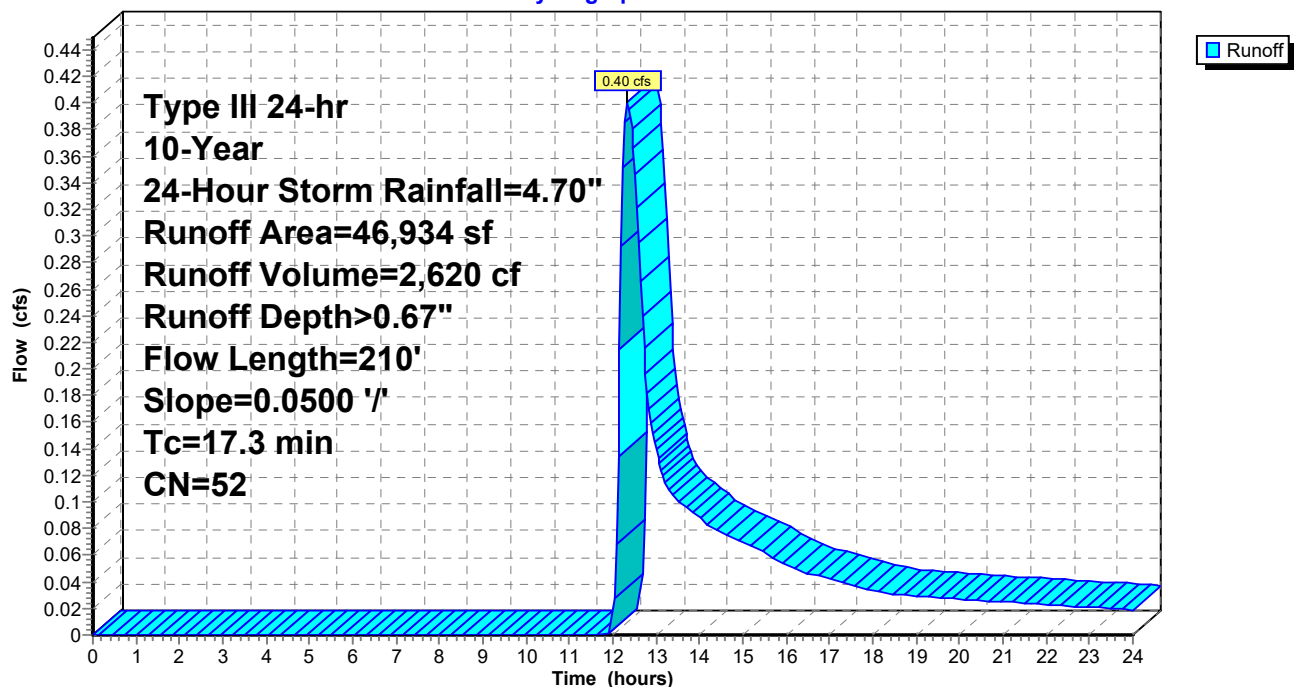
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,043 | 98 | Roofs, HSG A |
| 1,867 | 98 | Paved parking, HSG A |
| 14,063 | 49 | 50-75% Grass cover, Fair, HSG A |
| 26,961 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 46,934 | 52 | Weighted Average |
| 41,024 | | 87.41% Pervious Area |
| 5,910 | | 12.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 2.4 | 160 | 0.0500 | 1.12 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 17.3 | 210 | Total | | | |

Subcatchment A1C-OFF: A1C-OFF

Hydrograph



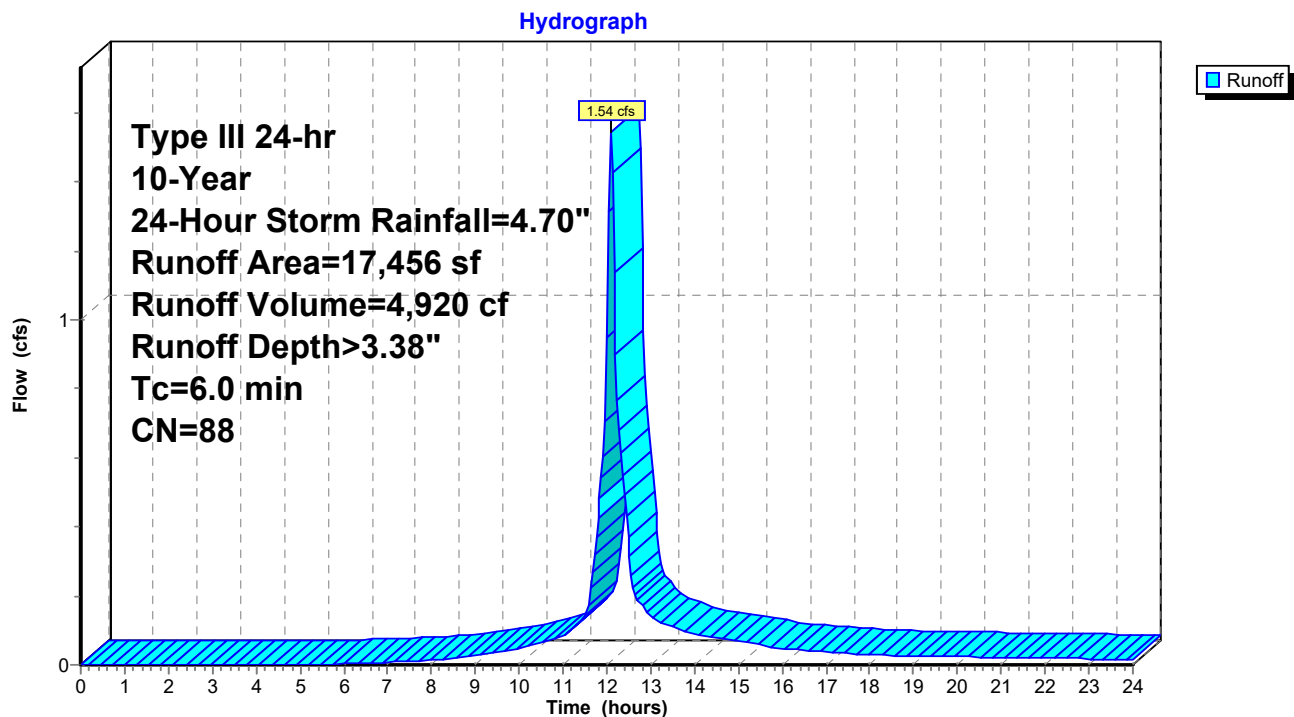
Summary for Subcatchment A2-PR: A2-PR

Runoff = 1.54 cfs @ 12.09 hrs, Volume= 4,920 cf, Depth> 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 13,777 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,679 | 49 | 50-75% Grass cover, Fair, HSG A |
| 17,456 | 88 | Weighted Average |
| 3,679 | | 21.08% Pervious Area |
| 13,777 | | 78.92% Impervious Area |

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

Subcatchment A2-PR: A2-PR

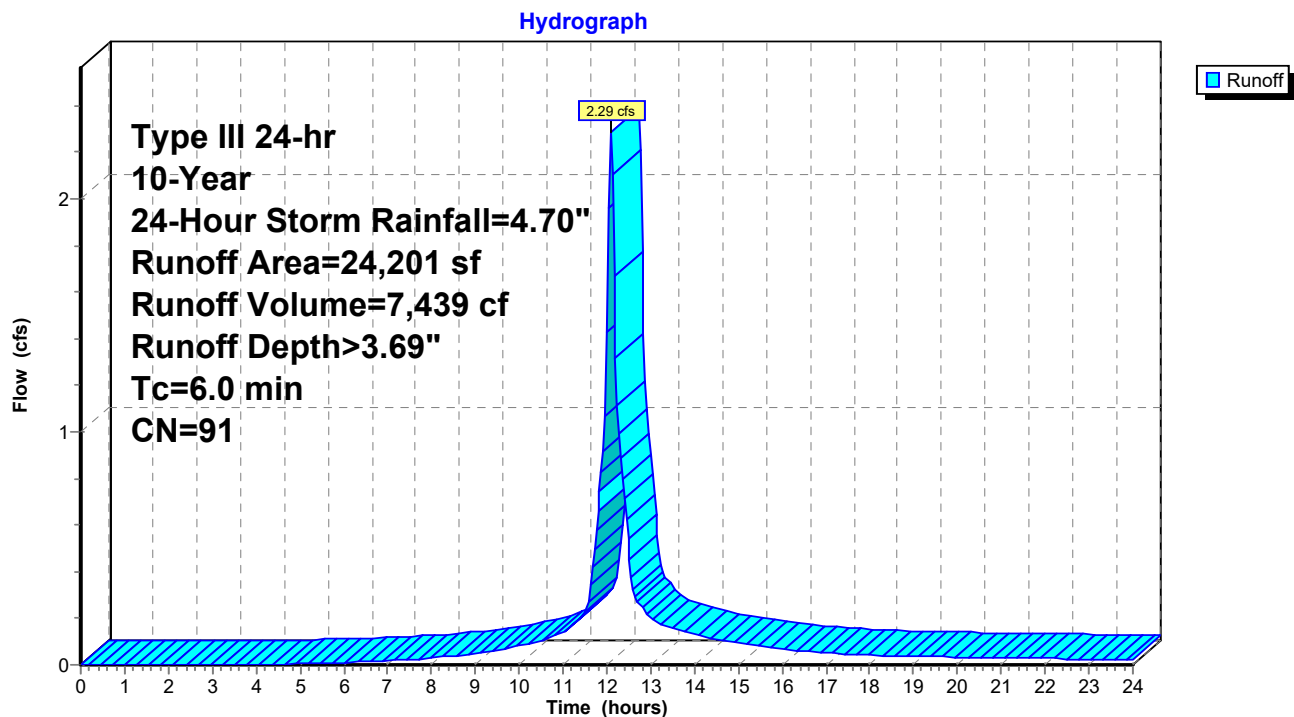
Summary for Subcatchment A3-PR: A3-PR

Runoff = 2.29 cfs @ 12.09 hrs, Volume= 7,439 cf, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 20,955 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,246 | 49 | 50-75% Grass cover, Fair, HSG A |
| 24,201 | 91 | Weighted Average |
| 3,246 | | 13.41% Pervious Area |
| 20,955 | | 86.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A3-PR: A3-PR

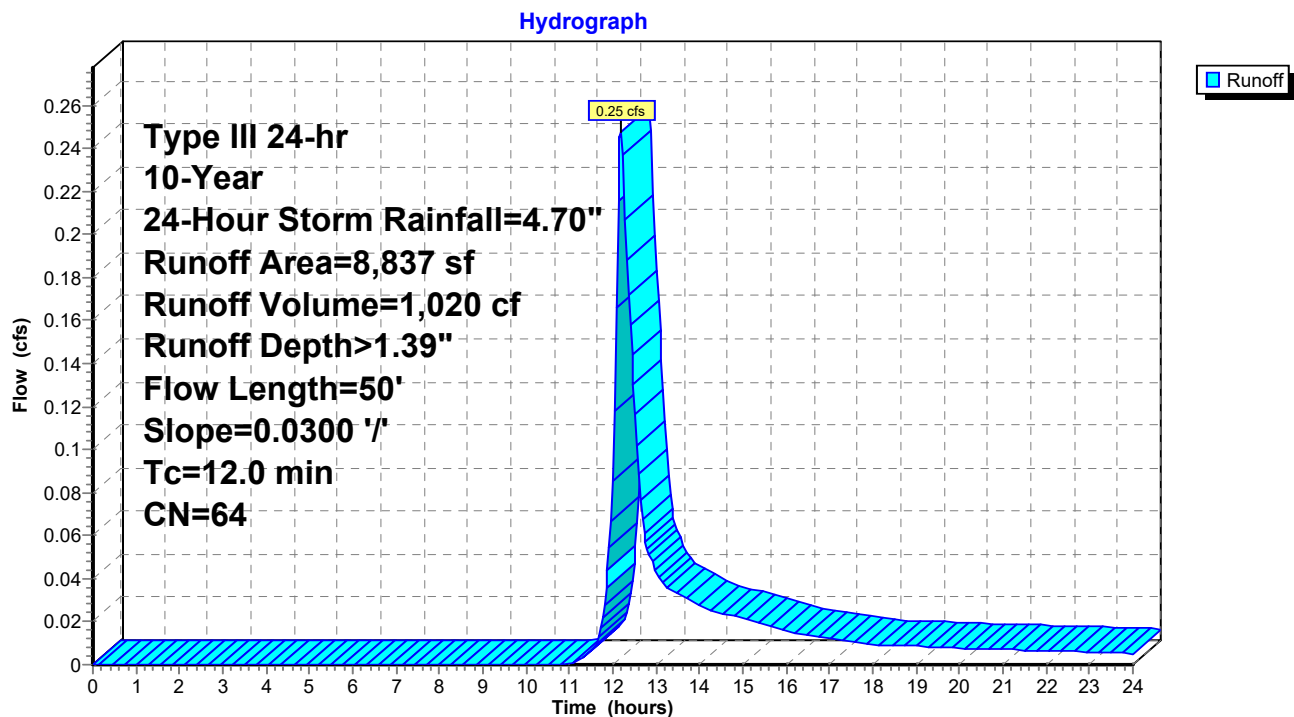
Summary for Subcatchment A4-OFF: A4-OFF

Runoff = 0.25 cfs @ 12.18 hrs, Volume= 1,020 cf, Depth> 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 4,743 | 36 | Woods, Fair, HSG A |
| 4,094 | 96 | Gravel surface, HSG A |
| 8,837 | 64 | Weighted Average |
| 8,837 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 3.2 | 30 | 0.0300 | 0.16 | | Sheet Flow, SHEET FLOW |
| | | | | | Grass: Short n= 0.150 P2= 3.20" |
| 8.8 | 20 | 0.0300 | 0.04 | | Sheet Flow, |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 12.0 | 50 | Total | | | |

Subcatchment A4-OFF: A4-OFF

Summary for Subcatchment A5A-PR: A5A-PR

Runoff = 0.02 cfs @ 12.54 hrs, Volume= 213 cf, Depth> 0.27"

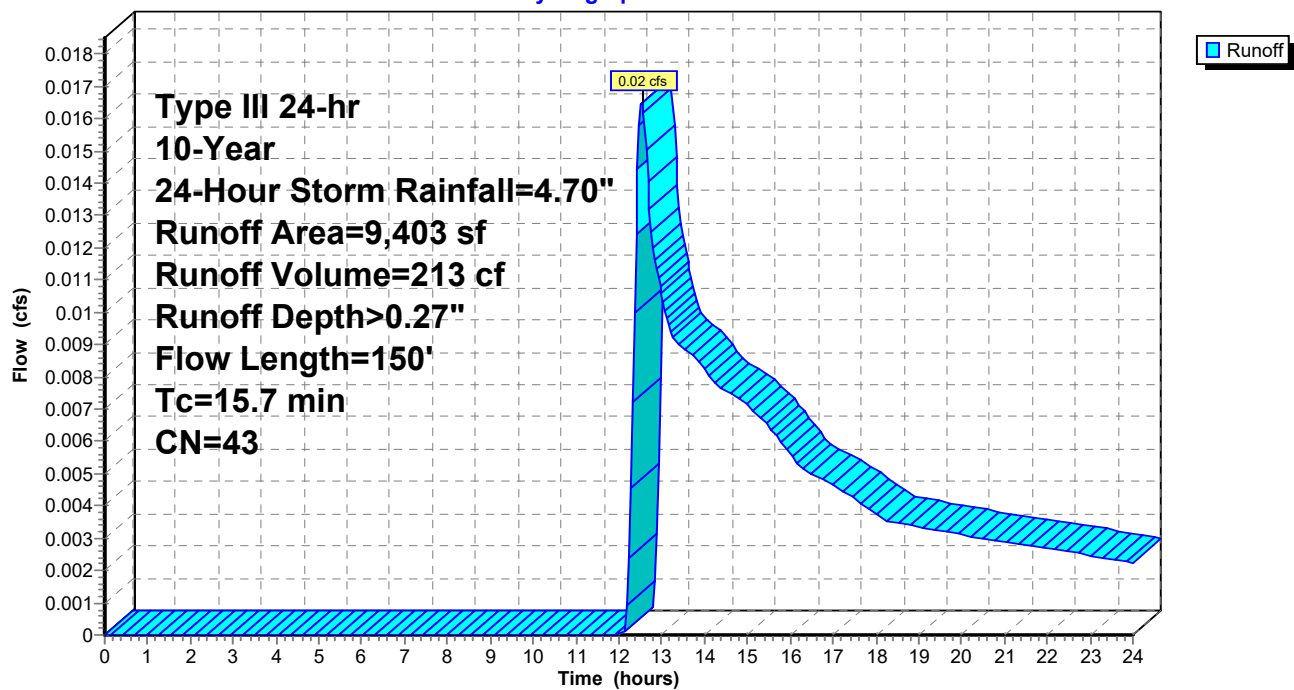
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 912 | 98 | Paved parking, HSG A |
| 587 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,904 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 9,403 | 43 | Weighted Average |
| 8,491 | | 90.30% Pervious Area |
| 912 | | 9.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 15.7 | 150 | Total | | | |

Subcatchment A5A-PR: A5A-PR

Hydrograph



Summary for Subcatchment A5B-PR: A5B-PR

Runoff = 0.01 cfs @ 12.55 hrs, Volume= 194 cf, Depth> 0.20"

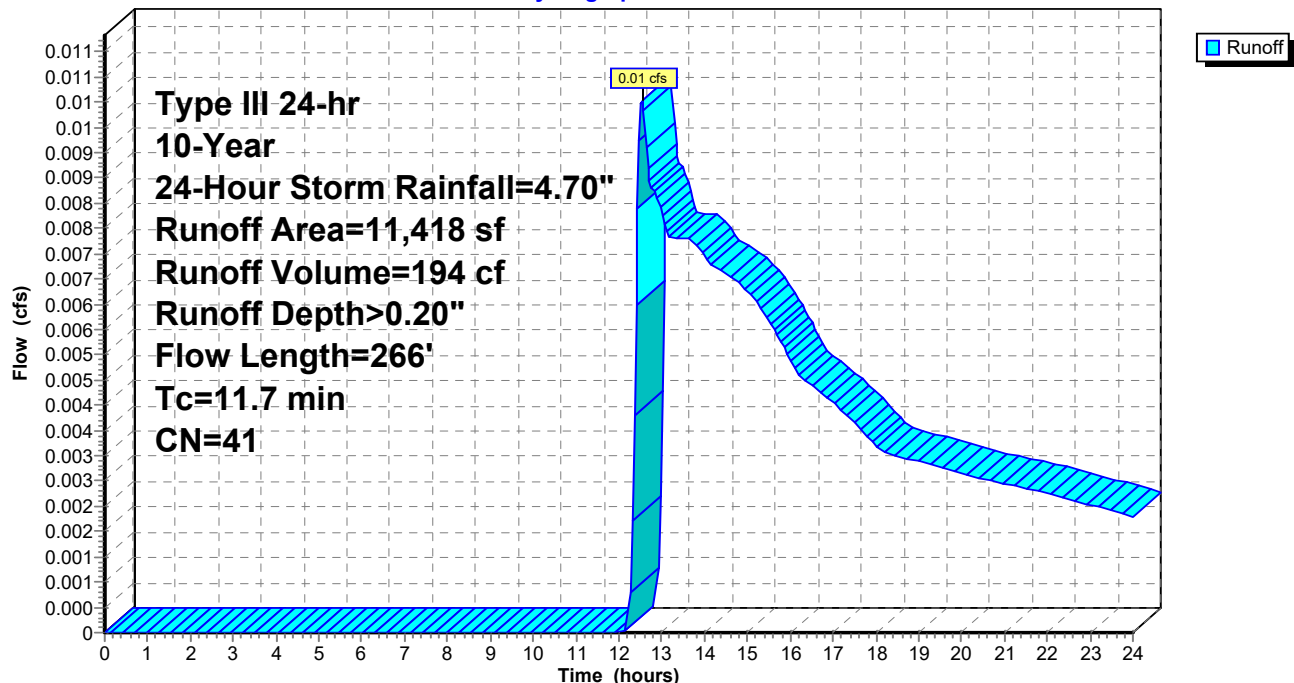
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 4,051 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,367 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 11,418 | 41 | Weighted Average |
| 11,418 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.6 | 50 | 0.1500 | 0.09 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.4 | 133 | 0.1060 | 1.63 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 0.7 | 83 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 11.7 | 266 | Total | | | |

Subcatchment A5B-PR: A5B-PR

Hydrograph



Summary for Subcatchment A5C-PR: A5C-PR

Runoff = 0.02 cfs @ 12.47 hrs, Volume= 258 cf, Depth> 0.24"

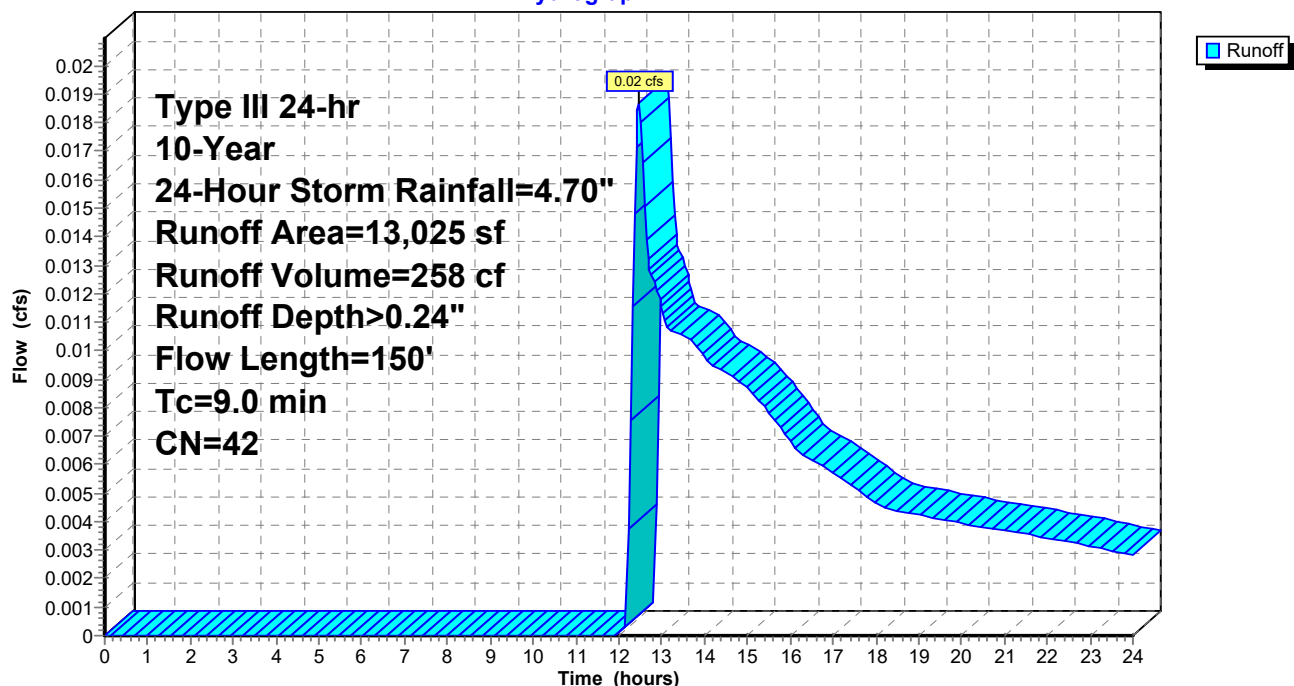
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 5,674 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,351 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 13,025 | 42 | Weighted Average |
| 13,025 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 6.5 | 25 | 0.1000 | 0.06 | | Sheet Flow, SHEET FLOW Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.7 | 25 | 0.1000 | 0.25 | | Sheet Flow, Grass: Short n= 0.150 P2= 3.20" |
| 0.8 | 100 | 0.0800 | 1.98 | | Shallow Concentrated Flow, SHALLOW CONC FLOW Short Grass Pasture Kv= 7.0 fps |
| 9.0 | 150 | Total | | | |

Subcatchment A5C-PR: A5C-PR

Hydrograph



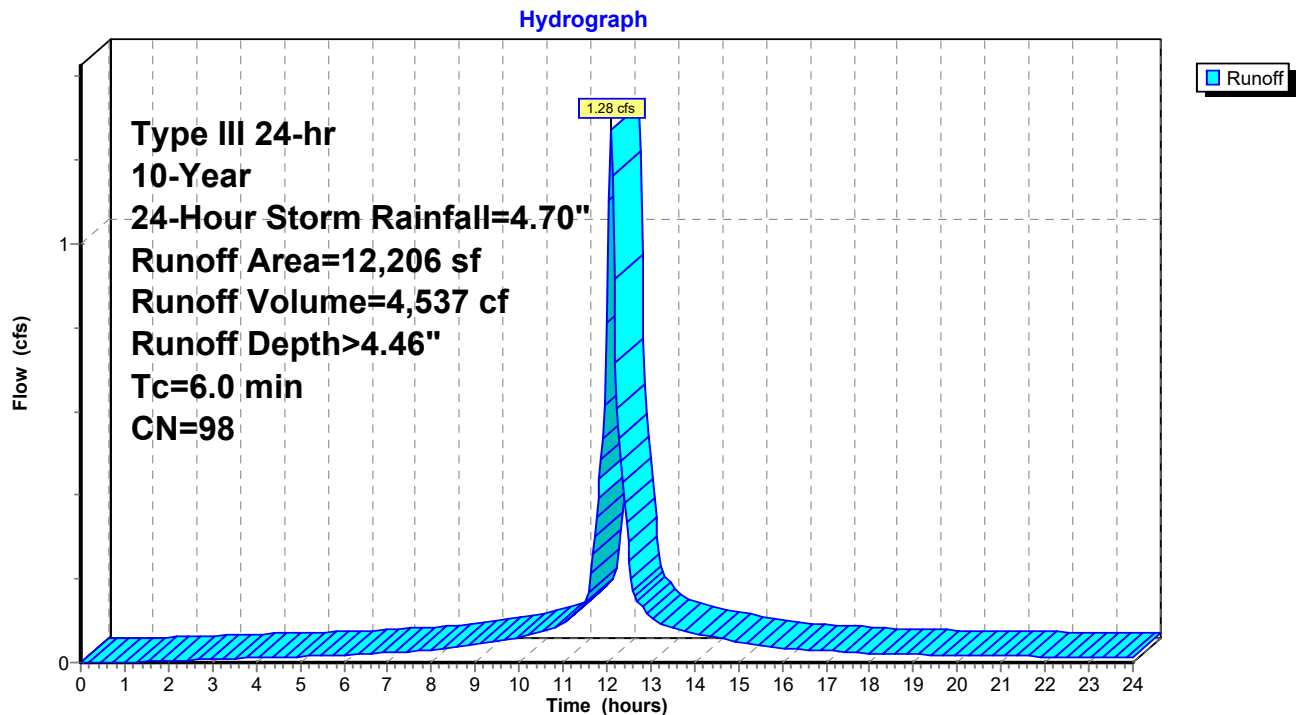
Summary for Subcatchment A6-PR: A6-PR

Runoff = 1.28 cfs @ 12.08 hrs, Volume= 4,537 cf, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Paved parking, HSG A |
| 12,206 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 12,206 | 98 | Weighted Average |
| 12,206 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A6-PR: A6-PR

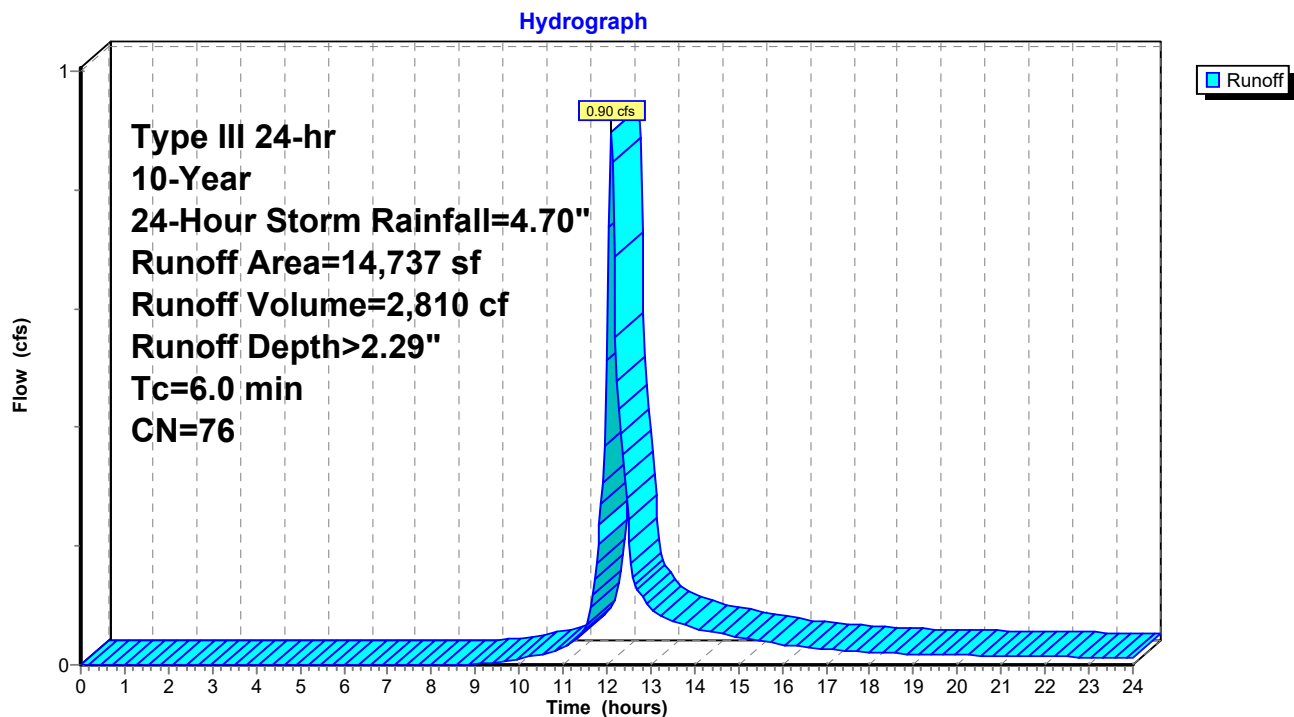
Summary for Subcatchment A7-PR: A7-PR

Runoff = 0.90 cfs @ 12.09 hrs, Volume= 2,810 cf, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,643 | 98 | Roofs, HSG A |
| 3,344 | 98 | Paved parking, HSG A |
| 6,750 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 14,737 | 76 | Weighted Average |
| 6,750 | | 45.80% Pervious Area |
| 7,987 | | 54.20% Impervious Area |

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

Subcatchment A7-PR: A7-PR

Summary for Subcatchment A8-PR: A8-PR

Runoff = 0.76 cfs @ 12.08 hrs, Volume= 2,710 cf, Depth> 4.46"

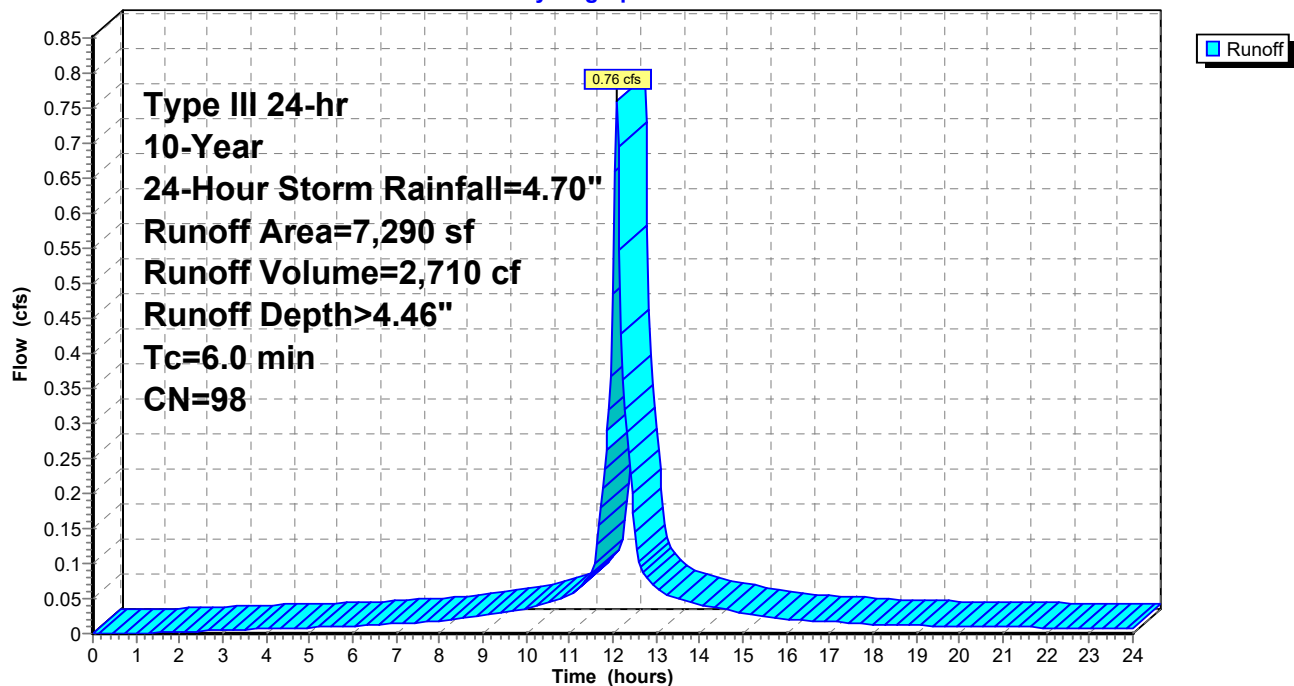
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 7,290 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 7,290 | 98 | Weighted Average |
| 7,290 | | 100.00% Impervious Area |

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

Subcatchment A8-PR: A8-PR

Hydrograph



Summary for Subcatchment A9-PR: A9-PR

Runoff = 0.02 cfs @ 12.61 hrs, Volume= 299 cf, Depth> 0.27"

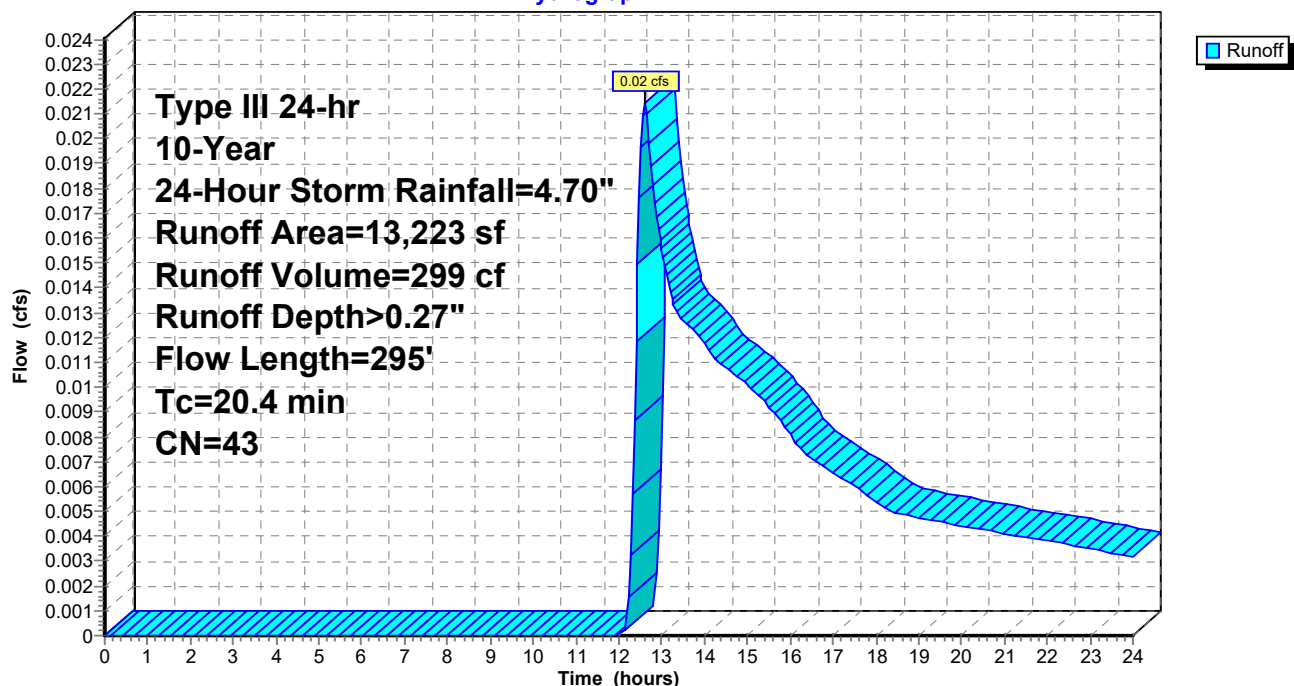
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Year, 24-Hour Storm Rainfall=4.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 7,203 | 49 | 50-75% Grass cover, Fair, HSG A |
| 6,020 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 13,223 | 43 | Weighted Average |
| 13,223 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 18.3 | 50 | 0.0300 | 0.05 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 1.3 | 145 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 20.4 | 295 | Total | | | |

Subcatchment A9-PR: A9-PR

Hydrograph



Summary for Reach 1R: Open Channel

Inflow Area = 8,837 sf, 0.00% Impervious, Inflow Depth > 1.39" for 10-Year, 24-Hour Storm event
 Inflow = 0.25 cfs @ 12.18 hrs, Volume= 1,020 cf
 Outflow = 0.25 cfs @ 12.21 hrs, Volume= 1,019 cf, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 1.76 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.40 fps, Avg. Travel Time= 1.1 min

Peak Storage= 13 cf @ 12.19 hrs

Average Depth at Peak Storage= 0.01'

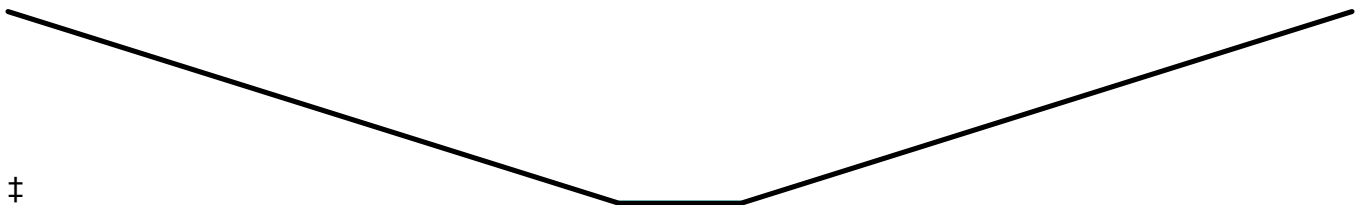
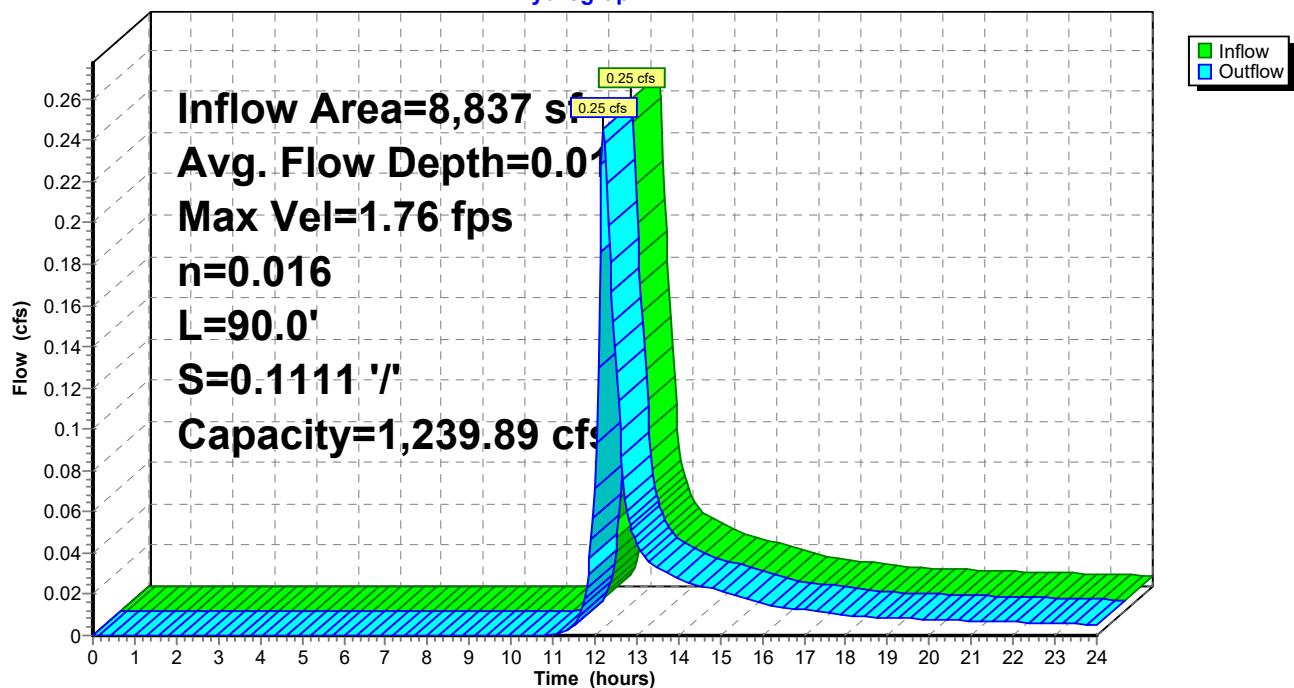
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 1,239.89 cfs

10.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 ' / ' Top Width= 110.00'

Length= 90.0' Slope= 0.1111 ' / '

Inlet Invert= 35.00', Outlet Invert= 25.00'

**Reach 1R: Open Channel****Hydrograph**

Summary for Reach 2R: Open Channel

Inflow Area = 56,019 sf, 42.72% Impervious, Inflow Depth > 1.66" for 10-Year, 24-Hour Storm event
 Inflow = 1.77 cfs @ 12.24 hrs, Volume= 7,762 cf
 Outflow = 1.75 cfs @ 12.27 hrs, Volume= 7,754 cf, Atten= 1%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 2.70 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.30 fps, Avg. Travel Time= 2.0 min

Peak Storage= 100 cf @ 12.25 hrs

Average Depth at Peak Storage= 0.10'

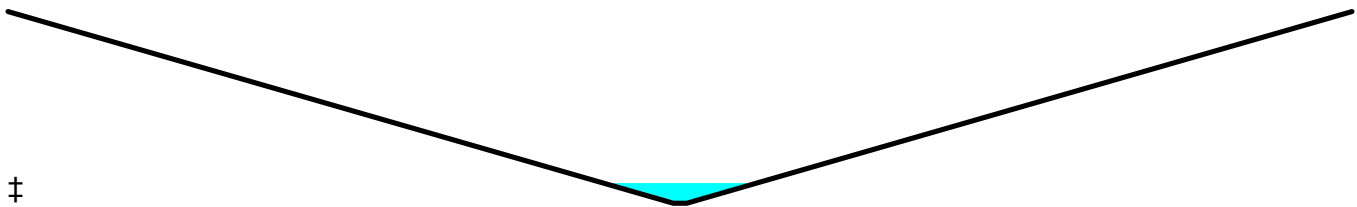
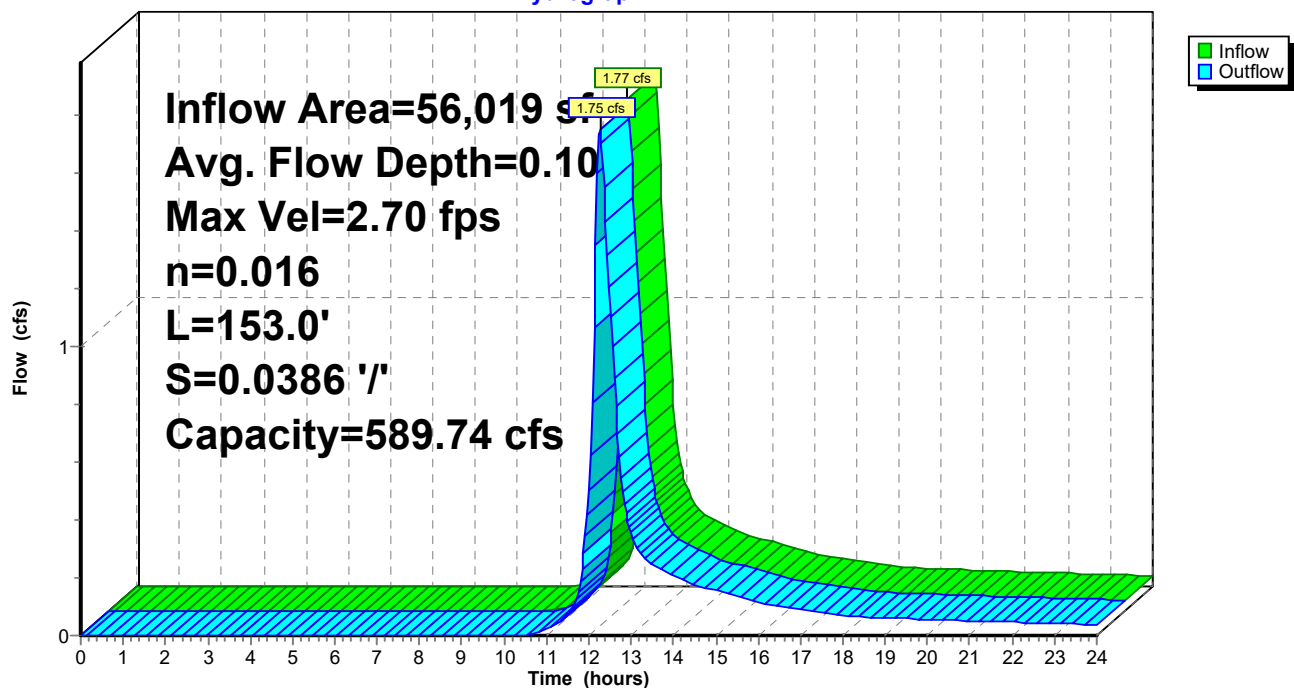
Bank-Full Depth= 1.00' Flow Area= 51.0 sf, Capacity= 589.74 cfs

1.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 '/' Top Width= 101.00'

Length= 153.0' Slope= 0.0386 '/'

Inlet Invert= 30.90', Outlet Invert= 25.00'

**Reach 2R: Open Channel****Hydrograph**

Summary for Reach 3R: Routing

Inflow Area = 6,592 sf, 1.05% Impervious, Inflow Depth > 0.43" for 10-Year, 24-Hour Storm event
 Inflow = 0.03 cfs @ 12.29 hrs, Volume= 239 cf
 Outflow = 0.03 cfs @ 12.49 hrs, Volume= 237 cf, Atten= 6%, Lag= 11.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 1.06 fps, Min. Travel Time= 6.3 min

Avg. Velocity= 0.68 fps, Avg. Travel Time= 9.8 min

Peak Storage= 11 cf @ 12.39 hrs

Average Depth at Peak Storage= 0.02'

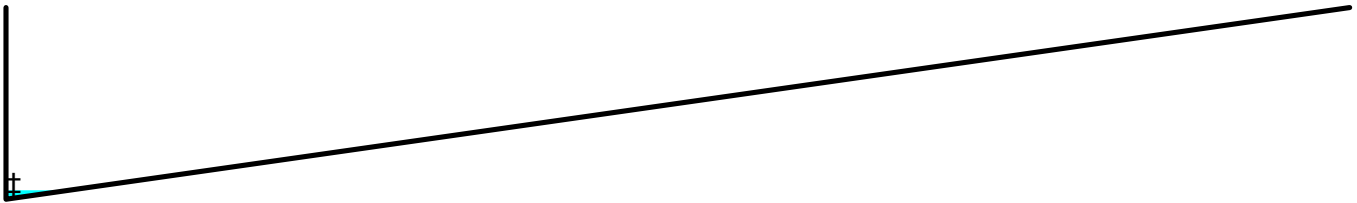
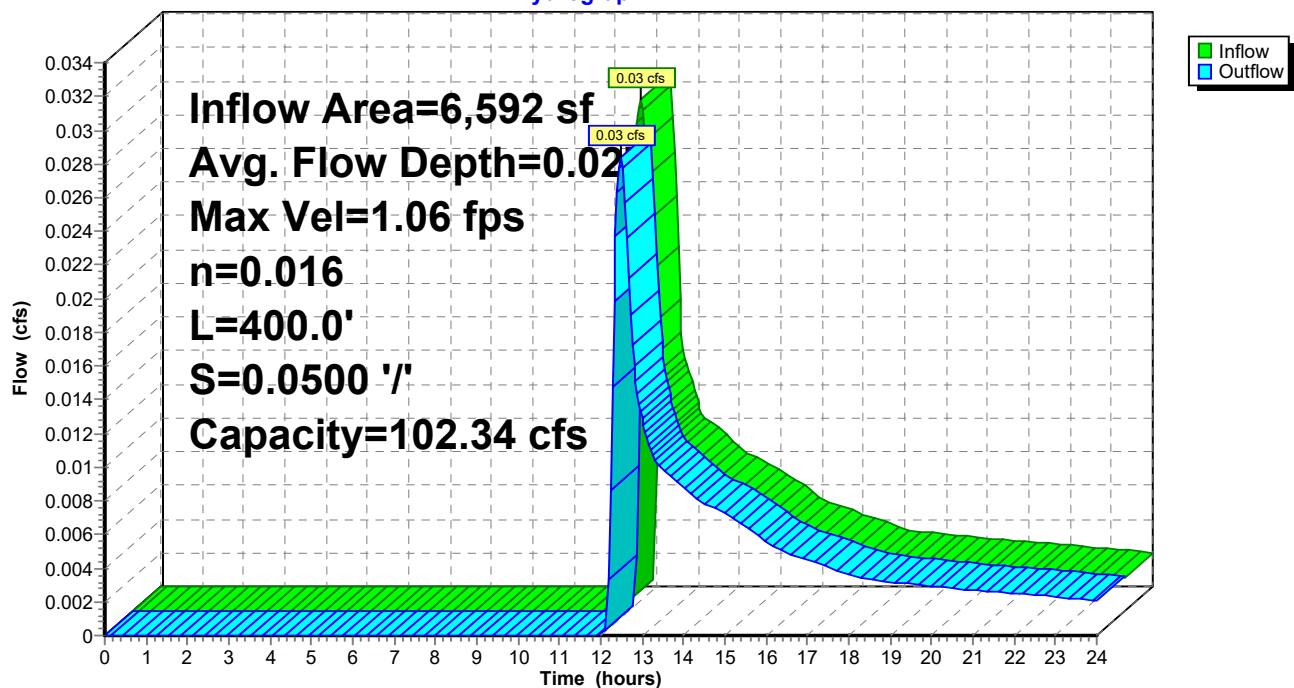
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 102.34 cfs

0.00' x 0.50' deep channel, n= 0.016

Side Slope Z-value= 0.0 100.0 '/' Top Width= 50.00'

Length= 400.0' Slope= 0.0500 '/'

Inlet Invert= 20.00', Outlet Invert= 0.00'

**Reach 3R: Routing****Hydrograph**

Summary for Reach 4R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 67,437 sf, 35.49% Impervious, Inflow Depth > 1.41" for 10-Year, 24-Hour Storm event
 Inflow = 1.75 cfs @ 12.27 hrs, Volume= 7,948 cf
 Outflow = 1.75 cfs @ 12.27 hrs, Volume= 7,946 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 4.83 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.13 fps, Avg. Travel Time= 0.3 min

Peak Storage= 16 cf @ 12.27 hrs

Average Depth at Peak Storage= 0.47'

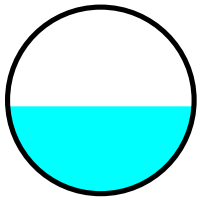
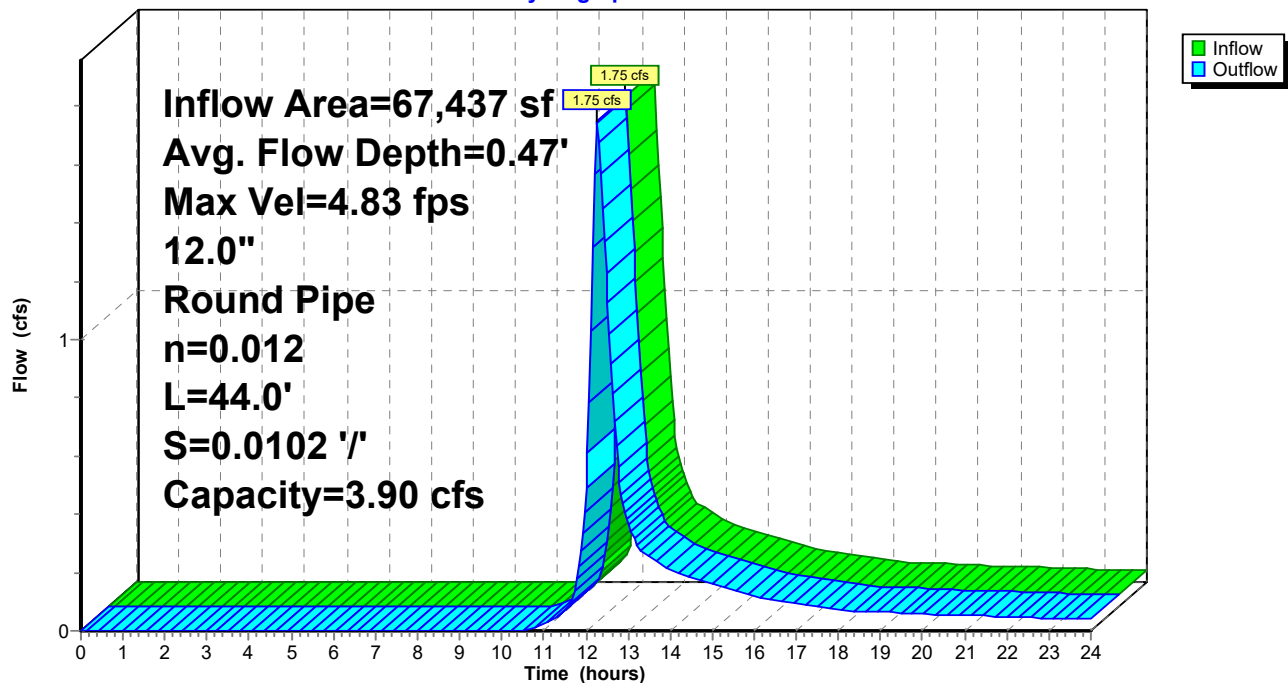
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.90 cfs

12.0" Round Pipe

n= 0.012

Length= 44.0' Slope= 0.0102 '/'

Inlet Invert= 18.65', Outlet Invert= 18.20'

**Reach 4R: 12" Pipe****Hydrograph**

Summary for Reach 5R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 0.98" for 10-Year, 24-Hour Storm event
 Inflow = 3.94 cfs @ 12.25 hrs, Volume= 20,643 cf
 Outflow = 3.93 cfs @ 12.26 hrs, Volume= 20,635 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 7.27 fps, Min. Travel Time= 0.4 min

Avg. Velocity = 2.80 fps, Avg. Travel Time= 0.9 min

Peak Storage= 85 cf @ 12.25 hrs

Average Depth at Peak Storage= 0.52'

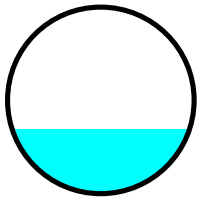
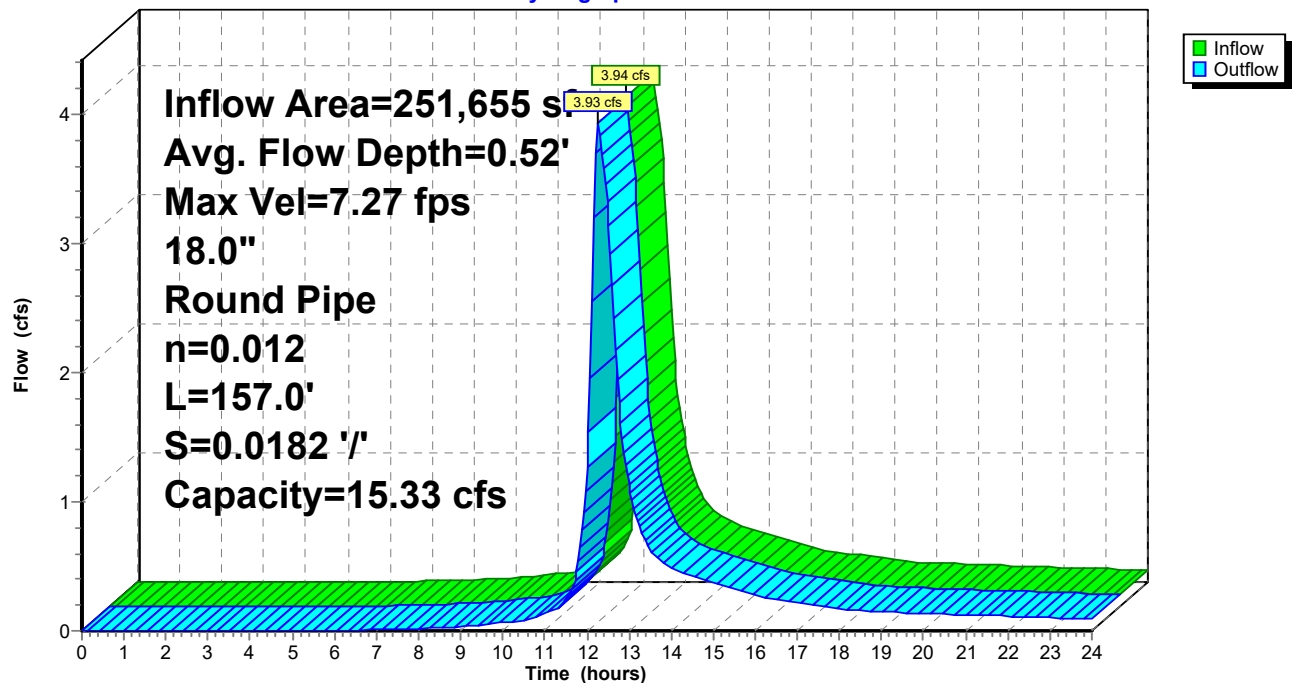
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.33 cfs

18.0" Round Pipe

n= 0.012

Length= 157.0' Slope= 0.0182 '/'

Inlet Invert= 14.55', Outlet Invert= 11.70'

**Reach 5R: 18" Pipe****Hydrograph**

Summary for Reach 6R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 0.97" for 10-Year, 24-Hour Storm event
 Inflow = 3.93 cfs @ 12.26 hrs, Volume= 20,635 cf
 Outflow = 3.93 cfs @ 12.26 hrs, Volume= 20,632 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 7.48 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.89 fps, Avg. Travel Time= 0.3 min

Peak Storage= 25 cf @ 12.26 hrs

Average Depth at Peak Storage= 0.51'

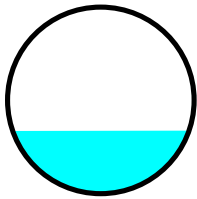
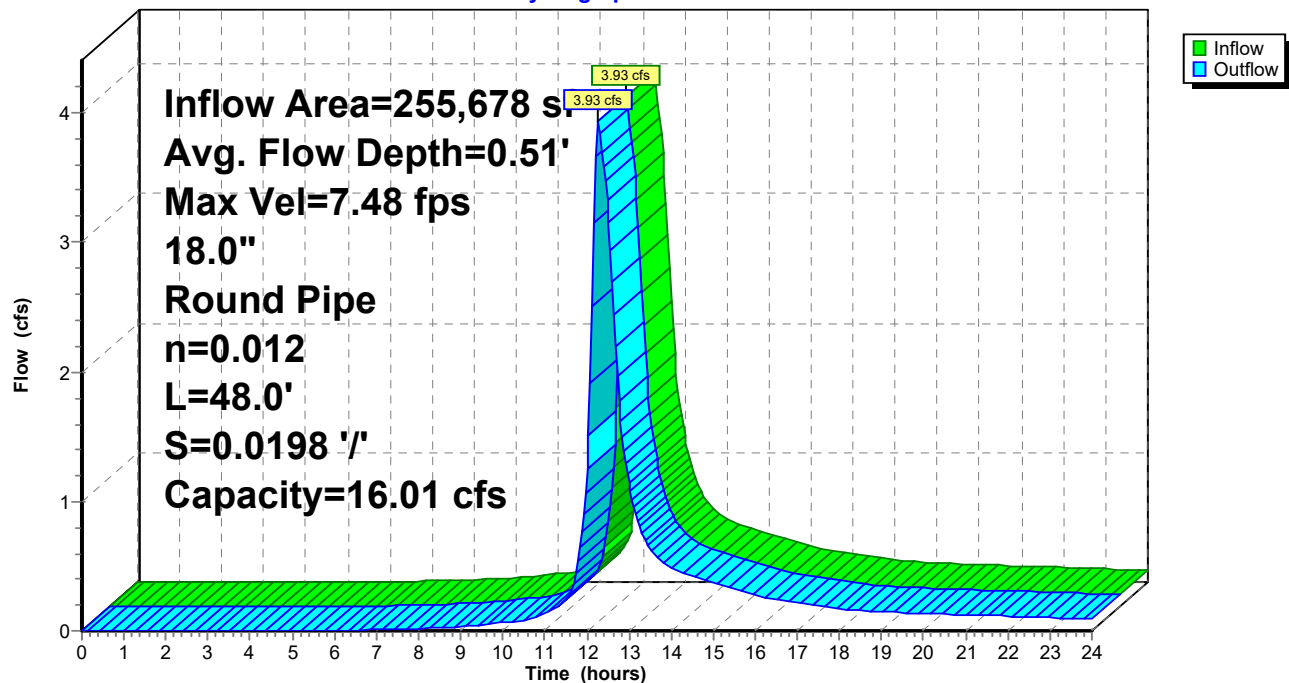
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 16.01 cfs

18.0" Round Pipe

n= 0.012

Length= 48.0' Slope= 0.0198 '/'

Inlet Invert= 11.70', Outlet Invert= 10.75'

**Reach 6R: 18" Pipe****Hydrograph**

Summary for Reach 7R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 59,959 sf, 9.86% Impervious, Inflow Depth > 0.58" for 10-Year, 24-Hour Storm event
 Inflow = 0.41 cfs @ 12.36 hrs, Volume= 2,877 cf
 Outflow = 0.41 cfs @ 12.36 hrs, Volume= 2,876 cf, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 3.44 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 1.85 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.36 hrs

Average Depth at Peak Storage= 0.21'

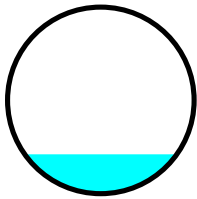
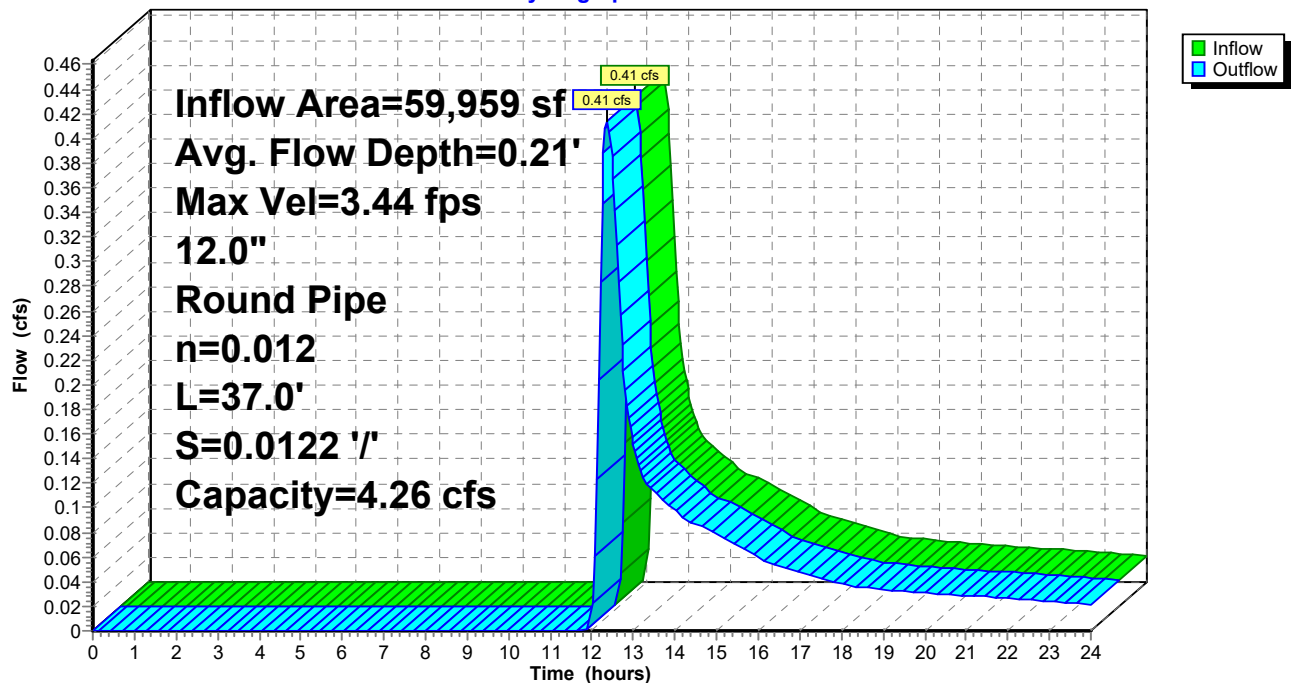
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe

n= 0.012

Length= 37.0' Slope= 0.0122 '/'

Inlet Invert= 18.00', Outlet Invert= 17.55'

**Reach 7R: 12" Pipe****Hydrograph**

Summary for Reach 8R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.42' @ 12.16 hrs

Inflow Area = 43,402 sf, 42.31% Impervious, Inflow Depth > 2.30" for 10-Year, 24-Hour Storm event
Inflow = 2.11 cfs @ 12.16 hrs, Volume= 8,318 cf
Outflow = 2.09 cfs @ 12.17 hrs, Volume= 8,313 cf, Atten= 1%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 6.55 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.5 min

Peak Storage= 71 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.43'

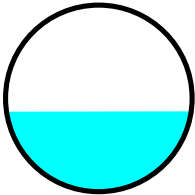
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.51 cfs

12.0" Round Pipe

n= 0.012

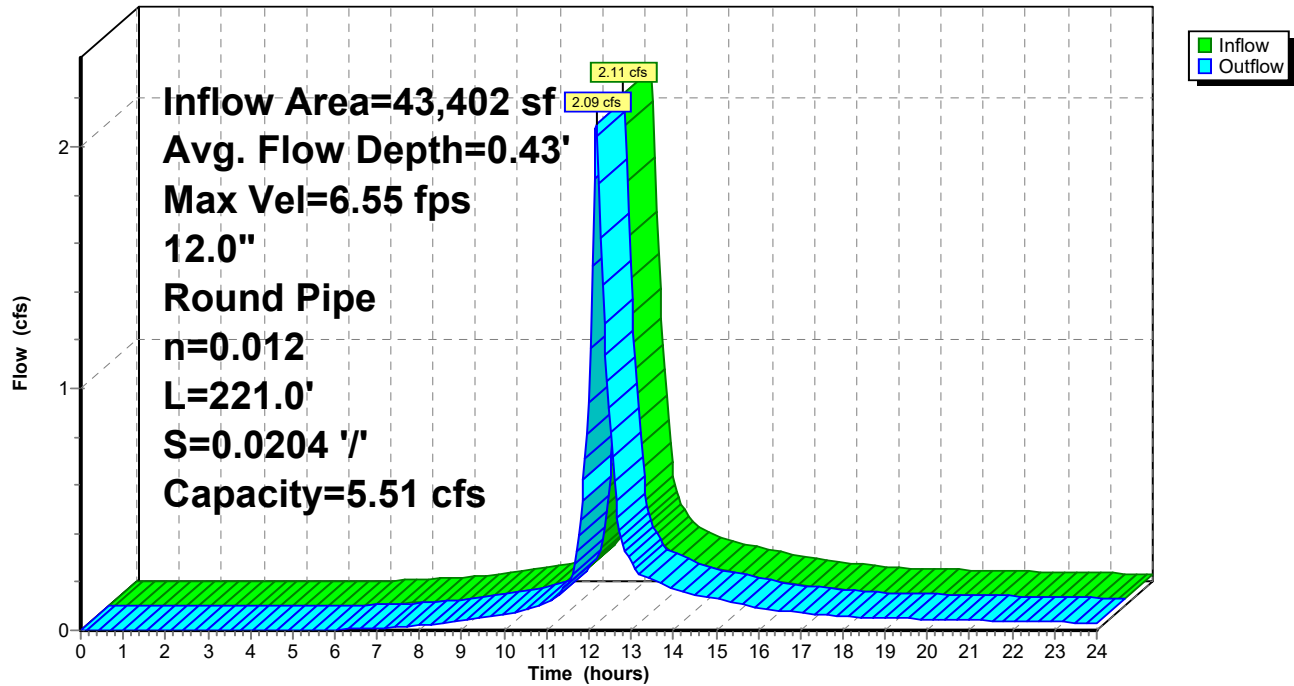
Length= 221.0' Slope= 0.0204 '/'

Inlet Invert= 25.00', Outlet Invert= 20.50'



Reach 8R: 12" Pipe

Hydrograph



Summary for Reach 9R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 1.76" for 10-Year, 24-Hour Storm event
 Inflow = 3.63 cfs @ 12.21 hrs, Volume= 16,260 cf
 Outflow = 3.60 cfs @ 12.23 hrs, Volume= 16,248 cf, Atten= 1%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 5.71 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 2.13 fps, Avg. Travel Time= 1.7 min

Peak Storage= 139 cf @ 12.22 hrs

Average Depth at Peak Storage= 0.58'

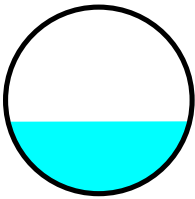
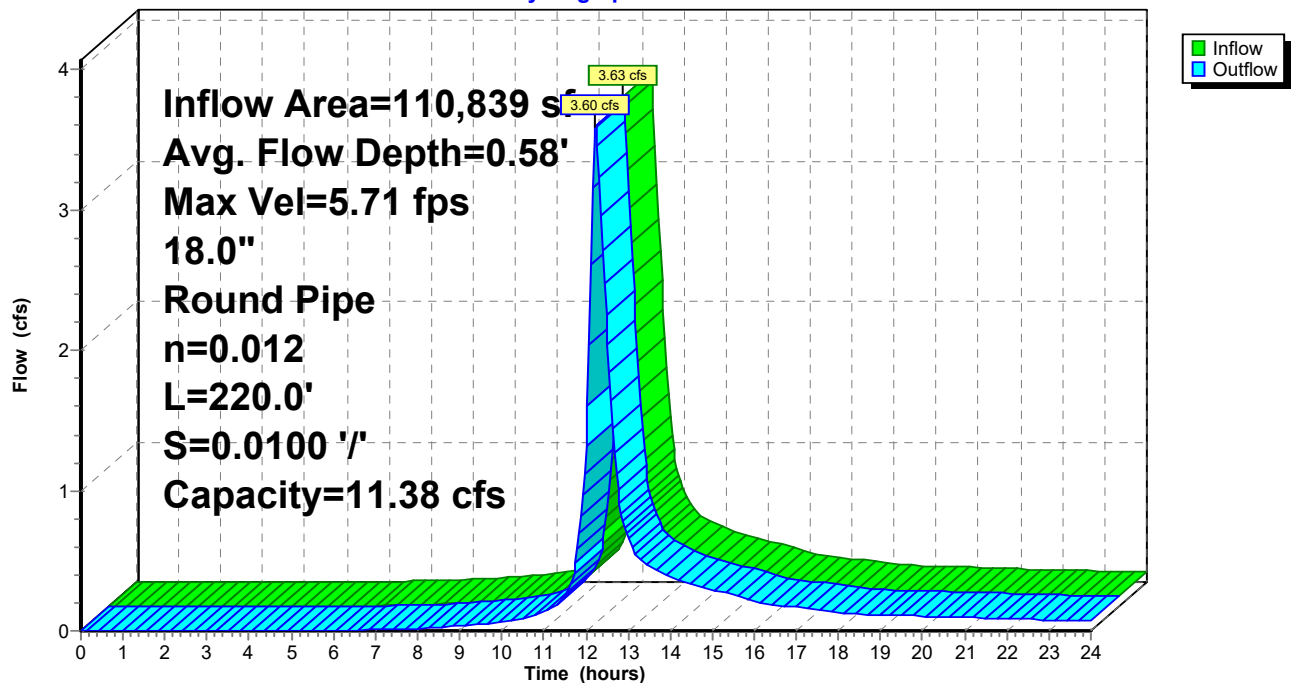
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.38 cfs

18.0" Round Pipe

n= 0.012

Length= 220.0' Slope= 0.0100 '/'

Inlet Invert= 16.75', Outlet Invert= 14.55'

**Reach 9R: 18" Pipe****Hydrograph**

Summary for Pond A2-P: CHAMBERS

Inflow Area = 80,857 sf, 87.50% Impervious, Inflow Depth > 3.78" for 10-Year, 24-Hour Storm event
 Inflow = 7.70 cfs @ 12.09 hrs, Volume= 25,492 cf
 Outflow = 1.37 cfs @ 12.54 hrs, Volume= 25,483 cf, Atten= 82%, Lag= 27.5 min
 Discarded = 0.69 cfs @ 11.44 hrs, Volume= 23,965 cf
 Primary = 0.68 cfs @ 12.54 hrs, Volume= 1,518 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 17.90' @ 12.54 hrs Surf.Area= 3,603 sf Storage= 8,621 cf

Plug-Flow detention time= 79.8 min calculated for 25,483 cf (100% of inflow)
 Center-of-Mass det. time= 79.6 min (859.7 - 780.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1A | 14.50' | 5,063 cf | 29.92'W x 120.42'L x 5.50'H Field A 19,814 cf Overall - 7,156 cf Embedded = 12,658 cf x 40.0% Voids |
| #2A | 15.25' | 7,156 cf | ADS_StormTech MC-3500 d +Capx 64 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 64 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf |
| | | 12,219 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

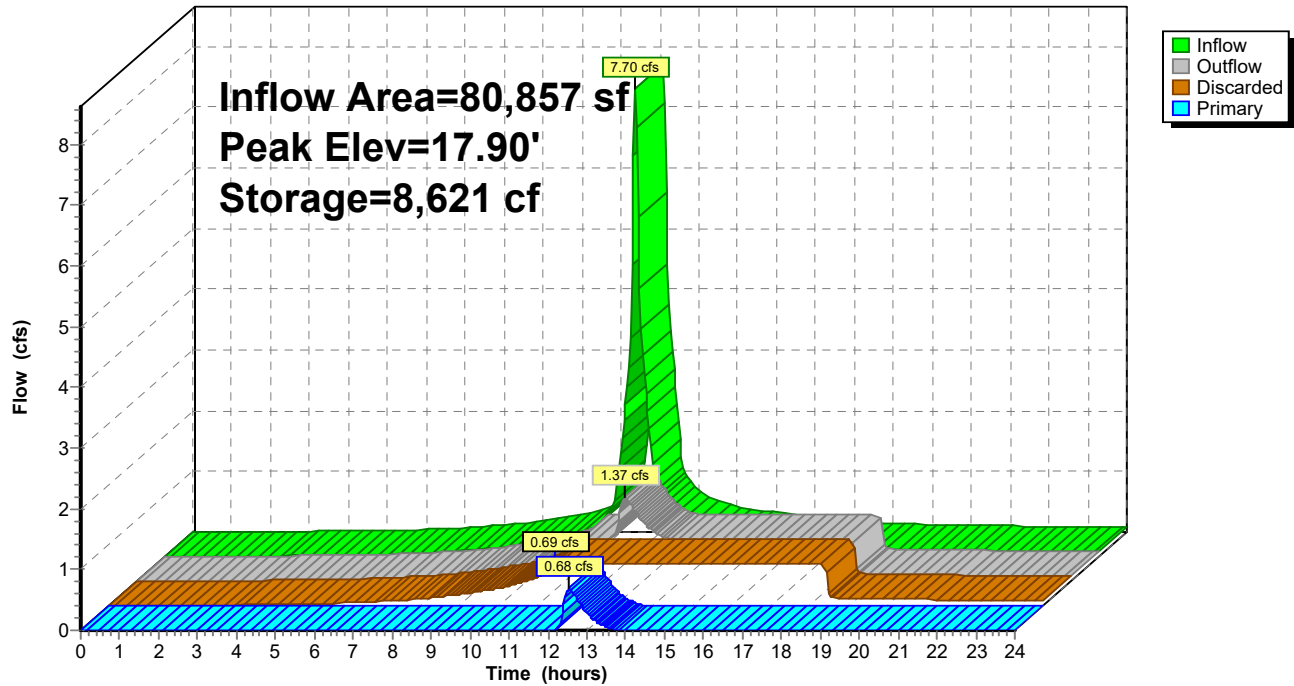
| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.25' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.25' / 15.15' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 19.50' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |
| #4 | Device 1 | 17.40' | 8.0" Vert. Orifice/Grate C= 0.600 |

Discarded OutFlow Max=0.69 cfs @ 11.44 hrs HW=14.56' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.69 cfs)

Primary OutFlow Max=0.68 cfs @ 12.54 hrs HW=17.90' (Free Discharge)
 ↑ **1=Culvert** (Passes 0.68 cfs of 5.55 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **4=Orifice/Grate** (Orifice Controls 0.68 cfs @ 2.41 fps)

Pond A2-P: CHAMBERS

Hydrograph



Summary for Pond A3-P: CHAMBERS

Inflow Area = 4,023 sf, 82.53% Impervious, Inflow Depth > 3.48" for 10-Year, 24-Hour Storm event
 Inflow = 0.36 cfs @ 12.09 hrs, Volume= 1,168 cf
 Outflow = 0.07 cfs @ 11.72 hrs, Volume= 1,168 cf, Atten= 81%, Lag= 0.0 min
 Discarded = 0.07 cfs @ 11.72 hrs, Volume= 1,168 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2

Peak Elev= 15.91' @ 12.54 hrs Surf.Area= 353 sf Storage= 308 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 26.2 min (822.3 - 796.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1A | 14.50' | 347 cf | 11.00'W x 32.10'L x 3.50'H Field A 1,236 cf Overall - 368 cf Embedded = 868 cf x 40.0% Voids |
| #2A | 15.00' | 368 cf | ADS_StormTech SC-740 +Cap x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 8 Chambers in 2 Rows |
| | | 715 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.00' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.00' / 14.90' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 16.90' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Device 1 | 16.15' | 6.0" Vert. Orifice/Grate C= 0.600 |
| #4 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |

Discarded OutFlow Max=0.07 cfs @ 11.72 hrs HW=14.54' (Free Discharge)

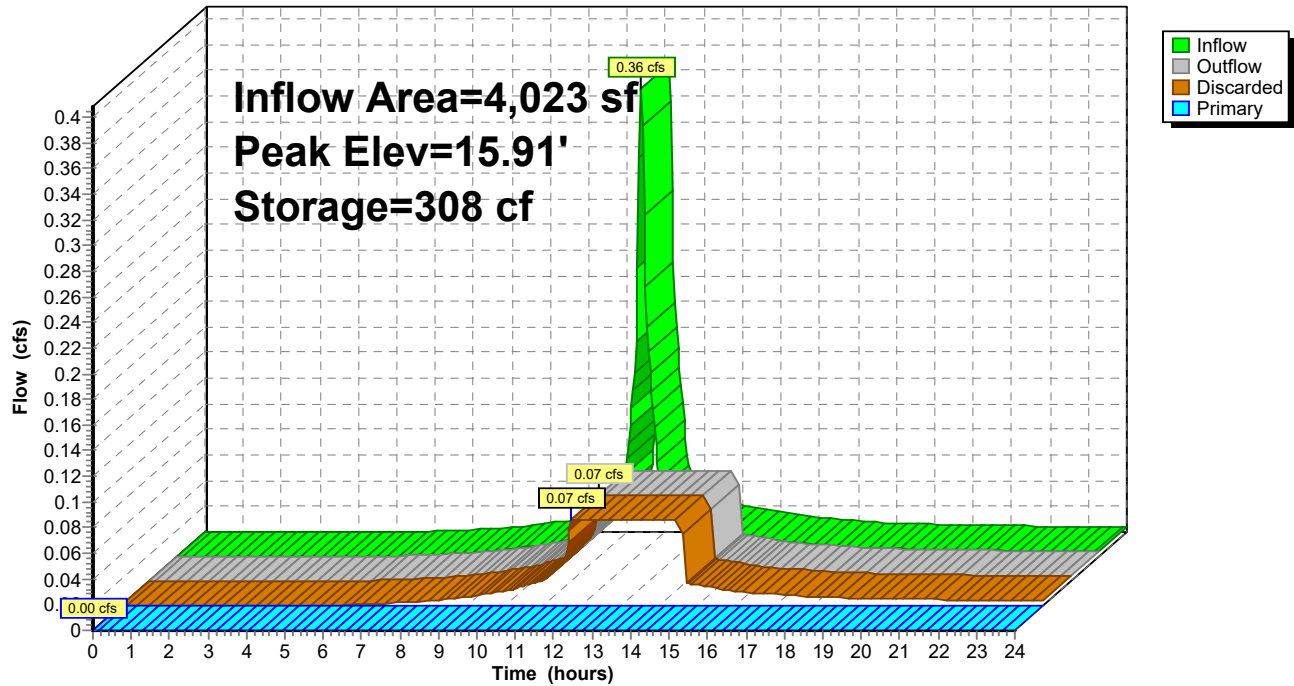
↑ **4=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=14.50' (Free Discharge)

↑ **1=Culvert** (Controls 0.00 cfs)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

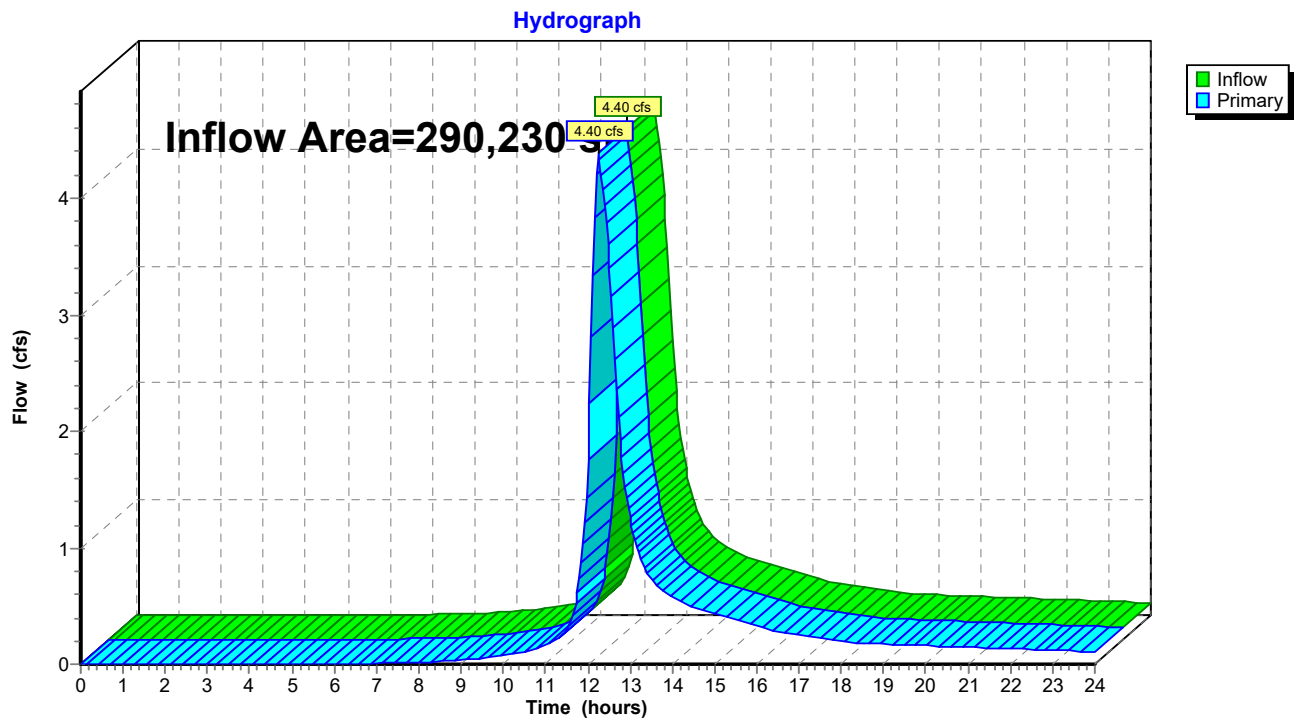
↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Pond A3-P: CHAMBERS**Hydrograph**

Summary for Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Inflow Area = 290,230 sf, 44.91% Impervious, Inflow Depth > 0.99" for 10-Year, 24-Hour Storm event
Inflow = 4.40 cfs @ 12.25 hrs, Volume= 23,978 cf
Primary = 4.40 cfs @ 12.25 hrs, Volume= 23,978 cf, Atten= 0%, Lag= 0.0 min

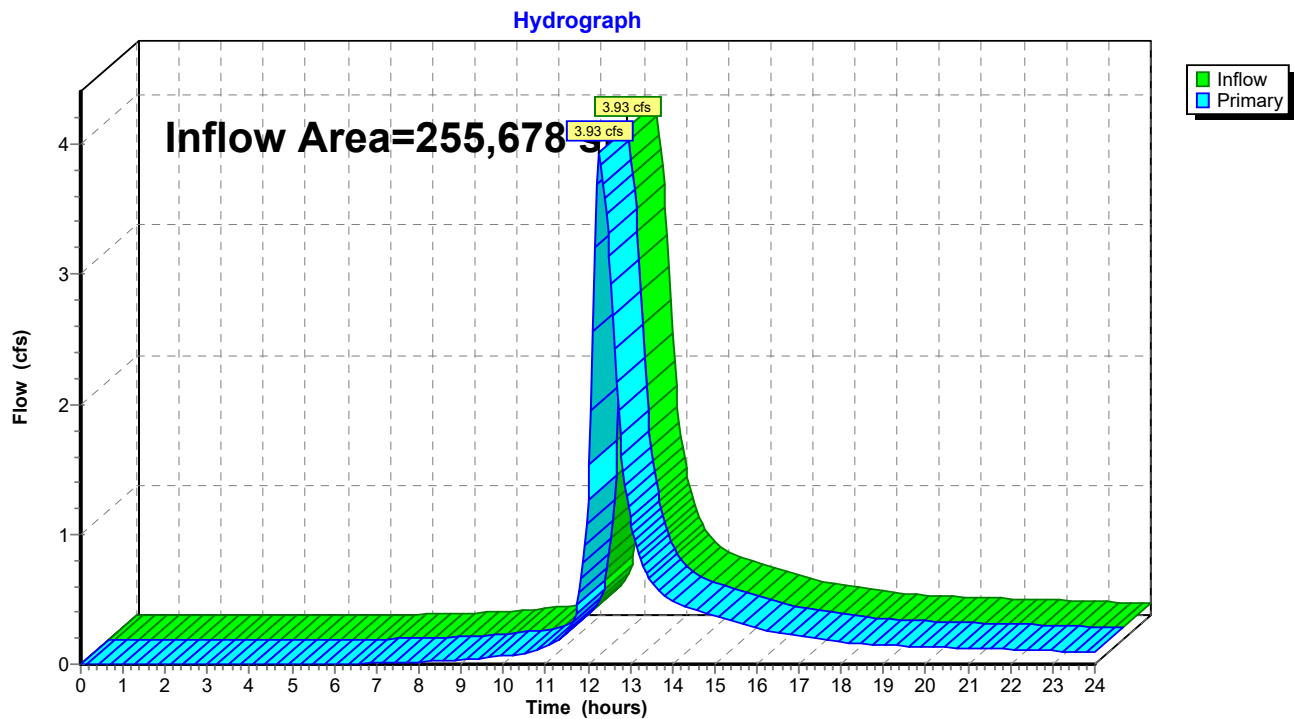
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Summary for Link DMH-A2: DMH-A2

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 0.97" for 10-Year, 24-Hour Storm event
Inflow = 3.93 cfs @ 12.26 hrs, Volume= 20,635 cf
Primary = 3.93 cfs @ 12.26 hrs, Volume= 20,635 cf, Atten= 0%, Lag= 0.0 min

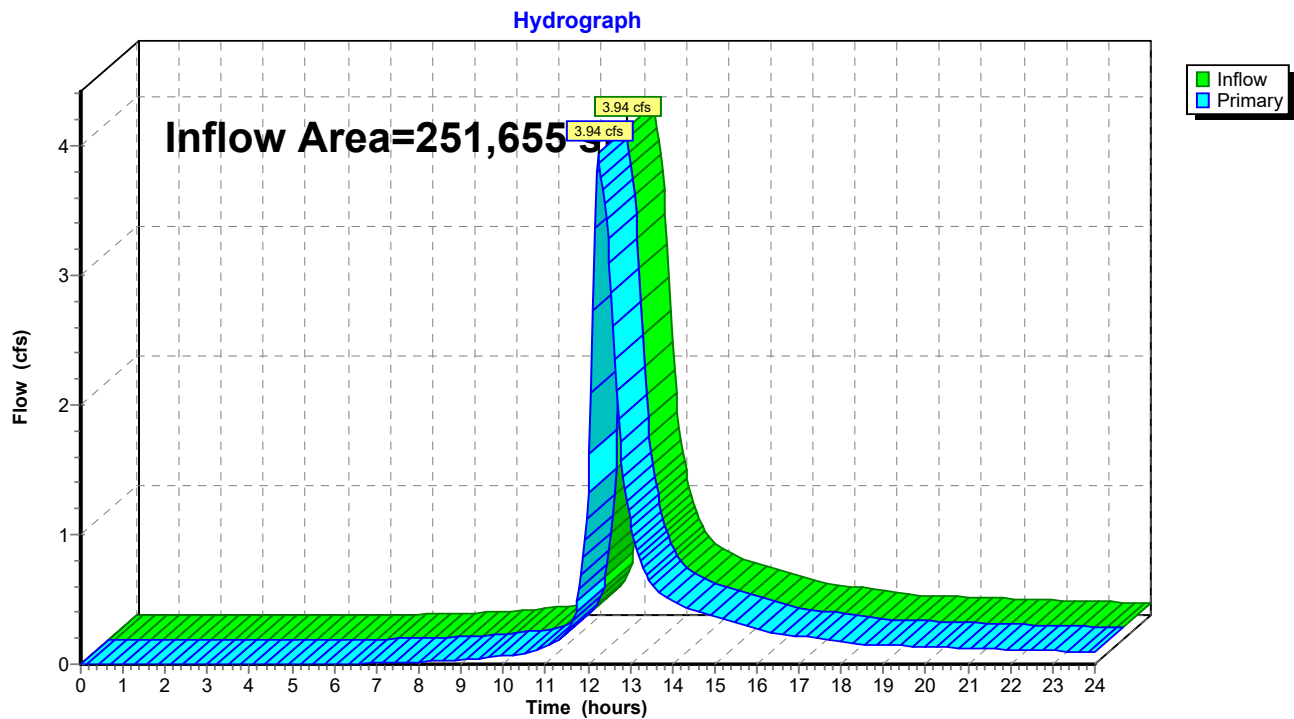
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A2: DMH-A2

Summary for Link DMH-A3: DMH-A3

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 0.98" for 10-Year, 24-Hour Storm event
Inflow = 3.94 cfs @ 12.25 hrs, Volume= 20,643 cf
Primary = 3.94 cfs @ 12.25 hrs, Volume= 20,643 cf, Atten= 0%, Lag= 0.0 min

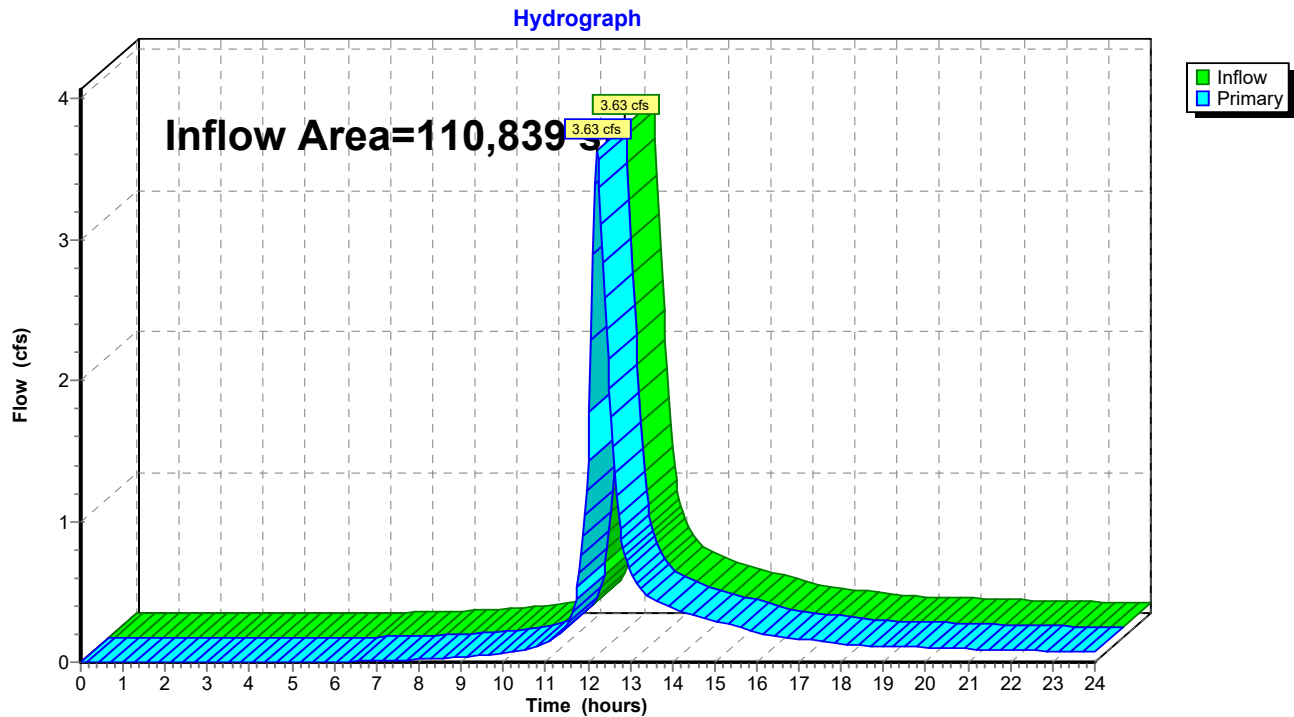
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A3: DMH-A3

Summary for Link DMH-A4: DMH-A4

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 1.76" for 10-Year, 24-Hour Storm event
Inflow = 3.63 cfs @ 12.21 hrs, Volume= 16,260 cf
Primary = 3.63 cfs @ 12.21 hrs, Volume= 16,260 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A4: DMH-A4

Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| | |
|-------------------------------------|--|
| SubcatchmentA10-PR: A10-PR | Runoff Area=19,704 sf 83.87% Impervious Runoff Depth>4.36" Tc=6.0 min CN=90 Runoff=2.20 cfs 7,154 cf |
| SubcatchmentA11-PR: A11-PR | Runoff Area=6,592 sf 1.05% Impervious Runoff Depth>0.72" Tc=6.0 min CN=47 Runoff=0.08 cfs 398 cf |
| SubcatchmentA12-PR: A12-PR | Runoff Area=4,023 sf 82.53% Impervious Runoff Depth>4.25" Tc=6.0 min CN=89 Runoff=0.44 cfs 1,424 cf |
| SubcatchmentA1A-OFF: A1A-OFF | Runoff Area=25,162 sf 69.35% Impervious Runoff Depth>4.14" Flow Length=167' Slope=0.0500 ' ' Tc=11.1 min CN=88 Runoff=2.29 cfs 8,679 cf |
| SubcatchmentA1B-OFF: A1B-OFF | Runoff Area=56,019 sf 42.72% Impervious Runoff Depth>2.24" Flow Length=155' Tc=16.0 min CN=68 Runoff=2.43 cfs 10,434 cf |
| SubcatchmentA1C-OFF: A1C-OFF | Runoff Area=46,934 sf 12.59% Impervious Runoff Depth>1.03" Flow Length=210' Slope=0.0500 ' ' Tc=17.3 min CN=52 Runoff=0.73 cfs 4,030 cf |
| SubcatchmentA2-PR: A2-PR | Runoff Area=17,456 sf 78.92% Impervious Runoff Depth>4.14" Tc=6.0 min CN=88 Runoff=1.87 cfs 6,026 cf |
| SubcatchmentA3-PR: A3-PR | Runoff Area=24,201 sf 86.59% Impervious Runoff Depth>4.47" Tc=6.0 min CN=91 Runoff=2.74 cfs 9,005 cf |
| SubcatchmentA4-OFF: A4-OFF | Runoff Area=8,837 sf 0.00% Impervious Runoff Depth>1.91" Flow Length=50' Slope=0.0300 ' ' Tc=12.0 min CN=64 Runoff=0.36 cfs 1,406 cf |
| SubcatchmentA5A-PR: A5A-PR | Runoff Area=9,403 sf 9.70% Impervious Runoff Depth>0.50" Flow Length=150' Tc=15.7 min CN=43 Runoff=0.05 cfs 392 cf |
| SubcatchmentA5B-PR: A5B-PR | Runoff Area=11,418 sf 0.00% Impervious Runoff Depth>0.40" Flow Length=266' Tc=11.7 min CN=41 Runoff=0.04 cfs 382 cf |
| SubcatchmentA5C-PR: A5C-PR | Runoff Area=13,025 sf 0.00% Impervious Runoff Depth>0.45" Flow Length=150' Tc=9.0 min CN=42 Runoff=0.06 cfs 490 cf |
| SubcatchmentA6-PR: A6-PR | Runoff Area=12,206 sf 100.00% Impervious Runoff Depth>5.26" Tc=6.0 min CN=98 Runoff=1.50 cfs 5,349 cf |
| SubcatchmentA7-PR: A7-PR | Runoff Area=14,737 sf 54.20% Impervious Runoff Depth>2.95" Tc=6.0 min CN=76 Runoff=1.16 cfs 3,623 cf |
| SubcatchmentA8-PR: A8-PR | Runoff Area=7,290 sf 100.00% Impervious Runoff Depth>5.26" Tc=6.0 min CN=98 Runoff=0.89 cfs 3,195 cf |
| SubcatchmentA9-PR: A9-PR | Runoff Area=13,223 sf 0.00% Impervious Runoff Depth>0.50" Flow Length=295' Tc=20.4 min CN=43 Runoff=0.06 cfs 550 cf |

Reach 1R: Open Channel Avg. Flow Depth=0.02' Max Vel=1.99 fps Inflow=0.36 cfs 1,406 cf
n=0.016 L=90.0' S=0.1111 '/' Capacity=1,239.89 cfs Outflow=0.35 cfs 1,405 cf

Reach 2R: Open Channel Avg. Flow Depth=0.12' Max Vel=2.93 fps Inflow=2.43 cfs 10,434 cf
n=0.016 L=153.0' S=0.0386 '/' Capacity=589.74 cfs Outflow=2.41 cfs 10,425 cf

Reach 3R: Routing Avg. Flow Depth=0.03' Max Vel=1.29 fps Inflow=0.08 cfs 398 cf
n=0.016 L=400.0' S=0.0500 '/' Capacity=102.34 cfs Outflow=0.06 cfs 395 cf

Reach 4R: 12" Pipe Avg. Flow Depth=0.57' Max Vel=5.23 fps Inflow=2.44 cfs 10,808 cf
12.0" Round Pipe n=0.012 L=44.0' S=0.0102 '/' Capacity=3.90 cfs Outflow=2.43 cfs 10,806 cf

Reach 5R: 18" Pipe Avg. Flow Depth=0.68' Max Vel=8.29 fps Inflow=6.42 cfs 30,027 cf
18.0" Round Pipe n=0.012 L=157.0' S=0.0182 '/' Capacity=15.33 cfs Outflow=6.41 cfs 30,018 cf

Reach 6R: 18" Pipe Avg. Flow Depth=0.66' Max Vel=8.56 fps Inflow=6.41 cfs 30,052 cf
18.0" Round Pipe n=0.012 L=48.0' S=0.0198 '/' Capacity=16.01 cfs Outflow=6.41 cfs 30,049 cf

Reach 7R: 12" Pipe Avg. Flow Depth=0.29' Max Vel=4.12 fps Inflow=0.78 cfs 4,520 cf
12.0" Round Pipe n=0.012 L=37.0' S=0.0122 '/' Capacity=4.26 cfs Outflow=0.78 cfs 4,519 cf

Reach 8R: 12" Pipe Avg. Flow Depth=0.49' Max Vel=6.93 fps Inflow=2.63 cfs 10,476 cf
12.0" Round Pipe n=0.012 L=221.0' S=0.0204 '/' Capacity=5.51 cfs Outflow=2.60 cfs 10,470 cf

Reach 9R: 18" Pipe Avg. Flow Depth=0.68' Max Vel=6.15 fps Inflow=4.79 cfs 21,277 cf
18.0" Round Pipe n=0.012 L=220.0' S=0.0100 '/' Capacity=11.38 cfs Outflow=4.74 cfs 21,263 cf

Pond A2-P: CHAMBERS Peak Elev=18.48' Storage=9,918 cf Inflow=9.20 cfs 30,729 cf
Discarded=0.69 cfs 26,475 cf Primary=1.45 cfs 4,244 cf Outflow=2.14 cfs 30,719 cf

Pond A3-P: CHAMBERS Peak Elev=16.27' Storage=396 cf Inflow=0.44 cfs 1,424 cf
Discarded=0.07 cfs 1,390 cf Primary=0.04 cfs 34 cf Outflow=0.11 cfs 1,424 cf

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM Inflow=7.04 cfs 34,617 cf
Primary=7.04 cfs 34,617 cf

Link DMH-A2: DMH-A2 Inflow=6.41 cfs 30,052 cf
Primary=6.41 cfs 30,052 cf

Link DMH-A3: DMH-A3 Inflow=6.42 cfs 30,027 cf
Primary=6.42 cfs 30,027 cf

Link DMH-A4: DMH-A4 Inflow=4.79 cfs 21,277 cf
Primary=4.79 cfs 21,277 cf

Total Runoff Area = 290,230 sf Runoff Volume = 62,538 cf Average Runoff Depth = 2.59"
55.09% Pervious = 159,896 sf 44.91% Impervious = 130,334 sf

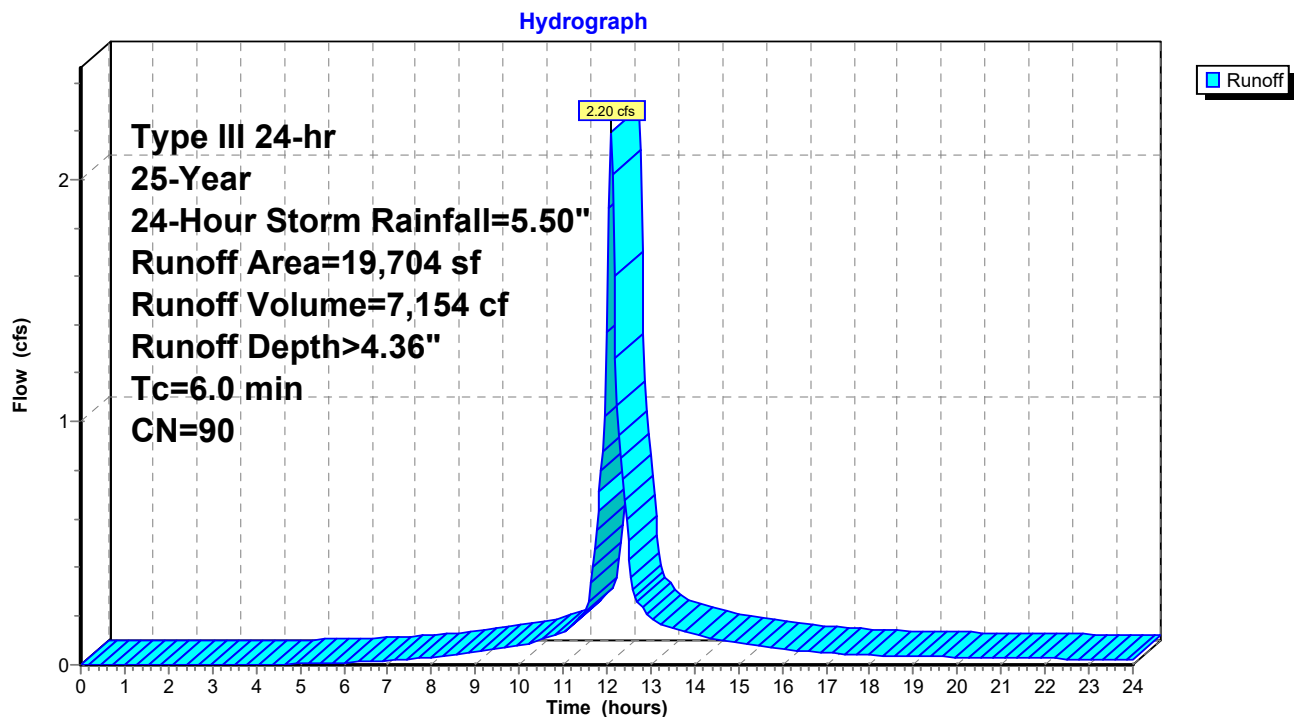
Summary for Subcatchment A10-PR: A10-PR

Runoff = 2.20 cfs @ 12.09 hrs, Volume= 7,154 cf, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,128 | 98 | Roofs, HSG A |
| 12,397 | 98 | Paved parking, HSG A |
| 3,179 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 19,704 | 90 | Weighted Average |
| 3,179 | | 16.13% Pervious Area |
| 16,525 | | 83.87% Impervious Area |

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

Subcatchment A10-PR: A10-PR

Summary for Subcatchment A11-PR: A11-PR

Runoff = 0.08 cfs @ 12.13 hrs, Volume= 398 cf, Depth> 0.72"

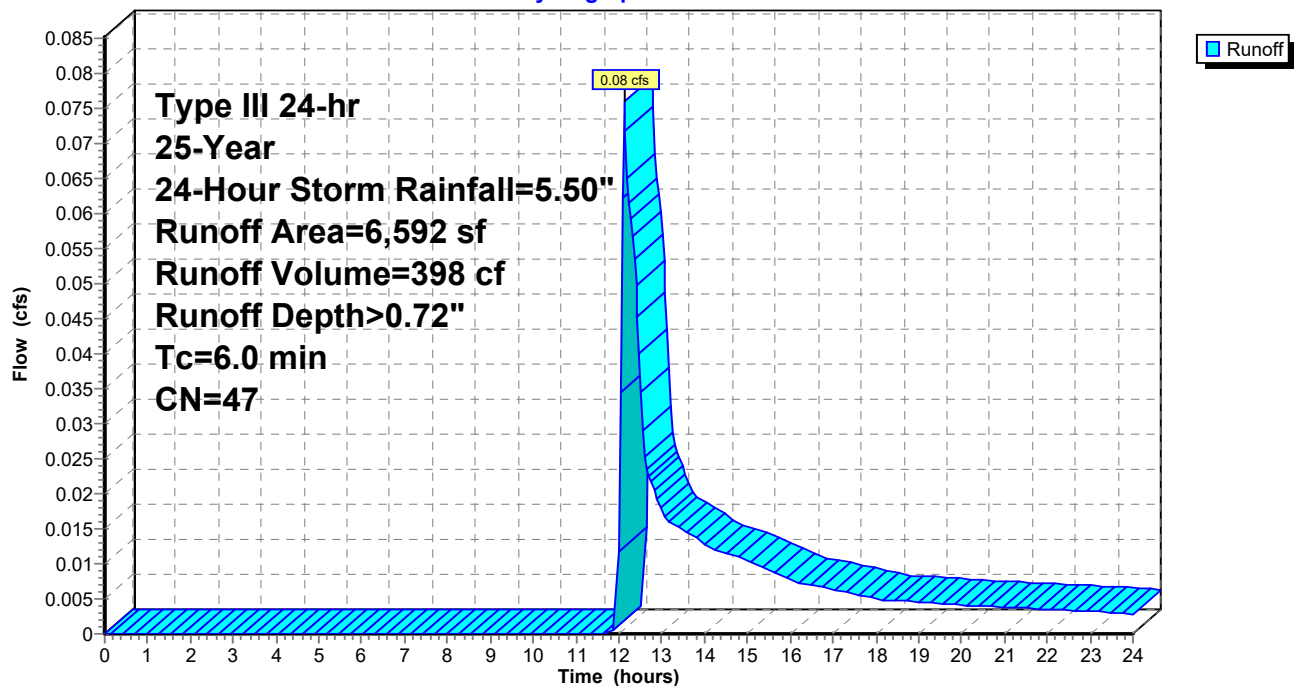
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 69 | 98 | Paved parking, HSG A |
| 5,348 | 49 | 50-75% Grass cover, Fair, HSG A |
| 1,175 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 6,592 | 47 | Weighted Average |
| 6,523 | | 98.95% Pervious Area |
| 69 | | 1.05% Impervious Area |

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

Subcatchment A11-PR: A11-PR

Hydrograph



Summary for Subcatchment A12-PR: A12-PR

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 1,424 cf, Depth> 4.25"

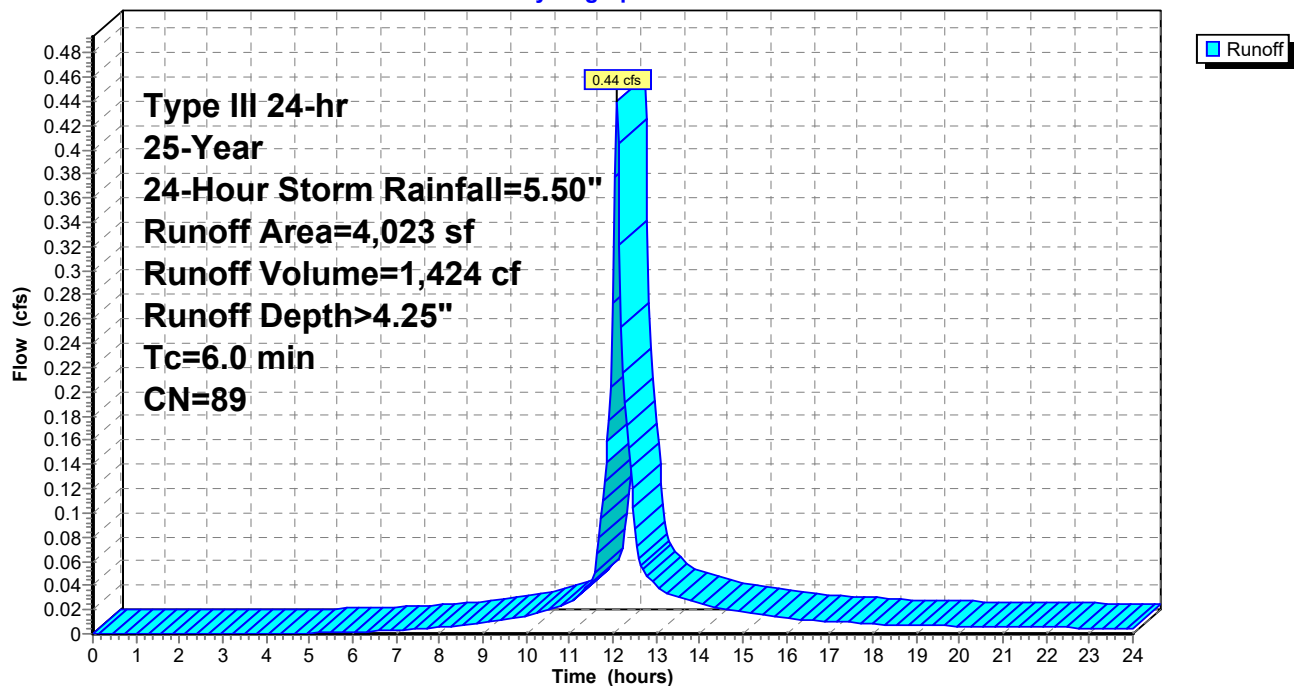
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 208 | 98 | Roofs, HSG A |
| 3,112 | 98 | Paved parking, HSG A |
| 703 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 4,023 | 89 | Weighted Average |
| 703 | | 17.47% Pervious Area |
| 3,320 | | 82.53% Impervious Area |

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

Subcatchment A12-PR: A12-PR

Hydrograph



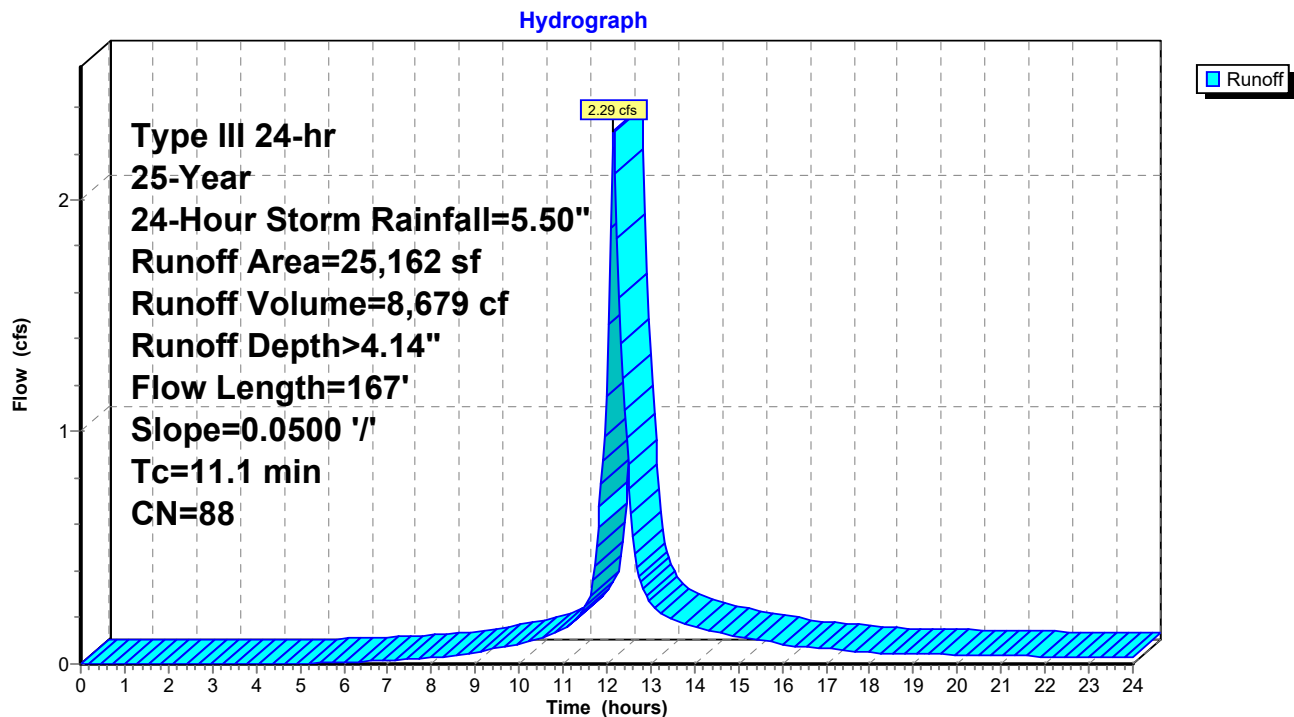
Summary for Subcatchment A1A-OFF: A1A-OFF

Runoff = 2.29 cfs @ 12.15 hrs, Volume= 8,679 cf, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 3,405 | 98 | Roofs, HSG A |
| 14,045 | 98 | Paved parking, HSG A |
| 1,238 | 49 | 50-75% Grass cover, Fair, HSG A |
| 3,513 | 43 | Woods/grass comb., Fair, HSG A |
| 2,961 | 96 | Gravel surface, HSG A |
| 25,162 | 88 | Weighted Average |
| 7,712 | | 30.65% Pervious Area |
| 17,450 | | 69.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.2 | 25 | 0.0500 | 0.19 | | Sheet Flow, SHEET FLOW |
| | | | | | Grass: Short n= 0.150 P2= 3.20" |
| 8.5 | 25 | 0.0500 | 0.05 | | Sheet Flow, |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.4 | 117 | 0.0500 | 4.54 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Paved Kv= 20.3 fps |
| 11.1 | 167 | Total | | | |

Subcatchment A1A-OFF: A1A-OFF

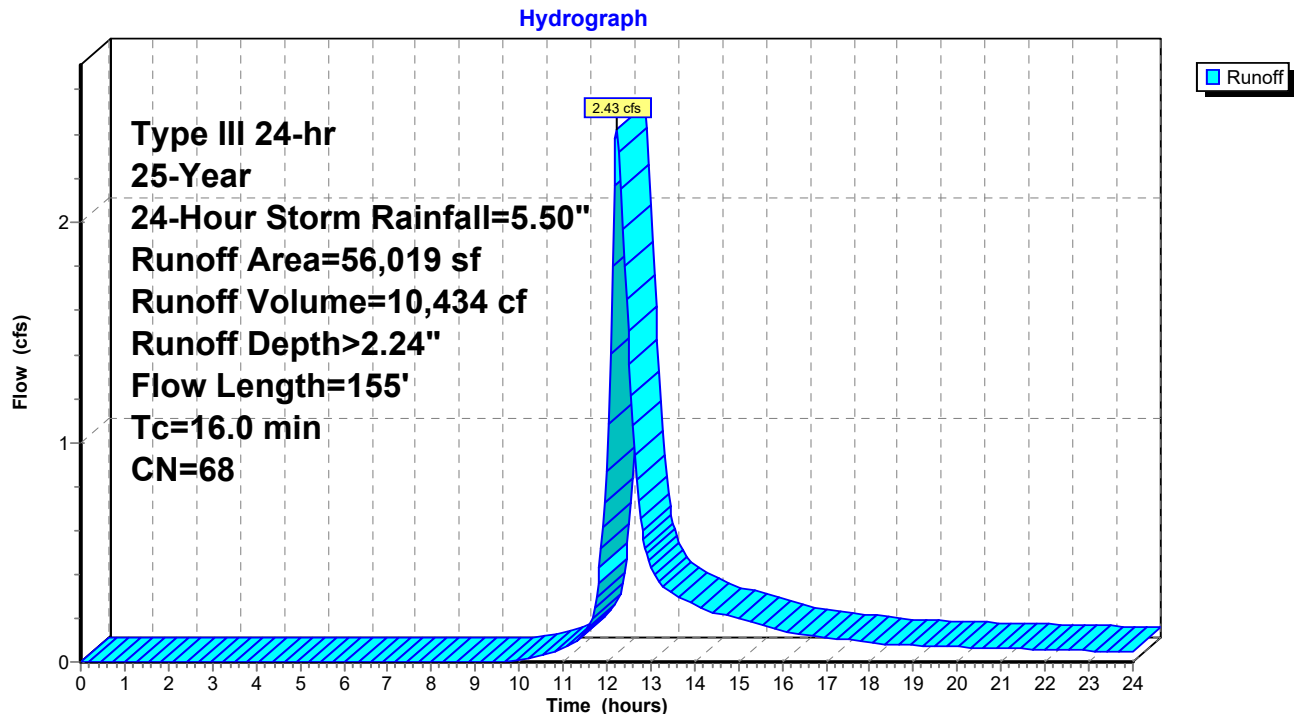
Summary for Subcatchment A1B-OFF: A1B-OFF

Runoff = 2.43 cfs @ 12.23 hrs, Volume= 10,434 cf, Depth> 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 5,821 | 98 | Roofs, HSG A |
| 18,112 | 98 | Paved parking, HSG A |
| 13,113 | 49 | 50-75% Grass cover, Fair, HSG A |
| 18,973 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 56,019 | 68 | Weighted Average |
| 32,086 | | 57.28% Pervious Area |
| 23,933 | | 42.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.1 | 105 | 0.1090 | 1.65 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 16.0 | 155 | Total | | | |

Subcatchment A1B-OFF: A1B-OFF

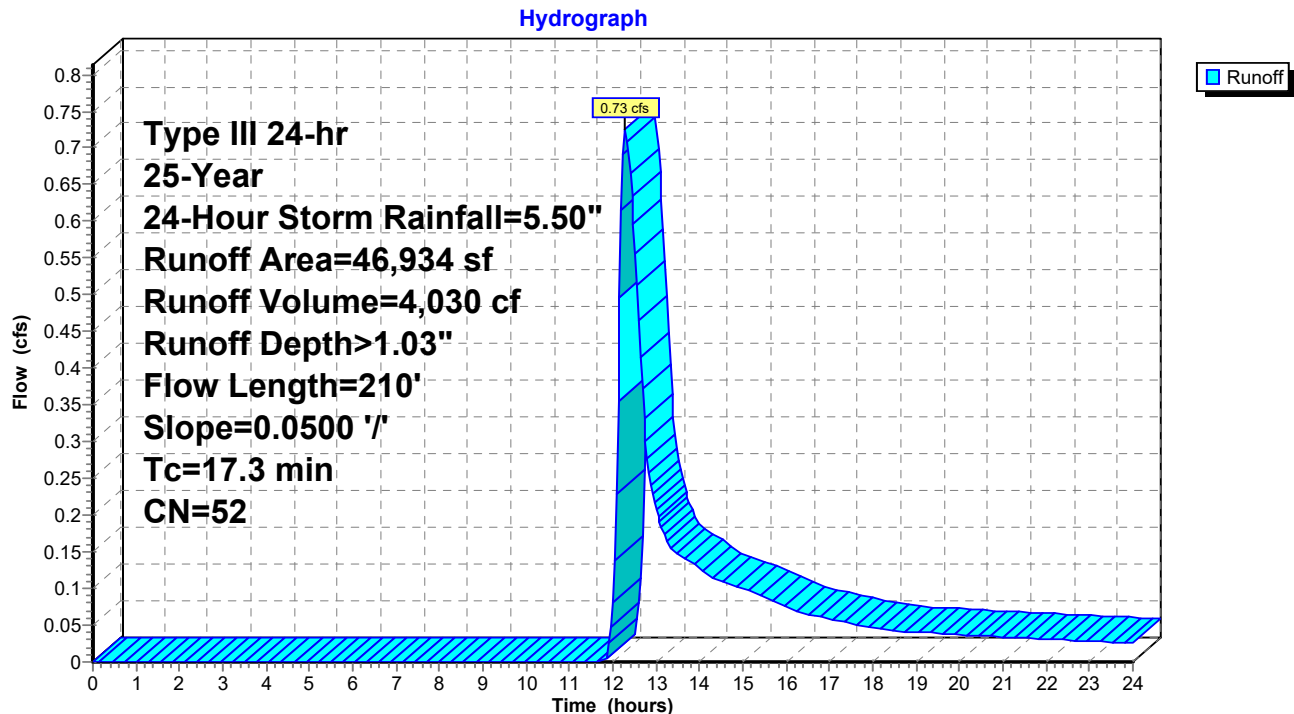
Summary for Subcatchment A1C-OFF: A1C-OFF

Runoff = 0.73 cfs @ 12.30 hrs, Volume= 4,030 cf, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,043 | 98 | Roofs, HSG A |
| 1,867 | 98 | Paved parking, HSG A |
| 14,063 | 49 | 50-75% Grass cover, Fair, HSG A |
| 26,961 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 46,934 | 52 | Weighted Average |
| 41,024 | | 87.41% Pervious Area |
| 5,910 | | 12.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 2.4 | 160 | 0.0500 | 1.12 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 17.3 | 210 | Total | | | |

Subcatchment A1C-OFF: A1C-OFF

Summary for Subcatchment A2-PR: A2-PR

Runoff = 1.87 cfs @ 12.09 hrs, Volume= 6,026 cf, Depth> 4.14"

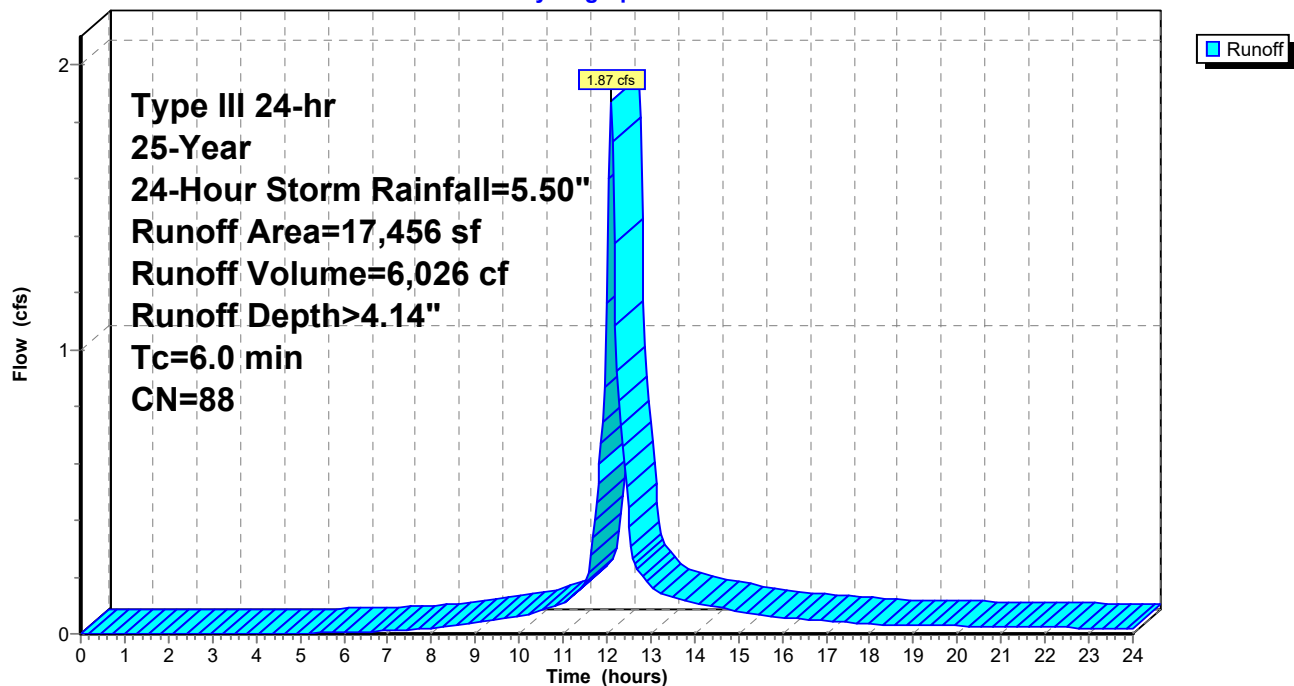
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 13,777 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,679 | 49 | 50-75% Grass cover, Fair, HSG A |
| 17,456 | 88 | Weighted Average |
| 3,679 | | 21.08% Pervious Area |
| 13,777 | | 78.92% Impervious Area |

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

Subcatchment A2-PR: A2-PR

Hydrograph



Summary for Subcatchment A3-PR: A3-PR

Runoff = 2.74 cfs @ 12.09 hrs, Volume= 9,005 cf, Depth> 4.47"

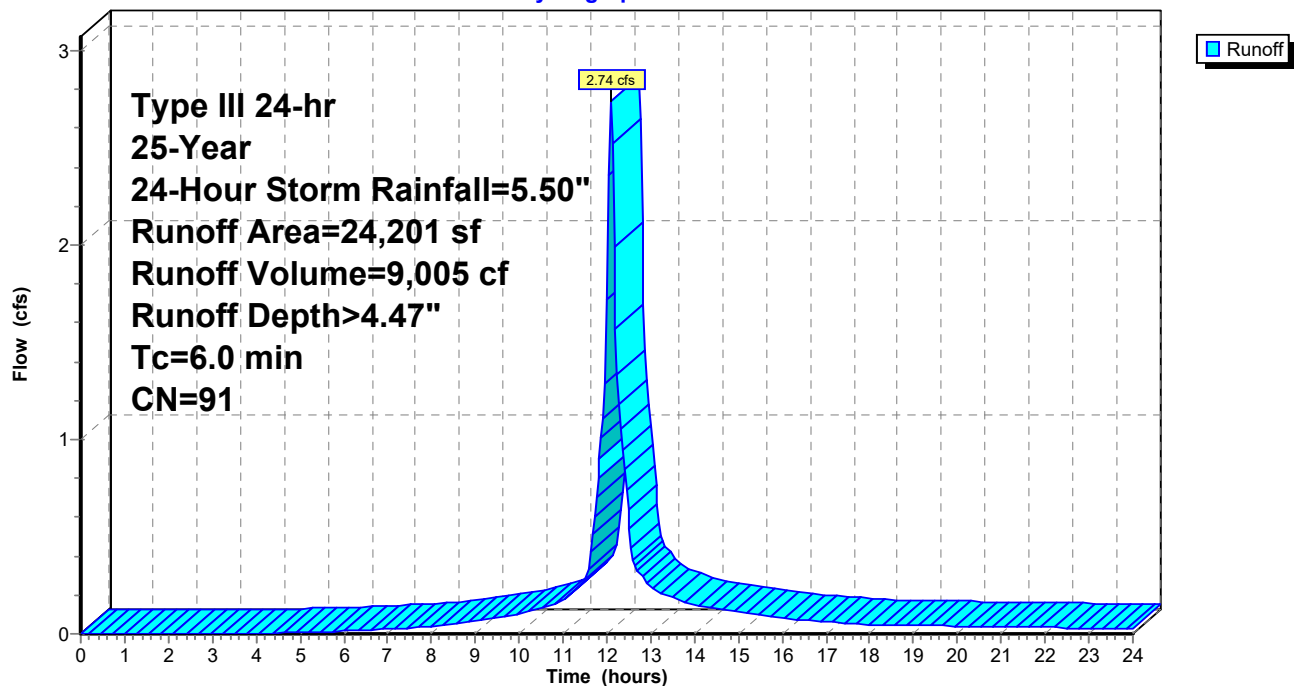
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 20,955 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,246 | 49 | 50-75% Grass cover, Fair, HSG A |
| 24,201 | 91 | Weighted Average |
| 3,246 | | 13.41% Pervious Area |
| 20,955 | | 86.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A3-PR: A3-PR

Hydrograph



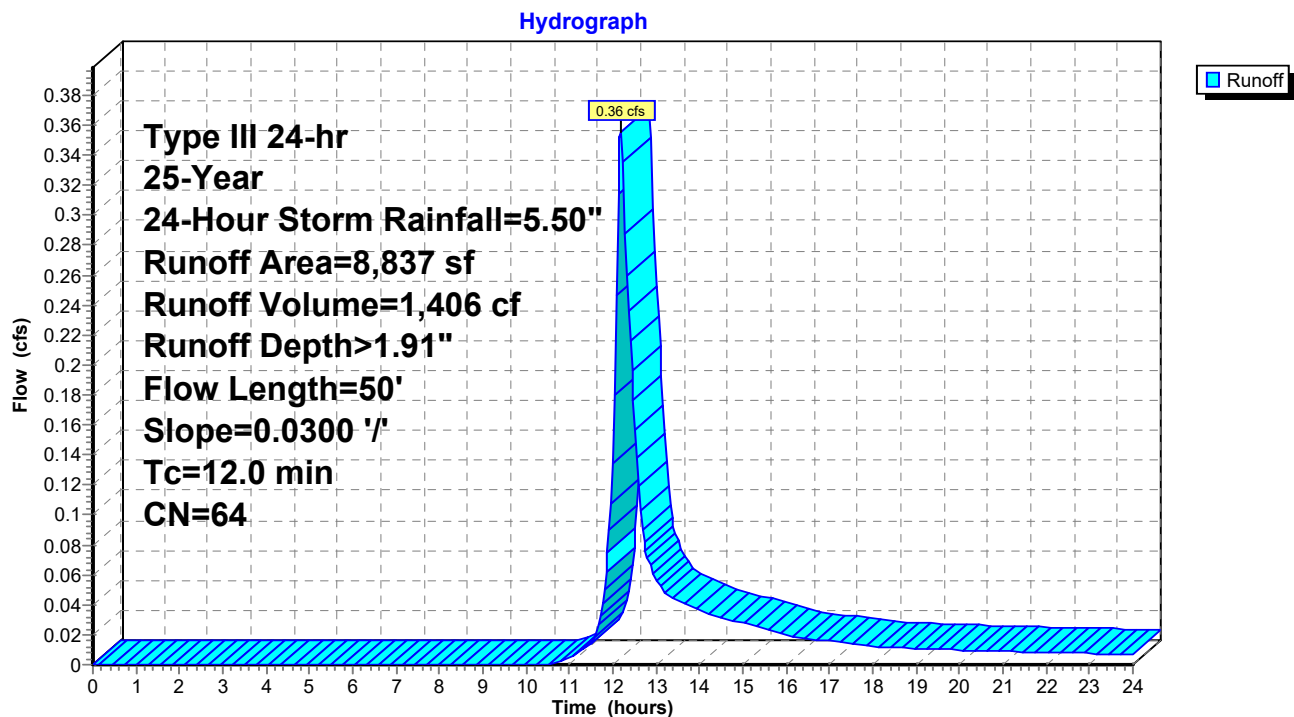
Summary for Subcatchment A4-OFF: A4-OFF

Runoff = 0.36 cfs @ 12.18 hrs, Volume= 1,406 cf, Depth> 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 4,743 | 36 | Woods, Fair, HSG A |
| 4,094 | 96 | Gravel surface, HSG A |
| 8,837 | 64 | Weighted Average |
| 8,837 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 3.2 | 30 | 0.0300 | 0.16 | | Sheet Flow, SHEET FLOW |
| | | | | | Grass: Short n= 0.150 P2= 3.20" |
| 8.8 | 20 | 0.0300 | 0.04 | | Sheet Flow, |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 12.0 | 50 | Total | | | |

Subcatchment A4-OFF: A4-OFF

Summary for Subcatchment A5A-PR: A5A-PR

Runoff = 0.05 cfs @ 12.45 hrs, Volume= 392 cf, Depth> 0.50"

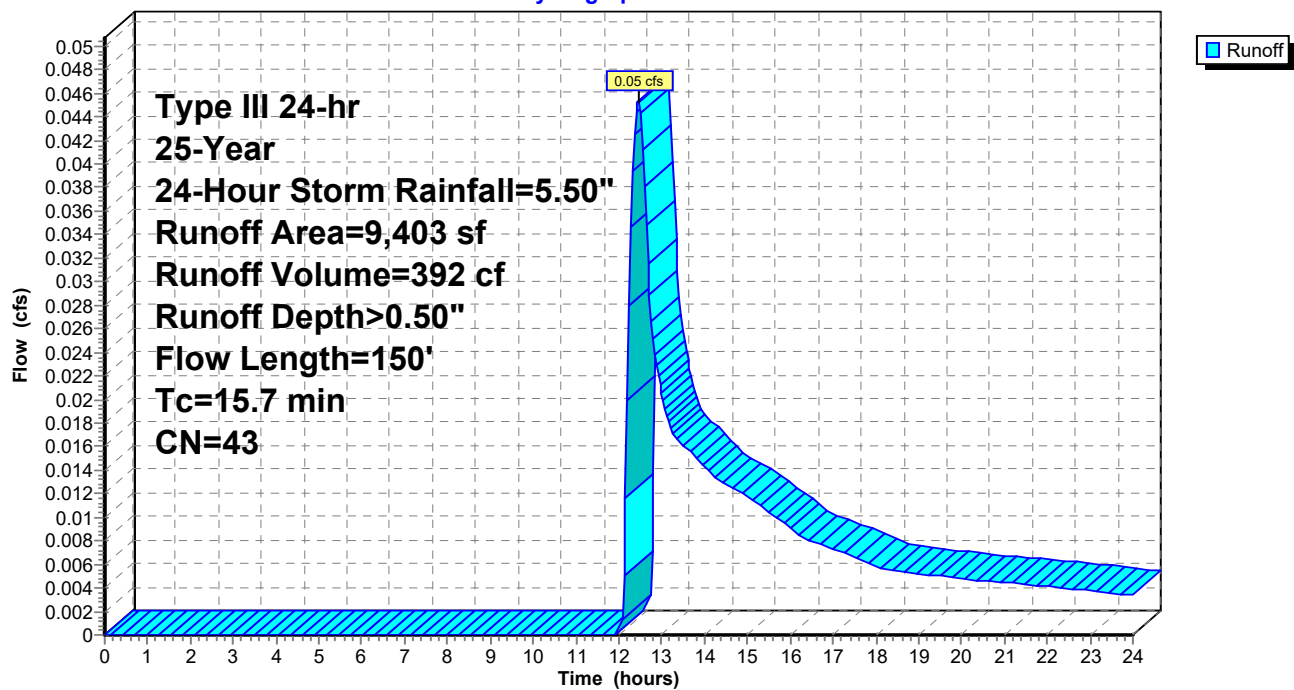
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 912 | 98 | Paved parking, HSG A |
| 587 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,904 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 9,403 | 43 | Weighted Average |
| 8,491 | | 90.30% Pervious Area |
| 912 | | 9.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 15.7 | 150 | Total | | | |

Subcatchment A5A-PR: A5A-PR

Hydrograph



Summary for Subcatchment A5B-PR: A5B-PR

Runoff = 0.04 cfs @ 12.44 hrs, Volume= 382 cf, Depth> 0.40"

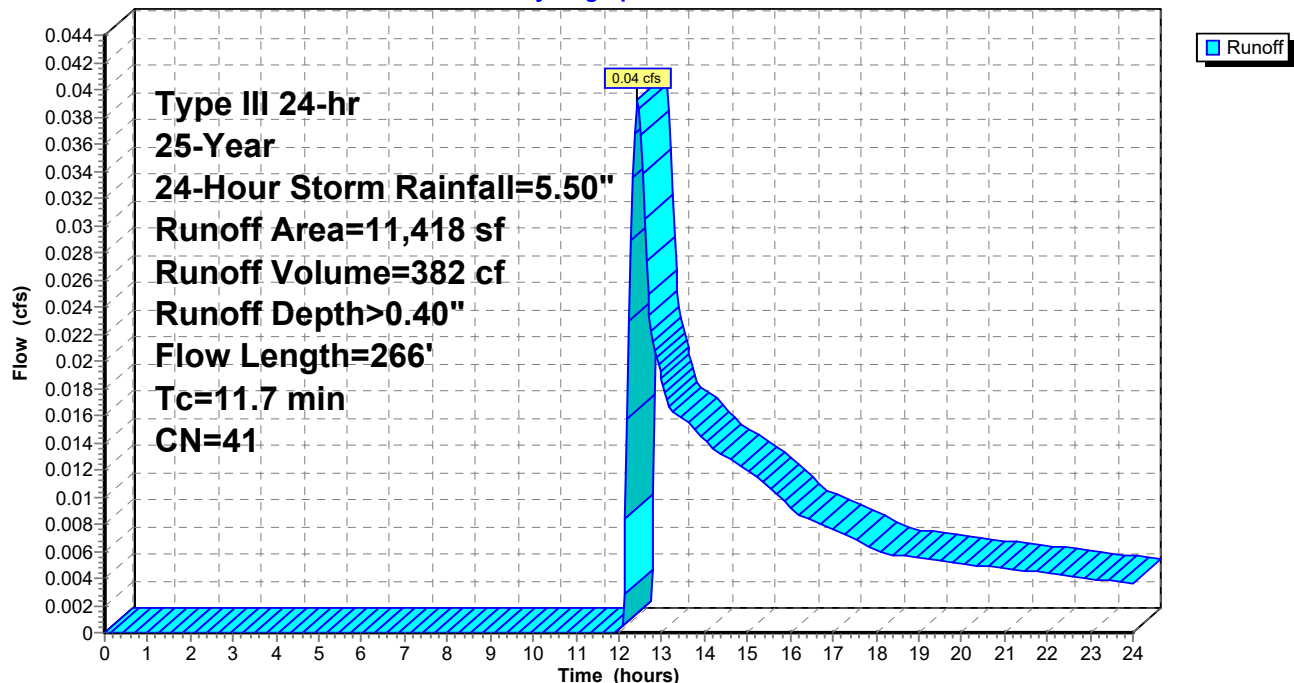
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 4,051 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,367 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 11,418 | 41 | Weighted Average |
| 11,418 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.6 | 50 | 0.1500 | 0.09 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.4 | 133 | 0.1060 | 1.63 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 0.7 | 83 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 11.7 | 266 | Total | | | |

Subcatchment A5B-PR: A5B-PR

Hydrograph



Summary for Subcatchment A5C-PR: A5C-PR

Runoff = 0.06 cfs @ 12.37 hrs, Volume= 490 cf, Depth> 0.45"

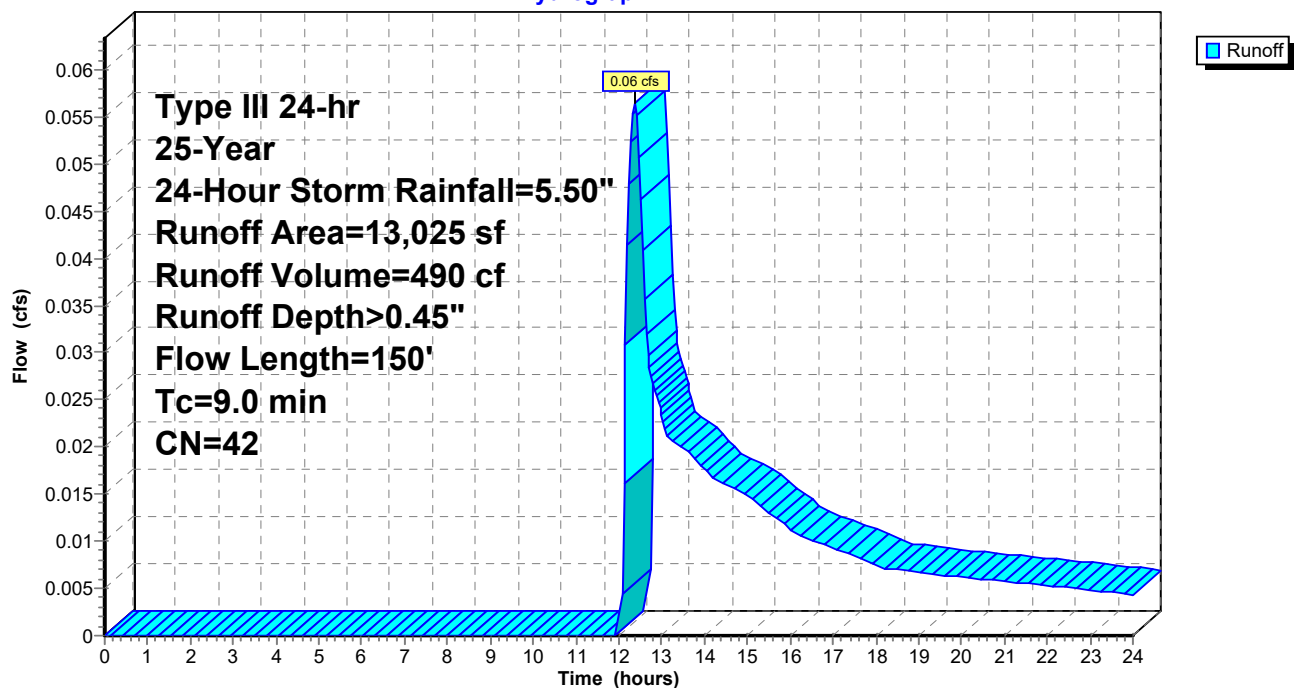
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 5,674 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,351 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 13,025 | 42 | Weighted Average |
| 13,025 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 6.5 | 25 | 0.1000 | 0.06 | | Sheet Flow, SHEET FLOW Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.7 | 25 | 0.1000 | 0.25 | | Sheet Flow, Grass: Short n= 0.150 P2= 3.20" |
| 0.8 | 100 | 0.0800 | 1.98 | | Shallow Concentrated Flow, SHALLOW CONC FLOW Short Grass Pasture Kv= 7.0 fps |
| 9.0 | 150 | Total | | | |

Subcatchment A5C-PR: A5C-PR

Hydrograph



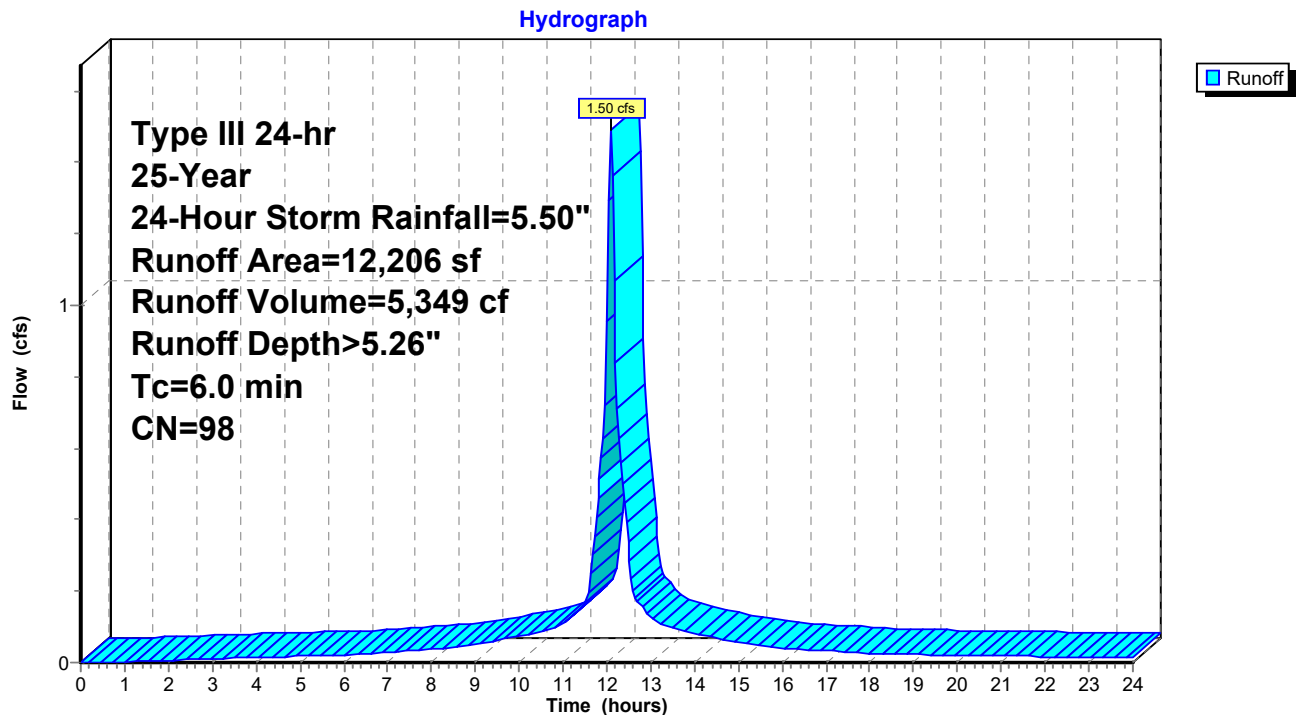
Summary for Subcatchment A6-PR: A6-PR

Runoff = 1.50 cfs @ 12.08 hrs, Volume= 5,349 cf, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Paved parking, HSG A |
| 12,206 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 12,206 | 98 | Weighted Average |
| 12,206 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A6-PR: A6-PR

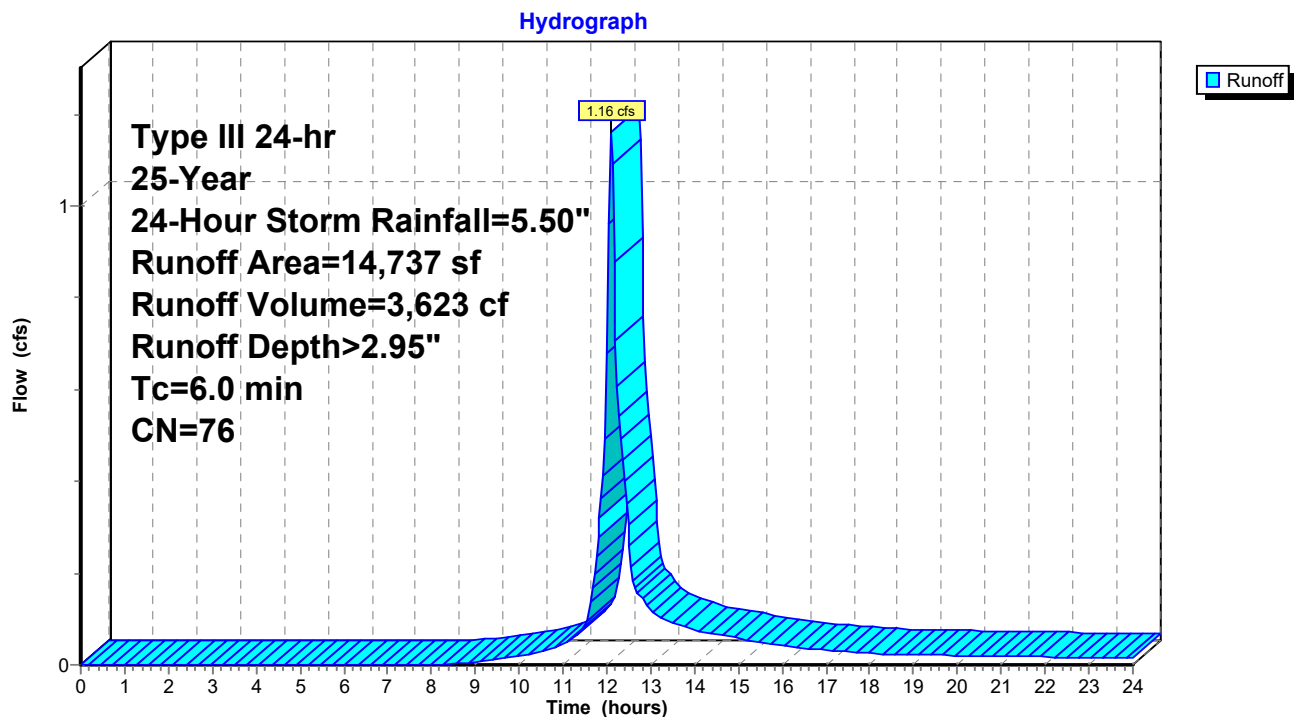
Summary for Subcatchment A7-PR: A7-PR

Runoff = 1.16 cfs @ 12.09 hrs, Volume= 3,623 cf, Depth> 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,643 | 98 | Roofs, HSG A |
| 3,344 | 98 | Paved parking, HSG A |
| 6,750 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 14,737 | 76 | Weighted Average |
| 6,750 | | 45.80% Pervious Area |
| 7,987 | | 54.20% Impervious Area |

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

Subcatchment A7-PR: A7-PR

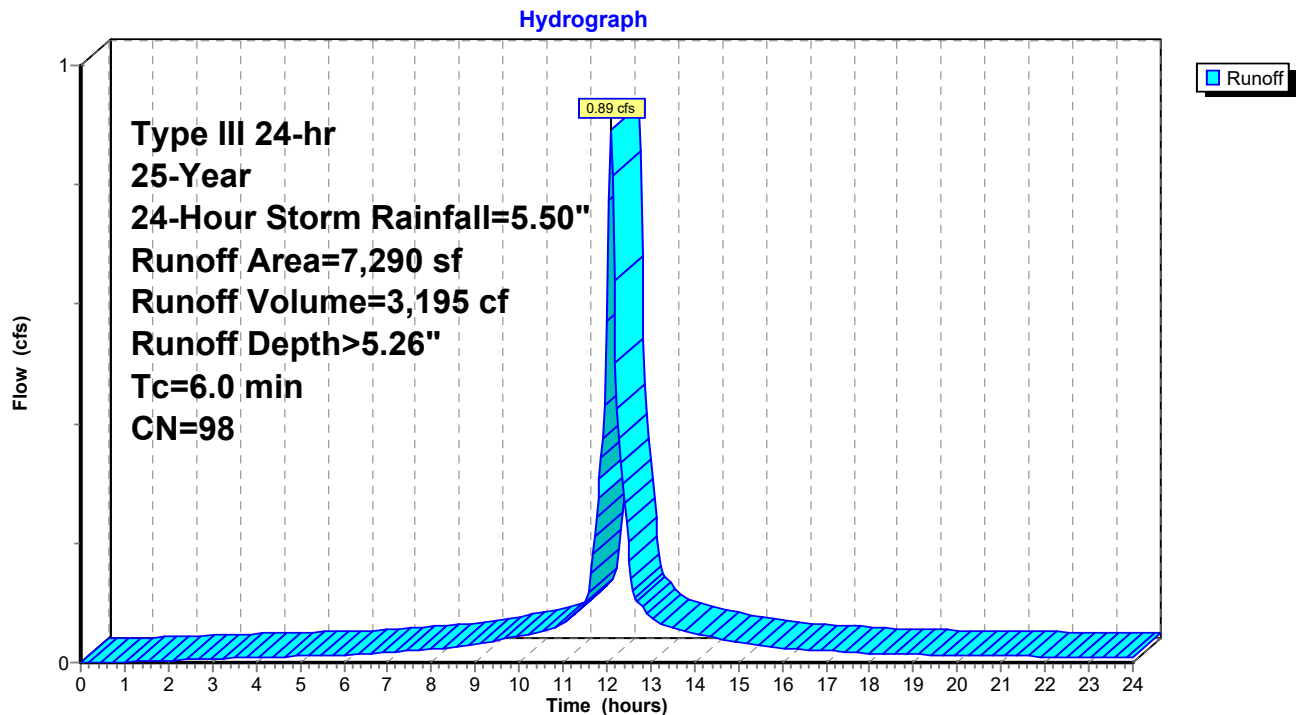
Summary for Subcatchment A8-PR: A8-PR

Runoff = 0.89 cfs @ 12.08 hrs, Volume= 3,195 cf, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 7,290 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 7,290 | 98 | Weighted Average |
| 7,290 | | 100.00% Impervious Area |

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

Subcatchment A8-PR: A8-PR

Summary for Subcatchment A9-PR: A9-PR

Runoff = 0.06 cfs @ 12.52 hrs, Volume= 550 cf, Depth> 0.50"

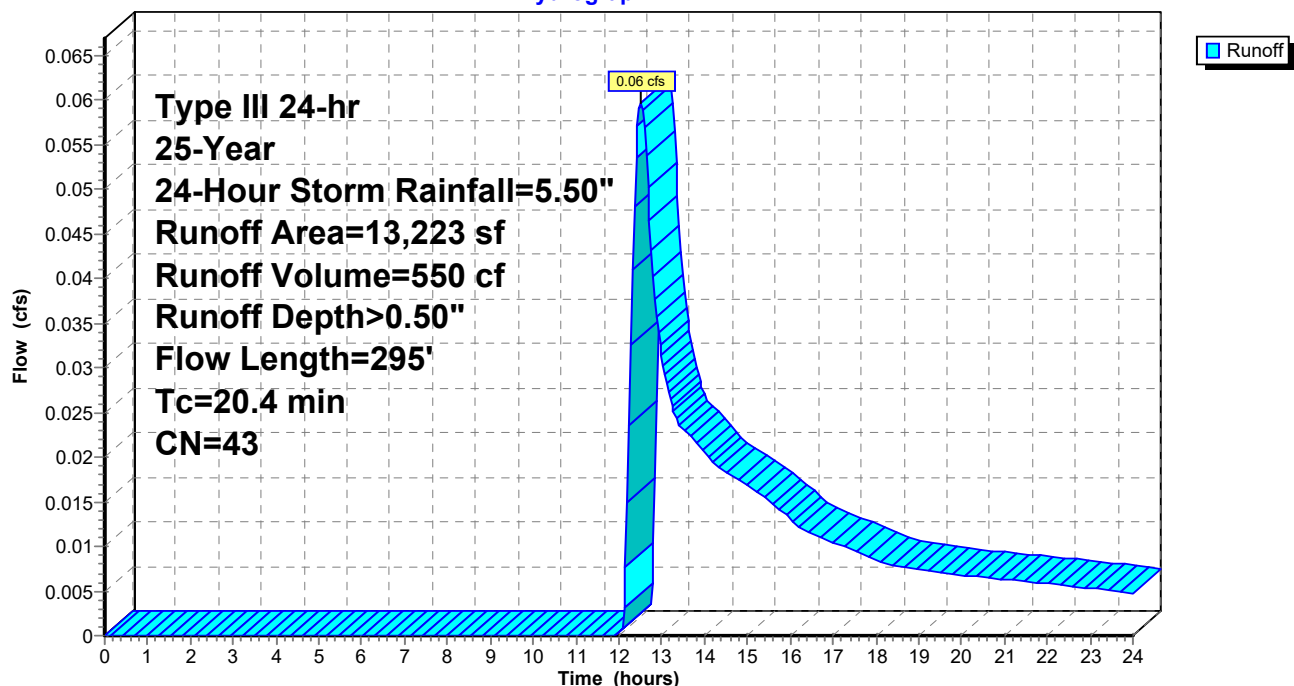
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-Year, 24-Hour Storm Rainfall=5.50"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 7,203 | 49 | 50-75% Grass cover, Fair, HSG A |
| 6,020 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 13,223 | 43 | Weighted Average |
| 13,223 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 18.3 | 50 | 0.0300 | 0.05 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 1.3 | 145 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 20.4 | 295 | Total | | | |

Subcatchment A9-PR: A9-PR

Hydrograph



Summary for Reach 1R: Open Channel

Inflow Area = 8,837 sf, 0.00% Impervious, Inflow Depth > 1.91" for 25-Year, 24-Hour Storm event
 Inflow = 0.36 cfs @ 12.18 hrs, Volume= 1,406 cf
 Outflow = 0.35 cfs @ 12.20 hrs, Volume= 1,405 cf, Atten= 1%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 1.99 fps, Min. Travel Time= 0.8 min

Avg. Velocity= 1.41 fps, Avg. Travel Time= 1.1 min

Peak Storage= 16 cf @ 12.19 hrs

Average Depth at Peak Storage= 0.02'

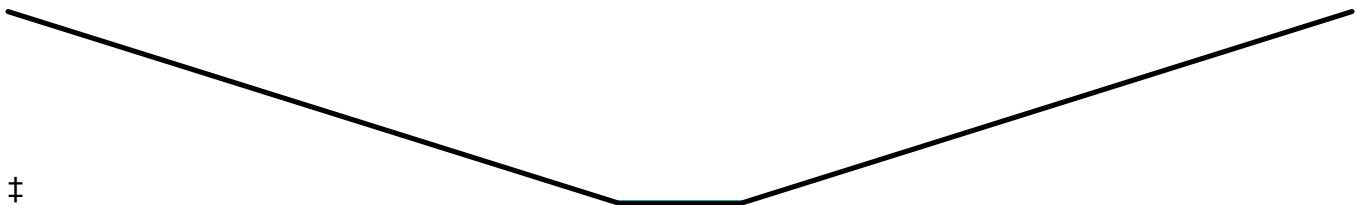
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 1,239.89 cfs

10.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

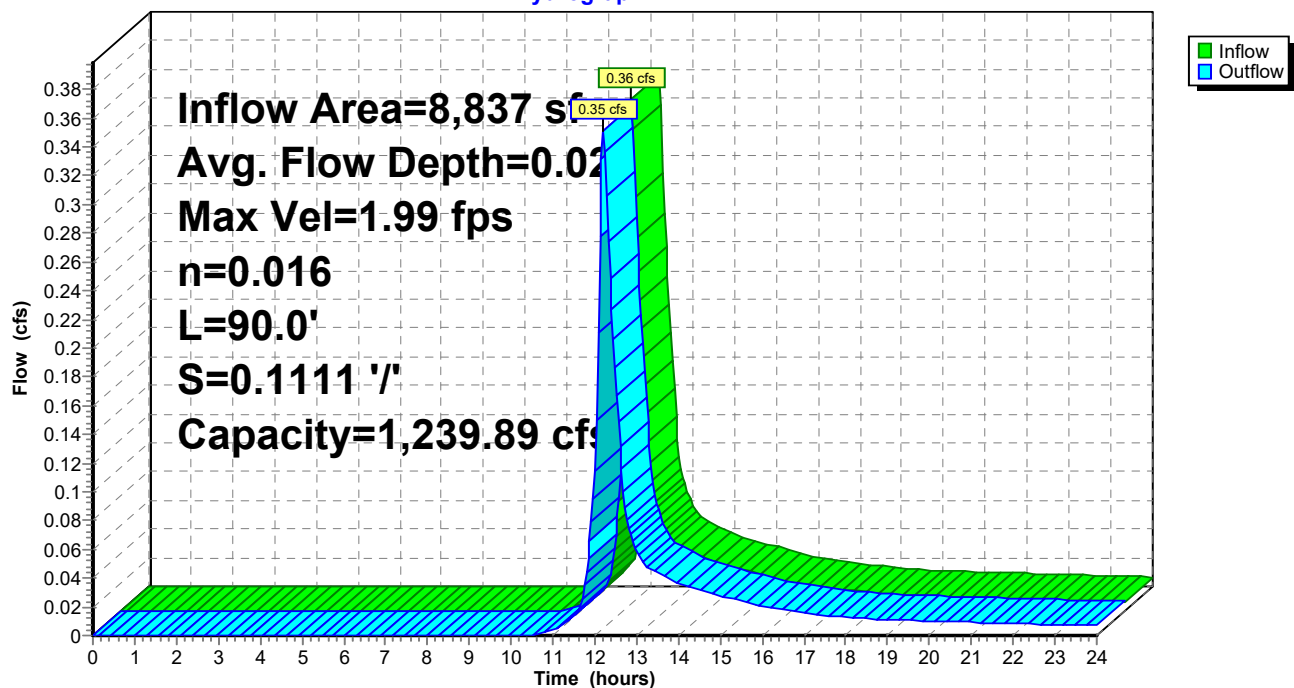
Side Slope Z-value= 50.0 '/' Top Width= 110.00'

Length= 90.0' Slope= 0.1111 '/'

Inlet Invert= 35.00', Outlet Invert= 25.00'

**Reach 1R: Open Channel**

Hydrograph



Summary for Reach 2R: Open Channel

Inflow Area = 56,019 sf, 42.72% Impervious, Inflow Depth > 2.24" for 25-Year, 24-Hour Storm event
 Inflow = 2.43 cfs @ 12.23 hrs, Volume= 10,434 cf
 Outflow = 2.41 cfs @ 12.26 hrs, Volume= 10,425 cf, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 2.93 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.38 fps, Avg. Travel Time= 1.9 min

Peak Storage= 127 cf @ 12.24 hrs

Average Depth at Peak Storage= 0.12'

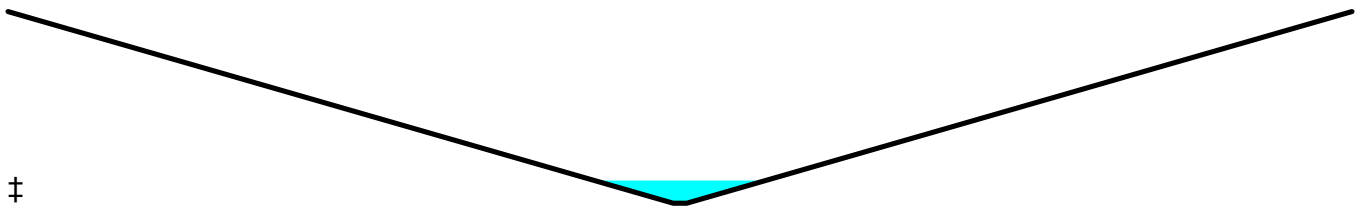
Bank-Full Depth= 1.00' Flow Area= 51.0 sf, Capacity= 589.74 cfs

1.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

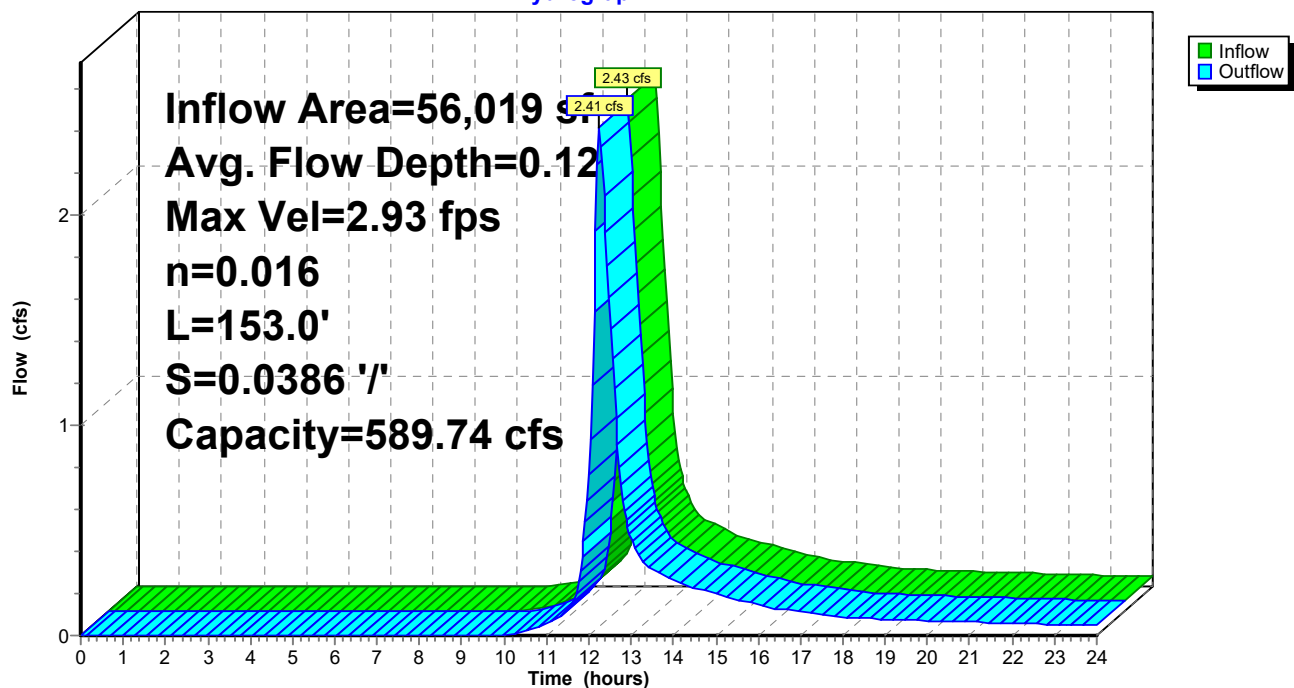
Side Slope Z-value= 50.0 '/' Top Width= 101.00'

Length= 153.0' Slope= 0.0386 '/'

Inlet Invert= 30.90', Outlet Invert= 25.00'

**Reach 2R: Open Channel**

Hydrograph



Summary for Reach 3R: Routing

Inflow Area = 6,592 sf, 1.05% Impervious, Inflow Depth > 0.72" for 25-Year, 24-Hour Storm event
 Inflow = 0.08 cfs @ 12.13 hrs, Volume= 398 cf
 Outflow = 0.06 cfs @ 12.33 hrs, Volume= 395 cf, Atten= 18%, Lag= 11.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 1.29 fps, Min. Travel Time= 5.2 min

Avg. Velocity = 0.76 fps, Avg. Travel Time= 8.8 min

Peak Storage= 19 cf @ 12.24 hrs

Average Depth at Peak Storage= 0.03'

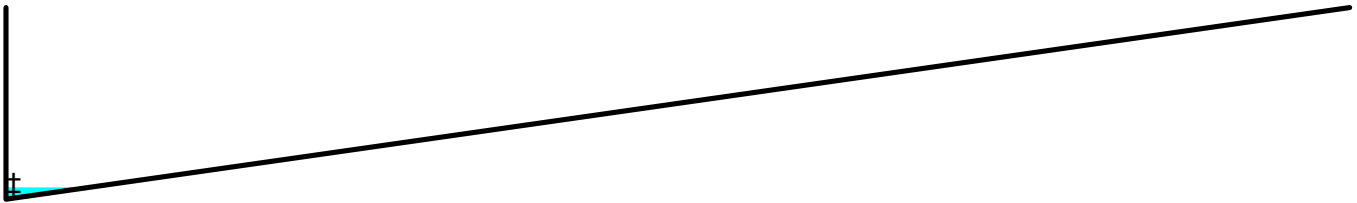
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 102.34 cfs

0.00' x 0.50' deep channel, n= 0.016

Side Slope Z-value= 0.0 100.0 '/' Top Width= 50.00'

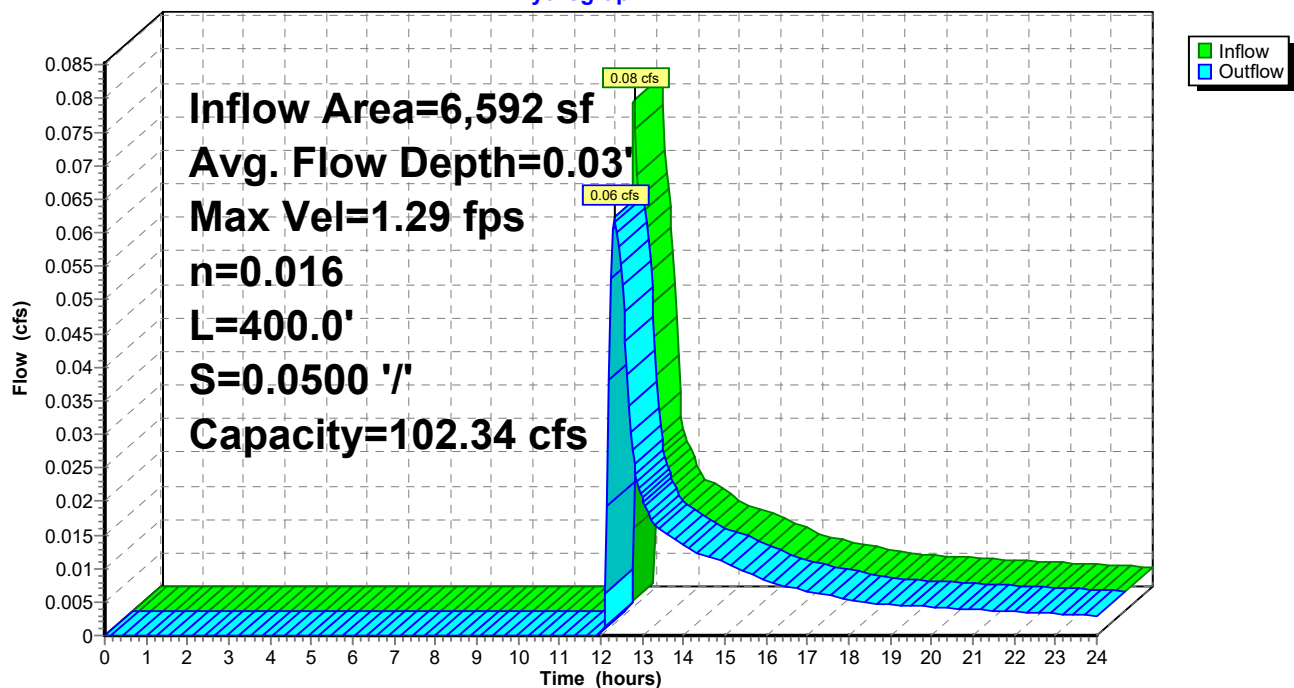
Length= 400.0' Slope= 0.0500 '/'

Inlet Invert= 20.00', Outlet Invert= 0.00'



Reach 3R: Routing

Hydrograph



Summary for Reach 4R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 67,437 sf, 35.49% Impervious, Inflow Depth > 1.92" for 25-Year, 24-Hour Storm event
 Inflow = 2.44 cfs @ 12.26 hrs, Volume= 10,808 cf
 Outflow = 2.43 cfs @ 12.26 hrs, Volume= 10,806 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 5.23 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.3 min

Peak Storage= 20 cf @ 12.26 hrs

Average Depth at Peak Storage= 0.57'

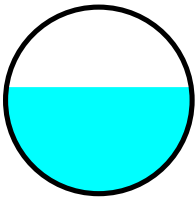
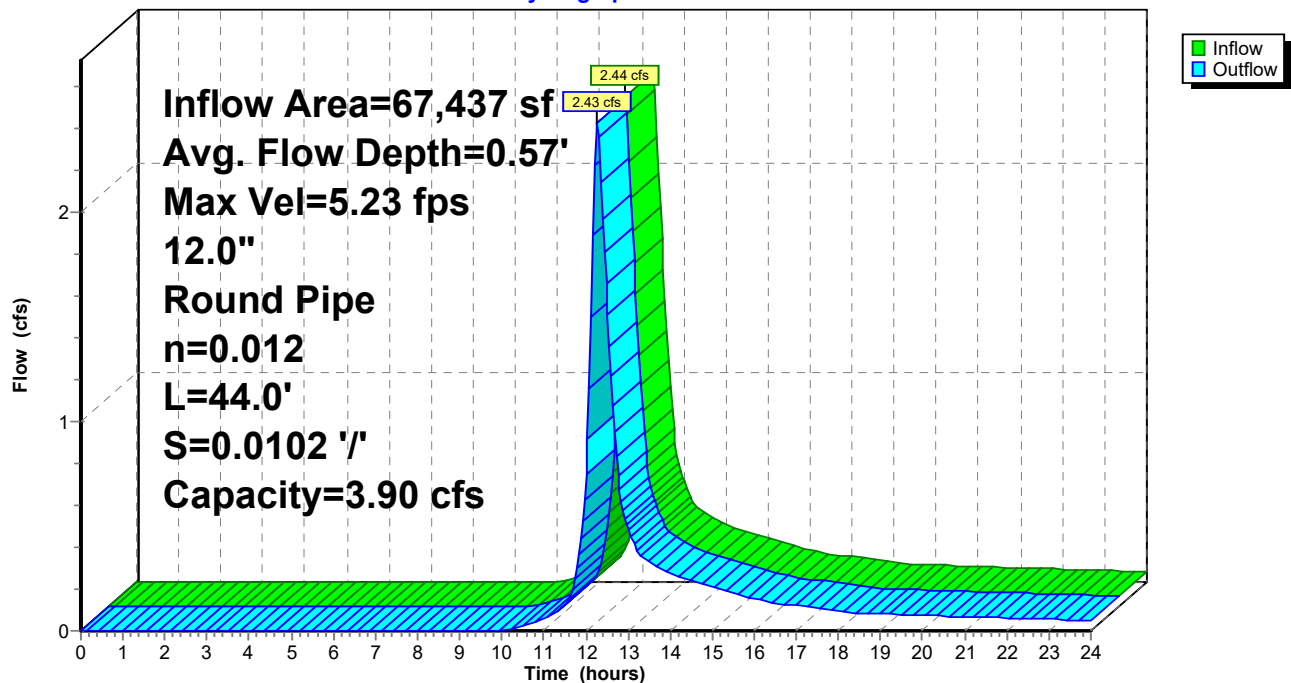
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.90 cfs

12.0" Round Pipe

n= 0.012

Length= 44.0' Slope= 0.0102 '/'

Inlet Invert= 18.65', Outlet Invert= 18.20'

**Reach 4R: 12" Pipe****Hydrograph**

Summary for Reach 5R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 1.43" for 25-Year, 24-Hour Storm event
 Inflow = 6.42 cfs @ 12.27 hrs, Volume= 30,027 cf
 Outflow = 6.41 cfs @ 12.29 hrs, Volume= 30,018 cf, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 8.29 fps, Min. Travel Time= 0.3 min

Avg. Velocity= 3.02 fps, Avg. Travel Time= 0.9 min

Peak Storage= 122 cf @ 12.28 hrs

Average Depth at Peak Storage= 0.68'

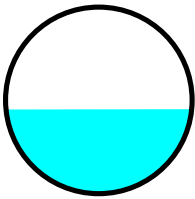
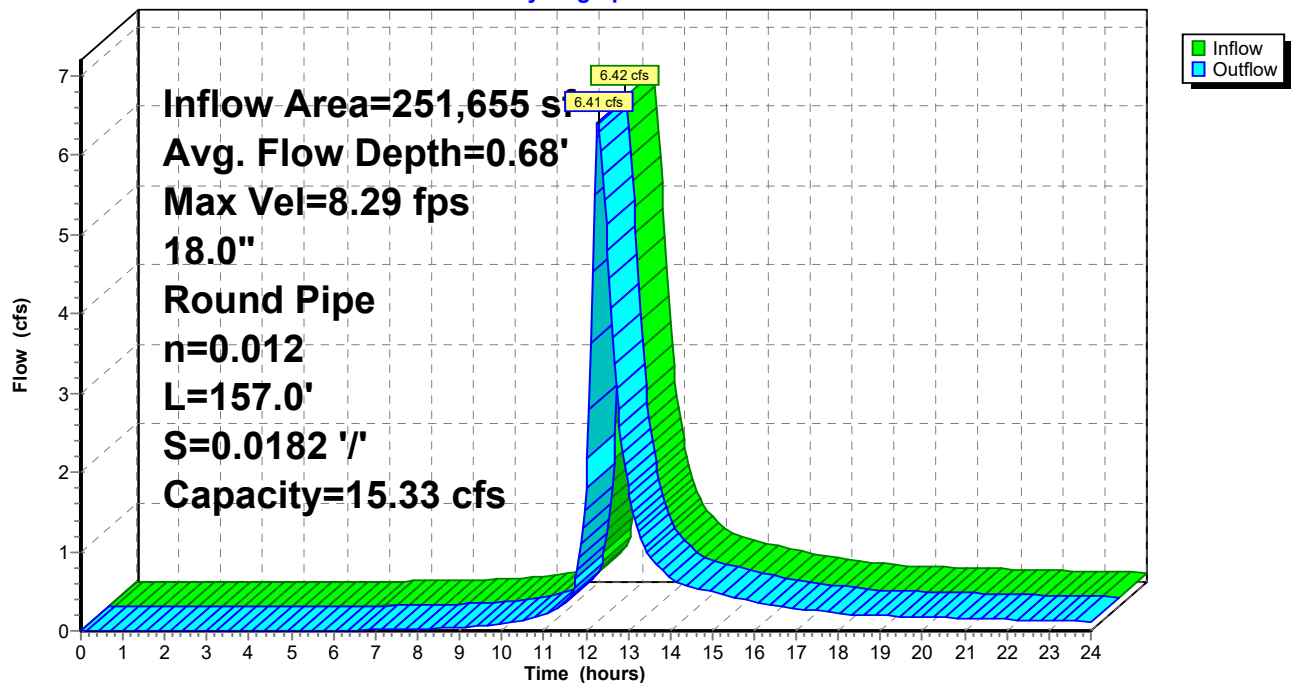
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.33 cfs

18.0" Round Pipe

n= 0.012

Length= 157.0' Slope= 0.0182 '/'

Inlet Invert= 14.55', Outlet Invert= 11.70'

**Reach 5R: 18" Pipe****Hydrograph**

Summary for Reach 6R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 1.41" for 25-Year, 24-Hour Storm event
 Inflow = 6.41 cfs @ 12.29 hrs, Volume= 30,052 cf
 Outflow = 6.41 cfs @ 12.29 hrs, Volume= 30,049 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 8.56 fps, Min. Travel Time= 0.1 min

Avg. Velocity= 3.11 fps, Avg. Travel Time= 0.3 min

Peak Storage= 36 cf @ 12.29 hrs

Average Depth at Peak Storage= 0.66'

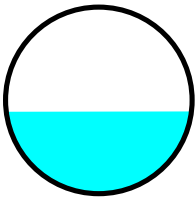
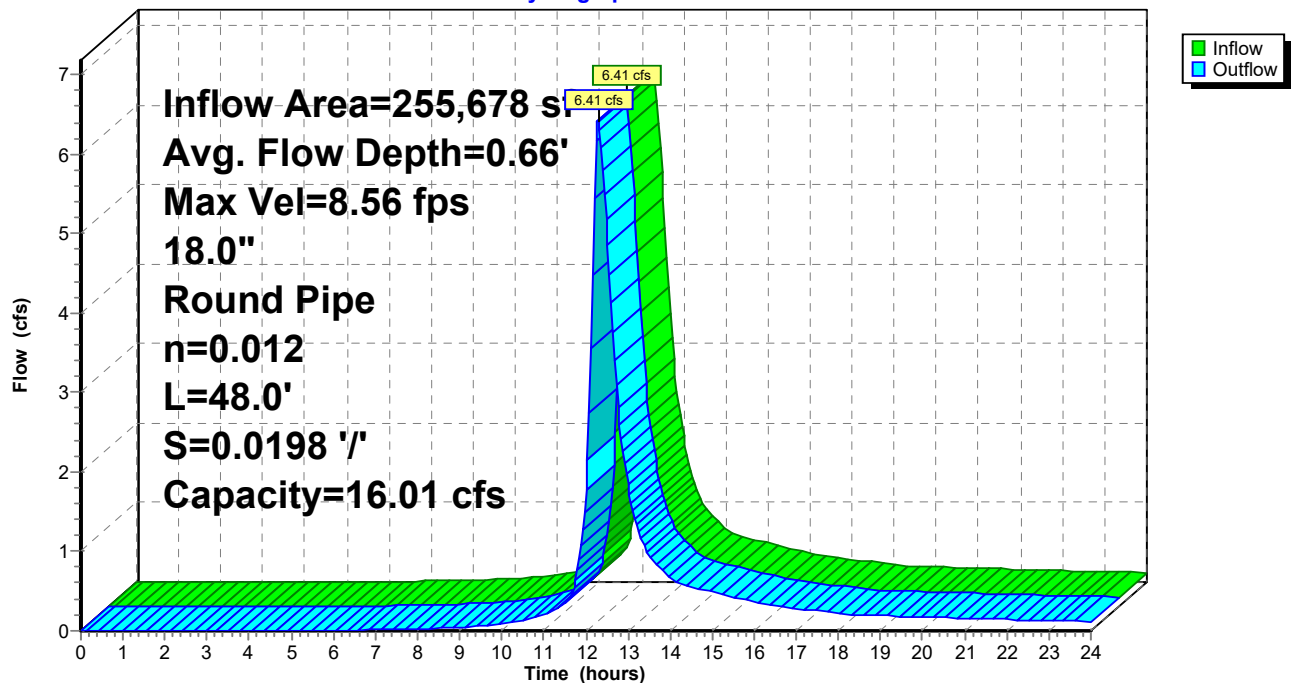
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 16.01 cfs

18.0" Round Pipe

n= 0.012

Length= 48.0' Slope= 0.0198 '/'

Inlet Invert= 11.70', Outlet Invert= 10.75'

**Reach 6R: 18" Pipe****Hydrograph**

Summary for Reach 7R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 59,959 sf, 9.86% Impervious, Inflow Depth > 0.90" for 25-Year, 24-Hour Storm event
 Inflow = 0.78 cfs @ 12.30 hrs, Volume= 4,520 cf
 Outflow = 0.78 cfs @ 12.31 hrs, Volume= 4,519 cf, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 4.12 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.3 min

Peak Storage= 7 cf @ 12.30 hrs

Average Depth at Peak Storage= 0.29'

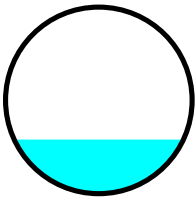
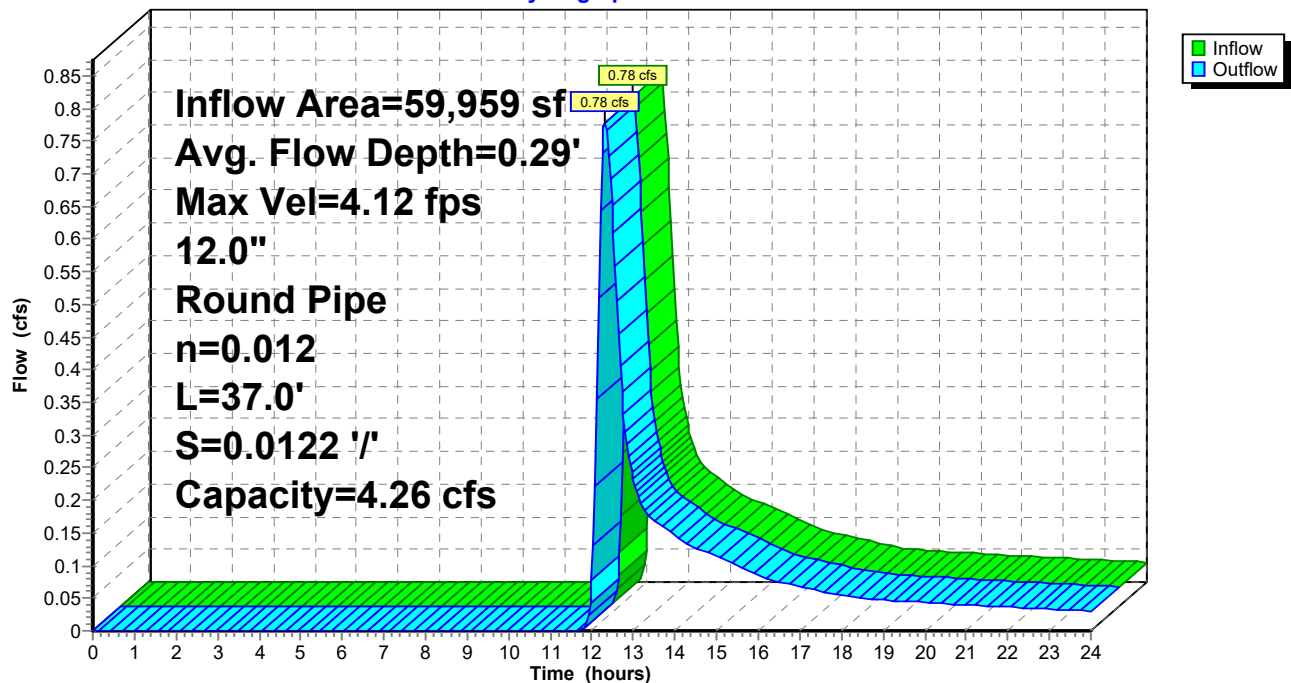
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe

n= 0.012

Length= 37.0' Slope= 0.0122 '/'

Inlet Invert= 18.00', Outlet Invert= 17.55'

**Reach 7R: 12" Pipe****Hydrograph**

Summary for Reach 8R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.47' @ 12.16 hrs

Inflow Area = 43,402 sf, 42.31% Impervious, Inflow Depth > 2.90" for 25-Year, 24-Hour Storm event
Inflow = 2.63 cfs @ 12.16 hrs, Volume= 10,476 cf
Outflow = 2.60 cfs @ 12.17 hrs, Volume= 10,470 cf, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 6.93 fps, Min. Travel Time= 0.5 min

Avg. Velocity = 2.53 fps, Avg. Travel Time= 1.5 min

Peak Storage= 84 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.49'

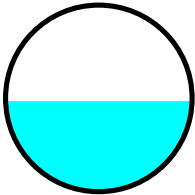
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.51 cfs

12.0" Round Pipe

n= 0.012

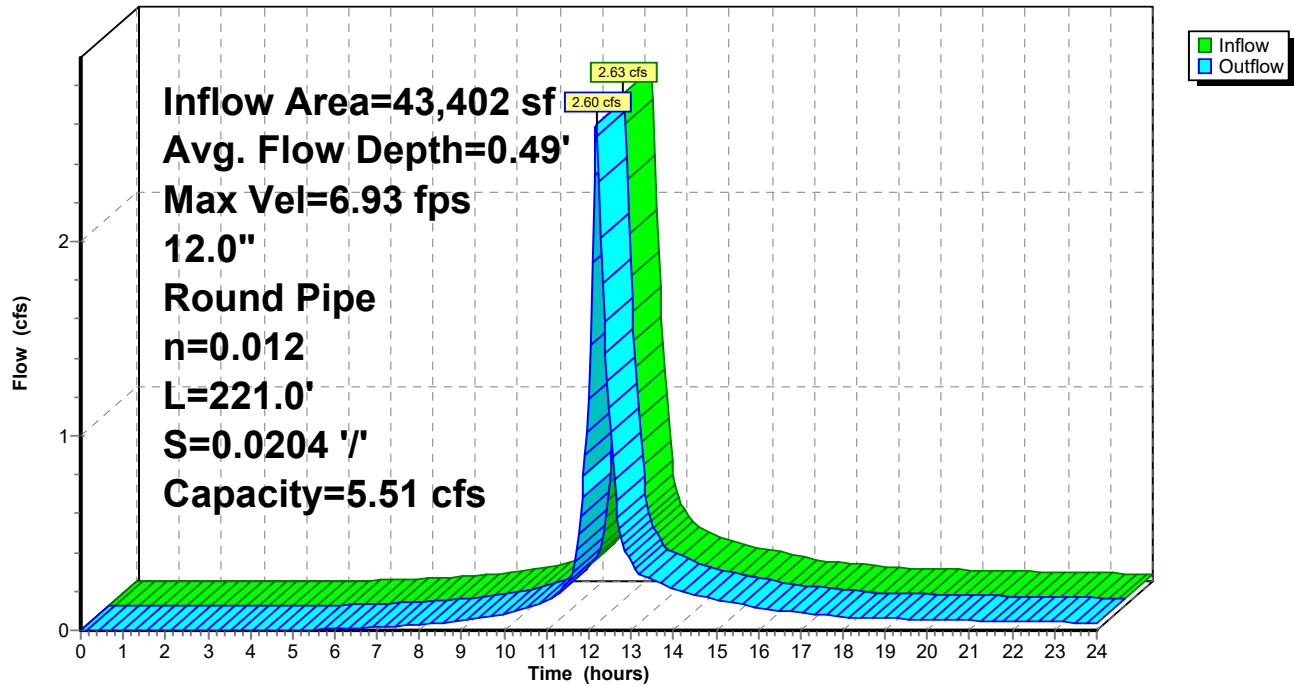
Length= 221.0' Slope= 0.0204 '/'

Inlet Invert= 25.00', Outlet Invert= 20.50'



Reach 8R: 12" Pipe

Hydrograph



Summary for Reach 9R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 2.30" for 25-Year, 24-Hour Storm event
 Inflow = 4.79 cfs @ 12.21 hrs, Volume= 21,277 cf
 Outflow = 4.74 cfs @ 12.23 hrs, Volume= 21,263 cf, Atten= 1%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 6.15 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 2.27 fps, Avg. Travel Time= 1.6 min

Peak Storage= 170 cf @ 12.22 hrs

Average Depth at Peak Storage= 0.68'

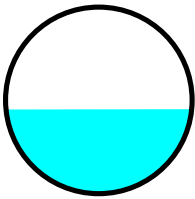
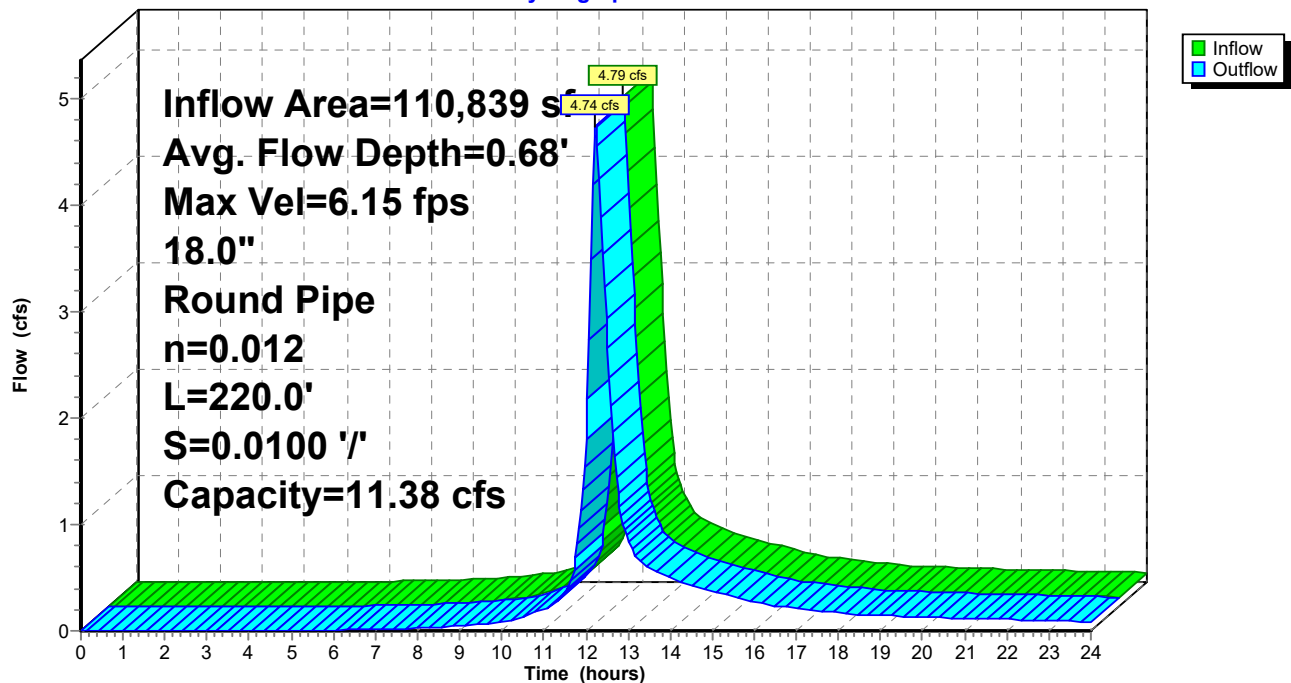
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.38 cfs

18.0" Round Pipe

n= 0.012

Length= 220.0' Slope= 0.0100 '/'

Inlet Invert= 16.75', Outlet Invert= 14.55'

**Reach 9R: 18" Pipe****Hydrograph**

Summary for Pond A2-P: CHAMBERS

Inflow Area = 80,857 sf, 87.50% Impervious, Inflow Depth > 4.56" for 25-Year, 24-Hour Storm event
 Inflow = 9.20 cfs @ 12.09 hrs, Volume= 30,729 cf
 Outflow = 2.14 cfs @ 12.48 hrs, Volume= 30,719 cf, Atten= 77%, Lag= 23.7 min
 Discarded = 0.69 cfs @ 11.24 hrs, Volume= 26,475 cf
 Primary = 1.45 cfs @ 12.48 hrs, Volume= 4,244 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 18.48' @ 12.48 hrs Surf.Area= 3,603 sf Storage= 9,918 cf

Plug-Flow detention time= 76.5 min calculated for 30,719 cf (100% of inflow)
 Center-of-Mass det. time= 76.3 min (852.2 - 775.9)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1A | 14.50' | 5,063 cf | 29.92'W x 120.42'L x 5.50'H Field A 19,814 cf Overall - 7,156 cf Embedded = 12,658 cf x 40.0% Voids |
| #2A | 15.25' | 7,156 cf | ADS_StormTech MC-3500 d +Capx 64 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 64 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf |
| | | 12,219 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

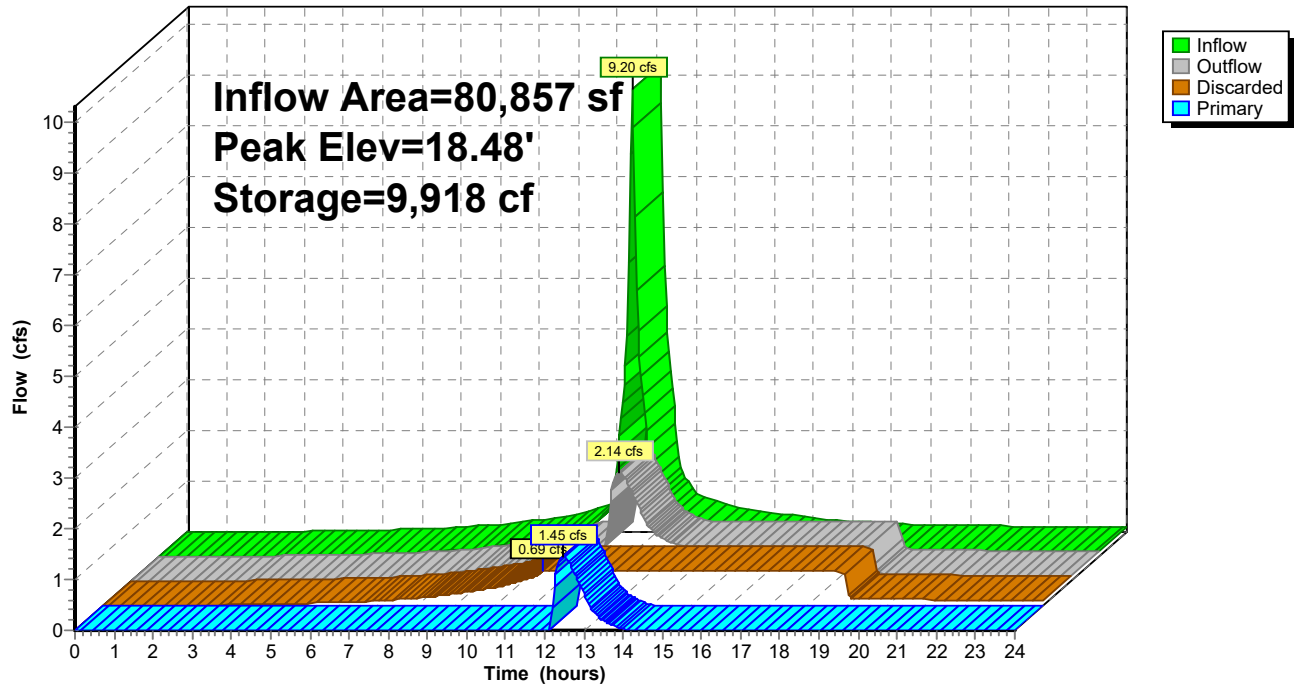
| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.25' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.25' / 15.15' S= 0.0083 ' S= 0.0083 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 19.50' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |
| #4 | Device 1 | 17.40' | 8.0" Vert. Orifice/Grate C= 0.600 |

Discarded OutFlow Max=0.69 cfs @ 11.24 hrs HW=14.56' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.69 cfs)

Primary OutFlow Max=1.45 cfs @ 12.48 hrs HW=18.48' (Free Discharge)
 ↑ **1=Culvert** (Passes 1.45 cfs of 6.25 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **4=Orifice/Grate** (Orifice Controls 1.45 cfs @ 4.17 fps)

Pond A2-P: CHAMBERS

Hydrograph



Summary for Pond A3-P: CHAMBERS

Inflow Area = 4,023 sf, 82.53% Impervious, Inflow Depth > 4.25" for 25-Year, 24-Hour Storm event
 Inflow = 0.44 cfs @ 12.09 hrs, Volume= 1,424 cf
 Outflow = 0.11 cfs @ 12.47 hrs, Volume= 1,424 cf, Atten= 75%, Lag= 23.2 min
 Discarded = 0.07 cfs @ 11.68 hrs, Volume= 1,390 cf
 Primary = 0.04 cfs @ 12.47 hrs, Volume= 34 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2

Peak Elev= 16.27' @ 12.47 hrs Surf.Area= 353 sf Storage= 396 cf

Plug-Flow detention time= 34.1 min calculated for 1,422 cf (100% of inflow)

Center-of-Mass det. time= 33.8 min (824.4 - 790.6)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1A | 14.50' | 347 cf | 11.00'W x 32.10'L x 3.50'H Field A 1,236 cf Overall - 368 cf Embedded = 868 cf x 40.0% Voids |
| #2A | 15.00' | 368 cf | ADS_StormTech SC-740 +Cap x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 8 Chambers in 2 Rows |
| | | 715 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.00' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.00' / 14.90' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 16.90' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Device 1 | 16.15' | 6.0" Vert. Orifice/Grate C= 0.600 |
| #4 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |

Discarded OutFlow Max=0.07 cfs @ 11.68 hrs HW=14.54' (Free Discharge)

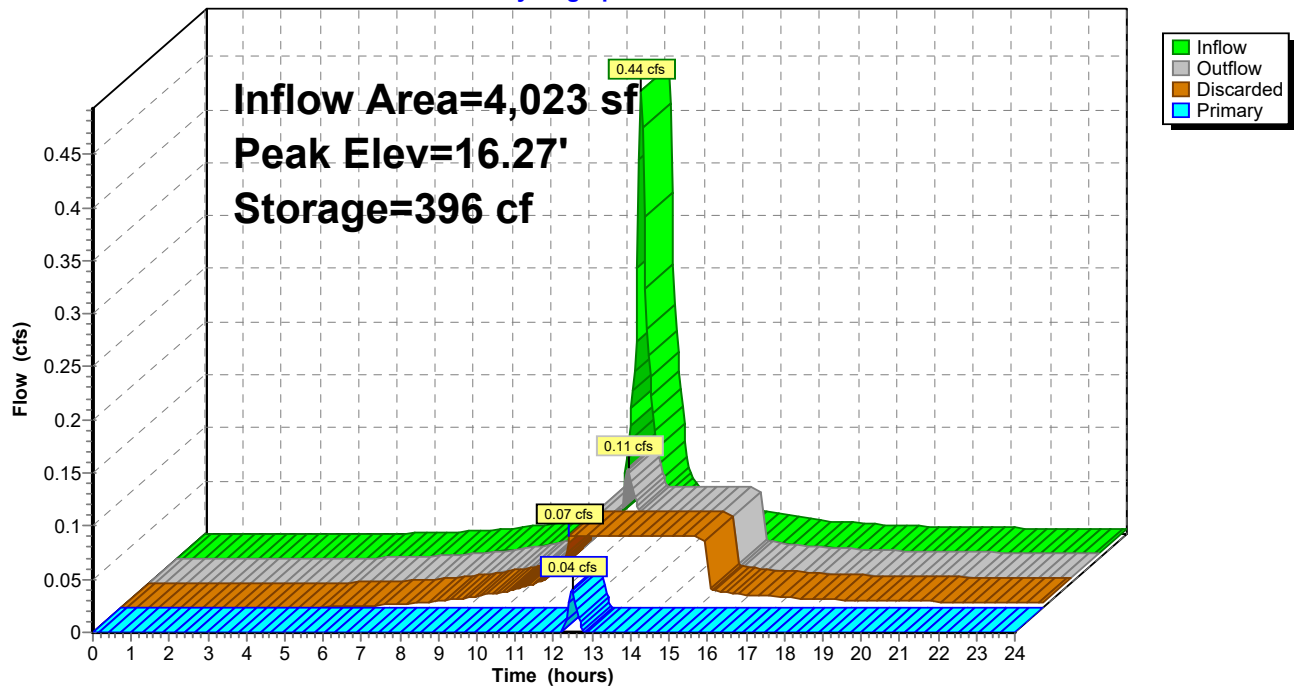
↑ **4=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.04 cfs @ 12.47 hrs HW=16.26' (Free Discharge)

↑ **1=Culvert** (Passes 0.04 cfs of 3.00 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.15 fps)

Pond A3-P: CHAMBERS

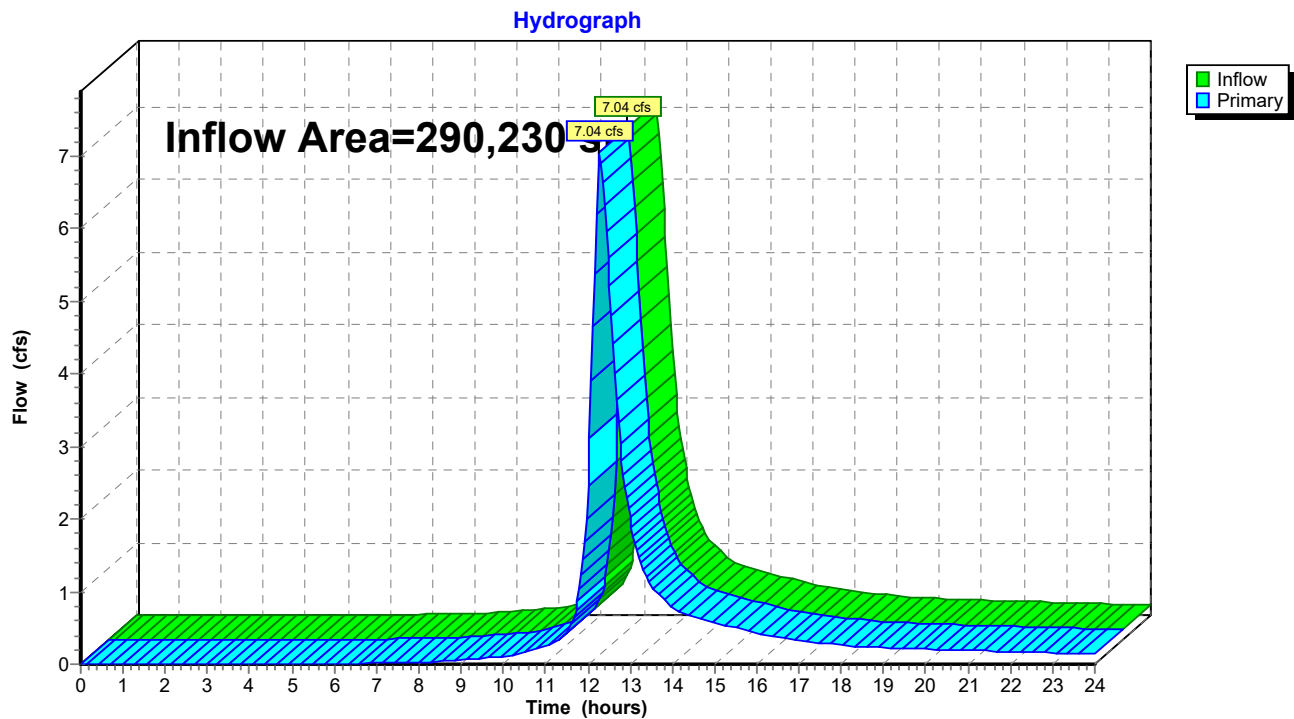
Hydrograph



Summary for Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Inflow Area = 290,230 sf, 44.91% Impervious, Inflow Depth > 1.43" for 25-Year, 24-Hour Storm event
Inflow = 7.04 cfs @ 12.28 hrs, Volume= 34,617 cf
Primary = 7.04 cfs @ 12.28 hrs, Volume= 34,617 cf, Atten= 0%, Lag= 0.0 min

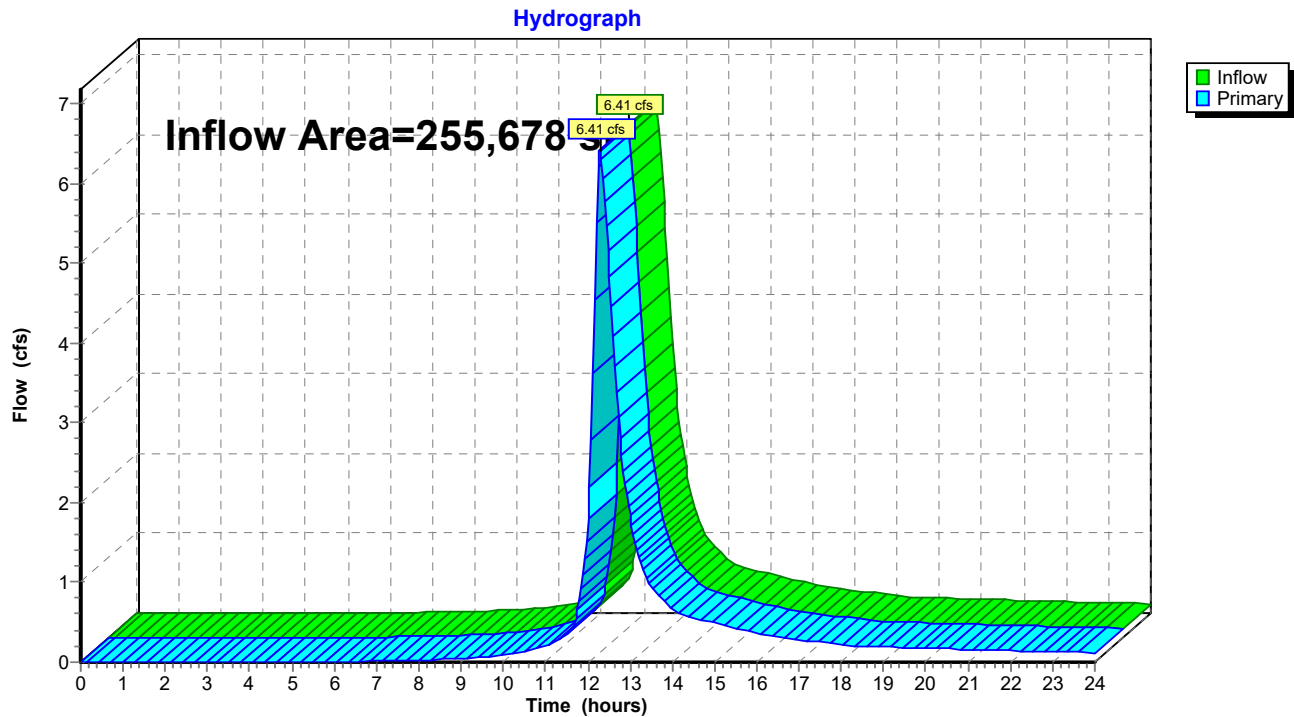
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Summary for Link DMH-A2: DMH-A2

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 1.41" for 25-Year, 24-Hour Storm event
Inflow = 6.41 cfs @ 12.29 hrs, Volume= 30,052 cf
Primary = 6.41 cfs @ 12.29 hrs, Volume= 30,052 cf, Atten= 0%, Lag= 0.0 min

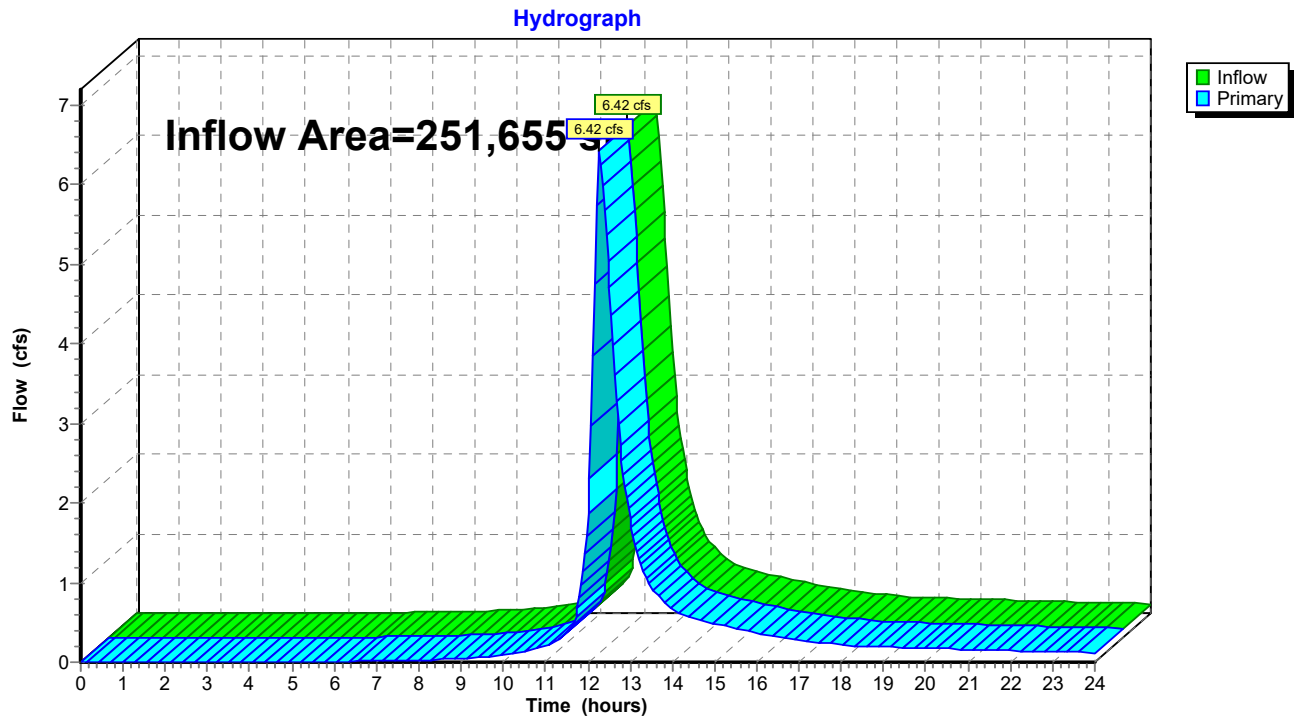
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A2: DMH-A2

Summary for Link DMH-A3: DMH-A3

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 1.43" for 25-Year, 24-Hour Storm event
Inflow = 6.42 cfs @ 12.27 hrs, Volume= 30,027 cf
Primary = 6.42 cfs @ 12.27 hrs, Volume= 30,027 cf, Atten= 0%, Lag= 0.0 min

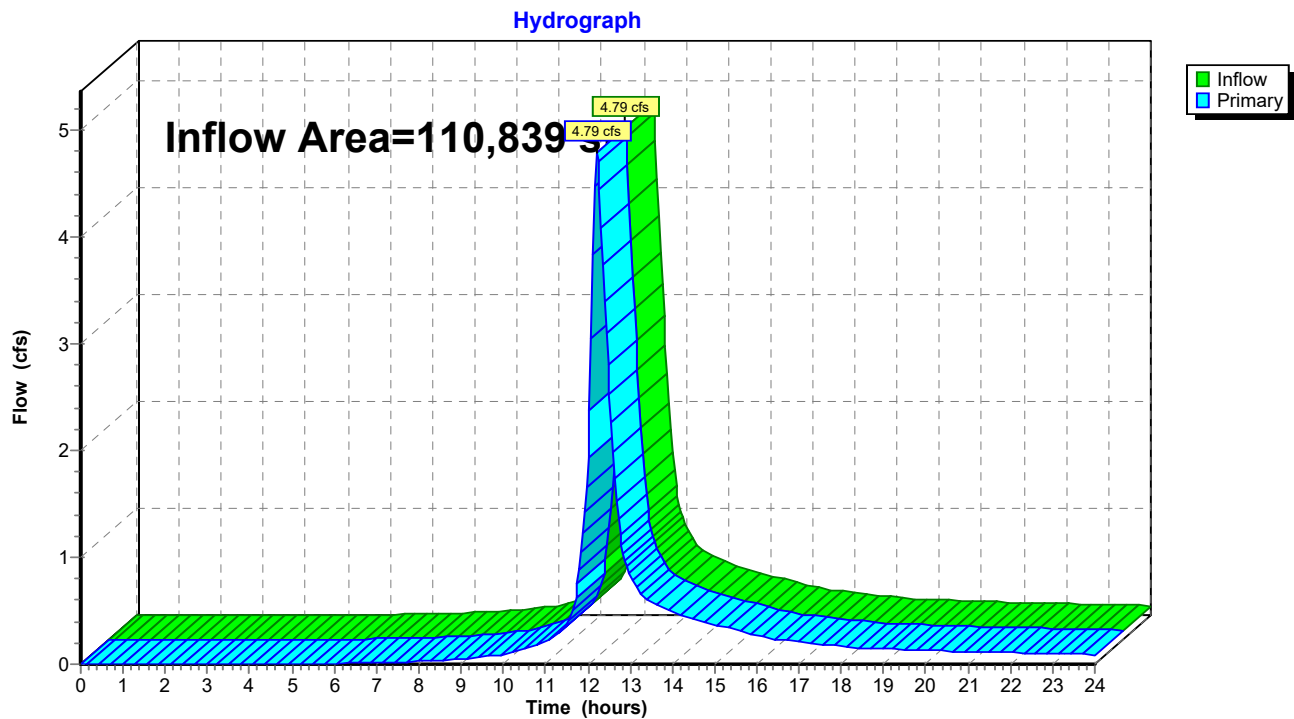
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A3: DMH-A3

Summary for Link DMH-A4: DMH-A4

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 2.30" for 25-Year, 24-Hour Storm event
Inflow = 4.79 cfs @ 12.21 hrs, Volume= 21,277 cf
Primary = 4.79 cfs @ 12.21 hrs, Volume= 21,277 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A4: DMH-A4

Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| | |
|-------------------------------------|---|
| SubcatchmentA10-PR: A10-PR | Runoff Area=19,704 sf 83.87% Impervious Runoff Depth>5.53" Tc=6.0 min CN=90 Runoff=2.75 cfs 9,072 cf |
| SubcatchmentA11-PR: A11-PR | Runoff Area=6,592 sf 1.05% Impervious Runoff Depth>1.25" Tc=6.0 min CN=47 Runoff=0.17 cfs 689 cf |
| SubcatchmentA12-PR: A12-PR | Runoff Area=4,023 sf 82.53% Impervious Runoff Depth>5.41" Tc=6.0 min CN=89 Runoff=0.55 cfs 1,814 cf |
| SubcatchmentA1A-OFF: A1A-OFF | Runoff Area=25,162 sf 69.35% Impervious Runoff Depth>5.29" Flow Length=167' Slope=0.0500 '/' Tc=11.1 min CN=88 Runoff=2.90 cfs 11,100 cf |
| SubcatchmentA1B-OFF: A1B-OFF | Runoff Area=56,019 sf 42.72% Impervious Runoff Depth>3.16" Flow Length=155' Tc=16.0 min CN=68 Runoff=3.49 cfs 14,745 cf |
| SubcatchmentA1C-OFF: A1C-OFF | Runoff Area=46,934 sf 12.59% Impervious Runoff Depth>1.66" Flow Length=210' Slope=0.0500 '/' Tc=17.3 min CN=52 Runoff=1.32 cfs 6,510 cf |
| SubcatchmentA2-PR: A2-PR | Runoff Area=17,456 sf 78.92% Impervious Runoff Depth>5.30" Tc=6.0 min CN=88 Runoff=2.37 cfs 7,707 cf |
| SubcatchmentA3-PR: A3-PR | Runoff Area=24,201 sf 86.59% Impervious Runoff Depth>5.64" Tc=6.0 min CN=91 Runoff=3.42 cfs 11,374 cf |
| SubcatchmentA4-OFF: A4-OFF | Runoff Area=8,837 sf 0.00% Impervious Runoff Depth>2.77" Flow Length=50' Slope=0.0300 '/' Tc=12.0 min CN=64 Runoff=0.53 cfs 2,038 cf |
| SubcatchmentA5A-PR: A5A-PR | Runoff Area=9,403 sf 9.70% Impervious Runoff Depth>0.94" Flow Length=150' Tc=15.7 min CN=43 Runoff=0.11 cfs 738 cf |
| SubcatchmentA5B-PR: A5B-PR | Runoff Area=11,418 sf 0.00% Impervious Runoff Depth>0.80" Flow Length=266' Tc=11.7 min CN=41 Runoff=0.11 cfs 760 cf |
| SubcatchmentA5C-PR: A5C-PR | Runoff Area=13,025 sf 0.00% Impervious Runoff Depth>0.87" Flow Length=150' Tc=9.0 min CN=42 Runoff=0.16 cfs 946 cf |
| SubcatchmentA6-PR: A6-PR | Runoff Area=12,206 sf 100.00% Impervious Runoff Depth>6.46" Tc=6.0 min CN=98 Runoff=1.82 cfs 6,568 cf |
| SubcatchmentA7-PR: A7-PR | Runoff Area=14,737 sf 54.20% Impervious Runoff Depth>3.99" Tc=6.0 min CN=76 Runoff=1.57 cfs 4,897 cf |
| SubcatchmentA8-PR: A8-PR | Runoff Area=7,290 sf 100.00% Impervious Runoff Depth>6.46" Tc=6.0 min CN=98 Runoff=1.09 cfs 3,923 cf |
| SubcatchmentA9-PR: A9-PR | Runoff Area=13,223 sf 0.00% Impervious Runoff Depth>0.94" Flow Length=295' Tc=20.4 min CN=43 Runoff=0.15 cfs 1,036 cf |

Reach 1R: Open Channel Avg. Flow Depth=0.02' Max Vel=2.24 fps Inflow=0.53 cfs 2,038 cf
 n=0.016 L=90.0' S=0.1111 '/' Capacity=1,239.89 cfs Outflow=0.52 cfs 2,037 cf

Reach 2R: Open Channel Avg. Flow Depth=0.14' Max Vel=3.20 fps Inflow=3.49 cfs 14,745 cf
 n=0.016 L=153.0' S=0.0386 '/' Capacity=589.74 cfs Outflow=3.46 cfs 14,734 cf

Reach 3R: Routing Avg. Flow Depth=0.04' Max Vel=1.60 fps Inflow=0.17 cfs 689 cf
 n=0.016 L=400.0' S=0.0500 '/' Capacity=102.34 cfs Outflow=0.15 cfs 686 cf

Reach 4R: 12" Pipe Avg. Flow Depth=0.75' Max Vel=5.63 fps Inflow=3.57 cfs 15,494 cf
 12.0" Round Pipe n=0.012 L=44.0' S=0.0102 '/' Capacity=3.90 cfs Outflow=3.57 cfs 15,492 cf

Reach 5R: 18" Pipe Avg. Flow Depth=0.90' Max Vel=9.30 fps Inflow=10.32 cfs 45,548 cf
 18.0" Round Pipe n=0.012 L=157.0' S=0.0182 '/' Capacity=15.33 cfs Outflow=10.27 cfs 45,537 cf

Reach 6R: 18" Pipe Avg. Flow Depth=0.88' Max Vel=9.65 fps Inflow=10.44 cfs 45,743 cf
 18.0" Round Pipe n=0.012 L=48.0' S=0.0198 '/' Capacity=16.01 cfs Outflow=10.43 cfs 45,739 cf

Reach 7R: 12" Pipe Avg. Flow Depth=0.40' Max Vel=4.92 fps Inflow=1.47 cfs 7,456 cf
 12.0" Round Pipe n=0.012 L=37.0' S=0.0122 '/' Capacity=4.26 cfs Outflow=1.46 cfs 7,455 cf

Reach 8R: 12" Pipe Avg. Flow Depth=0.58' Max Vel=7.41 fps Inflow=3.47 cfs 13,876 cf
 12.0" Round Pipe n=0.012 L=221.0' S=0.0204 '/' Capacity=5.51 cfs Outflow=3.43 cfs 13,870 cf

Reach 9R: 18" Pipe Avg. Flow Depth=0.83' Max Vel=6.69 fps Inflow=6.71 cfs 29,362 cf
 18.0" Round Pipe n=0.012 L=220.0' S=0.0100 '/' Capacity=11.38 cfs Outflow=6.64 cfs 29,346 cf

Pond A2-P: CHAMBERS Peak Elev=19.69' Storage=11,768 cf Inflow=11.45 cfs 38,644 cf
 Discarded=0.69 cfs 29,884 cf Primary=3.26 cfs 8,748 cf Outflow=3.95 cfs 38,632 cf

Pond A3-P: CHAMBERS Peak Elev=16.41' Storage=431 cf Inflow=0.55 cfs 1,814 cf
 Discarded=0.07 cfs 1,607 cf Primary=0.18 cfs 206 cf Outflow=0.25 cfs 1,813 cf

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM Inflow=11.34 cfs 52,358 cf
 Primary=11.34 cfs 52,358 cf

Link DMH-A2: DMH-A2 Inflow=10.44 cfs 45,743 cf
 Primary=10.44 cfs 45,743 cf

Link DMH-A3: DMH-A3 Inflow=10.32 cfs 45,548 cf
 Primary=10.32 cfs 45,548 cf

Link DMH-A4: DMH-A4 Inflow=6.71 cfs 29,362 cf
 Primary=6.71 cfs 29,362 cf

Total Runoff Area = 290,230 sf Runoff Volume = 83,918 cf Average Runoff Depth = 3.47"
55.09% Pervious = 159,896 sf 44.91% Impervious = 130,334 sf

Summary for Subcatchment A10-PR: A10-PR

Runoff = 2.75 cfs @ 12.09 hrs, Volume= 9,072 cf, Depth> 5.53"

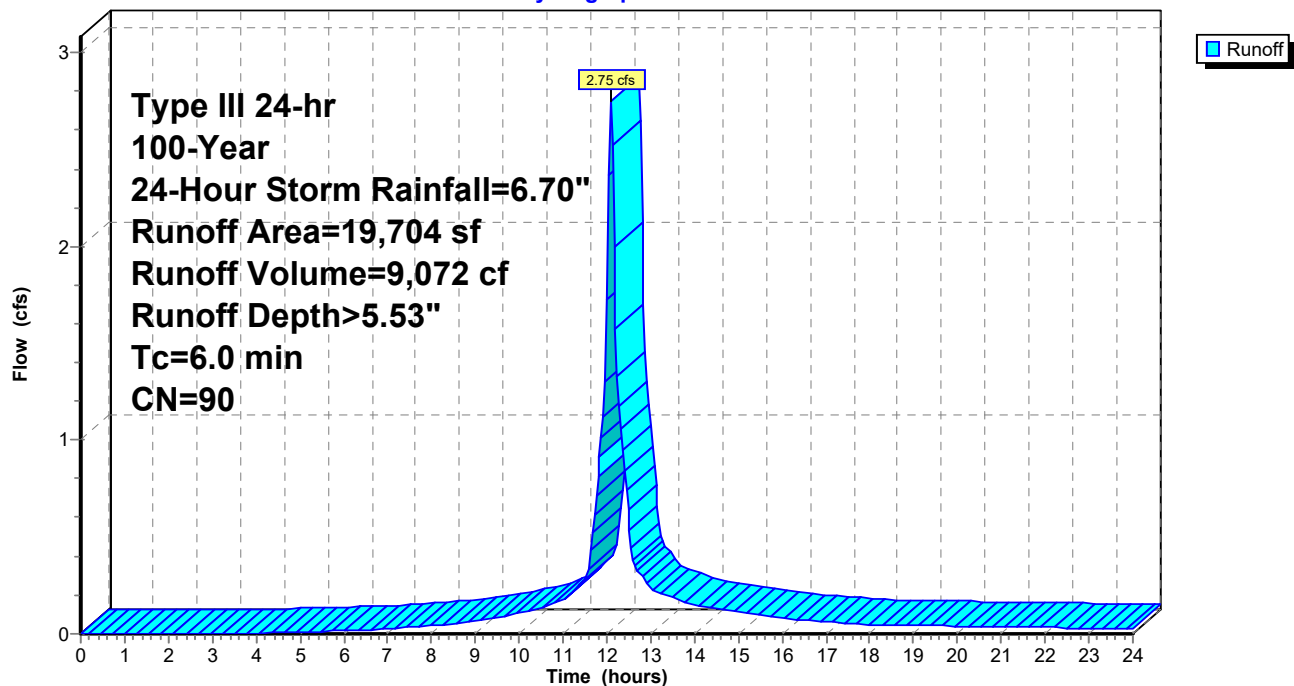
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,128 | 98 | Roofs, HSG A |
| 12,397 | 98 | Paved parking, HSG A |
| 3,179 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 19,704 | 90 | Weighted Average |
| 3,179 | | 16.13% Pervious Area |
| 16,525 | | 83.87% Impervious Area |

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

Subcatchment A10-PR: A10-PR

Hydrograph



Summary for Subcatchment A11-PR: A11-PR

Runoff = 0.17 cfs @ 12.11 hrs, Volume= 689 cf, Depth> 1.25"

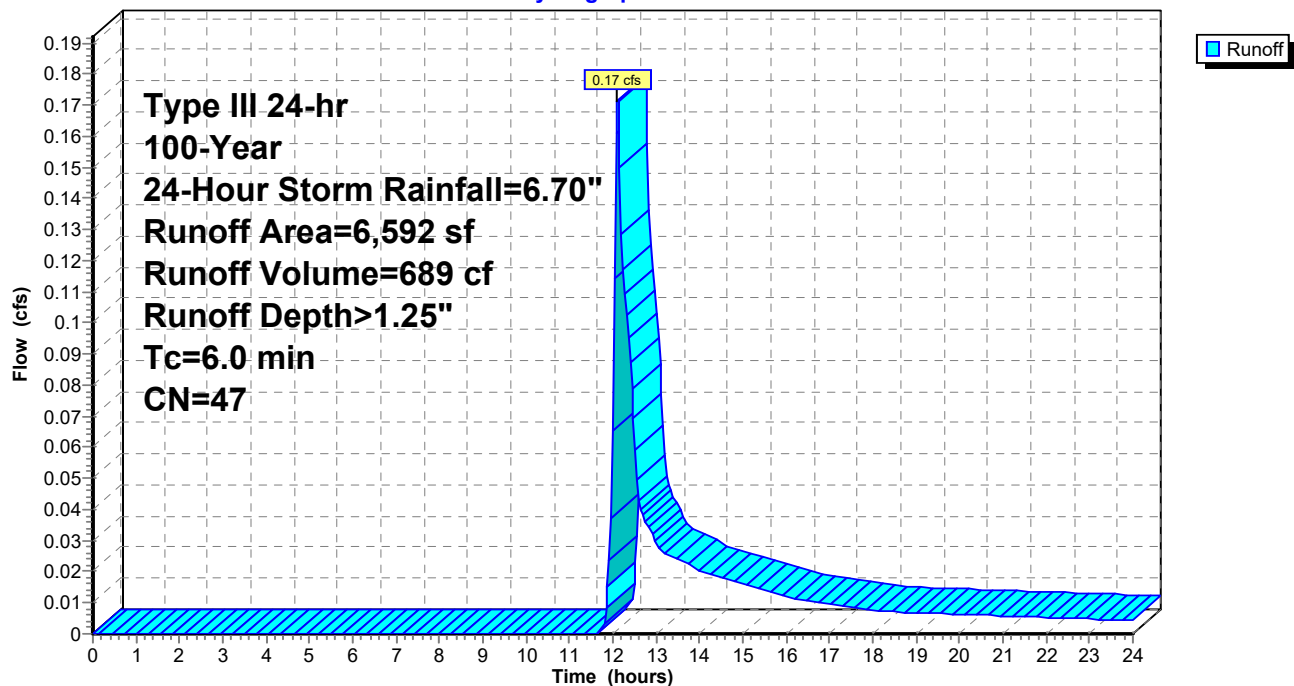
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 69 | 98 | Paved parking, HSG A |
| 5,348 | 49 | 50-75% Grass cover, Fair, HSG A |
| 1,175 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 6,592 | 47 | Weighted Average |
| 6,523 | | 98.95% Pervious Area |
| 69 | | 1.05% Impervious Area |

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

Subcatchment A11-PR: A11-PR

Hydrograph



Summary for Subcatchment A12-PR: A12-PR

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 1,814 cf, Depth> 5.41"

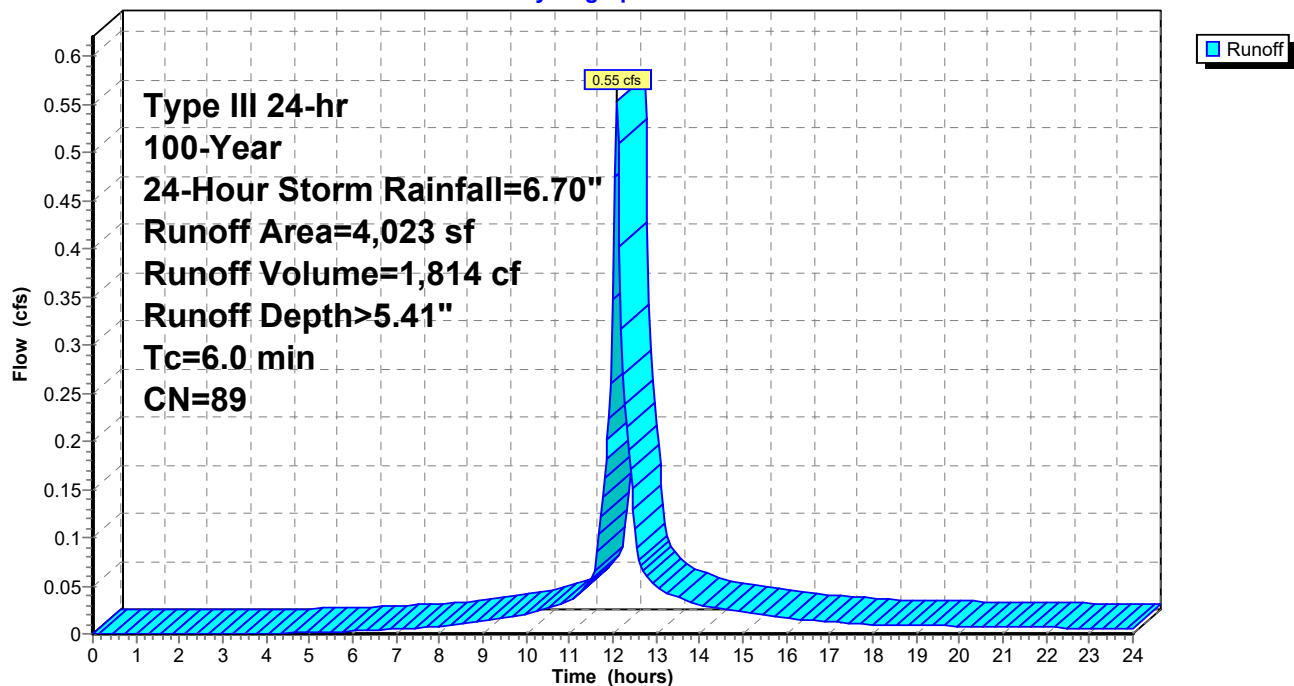
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 208 | 98 | Roofs, HSG A |
| 3,112 | 98 | Paved parking, HSG A |
| 703 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 4,023 | 89 | Weighted Average |
| 703 | | 17.47% Pervious Area |
| 3,320 | | 82.53% Impervious Area |

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

Subcatchment A12-PR: A12-PR

Hydrograph



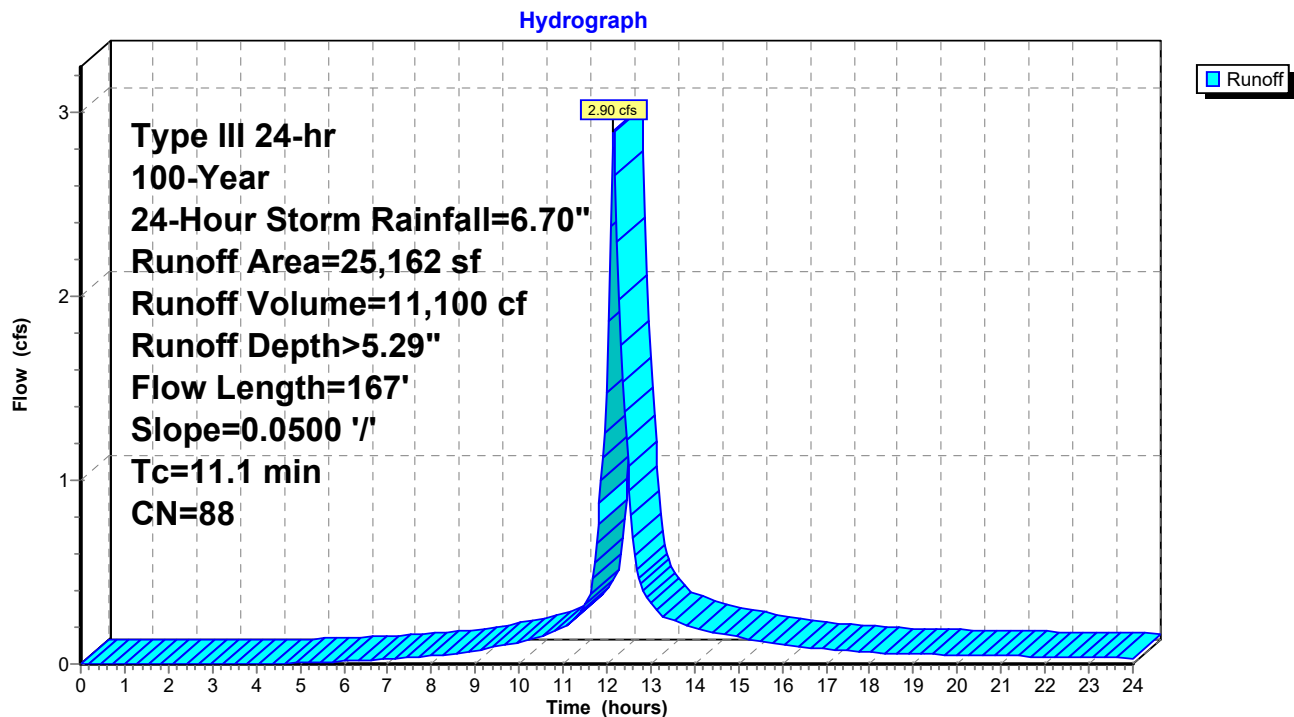
Summary for Subcatchment A1A-OFF: A1A-OFF

Runoff = 2.90 cfs @ 12.15 hrs, Volume= 11,100 cf, Depth> 5.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 3,405 | 98 | Roofs, HSG A |
| 14,045 | 98 | Paved parking, HSG A |
| 1,238 | 49 | 50-75% Grass cover, Fair, HSG A |
| 3,513 | 43 | Woods/grass comb., Fair, HSG A |
| 2,961 | 96 | Gravel surface, HSG A |
| 25,162 | 88 | Weighted Average |
| 7,712 | | 30.65% Pervious Area |
| 17,450 | | 69.35% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.2 | 25 | 0.0500 | 0.19 | | Sheet Flow, SHEET FLOW Grass: Short n= 0.150 P2= 3.20" |
| 8.5 | 25 | 0.0500 | 0.05 | | Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.4 | 117 | 0.0500 | 4.54 | | Shallow Concentrated Flow, shallow conc. flow Paved Kv= 20.3 fps |
| 11.1 | 167 | Total | | | |

Subcatchment A1A-OFF: A1A-OFF

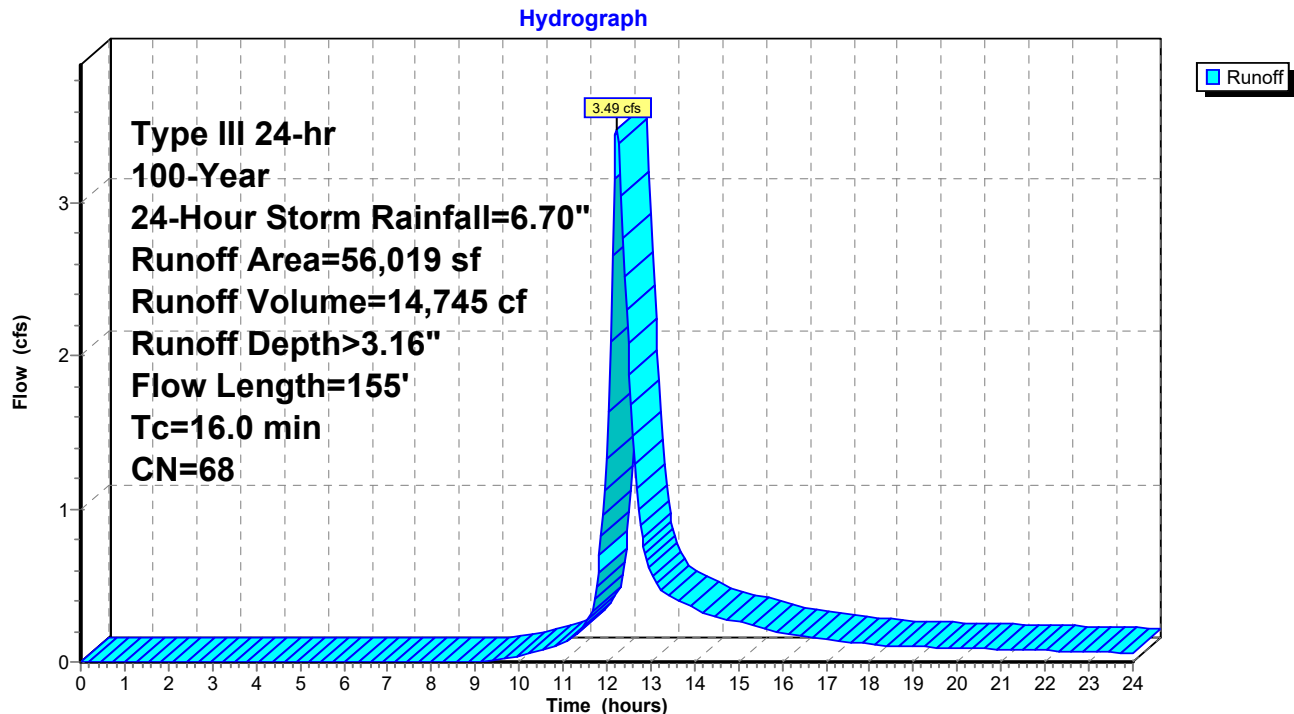
Summary for Subcatchment A1B-OFF: A1B-OFF

Runoff = 3.49 cfs @ 12.23 hrs, Volume= 14,745 cf, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 5,821 | 98 | Roofs, HSG A |
| 18,112 | 98 | Paved parking, HSG A |
| 13,113 | 49 | 50-75% Grass cover, Fair, HSG A |
| 18,973 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 56,019 | 68 | Weighted Average |
| 32,086 | | 57.28% Pervious Area |
| 23,933 | | 42.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.1 | 105 | 0.1090 | 1.65 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 16.0 | 155 | Total | | | |

Subcatchment A1B-OFF: A1B-OFF

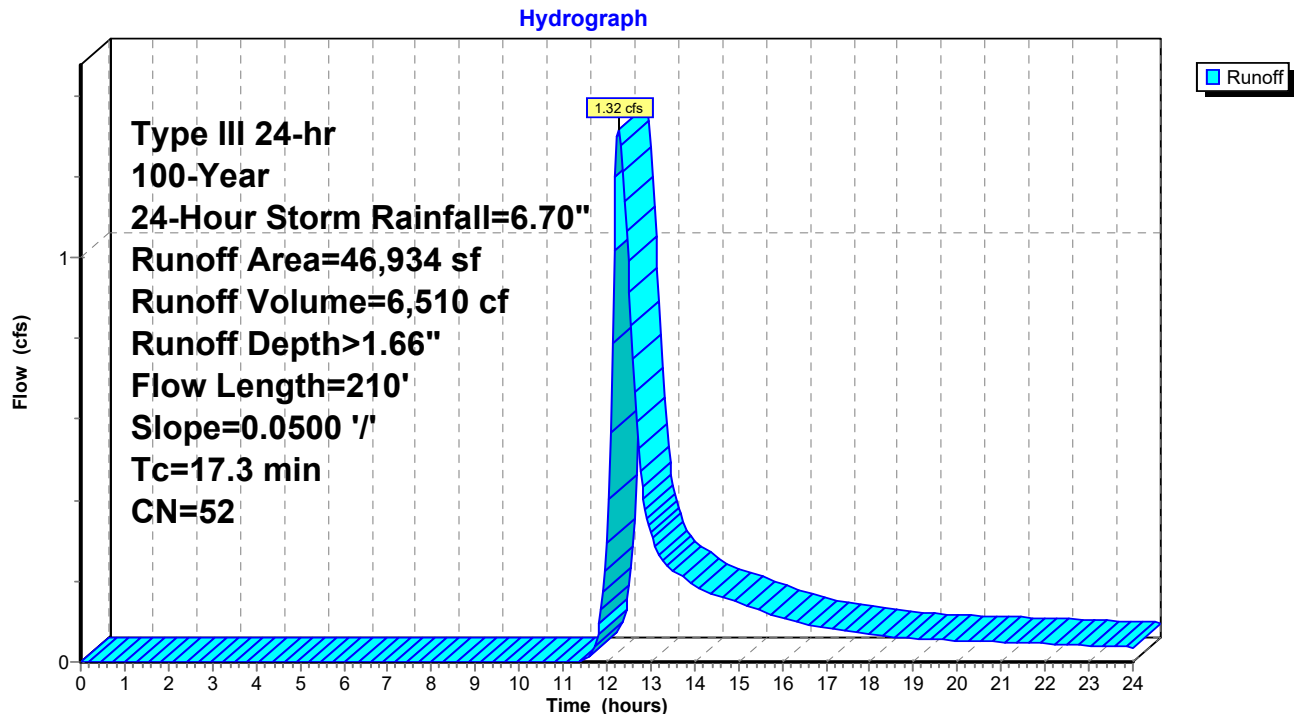
Summary for Subcatchment A1C-OFF: A1C-OFF

Runoff = 1.32 cfs @ 12.27 hrs, Volume= 6,510 cf, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,043 | 98 | Roofs, HSG A |
| 1,867 | 98 | Paved parking, HSG A |
| 14,063 | 49 | 50-75% Grass cover, Fair, HSG A |
| 26,961 | 43 | Woods/grass comb., Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 46,934 | 52 | Weighted Average |
| 41,024 | | 87.41% Pervious Area |
| 5,910 | | 12.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 2.4 | 160 | 0.0500 | 1.12 | | Shallow Concentrated Flow, shallow conc. flow |
| | | | | | Woodland Kv= 5.0 fps |
| 17.3 | 210 | Total | | | |

Subcatchment A1C-OFF: A1C-OFF

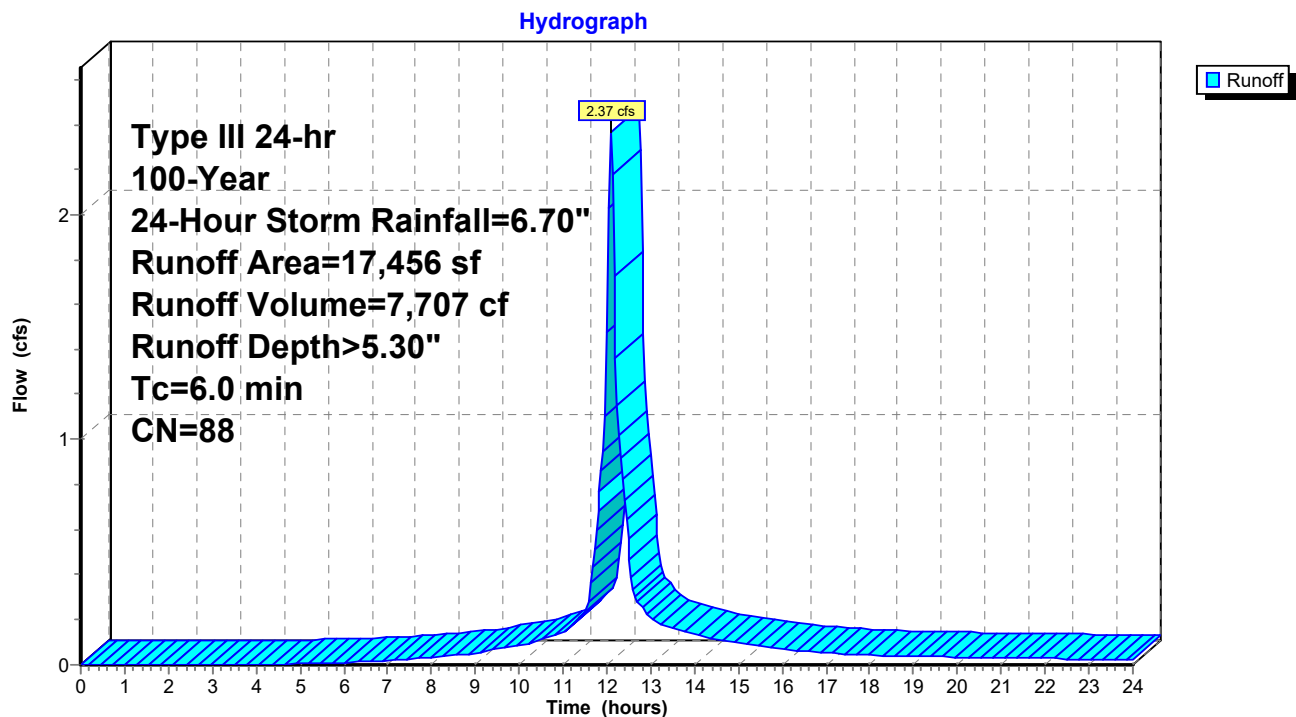
Summary for Subcatchment A2-PR: A2-PR

Runoff = 2.37 cfs @ 12.09 hrs, Volume= 7,707 cf, Depth> 5.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 13,777 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,679 | 49 | 50-75% Grass cover, Fair, HSG A |
| 17,456 | 88 | Weighted Average |
| 3,679 | | 21.08% Pervious Area |
| 13,777 | | 78.92% Impervious Area |

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

Subcatchment A2-PR: A2-PR

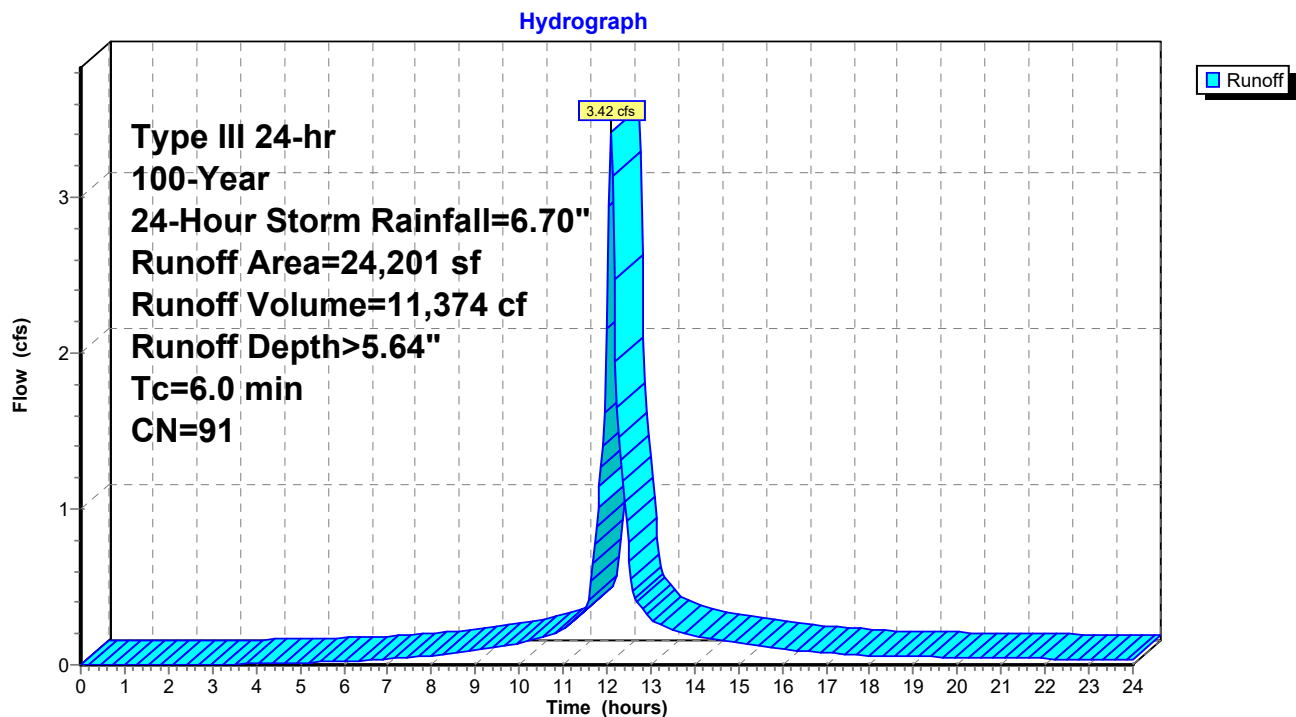
Summary for Subcatchment A3-PR: A3-PR

Runoff = 3.42 cfs @ 12.09 hrs, Volume= 11,374 cf, Depth> 5.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 20,955 | 98 | Paved parking, HSG A |
| 0 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 3,246 | 49 | 50-75% Grass cover, Fair, HSG A |
| 24,201 | 91 | Weighted Average |
| 3,246 | | 13.41% Pervious Area |
| 20,955 | | 86.59% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A3-PR: A3-PR

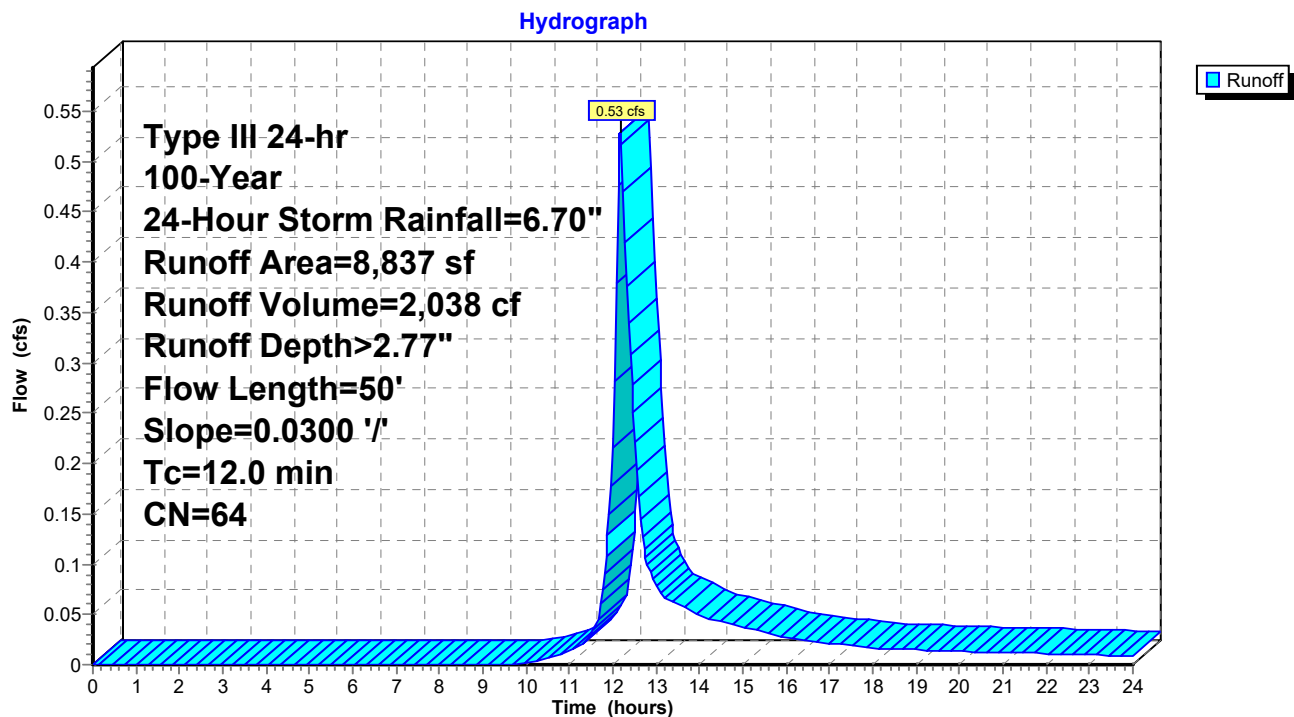
Summary for Subcatchment A4-OFF: A4-OFF

Runoff = 0.53 cfs @ 12.17 hrs, Volume= 2,038 cf, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 4,743 | 36 | Woods, Fair, HSG A |
| 4,094 | 96 | Gravel surface, HSG A |
| 8,837 | 64 | Weighted Average |
| 8,837 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 3.2 | 30 | 0.0300 | 0.16 | | Sheet Flow, SHEET FLOW |
| | | | | | Grass: Short n= 0.150 P2= 3.20" |
| 8.8 | 20 | 0.0300 | 0.04 | | Sheet Flow, |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 12.0 | 50 | Total | | | |

Subcatchment A4-OFF: A4-OFF

Summary for Subcatchment A5A-PR: A5A-PR

Runoff = 0.11 cfs @ 12.31 hrs, Volume= 738 cf, Depth> 0.94"

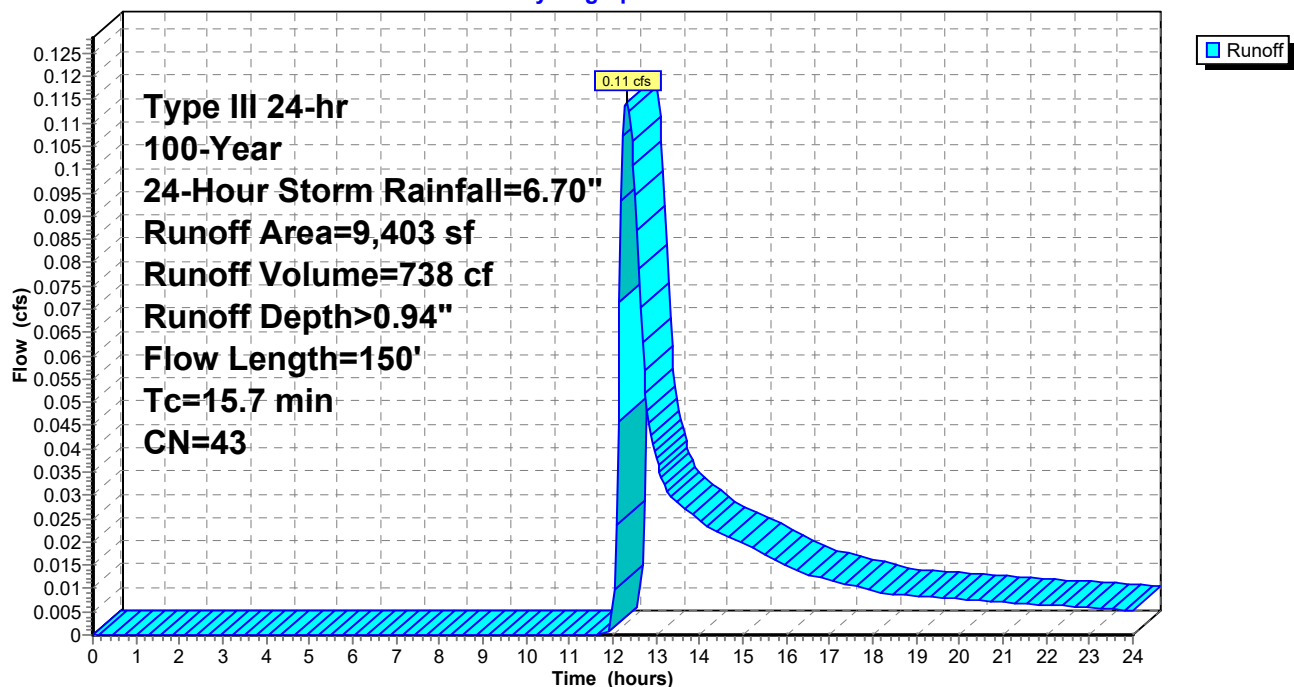
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 912 | 98 | Paved parking, HSG A |
| 587 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,904 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 9,403 | 43 | Weighted Average |
| 8,491 | | 90.30% Pervious Area |
| 912 | | 9.70% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 14.9 | 50 | 0.0500 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 15.7 | 150 | Total | | | |

Subcatchment A5A-PR: A5A-PR

Hydrograph



Summary for Subcatchment A5B-PR: A5B-PR

Runoff = 0.11 cfs @ 12.27 hrs, Volume= 760 cf, Depth> 0.80"

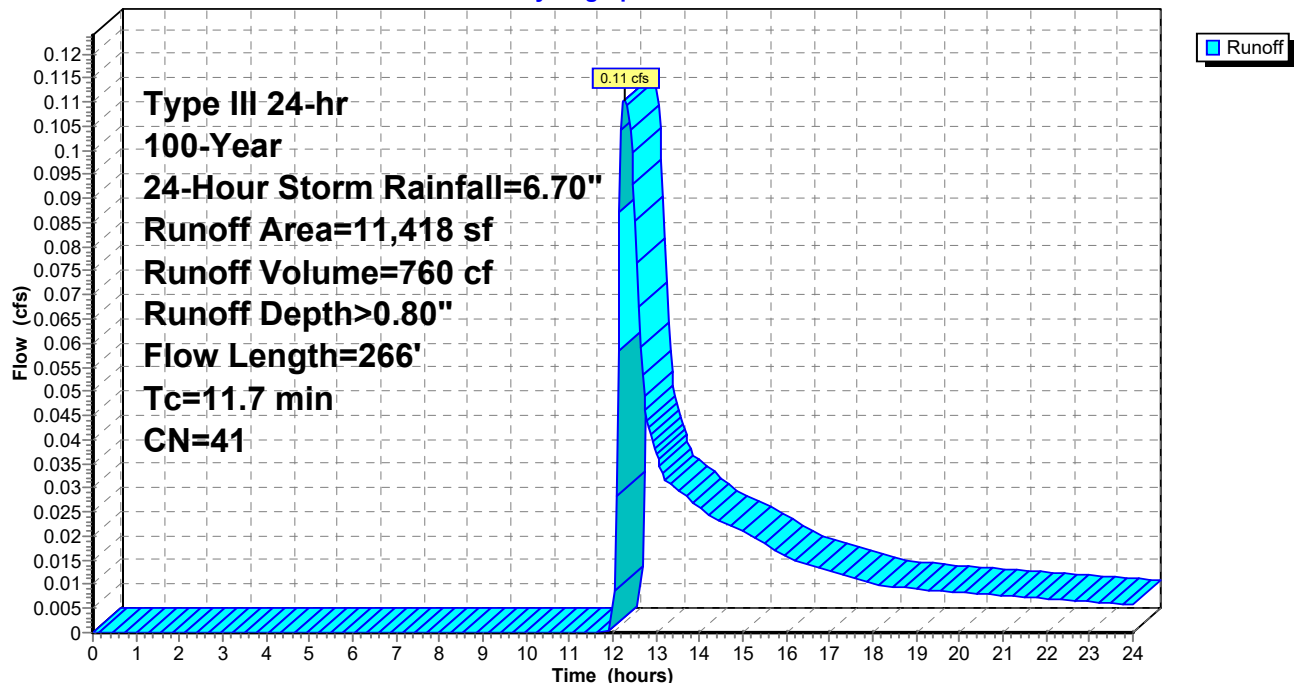
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 4,051 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,367 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 11,418 | 41 | Weighted Average |
| 11,418 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.6 | 50 | 0.1500 | 0.09 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.4 | 133 | 0.1060 | 1.63 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 0.7 | 83 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 11.7 | 266 | Total | | | |

Subcatchment A5B-PR: A5B-PR

Hydrograph



Summary for Subcatchment A5C-PR: A5C-PR

Runoff = 0.16 cfs @ 12.18 hrs, Volume= 946 cf, Depth> 0.87"

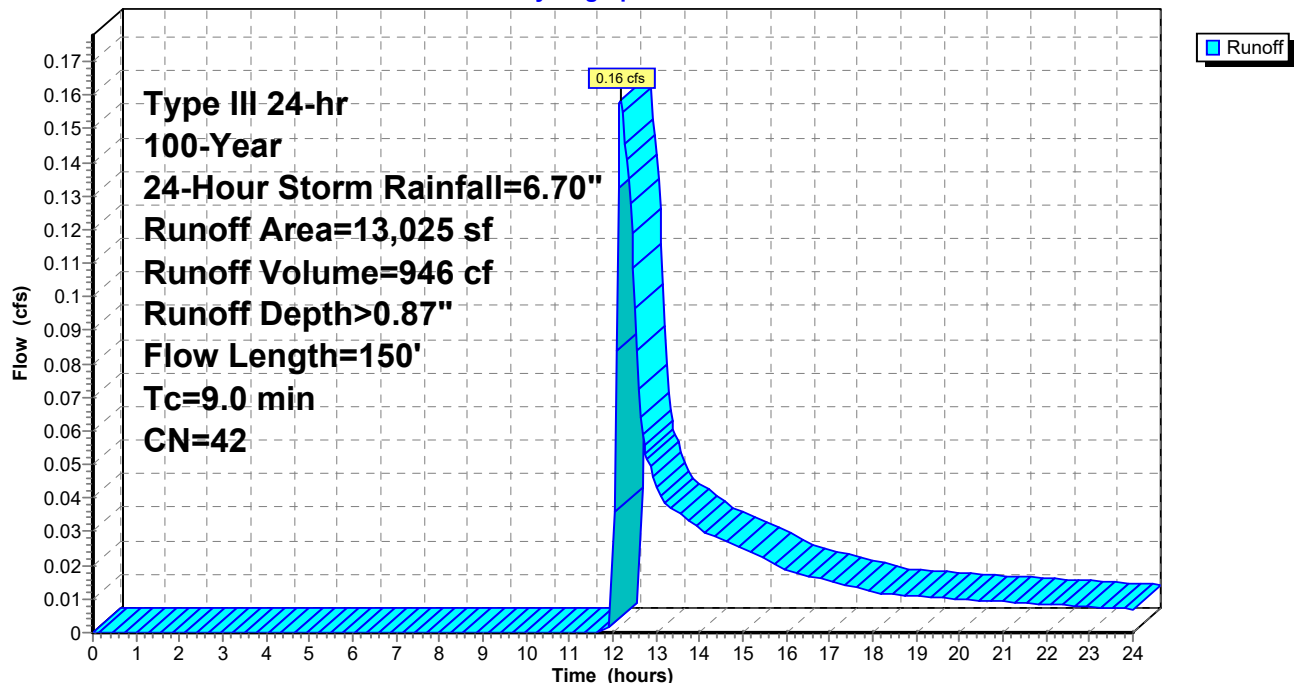
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 5,674 | 49 | 50-75% Grass cover, Fair, HSG A |
| 7,351 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 13,025 | 42 | Weighted Average |
| 13,025 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 6.5 | 25 | 0.1000 | 0.06 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 1.7 | 25 | 0.1000 | 0.25 | | Sheet Flow, |
| | | | | | Grass: Short n= 0.150 P2= 3.20" |
| 0.8 | 100 | 0.0800 | 1.98 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 9.0 | 150 | Total | | | |

Subcatchment A5C-PR: A5C-PR

Hydrograph



Summary for Subcatchment A6-PR: A6-PR

Runoff = 1.82 cfs @ 12.08 hrs, Volume= 6,568 cf, Depth> 6.46"

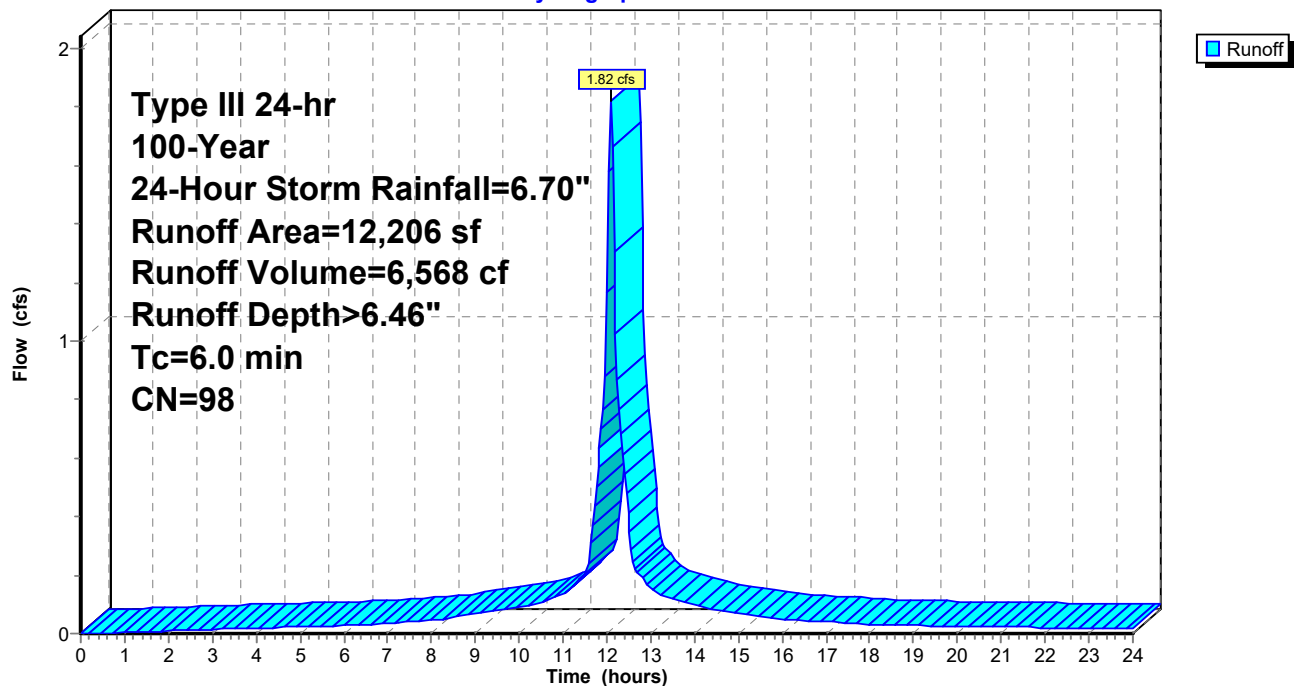
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Paved parking, HSG A |
| 12,206 | 98 | Roofs, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 12,206 | 98 | Weighted Average |
| 12,206 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|-----------------------------|
| 6.0 | | | | | Direct Entry, DIRECT 18 MIN |

Subcatchment A6-PR: A6-PR

Hydrograph



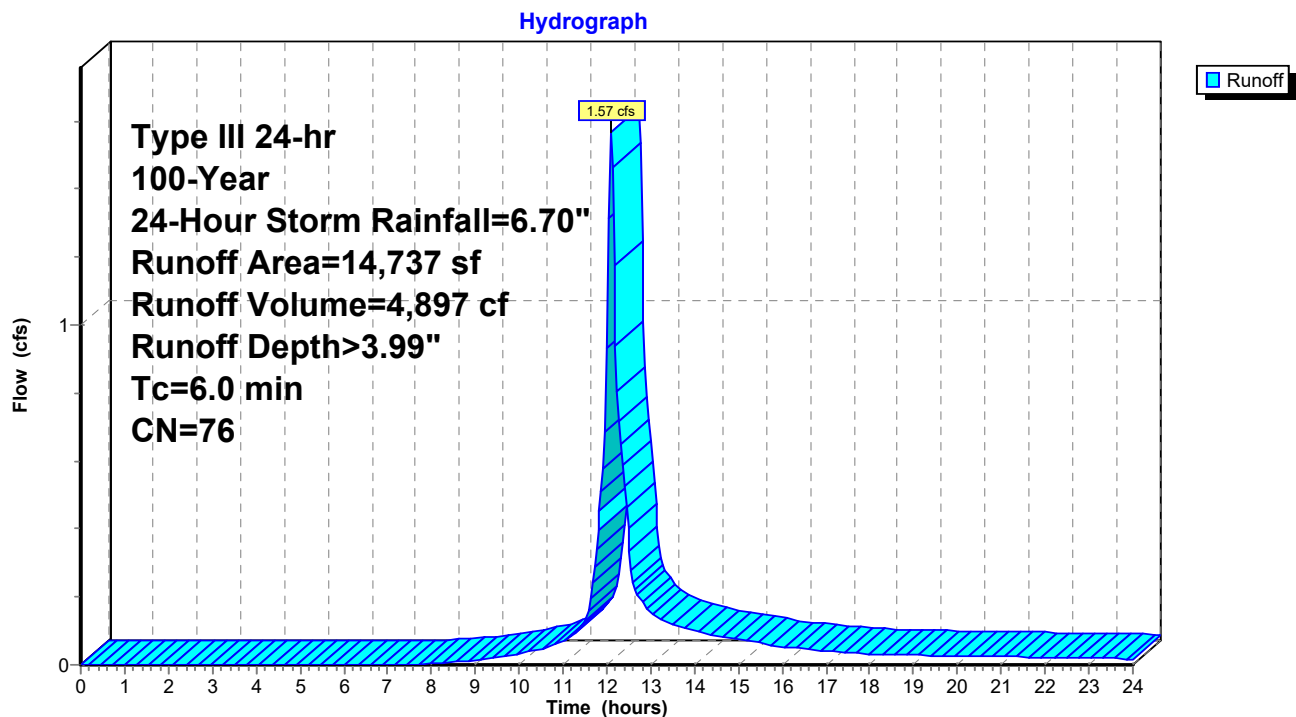
Summary for Subcatchment A7-PR: A7-PR

Runoff = 1.57 cfs @ 12.09 hrs, Volume= 4,897 cf, Depth> 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 4,643 | 98 | Roofs, HSG A |
| 3,344 | 98 | Paved parking, HSG A |
| 6,750 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 14,737 | 76 | Weighted Average |
| 6,750 | | 45.80% Pervious Area |
| 7,987 | | 54.20% Impervious Area |

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

Subcatchment A7-PR: A7-PR

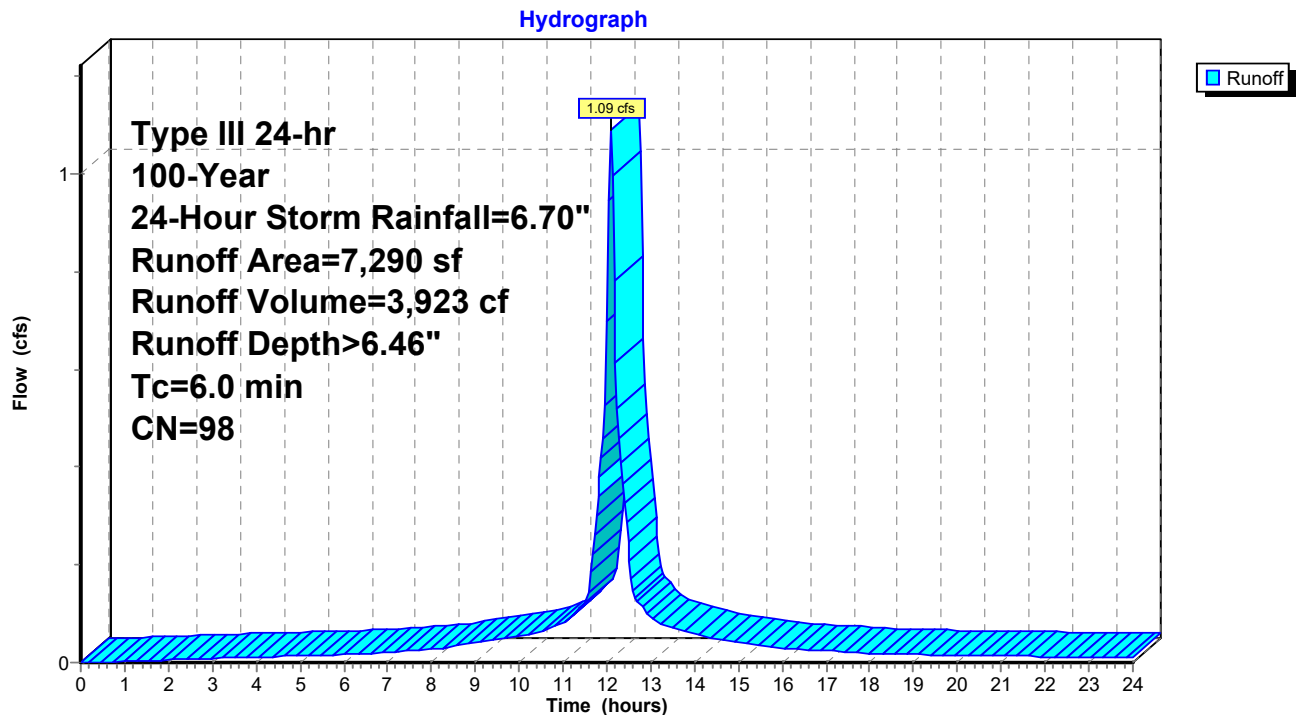
Summary for Subcatchment A8-PR: A8-PR

Runoff = 1.09 cfs @ 12.08 hrs, Volume= 3,923 cf, Depth> 6.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 7,290 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 0 | 49 | 50-75% Grass cover, Fair, HSG A |
| 0 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 7,290 | 98 | Weighted Average |
| 7,290 | | 100.00% Impervious Area |

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

Subcatchment A8-PR: A8-PR

Summary for Subcatchment A9-PR: A9-PR

Runoff = 0.15 cfs @ 12.40 hrs, Volume= 1,036 cf, Depth> 0.94"

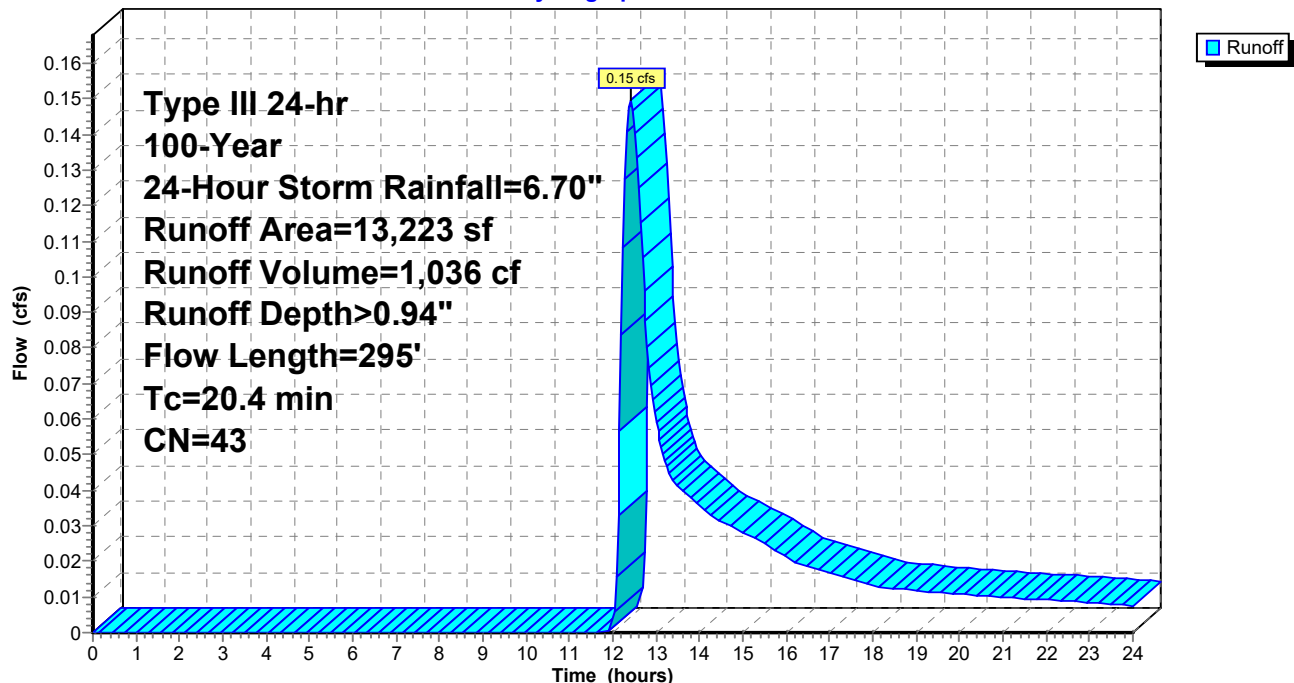
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Year, 24-Hour Storm Rainfall=6.70"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 0 | 98 | Roofs, HSG A |
| 0 | 98 | Paved parking, HSG A |
| 7,203 | 49 | 50-75% Grass cover, Fair, HSG A |
| 6,020 | 36 | Woods, Fair, HSG A |
| 0 | 96 | Gravel surface, HSG A |
| 13,223 | 43 | Weighted Average |
| 13,223 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 18.3 | 50 | 0.0300 | 0.05 | | Sheet Flow, SHEET FLOW |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.20" |
| 0.8 | 100 | 0.1600 | 2.00 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Woodland Kv= 5.0 fps |
| 1.3 | 145 | 0.0700 | 1.85 | | Shallow Concentrated Flow, SHALLOW CONC FLOW |
| | | | | | Short Grass Pasture Kv= 7.0 fps |
| 20.4 | 295 | Total | | | |

Subcatchment A9-PR: A9-PR

Hydrograph



Summary for Reach 1R: Open Channel

Inflow Area = 8,837 sf, 0.00% Impervious, Inflow Depth > 2.77" for 100-Year, 24-Hour Storm event
 Inflow = 0.53 cfs @ 12.17 hrs, Volume= 2,038 cf
 Outflow = 0.52 cfs @ 12.19 hrs, Volume= 2,037 cf, Atten= 2%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 2.24 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 1.42 fps, Avg. Travel Time= 1.1 min

Peak Storage= 21 cf @ 12.18 hrs

Average Depth at Peak Storage= 0.02'

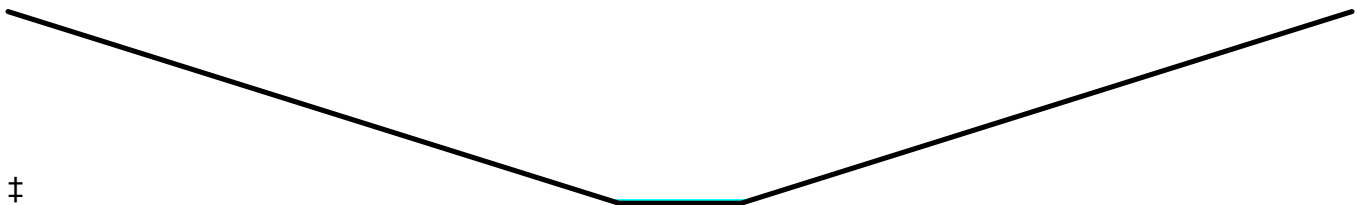
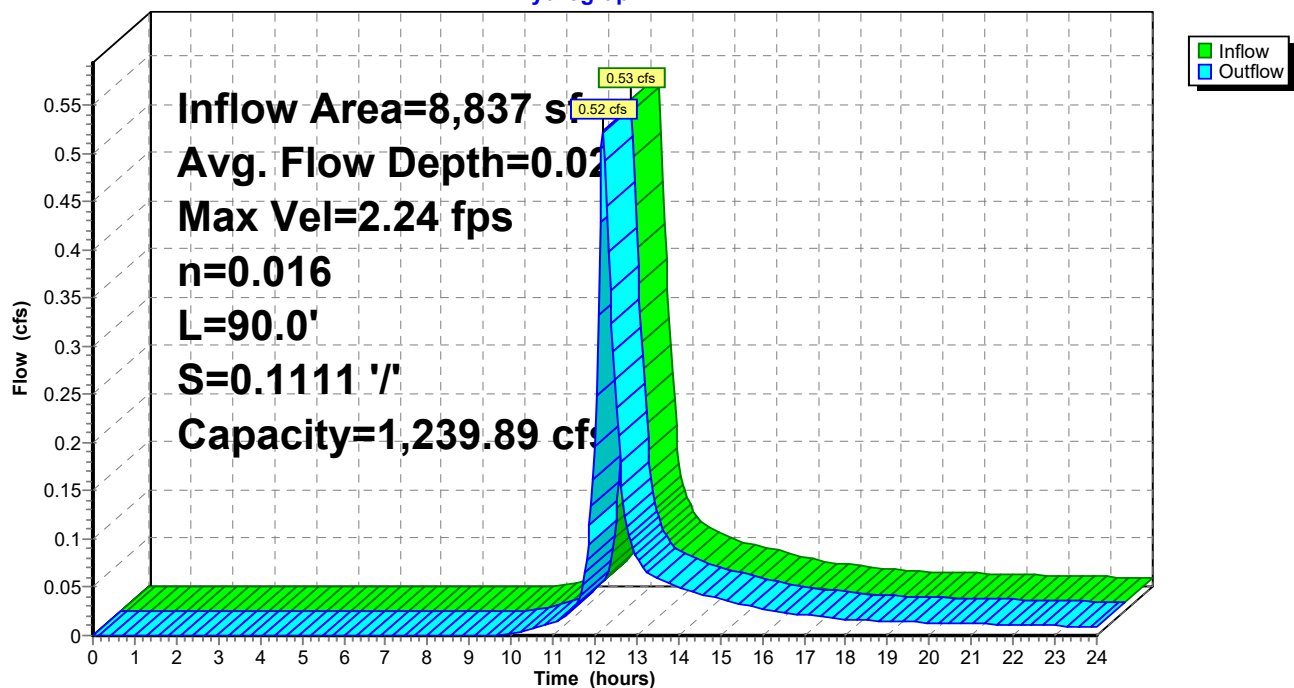
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 1,239.89 cfs

10.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 '/' Top Width= 110.00'

Length= 90.0' Slope= 0.1111 '/'

Inlet Invert= 35.00', Outlet Invert= 25.00'

**Reach 1R: Open Channel****Hydrograph**

Summary for Reach 2R: Open Channel

Inflow Area = 56,019 sf, 42.72% Impervious, Inflow Depth > 3.16" for 100-Year, 24-Hour Storm event
 Inflow = 3.49 cfs @ 12.23 hrs, Volume= 14,745 cf
 Outflow = 3.46 cfs @ 12.25 hrs, Volume= 14,734 cf, Atten= 1%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 3.20 fps, Min. Travel Time= 0.8 min

Avg. Velocity= 1.47 fps, Avg. Travel Time= 1.7 min

Peak Storage= 166 cf @ 12.24 hrs

Average Depth at Peak Storage= 0.14'

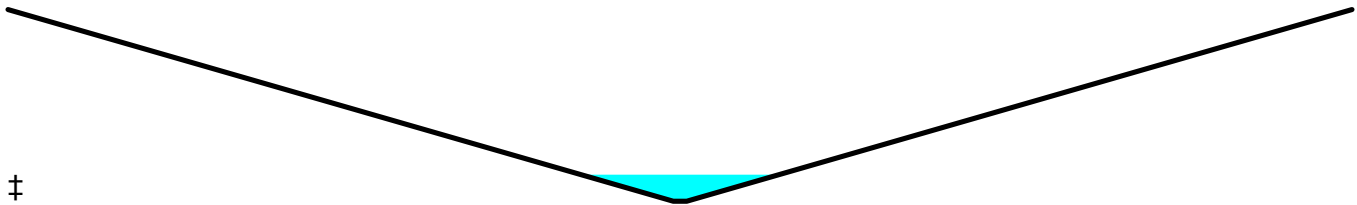
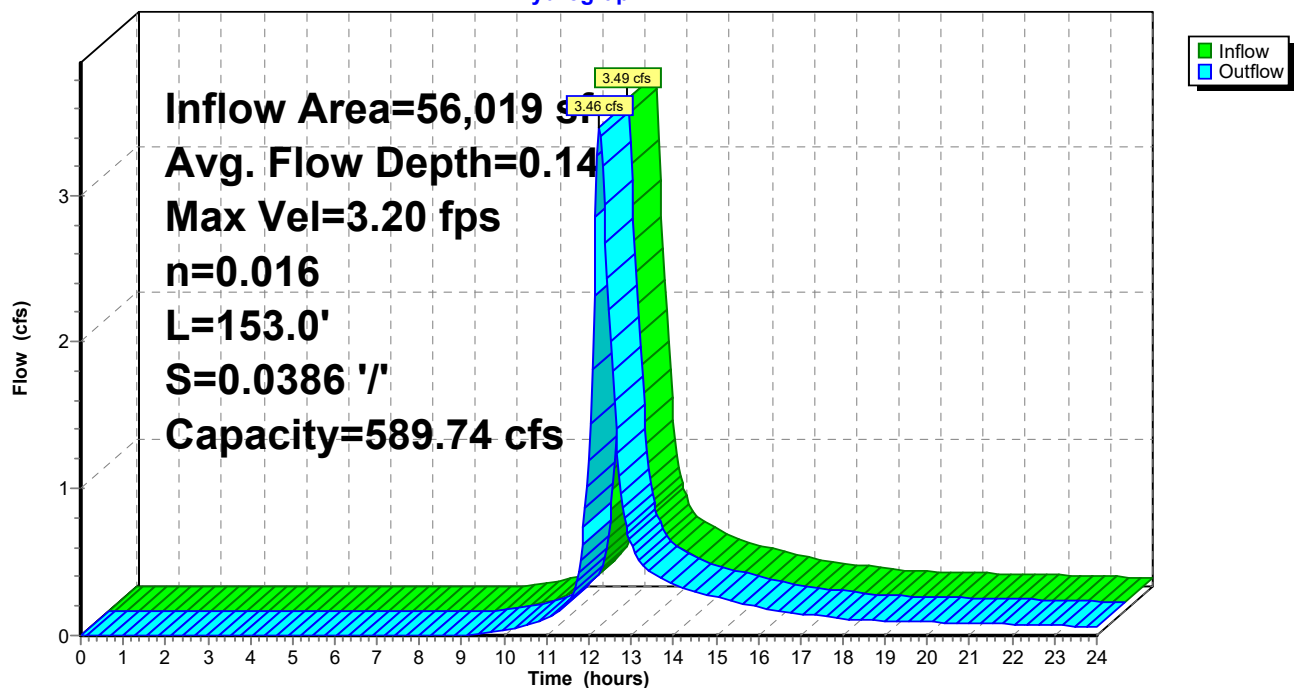
Bank-Full Depth= 1.00' Flow Area= 51.0 sf, Capacity= 589.74 cfs

1.00' x 1.00' deep channel, n= 0.016 Asphalt, rough

Side Slope Z-value= 50.0 '/' Top Width= 101.00'

Length= 153.0' Slope= 0.0386 '/'

Inlet Invert= 30.90', Outlet Invert= 25.00'

**Reach 2R: Open Channel****Hydrograph**

Summary for Reach 3R: Routing

Inflow Area = 6,592 sf, 1.05% Impervious, Inflow Depth > 1.25" for 100-Year, 24-Hour Storm event
 Inflow = 0.17 cfs @ 12.11 hrs, Volume= 689 cf
 Outflow = 0.15 cfs @ 12.24 hrs, Volume= 686 cf, Atten= 14%, Lag= 7.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 1.60 fps, Min. Travel Time= 4.2 min

Avg. Velocity = 0.85 fps, Avg. Travel Time= 7.9 min

Peak Storage= 37 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.04'

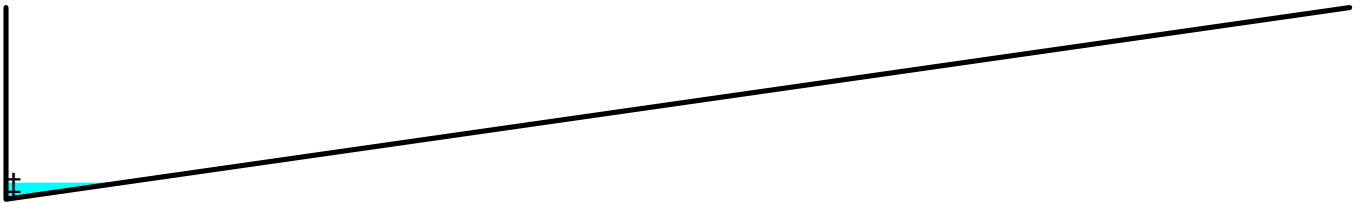
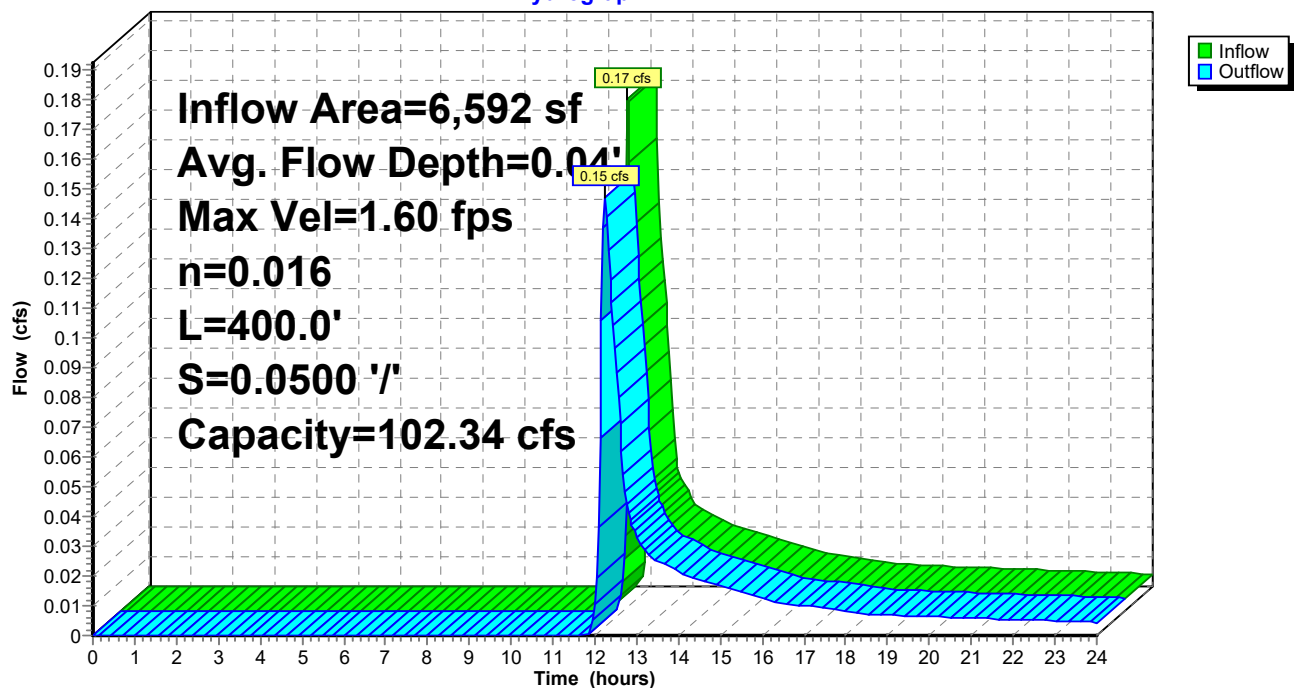
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 102.34 cfs

0.00' x 0.50' deep channel, n= 0.016

Side Slope Z-value= 0.0 100.0 '/' Top Width= 50.00'

Length= 400.0' Slope= 0.0500 '/'

Inlet Invert= 20.00', Outlet Invert= 0.00'

**Reach 3R: Routing****Hydrograph**

Summary for Reach 4R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 67,437 sf, 35.49% Impervious, Inflow Depth > 2.76" for 100-Year, 24-Hour Storm event
 Inflow = 3.57 cfs @ 12.25 hrs, Volume= 15,494 cf
 Outflow = 3.57 cfs @ 12.26 hrs, Volume= 15,492 cf, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 5.63 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.48 fps, Avg. Travel Time= 0.3 min

Peak Storage= 28 cf @ 12.25 hrs

Average Depth at Peak Storage= 0.75'

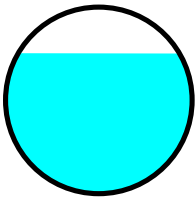
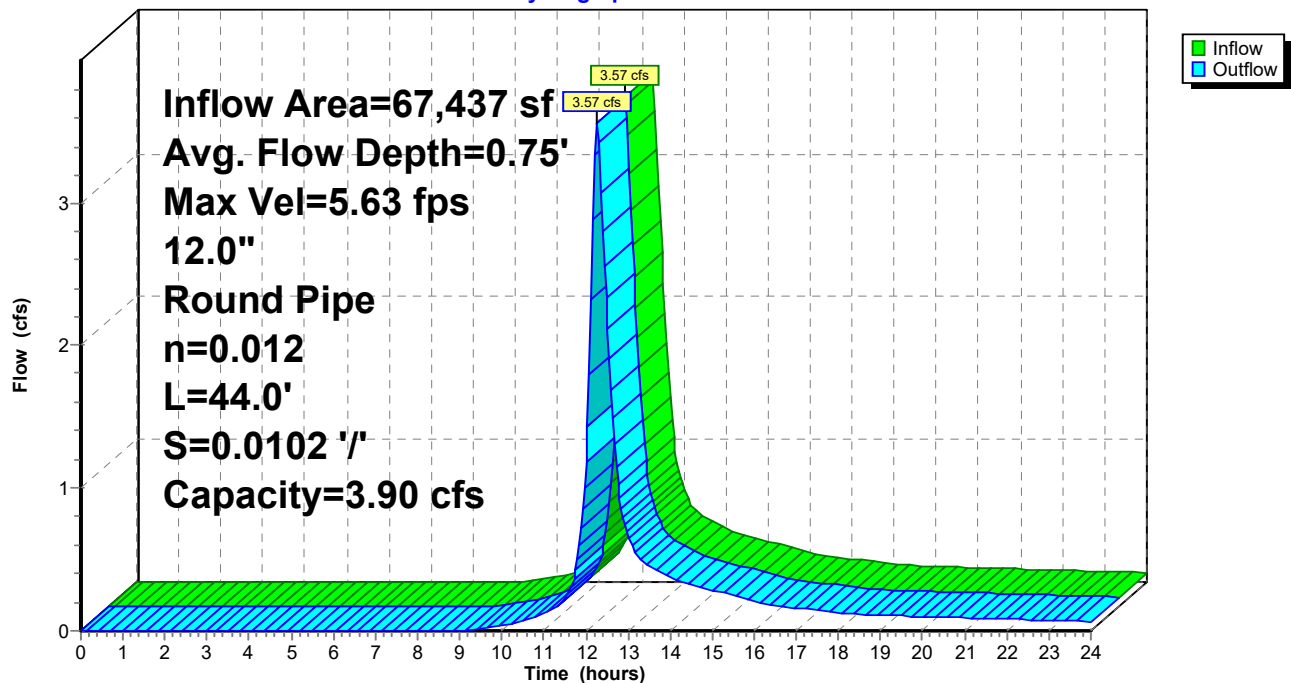
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.90 cfs

12.0" Round Pipe

n= 0.012

Length= 44.0' Slope= 0.0102 '/'

Inlet Invert= 18.65', Outlet Invert= 18.20'

**Reach 4R: 12" Pipe****Hydrograph**

Summary for Reach 5R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 2.17" for 100-Year, 24-Hour Storm event
 Inflow = 10.32 cfs @ 12.31 hrs, Volume= 45,548 cf
 Outflow = 10.27 cfs @ 12.32 hrs, Volume= 45,537 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 9.30 fps, Min. Travel Time= 0.3 min

Avg. Velocity = 3.30 fps, Avg. Travel Time= 0.8 min

Peak Storage= 174 cf @ 12.32 hrs

Average Depth at Peak Storage= 0.90'

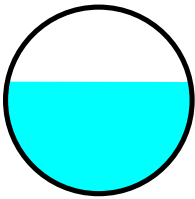
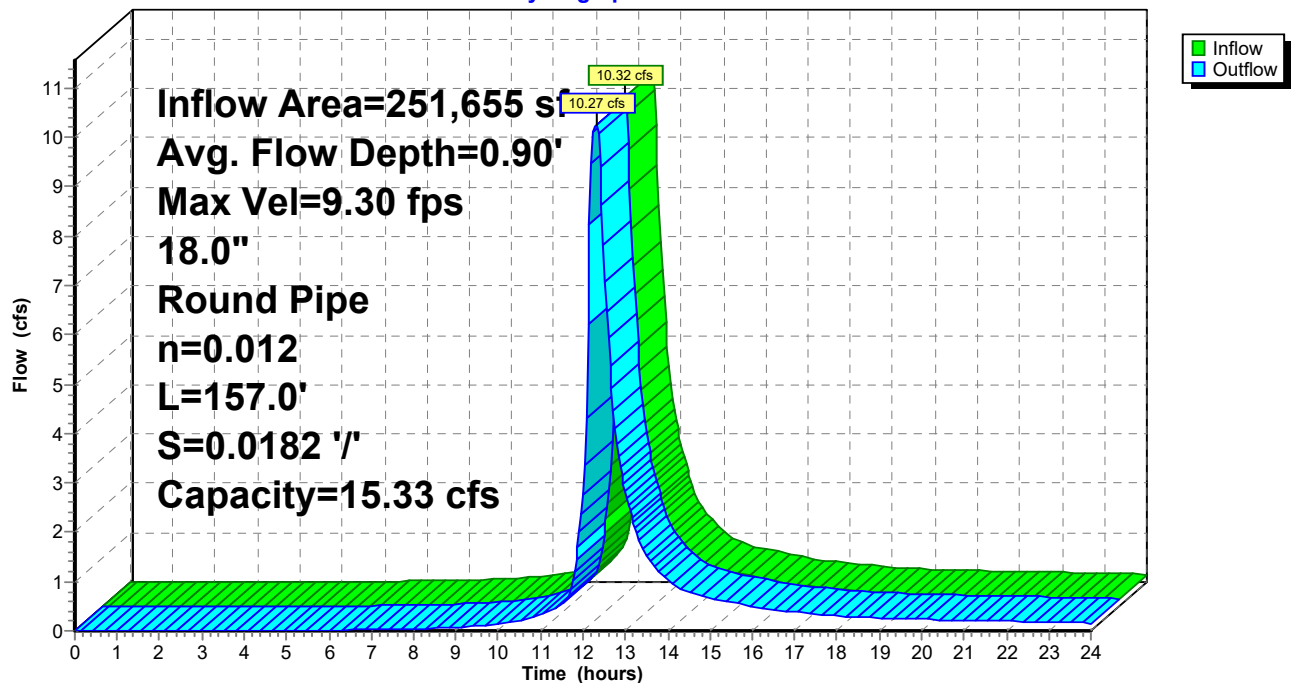
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.33 cfs

18.0" Round Pipe

n= 0.012

Length= 157.0' Slope= 0.0182 1/100

Inlet Invert= 14.55', Outlet Invert= 11.70'

**Reach 5R: 18" Pipe****Hydrograph**

Summary for Reach 6R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 2.15" for 100-Year, 24-Hour Storm event
 Inflow = 10.44 cfs @ 12.31 hrs, Volume= 45,743 cf
 Outflow = 10.43 cfs @ 12.32 hrs, Volume= 45,739 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 9.65 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 3.40 fps, Avg. Travel Time= 0.2 min

Peak Storage= 52 cf @ 12.32 hrs

Average Depth at Peak Storage= 0.88'

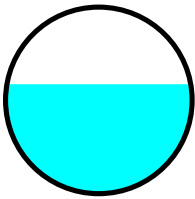
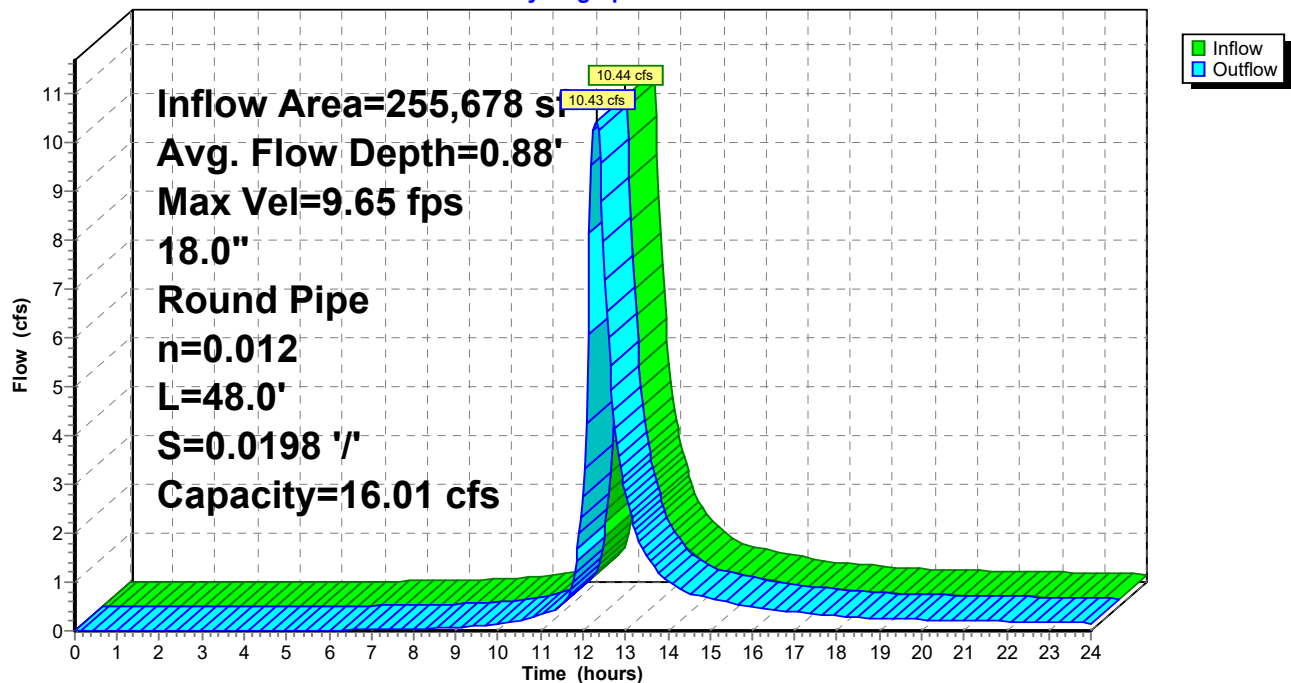
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 16.01 cfs

18.0" Round Pipe

n= 0.012

Length= 48.0' Slope= 0.0198 '/'

Inlet Invert= 11.70', Outlet Invert= 10.75'

**Reach 6R: 18" Pipe****Hydrograph**

Summary for Reach 7R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 59,959 sf, 9.86% Impervious, Inflow Depth > 1.49" for 100-Year, 24-Hour Storm event
 Inflow = 1.47 cfs @ 12.27 hrs, Volume= 7,456 cf
 Outflow = 1.46 cfs @ 12.27 hrs, Volume= 7,455 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 4.92 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.33 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.27 hrs

Average Depth at Peak Storage= 0.40'

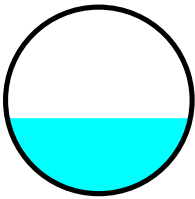
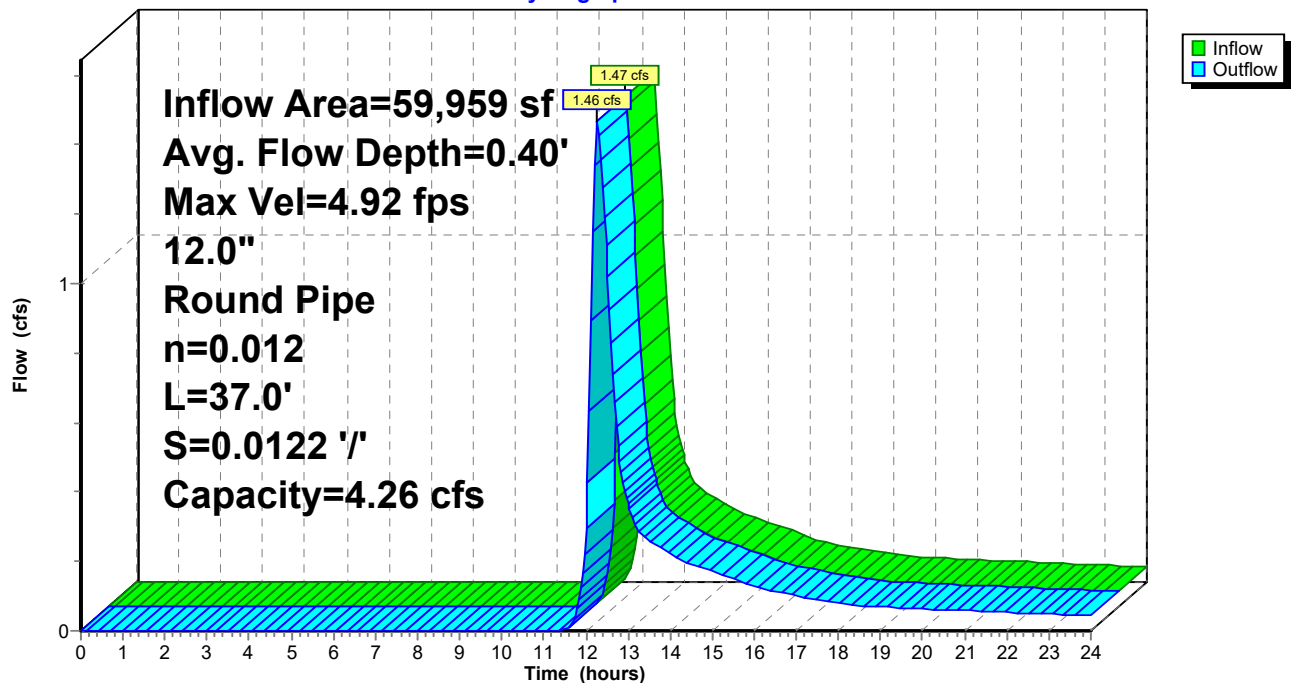
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe

n= 0.012

Length= 37.0' Slope= 0.0122 '/'

Inlet Invert= 18.00', Outlet Invert= 17.55'

**Reach 7R: 12" Pipe****Hydrograph**

Summary for Reach 8R: 12" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.55' @ 12.16 hrs

Inflow Area = 43,402 sf, 42.31% Impervious, Inflow Depth > 3.84" for 100-Year, 24-Hour Storm event
Inflow = 3.47 cfs @ 12.16 hrs, Volume= 13,876 cf
Outflow = 3.43 cfs @ 12.17 hrs, Volume= 13,870 cf, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 7.41 fps, Min. Travel Time= 0.5 min

Avg. Velocity = 2.71 fps, Avg. Travel Time= 1.4 min

Peak Storage= 103 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.58'

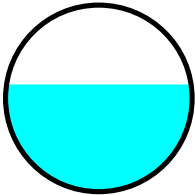
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.51 cfs

12.0" Round Pipe

n= 0.012

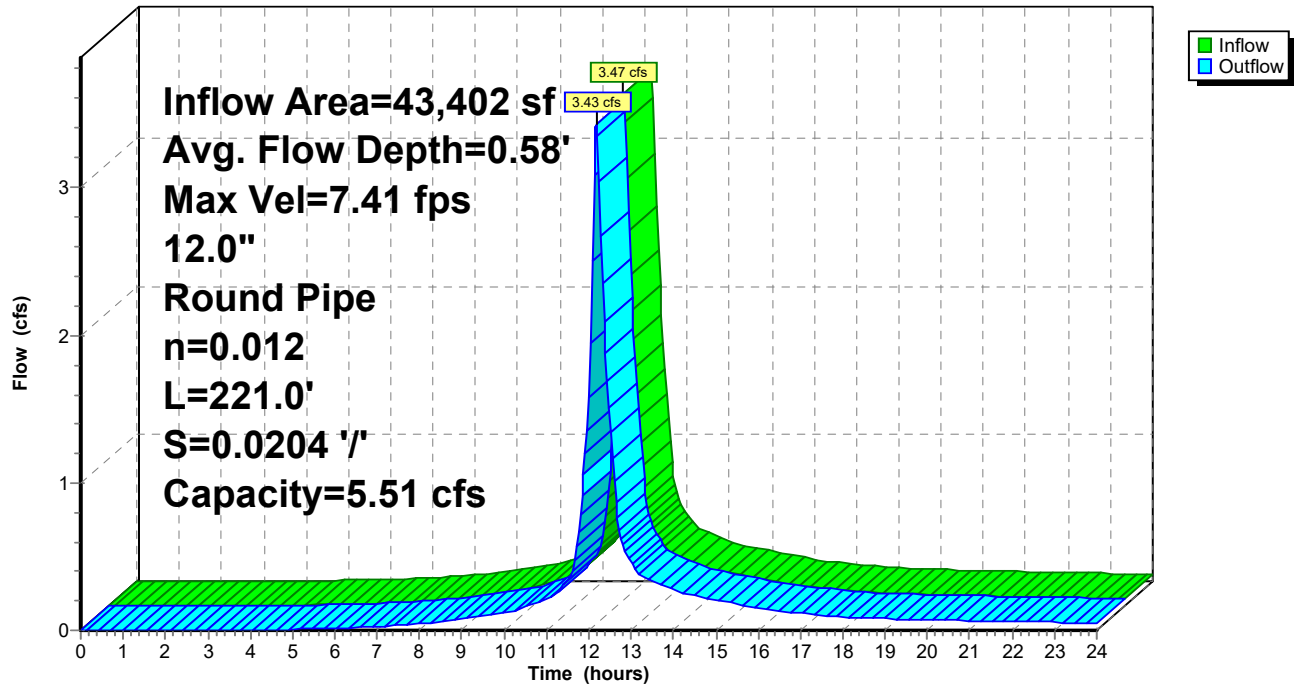
Length= 221.0' Slope= 0.0204 '/'

Inlet Invert= 25.00', Outlet Invert= 20.50'



Reach 8R: 12" Pipe

Hydrograph



Summary for Reach 9R: 18" Pipe

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 3.18" for 100-Year, 24-Hour Storm event
 Inflow = 6.71 cfs @ 12.21 hrs, Volume= 29,362 cf
 Outflow = 6.64 cfs @ 12.23 hrs, Volume= 29,346 cf, Atten= 1%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Max. Velocity= 6.69 fps, Min. Travel Time= 0.5 min

Avg. Velocity = 2.45 fps, Avg. Travel Time= 1.5 min

Peak Storage= 220 cf @ 12.22 hrs

Average Depth at Peak Storage= 0.83'

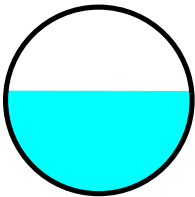
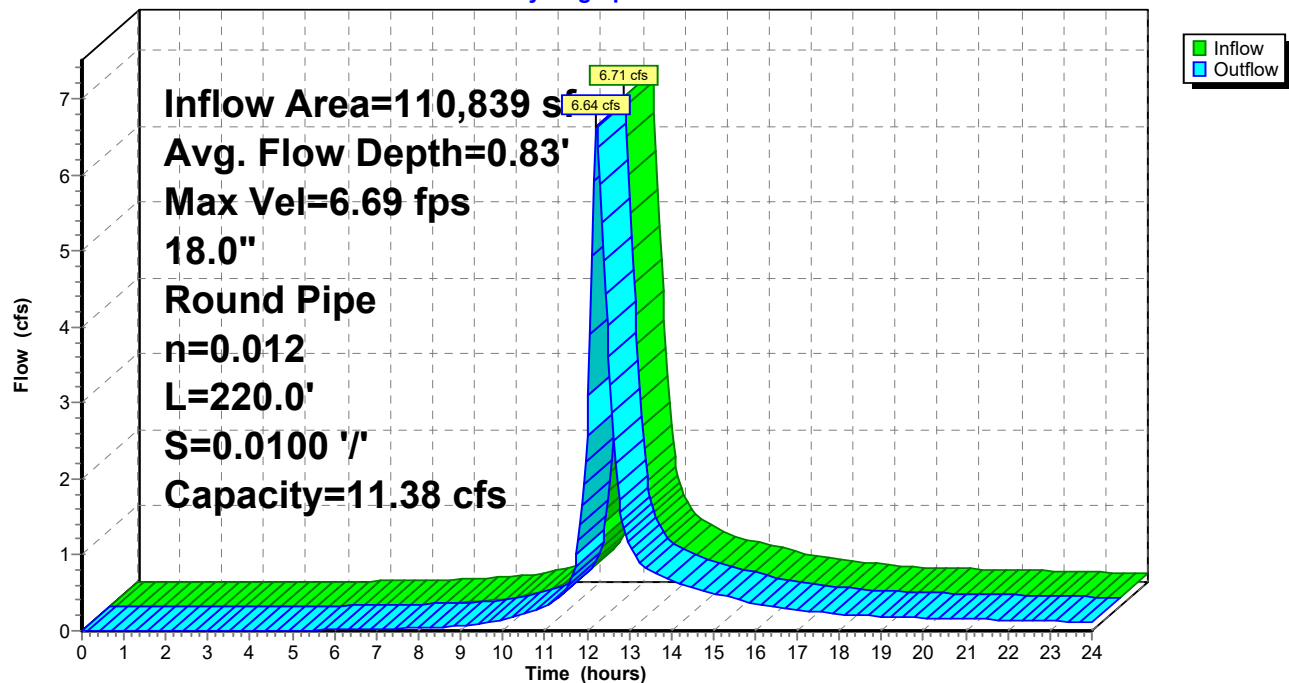
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.38 cfs

18.0" Round Pipe

n= 0.012

Length= 220.0' Slope= 0.0100 '/'

Inlet Invert= 16.75', Outlet Invert= 14.55'

**Reach 9R: 18" Pipe****Hydrograph**

Summary for Pond A2-P: CHAMBERS

Inflow Area = 80,857 sf, 87.50% Impervious, Inflow Depth > 5.74" for 100-Year, 24-Hour Storm event
 Inflow = 11.45 cfs @ 12.09 hrs, Volume= 38,644 cf
 Outflow = 3.95 cfs @ 12.37 hrs, Volume= 38,632 cf, Atten= 66%, Lag= 16.9 min
 Discarded = 0.69 cfs @ 10.84 hrs, Volume= 29,884 cf
 Primary = 3.26 cfs @ 12.37 hrs, Volume= 8,748 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 19.69' @ 12.37 hrs Surf.Area= 3,603 sf Storage= 11,768 cf

Plug-Flow detention time= 72.4 min calculated for 38,632 cf (100% of inflow)
 Center-of-Mass det. time= 72.2 min (843.0 - 770.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|---|
| #1A | 14.50' | 5,063 cf | 29.92'W x 120.42'L x 5.50'H Field A 19,814 cf Overall - 7,156 cf Embedded = 12,658 cf x 40.0% Voids |
| #2A | 15.25' | 7,156 cf | ADS_StormTech MC-3500 d +Capx 64 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 64 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf |
| | | 12,219 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

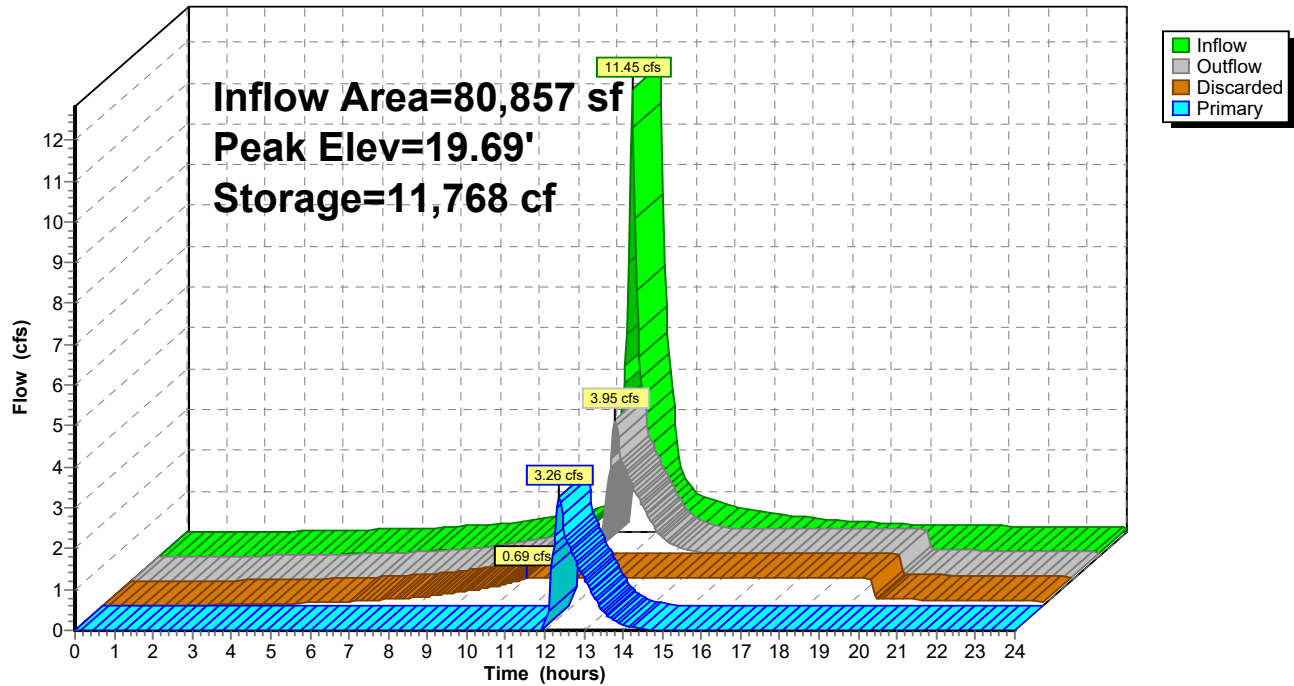
| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.25' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.25' / 15.15' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 19.50' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |
| #4 | Device 1 | 17.40' | 8.0" Vert. Orifice/Grate C= 0.600 |

Discarded OutFlow Max=0.69 cfs @ 10.84 hrs HW=14.56' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.69 cfs)

Primary OutFlow Max=3.23 cfs @ 12.37 hrs HW=19.68' (Free Discharge)
 ↑ **1=Culvert** (Passes 3.23 cfs of 7.50 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.88 cfs @ 1.20 fps)
 ↑ **4=Orifice/Grate** (Orifice Controls 2.35 cfs @ 6.72 fps)

Pond A2-P: CHAMBERS

Hydrograph



Summary for Pond A3-P: CHAMBERS

Inflow Area = 4,023 sf, 82.53% Impervious, Inflow Depth > 5.41" for 100-Year, 24-Hour Storm event
 Inflow = 0.55 cfs @ 12.09 hrs, Volume= 1,814 cf
 Outflow = 0.25 cfs @ 12.27 hrs, Volume= 1,813 cf, Atten= 55%, Lag= 11.3 min
 Discarded = 0.07 cfs @ 11.64 hrs, Volume= 1,607 cf
 Primary = 0.18 cfs @ 12.27 hrs, Volume= 206 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2

Peak Elev= 16.41' @ 12.27 hrs Surf.Area= 353 sf Storage= 431 cf

Plug-Flow detention time= 32.2 min calculated for 1,810 cf (100% of inflow)

Center-of-Mass det. time= 31.7 min (815.8 - 784.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1A | 14.50' | 347 cf | 11.00'W x 32.10'L x 3.50'H Field A 1,236 cf Overall - 368 cf Embedded = 868 cf x 40.0% Voids |
| #2A | 15.00' | 368 cf | ADS_StormTech SC-740 +Cap x 8 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 8 Chambers in 2 Rows |
| | | 715 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

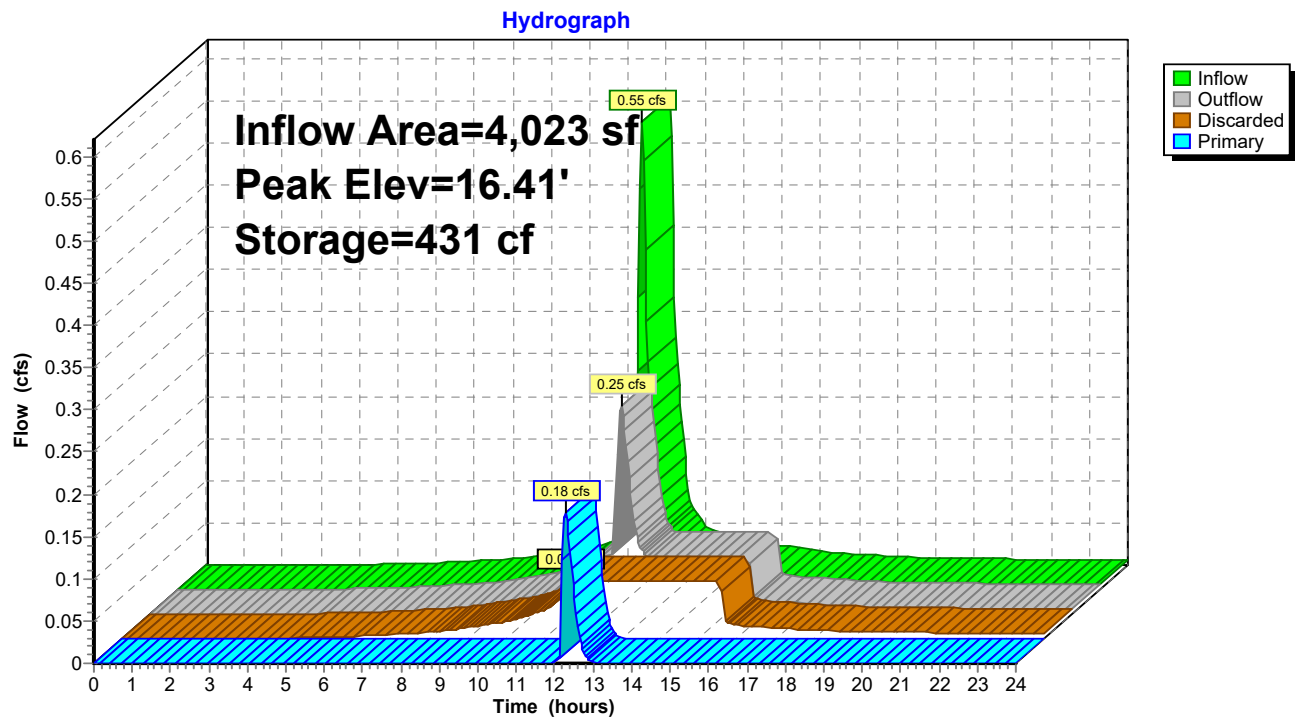
| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 15.00' | 12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 15.00' / 14.90' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 16.90' | 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #3 | Device 1 | 16.15' | 6.0" Vert. Orifice/Grate C= 0.600 |
| #4 | Discarded | 14.50' | 8.270 in/hr Exfiltration over Surface area |

Discarded OutFlow Max=0.07 cfs @ 11.64 hrs HW=14.55' (Free Discharge)

↑ **4=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.18 cfs @ 12.27 hrs HW=16.41' (Free Discharge)

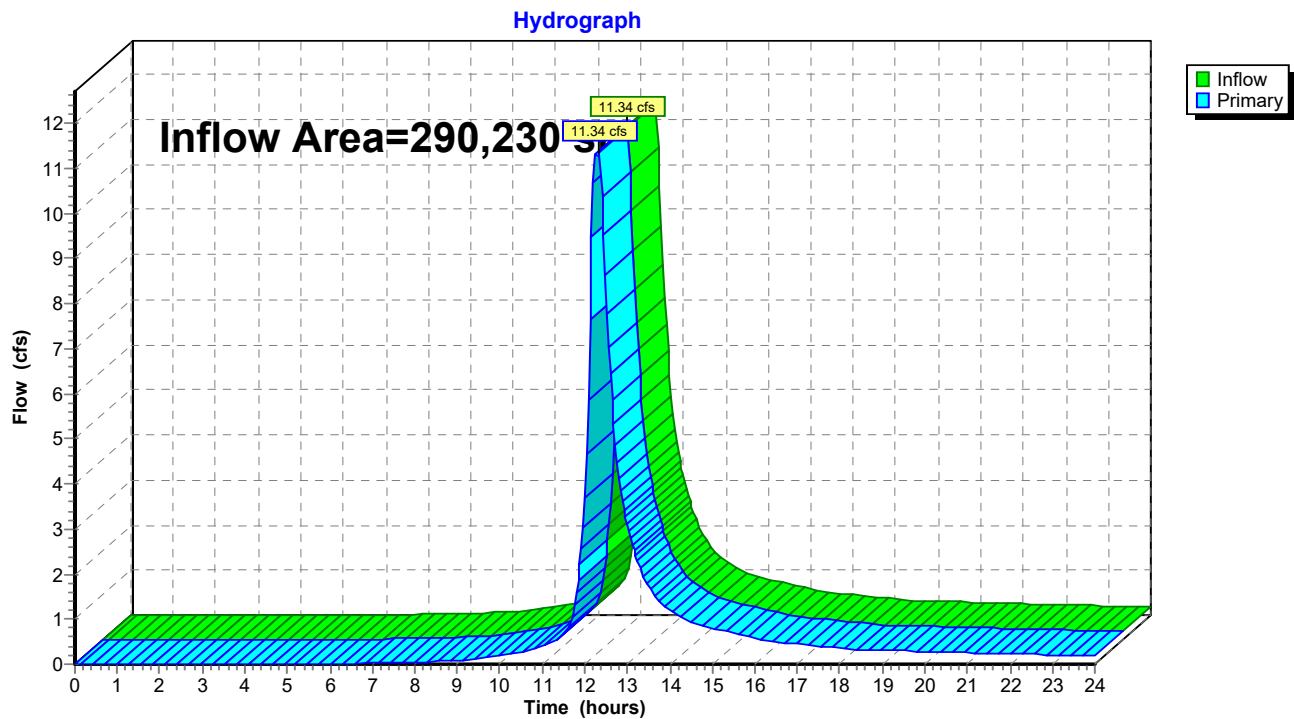
↑ **1=Culvert** (Passes 0.18 cfs of 3.33 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **3=Orifice/Grate** (Orifice Controls 0.18 cfs @ 1.73 fps)

Pond A3-P: CHAMBERS

Summary for Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Inflow Area = 290,230 sf, 44.91% Impervious, Inflow Depth > 2.16" for 100-Year, 24-Hour Storm event
Inflow = 11.34 cfs @ 12.32 hrs, Volume= 52,358 cf
Primary = 11.34 cfs @ 12.32 hrs, Volume= 52,358 cf, Atten= 0%, Lag= 0.0 min

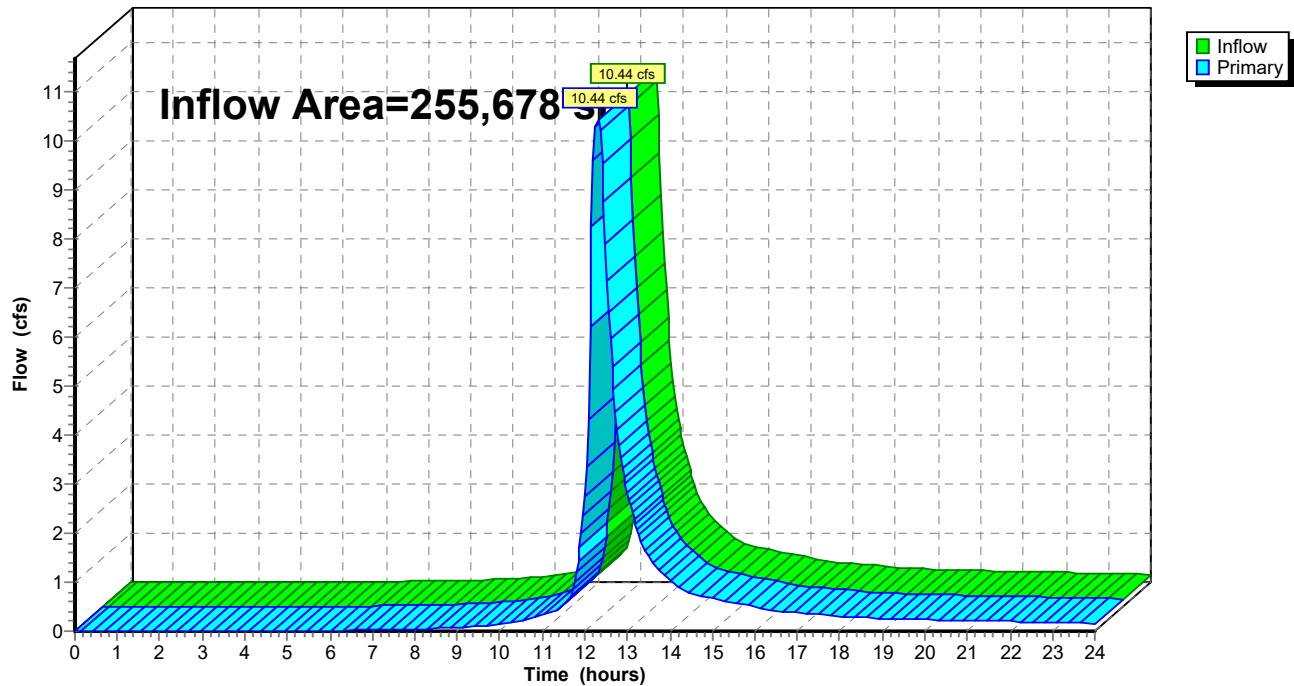
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link A: DESIGN POINT A - EXISTING MUNICIPAL DRAINAGE SYSTEM

Summary for Link DMH-A2: DMH-A2

Inflow Area = 255,678 sf, 47.82% Impervious, Inflow Depth > 2.15" for 100-Year, 24-Hour Storm event
Inflow = 10.44 cfs @ 12.31 hrs, Volume= 45,743 cf
Primary = 10.44 cfs @ 12.31 hrs, Volume= 45,743 cf, Atten= 0%, Lag= 0.0 min

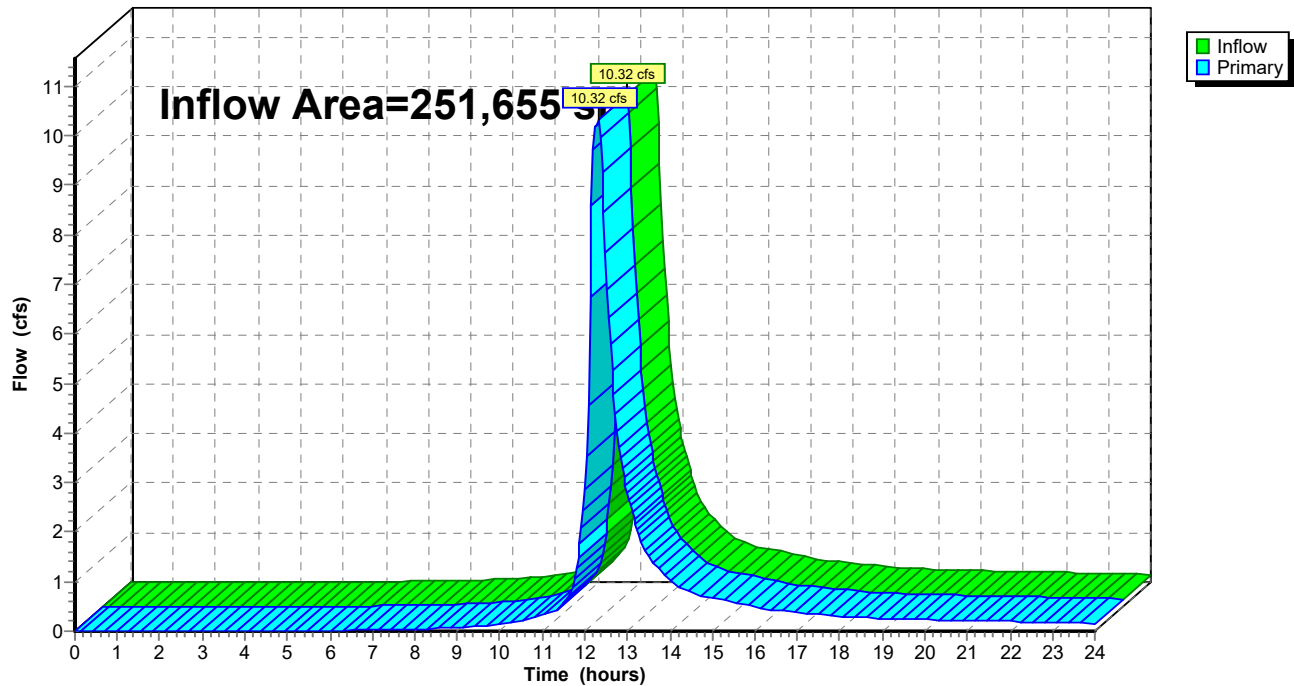
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A2: DMH-A2**Hydrograph**

Summary for Link DMH-A3: DMH-A3

Inflow Area = 251,655 sf, 47.27% Impervious, Inflow Depth > 2.17" for 100-Year, 24-Hour Storm event
Inflow = 10.32 cfs @ 12.31 hrs, Volume= 45,548 cf
Primary = 10.32 cfs @ 12.31 hrs, Volume= 45,548 cf, Atten= 0%, Lag= 0.0 min

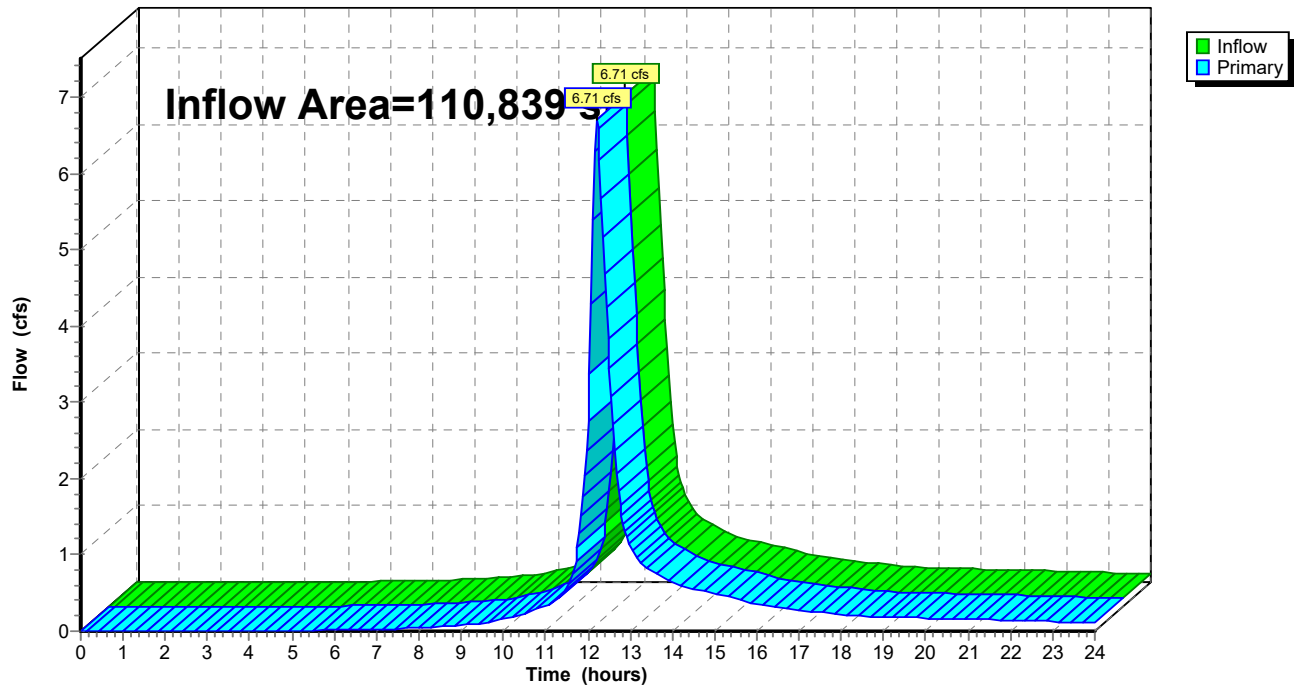
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A3: DMH-A3**Hydrograph**

Summary for Link DMH-A4: DMH-A4

Inflow Area = 110,839 sf, 38.16% Impervious, Inflow Depth > 3.18" for 100-Year, 24-Hour Storm event
Inflow = 6.71 cfs @ 12.21 hrs, Volume= 29,362 cf
Primary = 6.71 cfs @ 12.21 hrs, Volume= 29,362 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link DMH-A4: DMH-A4**Hydrograph**

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Sep 3 2020

Open Channel Flow From MBTA Tracks

Trapezoidal

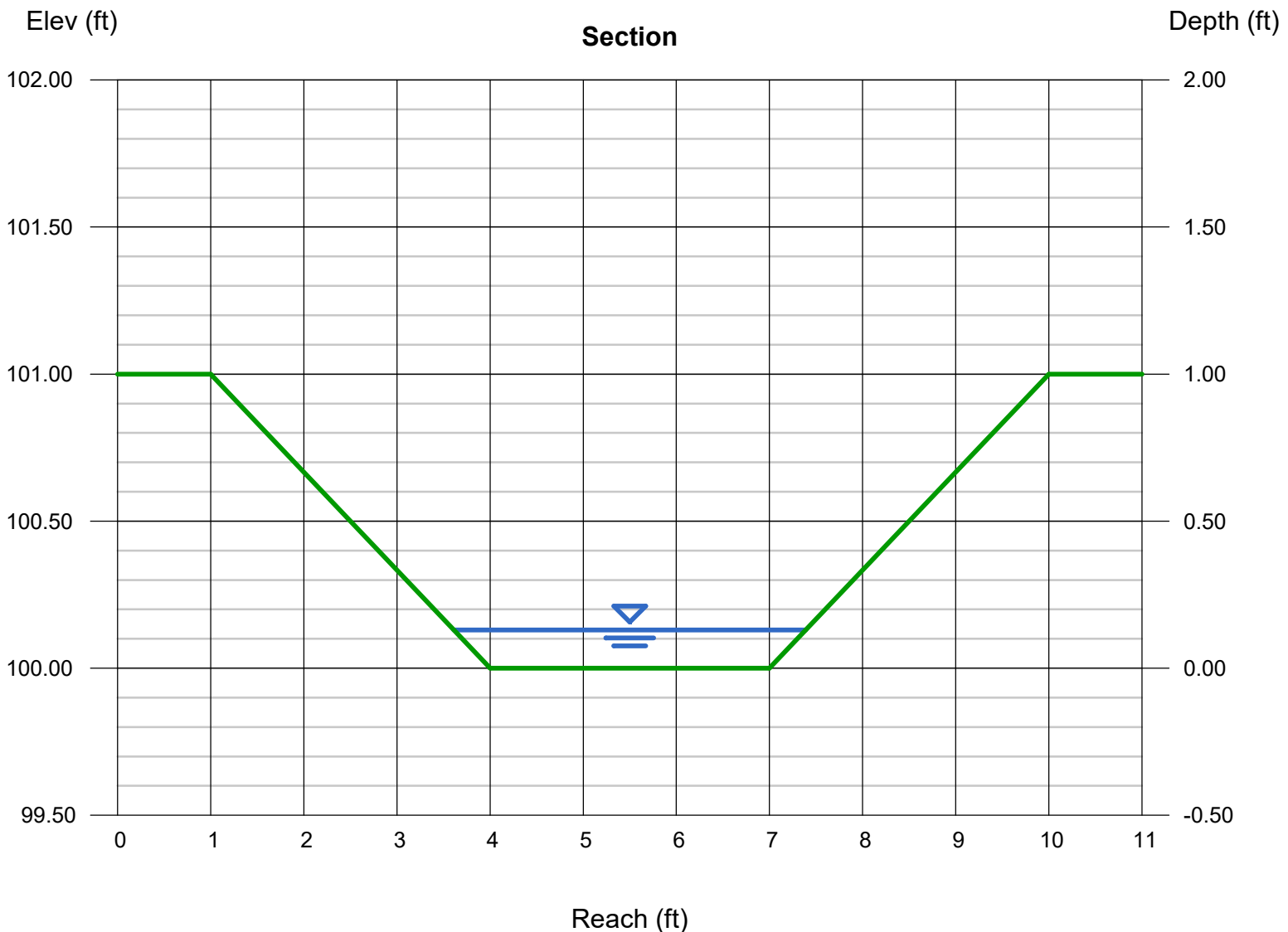
Bottom Width (ft) = 3.00
Side Slopes (z:1) = 3.00, 3.00
Total Depth (ft) = 1.00
Invert Elev (ft) = 100.00
Slope (%) = 10.00
N-Value = 0.025

Highlighted

Depth (ft) = 0.13
Q (cfs) = 1.900
Area (sqft) = 0.44
Velocity (ft/s) = 4.31
Wetted Perim (ft) = 3.82
Crit Depth, Yc (ft) = 0.22
Top Width (ft) = 3.78
EGL (ft) = 0.42

Calculations

Compute by: Known Q
Known Q (cfs) = 1.90





Calculations For Outlet Protection

Project: Wharf Street Redevelopment

Date: 9/3/2020

Prepared by: DP

Job #: 193-187

Revised by: -

Checked by: KPS

8-inch Culvert from MBTA ROW

| | | |
|---|-------|-----|
| Total Peak Flow (Q) | 1.9 | cfs |
| Total Diameter of Structure (Do) | 0.67 | ft |
| Invert Out | 34.20 | ft |
| Tailwater Elevation (at Peak Flow) in Basin | 34.32 | ft |

Step 1: Calculate unit discharge (q):

$$q = Q/Do$$

$$q = 3$$

Step 2: Calculate Tw: Tailwater Elevation - Invert Out Elevation
0.12 ft

Step 3: Calculate La:

Determine which La formula to use

If $TW < 1/2 Do$

Then ,

$$La = 1.8(q/(Do^{1.5})) + 7$$

If $TW > 1/2 Do$

Then ,

$$La = 3 * Do(q/(Do^{1.5}))$$

Since $TW < 1/2 Do$:

$$La = 16 \text{ ft}$$

Step 3: Calculate W:

 $TW < 1/2 Do$

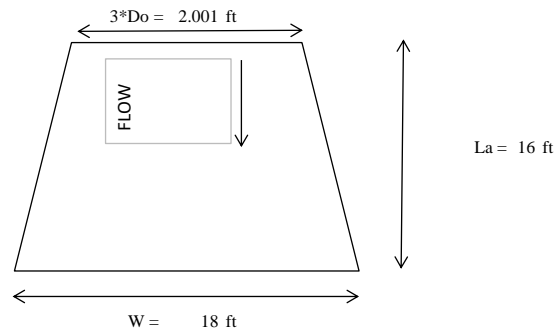
$$W = 3 * Do + La$$

 $TW > 1/2 Do$

$$W = 3 * Do + 0.4La$$

Since $TW < 1/2 Do$:

$$W = 18 \text{ ft}$$



Step 4: Size Rip Rap:

$$d50 = (0.02/Tw) * q^{1.33}$$

$$d50 = \frac{0.67}{8.05} \text{ ft}$$

$$d50 = 9 \text{ inches (min)}$$

$$\text{Thickness (6-inch minimum)} = d50 \times 2$$

$$\text{Thickness} = 18 \text{ inches (min)}$$

Notes:

- Equations and tables taken from "Standards for Soil Erosion and Sediment Control in New Jersey", Standard for Conduit Outlet Protection, dated May 2012, based upon design standards from U.S. Department of Transportation Federal Highway Administration.
- Flow and Tailwater taken from HydroCAD model for 25-Year, 24-Hour design storm.



Water Quality Volume Flow Rate Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

Structure Name: Stormwater Chambers (SC-740)

Description: Water Quality Inlet

Subcatchment: A12-PR

Total Drainage Area: 4,023 sq ft
0.09 ac

Total Impervious Area: 3,112 sq ft
0.07 ac

**Excludes
Roof Areas*

0.776317341

Runoff Depth to be Treated: 1.0 inches

| | |
|---------------------------------------|--------------------|
| Required Water Quality Volume: | 0.006 ac ft |
| | 260 cf |

Water Quality Volume Provided: 368 cf in Pond A3-P

FLOW RATE CONVERSION

$$Q = (qu)(A)(WQV)$$

Where:

Q = flow rate associated with the 1-inch of runoff, in cfs

qu = the unit peak discharge, in csm/in.

A = impervious surface drainage area, in square miles

WQV = water quality volume in watershed inches

Given:

1-acre = 0.0015625 mi²
5 minute = 0.083 hours
qu (1-inch) = 774 csm/in

Calculation:

qu = 774
A = 0.07 ac
WQV = 1.0 in

| | |
|--|-----------------|
| Required Water Quality Flow Rate: | 0.09 cfs |
|--|-----------------|

**WQU-A6 will provide 80% TSS Removal Efficiency for flows up to
0.40 cfs**

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

Stage-Area-Storage for Pond A3-P: CHAMBERS (continued)

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 15.54 | 353 | 214 | 16.06 | 353 | 346 |
| 15.55 | 353 | 217 | 16.07 | 353 | 349 |
| 15.56 | 353 | 219 | 16.08 | 353 | 351 |
| 15.57 | 353 | 222 | 16.09 | 353 | 354 |
| 15.58 | 353 | 224 | 16.10 | 353 | 356 |
| 15.59 | 353 | 227 | 16.11 | 353 | 359 |
| 15.60 | 353 | 230 | 16.12 | 353 | 361 |
| 15.61 | 353 | 232 | 16.13 | 353 | 363 |
| 15.62 | 353 | 235 | 16.14 | 353 | 366 |
| 15.63 | 353 | 237 | 16.15 | 353 | 368 |
| 15.64 | 353 | 240 | 16.16 | 353 | 371 |
| 15.65 | 353 | 242 | 16.17 | 353 | 373 |
| 15.66 | 353 | 245 | 16.18 | 353 | 376 |
| 15.67 | 353 | 248 | 16.19 | 353 | 378 |
| 15.68 | 353 | 250 | 16.20 | 353 | 381 |
| 15.69 | 353 | 253 | 16.21 | 353 | 383 |
| 15.70 | 353 | 255 | 16.22 | 353 | 385 |
| 15.71 | 353 | 258 | 16.23 | 353 | 388 |
| 15.72 | 353 | 260 | 16.24 | 353 | 390 |
| 15.73 | 353 | 263 | 16.25 | 353 | 393 |
| 15.74 | 353 | 266 | 16.26 | 353 | 395 |
| 15.75 | 353 | 268 | 16.27 | 353 | 397 |
| 15.76 | 353 | 271 | 16.28 | 353 | 400 |
| 15.77 | 353 | 273 | 16.29 | 353 | 402 |
| 15.78 | 353 | 276 | 16.30 | 353 | 405 |
| 15.79 | 353 | 278 | 16.31 | 353 | 407 |
| 15.80 | 353 | 281 | 16.32 | 353 | 409 |
| 15.81 | 353 | 283 | 16.33 | 353 | 412 |
| 15.82 | 353 | 286 | 16.34 | 353 | 414 |
| 15.83 | 353 | 289 | 16.35 | 353 | 416 |
| 15.84 | 353 | 291 | 16.36 | 353 | 419 |
| 15.85 | 353 | 294 | 16.37 | 353 | 421 |
| 15.86 | 353 | 296 | 16.38 | 353 | 424 |
| 15.87 | 353 | 299 | 16.39 | 353 | 426 |
| 15.88 | 353 | 301 | 16.40 | 353 | 428 |
| 15.89 | 353 | 304 | 16.41 | 353 | 431 |
| 15.90 | 353 | 306 | 16.42 | 353 | 433 |
| 15.91 | 353 | 309 | 16.43 | 353 | 435 |
| 15.92 | 353 | 311 | 16.44 | 353 | 438 |
| 15.93 | 353 | 314 | 16.45 | 353 | 440 |
| 15.94 | 353 | 316 | 16.46 | 353 | 442 |
| 15.95 | 353 | 319 | 16.47 | 353 | 445 |
| 15.96 | 353 | 321 | 16.48 | 353 | 447 |
| 15.97 | 353 | 324 | 16.49 | 353 | 449 |
| 15.98 | 353 | 326 | 16.50 | 353 | 452 |
| 15.99 | 353 | 329 | 16.51 | 353 | 454 |
| 16.00 | 353 | 331 | 16.52 | 353 | 456 |
| 16.01 | 353 | 334 | 16.53 | 353 | 458 |
| 16.02 | 353 | 336 | 16.54 | 353 | 461 |
| 16.03 | 353 | 339 | 16.55 | 353 | 463 |
| 16.04 | 353 | 341 | 16.56 | 353 | 465 |
| 16.05 | 353 | 344 | 16.57 | 353 | 468 |

**368 CF OF WQV AND
RECHARGE PROVIDED
BELOW LOW FLOW
ORIFICE**



Water Quality Volume Flow Rate Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

Structure Name: WQU-A10

Description: Water Quality Unit

Subcatchment: A2-PR & A10-PR

Total Drainage Area: 37,160 sq ft
0.85 ac

Total Impervious Area: 26,174 sq ft
0.60 ac

**Excludes
Roof Areas*

0.776317341

Runoff Depth to be Treated: 1.0 inches

| | |
|---------------------------------------|--------------------|
| Required Water Quality Volume: | 0.050 ac ft |
| | 2182 cf |

FLOW RATE CONVERSION

$$Q = (qu)(A)(WQV)$$

Where:

Q = flow rate associated with the 1-inch of runoff, in cfs

qu = the unit peak discharge, in csm/in.

A = impervious surface drainage area, in square miles

WQV = water quality volume in watershed inches

Given:

1-acre = 0.0015625 mi²
5 minute = 0.083 hours
qu (1-inch) = **774** csm/in

Calculation:

qu= **774**
A= 0.60 ac
WQV= 1.0 in

| | |
|--|-----------------|
| Required Water Quality Flow Rate: | 0.73 cfs |
|--|-----------------|

**WQU-A10 (STC-900) estimated to provide 80% TSS Removal
Efficiency at this flow rate**

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices



Water Quality Volume Flow Rate Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

Structure Name: WQU-A9

Description: Water Quality Inlet

Subcatchment: A3-PR

Total Drainage Area: 24,201 sq ft
0.56 ac

Total Impervious Area: 20,955 sq ft
0.48 ac

**Excludes
Roof Areas*

0.776317341

Runoff Depth to be Treated: 1.0 inches

| | |
|--------------------------------|-------------|
| Required Water Quality Volume: | 0.040 ac ft |
| | 1747 cf |

FLOW RATE CONVERSION

$$Q = (qu)(A)(WQV)$$

Where:

Q = flow rate associated with the 1-inch of runoff, in cfs

qu = the unit peak discharge, in csm/in.

A = impervious surface drainage area, in square miles

WQV = water quality volume in watershed inches

Given:

1-acre = 0.0015625 mi²

5 minute = 0.083 hours

qu (1-inch) = 774 csm/in

Calculation:

qu= 774

A= 0.48 ac

WQV= 1.0 in

| | |
|-----------------------------------|----------|
| Required Water Quality Flow Rate: | 0.58 cfs |
|-----------------------------------|----------|

**WQU-A9 estimated to provide 50% TSS Removal Efficiency at
this flow rate**

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices



Water Quality Volume Flow Rate Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

Structure Name: Stormwater Chambers (MC-3500)

Description: Chambers

Subcatchment: A10-PR, A2-PR, A3-PR

Total Drainage Area: 80,857 sq ft
1.86 ac

Total Impervious Area: 47,129 sq ft
1.08 ac

**Excludes
Roof Areas*

0.776317341

Runoff Depth to be Treated: 1.0 inches

| | |
|--------------------------------|-------------|
| Required Water Quality Volume: | 0.090 ac ft |
| | 3928 cf |

Water Quality Volume Provided: 7,342 cf in Pond A2-P

Stage-Area-Storage for Pond A2-P: CHAMBERS (continued)

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 16.58 | 3,603 | 5,066 | 17.62 | 3,603 | 7,915 |
| 16.60 | 3,603 | 5,124 | 17.64 | 3,603 | 7,966 |
| 16.62 | 3,603 | 5,181 | 17.66 | 3,603 | 8,017 |
| 16.64 | 3,603 | 5,239 | 17.68 | 3,603 | 8,068 |
| 16.66 | 3,603 | 5,296 | 17.70 | 3,603 | 8,118 |
| 16.68 | 3,603 | 5,353 | 17.72 | 3,603 | 8,169 |
| 16.70 | 3,603 | 5,410 | 17.74 | 3,603 | 8,219 |
| 16.72 | 3,603 | 5,467 | 17.76 | 3,603 | 8,269 |
| 16.74 | 3,603 | 5,524 | 17.78 | 3,603 | 8,319 |
| 16.76 | 3,603 | 5,581 | 17.80 | 3,603 | 8,369 |
| 16.78 | 3,603 | 5,638 | 17.82 | 3,603 | 8,418 |
| 16.80 | 3,603 | 5,694 | 17.84 | 3,603 | 8,467 |
| 16.82 | 3,603 | 5,751 | 17.86 | 3,603 | 8,516 |
| 16.84 | 3,603 | 5,807 | 17.88 | 3,603 | 8,565 |
| 16.86 | 3,603 | 5,864 | 17.90 | 3,603 | 8,614 |
| 16.88 | 3,603 | 5,920 | 17.92 | 3,603 | 8,662 |
| 16.90 | 3,603 | 5,976 | 17.94 | 3,603 | 8,711 |
| 16.92 | 3,603 | 6,032 | 17.96 | 3,603 | 8,759 |
| 16.94 | 3,603 | 6,088 | 17.98 | 3,603 | 8,806 |
| 16.96 | 3,603 | 6,144 | 18.00 | 3,603 | 8,854 |
| 16.98 | 3,603 | 6,200 | 18.02 | 3,603 | 8,901 |
| 17.00 | 3,603 | 6,255 | 18.04 | 3,603 | 8,949 |
| 17.02 | 3,603 | 6,311 | 18.06 | 3,603 | 8,995 |
| 17.04 | 3,603 | 6,366 | 18.08 | 3,603 | 9,042 |
| 17.06 | 3,603 | 6,421 | 18.10 | 3,603 | 9,088 |
| 17.08 | 3,603 | 6,477 | 18.12 | 3,603 | 9,134 |
| 17.10 | 3,603 | 6,532 | 18.14 | 3,603 | 9,180 |
| 17.12 | 3,603 | 6,586 | 18.16 | 3,603 | 9,226 |
| 17.14 | 3,603 | 6,641 | 18.18 | 3,603 | 9,271 |
| 17.16 | 3,603 | 6,696 | 18.20 | 3,603 | 9,316 |
| 17.18 | 3,603 | 6,750 | 18.22 | 3,603 | 9,361 |
| 17.20 | 3,603 | 6,805 | 18.24 | 3,603 | 9,406 |
| 17.22 | 3,603 | 6,859 | 18.26 | 3,603 | 9,450 |
| 17.24 | 3,603 | 6,913 | 18.28 | 3,603 | 9,494 |
| 17.26 | 3,603 | 6,967 | 18.30 | 3,603 | 9,537 |
| 17.28 | 3,603 | 7,021 | 18.32 | 3,603 | 9,581 |
| 17.30 | 3,603 | 7,075 | 18.34 | 3,603 | 9,623 |
| 17.32 | 3,603 | 7,128 | 18.36 | 3,603 | 9,666 |
| 17.34 | 3,603 | 7,182 | 18.38 | 3,603 | 9,708 |
| 17.36 | 3,603 | 7,235 | 18.40 | 3,603 | 9,750 |
| 17.38 | 3,603 | 7,288 | 18.42 | 3,603 | 9,791 |
| 17.40 | 3,603 | 7,342 | 18.44 | 3,603 | 9,832 |
| 17.42 | 3,603 | 7,394 | 18.46 | 3,603 | 9,873 |
| 17.44 | 3,603 | 7,447 | 18.48 | 3,603 | 9,913 |
| 17.46 | 3,603 | 7,500 | 18.50 | 3,603 | 9,953 |
| 17.48 | 3,603 | 7,552 | 18.52 | 3,603 | 9,992 |
| 17.50 | 3,603 | 7,604 | 18.54 | 3,603 | 10,031 |
| 17.52 | 3,603 | 7,657 | 18.56 | 3,603 | 10,068 |
| 17.54 | 3,603 | 7,709 | 18.58 | 3,603 | 10,106 |
| 17.56 | 3,603 | 7,760 | 18.60 | 3,603 | 10,142 |
| 17.58 | 3,603 | 7,812 | 18.62 | 3,603 | 10,178 |
| 17.60 | 3,603 | 7,863 | 18.64 | 3,603 | 10,213 |

7,342 CF OF WQV AND RECHARGE
PROVIDED BELOW LOW FLOW ORIFICE



Water Quality Volume Flow Rate Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

Structure Name: WQU-B1

Description: Water Quality Unit

Subcatchment: A7-PR

Total Drainage Area: 14,737 sq ft
0.34 ac

Total Impervious Area: 3,344 sq ft
0.08 ac

**Excludes
Roof Areas*

0.776317341

Runoff Depth to be Treated: 1.0 inches

| | |
|---------------------------------------|--------------------|
| Required Water Quality Volume: | 0.006 ac ft |
| | 279 cf |

FLOW RATE CONVERSION

$$Q = (qu)(A)(WQV)$$

Where:

Q = flow rate associated with the 1-inch of runoff, in cfs

qu = the unit peak discharge, in csm/in.

A = impervious surface drainage area, in square miles

WQV = water quality volume in watershed inches

Given:

1-acre = 0.0015625 mi²

5 minute = 0.083 hours

qu (1-inch) = **774** csm/in

Calculation:

qu= **774**

A= 0.08 ac

WQV= 1.0 in

| | |
|--|-----------------|
| Required Water Quality Flow Rate: | 0.09 cfs |
|--|-----------------|

WQU-B1 will provide 80% TSS Removal Efficiency for flows up to 0.40 cfs

* Flow rate conversion based on the Massachusetts Department of Environmental Protection Wetlands Program - Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices



Groundwater Recharge Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

OVERALL SITE RECHARGE

Existing Conditions Impervious Area

| Hydraulic Soil Group | Area | | Recharge Depth (in) | Volume (cu ft) |
|-------------------------|---------------|-------------|------------------------|-------------------|
| | (sq ft) | (acres) | | |
| A | 61,132 | 1.40 | 0.60 | 3,057 |
| B | 0 | 0.00 | 0.35 | 0 |
| C | 0 | 0.00 | 0.25 | 0 |
| D | 0 | 0.00 | 0.10 | 0 |
| TOTAL | 61,132 | 1.40 | | 3,057 |

Proposed Conditions Impervious Area

| Hydraulic Soil Group | Area | | Recharge Depth (in) | Volume (cu ft) |
|-------------------------|---------------|-------------|------------------------|-------------------|
| | (sq ft) | (acres) | | |
| A | 83,041 | 1.91 | 0.60 | 4,152 |
| B | 0 | 0.00 | 0.35 | 0 |
| C | 0 | 0.00 | 0.25 | 0 |
| D | 0 | 0.00 | 0.10 | 0 |
| TOTAL | 83,041 | 1.91 | | 4,152 |

Net Required
Recharge Volume: 1,095 cu ft

Capture Area Adjustment

* Impervious Area to Recharge Facility: 1.70 ac
Total Site Impervious Area: 1.91 ac
** Impervious Ratio: 1.12

* (includes portions of the pavement and the entire roof)

** (Total Site Impervious / Impervious Area to Recharge Facility)

Adjusted Required
Recharge Volume: 1,228 cu ft

Provided Recharge Volume

| | | | |
|----------------|--------------|-----------|---------------------------|
| Subcatchment 1 | 7,342 | cf | Stormtech Chambers (A2-P) |
| Subcatchment 2 | 368 | cf | Stormtech Chambers (A3-P) |
| TOTAL | 7,710 | cf | |

Total Provided
Recharge Volume: 7,710 cu ft



Groundwater Recharge Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

Stormwater BMP: Subcatchment A2-PR, A10-PR, A3-PR, A6-PR & A8-PR

Description: Stormtech Chambers (A2-P)

Provided Recharge Volume

Bottom of Stone: 14.50 ft
Low Flow Outlet Elevation: 17.40 ft
*** Recharge Provided: 7342 cu ft *** (See attached HydroCAD output)

**Total Provided
Recharge Volume: 7,342 cu ft**

72-hour Drawdown Calculation

Provided Recharge Volume: 7,342 cu ft
Saturated Hydraulic Conductivity: 8.27 in / hr (Rawls Rate for HSG C was used)
Bottom Area: 3,603 sq ft

Drawdown Time: 3.0 hours



Groundwater Recharge Calculations

Project Name: Wharf Street Redevelopment
Project Location: 44 Wharf Street, Weymouth, MA
Project Number: 193-187

Date: 9/4/2020
Calculated By: DWP
Checked By: KPS

Stormwater BMP: Subcatchment A12-PR

Description: Stormtech Chambers (A3-P)

Provided Recharge Volume

Bottom of Stone: 14.50 ft
Low Flow Outlet Elevation: 16.15 ft
*** Recharge Provided: 368 cu ft *** (See attached HydroCAD output)

**Total Provided
Recharge Volume: 368 cu ft**

72-hour Drawdown Calculation

Provided Recharge Volume: 368 cu ft
Saturated Hydraulic Conductivity: 8.27 in / hr (Rawls Rate for HSG C was used)
Bottom Area: 353 sq ft

Drawdown Time: 1.5 hours



Project: The Overlook, 44 Wharf Street, Weymouth, MA
 Prepared by: TWR
 Checked by: KPS

Date: 9/4/2020
 Job #: 193-187

Buoyancy Calculation - Stormcapture Drainage Holding Tanks

Problem: Determine if additional ballast is needed to keep the structure in place during seasonal high groundwater elevations

ASSUMPTIONS:

1. The storage tank is empty
2. The storage tank has 2 feet of cover soil
3. The specific weight of water, $\gamma_w = 62.4 \text{ lb/ft}^3$
4. The specific weight of cover soil, $\gamma_s = 100 \text{ lb/ft}^3$
5. The specific weight of concrete, $\gamma_c = 150 \text{ lb/ft}^3$
6. The seasonal high groundwater elevation is 12.50 feet

STRUCTURE DIMENSIONS

| | | | |
|---------------------------|-------|----|----------------------|
| Slab thickness 1 | 0.60 | ft | top slab |
| Slab thickness 2 | 0.58 | ft | bottom slab |
| Wall thickness | 0.50 | ft | sidewalls |
| Structure length | 16.00 | ft | outside length |
| Structure height (inside) | 6.00 | ft | inside height |
| Structure width | 8.00 | ft | outside width |
| Cover Depth | 2.00 | ft | Cover above top slab |

Step 1: Determine the weight of the cover soil above the structure

| | | | |
|------------------------|--|-----------|------------------|
| Input: | Volume of Cover Soil (V_s) | 256 | ft^3 |
| | Unit weight of cover soil (γ_s) | 100 | lb/ft^3 |
| $W_s = V_s * \gamma_s$ | = | 25,600 lb | |
| $W_s =$ | 25600 lb | | |

Step 2: Determine the weight of the structure

| | | | |
|------------------------|--|-----------|------------------|
| Input: | Volume of Concrete (V_c) | 290 | ft^3 |
| | Unit weight of concrete (γ_c) | 150 | lb/ft^3 |
| $W_t = V_c * \gamma_c$ | = | 43,500 lb | |
| $W_s =$ | 43500 lb | | |

Step 3: Determine the outside volume of the structure

| | | | |
|-------------------------|-------------------------------|-------------------|----|
| Input: | Length of Structure (L_s) | 16.00 | ft |
| | Width of Structure (w_s) | 8.00 | ft |
| | Height of Structure (h_s) | 7.19 | ft |
| $V_t = L_s * w_s * h_s$ | = | 920 ft^3 | |
| $V_t =$ | 920 ft^3 | | |

Step 4: Determine the buoyant force (resulting from the displaced water volume of the structure)

| | | | |
|------------------------|-------------------------------------|-----------|------------------|
| Input: | Volume of Structure (V_t) | 920 | ft^3 |
| | Unit weight of water (γ_w) | 62.4 | lb/ft^3 |
| $F_b = V_t * \gamma_w$ | = | 57,408 lb | |
| $F_b =$ | 57408 lb | | |

Step 5: Determine if additional ballast is required

| | | |
|--------------------------------|--------|----|
| Weight of Cover Soil (W_s) | 25,600 | lb |
| Weight of Structure (W_t) | 43,500 | lb |
| Buoyant Force (F_b) | 57,408 | lb |

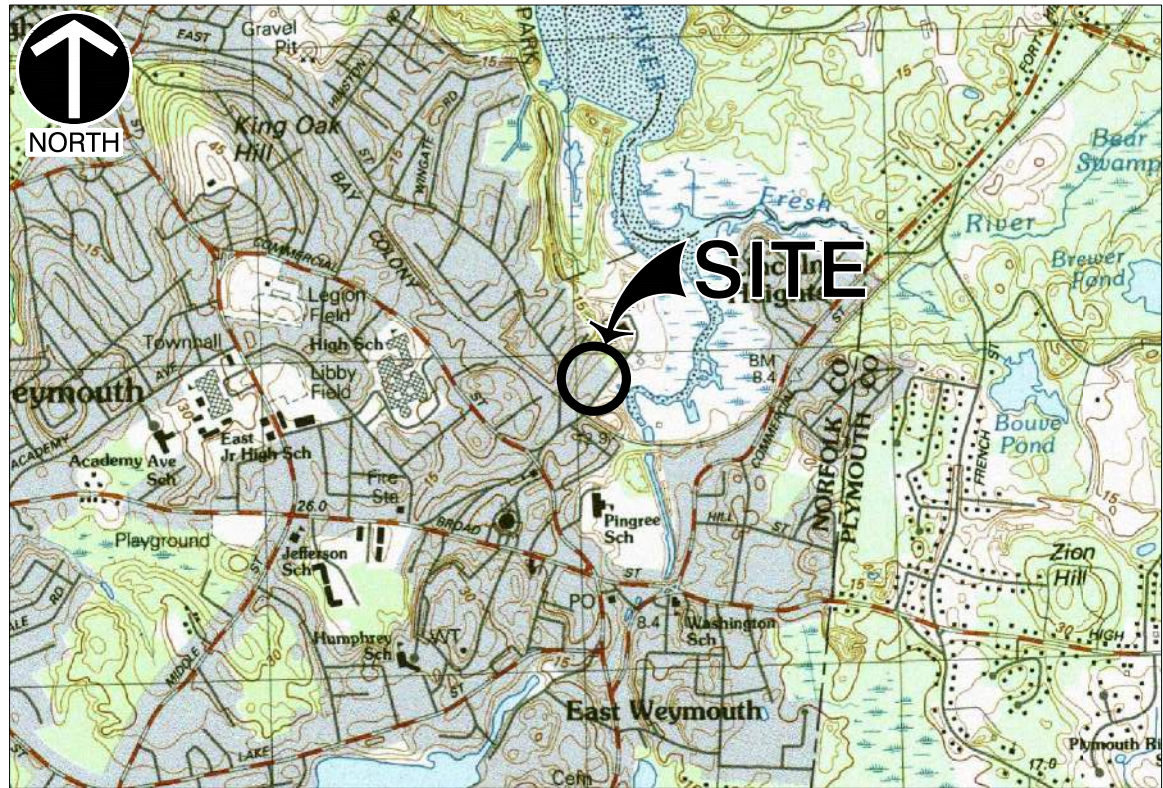
$$W_s + W_t > F_b$$

$$69,100 > 57,408 \quad \text{GOOD}$$

1.20 Factor of Safety

CONCLUSION:

THE WEIGHT OF THE TANK AND COVER SOIL IS ADEQUATE TO KEEP THE TANK IN PLACE DURING HIGH GROUNDWATER ELEVATIONS.



VICINITY MAP
SCALE: 1"=2000'

THE OVERLOOK

MULTI-FAMILY REDEVELOPMENT

44 WHARF STREET, WEYMOUTH, MASSACHUSETTS, 02189

LOCAL PERMITTING

JULY 2020

| DRAWING INDEX | | |
|-------------------------|----------------|-------------------------------------|
| SHEET NUMBER | DRAWING NUMBER | SHEET TITLE |
| CIVIL ENGINEERING PLANS | | |
| 1 | C000 | COVER SHEET |
| 2 | C001 | GENERAL NOTES |
| 3 | C100 | DEMOLITION AND EROSION CONTROL PLAN |
| 4 | C200 | LAYOUT AND MATERIALS PLAN |
| 5 | C300 | GRADING AND DRAINAGE PLAN |
| 6 | C500 | UTILITIES PLAN |
| 7 | C800 | DETAIL SHEET 1 |
| 8 | C801 | DETAIL SHEET 2 |
| 9 | C802 | DETAIL SHEET 3 |
| 10 | C803 | DETAIL SHEET 4 |
| 11 | C804 | DETAIL SHEET 5 |
| 12 | C805 | DETAIL SHEET 6 |
| LAND SURVEY PLANS | | |
| 1 | 1 | BOUNDARY AND TOPOGRAPHIC SURVEY |
| 2 | 2 | BOUNDARY AND TOPOGRAPHIC SURVEY |
| 3 | 3 | BOUNDARY AND TOPOGRAPHIC SURVEY |
| LANDSCAPE PLANS | | |
| 1 | L100 | SITE PLANTING PLAN |
| 2 | L200 | PLANT SCHEDULE AND PLANTING DETAILS |



SITE MAP
SCALE: 1"=200'

REFERENCE: ORTHOGRAPHIC AERIAL IMAGERY AND MAPS ARE BASED ON GIS DATA OBTAINED FROM MASSGIS PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES.

OWNER/TEAM INFORMATION

CIVIL ENGINEER
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
31 BELLOWS ROAD
RAYNHAM, MA 02767
PH: (774) 501-2176
CONTACT: KARLIS SKULTE

APPLICANT
HERITAGE COMPANIES
70 QUINCY AVENUE
QUINCY, MA 02189
PH: (617) 221-1033
CONTACT: MICHAEL KILEY

TRANSPORTATION ENGINEER
MCMAHON ASSOCIATES, INC.
350 MYLES STANDISH BLVD #103
TAUNTON, MA 02780
PH: (508) 823-2245

OWNER
FRANCER MANUFACTURING & SUPPLY CORPORATION
44 WHARF STREET
WEYMOUTH, MA 02189

ARCHITECT
BKA ARCHITECTS
142 CRESCENT STREET
BROCKTON, MA 02302
PH: (508) 583-5603

LANDSCAPE ARCHITECT
HAWK DESIGN
39 PLEASANT ST.
SAGAMORE, MA 02561
PH: (508) 833-8800

LAND SURVEYOR
CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
PH: (508) 948-3000

SITE DATA

ADDRESS: 44 WHARF STREET
WEYMOUTH, MA 02189
PARCEL I.D.: 19-172-25
TOTAL AREA: ±153,276 SF
ZONING DISTRICT: I-2 (GENERAL INDUSTRIAL)
HISTORIC MILL OVERLAY DISTRICT (HM0D)

APPROVAL BLOCK

| | |
|-----------|------|
| SIGNATURE | DATE |
| SIGNATURE | DATE |
| SIGNATURE | DATE |
| SIGNATURE | DATE |
| SIGNATURE | DATE |

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 Dig Safe Systems, Inc.
1-888-DIG-SAFE
(1-888-344-7233)



| SUBMITTAL & REVISION RECORD | | |
|-----------------------------|-----------|--|
| NO | DATE | DESCRIPTION |
| 1 | 7/21/2020 | SUBMISSION FOR PLANNING, ZONING & CONSERVATION COMMISSION REVIEW |
| 2 | 8/4/2020 | REVISIONS PER TOWN COMMENTS |
| | | |
| | | |
| | | |
| | | |


Civil & Environmental Consultants, Inc.
31 Bellows Road • Raynham, MA 02767
Ph: 774.501.2176 • 866.312.2024 • Fax: 774.501.2669
www.ccecinc.com

HERITAGE COMPANIES
THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS

DRAWN BY: DWP CHECKED BY: KPS APPROVED BY: DRAFT
DATE: JULY 21, 2020 DWG SCALE: AS SHOWN PROJECT NO: 193-187

COVER SHEET

DRAWING NO.:
C000
SHEET 1 OF 12

GENERAL NOTES

1. EXISTING CONDITIONS AS DEPICTED ON THESE PLANS ARE GENERAL AND ILLUSTRATIVE IN NATURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE SITE AND BE FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING ON THIS PROJECT. IF CONDITIONS ENCOUNTERED DURING EXAMINATION ARE SIGNIFICANTLY DIFFERENT FROM THOSE SHOWN, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND TOWN OF WEYMOUTH IMMEDIATELY.
2. TOPOGRAPHIC AND BOUNDARY SURVEY WAS PERFORMED BY CONTROL POINT ASSOCIATES, INC. IN APRIL 2020 AND IS DEPICTED ON AN EXISTING CONDITIONS PLAN PREPARED BY CONTROL POINT ASSOCIATES, INC. DATED MAY 11, 2020. CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.
3. WETLANDS DELINEATION LINE WAS PLACED IN THE FIELD BY LUCAS ENVIRONMENTAL, LLC IN APRIL 2020 AND FIELD LOCATED BY CONTROL POINT ASSOCIATES, INC.
4. THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES (INCLUDING THOSE LABELED PER RECORD DATA) PRIOR TO THE BEGINNING OF CONSTRUCTION OR EARTH MOVING OPERATIONS. INFORM ENGINEER AND TOWN OF WEYMOUTH OF ANY CONFLICTS DETRIMENTAL TO THE DESIGN INTENT.
5. THE CONTRACTOR SHALL CALL DISSAFE AT 1-888-344-7233 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DISSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER AND ENGINEER PRIOR TO EXCAVATION.
6. THE CONTRACTOR AND SUBCONTRACTORS SHALL BE RESPONSIBLE FOR COMPLYING WITH APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS, TOGETHER WITH EXERCISING PRECAUTIONS AT ALL TIMES FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTORS TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.
7. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER AND OWNER'S REPRESENTATIVE FOR ANY AND ALL INJURIES AND/OR DAMAGES TO PERSONNEL, EQUIPMENT AND/OR EXISTING FACILITIES OCCURRING IN THE COURSE OF THE DEMOLITION AND CONSTRUCTION DESCRIBED IN THE PLANS AND SPECIFICATIONS.
8. CONTRACTOR SHALL OBTAIN A PERMIT FOR ALL CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH LOCAL, STATE, & FEDERAL REGULATIONS.
9. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL CODES, OBTAIN ALL APPLICABLE PERMITS, AND PAY ALL REQUIRED FEES PRIOR TO BEGINNING WORK.
10. ANY WORK PERFORMED IN RIGHT OF WAYS SHALL BE IN ACCORDANCE WITH THE APPLICABLE LOCAL OR STATE REQUIREMENTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE NECESSARY PERMITS FOR THE WORK, SCHEDULE NECESSARY INSPECTIONS, AND PROVIDE THE NECESSARY TRAFFIC CONTROL MEASURES AND DEVICES, ETC., FOR WORK PERFORMED IN THE RIGHT OF WAYS.
11. THE CONTRACTOR IS TO PERFORM ALL INSPECTIONS AS REQUIRED BY THE UNITED STATES EPA FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND FURNISH OWNERS REPRESENTATIVE WITH WRITTEN REPORTS.
12. CONTRACTOR SHALL IMPLEMENT ALL SOIL AND EROSION CONTROL PRACTICES IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN, STORM WATER POLLUTION PREVENTION PLAN AND STATE AND LOCAL REGULATIONS.
13. ALL GROUND SURFACE AREAS THAT HAVE BEEN EXPOSED OR LEFT BARE AS A RESULT OF CONSTRUCTION AND ARE TO FINAL GRADE AND ARE TO REMAIN SO, SHALL BE SEEDED AND MULCHED AS SOON AS PRACTICAL IN ACCORDANCE WITH SPECIFICATIONS. IF NO SPECIFICATIONS ARE SUPPLIED, USE STATE OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
14. ALL CONSTRUCTION WORK SHALL BE DONE ACCORDING TO THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND APPLICABLE STANDARDS OF THE TOWN OF WEYMOUTH. WHEN IN CONFLICT, THE TOWN OF WEYMOUTH REQUIREMENTS SHALL PREVAIL.
15. ALL WORK PERFORMED BY THE CONTRACTOR SHALL CONFORM TO THE LATEST REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT.
16. THE CONTRACTOR SHALL REFER TO OTHER PLANS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION. IT IS NOT THE ENGINEER'S INTENT THAT ANY SINGLE PLAN SHEET IN THIS SET OF DOCUMENTS FULLY DEPICTS ALL WORK ASSOCIATED WITH THE PROJECT.
17. BEFORE INSTALLATION OF STORM OR SANITARY SEWER, OR OTHER UTILITY, THE CONTRACTOR SHALL VERIFY ALL CROSSINGS, BY EXCAVATION WHERE NECESSARY, AND INFORM THE OWNER AND THE ENGINEER OF ANY CONFLICTS. THE ENGINEER WILL BE HELD HARMLESS IN THE EVENT HE IS NOT NOTIFIED OF DESIGN CONFLICTS PRIOR TO CONSTRUCTION.
18. ADJUST/RECONSTRUCT ALL EXISTING CASTINGS, CLEANOUTS, ETC. WITHIN PROJECT AREA TO GRADE AS REQUIRED.
19. CONTRACTOR TO REMOVE & REPLACE PAVEMENT AS SPECIFIED.
20. ALL STANDARD PARKING SPACES ARE 9' BY 18'.
21. SITE SIGNAGE AND STRIPING SHALL BE IN ACCORDANCE WITH THE MASSACHUSETTS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

DEMOLITION NOTES

1. ALL EXISTING ABOVE AND BELOW GROUND STRUCTURES WITHIN THE LIMITS OF CONSTRUCTION SHALL BE REMOVED UNLESS NOTED OTHERWISE WITHIN THIS CONSTRUCTION SET AND/OR PROJECT SPECIFICATIONS. THIS INCLUDES FOUNDATION SLABS, WALLS AND FOOTINGS. CAVITIES LEFT BY STRUCTURE REMOVAL SHALL BE BACKFILLED WITH SATISFACTORY MATERIALS AND COMPACTED TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATION.
2. NO TREES SHALL BE REMOVED, NOR VEGETATION DISTURBED BEYOND THE LIMITS OF CONSTRUCTION WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
3. TREE PROTECTION FENCING SHALL BE IN ACCORDANCE WITH THE DETAILED DRAWINGS. DO NOT OPERATE OR STORE EQUIPMENT, NOR HANDLE OR STORE MATERIALS WITHIN THE DRIP LINES OF THE TREES SHOWN TO REMAIN.
4. PROTECTION OF EXISTING TREES AND VEGETATION: PROTECT EXISTING TREES AND OTHER VEGETATION INDICATED TO REMAIN IN PLACE AGAINST UNNECESSARY CUTTING, BREAKING OR SKINNING OF ROOTS, SKINNING OR BRUISING OF BARK, SMOTHERING OF TREES BY STOCKPILING CONSTRUCTION MATERIALS OR EXCAVATED MATERIALS WITHIN DRIP LINE, EXCESS FOOT OR VEHICULAR TRAFFIC, OR PARKING OF VEHICLES WITHIN DRIP LINE. PROVIDE TEMPORARY GUARDS TO PROTECT TREES AND VEGETATION TO BE LEFT STANDING.
5. ALL DEMOLITION WASTE AND CONSTRUCTION DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE DESIGNATED AND SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE IN A STATE APPROVED WASTE SITE AND IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. REPAIR DAMAGE ACCORDING TO THE APPROPRIATE UTILITY COMPANY STANDARDS AND AT THE CONTRACTOR'S EXPENSE.
6. ALL UTILITY DISCONNECTION, REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY / AGENCY.
7. THE BURNING OF CLEARED MATERIAL AND DEBRIS SHALL NOT BE ALLOWED UNLESS CONTRACTOR OBTAINS PRIOR WRITTEN AUTHORIZATION FROM THE LOCAL AUTHORITIES.
8. EROSION & SEDIMENT CONTROL MEASURES AROUND AREAS OF DEMOLITION SHALL BE PROPERLY INSTALLED AND FUNCTION PROPERLY PRIOR TO INITIATION OF DEMOLITION ACTIVITIES.
9. IF ASBESTOS OR HAZARDOUS MATERIALS ARE FOUND ON SITE, SUCH MATERIALS SHALL BE REMOVED BY A LICENSED HAZARDOUS MATERIALS CONTRACTOR. CONTRACTOR SHALL NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED.
10. CONTRACTOR SHALL ADHERE TO ALL LOCAL, STATE, FEDERAL AND OSHA REGULATIONS DURING ALL DEMOLITION ACTIVITIES.
11. CONTRACTOR SHALL PROTECT ALL CORNER PINS, MONUMENTS, PROPERTY CORNERS AND BENCHMARKS DURING DEMOLITION ACTIVITIES. IF DISTURBED, CONTRACTOR SHALL HAVE DISTURBED ITEMS RESET BY A LICENSED SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.
12. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND FEATURES TO REMAIN. ANY ITEMS TO REMAIN THAT HAVE BEEN DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.
13. CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND AS REQUIRED BY LOCAL AGENCIES WHEN WORKING IN AND/OR ALONG STREETS, ROADS, HIGHWAYS, ETC.. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL AND COORDINATE WITH LOCAL AND/OR STATE AGENCIES REGARDING THE NEED, EXTENT AND LIMITATIONS ASSOCIATED WITH INSTALLING AND MAINTAINING TRAFFIC CONTROL MEASURES.
14. PROVIDE NEAT, STRAIGHT, FULL DEPTH, SAW CUTS OF EXISTING PAVEMENT WHERE INDICATED ALONG LIMITS OF PAVEMENT DEMOLITION.

15. ALL UTILITY AND STRUCTURE REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED AND PROPERLY DOCUMENTED BY A CERTIFIED PROFESSIONAL, WHEN APPLICABLE, WITH THE APPROPRIATE UTILITY COMPANY, MUNICIPALITY AND/OR AGENCY. DEMOLITION OF REGULATED ITEMS MAY INCLUDE, BUT ARE NOT LIMITED TO: WELLS, ASBESTOS, UNDER GROUND STORAGE TANKS, SEPTIC TANKS AND ELECTRIC TRANSFORMERS. DEMOLITION CONTRACTOR SHALL REFER TO ANY ENVIRONMENTAL STUDIES FOR DEMOLITION RECOMMENDATIONS AND GUIDANCE. AVAILABLE ENVIRONMENTAL STUDIES MAY INCLUDE, BUT ARE NOT LIMITED TO PHASE I ESA, PHASE II, WETLAND AND STREAM DELINEATION AND ASBESTOS SURVEY. ALL APPLICABLE ENVIRONMENTAL STUDIES SHALL BE MADE AVAILABLE UPON REQUEST.
16. ALL PAVEMENT, BASE COURSES, SIDEWALKS, CURBS, BUILDINGS, FOUNDATIONS, ETC., WITHIN THE AREA TO BE DEMOLISHED SHALL BE REMOVED TO FULL DEPTH. EXISTING BASE COURSE MATERIALS MAY BE WORKED INTO THE NEW PAVEMENT OR BUILDING SUBGRADE IF THE GRADATION, CONSISTENCY, COMPACTION, SUBGRADE CONDITION, ETC., ARE IN ACCORDANCE WITH THE SPECIFICATIONS AND RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION REPORT. BASE COURSE MATERIALS SHALL NOT BE WORKED INTO THE SUBGRADE AREAS TO RECEIVE LANDSCAPING.
17. THE CONTRACTOR SHALL USE SUITABLE METHODS TO CONTROL DUST AND DIRT CAUSED BY THE DEMOLITION ACTIVITIES.

LAYOUT NOTES

1. THE CONTRACTOR SHALL CHECK EXISTING GRADES, DIMENSIONS, AND INVERTS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.
2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES, INCLUDING IRRIGATION LINES, AND SHALL TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. THE CONTRACTOR SHALL RELOCATE EXISTING UTILITIES AS INDICATED OR AS NECESSARY FOR CONSTRUCTION.
3. THE CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY. THE CONTRACTOR SHALL INSTALL ALL UTILITIES, INCLUDING IRRIGATION SLEEVING, PRIOR TO THE INSTALLATION OF PAVED SURFACES.
4. THE CONTRACTOR SHALL PROTECT ALL TREES TO REMAIN.
5. ALL DAMAGE TO EXISTING PAVEMENT TO REMAIN WHICH RESULTS FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED WITH EQUIVALENT MATERIALS AT THE CONTRACTOR'S EXPENSE.
6. SITE DIMENSIONS SHOWN ARE TO THE FACE OF CURB OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
7. COORDINATES ARE FOR BUILDING COLUMNS, EXTERIOR BUILDING WALLS, CENTER OF DRIVEWAYS, CENTER OF SANITARY SEWER MANHOLES, AND CENTER OF STRUCTURES PLACED SIX INCHES INSIDE FACE OF CURB FOR DRAIN INLETS, UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL MAINTAIN ONE SET OF AS-BUILT / RECORD DRAWINGS ON-SITE DURING CONSTRUCTION FOR DISTRIBUTION TO THE OWNER AND/OR OWNER'S REPRESENTATIVE UPON COMPLETION.
9. REFER TO THE ARCHITECTURAL, PLUMBING & ELECTRICAL DRAWINGS FOR EXACT DIMENSIONS AND LOCATIONS OF UTILITY SERVICE ENTRY LOCATIONS AND PRECISE BUILDING DIMENSIONS.
10. THIS SITE LAYOUT IS SPECIFIC TO THE APPROVALS NECESSARY FOR THE CONSTRUCTION IN ACCORDANCE WITH THE TOWN OF WEYMOUTH. NO CHANGES TO THE SITE LAYOUT ARE ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. CHANGES MADE TO THE SITE LAYOUT WITHOUT APPROVAL ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. CHANGES INCLUDE BUT ARE NOT LIMITED TO, INCREASED IMPERVIOUS PAVEMENT, ADDITION / DELETION OF PARKING SPACES, MOVEMENT OF CURB LINES, CHANGES TO DRAINAGE STRUCTURES AND PATTERNS, CHANGES TO LANDSCAPING, ETC.

GRADING NOTES

1. ALL PROPOSED GRADES SHOWN ARE FINAL GRADES, TOP OF GROUND LEVEL, TOP OF PAVEMENT, OR GRATE ELEVATION AT THE DRAWDOWN POINT UNLESS NOTED OTHERWISE.
2. REFER TO AND FOLLOW THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED FOR THIS PROJECT.
3. ALL FILL UNDER PAVEMENT SHALL BE COMPACTED TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
4. CONTRACTOR SHALL STRICTLY ADHERE TO THE EROSION & SEDIMENT CONTROL PLAN PREPARED FOR THIS PROJECT.
5. EARTHWORK SHALL INCLUDE CLEARING AND GRUBBING, STRIPPING AND STOCKPILING TOPSOIL, MASS GRADING, EXCAVATION, FILLING, UNDER CUT AND REPLACEMENT, IF REQUIRED, AND COMPACTION.
6. CONTRACTOR TO REFILL UNDERCUT AREAS WITH SUITABLE MATERIAL AND COMPACT AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
7. CONTRACTOR TO PLACE TOPSOIL OVER THE SUBGRADE OF UNPAVED, DISTURBED AREAS TO A DEPTH INDICATED ON THE LANDSCAPE PLANS (6" MINIMUM).
8. PAVEMENT SLOPES ACROSS ACCESSIBLE PARKING STALLS AND ADJOINING ACCESS AISLES SHALL BE MAXIMUM 2% AND SHALL CONFORM TO THE LATEST REGULATIONS OF THE AMERICANS WITH DISABILITIES ACT.
9. ALL SLOPES IN NON-PAVED AREAS SHALL BE 3:1 (HORIZONTAL:VERTICAL) MAXIMUM UNLESS NOTED OTHERWISE.
10. ALL AREAS NOT PAVED SHALL BE STABILIZED IN ACCORDANCE WITH THE EROSION & SEDIMENT CONTROL PLAN, UNLESS NOTED OTHERWISE.
11. COMPACTED FILLS ARE TO BE MADE TO A MINIMUM OF THREE FEET ABOVE THE CROWN OF ANY PROPOSED SEWER PRIOR TO CUTTING OF TRENCHES FOR SAID SEWERS. ALL FILLS SHALL BE CONTROLLED, COMPACTED, AND INSPECTED BY AN APPROVED TESTING LABORATORY OR AN INSPECTOR FROM THE APPROPRIATE GOVERNMENTAL AGENCY.
12. ALL EXCESS SOIL MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE. EXCESS SOIL MATERIALS SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF OFFSITE AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.
13. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING THE SITE EARTHWORK BY IMPORTING OR EXPORTING AS NECESSARY TO ACHIEVE DESIGN GRADES AND SPECIFICATIONS.

STORM DRAINAGE NOTES

1. DISTANCES SHOWN ON PIPING ARE HORIZONTAL DISTANCES FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE, UNLESS NOTED OTHERWISE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE INSTALLATION, INSPECTION, TESTING AND FINAL ACCEPTANCE OF ALL NEW STORMWATER MANAGEMENT FACILITIES. CONTRACTOR SHALL COORDINATE WITH ALL APPLICABLE REGULATING AGENCIES CONCERNING INSTALLATION, INSPECTION AND APPROVAL OF THE STORM DRAINAGE SYSTEM CONSTRUCTION.
3. ALL STORMWATER MANAGEMENT FACILITIES, INCLUDING COLLECTION AND CONVEYANCE STRUCTURES, SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS.
4. ALL PROPOSED STORM SEWERS, SURFACE OR OTHER DRAINAGE FACILITIES WITHIN THE PROPERTY ARE TO BE PRIVATE AND MAINTAINED BY THE OWNER.
5. THE CONTRACTOR IS TO CONSTRUCT CURBS, CATCH BASINS, DOWNSPOUTS, PIPING AND CONNECTION ETC. AS REQUIRED TO CONVEY THE ROOF AND PAVED SURFACE DRAINAGE TO THE INFILTRATION CHAMBERS.
6. ALL CATCH BASINS AND MANHOLES WITH A DEPTH GREATER THAN 4' SHALL BE PROVIDED WITH STEPS. STEPS SHALL MEET THE REQUIREMENTS OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
7. STORM SEWER PIPE LABELED "ST" SHALL BE ONE OF THE FOLLOWING: PVC SDR-35, OR HIGH DENSITY POLYETHYLENE UNLESS NOTED OTHERWISE. STORM SEWER PIPE LABELED "RCP" SHALL BE REINFORCED CONCRETE PIPE. ALL STORM SEWER PIPE IS TO BE INSTALLED PER MASSDOT SPECIFICATIONS, UNLESS OTHERWISE NOTED.
8. STORM SEWER IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL--AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

UTILITY NOTES

1. ALL PROPOSED UTILITY LINES AND EXTENSIONS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE PRIVATE UTILITY COMPANY SPECIFICATIONS. CONTRACTOR SHALL COORDINATE UTILITY DISCONNECTIONS WITH THE APPROPRIATE AGENCY.
2. PROVIDE FIRE DEPARTMENT CONNECTION WITH 30 DEGREE TURN DOWN PER LOCAL FIRE DEPARTMENT REQUIREMENTS. UNDERGROUND PIPING SERVING REMOTE FIRE DEPARTMENT CONNECTION SHALL BE DUCTILE IRON PIPING WITH RUBBER-GASKET PUSH-ON JOINTS. ABOVE GROUND PIPING AT LOCATION OF FIRE DEPARTMENT CONNECTION SHALL BE GALVANIZED, PROVIDE FLANGE ABOVE GRADE AT TRANSITION. PROVIDE CONCRETE THRUST BLOCKING AT ALL CHANGES OF DIRECTION AND MOUNT FIRE DEPARTMENT CONNECTION PIPING IN A 12" X 12" CONCRETE PAD 4" THICK. PROVIDE BALL DRIP VALVE AT BASE OF VERTICAL PIPING SERVING FIRE DEPARTMENT CONNECTION AND SURROUND WITH PEA GRAVEL.
3. THE CONTRACTOR IS PARTICULARLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF THE EXISTING UTILITIES SHOWN HEREON IS BASED ON TOPOGRAPHIC SURVEYS AND RECORD DRAWINGS. THE CONTRACTOR SHALL NOT RELY UPON THIS INFORMATION AS BEING EXACT OR COMPLETE. SHOULD UNCHARTED UTILITIES BE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE FOR INSTRUCTIONS. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION AND REQUEST FIELD VERIFICATION OF UTILITY LOCATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO RELOCATE EXISTING UTILITIES CONFLICTING WITH IMPROVEMENTS SHOWN HEREON IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS.
4. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. MAINTAIN MINIMUM 10-FOOT HORIZONTAL AND 18-INCH MINIMUM VERTICAL SEPARATION BETWEEN SANITARY SEWER, STORM SEWER AND WATER SUPPLY LINE, UNLESS NOTED OTHERWISE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES SO THAT WATER LINES, GAS LINES, AND UNDERGROUND ELECTRIC DO NOT CONFLICT WITH SANITARY SEWERS OR STORM SEWERS. INSTALL UTILITIES PRIOR TO PAVEMENT CONSTRUCTION.
7. ALL TRENCH SPOILS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE. TRENCH SPOILS SHALL BE DISPOSED OF OFFSITE AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS.
8. SANITARY SEWER SHALL BE PVC-SDR 35 PER ASTM D-3034 OR APPROVED EQUAL (CONFORMING TO TOWN OF WEYMOUTH WATER & SEWER DEPARTMENT RULES AND REGULATIONS) INSTALLED AT A MINIMUM SLOPE OF ONE PERCENT (1.00%) UNLESS NOTED OTHERWISE. SANITARY SEWER SERVICE SHALL BE INSTALLED AT A MINIMUM DEPTH OF FOUR FEET (4') UNLESS NOTED OTHERWISE. A MINIMUM OF 18" CLEARANCE SHALL BE MAINTAINED AT ALL WATER LINE & SANITARY SEWER CROSSINGS. SANITARY SEWER SERVICE JOINTS SHALL CONFORM TO ASTM D-3212.
9. SANITARY SEWER IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL--AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.
10. DISTANCES SHOWN FOR BOTH SANITARY AND STORM SEWER PIPES ARE MEASURED FROM CENTER OF STRUCTURE. CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL FIELD CUT LENGTH. COORDINATES FOR STORM & SANITARY STRUCTURES ARE SHOWN TO THE CENTER STRUCTURE UNLESS NOTED OTHERWISE.
11. ROOF DRAINS, FOUNDATION DRAINS AND ALL OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEMS ARE PROHIBITED.
12. CONTRACTOR SHALL ADJUST ALL EXISTING UTILITY SURFACE FEATURES INCLUDING BUT NOT LIMITED TO CASTINGS, VALVE BOXES, PEDESTALS, CLEANOUTS, ETC. TO MATCH PROPOSED FINISHED GRADES, UNLESS NOTED OTHERWISE.
13. THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS OF ALL IMPROVEMENTS. DRAWINGS SHALL INCLUDE AT LEAST TWO DIMENSIONS TO EACH VALVE AND MANHOLE FROM KNOWN SITE FEATURES. DRAWINGS SHALL INCLUDE HORIZONTAL AND VERTICAL INFORMATION ON ALL NEW UTILITIES AS WELL AS EXISTING UTILITIES ENCOUNTERED.
14. ALL WATERLINE CROSSINGS SHALL MAINTAIN A VERTICAL SEPARATION OF 18" MINIMUM. SANITARY SEWER SHALL BE LOCATED 18" BELOW WATERMAIN AT ALL CROSSINGS. WATERMAIN SHALL BE LOCATED A MINIMUM OF 10' HORIZONTALLY FROM ANY SANITARY SEWER OR STORM SEWER. ALL MEASUREMENTS SHALL BE TAKEN FROM OUTSIDE OF SEWER PIPE TO THE OUTSIDE OF WATERMAIN PIPE. ONE FULL LENGTH OF WATERMAIN PIPE SHALL BE LOCATED AT ALL CROSSINGS TO ENABLE BOTH JOINTS TO BE LOCATED AS FAR FROM SEWER AS POSSIBLE.
15. ALL WATER SERVICE PIPE SIZES 3" THRU 12" SHALL BE DUCTILE IRON PIPE CLASS 52 PIPE PER LOCAL JURISDICTION, FROM WATERMAIN THRU METER SETTING(S) INCLUDING THE METER BYPASS.
16. ALL WATER SERVICE PIPE, 2" AND SMALLER, SHALL BE K SOFT COPPER FROM WATERMAIN THRU CURB STOP, OR APPROVED EQUAL.
17. WATERLINE IS TO BE BEDDED WITH CLEAN GRANULAR MATERIAL--AGGREGATES NOT TO BE LARGER THAN 3/4" AND NOT SMALLER THAN NO. 8 SIEVE, AND SHALL BE FREE OF SILT AND FINES. BEDDING TO EXTEND MINIMUM OF 6" BELOW & 12" ABOVE THE PIPE AND AS SHOWN ON THE DETAILS.

APPROVAL BLOCK

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WEYMOUTH, MASSACHUSETTS

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| DRAWN BY: | DWP | CHECKED BY: | KPS | APPROVED BY: | DRAFT |
| DATE: | JULY 21, 2020 | DWG SCALE: | AS SHOWN | PROJECT NO: | 193-187 |

GENERAL NOTES

DRAWING NO.:
C001
SHEET 2 OF 12

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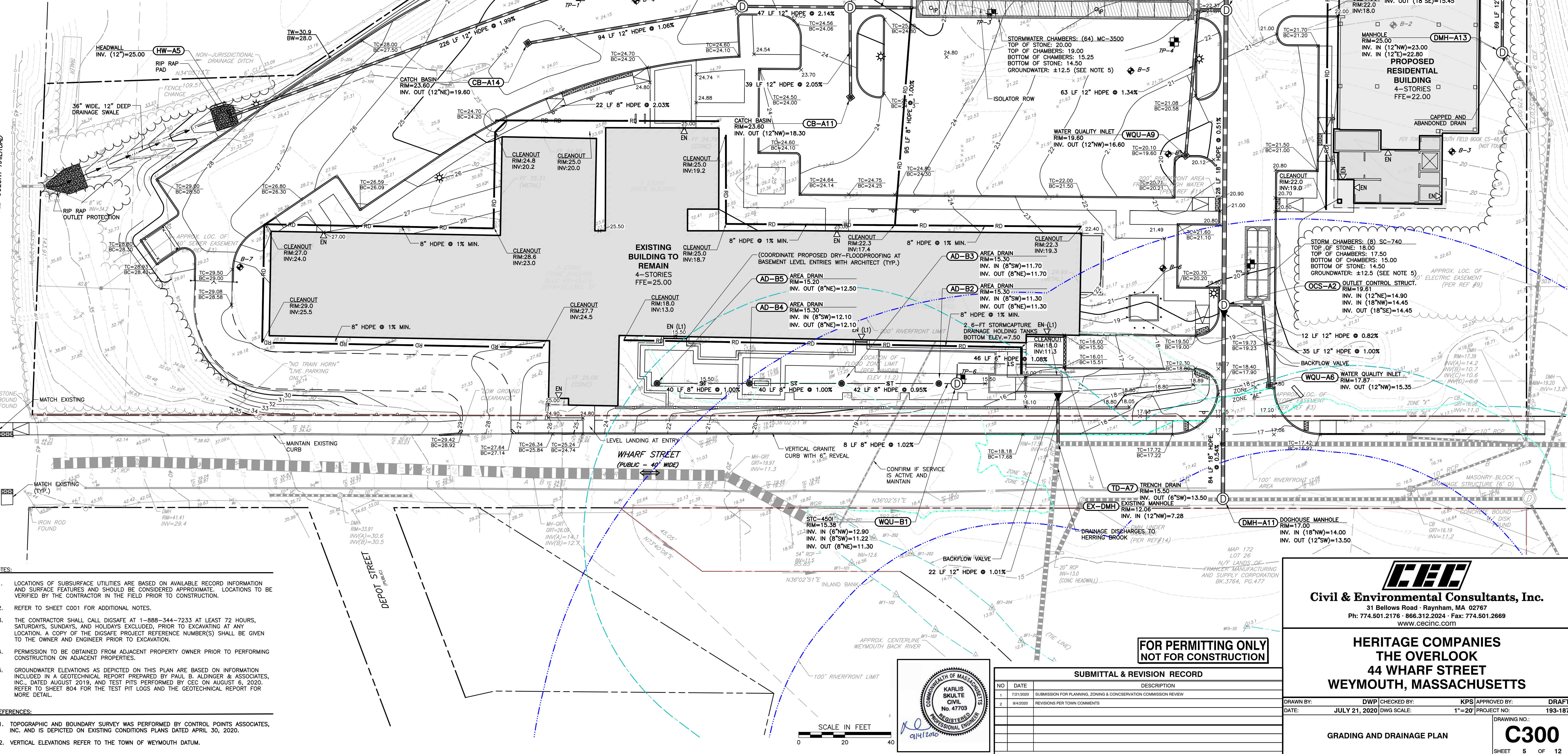
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| NO | DATE | DESCRIPTION |
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| 2 | 8/4/2020 | REVISIONS PER TOWN COMMENTS |
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APPENDIX B
Revised Plans

LEGEND

| | | | |
|--|--|--|---------------------------------------|
| | EXISTING SUBJECT PROPERTY LINE | | PROPOSED GROUND FLOOR BUILDING |
| | EXISTING ADJACENT PROPERTY LINE | | PROPOSED BUILDING OVERHANG |
| | EXISTING EASEMENT | | PROPOSED FENCE |
| | EXISTING RIGHT OF WAY | | PROPOSED TREELINE |
| | EXISTING INDEX (MAJOR) CONTOUR | | PROPOSED INDEX (MAJOR) CONTOUR |
| | EXISTING INTERMEDIATE (MINOR) CONTOUR | | PROPOSED INTERMEDIATE (MINOR) CONTOUR |
| | EXISTING FENCE LINE | | PROPOSED SPOT ELEVATION |
| | EXISTING CURB | | TOP OF WALL ELEVATION |
| | EXISTING EDGE OF PAVED ROAD | | BOTTOM OF WALL ELEVATION |
| | EXISTING EDGE OF UNPAVED ROAD | | TOP OF CURB ELEVATION |
| | EXISTING STRUCTURE | | BOTTOM OF CURB ELEVATION |
| | EXISTING TREE LINE | | PROPOSED STORM PIPE |
| | EXISTING WETLANDS | | PROPOSED YARD DRAIN |
| | EXISTING WETLANDS BUFFER | | PROPOSED CURB INLET |
| | EXISTING ZONE AE FLOOD LIMITS | | PROPOSED CATCH BASIN |
| | EXISTING RIVERFRONT AREA | | PROPOSED STORM MANHOLE |
| | EXISTING WETLANDS FLAG | | PROPOSED ROOF DRAIN |
| | EXISTING NON-JURISDICTIONAL DRAINAGE DITCH | | PROPOSED SWALE |
| | PROPOSED EDGE OF PAVED DRIVE | | |
| | PROPOSED GRAVEL DRIVE | | |
| | PROPOSED ENTRANCE | | |
| | PROPOSED ZONE AE FLOOD LIMITS | | |

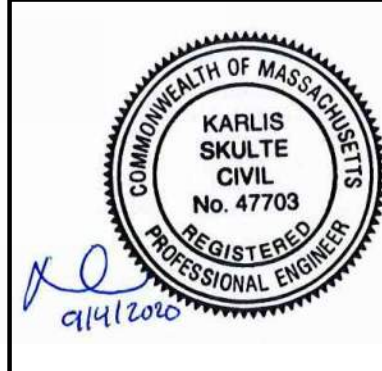


NOTES

- LOCATIONS OF SUBSURFACE UTILITIES ARE BASED ON AVAILABLE RECORD INFORMATION AND SURFACE FEATURES AND SHOULD BE CONSIDERED APPROXIMATE. LOCATIONS TO BE VERIFIED BY THE CONTRACTOR IN THE FIELD PRIOR TO CONSTRUCTION.
- REFER TO SHEET C001 FOR ADDITIONAL NOTES.
- THE CONTRACTOR SHALL CALL DIGSAFE AT 1-888-344-7233 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER AND ENGINEER PRIOR TO EXCAVATION.
- PERMISSION TO BE OBTAINED FROM ADJACENT PROPERTY OWNER PRIOR TO PERFORMING CONSTRUCTION ON ADJACENT PROPERTIES.
- GROUNDWATER ELEVATIONS AS DEPICTED ON THIS PLAN ARE BASED ON INFORMATION INCLUDED IN A GEOTECHNICAL REPORT PREPARED BY PAUL B. ALDINGER & ASSOCIATES, INC., DATED AUGUST 2019, AND TEST PITS PERFORMED BY CEC ON AUGUST 6, 2020. REFER TO SHEET 804 FOR THE TEST PIT LOGS AND THE GEOTECHNICAL REPORT FOR MORE DETAIL.

REFERENCES

- TOPOGRAPHIC AND BOUNDARY SURVEY WAS PERFORMED BY CONTROL POINTS ASSOCIATES, INC. AND IS DEPICTED ON EXISTING CONDITIONS PLANS DATED APRIL 30, 2020.
- VERTICAL ELEVATIONS REFER TO THE TOWN OF WEYMOUTH DATUM.



| SUBMITTAL & REVISION RECORD | | |
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| 2 | 9/4/2020 | REVISIONS PER TOWN COMMENTS |

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THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS**

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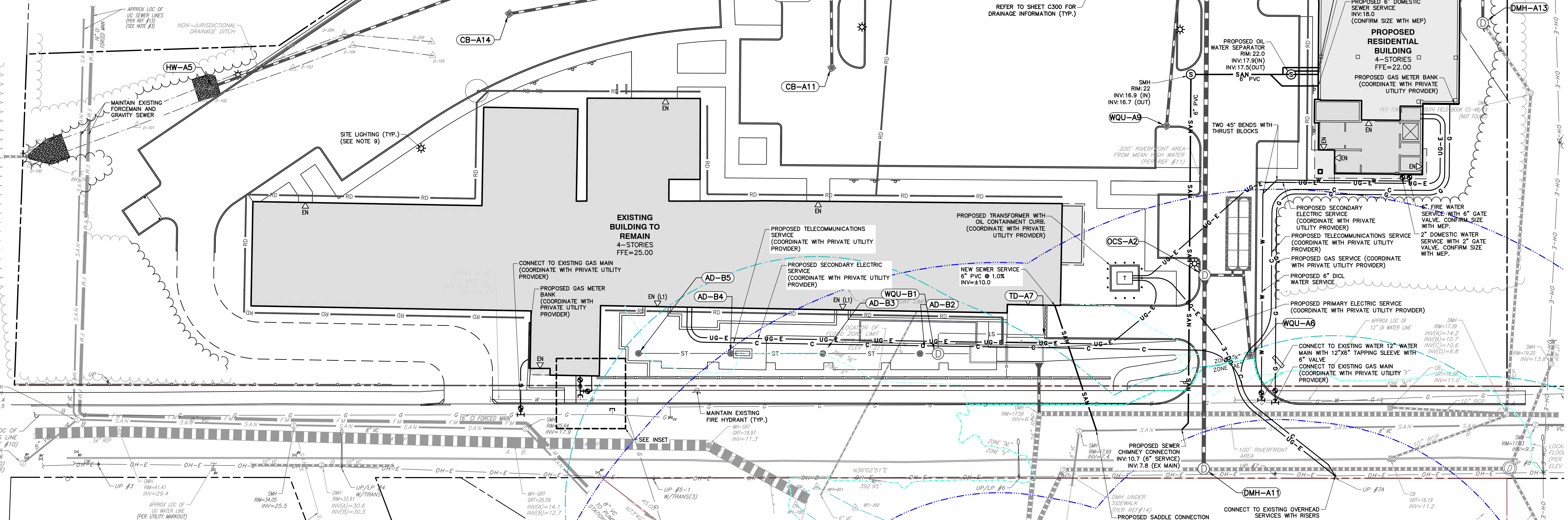
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DATE: JULY 21, 2020 DWG SCALE: 1"=20' PROJECT NO: 193-187

GRADING AND DRAINAGE PLAN

DRAWING NO: **C300**
SHEET 5 OF 12

LEGEND

| | | | |
|-----|--|---|-------------------------------|
| --- | EXISTING SUBJECT PROPERTY LINE | ⊙ | PROPOSED SANITARY MANHOLE |
| --- | EXISTING ADJACENT PROPERTY LINE | ⊙ | PROPOSED SANITARY CLEANOUT |
| --- | EXISTING EASEMENT | ⊙ | PROPOSED LIGHT POLE |
| --- | EXISTING RIGHT OF WAY | ⊙ | PROPOSED SANITARY SEWER |
| --- | EXISTING FENCE LINE | ⊙ | PROPOSED WATER LINE |
| --- | EXISTING CURB | ⊙ | PROPOSED UNDERGROUND ELECTRIC |
| --- | EXISTING EDGE OF PAVED ROAD | ⊙ | PROPOSED GAS LINE |
| --- | EXISTING EDGE OF UNPAVED ROAD | ⊙ | PROPOSED COMMUNICATION LINES |
| --- | EXISTING STRUCTURE | ⊙ | PROPOSED STORM PIPE |
| --- | EXISTING STORM PIPE | ⊙ | PROPOSED YARD DRAIN |
| --- | EXISTING WATER LINE | ⊙ | PROPOSED CURB INLET |
| --- | EXISTING SANITARY SEWER LINE | ⊙ | PROPOSED CATCH BASIN |
| --- | EXISTING SANITARY SEWER FORCEMAIN | ⊙ | PROPOSED STORM MANHOLE |
| --- | EXISTING GAS LINE | ⊙ | PROPOSED ROOF DRAIN |
| --- | EXISTING OVERHEAD WIRE | ⊙ | PROPOSED ZONE AE FLOOD LIMITS |
| --- | EXISTING WETLANDS BUFFER | ⊙ | |
| --- | EXISTING ZONE AE FLOOD LIMITS | ⊙ | |
| --- | EXISTING RIVERFRONT AREA | ⊙ | |
| --- | EXISTING WETLANDS FLAG | ⊙ | |
| --- | EXISTING NON-JURISDICTIONAL DRAINAGE DITCH | ⊙ | |
| --- | EXISTING CATCH BASIN GRATE | ⊙ | |
| --- | EXISTING MANHOLE GRATE | ⊙ | |
| --- | EXISTING SANITARY MANHOLE | ⊙ | |

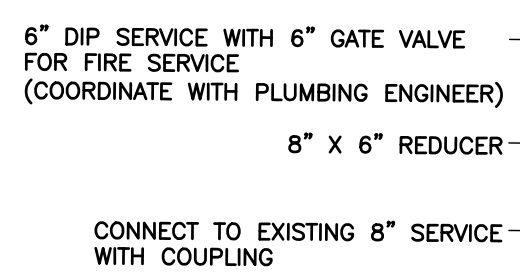


NOTES

- LOCATION OF SUBSURFACE UTILITIES IS BASED ON AVAILABLE RECORD INFORMATION AND SURFACE FEATURES AND SHOULD BE CONSIDERED APPROXIMATE. LOCATIONS TO BE VERIFIED BY THE CONTRACTOR IN THE FIELD PRIOR TO CONSTRUCTION.
- THE SANITARY SEWER AND STORM DRAIN SYSTEMS SHALL BE FLUSHED PRIOR TO FINAL ACCEPTANCE.
- REFER TO SHEET C001 FOR ADDITIONAL NOTES.
- THE CONTRACTOR SHALL CALL DIGSAFE AT 1-888-344-7233 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER AND ENGINEER PRIOR TO EXCAVATION.
- SIZES AND LOCATIONS OF PROPOSED UTILITY SERVICES ARE PRELIMINARY ONLY AND SHALL BE COORDINATED WITH MEP ENGINEER PRIOR TO FINAL DESIGN.
- REFER TO SHEET C300 FOR SIZES, MATERIALS, RIMS AND INVERTS OF STORM DRAIN.
- ALL FIRE HYDRANTS SHALL BE PER TOWN OF WEYMOUTH FIRE DEPARTMENT SPECIFICATIONS.
- ALL BENDS AND TEE CONNECTIONS SHALL HAVE THRUST BLOCKS INSTALLED.
- SITE LIGHTING IS PRELIMINARY AND IS SHOWN FOR REFERENCE. FINAL LOCATIONS, FIXTURES, HEIGHTS AND APPURTENANCES TO BE COORDINATED WITH SITE LIGHTING CONSULTANT.

REFERENCES

- TOPOGRAPHIC AND BOUNDARY SURVEY WAS PERFORMED BY CONTROL POINTS ASSOCIATES, INC. AND IS DEPICTED ON EXISTING CONDITIONS PLANS DATED APRIL 30, 2020.
- VERTICAL ELEVATIONS REFER TO THE TOWN OF WEYMOUTH DATUM.
- WETLANDS DELINEATION LINE WAS PLACED BY IN THE FIELD BY LUCAS ENVIRONMENTAL, LLC. AND FIELD LOCATED BY CONTROL POINT ASSOCIATES.



INSET 1

SCALE: 1"=10'



SCALE IN FEET
0 20 40

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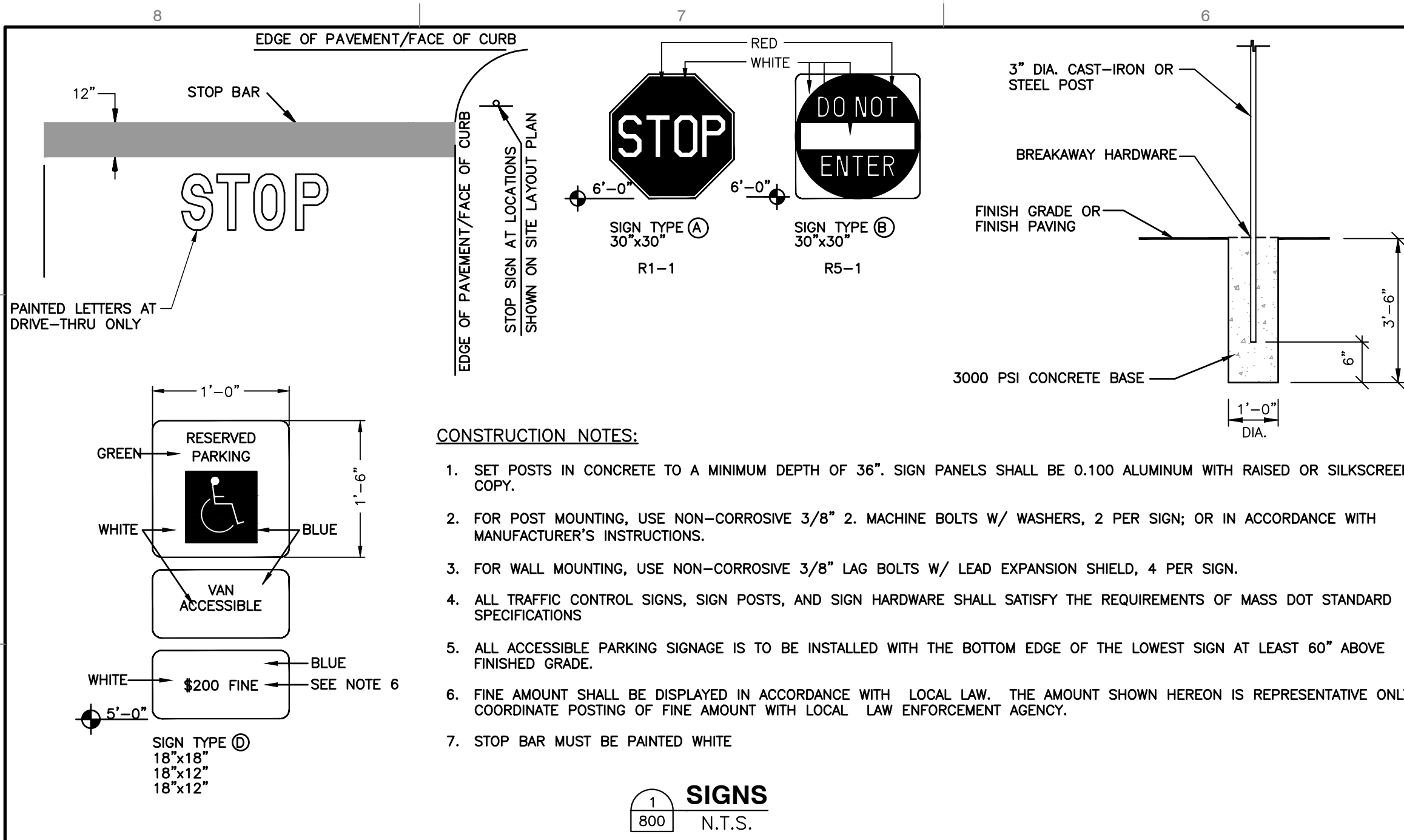
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DATE: **JULY 21, 2020** DWG SCALE: **1"=20'** PROJECT NO: **193-187**

UTILITIES PLAN

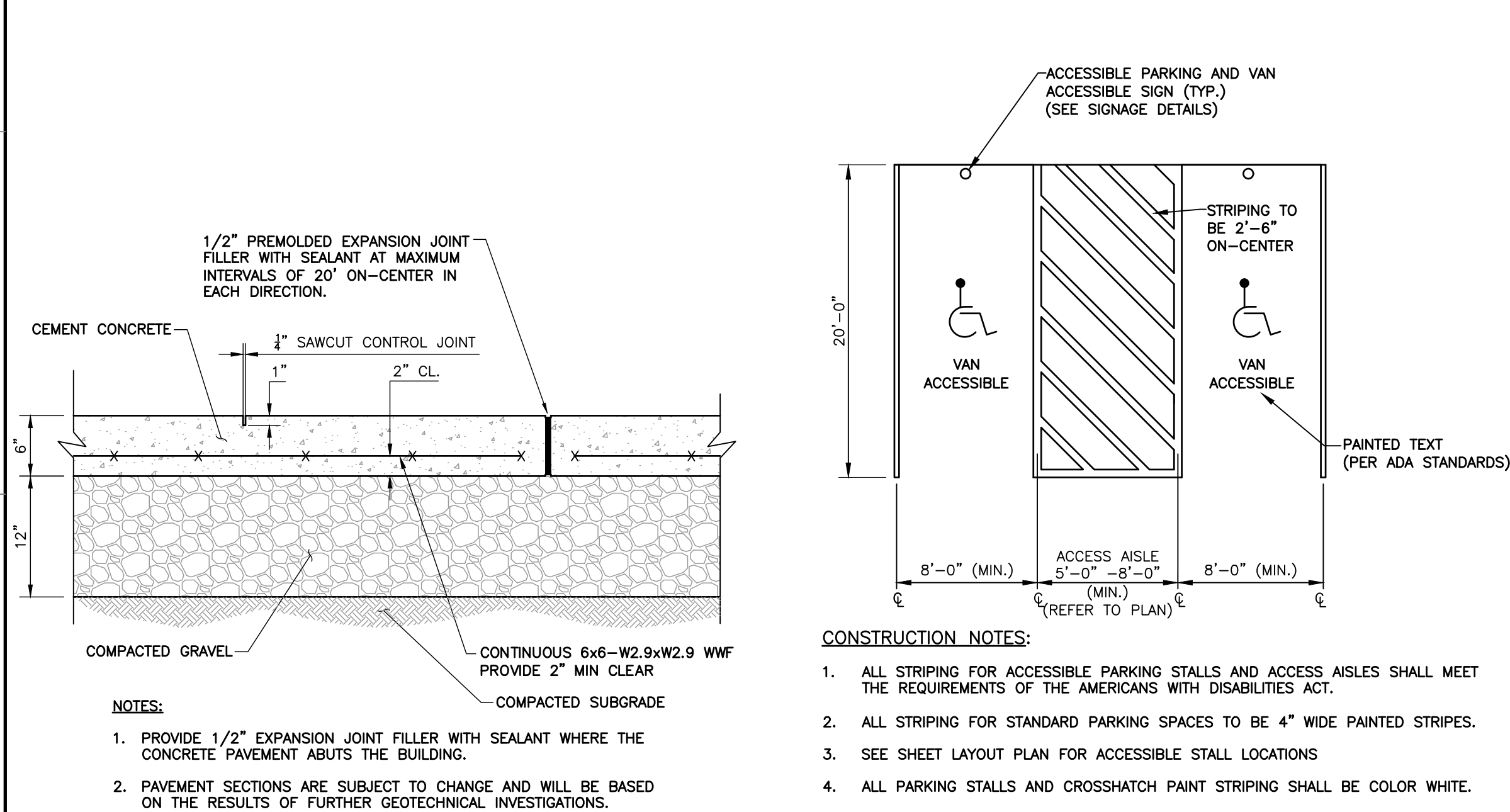
C500
SHEET 6 OF 12



CONSTRUCTION NOTES:

1. SET POSTS IN CONCRETE TO A MINIMUM DEPTH OF 36". SIGN PANELS SHALL BE 0.100 ALUMINUM WITH RAISED OR SILKSCREEN COPY.
2. FOR POST MOUNTING, USE NON-CORROSIVE 3/8" 2. MACHINE BOLTS W/ WASHERS, 2 PER SIGN; OR IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3. FOR WALL MOUNTING, USE NON-CORROSIVE 3/8" LAG BOLTS W/ LEAD EXPANSION SHIELD, 4 PER SIGN.
4. ALL TRAFFIC CONTROL SIGNS, SIGN POSTS, AND SIGN HARDWARE SHALL SATISFY THE REQUIREMENTS OF MASS DOT STANDARD SPECIFICATIONS
5. ALL ACCESSIBLE PARKING SIGNAGE IS TO BE INSTALLED WITH THE BOTTOM EDGE OF THE LOWEST SIGN AT LEAST 60" ABOVE FINISHED GRADE.
6. FINE AMOUNT SHALL BE DISPLAYED IN ACCORDANCE WITH LOCAL LAW. THE AMOUNT SHOWN HEREON IS REPRESENTATIVE ONLY. COORDINATE POSTING OF FINE AMOUNT WITH LOCAL LAW ENFORCEMENT AGENCY.
7. STOP BAR MUST BE PAINTED WHITE

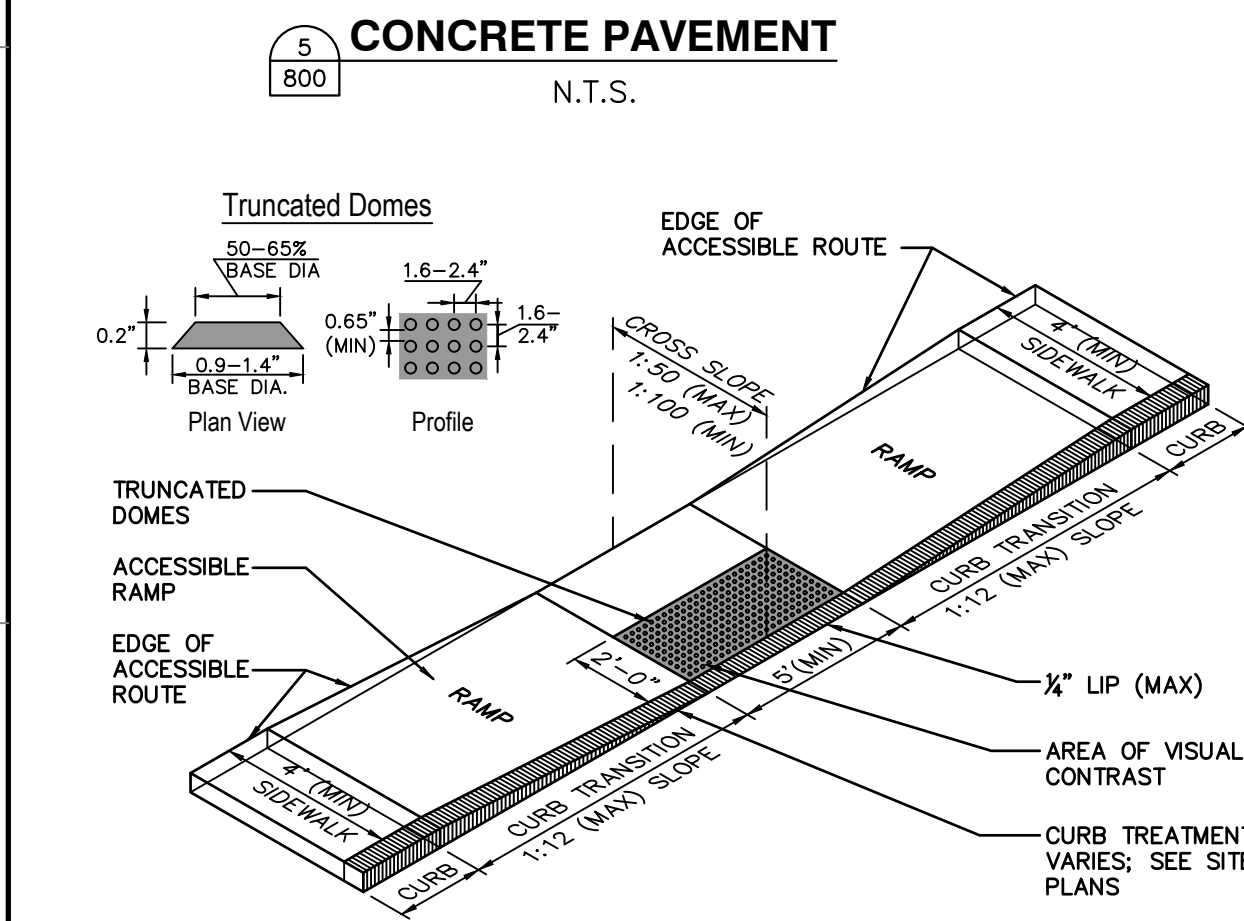
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CONSTRUCTION NOTES:

1. ALL STRIPING FOR ACCESSIBLE PARKING STALLS AND ACCESS AISLES SHALL MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT.
2. ALL STRIPING FOR STANDARD PARKING SPACES TO BE 4" WIDE PAINTED STRIPES.
3. SEE SHEET LAYOUT PLAN FOR ACCESSIBLE STALL LOCATIONS
4. ALL PARKING STALLS AND CROSSHATCH PAINT STRIPING SHALL BE COLOR WHITE.
5. ACCESS ISLE MUST BE 5'-0" (MIN.) FOR NON-VAN ACCESSIBLE STALLS

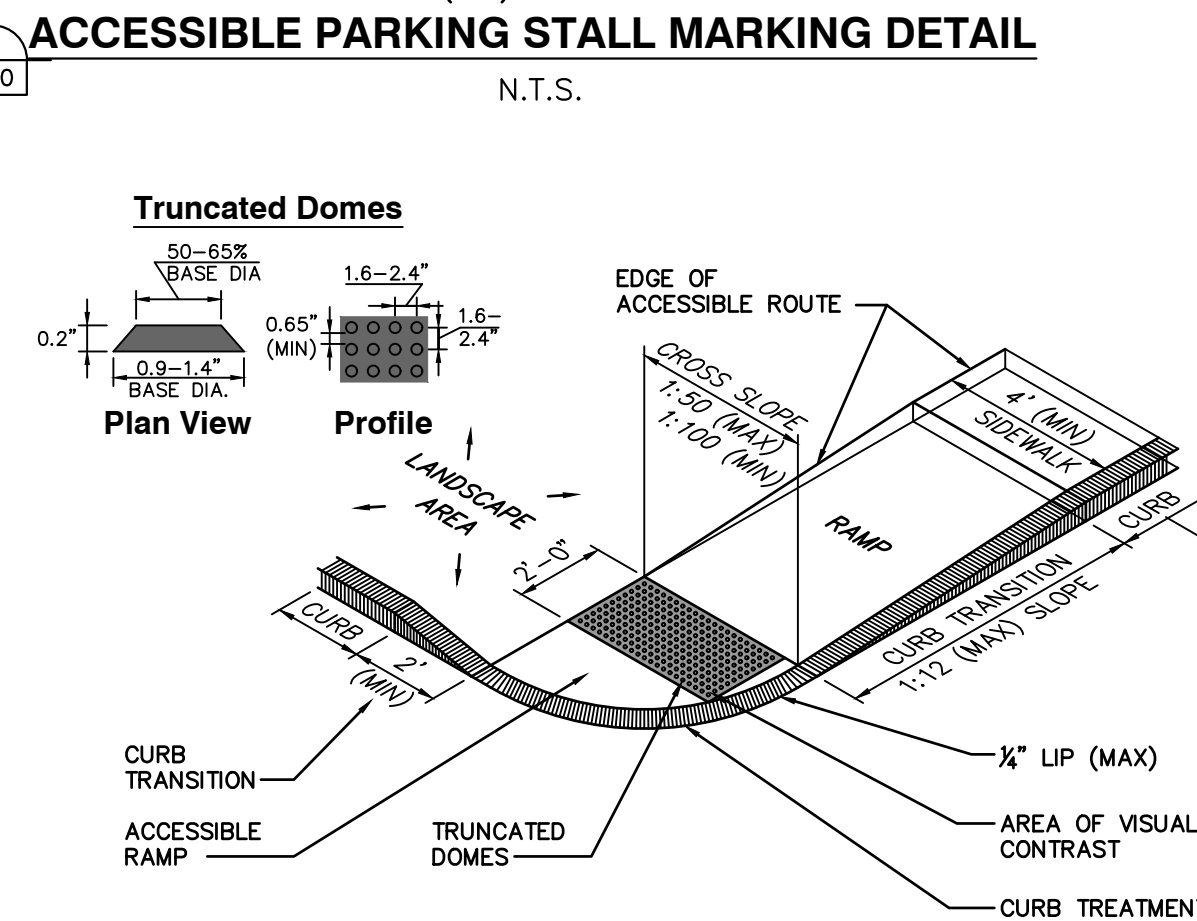
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NOTES:

1. PROVIDE 1/2" EXPANSION JOINT FILLER WITH SEALANT WHERE THE CONCRETE PAVEMENT ABUTS THE BUILDING.
2. PAVEMENT SECTIONS ARE SUBJECT TO CHANGE AND WILL BE BASED ON THE RESULTS OF FURTHER GEOTECHNICAL INVESTIGATIONS.

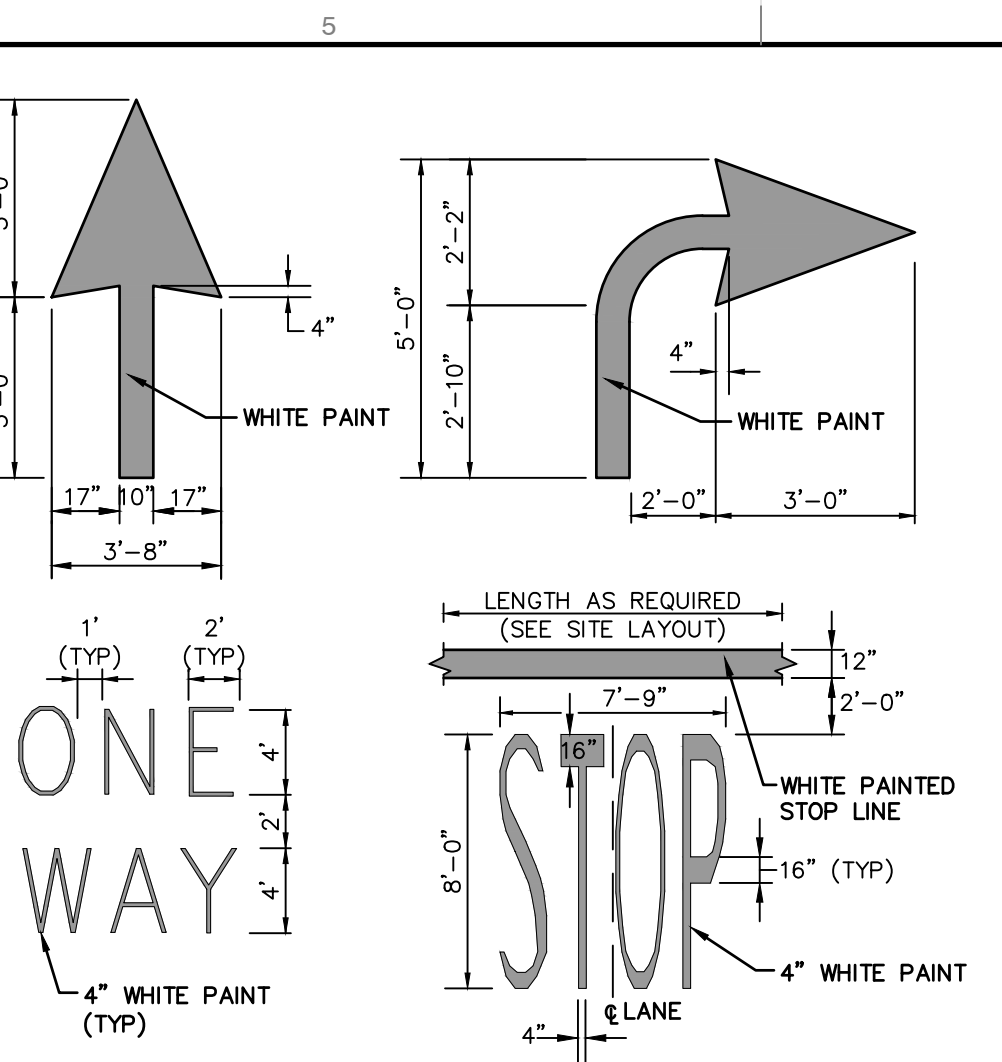
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CONSTRUCTION NOTES:

1. CURB RAMPS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS FOR ACCESSIBLE DESIGN AND THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) RULES AND REGULATIONS (521 CMR).
2. THE RUNNING SLOPE OF CURB RAMPS SHALL NOT BE GREATER THAN 1:12. THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE GREATER THAN 1:20. THE CROSS SLOPE OF CURB RAMPS AND WALKING SURFACES SHALL NOT BE GREATER THAN 1:50 OR LESS THAN 1:100.
3. LANDINGS SHALL BE PROVIDED AT THE TOPS OF CURB RAMPS. THE LANDING CLEAR LENGTH SHALL BE 36 INCHES (3 FEET) MINIMUM. THE LANDING CLEAR WIDTH SHALL BE AT LEAST AS WIDE AS THE CURB RAMP, EXCLUDING FLARED SIDES, LEADING TO THE LANDING.
4. COUNTER SLOPES OF ADJOINING SURFACES IMMEDIATELY ADJACENT TO THE CURB RAMP SHALL NOT BE STEEPER THAN 1:20.
5. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES AND BE INSTALLED PERPENDICULAR TO THE ACCESSIBLE ROUTE.

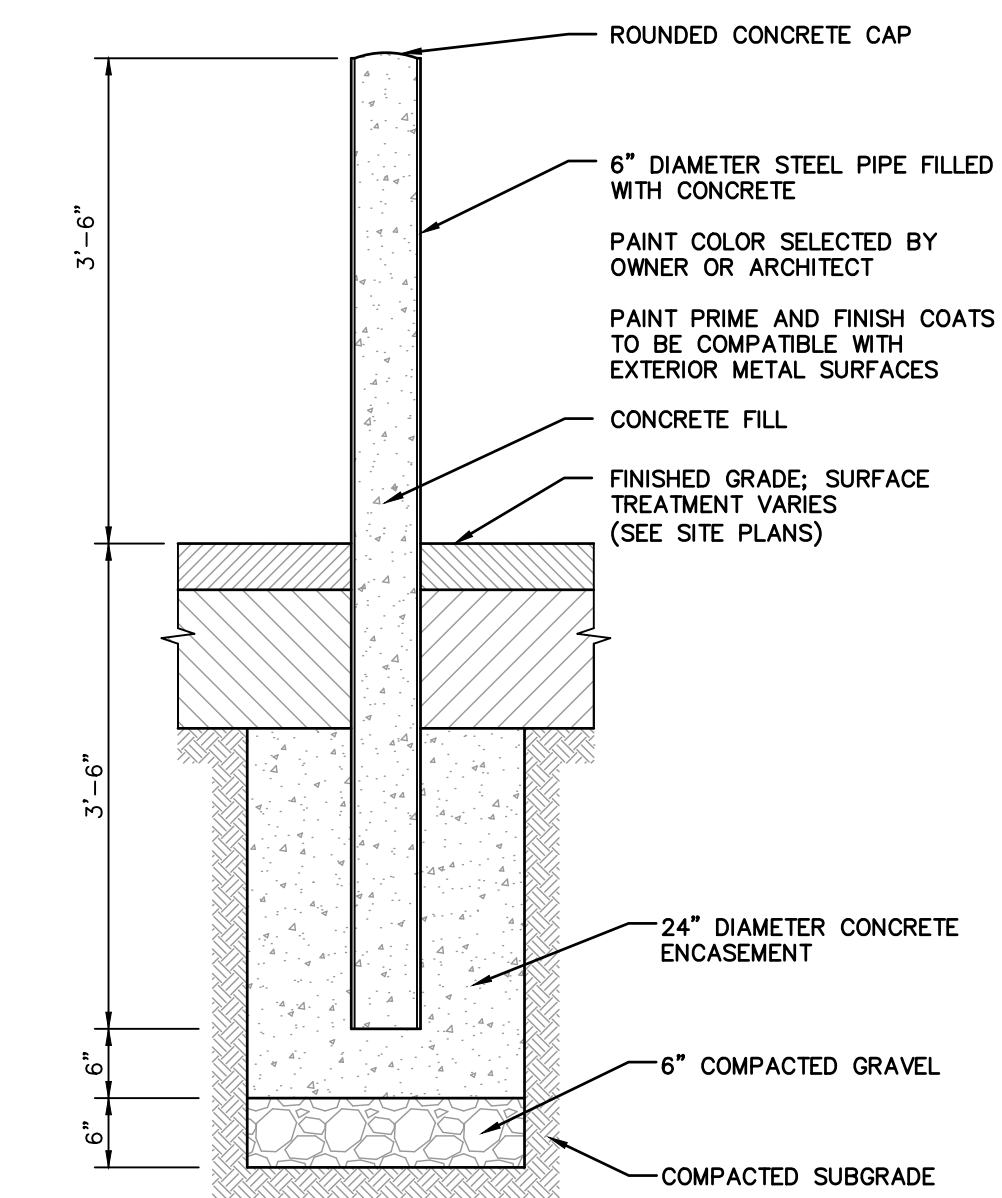
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CONSTRUCTION NOTES:

1. PAVEMENT MARKINGS TO BE INSTALLED FOR ON-SITE WORK IN THE LOCATIONS SHOWN ON THE LAYOUT AND MATERIALS PLAN.

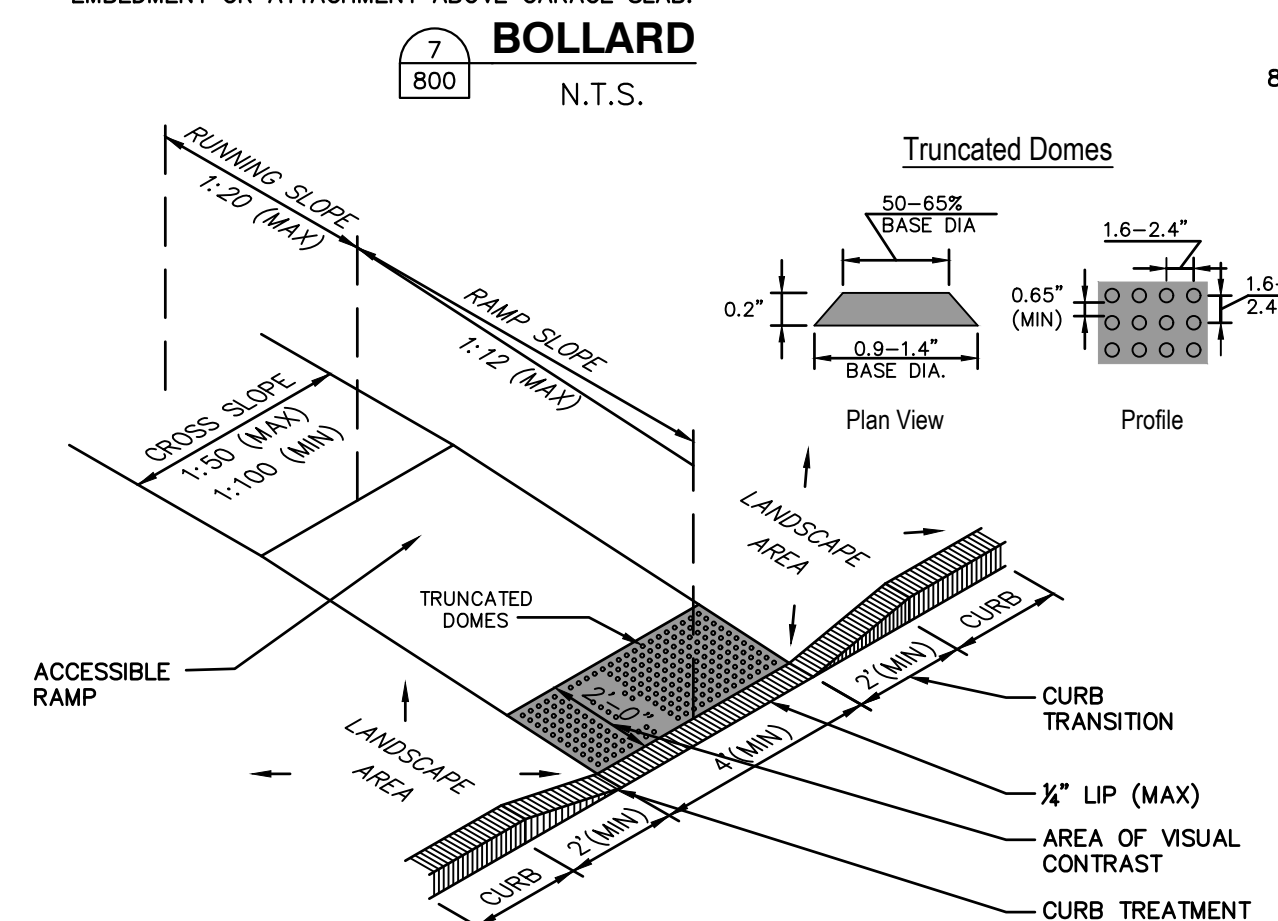
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NOTES:

REFER TO STRUCTURAL PLANS FOR MODIFICATIONS TO BOLLARD EMBEDMENT OR ATTACHMENT ABOVE GARAGE SLAB.

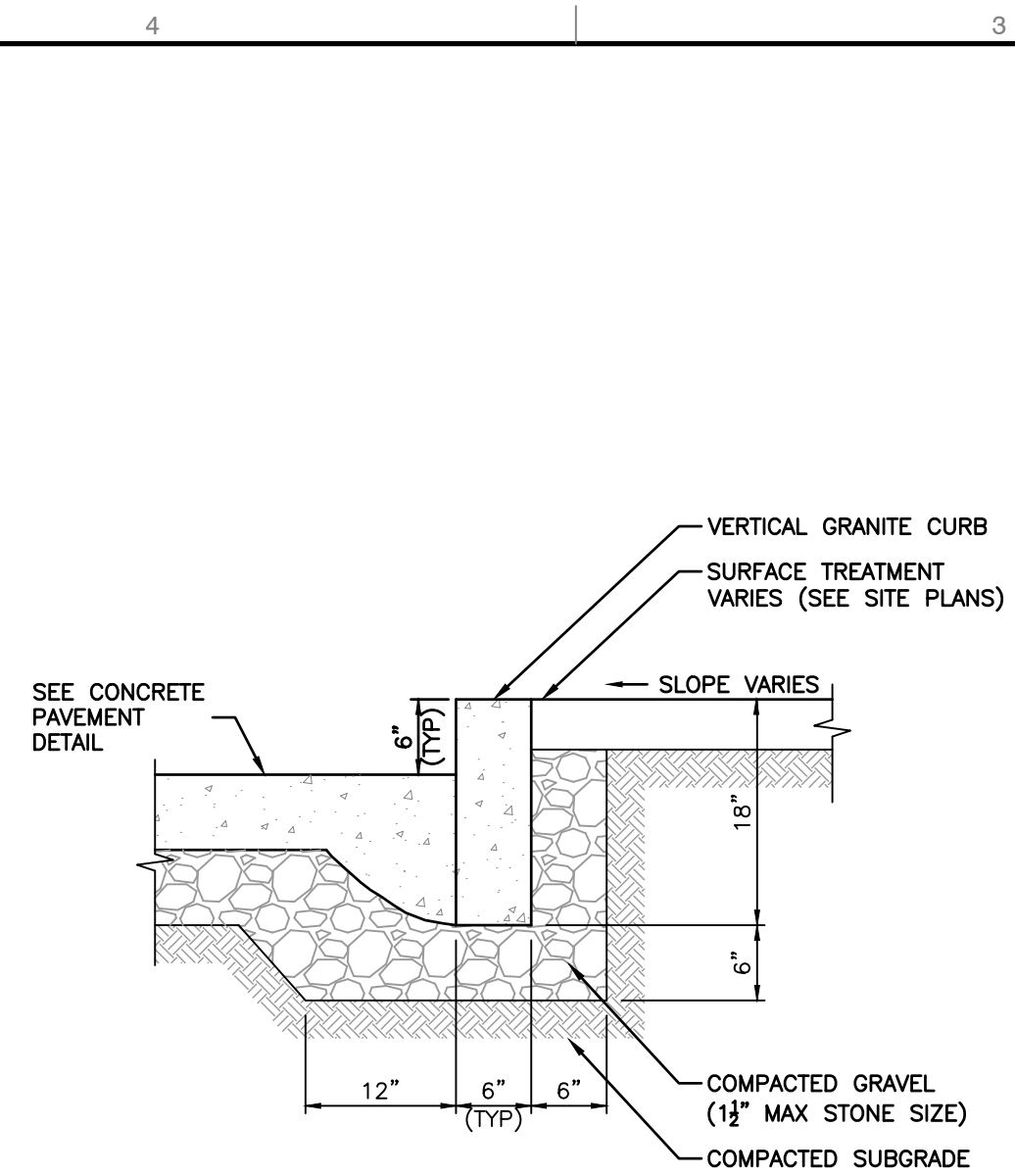
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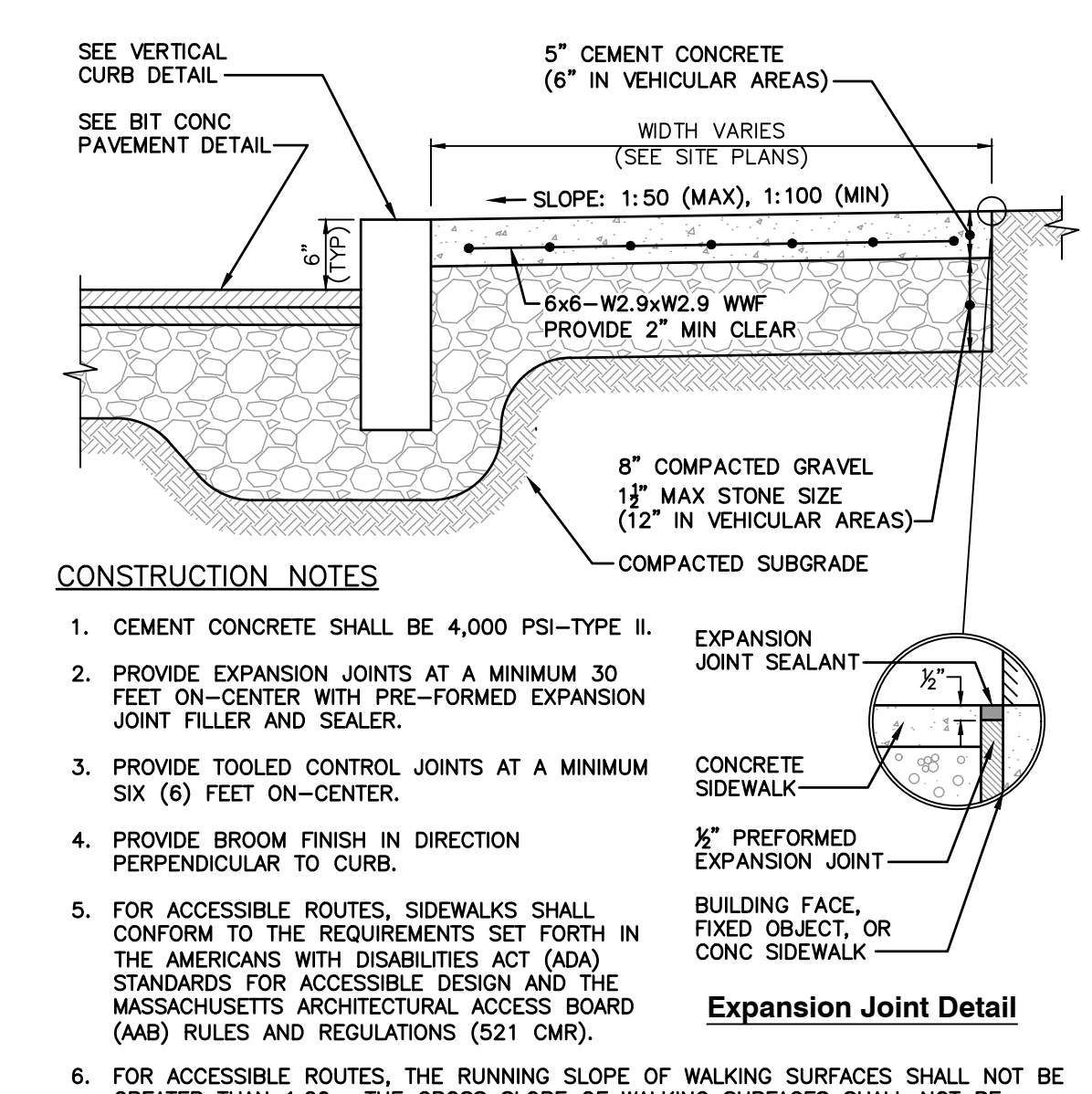
CONSTRUCTION NOTES:

1. CURB RAMPS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS FOR ACCESSIBLE DESIGN AND THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) RULES AND REGULATIONS (521 CMR).
2. THE RUNNING SLOPE OF CURB RAMPS SHALL NOT BE GREATER THAN 1:12. THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE GREATER THAN 1:20. THE CROSS SLOPE OF CURB RAMPS AND WALKING SURFACES SHALL NOT BE GREATER THAN 1:50 OR LESS THAN 1:100.
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4. COUNTER SLOPES OF ADJOINING SURFACES IMMEDIATELY ADJACENT TO THE CURB RAMP SHALL NOT BE STEEPER THAN 1:20.
5. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES AND BE INSTALLED PERPENDICULAR TO THE ACCESSIBLE ROUTE.

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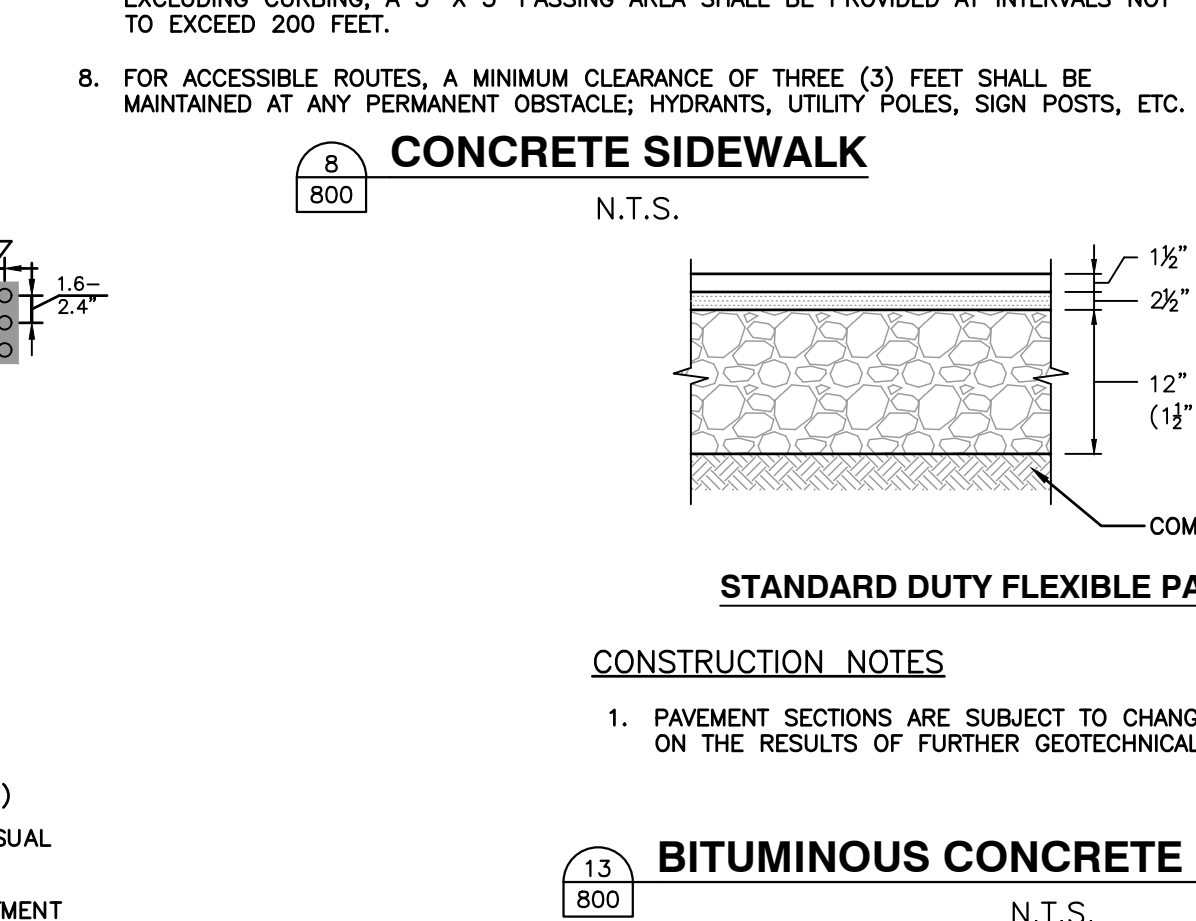
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NOTES:

1. CEMENT CONCRETE SHALL BE 4,000 PSI-TYPE II.
2. PROVIDE EXPANSION JOINTS AT A MINIMUM 30 FEET ON-CENTER WITH PRE-FORMED EXPANSION JOINT FILLER AND SEALER.
3. PROVIDE TOOLED CONTROL JOINTS AT A MINIMUM SIX (6) FEET ON-CENTER.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
5. FOR ACCESSIBLE ROUTES, SIDEWALKS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS FOR ACCESSIBLE DESIGN AND THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) RULES AND REGULATIONS (521 CMR).
6. FOR ACCESSIBLE ROUTES, THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE GREATER THAN 1:20. THE CROSS SLOPE OF WALKING SURFACES SHALL NOT BE GREATER THAN 1:50 OR LESS THAN 1:100.
7. FOR ACCESSIBLE ROUTES, WHERE THE SIDEWALK IS LESS THAN FIVE (5) FEET IN WIDTH, EXCLUDING CURBING, A 5' X 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
8. FOR ACCESSIBLE ROUTES, A MINIMUM CLEARANCE OF THREE (3) FEET SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE; HYDRANTS, UTILITY POLES, SIGN POSTS, ETC.

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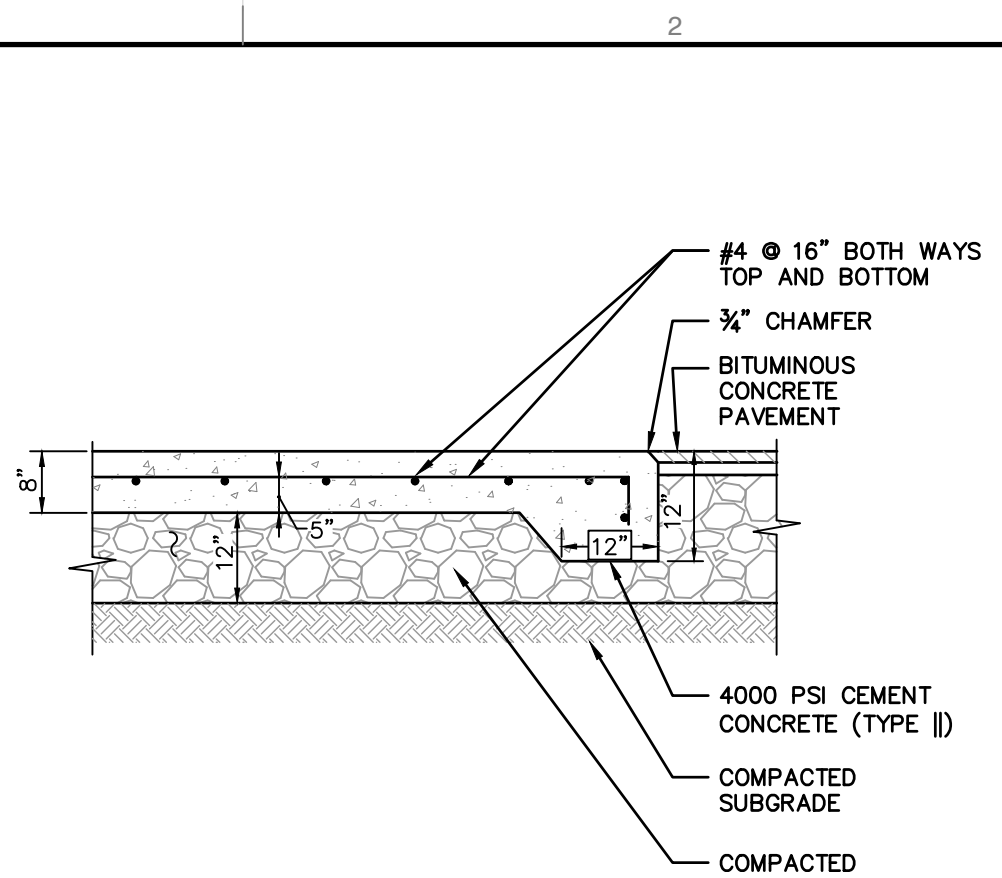


STANDARD DUTY FLEXIBLE PAVEMENT

CONSTRUCTION NOTES:

1. PAVEMENT SECTIONS ARE SUBJECT TO CHANGE AND WILL BE BASED ON THE RESULTS OF FURTHER GEOTECHNICAL INVESTIGATIONS.

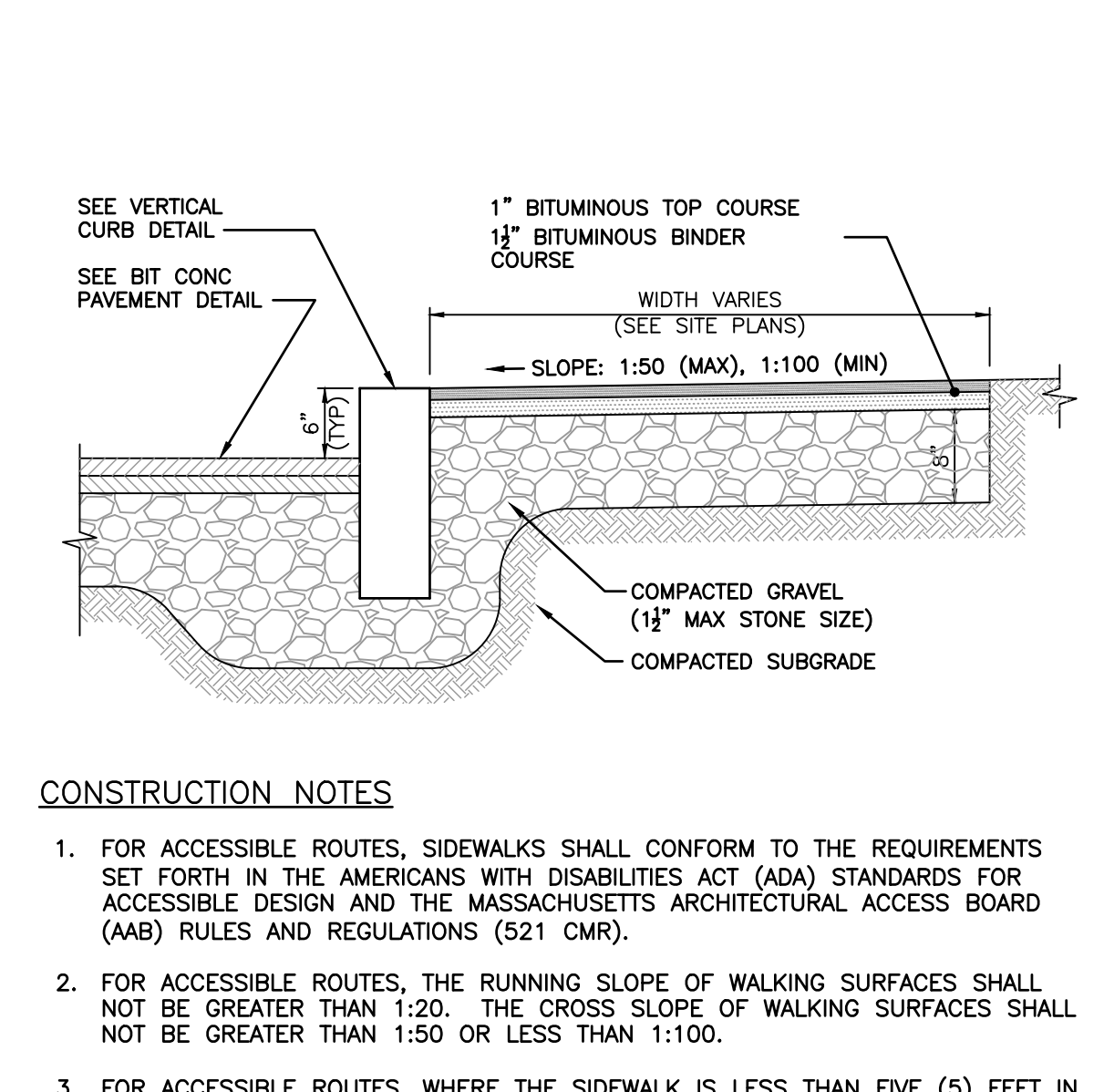
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NOTES:

1. SIZE OF LOADING DOCK PAD TO BE AS INDICATED ON PLANS.
2. CONSTRUCTION JOINTS SHALL BE SPACED NO MORE THAN 40 FEET ON CENTER AND SHALL BE EQUALLY SPACED OVER THE LENGTH AND WIDTH OF THE PAD.

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CONSTRUCTION NOTES:

1. FOR ACCESSIBLE ROUTES, SIDEWALKS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS FOR ACCESSIBLE DESIGN AND THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) RULES AND REGULATIONS (521 CMR).
2. FOR ACCESSIBLE ROUTES, THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE GREATER THAN 1:20. THE CROSS SLOPE OF WALKING SURFACES SHALL NOT BE GREATER THAN 1:50 OR LESS THAN 1:100.
3. FOR ACCESSIBLE ROUTES, WHERE THE SIDEWALK IS LESS THAN FIVE (5) FEET IN WIDTH, EXCLUDING CURBING, A 5' X 5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
4. FOR ACCESSIBLE ROUTES, A MINIMUM CLEARANCE OF THREE (3) FEET SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE; HYDRANTS, UTILITY POLES, SIGN POSTS, ETC.

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| SUBMITTAL & REVISION RECORD | | |
|-----------------------------|-----------|--|
| NO | DATE | DESCRIPTION |
| 1 | 7/21/2020 | SUBMISSION FOR PLANNING, ZONING & CONSERVATION COMMISSION REVIEW |
| 2 | 8/4/2020 | REVISIONS PER TOWN COMMENTS |
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FOR PERMITTING ONLY
NOT FOR CONSTRUCTION

Civil & Environmental Consultants, Inc.
31 Bellows Road • Raynham, MA 02767
Ph: 774.501.2176 • 866.312.2024 • Fax: 774.501.2669
www.ccecinc.com

HERITAGE COMPANIES
THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS

DRAWN BY: **DWP** CHECKED BY: **KPS** APPROVED BY: **DRAFT**

DATE: **JULY 21, 2020** DWG SCALE: **AS SHOWN** PROJECT NO: **193-187**

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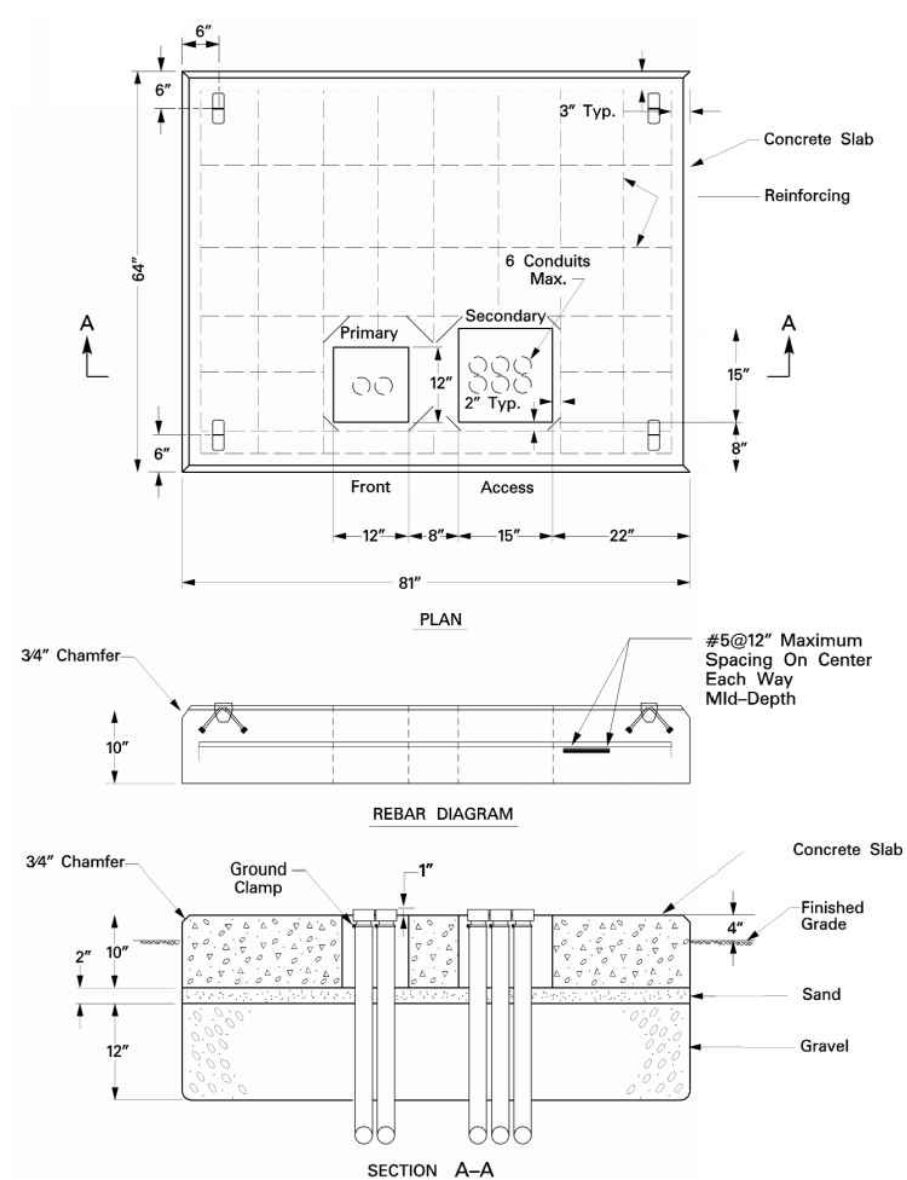
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Figure 27-0-1 15kV Transformer Pad 75-500kVA 44-113 (ref-44-113/JF8A)



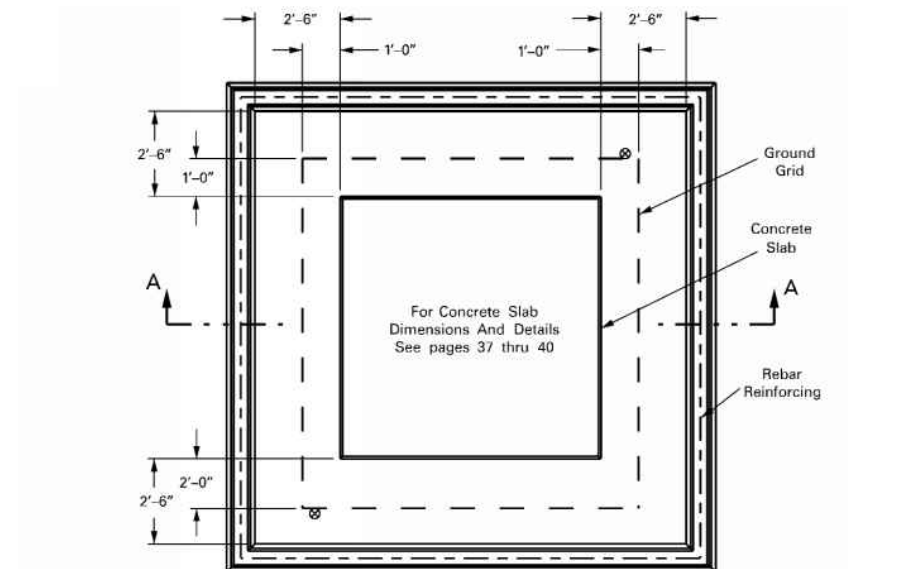
CONSTRUCTION NOTES

- DETAIL SHOWN FOR REFERENCE ONLY. REFER TO LATEST EDITION OF NATIONAL GRID SPECIFICATIONS FOR LATEST AUTHORIZED VERSION.
- CONTRACTOR TO REVIEW NATIONAL GRID STANDARDS AND SAIL INSTALL ALL ELECTRIC EQUIPMENT IN ACCORDANCE WITH NATIONAL GRID STANDARDS AND DETAILS. AUTHORIZATION FROM NATIONAL GRID IS REQUIRED PRIOR TO CONSTRUCTION.

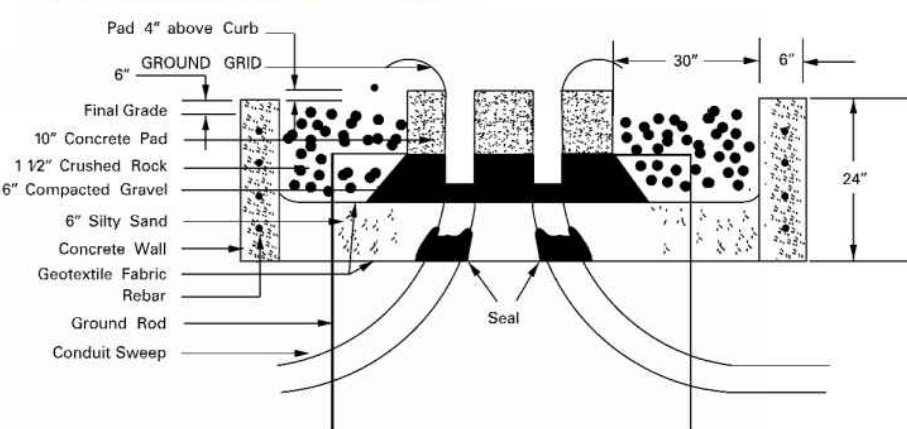
1 CONCRETE PAD - TRANSFORMER

N.T.S.

Containment Area Plan View



Typical Cross Section of Containment Pad A-A

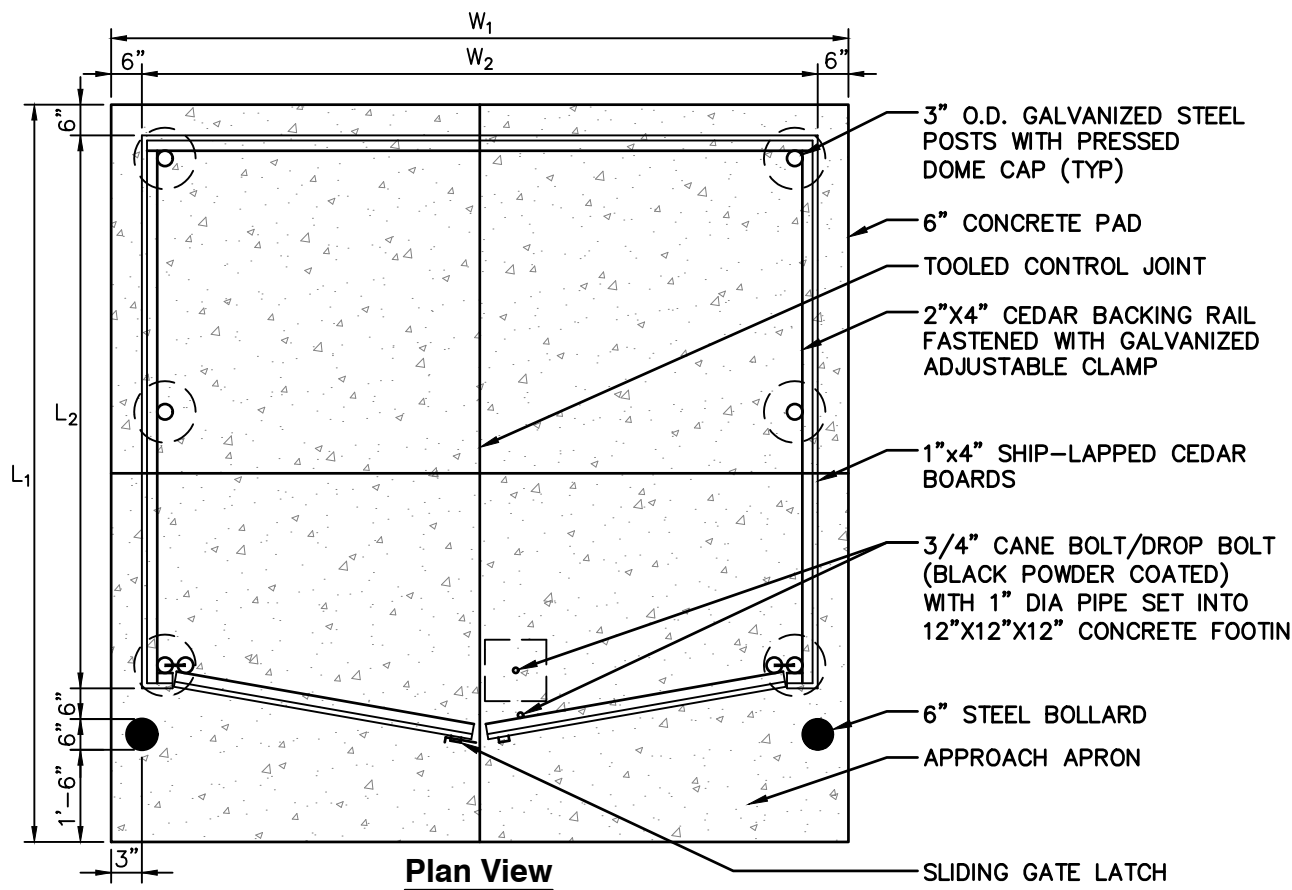


CONSTRUCTION NOTES

- DETAIL SHOWN FOR REFERENCE ONLY. REFER TO LATEST EDITION OF NATIONAL GRID SPECIFICATIONS FOR LATEST AUTHORIZED VERSION.
- CONTRACTOR TO REVIEW NATIONAL GRID STANDARDS AND SAIL INSTALL ALL ELECTRIC EQUIPMENT IN ACCORDANCE WITH NATIONAL GRID STANDARDS AND DETAILS. AUTHORIZATION FROM NATIONAL GRID IS REQUIRED PRIOR TO CONSTRUCTION.

2 TYPICAL OIL CONTAINMENT - TRANSFORMER

N.T.S.

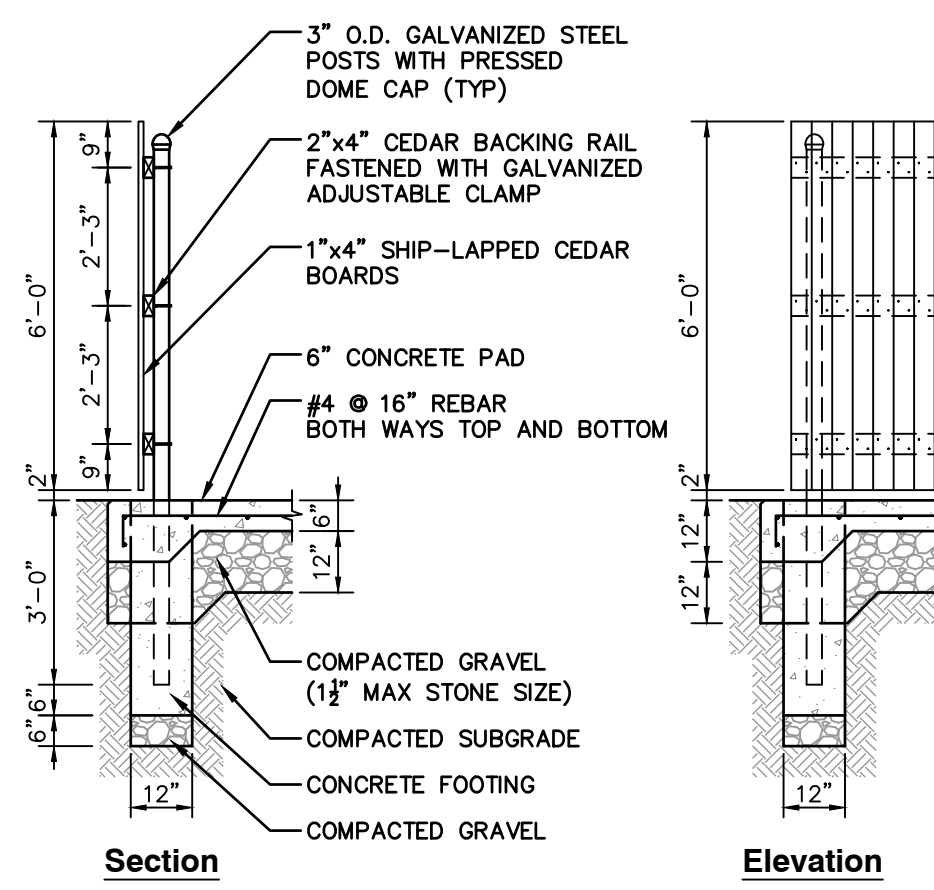


CONSTRUCTION NOTES

- CEMENT CONCRETE SHALL BE 4,000 PSI-TYPE II.
- PROVIDE TOOLED CONTROL JOINTS AT A MINIMUM SIX (6) FEET ON-CENTER AND EQUALLY SPACED OVER THE LENGTH AND WIDTH OF THE PAD.
- ALL WOODEN FENCING MATERIAL SHALL BE NORTHERN WHITE CEDAR, INSTALLED TO THE DIMENSIONS SHOWN ON THE DRAWING.
- POSTS SHALL MAINTAIN A DEPTH OF 3'-0" IN GROUND AND SHALL NOT BE RACKED TO ACCOMMODATE CHANGES IN GRADE.
- LINE OF FENCE TOP AND BOTTOM SHALL BE INSTALLED STRAIGHT AND TRUE. POSTS AND PICKETS SHALL BE INSTALLED PARALLEL AND PLUMB. RAILS SHALL BE INSTALLED PARALLEL TO GROUND SURFACE AND EACH OTHER.

3 DUMPSTER PAD WITH ENCLOSURE

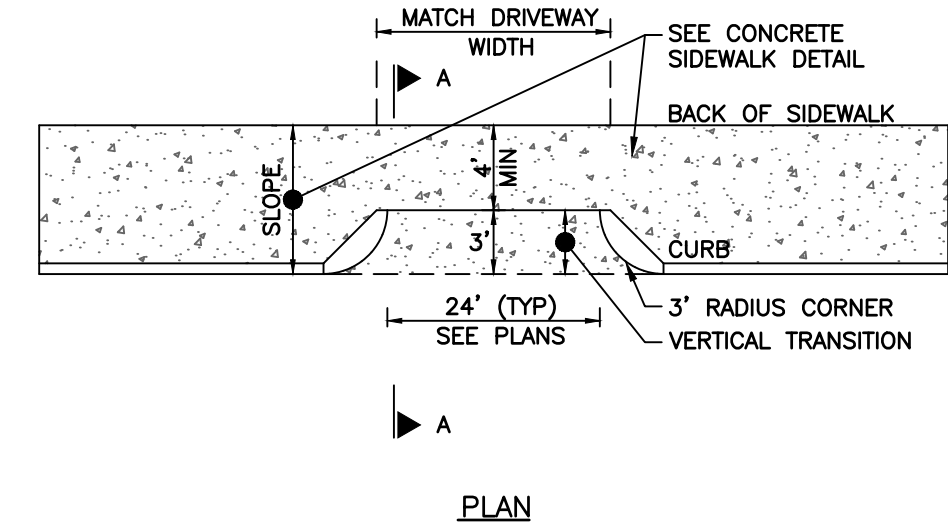
N.T.S.



Section

Elevation

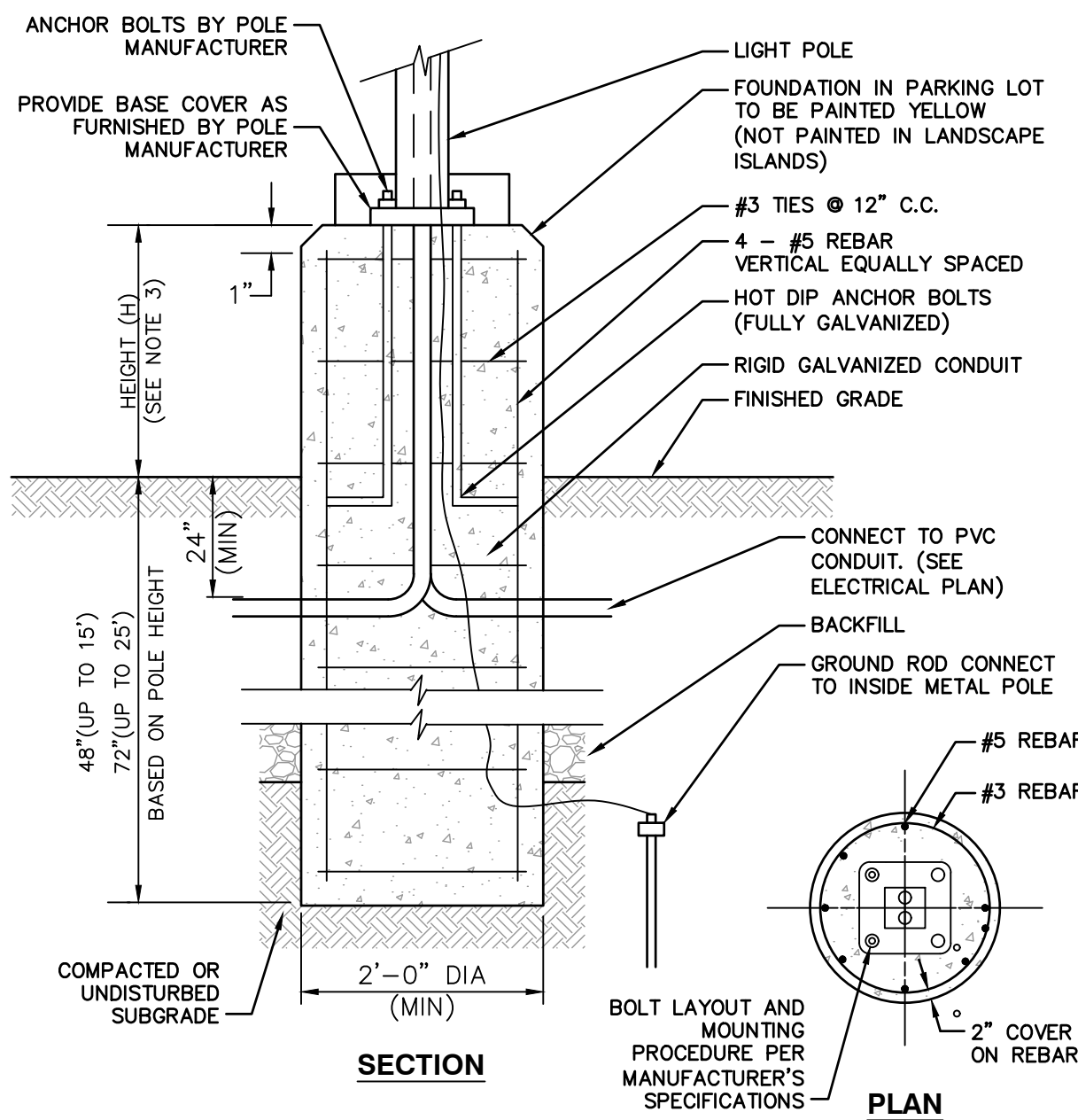
| Table of Dimensions | | | | |
|----------------------|----------------|----------------|----------------|----------------|
| DUMPSTER DESIGNATION | L ₁ | L ₂ | W ₁ | W ₂ |
| DUMPSTER 1 | 12'-0" | 9'-0" | 12'-0" | 11'-0" |
| DUMPSTER 2 | 12'-0" | 9'-0" | 12'-0" | 11'-0" |



Section

CONCRETE DRIVEWAY APRON

N.T.S.

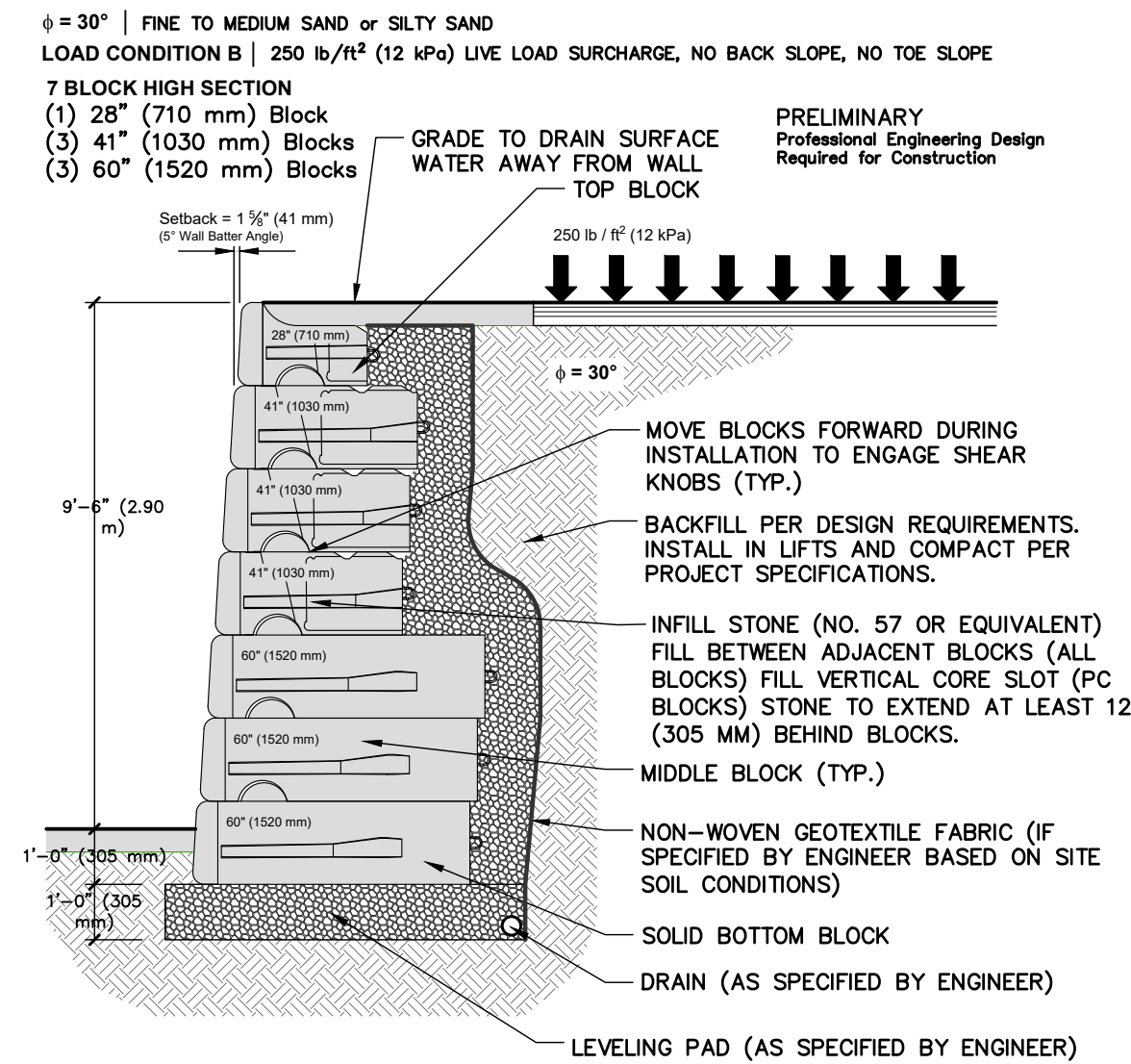


CONSTRUCTION NOTES

- LIGHT POLE FOUNDATION DESIGN IS SUBJECT TO CHANGE BASED ON FINAL POLE HEIGHT AND FIXTURE SELECTION AND GEOTECHNICAL SITE INVESTIGATIONS.
- LIGHT POLE FOUNDATION TO BE PRECAST CONCRETE, MINIMUM 4,000 PSI. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC.
- HEIGHT (H) OF FOUNDATION ABOVE FINISHED GRADE TO BE 6 INCHES IN LANDSCAPED AREAS, 30 INCHES IN VEHICULAR AREAS, AND FLUSH IN SIDEWALKS.

5 LIGHTPOLE FOUNDATION DETAIL

N.T.S.

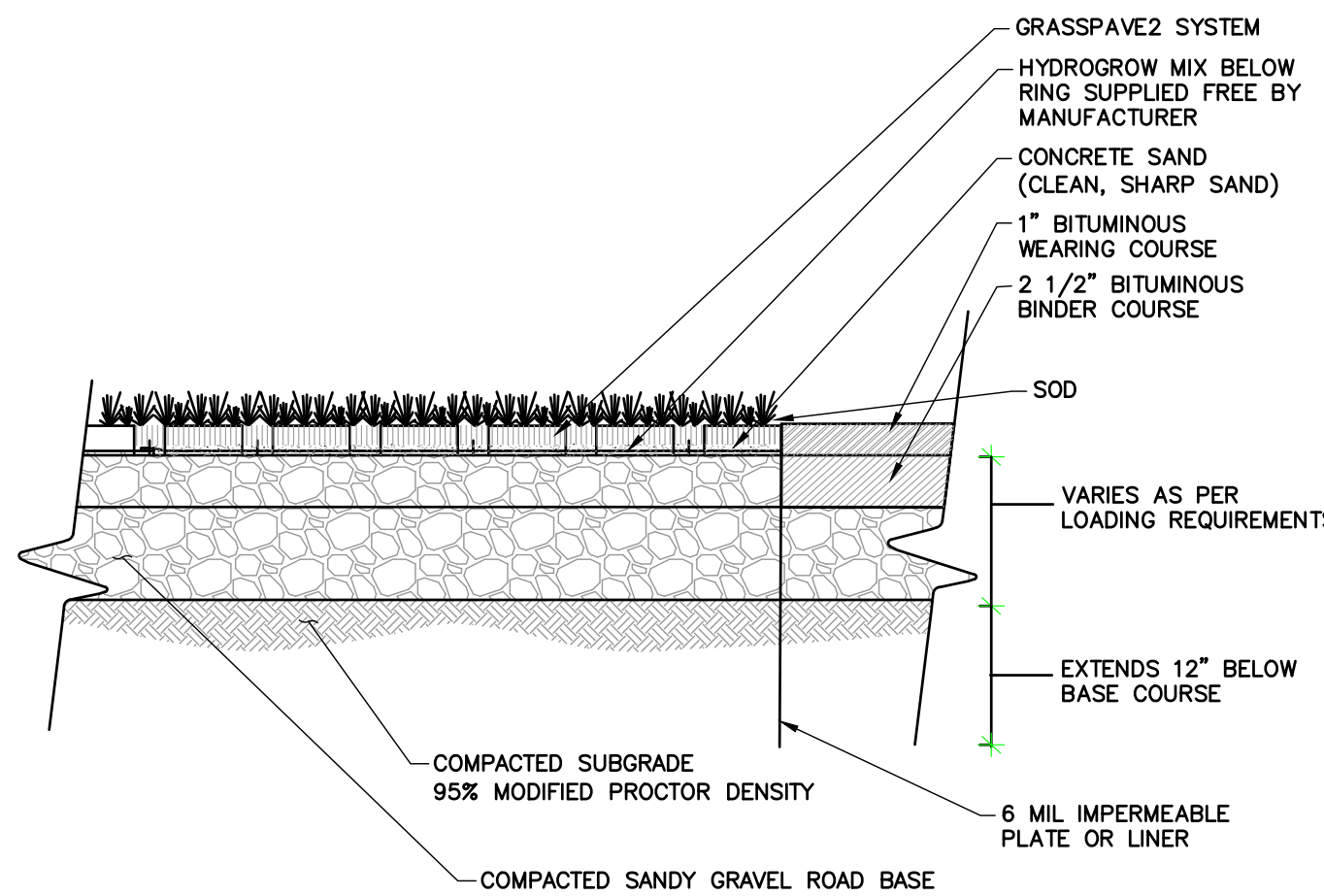


NOTES

- DETAILS PROVIDED BY MANUFACTURER AND ARE PRELIMINARY ONLY AND SUBJECT TO CHANGE. FINAL DESIGN TO BE PERFORMED BY STRUCTURAL ENGINEER AND COORDINATED WITH WALL MANUFACTURER.

6 TYPICAL REDI-ROCK WALL SECTIONS

N.T.S.

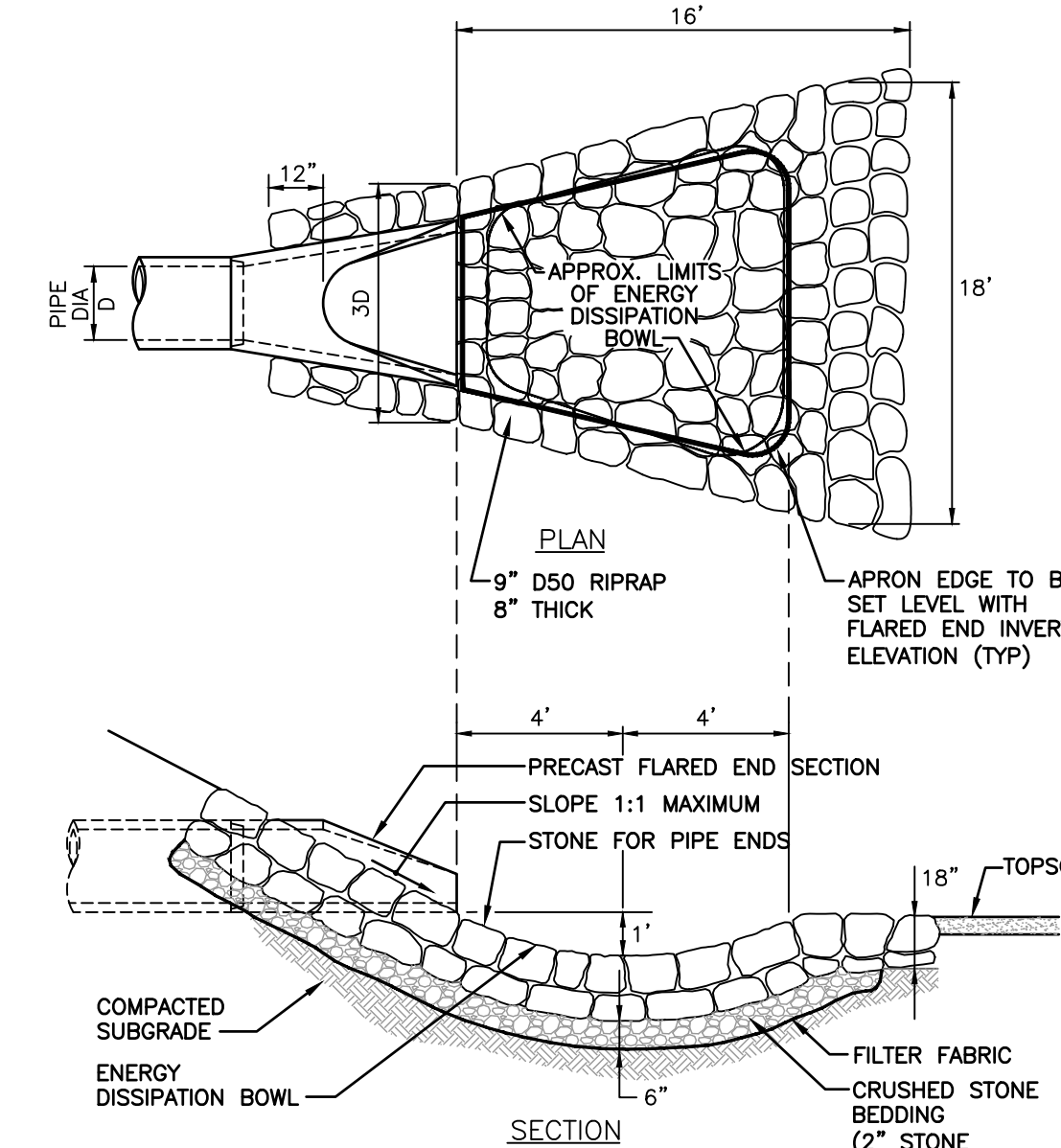


NOTES

- DETAILS PROVIDED BY MANUFACTURER AND ARE PRELIMINARY ONLY AND SUBJECT TO CHANGE. FINAL DESIGN TO BE PERFORMED BY STRUCTURAL ENGINEER AND COORDINATED WITH WALL MANUFACTURER.

7 GRASSPAVE2 AT ASPHALT EDGE

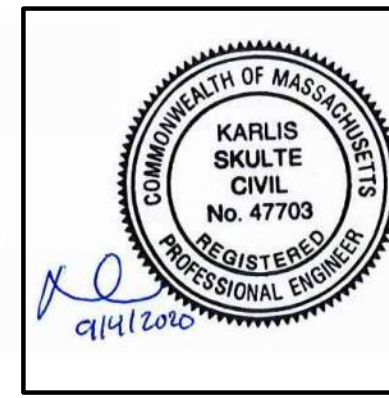
N.T.S.



8 OUTLET WITH STONE PROTECTION

N.T.S.

FOR PERMITTING ONLY
NOT FOR CONSTRUCTION



| SUBMITTAL & REVISION RECORD | | |
|-----------------------------|-----------|--|
| NO | DATE | DESCRIPTION |
| 1 | 7/21/2020 | SUBMISSION FOR PLANNING, ZONING & CONSERVATION COMMISSION REVIEW |
| 2 | 8/4/2020 | REVISIONS PER TOWN COMMENTS |

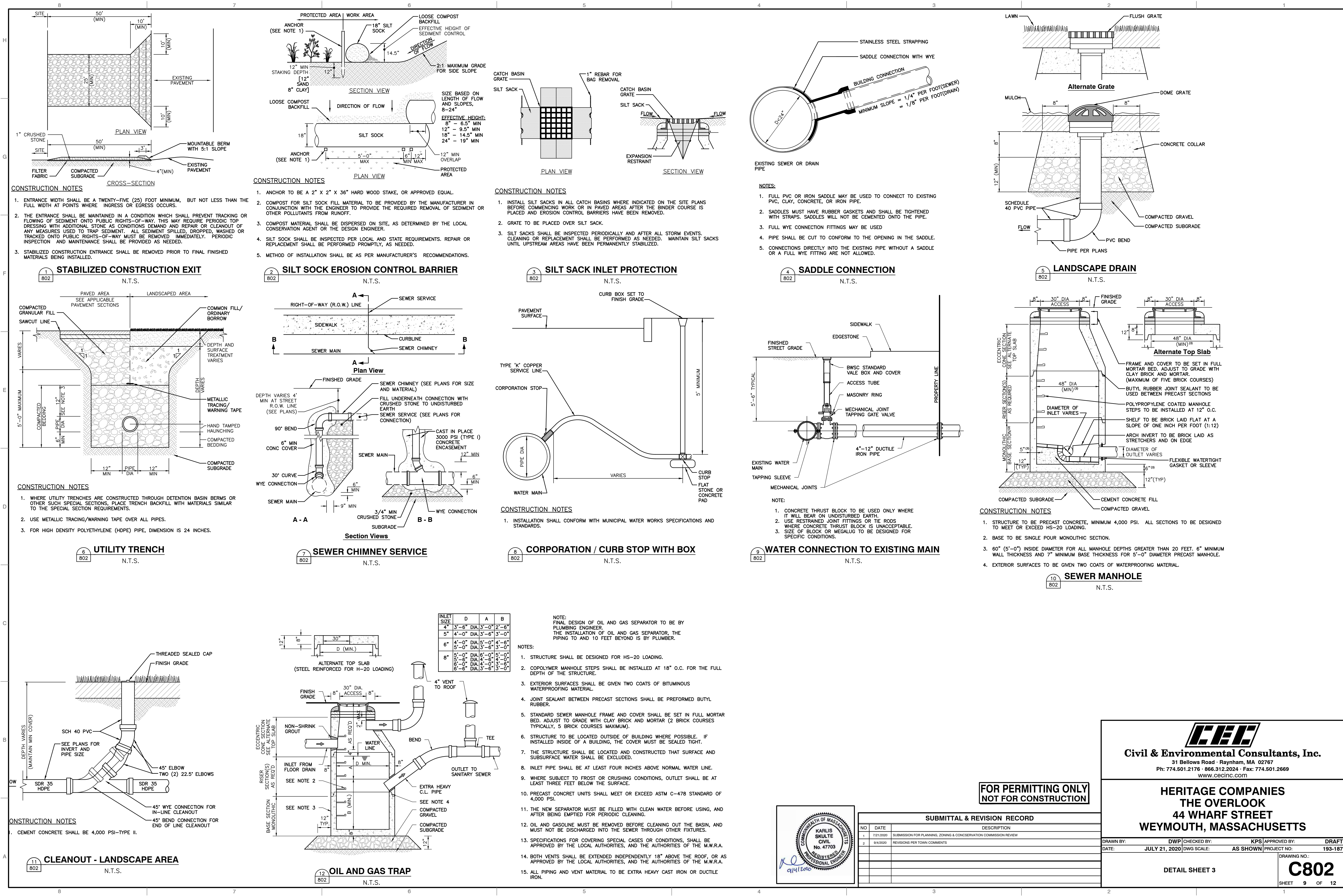
Civil & Environmental Consultants, Inc.
31 Bellows Road - Raynham, MA 02767
Ph: 774.501.2176 • 866.312.2024 • Fax: 774.501.2669
www.ccecinc.com

**HERITAGE COMPANIES
THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS**

DRAWN BY: **DWP** CHECKED BY: **KPS** APPROVED BY: **DRAFT**
DATE: **JULY 21, 2020** DWG SCALE: **AS SHOWN** PROJECT NO.: **193-187**

DETAIL SHEET 2

DRAWING NO.: **C801**
SHEET 8 OF 12



A:19/19 (193-187) - CADD [DWG] (DWG) - Revision 1/193187-CV01-2000.dwg [0202] LS:19/1/2020 - 09:55 AM - LP: 9/4/2020 09:55 AM

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**HERITAGE COMPANIES
THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS**

**FOR PERMITTING ONLY
NOT FOR CONSTRUCTION**

DETAIL SHEET 3

SEWER MANHOLE
N.T.S.

CONSTRUCTION NOTES

1. CEMENT CONCRETE SHALL BE 4,000 PSI-TYPE II.

2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.

3. STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED PRIOR TO FINAL FINISHED MATERIALS BEING INSTALLED.

4. SILT SOCK SHALL BE INSPECTED PER LOCAL AND STATE REQUIREMENTS. REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY, AS NEEDED.

5. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.

6. FULL PVC OR IRON SADDLE MAY BE USED TO CONNECT TO EXISTING PVC, CLAY, CONCRETE, OR IRON PIPE.

7. SADDLES MUST HAVE RUBBER GASKETS AND SHALL BE TIGHTENED WITH STRAPS. SADDLES WILL NOT BE CEMENTED ONTO THE PIPE.

8. FULL WYE CONNECTION FITTINGS MAY BE USED.

9. PIPE SHALL BE CUT TO CONFORM TO THE OPENING IN THE SADDLE.

10. CONNECTIONS DIRECTLY INTO THE EXISTING PIPE WITHOUT A SADDLE OR A FULL WYE FITTING ARE NOT ALLOWED.

11. STRUCTURE TO BE PRECAST CONCRETE, MINIMUM 4,000 PSI. ALL SECTIONS TO BE DESIGNED TO MEET OR EXCEED HS-20 LOADING.

12. BASE TO BE SINGLE POUR MONOLITHIC SECTION.

13. 60" (5'-0") INSIDE DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET. 6" MINIMUM WALL THICKNESS AND 7" MINIMUM BASE THICKNESS FOR 5'-0" DIAMETER PRECAST MANHOLE.

14. EXTERIOR SURFACES TO BE GIVEN TWO COATS OF WATERPROOFING MATERIAL.

15. FINAL DESIGN OF OIL AND GAS SEPARATOR TO BE BY PLUMBING ENGINEER. THE INSTALLATION OF OIL AND GAS SEPARATOR, THE PIPING TO AND 10 FEET BEYOND IS BY PLUMBER.

16. STRUCTURE SHALL BE DESIGNED FOR HS-20 LOADING.

17. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 18" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.

18. EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATERPROOFING MATERIAL.

19. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.

20. STANDARD SEWER MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).

21. STRUCTURE TO BE LOCATED OUTSIDE OF BUILDING WHERE POSSIBLE. IF INSTALLED INSIDE OF A BUILDING, THE COVER MUST BE SEALED TIGHT.

22. THE STRUCTURE SHALL BE LOCATED AND CONSTRUCTED THAT SURFACE AND SUBSURFACE WATER SHALL BE EXCLUDED.

23. INLET PIPE SHALL BE AT LEAST FOUR INCHES ABOVE NORMAL WATER LINE.

24. WHERE SUBJECT TO FROST OR CRUSHING CONDITIONS, OUTLET SHALL BE AT LEAST THREE FEET BELOW THE SURFACE.

25. PRECAST CONCRET UNITS SHALL MEET OR EXCEED ASTM C-478 STANDARD OF 4,000 PSI.

26. THE NEW SEPARATOR MUST BE FILLED WITH CLEAN WATER BEFORE USING, AND AFTER BEING EMPTIED FOR PERIODIC CLEANING.

27. OIL AND GASOLINE MUST BE REMOVED BEFORE CLEANING OUT THE BASIN, AND MUST NOT BE DISCHARGED INTO THE SEWER THROUGH OTHER FIXTURES.

28. SPECIFICATIONS FOR COVERING SPECIAL CASES OR CONDITIONS, SHALL BE APPROVED BY THE LOCAL AUTHORITIES, AND THE AUTHORITIES OF THE M.W.R.A.

29. BOTH VENTS SHALL BE EXTENDED INDEPENDENTLY 18" ABOVE THE ROOF, OR AS APPROVED BY THE LOCAL AUTHORITIES, AND THE AUTHORITIES OF THE M.W.R.A.

30. ALL PIPING AND VENT MATERIAL TO BE EXTRA HEAVY CAST IRON OR DUCTILE IRON.

31. CEMENT CONCRETE SHALL BE 4,000 PSI-TYPE II.

32. USE METALLIC TRACING/WARNING TAPE OVER ALL PIPES.

33. FOR HIGH DENSITY POLYETHYLENE (HDPE) PIPE, DIMENSION IS 24 INCHES.

34. FRAME AND COVER TO BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (MAXIMUM OF FIVE BRICK COURSES).

35. BUTYL RUBBER JOINT SEALANT TO BE USED BETWEEN PRECAST SECTIONS.

36. POLYPROPYLENE COATED MANHOLE STEPS TO BE INSTALLED AT 12" O.C.

37. SHELF TO BE BRICK LAID FLAT AT A SLOPE OF ONE INCH PER FOOT (1:12).

38. ARCH INVERT TO BE BRICK LAID AS STRETCHERS AND ON EDGE.

39. DIAMETER OF INLET VARIES.

40. DIAMETER OF OUTLET VARIES.

41. FLEXIBLE WATERTIGHT GASKET OR SLEEVE.

42. CEMENT CONCRETE FILL.

43. COMPACTED GRAVEL.

44. COMPACTED SUBGRADE.

45. FINISHED GRADE.

46. 30" DIA ACCESS.

47. 8" DIA.

48. 12" DIA.

49. 48" DIA (MIN) DIA.

50. 12" DIA.

51. 8" DIA.

52. 30" DIA.

53. 8" DIA.

54. 12" DIA.

55. 8" DIA.

56. 30" DIA.

57. 8" DIA.

58. 12" DIA.

59. 8" DIA.

60. 30" DIA.

61. 8" DIA.

62. 12" DIA.

63. 8" DIA.

64. 30" DIA.

65. 8" DIA.

66. 12" DIA.

67. 8" DIA.

68. 30" DIA.

69. 8" DIA.

70. 12" DIA.

71. 8" DIA.

72. 30" DIA.

73. 8" DIA.

74. 12" DIA.

75. 8" DIA.

76. 30" DIA.

77. 8" DIA.

78. 12" DIA.

79. 8" DIA.

80. 30" DIA.

81. 8" DIA.

82. 12" DIA.

83. 8" DIA.

84. 30" DIA.

85. 8" DIA.

86. 12" DIA.

87. 8" DIA.

88. 30" DIA.

89. 8" DIA.

90. 12" DIA.

91. 8" DIA.

92. 30" DIA.

93. 8" DIA.

94. 12" DIA.

95. 8" DIA.

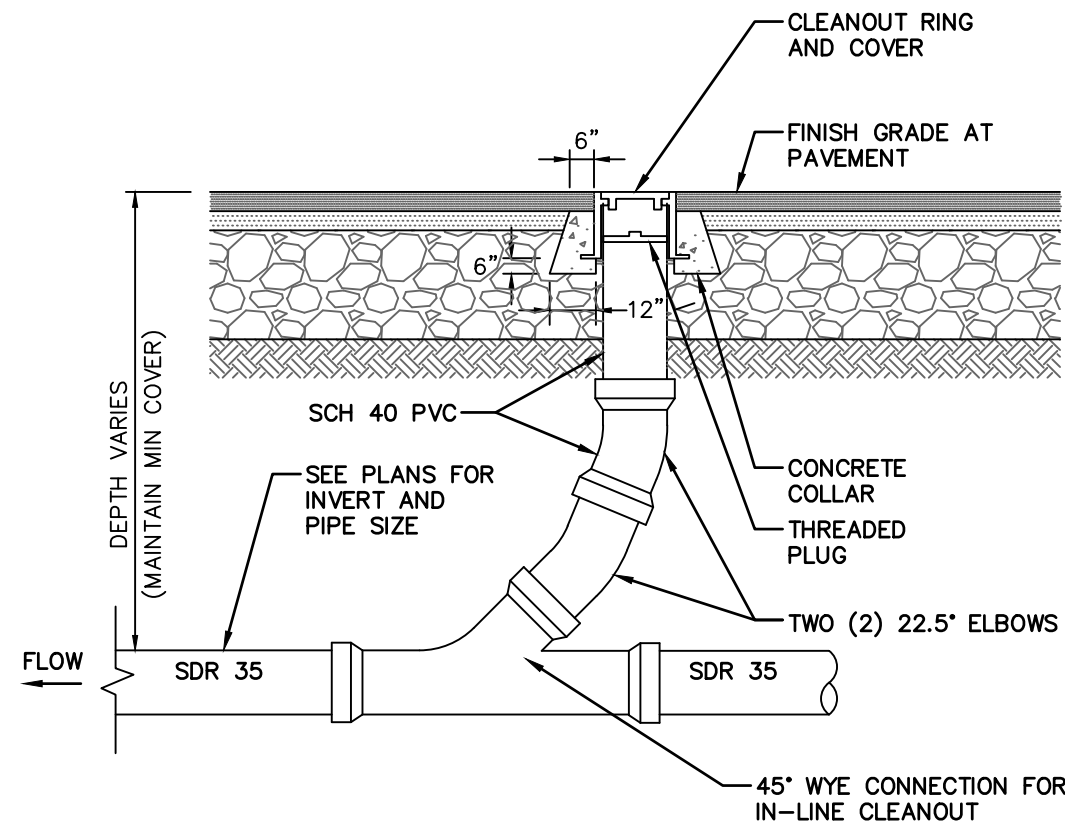
96. 30" DIA.

97. 8" DIA.

98. 12" DIA.

99. 8" DIA.

100. 30" DIA.

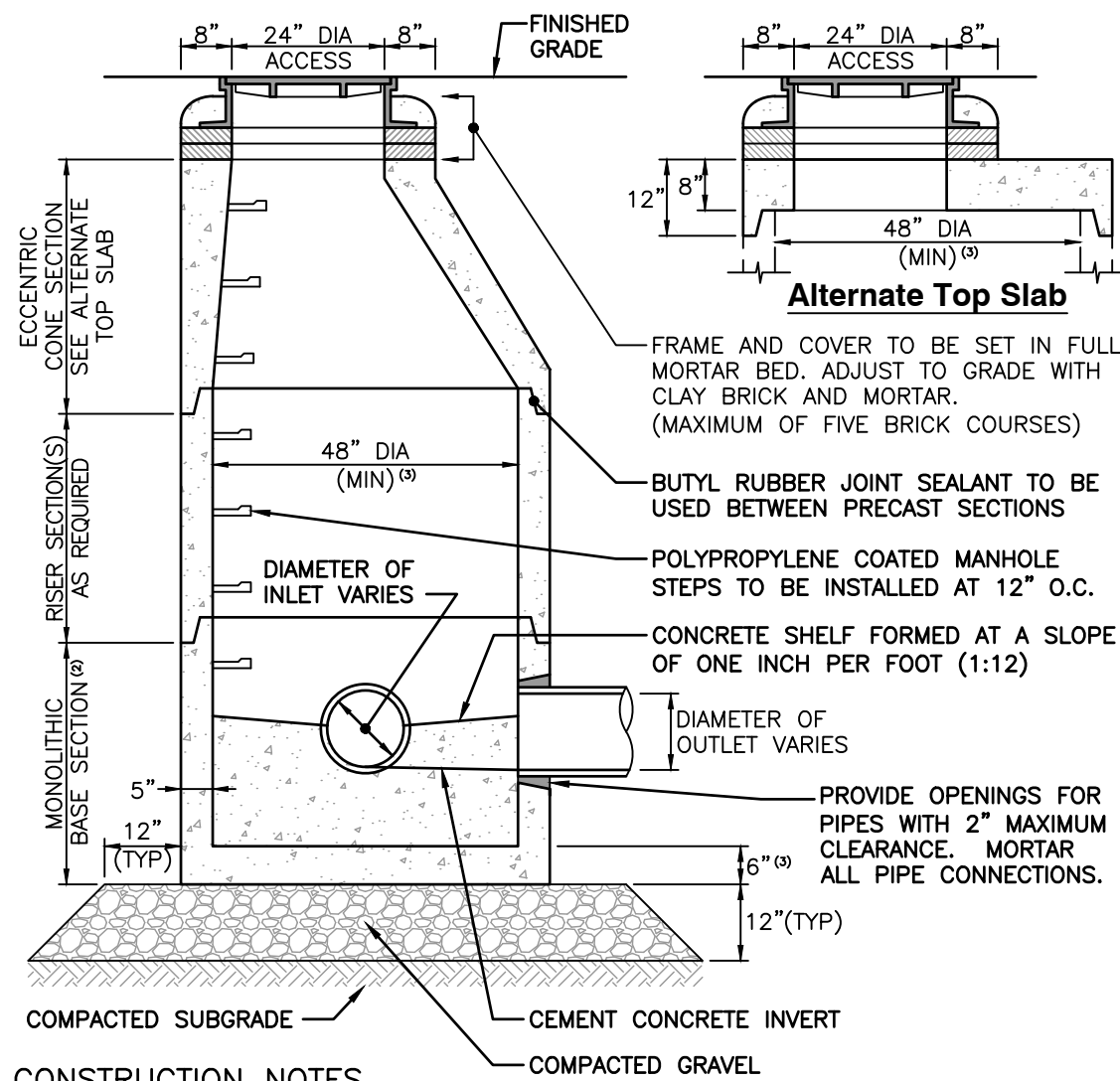


NOTES

1. CEMENT CONCRETE SHALL BE 4,000 PSI-TYPE II.

CLEANOUT (PAVEMENT)

N.T.S.

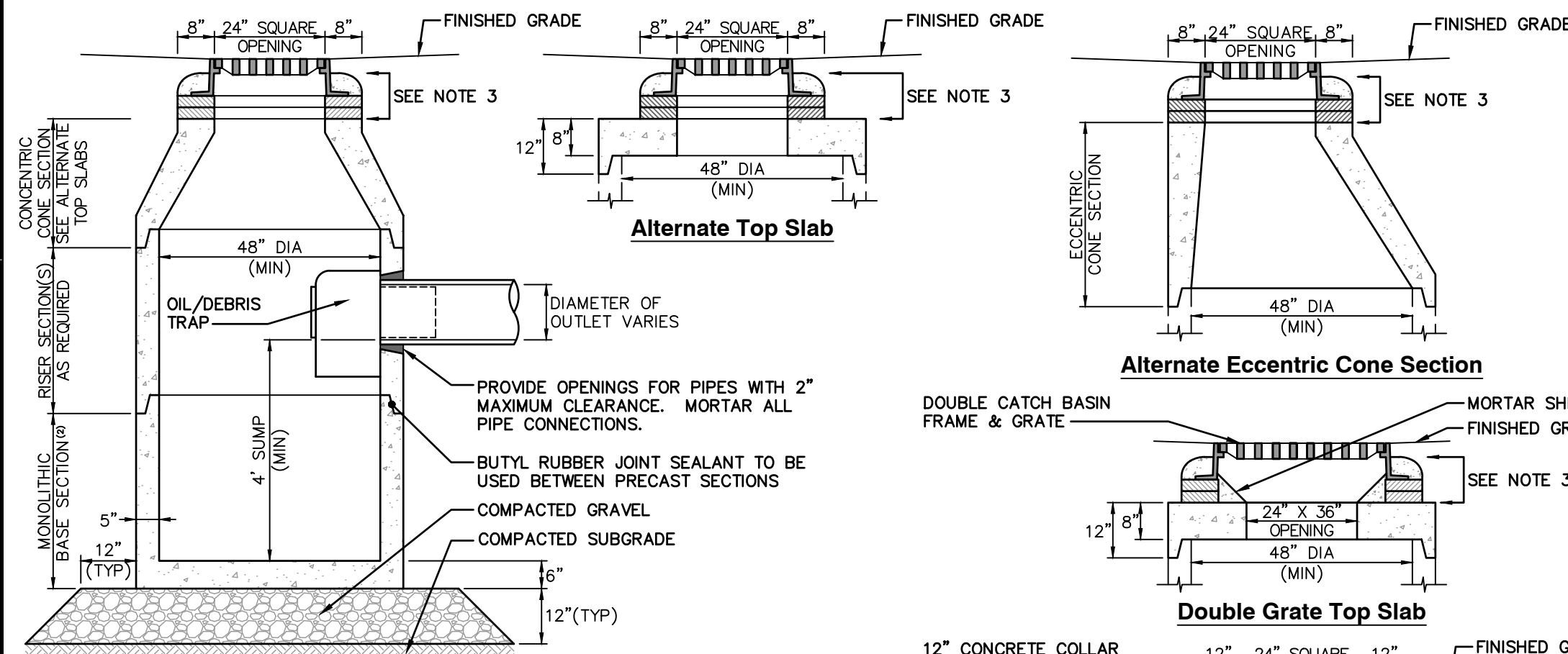


CONSTRUCTION NOTES

1. STRUCTURE TO BE PRECAST CONCRETE, MINIMUM 4,000 PSI. ALL SECTIONS TO BE DESIGNED TO MEET OR EXCEED HS-20 LOADING.
2. BASE TO BE SINGLE POUR MONOLITHIC SECTION.
3. 60" (5'-0") INSIDE DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET. 6" MINIMUM WALL THICKNESS AND 8" MINIMUM BASE THICKNESS FOR 5'-0" DIAMETER PRECAST MANHOLE.

DRAIN MANHOLE

N.T.S.



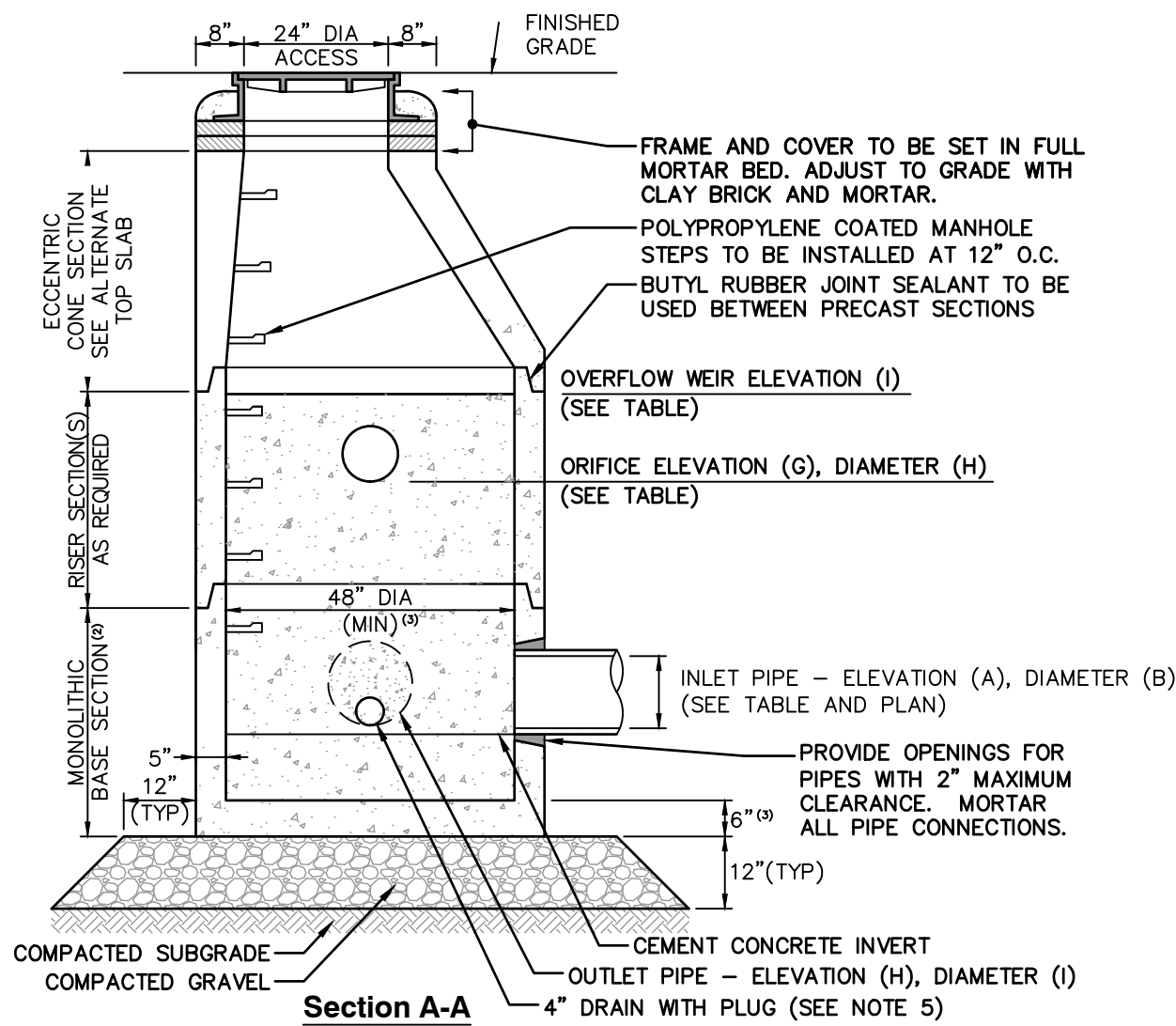
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2. BASE TO BE SINGLE POUR MONOLITHIC SECTION.
3. FRAME AND GRATE TO BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. MAXIMUM OF FIVE BRICK COURSES.
4. PROVIDE DOGHOUSE OPENING FOR PIPES WITH 2" MAXIMUM CLEARANCE TO OUTSIDE OF PIPE. TOP SLAB SHALL NOT REST DIRECTLY ON THE PIPE. GROUT ALL CONNECTIONS WITH NON-SHRINK GROUT.

CATCH BASIN WITH OIL/DEBRIS TRAP

N.T.S.

| OUTLET CONTROL STRUCTURE | INLET PIPE (A) | | INLET PIPE (B) | | ORIFICE | | OVERFLOW WEIR | OUTLET PIPE | |
|--------------------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|----------------|--------------|
| | (A) INVERT EL. | (B) DIAMETER | (C) INVERT EL. | (D) DIAMETER | (G) INVERT EL. | (H) DIAMETER | (I) INVERT EL. | (J) INVERT EL. | (K) DIAMETER |
| OCS A2 | 14.90 | 12" | 14.45 | 12" | 14.25 | 6" | 15.00 | 14.45 | 18" |
| OCS A8 | 15.15 | 12" | 15.15 | 18" | 17.40 | 8" | 19.50 | 15.15 | 18" |

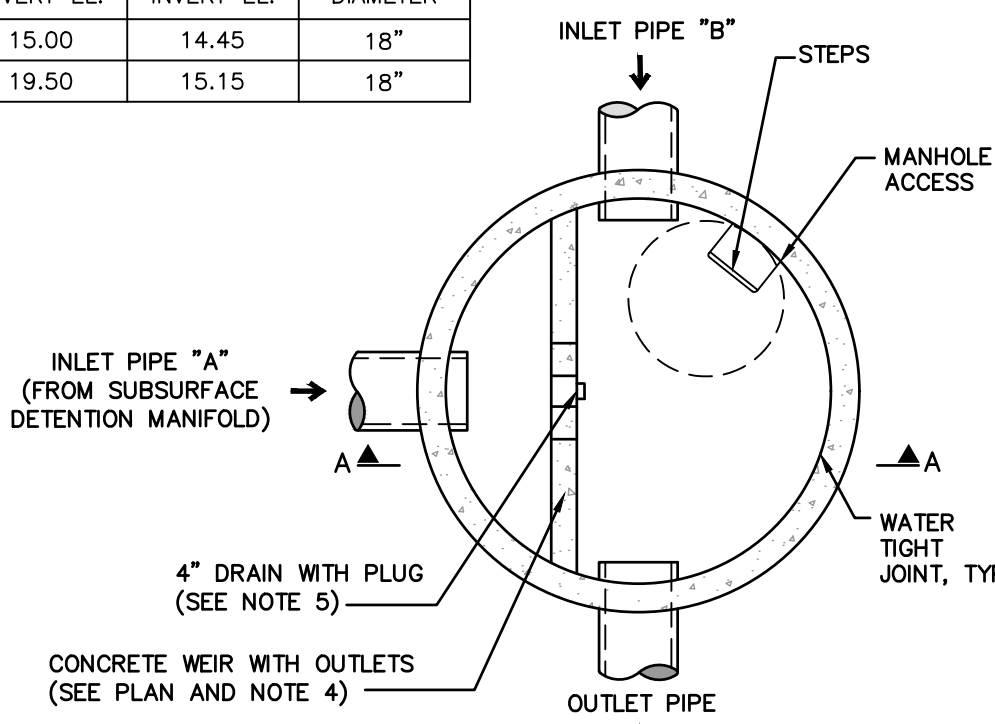


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4. SEE PLANS FOR WEIR ELEVATIONS AND CONFIGURATIONS.
5. PLUG SHALL CONSIST OF A 4" PVC PIPE WITH A THREADED PLUG.

OUTLET CONTROL STRUCTURE

N.T.S.

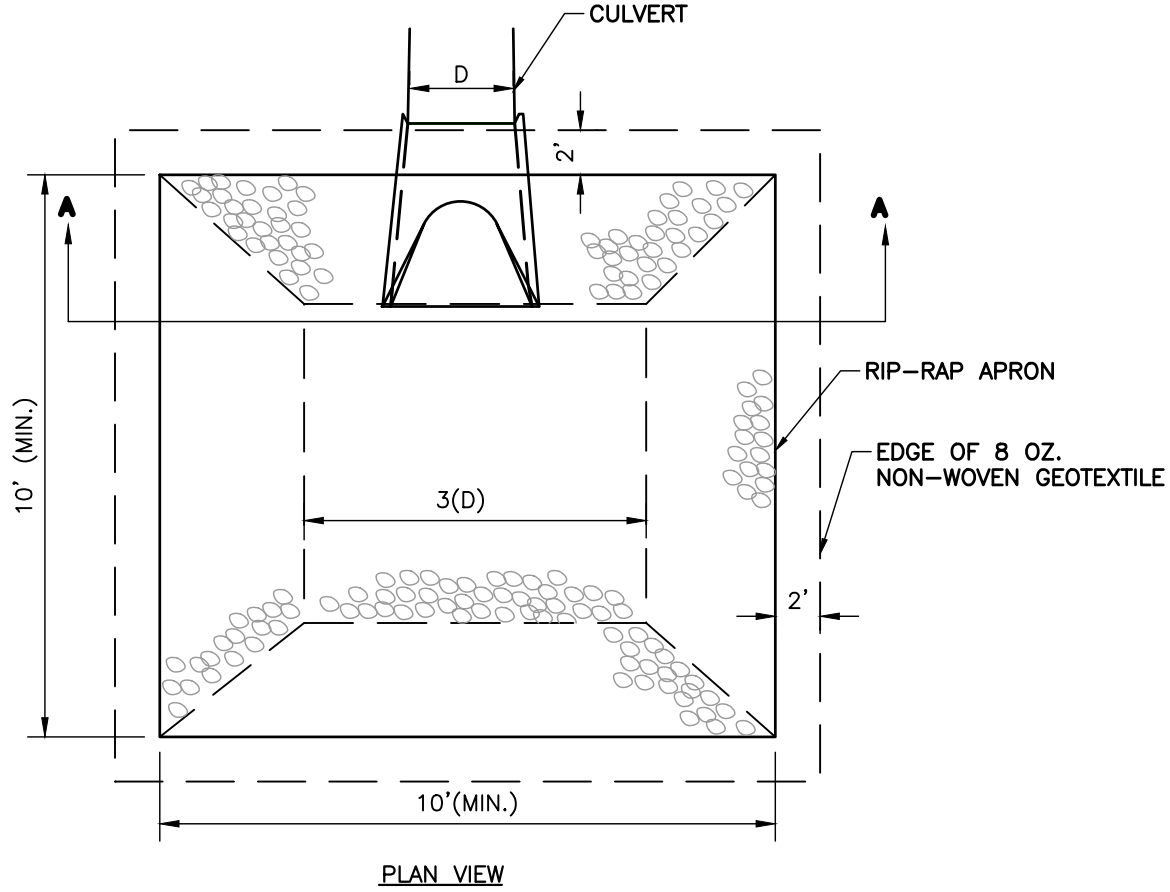


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4. SEE PLANS FOR WEIR ELEVATIONS AND CONFIGURATIONS.
5. PLUG SHALL CONSIST OF A 4" PVC PIPE WITH A THREADED PLUG.

OUTLET CONTROL STRUCTURE

N.T.S.

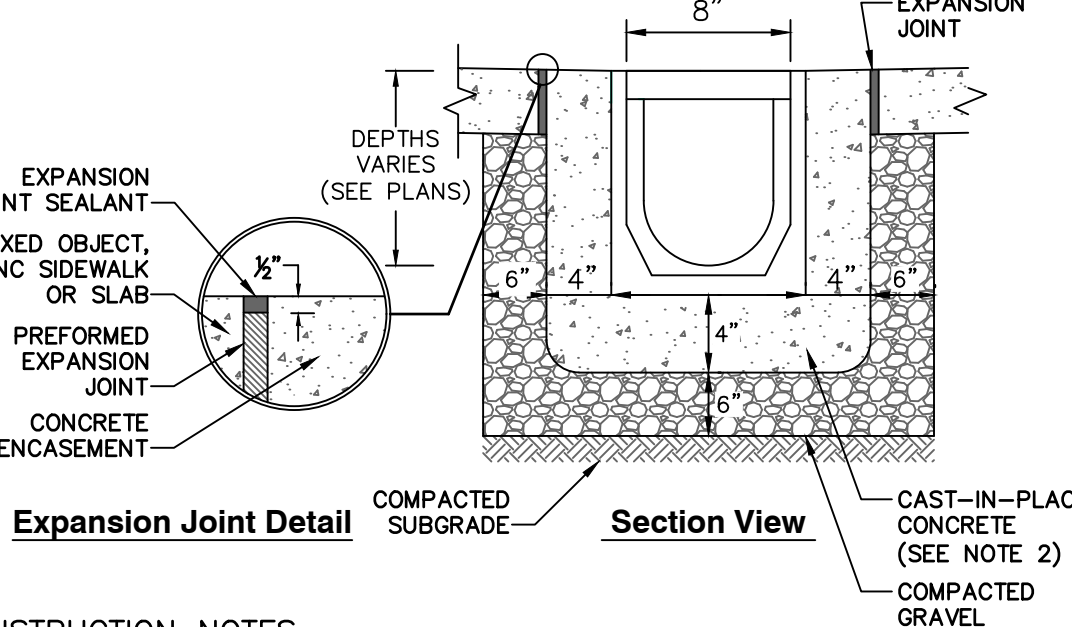
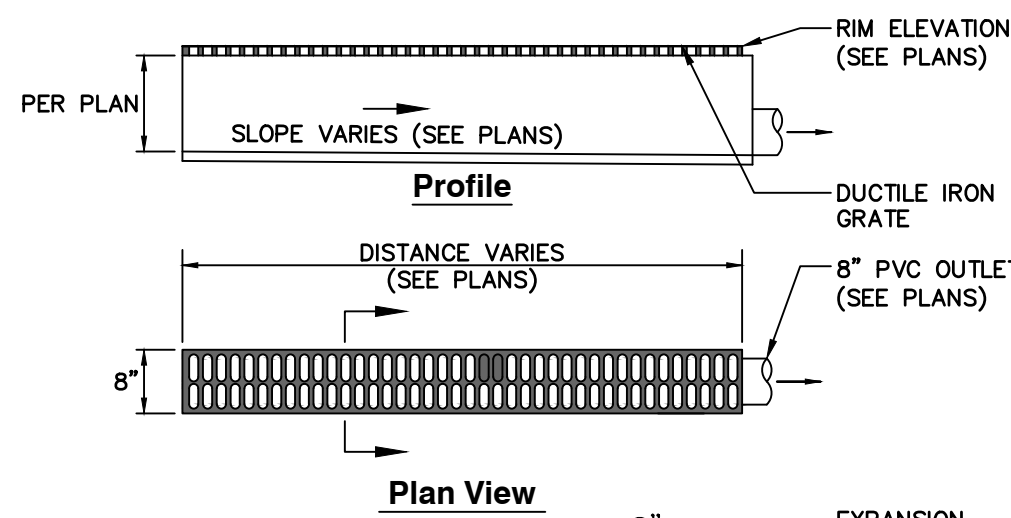


NOTE:

RIP-RAP SHALL BE WELL GRADED FROM A MINIMUM SIZE OF 6" TO A MAXIMUM SIZE OF 12", 12" THICK, MIN.

RIP-RAP INLET APRON DETAIL

N.T.S.



CONSTRUCTION NOTES

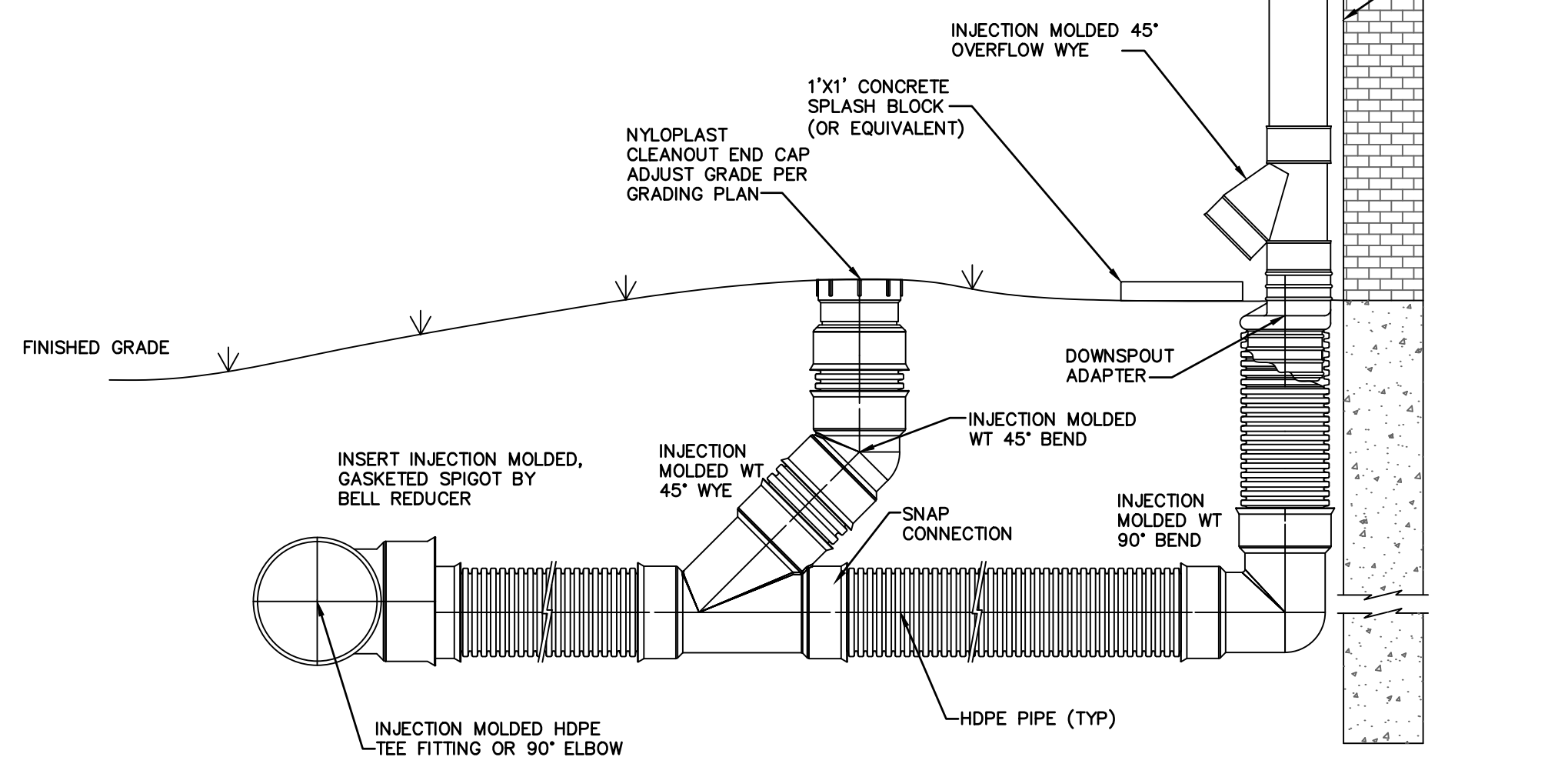
1. TRENCH DRAIN SHALL BE HEAVY DUTY TYPE DESIGNED FOR HS-20 LOADING.
2. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
3. TRENCH DRAIN GRATE SHALL MEET AMERICANS WITH DISABILITY ACT (ADA) REGULATIONS WHEN PLACES IN ACCESSIBLE ROUTES.
4. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS

TRENCH DRAIN

N.T.S.

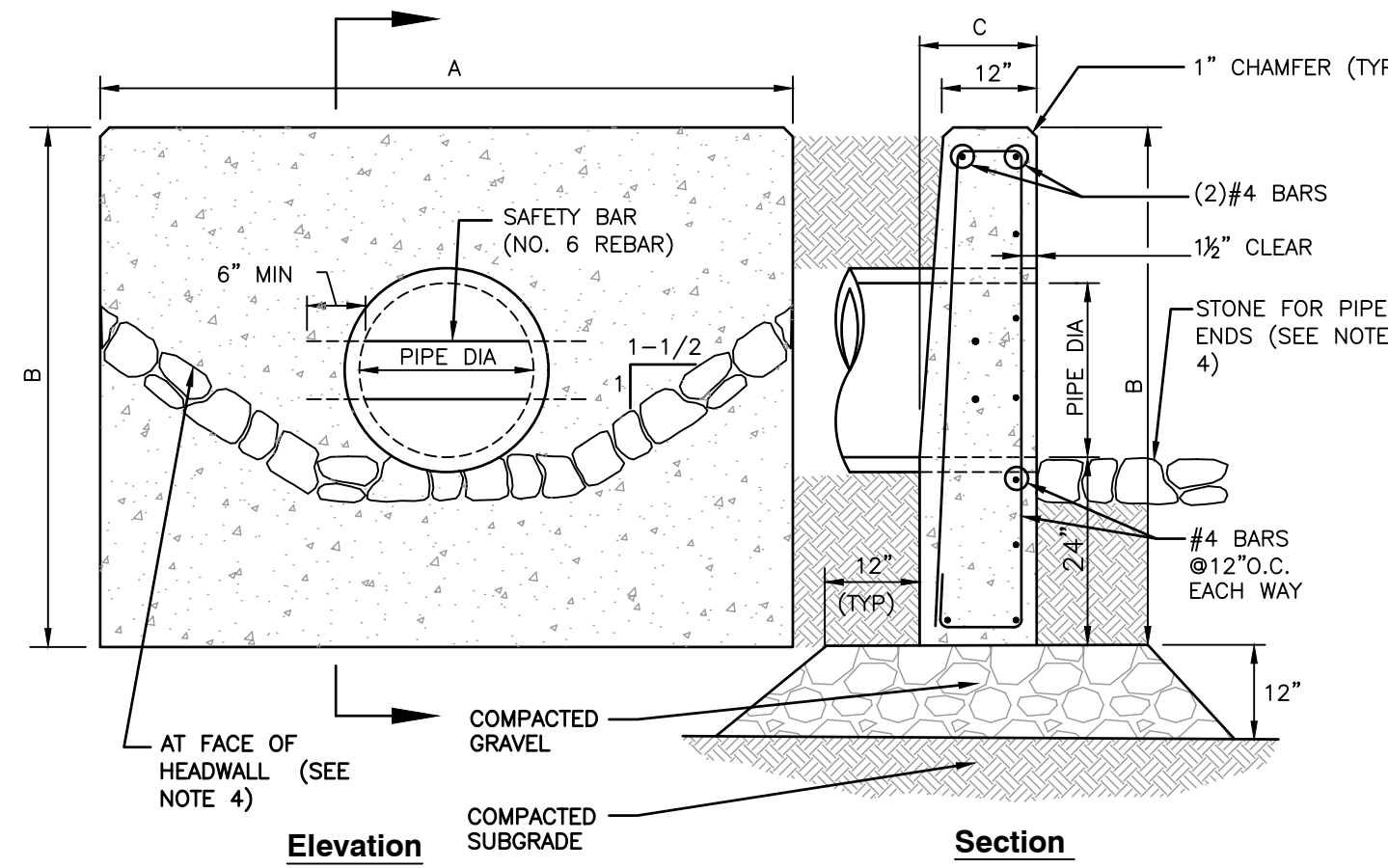
NOTES

1. INJECTION MOLDED FITTINGS ARE AVAILABLE IN TEES, WYES, REDUCERS, 45° BENDS AND BELL/BELL COUPLERS.
2. WATERTIGHT (WT) JOINTS SHOWN. SOIL-TIGHT (ST) FITTINGS ARE ALSO AVAILABLE.



ROOF DRAIN LEADER

N.T.S.



CONSTRUCTION NOTES

1. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
2. SAFETY BARS TO BE OMITTED WHERE INDICATED ON PLANS.
3. SAFETY BARS SHALL BE SET TO CREATE EQUAL OPENING DIMENSIONS.
4. SEE STONE PROTECTION AT HEADWALL DETAIL.

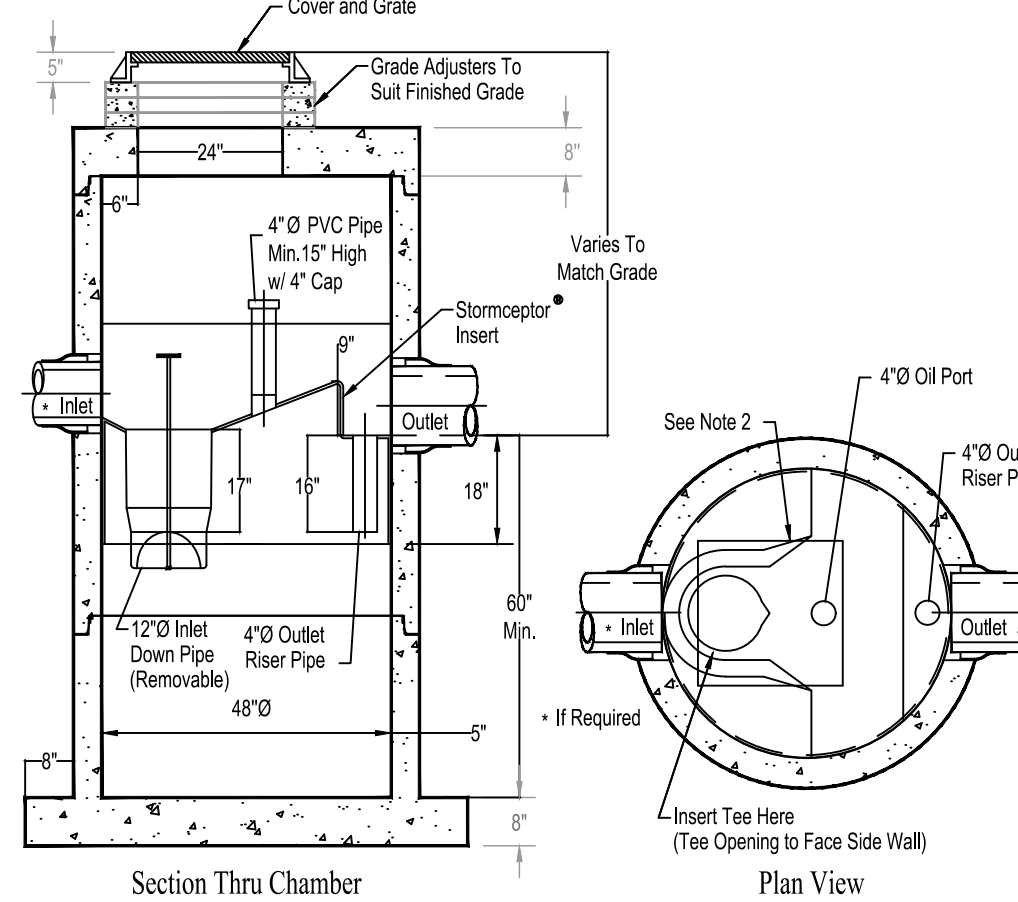
| PIPE DIA | A | B | C | # OF SAFETY BARS |
|----------|--------|--------|-------|------------------|
| 12" | 5'-6" | 4'-2" | 1'-6" | — |
| 15" | 6'-6" | 4'-5" | 1'-6" | — |
| 18" | 7'-6" | 4'-9" | 1'-6" | 1 |
| 24" | 9'-0" | 5'-3" | 1'-6" | 1 |
| 30" | 11'-0" | 5'-10" | 1'-6" | 2 |
| 36" | 13'-0" | 6'-4" | 1'-9" | 2 |
| 42" | 15'-9" | 6'-11" | 1'-9" | 3 |
| 48" | 17'-9" | 7'-5" | 2'-0" | 3 |
| 60" | 21'-9" | 8'-6" | 2'-6" | 4 |
| 72" | 25'-9" | 9'-7" | 3'-0" | 5 |

CONCRETE HEADWALL

N.T.S.

Rinker
Concrete Pipe Division

STC 450i Precast Concrete Stormceptor
(450 U.S. Gallon Capacity)



NOTES:

1. The Use Of Flexible Connection is Recommended At The Inlet and Outlet Where Applicable.
2. The Cover Should be Positioned Over The Inlet Drop Pipe and The Oil Port.
3. The Stormceptor System is protected by one or more of the following U.S. Patents: #4985148, #5498311, #5725760, #5753115, #5849181, #6068765, #6371690.
4. Contact a Concrete Pipe Division representative for further details not listed on this drawing.

Rinker 027

WATER QUALITY UNIT (450i)

N.T.S.

CEC

Civil & Environmental Consultants, Inc.

31 Bellows Road - Raynham, MA 02767
Ph: 774.501.2176 - 866.312.2024 - Fax: 774.501.2669
www.cecinc.com

**HERITAGE COMPANIES
THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS**

DRAWN BY: **DWP** CHECKED BY: **KPS** APPROVED BY: **DRAFT**
DATE: **JULY 21, 2020** DWG SCALE: **AS SHOWN** PROJECT NO: **193-187**

DETAIL SHEET 4

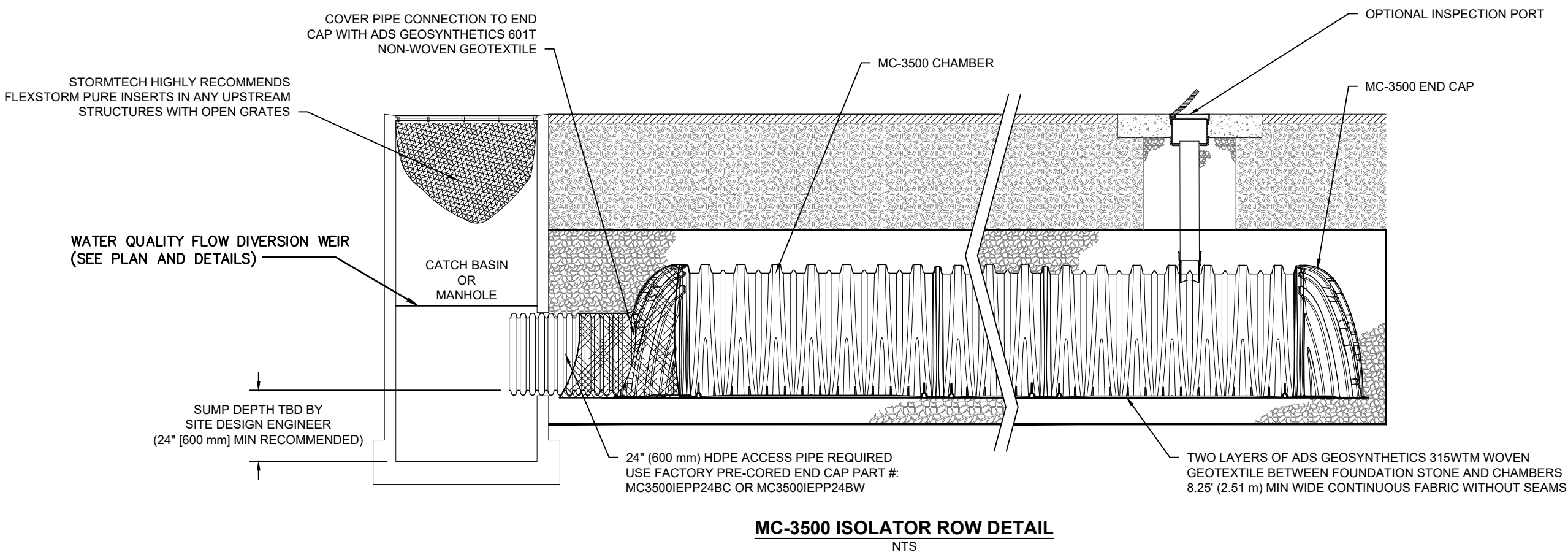
C803
SHEET 10 OF 12

| SUBMITTAL & REVISION RECORD | | |
|-----------------------------|-----------|--|
| NO | DATE | DESCRIPTION |
| 1 | 7/21/2020 | SUBMISSION FOR PLANNING, ZONING & CONSERVATION COMMISSION REVIEW |
| 2 | 8/4/2020 | REVISIONS PER TOWN COMMENTS |
| | | |
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**FOR PERMITTING ONLY
NOT FOR CONSTRUCTION**

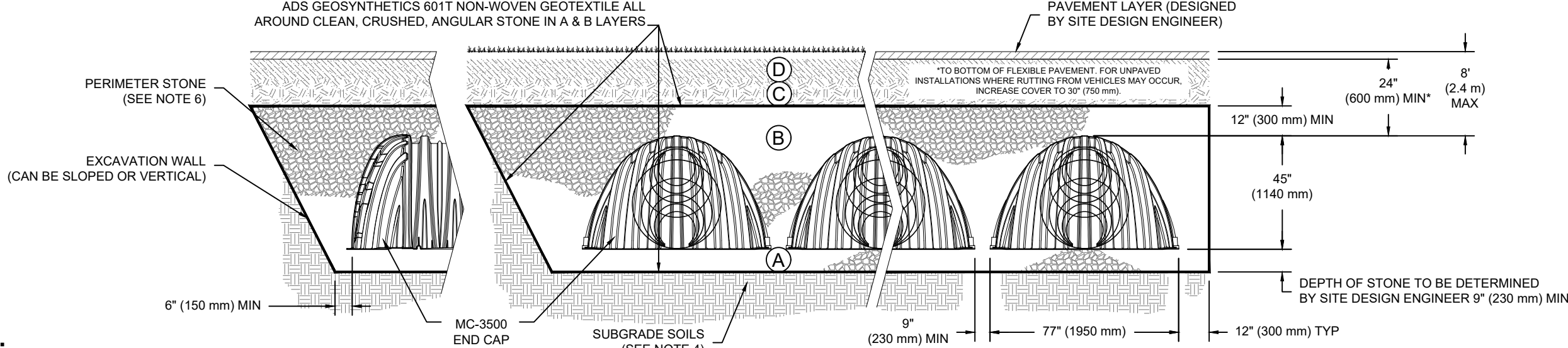
A: 1/2019 (193-187) - CADD [DWG] (DWG) - Revision 1 (193187-C001-2000.dwg) [CADD] LS: 9/1/2020 9:58 AM - LP: 9/1/2020 9:58 AM



ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

| MATERIAL LOCATION | DESCRIPTION | AASHTO MATERIAL CLASSIFICATIONS | COMPACTION / DENSITY REQUIREMENT |
|-------------------|--|---|---|
| D | FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER | N/A | PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS. |
| C | INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER. | GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 | BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL-GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. |
| B | EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE. | CLEAN, CRUSHED, ANGULAR STONE AASHTO M43 ¹ 3, 4 | NO COMPACTION REQUIRED. |
| A | FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER. | CLEAN, CRUSHED, ANGULAR STONE AASHTO M43 ¹ 3, 4 | PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{1, 2} |

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



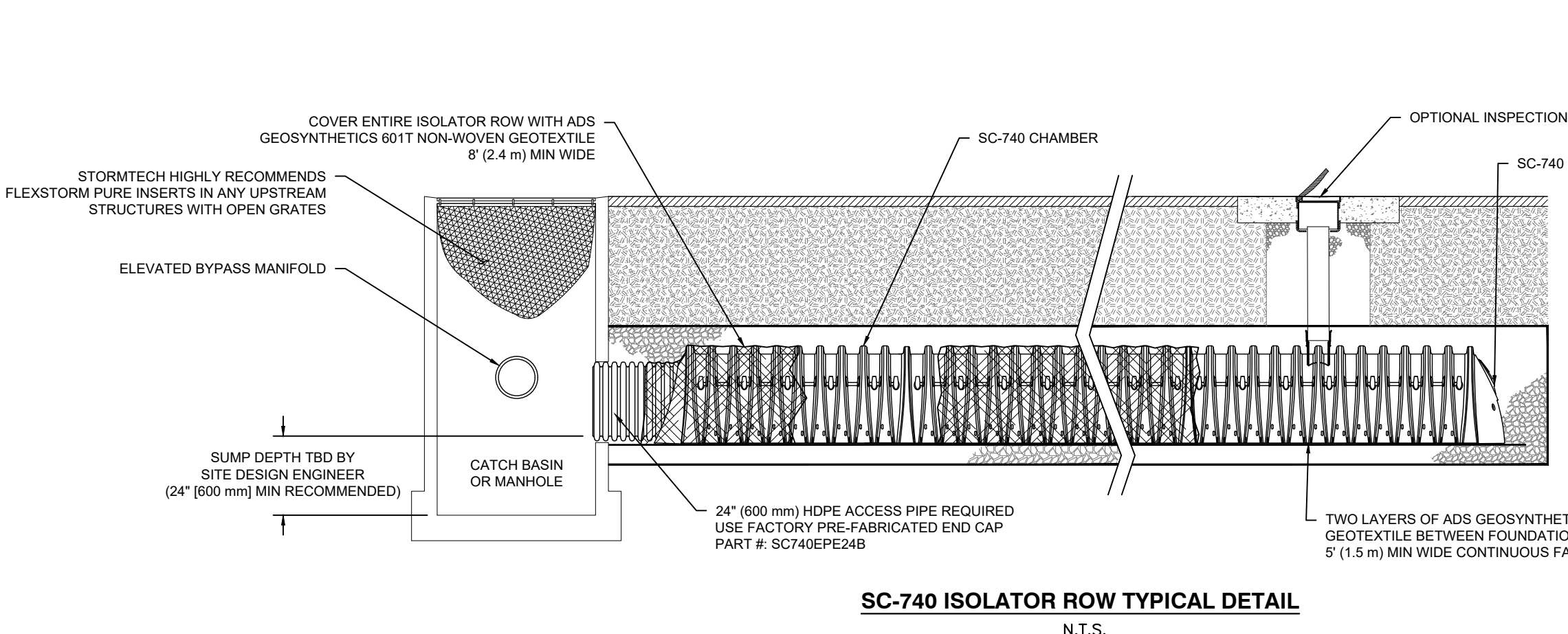
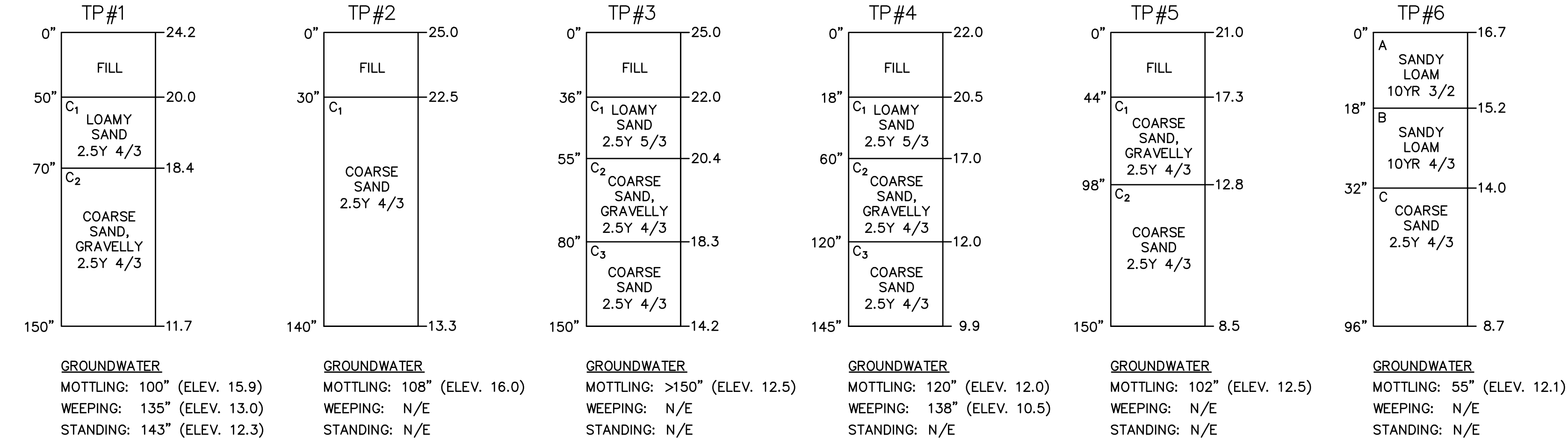
NOTES:

- MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL, LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

1
804
STORMTECH MC-3500 TYPICAL DETAIL
N.T.S.

SOIL DATA

DATE: 8-26-20
PERFORMED BY: JON C. CONNELL (SE #430)
WITNESSED BY: JAMES DONOVAN, P.E., WEYMOUTH PDW
MARY ELLEN SCHLOSS, WEYMOUTH CONSERVATION COMMISSION

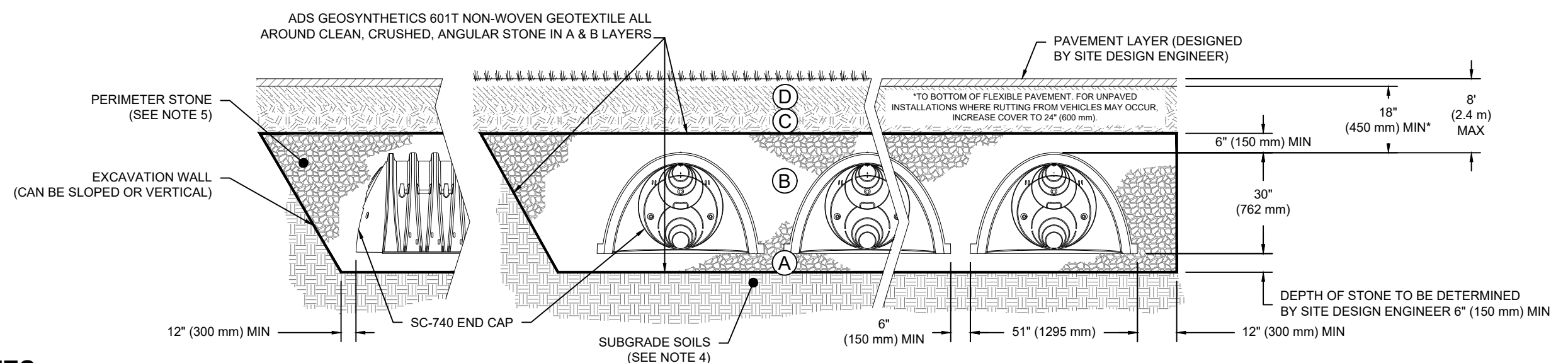


SC-740 ISOLATOR ROW TYPICAL DETAIL
N.T.S.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

| MATERIAL LOCATION | DESCRIPTION | AASHTO MATERIAL CLASSIFICATIONS | COMPACTION / DENSITY REQUIREMENT |
|-------------------|--|---|--|
| D | FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER | N/A | PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS. |
| C | INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER. | GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 | BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL-GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN). |
| B | EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE. | CLEAN, CRUSHED, ANGULAR STONE AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57 | NO COMPACTION REQUIRED. |
| A | FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER. | CLEAN, CRUSHED, ANGULAR STONE AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57 | PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2, 3} |

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

- SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL, LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

2
804
STORMTECH SC-740 TYPICAL DETAIL
N.T.S.

FOR PERMITTING ONLY
NOT FOR CONSTRUCTION



| SUBMITTAL & REVISION RECORD | |
|-----------------------------|-----------|
| NO | DATE |
| 1 | 7/21/2020 |
| 2 | 9/4/2020 |

Civil & Environmental Consultants, Inc.
31 Bellows Road • Raynham, MA 02767
Ph: 774.501.2176 • 866.312.2024 • Fax: 774.501.2669
www.cecinc.com

**HERITAGE COMPANIES
THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS**

DRAWN BY: **DWP** CHECKED BY: **KPS** APPROVED BY: **DRAFT**
DATE: **JULY 21, 2020** DWG SCALE: **AS SHOWN** PROJECT NO.: **193-187**

DETAIL SHEET 5

SHEET 11 OF 12

GENERAL NOTES:

THE STORM CAPTURE™ SYSTEM BY OLDCASTLE PRECAST IS PART OF THE STORMWATER MANAGEMENT SYSTEM FOR THE RESPECTIVE SITE, AS PREPARED BY THE PROJECT DESIGN ENGINEER. IT IS THE RESPONSIBILITY OF THE DESIGN ENGINEER TO DETERMINE DESIGN FLOW RATES, PRE-TREATMENT AND POST-TREATMENT REQUIREMENTS, STORAGE VOLUME, AND ENSURE THE FINAL DESIGN MEETS ALL CONVEYANCE AND STORAGE REQUIREMENTS. SYSTEM DESIGN AND TYPE, SOIL ANALYSIS, LOADING REQUIREMENTS, COVER HEIGHT AND MODULE SIZE DETERMINE THE FOUNDATION TYPE AND REQUIREMENTS AS STATED HEREIN. ANY VARIATIONS FOUND DURING CONSTRUCTION FROM THE SITE AND SYSTEM ANALYSIS MUST BE REPORTED TO THE PROJECT DESIGN ENGINEER. THE PROJECT DESIGN ENGINEER IS RESPONSIBLE FOR OBTAINING A GEOTECHNICAL ENGINEERING REPORT VERIFYING THE BEARING CAPACITY STATED IN DESIGN NOTES.

DESIGN NOTES:

- DESIGN LOADINGS:
 - AASHTO HS-20-44 W/ IMPACT.
 - DEPTH OF COVER = 6" - 5'-0".
 - ASSUMED WATER TABLE = BELOW BOTTOM.
 - EQUIVALENT FLUID PRESSURE = 45 PCF.
 - LATERAL LIVE LOAD SURCHARGE = 80 PSF.
 - NO LATERAL SURCHARGE FROM ADJACENT STRUCTURES.
- CONCRETE 28 DAY COMPRESSIVE STRENGTH SHALL BE 6,000 PSI.
- STEEL REINFORCEMENT: REBAR, ASTM A615, GRADE 60.
- CEMENT: ASTM C-150 SPECIFICATION.
- STORM CAPTURE MODULE TYPE - DETENTION.
- REQUIRED BASE LAYER DEPTH = 2" SAND BEDDING LAYER.
- REQUIRED NATIVE ALLOWABLE SOIL BEARING PRESSURE = 3,000 PSF.
- REFERENCE STANDARDS:
 - ASTM C 880
 - ASTM C 891
 - ASTM C 913
- LESS THAN 6" OR GREATER THAN 5' OF COVER REQUIRES CUSTOM STRUCTURAL DESIGN AND MAY REQUIRE THICKER SUBGRADE.

INSTALLATION NOTES:

- THE STORM CAPTURE™ MODULE SYSTEM IS TO BE INSTALLED IN ACCORDANCE WITH ASTM C891, INSTALLATION OF UNDERGROUND PRECAST UTILITY STRUCTURES. PROJECT PLAN AND SPECIFICATIONS MUST BE FOLLOWED ALONG WITH ANY APPLICABLE REGULATIONS.
- WHERE SPECIFIED, AN 8 OZ. NON-WOVEN GEOTEXTILE FABRIC MUST BE USED AS A SEPARATION LAYER AROUND THE STORM CAPTURE SYSTEM.
 - PENETRATIONS IN THE GEOTEXTILE MAY ONLY BE MADE WITH SMOOTH WALL PIPES. MAKE PENETRATIONS FOR ALL OUTLETS BEFORE MAKING PENETRATIONS FOR ANY INLETS.
 - ALL SUBGRADE MATERIALS IF SPECIFIED, MUST BE CLEAN, DURABLE CRUSHED AGGREGATE COMPACTED OR ROLLED TO ACHIEVE 85% STANDARD PROCTOR DENSITY. OLDCASTLE RECOMMENDS SIZE 5, 56 OR 57 (PER ASTM C33).
 - DESIGNATED EMBEDDED LIFTERS MUST BE USED. USE PROPER RIGGING TO ASSURE ALL LIFTERS ARE EQUALLY ENGAGED WITH A MINIMUM 60 DEGREE ANGLE ON SLINGS AS NOTED AND IN ACCORDANCE WITH OLDCASTLE LIFTING PROCEDURES.
 - MODULES MUST BE PLACED AS CLOSE TOGETHER AS POSSIBLE, AND GAPS SHALL NOT BE GREATER THAN 3/4". ALL EXTERIOR SYSTEM JOINTS SHALL BE COVERED WITH A MIN. 1" JOINT WRAP ON SIDES AND TOP (CS-102 CONSEAL OR EQUIVALENT). IN A CLASHBELL DESIGN, INSTALL ONE ROW CS-102 CONSEAL (OR EQUIVALENT) BETWEEN PRECAST PIECES.
 - AUTHORIZATION SHOULD BE GIVEN BY THE PROJECT ENGINEER OR DESIGNATED PERSON PRIOR TO PLACEMENT ON BACKFILL FOR THE SYSTEM. CARE SHOULD BE TAKEN DURING PLACEMENT OF BACKFILL NOT TO DISPLACE MODULES OR JOINT WRAP. BACKFILL SHALL BE COMPACTED TO 85% STANDARD PROCTOR DENSITY OR AS SPECIFIED, AND SHOULD NOT BE COMPACTED WITHIN 6" OF MODULE.
 - CONSTRUCTION EQUIPMENT EXCEEDING DESIGN LOADING SHALL NOT BE ALLOWED ON STRUCTURE.
 - TERMINODUCTS TO BE KNOCKED OUT AT SPECIFIED LOCATIONS IN FIELD BY OTHERS. SEE SITE LAYOUT FOR LOCATIONS.

INLETS AND RISERS:

ALL PIPE INLETS SHALL EXTEND INSIDE MODULE A MINIMUM OF 4". PLACE A NON-SHRINK, NON-METALIC GROUT, MIN. 3,000 PSI IN ANNULAR SPACE TO ELIMINATE ALL VOIDS.

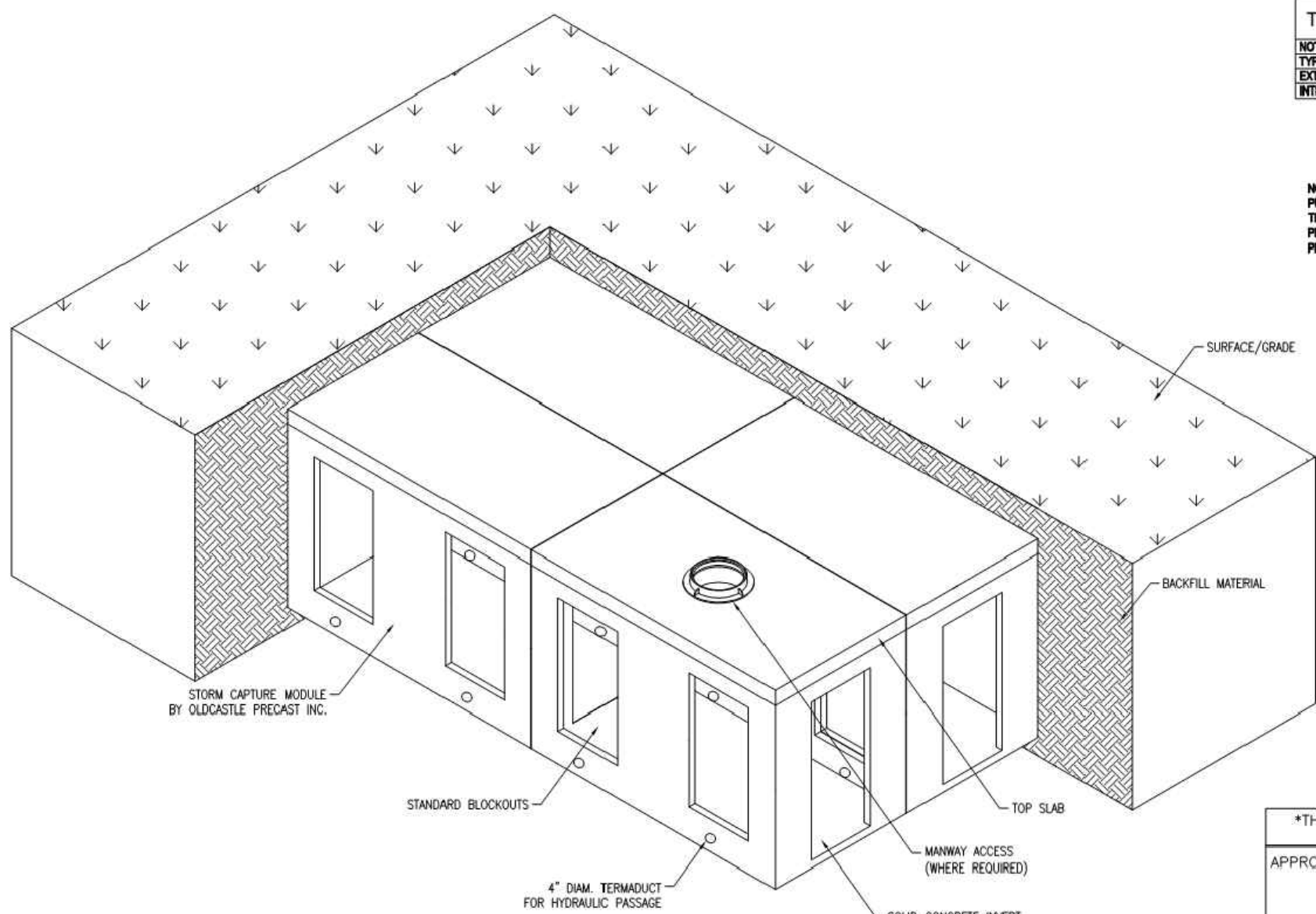
REVISIONS

| REVISION | DATE | SHEETS | DESCRIPTION OF REVISION |
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STORMCAPTURE™

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| NOTES & GENERAL | 1 |
| TYPICAL ELEVATION | 2 |
| EXTERIOR DETAILS | 3 |
| INTERIOR DETAILS | 4 |

NOTE: THIS VIEW IS FOR ILLUSTRATION PURPOSES ONLY TO SHOW FEATURES OF THE SYSTEM. ACTUAL LAYOUT VARIED BY PROJECT. SEE SITE PLAN AND/Or ALL PERIMETER WALLS ARE SOLID.



BOTTOM MODULE WITH TOP SLAB ISO VIEW
N.T.S.

THIS MUST BE FILLED OUT BEFORE MANUFACTURING BEGINS

APPROVED W/ NO EXCEPTIONS TAKEN: ☐

APPROVED AS NOTED: ☐

REVISE AND RESUBMIT: ☐

- PRELIMINARY -
NOT FOR CONSTRUCTION

SIGNATURE: _____ DATE: _____

Oldcastle®
Stormwater Solutions
1871 BUCKINGHAM AVE., SUITE 100, LITTLETON, CO 80120
PHONE: 303.948.8837 FAX: 303.948.8838

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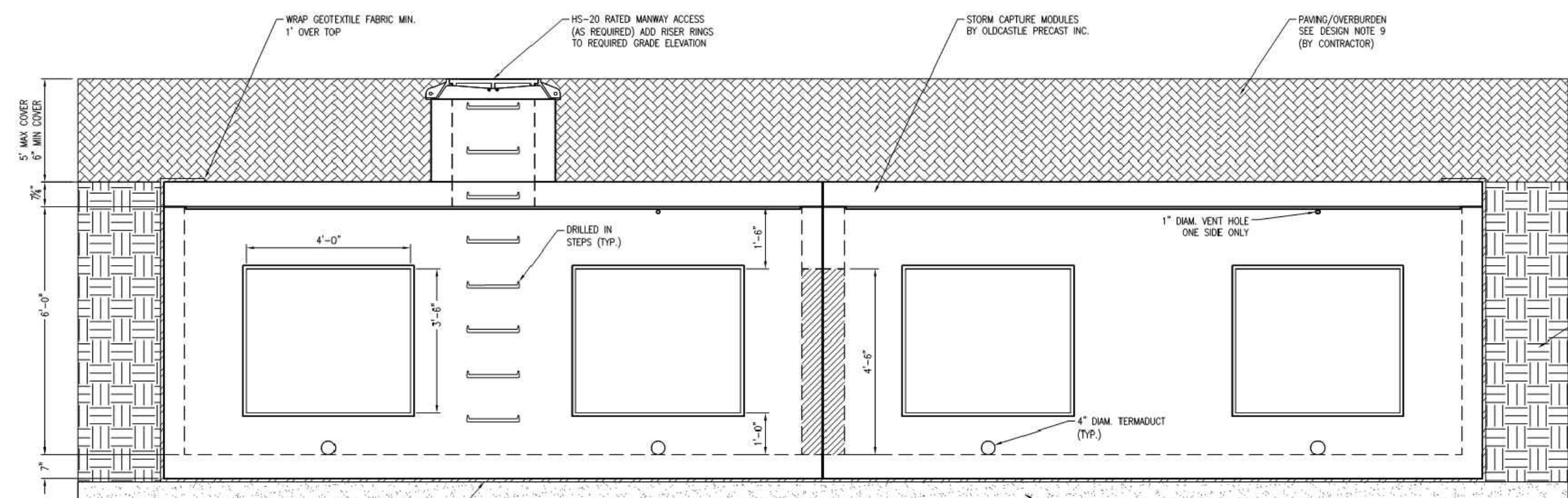
STORMCAPTURE
NOTES & GENERAL

CUSTOMER: _____

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|-----------|-------|-------|----------|---------|--------|-------|
| DATE | SHEET | DRAWN | REVISION | CHECKED | SCALE | ORDER |
| 7/21/2020 | 1 | STS | JH | STS | 1 OF 4 | |

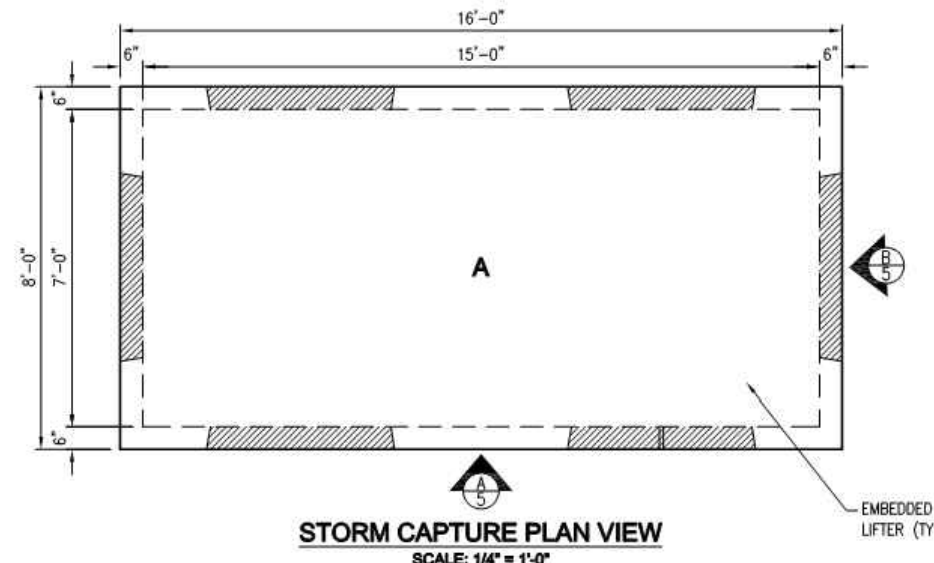
SC - 6 ft base with top slab

STORMCAPTURE™

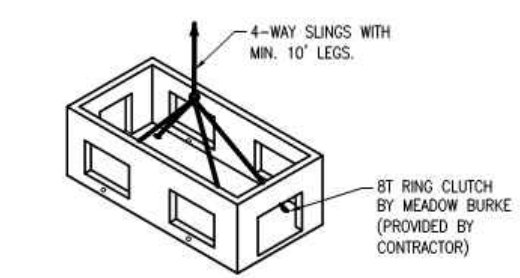


TYPICAL ELEVATION
SCALE: 3/8" = 1'-0"

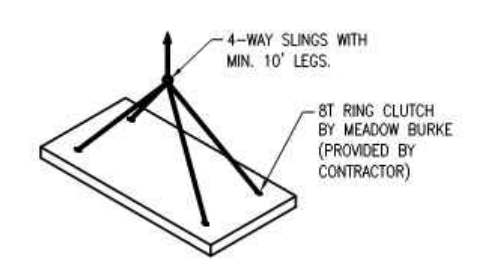
- PRELIMINARY -
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STORM CAPTURE PLAN VIEW
SCALE: 1/4" = 1'-0"



BOTTOM MODULE LIFTING DETAIL
N.T.S.



TOP SLAB LIFTING DETAIL
N.T.S.

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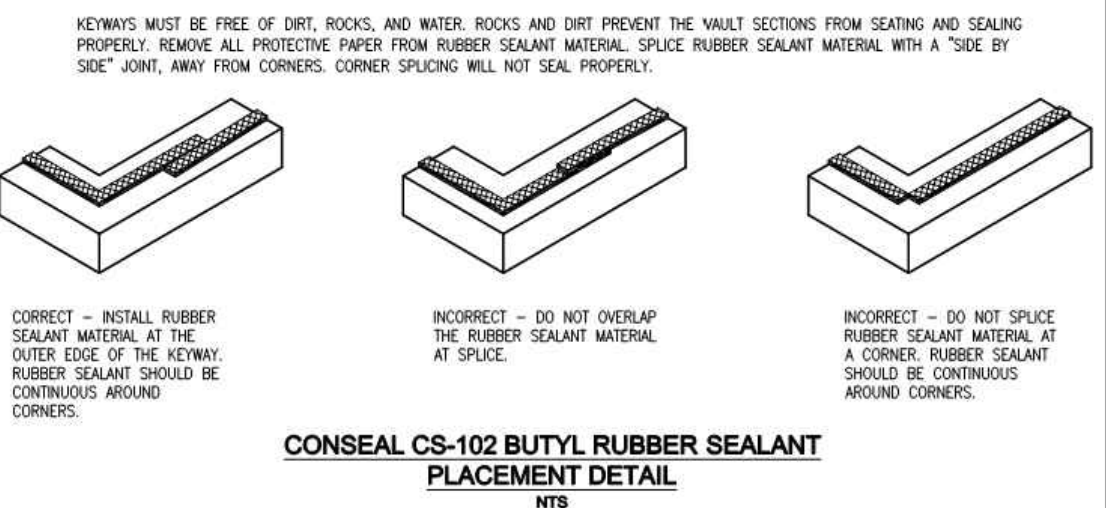
STORMCAPTURE
EXTERIOR DETAILS

CUSTOMER: _____

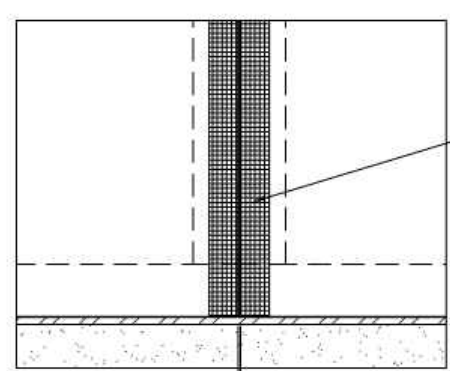
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| DATE | SHEET | DRAWN | REVISION | CHECKED | SCALE | ORDER |
| 7/21/2020 | 1 | STS | JH | STS | 4 OF 4 | |

SC - 6 ft base with top slab

STORMCAPTURE™



CONSEAL CS-102 BUTYL RUBBER SEALANT
PLACEMENT DETAIL
N.T.S.



MODULE JOINT DETAIL
SCALE: 1/2" = 1'-0"

- PRELIMINARY -
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STORMCAPTURE
EXTERIOR DETAILS

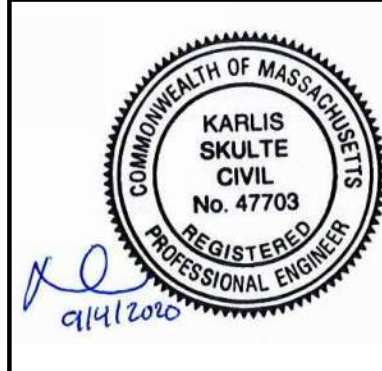
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| DATE | SHEET | DRAWN | REVISION | CHECKED | SCALE | ORDER |
| 7/21/2020 | 1 | STS | JH | STS | 3 OF 4 | |

SC - 6 ft base with top slab

STORMCAPTURE DETENTION CHAMBER DETAILS

1 805 N.T.S.



| SUBMITTAL & REVISION RECORD | | |
|-----------------------------|-----------|--|
| NO | DATE | DESCRIPTION |
| 1 | 7/21/2020 | SUBMISSION FOR PLANNING, ZONING & CONSERVATION COMMISSION REVIEW |
| 2 | 8/4/2020 | REVISIONS PER TOWN COMMENTS |
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FOR PERMITTING ONLY
NOT FOR CONSTRUCTION



Civil & Environmental Consultants, Inc.
31 Bellows Road - Raynham, MA 02767
Ph: 774.501.2176 • 866.312.2024 • Fax: 774.501.2669
www.cecinc.com

HERITAGE COMPANIES
THE OVERLOOK
44 WHARF STREET
WEYMOUTH, MASSACHUSETTS

| | | | | | |
|-----------|---------------|-------------|----------|--------------|---------|
| DRAWN BY: | DWP | CHECKED BY: | KPS | APPROVED BY: | DRAFT |
| DATE: | JULY 21, 2020 | DWG SCALE: | AS SHOWN | PROJECT NO.: | 193-187 |

DETAIL SHEET 6

DRAWING NO.:
C805
SHEET 12 OF 12

UTILITIES:

THE FOLLOWING COMPANIES WERE NOTIFIED BY MASSACHUSETTS ONE-CALL SYSTEM (1-888-344-7233) AND REQUESTED TO MARK OUT UNDERGROUND FACILITIES AFFECTING AND SERVICING THIS SITE. THE UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS BASED UPON THE UTILITY COMPANIES RESPONSE TO THIS REQUEST. REQUEST NUMBER: 20201601099

| UTILITY COMPANY | PHONE NUMBER |
|------------------------------------|--------------|
| AT&T TRANSMISSION | 800.331.0500 |
| VERIZON | 800.922.0204 |
| COMCAST- MA | 800.649.9364 |
| NATIONAL GRID ELECTRIC - MASS ELEC | 800.322.3223 |
| NATIONAL GRID GAS - BOSTON | 800.233.5325 |
| WEYMOUTH PUBLIC WORKS DEPARTMENT | 781.337.5100 |

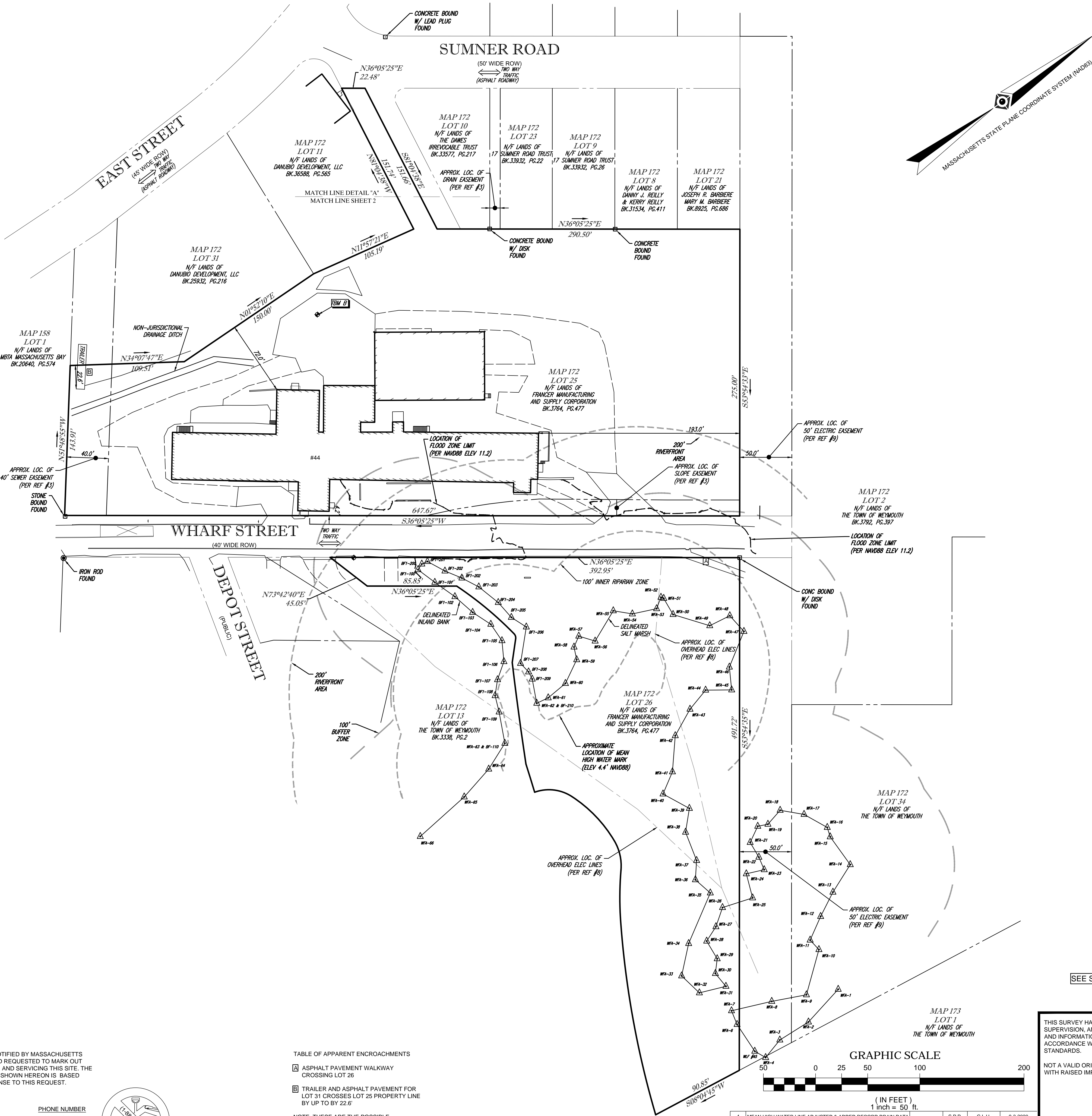


TABLE OF APPARENT ENCROACHMENTS

- ASPHALT PAVEMENT WALKWAY CROSSING LOT 26
- TRAILER AND ASPHALT PAVEMENT FOR LOT 31 CROSSES LOT 25 PROPERTY LINE BY UP TO BY 22.6'

NOTE: THESE ARE THE POSSIBLE ENCROACHMENTS OBSERVED DURING THE FIELD SURVEY. THERE MAY BE OTHERS NOT RECOGNIZED BY THE SURVEYOR.

MBTA RAILROAD F.K.A. OLD COLONY RAILROAD



SEE SHEET 2 & 3 FOR TOPOGRAPHIC DETAIL

THIS SURVEY HAS BEEN PERFORMED IN THE FIELD UNDER MY SUPERVISION, AND TO THE BEST OF MY KNOWLEDGE, BELIEF, AND INFORMATION, THIS SURVEY HAS BEEN PERFORMED IN ACCORDANCE WITH CURRENTLY ACCEPTED ACCURACY STANDARDS.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR STAMPED WITH A BLUE INK SEAL

GERRY L. HOLDRIGHT, PLS
MASSACHUSETTS PROFESSIONAL LAND SURVEYOR #49211



9-03-2020

DATE

FIELD DATE

4-25-2020

FIELD BOOK NO.

20-02MA

FIELD BOOK PGS.

63-68 & 83

FIELD CREW

S.B.H.

DRAWN:

B.A.V.

REVIEWED:

S.P.P.

BOUNDARY & TOPOGRAPHIC SURVEY
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

44 WHARF STREET
LOT 25 & 26, MAP 19
TOWN OF WEYMOUTH, NORFOLK COUNTY
COMMONWEALTH OF MASSACHUSETTS

CONTROL POINT ASSOCIATES, INC.
332 TURNPIKE ROAD
SOUTH BOKROUCH, MA 01772
508.948.3000 - 508.948.3003 FAX

ALBANY, NY 518.217.5010
CHALFONT, PA 215.712.8800
HAUPPAUGE, NY 631.580.7845
MANHATTAN, NY 646.780.0411
MT LAUREL, NJ 609.857.2099
WARREN, NJ 908.668.0099

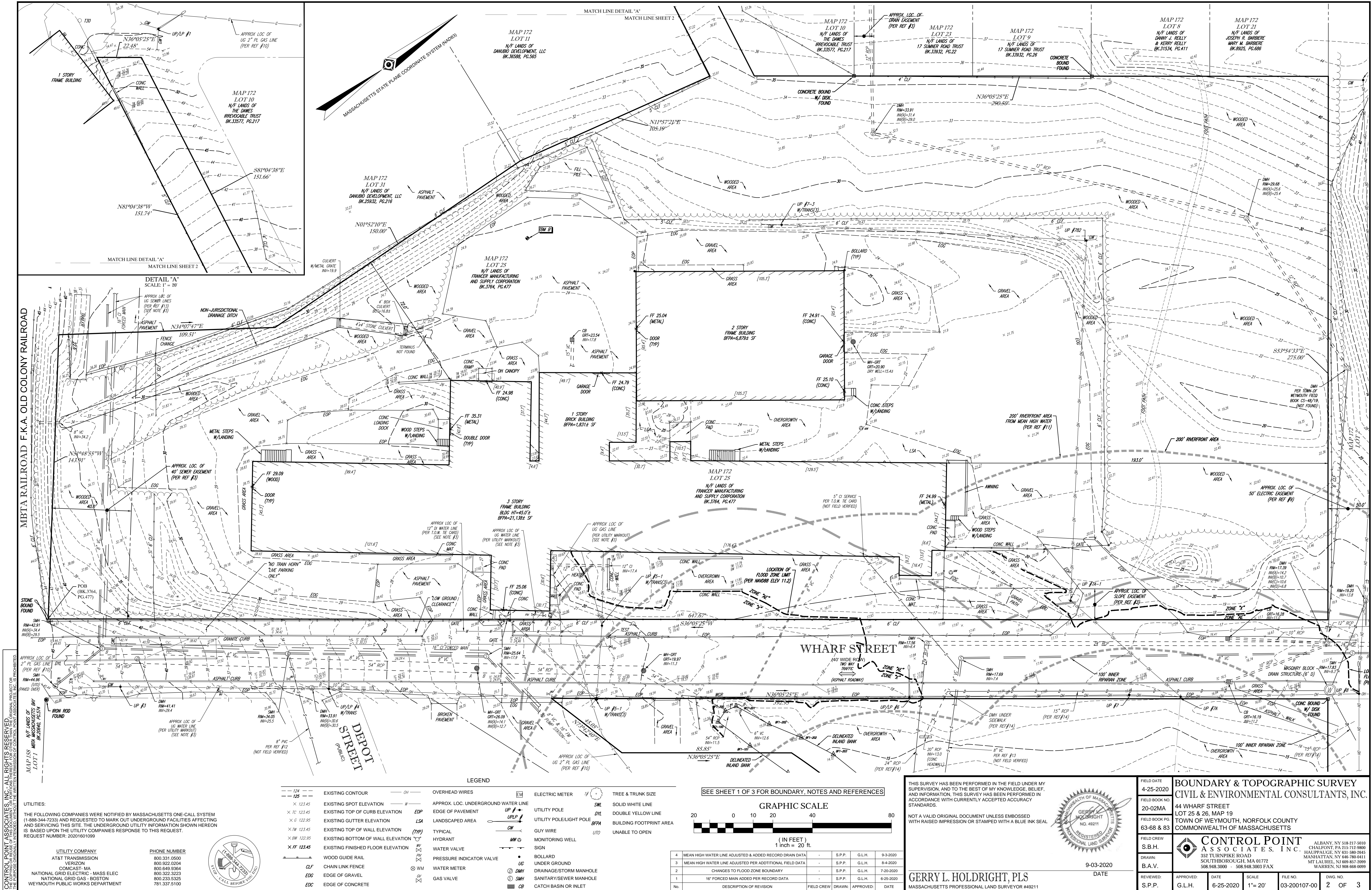
APPROVED: G.L.H. DATE: 6-25-2020 SCALE: 1"= 50' FILE NO.: 03-200107-00 DWG. NO.: 1 OF 3

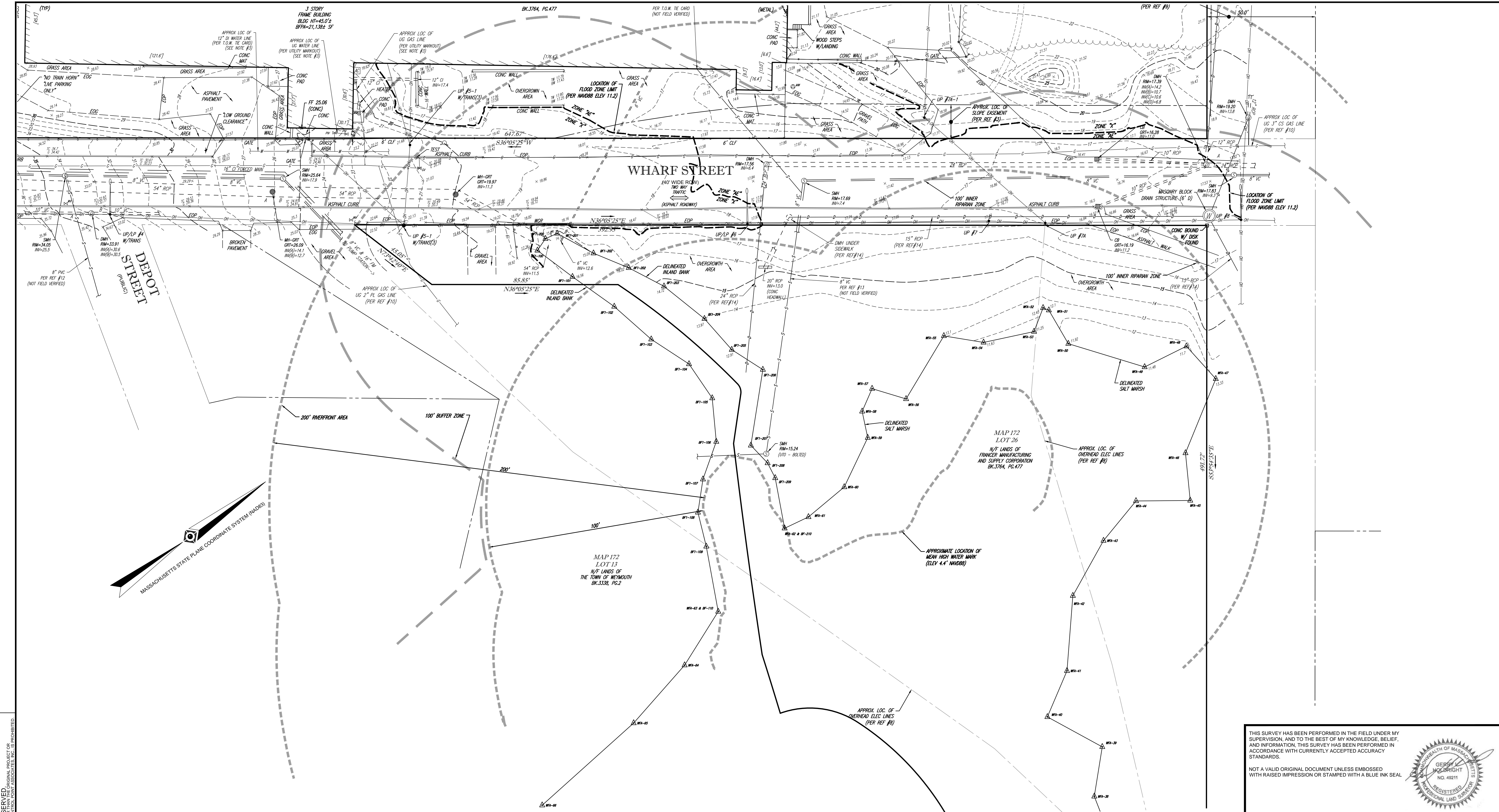
NOTES:

- PROPERTY KNOWN AS LOTS 25 & 26 AS SHOWN ON THE TOWN OF WEYMOUTH, NORFOLK COUNTY, COMMONWEALTH OF MASSACHUSETTS MAP NO. 19.
 - LOT 25 AREA = 153,276 SQUARE FEET OR 3.519 ACRES
LOT 26 AREA = 85,605 SQUARE FEET OR 1.962 ACRES
TOTAL AREA = 238,881 SQUARE FEET OR 5.481 ACRES
 - LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS, ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF THE SURVEY. AVAILABLE AS-BUILT PLANS AND UTILITY MARKOUT DOES NOT ENSURE MAPPING OF ALL UNDERGROUND UTILITIES AND STRUCTURES. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES. CONTROL POINT ASSOCIATES, INC. DOES NOT GUARANTEE THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA EITHER IN SERVICE OR ABANDONED.
 - THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
 - THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN.
 - BY GRAPHIC PLOTTING ONLY PROPERTY IS LOCATED IN THE FOLLOWING FLOOD HAZARD ZONES: ZONE 'X-UNSHADED' (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN), ZONE 'AE' (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD, WHERE THE BASE FLOOD ELEVATION IS DETERMINED, EL+10), & ZONE 'REGULATORY FLOOD WAY' (FLOODWAY AREAS IN ZONE 'AE'. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASE IN THE FLOOD HEIGHTS.) PER REF. #2
 - THE EXISTENCE OF UNDERGROUND STORAGE TANKS, IF ANY, WAS NOT KNOWN AT THE TIME OF THE FIELD SURVEY.
 - ELEVATIONS REFER TO THE TOWN OF WEYMOUTH VERTICAL DATUM OBTAINED BY ADDING 6.63 FEET TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), WHICH WAS ESTABLISHED BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNETGPS) TAKEN AT THE TIME OF THE FIELD SURVEY. THE FEMA FLOOD HAZARD ZONE (AE, ELEVATION 10) SHOWN HEREON REPRESENTS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
- TEMPORARY BENCH MARKS SET:
- TBM-A: RR SPIKE IN UTILITY POLE #5-1, ELEVATION = 23.26'
- TBM-B: MAG NAIL IN ASPHALT PAVEMENT, ELEVATION = 24.56'
- PRIOR TO CONSTRUCTION IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE BENCHMARKS ILLUSTRATED ON THIS SKETCH HAVE NOT BEEN DISTURBED AND THEIR ELEVATIONS HAVE BEEN CONFIRMED. ANY CONFLICTS MUST BE REPORTED PRIOR TO CONSTRUCTION.
- THE DELINEATION LINE WAS PLACED IN THE FIELD BY LUCAS ENVIRONMENTAL, LLC IN APRIL, 2020 AND FIELD LOCATED BY CONTROL POINT ASSOCIATES, INC. ON 4/17/2020.
 - THE OFFSETS SHOWN ARE NOT TO BE USED FOR THE CONSTRUCTION OF ANY STRUCTURE, FENCE, PERMANENT ADDITION, ETC.

REFERENCES:

- THE TAX ASSESSOR'S MAP OF WEYMOUTH, NORFOLK COUNTY, MAP 19.
- MAP ENTITLED 'NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, NORFOLK COUNTY, MASSACHUSETTS (ALL JURISDICTIONS), PANEL 231 OF 430,' MAP NUMBER 25021C0231E, EFFECTIVE DATE: JULY 17, 2012.
- MAP ENTITLED 'SUBDIVISION PLAN OF LAND EAST STREET & WHARF STREET, WEYMOUTH MASSACHUSETTS', PREPARED BY: CCR ASSOCIATES, DATED: NOVEMBER 12, 2003, RECORDED WITH THE NORFOLK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 520 PAGE 85.
- MAP ENTITLED 'PLAN SHOWING SUBDIVISION OF LAND IN EAST WEYMOUTH, MASS. FOR WEYMOUTH INDUSTRIAL ASSOCIATION', PREPARED BY: RUSSELL H. WHITTING, DATED: MARCH 30, 1921, RECORDED WITH THE NORFOLK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 1486 PAGE 501.
- MAP ENTITLED 'PLAN OF LAND WEYMOUTH, MASS. FOR GEO. E. KEITH COMPANY', PREPARED BY: RUSSELL H. WHITTING, DATED: JANUARY 8, 1921, RECORDED WITH THE NORFOLK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 98 PAGE 4764.
- MAP ENTITLED 'TAKING OF FEES & EASEMENTS EAST WEYMOUTH PUMPING STATION', PREPARED BY: THE SEWER DEPARTMENT OF WEYMOUTH, AS PLAN T-31-54, DATED: JULY 1, 1989, RECORDED WITH THE NORFOLK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 3338 PAGE 2.
- MAP ENTITLED 'COMPILED PLAN OF LAND DEPOT STREET WEYMOUTH, MASS.', PREPARED BY: C.F. ARNOLD ASSOCIATES, INC., DATED: MARCH 21, 1995, RECORDED WITH THE NORFOLK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 430 PAGE 302.
- MAP ENTITLED 'PLAN OF LAND IN WEYMOUTH, MASS. OF THE TOWN DUMP', PREPARED BY: FRANK A. LAGROTTERIA: MARCH 25, 1959, RECORDED WITH THE NORFOLK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 208 PAGE 65.
- MAP ENTITLED 'PROPOSED PARK AN RECREATION LAND DESIGNATION AT CAPPED LANDFILL SITE, WHARF STREET', PREPARED BY: DEPARTMENT OF PUBLIC WORKS TOWN OF WEYMOUTH, DATED: JANUARY 7, 2017, RECORDED WITH THE NORFOLK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 658 PAGE 100.
- GAS MAPPING PROVIDED BY NATIONAL GRID GAS - BOSTON.
- MAPPING OF RIVERFRONT AREA, BASED ON ELEVATIONS ON NAVD88, PROVIDED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
- MAP ENTITLED 'TOWN OF WEYMOUTH DEPARTMENT OF PUBLIC WORKS, SEWER RECORD PLAN, DEPOT STREET', DATED NOVEMBER 11, 2005, PROVIDED BY THE TOWN OF WEYMOUTH D.P.W.
- MAP ENTITLED 'TOWN OF WEYMOUTH DEPARTMENT OF PUBLIC WORKS, SEWER RECORD PLAN WHARF STREET INCINERATOR', DATED JANUARY 17, 1974, PROVIDED BY THE TOWN OF WEYMOUTH D.P.W.
- MAP ENTITLED 'COMBINED DRAIN STUDY, 2017-28, 2018-18 & 2018-18/8-10-2020,' PREPARED BY THE TOWN WEYMOUTH

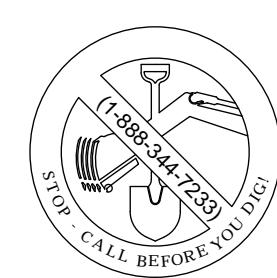




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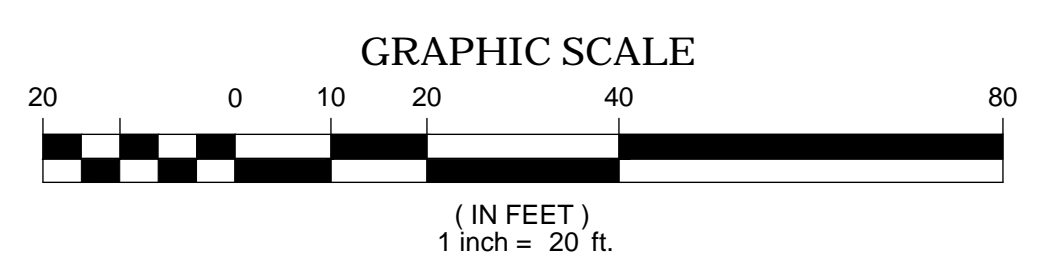
UTILITIES:
THE FOLLOWING COMPANIES WERE NOTIFIED BY MASSACHUSETTS ONE-CALL SYSTEM (1-888-344-7233) AND REQUESTED TO MARK OUT UNDERGROUND FACILITIES AFFECTING AND SERVICING THIS SITE. THE UNDERGROUND UTILITY INFORMATION SHOWN HEREON IS BASED UPON THE UTILITY COMPANIES RESPONSE TO THIS REQUEST.
REQUEST NUMBER: 20201601099

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| UTILITY COMPANY | PHONE NUMBER |
| AT&T TRANSMISSION | 800.331.0500 |
| VERIZON | 800.922.0204 |
| COMCAST - MA | 800.649.9364 |
| NATIONAL GRID ELECTRIC - MASS ELEC | 800.322.3223 |
| NATIONAL GRID GAS - BOSTON | 800.233.5325 |
| WYOMOUTH PUBLIC WORKS DEPARTMENT | 781.337.5100 |



| LEGEND | | | |
|--------|-----------------------------------|--|-------------------------------------|
| | EXISTING CONTOUR | | OVERHEAD WIRES |
| | EXISTING SPOT ELEVATION | | APPROX. LOC. UNDERGROUND WATER LINE |
| | EXISTING TOP OF CURB ELEVATION | | EDGE OF PAVEMENT |
| | EXISTING GUTTER ELEVATION | | LANDSCAPED AREA |
| | EXISTING TOP OF WALL ELEVATION | | TYPICAL HYDRANT |
| | EXISTING BOTTOM OF WALL ELEVATION | | WATER VALVE |
| | EXISTING FINISHED FLOOR ELEVATION | | PRESSURE INDICATOR VALVE |
| | CHAIN LINK FENCE | | WATER METER |
| | EDGE OF GRAVEL | | GAS VALVE |
| | EDGE OF CONCRETE | | |
| | ELECTRIC METER | | TREE & TRUNK SIZE |
| | UTILITY POLE | | SOLID WHITE LINE |
| | UTILITY POLE/LIGHT POLE | | DOUBLE YELLOW LINE |
| | GUY WIRE | | BUILDING FOOTPRINT AREA |
| | MONITORING WELL | | UNABLE TO OPEN |
| | SIGN | | |
| | BOLLARD | | |
| | UNDER GROUND | | |
| | DRAINAGE/STORM MANHOLE | | |
| | SANITARY/SEWER MANHOLE | | |
| | CATCH BASIN OR INLET | | |

SEE SHEET 1 OF 3 FOR BOUNDARY, NOTES AND REFERENCES



| No. | DESCRIPTION OF REVISION | FIELD CREW | DRAWN | APPROVED | DATE |
|-----|---|------------|--------|----------|-----------|
| 4 | MEAN HIGH WATER LINE ADJUSTED & ADDED RECORD DRAIN DATA | - | S.P.P. | G.L.H. | 9-3-2020 |
| 3 | MEAN HIGH WATER LINE ADJUSTED PER ADDITIONAL FIELD DATA | - | S.P.P. | G.L.H. | 8-4-2020 |
| 2 | CHANGES TO FLOOD ZONE BOUNDARY | - | S.P.P. | G.L.H. | 7-20-2020 |
| 1 | 16" FORCED MAIN ADDED PER RECORD DATA | - | S.P.P. | G.L.H. | 6-25-2020 |
| No. | DESCRIPTION OF REVISION | FIELD CREW | DRAWN | APPROVED | DATE |

THIS SURVEY HAS BEEN PERFORMED IN THE FIELD UNDER MY SUPERVISION, AND TO THE BEST OF MY KNOWLEDGE, BELIEF, AND INFORMATION, THIS SURVEY HAS BEEN PERFORMED IN ACCORDANCE WITH CURRENTLY ACCEPTED ACCURACY STANDARDS.

NOT A VALID ORIGINAL DOCUMENT UNLESS EMBOSSED WITH RAISED IMPRESSION OR STAMPED WITH A BLUE INK SEAL

9-03-2020
DATE

GERRY L. HOLDRIGHT, PLS
MASSACHUSETTS PROFESSIONAL LAND SURVEYOR #49211

BOUNDARY & TOPOGRAPHIC SURVEY
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

FIELD DATE: 4-25-2020
FIELD BOOK NO: 20-02MA
FIELD BOOK PG: 63-68 & 83
FIELD CREW: S.B.H.
DRAWN: B.A.V.
REVIEWED: S.P.P.

44 WHARF STREET
LOT 25 & 26, MAP 19
TOWN OF WYOMOUTH, NORFOLK COUNTY
COMMONWEALTH OF MASSACHUSETTS

CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX

ALBANY, NY 518.217.5010
CHALFONT, PA 215.712.8800
HAUPPAUGE, NY 631.980.9845
MANHATTAN, NY 646.780.0411
MT LAUREL, NJ 609.857.2099
WARREN, NJ 908.468.0099

FILE NO. 03-200107-00
DWG. NO. 3 OF 3