# Stormwater Management Report

**Owner:**
United Properties
250 Nicollet Mall, #500
Minneapolis, MN 55401

**Project:**
Amira Villas Minnetonka
901 Carlson Parkway
Minnetonka, MN 55305

## Engineer's Certification:

All plans and supporting Documentation contained in this report have been reviewed by me and it is hereby certified that to the best of my knowledge the plans comply with the requirements of the ordinance.

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

David J. Knaeble P.E.

Registration Number: 48776

**Date:**
6/7/24

# Table of Contents:



## Figures:



## Appendices:

# 2.0 Summary Analysis / Narrative:

## 2.1 Introduction:

This stormwater management report accompanies the Civil Engineering Plans prepared by Civil Site Group for the subject project dated 6/7/24. This report includes a summary of the existing and proposed site conditions, the stormwater requirements of relevant regulatory agencies, and proposed design calculations and data to meet the requirements.

## 2.2 Existing Site Conditions :

Site Description:
The existing site is a vacant lot adjacent to a recently constructed apartment building. Below is the existing surface area tabulation.

**Existing Conditions**

| Drainage Area | Impervious Area | | Pervious Area | | Total Area | |
|---|---|---|---|---|---|---|
| | Area [SF] | CN Value | Area [SF] | CN Value | Area [SF] | CN Value |
| EX1 | 9729 | 98 | 51485 | 80 | 61214 | 83 |
| EX2 | 687 | 98 | 39156 | 80 | 39843 | 80 |

Existing Soils:
A geotechnical evaluation report was completed by Braun Intertec Corporation dated April 19, 2024. This report determined the soils on site are a mix of topsoil and fill soils consisting of clayey sands, fat clays and lean clays and sandy lean clays. For the purposes of this report, soils have been assumed to have a hydrologic soil group “D” designation and are not conducive to infiltration.

Groundwater:
Groundwater was only observed in one of the soil borings at an approximate elevation of 963. This was deemed to be a perched condition and the groundwater was expected to be below that elevation. The deepest boring reached an approximate elevation of 945.7.

## 2.3 Proposed Site Conditions:

Site Description:
The proposed site is a multi-building rental townhome community with drive lanes, landscaping, utility and stormwater improvements.

The proposed site surface coverage areas are shown in the table below:

**Proposed Conditions**

| Drainage Area | Impervious Area | | Pervious Area | | Total Area | |
|---|---|---|---|---|---|---|
| | Area [SF] | CN Value | Area [SF] | CN Value | Area [SF] | CN Value |
| PR1A | 61334 | 98 | 12140 | 80 | 73474 | 95 |
| PR1B | 4181 | 98 | 10312 | 80 | 14493 | 85 |
| PR2 | 2797 | 98 | 10293 | 80 | 13090 | 84 |

## 2.4 Stormwater Requirements City (Minnetonka):

**Requirement threshold** - Projects that disturb 50 cubic yards of earth or more, or disturb 5,000 square feet of surface area.
**Rate Control** – Limit peak runoff flow rates to existing conditions for 2-YR, 10-YR, and 100-YR frequency storms (nested 24-hour distribution).
**Water Quality** – If unique, site-specific constraints preclude infiltration, 60% TP and 90% TSS removal and no net increase in TP or TSS annually must be met.

**Volume Control** – Retain 1.1 inches of runoff on-site from applicable impervious surfaces.

**2.5 Stormwater Requirements Watershed District – (Minnehaha Creek Watershed District):**

**Requirement threshold** – New development sites larger than one acre and that will result in more than 20% impervious surface over the site.
**Rate Control** – No net increase in the peak runoff rate for the 1-, 10- and 100-year design storms where stormwater discharges across the downgradient site boundary, compared to the rate for the site in its existing condition.
**Water Quality** – No net increase in phosphorus loading from existing conditions.
**Volume Control** – Abstraction of the first inch of rainfall from the site's impervious surface.

**MCWD is not a reviewing authority for projects within the City of Minnetonka. The City of Minnetonka acts as the LGU and issues the permits.**

**2.6 Stormwater Requirements - Minnesota Pollution Control Agency – NPPDES permit (MPCA):**

**Requirement threshold -** A permit is required for projects with a disturbed area over 1 acre in size, Stormwater management is required for a project adding 1-acre of more of NEW impervious surface (reconstructed impervious is not included).
**Rate Control** – No specific regulation, may not degrade downstream facilities.
**Water Quality** – Stormwater water quality treatment volume must be provided equal to 1.0" over all new impervious surfaces (includes all newly constructed impervious surfaces only, re-constructed impervious surfaces are not included).
**Volume Control** – Must consider volume reduction if feasible and not prohibited on site. The required infiltration volume is equal to the water quality volume described above.

# 3.0 Stormwater Calculations:

**3.1 Proposed Stormwater Management Strategy & Facilities Description**
This project is disturbing approximately 2.2 acres of land. The project will be constructing approximately 1.6 acres of new/reconstructed impervious surfaces. This land disturbance and creation of impervious surfaces will trigger stormwater management requirements from the City of Minnetonka and for the MPCA NPDES Permit.

This project is proposing to use underground detention basin along with pretreatment structures to meet the project requirements.

The underground CMP infiltration basin is designed to provide City of Minnetonka fire truck loading requirements of 83,000 lbs and 10,800 pounds per square foot outrigger point loading.

Below is a table from the manufacturer that indicates the fire truck loading can be provided by meeting minimum cover.

The proposed project will be utilizing a 84" pipe with a minimum cover of 36".

**Firetruck Loading**

Please use the table below for general guidance.

**HEL-COR® CSP Minimum Height of Cover Requirements for Firetruck Loading[1]**

| Pipe Span, Inches | Corrugation Profile, Inches | Minimum Cover, Inches for Firetruck Outrigger Load (64 kips)[2,3] | | | |
|---|---|---|---|---|---|
| | | 16 GA | 14 GA | 12 GA | 10 GA |
| | | 0.064 | 0.079 | 0.109 | 0.138 |
| 12 - 36 | 2 ⅔ x ½ | 12 | 12 | 12 | 12 |
| 42 - 48 | 2 ⅔ x ½ | 18 | 18 | 18 | 18 |
| 54 - 60 | 3 x 1 or 5 x 1 | 24 | 18 | | |
| 72 | 3 x 1 or 5 x 1 | 30 | 24 | | |
| 78 - 120 | 3 x 1 or 5 x 1 | | 36 | 30 | |
| 126 - 144 | 3 x 1 or 5 x 1 | | | 42 | 36 |

1. *Minimum cover may vary depending on local conditions. The contractor must provide additional cover required to avoid damage to the pipe.* ***Minimum cover is measured from the top of the pipe to the top of the maintained construction roadway surface.***
2. *Table is based on a typical 85,000 lb GVW firetruck with an outrigger load of 64,000 lbs. The 64,000 lb outrigger force is applied over a surface area of about 850.6 in2. The dimensions of the outrigger square pad are 25-7/8" x 32-7/8".*
3. *The outrigger load will be the heaviest load applied from the firetruck.*

## 3.2 Pretreatment Practices Proposed

The project will utilize sumped storm structures along with Momentum Preservers to function as pretreatment for the detention basin. Baffle walls and drawdown weirs will also be utilized within the system itself at locations where inlets are directly over the top of the system. The goal of the pretreatment devices is to remove an adequate amount of TSS (total suspended solids) from runoff prior to stormwater entering the infiltration device. Pretreating significantly reduces the frequency and invasiveness of maintenance for the infiltration device.

Calculations provided by the manufacturer of the Momentum Preserver pretreatment devices indicate that this system can remove approximately 67.9% of the TSS prior to the stormwater reaching the system. This has been utilized in the water quality modeling section below.

| | Outputs: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Annualized Pollutant Removal | Runoff Load (lbs.) | Bypassed Load (lbs.) | Load Removed, Excluding Scour (lbs.) | Removal Efficiency, Excluding Scour (%) | Scour Load (lbs.) | Load Removed, Including Scour (lbs.) | Removal Efficiency, Including Scour (%) | Pollutant Storage Depth (in) | Recommended Angle Between Pipes | Minimum Angle Between Pipes |
| | 461 | | 319 | 69.1% | 6 | 313 | 67.9% | 1.2 | Future Version | |
| Device-Specific Design Assumptions → (See "Devices" tab for details) | | Pipe Invert Elevations | Max. Pollutant Depth | | | | | | | |

## 3.3 Rate Control

*Limit peak runoff flow rates to existing conditions for 2-YR, 10-YR, and 100-YR frequency storms (nested 24-hour distribution)*

Rate control is provided by live storage within the proposed underground detention basin. This information was derived using HydroCAD stormwater modeling software. The existing and proposed runoff rates are shown in the summary table below.

**Stormwater Rate Summary**

| Drainage Area | Existing Rate (cfs) | | | |
|---|---|---|---|---|
| | 1-YR [2.50"] | 2-YR [2.88"] | 10-YR [4.29"] | 100-YR [7.42"] |
| EX1 | 2.76 | 3.50 | 6.43 | 13.28 |
| EX2 | 1.54 | 2.01 | 3.91 | 8.39 |
| TOTAL | 4.30 | 5.51 | 10.34 | 21.67 |

| Drainage Area | Proposed Conditions Rate (cfs) | | | |
|---|---|---|---|---|
| | 1-YR [2.50"] | 2-YR [2.88"] | 10-YR [4.29"] | 100-YR [7.42"] |
| 1P (PR1A) | 2.02 | 2.90 | 6.18 | 11.30 |
| PR1B | 0.74 | 0.92 | 1.61 | 3.23 |
| PR2 | 0.62 | 0.78 | 1.41 | 2.87 |
| TOTAL | 3.38 | 4.60 | 9.20 | 17.40 |

**Overall Stormwater Rate Summary**

| | Existing Conditions Rate (cfs) | Proposed Conditions Rate (cfs) |
|---|---|---|
| 1-Year Event | 4.30 | 3.38 |
| 2-Year Event | 5.51 | 4.60 |
| 10-Year Event | 10.34 | 9.20 |
| 100-Year Event | 21.67 | 17.40 |

**Stormwater Rate Summary - DA 1 - To Existing Storm Sewer South of Sit**

| | Existing Conditions Rate (cfs) | Proposed Conditions Rate (cfs) |
|---|---|---|
| 1-Year Event | 2.76 | 2.76 |
| 2-Year Event | 3.50 | 3.82 |
| 10-Year Event | 6.43 | 7.79 |
| 100-Year Event | 13.28 | 14.53 |

**Stormwater Rate Summary - DA 2 - To Amira Apts North of Site**

| | Existing Conditions Rate (cfs) | Proposed Conditions Rate (cfs) |
|---|---|---|
| 1-Year Event | 1.54 | 0.62 |
| 2-Year Event | 2.01 | 0.78 |
| 10-Year Event | 3.91 | 1.41 |
| 100-Year Event | 8.39 | 2.87 |

The existing project site discharges to two separate drainage subcatchments. Drainage Area DA1 discharges south towards the storm sewer system in Deer Creek Parkway. Drainage Area DA2 discharges north to the storm sewer system that is part of the Amira Apartments project.

The overall discharge rates from the proposed site will be less than the existing discharge rates in all events.

Discharge rates towards Drainage Area DA1 will be slightly higher than the existing rates heading this direction, but the storm sewer in this street appears to have been constructed to accept the full runoff from this site. The previously approved stormwater report for the Amira Apartments project (that included a hotel design for this site) had all of the runoff for this site directed to the storm sewer in Deer Creek Parkway.

The overall proposed runoff rates are less than the existing peak runoff rates. – REQUIREMENT SATISFIED

**3.4 Volume Control**

*Retain 1.1 inches of runoff on-site from applicable impervious surfaces. If unique, site-specific constraints preclude infiltration, 60% TP and 90% TSS removal and no net increase in TP or TSS annually must be met.*

**Restricted Site Classification:**

This site is not capable of meeting the required 1.1" abstraction and should be classified as restricted.

The MIDS flow chart asks the following questions to determine if a site is restricted:

Question 1 - "Are there very low infiltrating soils (<0.2 inches per hour)?"

Per the soils report, the existing soils are fill soils and very low permeability clay soils. These soils are classified with a hydrologic soil group "D" designation and not conducive to infiltration.

The Minnesota NPDES Construction Stormwater General Permit, which has requirements for permanent stormwater management systems, the permit severely limits infiltration in areas of Type "D" soils. For most projects in the state, the permit states (III.D.1.j.v.) "Infiltration is prohibited when the infiltration system will be constructed in: Areas of predominately Hydrologic Soil Group "D" (clay) soils

Question 2 - "Is BMP Relocation onsite to a lower-infiltrating location feasible?"

BMP relocation is not an option for this site, because the entire site has the same soils.

Question 3 - "Can BMP be sized to drain dry within 48 hours?"

An infiltration BMP is not appropriate for this site based on the low permeability soils present.

Question 4 - "Is FTO #1 (lower volume control standard) feasible, allowing the BMP to drain dry within 48 hours?"

FTO #1 is not feasible due to the soils present. An infiltration BMP cannot be designed to infiltrate 0.55" of runoff.

Based on these results, the MIDS flow chart indicates that FTO #2 be selected. FTO #2 has the following requirements:

- Achieve volume reduction to the maximum extent practicable.
- Remove 60% of the annual TP load.

Volume reduction is not feasible for this site due to the types of soils present. The MPCA NPDES permit does not allow infiltration when Hydrologic Soil Group "D" soils are present, which we would be on this site. Therefore, infiltration on this site is provided to the maximum extent practicable.

Water quality treatment will be provided in lieu of volume reduction per City of Minnetonka standards. – REQUIREMENT SATISFIED

**3.5 Water Quality**

*If unique, site-specific constraints preclude infiltration, 60% TP and 90% TSS removal and no net increase in TP or TSS annually must be met.*

Based on the restrictive site classification discussion from above, this site needs to provide 60% TP and 90% TSS removal to meet the City of Minnetonka requirements.

Water quality is provided by the pretreatment systems and the underground detention pond. This underground stormwater pond has been designed to MPCA Level 3 Standards.

**STORM WATER POND SIZING**

| Proposed BMP Area | Req. Vol (cf) Below Outlet (Dead Storage) 1800 cf/acre | Prov. Vol (cf) Below Outlet (Dead Storage) | Pond Surface Area (ac) | Req. MAX Disch. Rate (cfs) 5.66 cfs/acre [1.5" Rainfall] | Prov. Disch. Rate (cfs) [1.5" Rainfall Modeled] | Req. Vol (cf) Above Outlet (Live Storage) 1.5" x Impv. Area | Prov. Vol (cf) Above Outlet (Live Storage) 1.5" x Impv. Area |
|---|---|---|---|---|---|---|---|
| Underground Pond 1 | 4176 | 7467 | 0.10 | 0.57 | 0.57 | 8539 | 10775 |

*Underground Pond is designed to MPCA Level 3 Standards, which provides 60% TP and 90% TSS Removals.
*This project is providing abstraction to the maximum extent practicable. The site is restricted by site contamination and infiltration is not feasible.

The P8 Calculator has been utilized to verify that the project meets the TP and TSS reduction requirements. See the P8 Calculations for detailed analysis.

**P8 CALCULATOR RESULTS**

| | |
|---|---|
| TOTAL PHOS. REMOVAL | 60.5% |
| TSS REMOVAL | 90.0% |

NOTE: To model the pretreatment devices in P8, an arbitrary pond was developed that provided the same TSS removal that was calculated utilizing the Momentum Preserver Calculator.

Pretreatment TSS Removal per Momentum Preserver Calculator = 67.9%
Pretreatment TSS Removal in P8 Utilizing Arbitrary Pond = 66.8%

The proposed project will be reducing TP by 60.5% and TSS by 90.0%, meeting the City and watershed requirements.

## 4.0 Conclusions:

To the best of our knowledge, this project meets all State, City and Watershed District stormwater management requirements.

**Amira Villas**
**Civil Site Group - Stormwater Calculations**

**Existing Conditions**

| Drainage Area | Impervious Area | | Pervious Area | | Total Area | |
|---|---|---|---|---|---|---|
| | Area [SF] | CN Value | Area [SF] | CN Value | Area [SF] | CN Value |
| EX1 | 9729 | 98 | 51485 | 80 | 61214 | 83 |
| EX2 | 687 | 98 | 39156 | 80 | 39843 | 80 |

**Proposed Conditions**

| Drainage Area | Impervious Area | | Pervious Area | | Total Area | |
|---|---|---|---|---|---|---|
| | Area [SF] | CN Value | Area [SF] | CN Value | Area [SF] | CN Value |
| PR1A | 61334 | 98 | 12140 | 80 | 73474 | 95 |
| PR1B | 4181 | 98 | 10312 | 80 | 14493 | 85 |
| PR2 | 2797 | 98 | 10293 | 80 | 13090 | 84 |

**Site Area Summary**

| | Impervious [SF] | Impervious [AC] | Pervious [SF] | Pervious [AC] | Total [SF] | Total [AC] |
|---|---|---|---|---|---|---|
| Existing Site | 10416 | 0.24 | 90641 | 2.08 | 101057 | 2.32 |
| Proposed Site | 68312 | 1.57 | 32745 | 0.75 | 101057 | 2.32 |

**Stormwater Rate Summary**

| Drainage Area | Existing Rate (cfs) | | | |
|---|---|---|---|---|
| | 1-YR [2.50"] | 2-YR [2.88"] | 10-YR [4.29"] | 100-YR [7.42"] |
| EX1 | 2.76 | 3.50 | 6.43 | 13.28 |
| EX2 | 1.54 | 2.01 | 3.91 | 8.39 |
| TOTAL | 4.30 | 5.51 | 10.34 | 21.67 |

| Drainage Area | Proposed Conditions Rate (cfs) | | | |
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| TOTAL | 3.38 | 4.60 | 9.20 | 17.40 |

**Overall Stormwater Rate Summary**

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| | Existing Conditions Rate (cfs) | Proposed Conditions Rate (cfs) |
|---|---|---|
| 1-Year Event | 2.76 | 2.76 |
| 2-Year Event | 3.50 | 3.82 |
| 10-Year Event | 6.43 | 7.79 |
| 100-Year Event | 13.28 | 14.53 |

**Stormwater Rate Summary - DA 2 - To Amira Apts North of Site**

| | Existing Conditions Rate (cfs) | Proposed Conditions Rate (cfs) |
|---|---|---|
| 1-Year Event | 1.54 | 0.62 |
| 2-Year Event | 2.01 | 0.78 |
| 10-Year Event | 3.91 | 1.41 |
| 100-Year Event | 8.39 | 2.87 |

**Stormwater Water Quality and Volume Summary**

| Drainage Area | Required Infiltration Vol. Summary | |
|---|---|---|
| | New Impv. Area (sf) | Required Volume (cf) |
| PR1A | 61334 | 10222 |
| PR1B | 4181 | 697 |
| PR2 | 2797 | 466 |
| TOTAL | 68312 | 11385 |

Infiltration Volume = 1.1*Dist. Impv. Area

**STORM WATER POND SIZING**

| Proposed BMP Area | Req. Vol (cf) Below Outlet (Dead Storage) 1800 cf/acre | Prov. Vol (cf) Below Outlet (Dead Storage) | Pond Surface Area (ac) | Req. MAX Disch. Rate (cfs) 5.66 cfs/acre [1.5" Rainfall] | Prov. Disch. Rate (cfs) [1.5" Rainfall Modeled] | Req. Vol (cf) Above Outlet (Live Storage) 1.5" x Impv. Area | Prov. Vol (cf) Above Outlet (Live Storage) 1.5" x Impv. Area |
|---|---|---|---|---|---|---|---|
| Underground Pond 1 | 4176 | 7467 | 0.10 | 0.57 | 0.57 | 8539 | 10775 |

*Underground Pond is designed to MPCA Level 3 Standards, which provides 60% TP and 90% TSS Removals.
*This project is providing abstraction to the maximum extent practicable. The site is restricted by site contamination and infiltration is not feasible.

**P8 CALCULATOR RESULTS**

| | |
|---|---|
| TOTAL PHOS. REMOVAL | 60.5% |
| TSS REMOVAL | 90.0% |

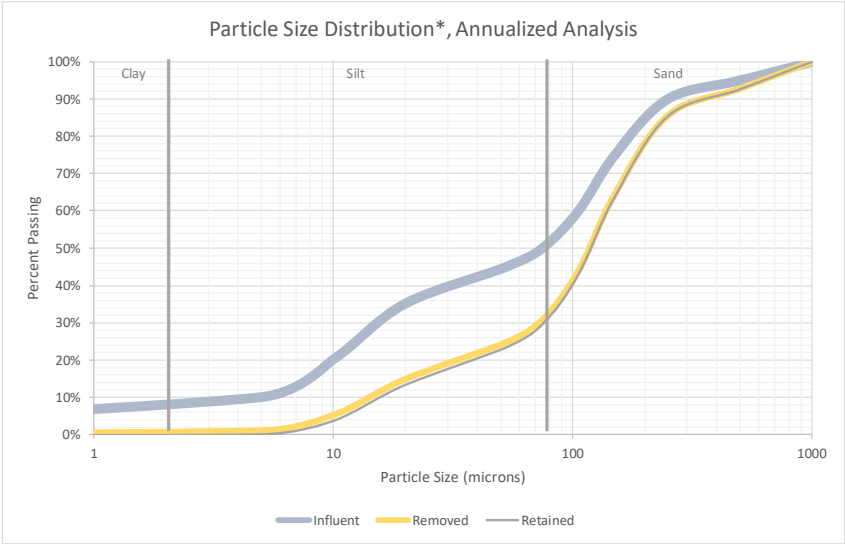
| | |
|---|---|
| **Project:** | AMIRA VILLAS |
| **Location:** | MINNETONKA |
| **Structure ID:** | SUMP STRUCTURES 11 & 21 |
| **Date:** | 6/4/2024 |

## TREATMENT STRUCTURE SIZING CALCULATOR - VERSION 2.8

**User Input:**

| Variable | | Value | Units |
|---|---|---|---|
| Structure | Device[1] | Preserver, w/Skimmer | n/a |
| | Diameter | 5 | ft |
| | Sump Depth | 5 | ft |
| | Inlet Diameter | 15 | in |
| | Outlet Diameter | 15 | in |
| Hydrology | Location[2] | MN, Twin Cities | n/a |
| | Drainage Area | 0.84 | acres |
| | Percent Impervious | 81.9% | % |
| | Time of Concentration | 10.0 | minutes |
| | Pervious CN Value[3] | 80 | unitless |
| | System Bypass? | No | n/a |
| | | | |
| | Water Temperature | 68 | °F |
| Pollutant Load | Particle Size Dist.[4] | NJDEP | n/a |
| | Runoff Concentration | 120 | mg/l |
| | Specific Gravity | 2.65 | unitless |

1) Refer to the "Devices" tab for device specifics (e.g. design and maintenance recommendations, etc.).
2) "Custom" rainfall data can be selected from the drop down list and entered below.
3) "Pervious CN Value" should include impervious areas not directly connected to the drainage system.
4) "Custom" Particle Size Distributions can be selected from the drop down list and entered below.




*This graph is accurate for particle size distributions only, not singular particle sizes.

**Outputs:**

| Annualized Pollutant Removal | Runoff Load (lbs.) | Bypassed Load (lbs.) | Load Removed, Excluding Scour (lbs.) | Removal Efficiency, Excluding Scour (%) | Scour Load (lbs.) | Load Removed, Including Scour (lbs.) | Removal Efficiency, Including Scour (%) | Pollutant Storage Depth (in) | Recommended Angle Between Pipes | Minimum Angle Between Pipes |
|---|---|---|---|---|---|---|---|---|---|---|
| | 461 | | 319 | 69.1% | 6 | **313** | **67.9%** | 1.2 | Future Version | |

| Device-Specific Design Assumptions → (See "Devices" tab for details) | Pipe Invert Elevations | Max. Pollutant Depth |
|---|---|---|

This calculator is downloadable at www.ThePreserver.com.

P8 Model Results
Amira Villas Minnetonka
6/7/24
PERCENT REMOVAL

| Variable | OVERALL | LAWN AREAS | PRETREATMENT STRUCTURES - WITH MOMENTUM PRESERVER | UNDERGROUND STORMWATER POND | CULVERT |
|---|---|---|---|---|---|
| P0% | | | | | |
| P10% | 69.2 | 33.2 | 30.8 | 63.6 | |
| P30% | 86.1 | 70.7 | 48.7 | 77.6 | |
| P50% | 95.4 | 87.9 | 66.5 | 89.8 | |
| P80% | 99.7 | 98.2 | 93.4 | 99.0 | |
| TSS | 90.0 | 77.6 | 66.6 | 75.9 | |
| TP | 60.5 | 46.8 | 35.2 | 42.4 | |
| TKN | 52.5 | 40.8 | 30.5 | 34.2 | |
| CU | 66.4 | 57.9 | 49.0 | 36.7 | |
| PB | 81.9 | 70.9 | 60.5 | 58.6 | |
| ZN | 52.5 | 40.8 | 30.5 | 34.2 | |
| HC | 81.9 | 70.9 | 60.5 | 58.6 | |

LBS REMOVED PER YEAR

| Variable | OVERALL | LAWN AREAS | PRETREATMENT STRUCTURES - WITH MOMENTUM PRESERVER | UNDERGROUND STORMWATER POND | CULVERT |
|---|---|---|---|---|---|
| P0% | | | | | |
| P10% | 153.0 | 9.9 | 59.0 | 84.1 | |
| P30% | 190.4 | 21.2 | 93.1 | 76.2 | |
| P50% | 211.1 | 26.4 | 127.2 | 57.5 | |
| P80% | 441.2 | 58.9 | 357.1 | 25.2 | |
| TSS | 995.7 | 116.4 | 636.5 | 242.9 | |
| TP | 2.1 | 0.2 | 1.1 | 0.8 | |
| TKN | 8.3 | 0.9 | 4.2 | 3.3 | |
| CU | 0.3 | 0.0 | 0.2 | 0.1 | |
| PB | 0.2 | 0.0 | 0.1 | 0.0 | |
| ZN | 0.9 | 0.1 | 0.4 | 0.3 | |
| HC | 22.4 | 2.6 | 14.3 | 5.5 | |

EX2
EX IMPV = 687 SF
EX PERV = 39156 SF
TOTAL = 39843 SF

EX1
EX IMPV = 9729 SF
EX PERV = 51485 SF
TOTAL = 61214 SF

1" = 40'-0"
20'-0" 0 40'-0"

AMIRA VILLAS

# EXISTING DRAINAGE MAP

901 CARLSON PARKWAY, MINNETONKA, MN 55305

| | | | |
|---|---|---|---|
| Project Number: | 24132 | Revision Number: | . |
| Issue Date: | 6/7/24 | Revision Date: | . |

DA 1

CivilSite GROUP
5000 Glenwood Avenue
Golden Valley, MN 55422
612-615-0060
www.CivilSiteGroup.com

PR2
PR IMPV = 2797 SF
PR PERV = 10293 SF
TOTAL = 13090 SF

PR1A
PR IMPV = 61334 SF
PR PERV = 12140 SF
TOTAL = 73474 SF

PR1B
PR IMPV = 4181 SF
PR PERV = 10312 SF
TOTAL = 14493 SF

1" = 40'-0"
20'-0" 0 40'-0"

AMIRA VILLAS

# PROPOSED DRAINAGE MAP

901 CARLSON PARKWAY, MINNETONKA, MN 55305

| | | | |
|---|---|---|---|
| Project Number: | 24132 | Revision Number: | . |
| Issue Date: | 6/7/24 | Revision Date: | . |

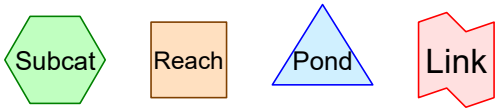
DA 2

CivilSite GROUP
5000 Glenwood Avenue
Golden Valley, MN 55422
612-615-0060
www.CivilSiteGroup.com

# EXISTING CONDITIONS


DRAINS NORTH TO
AMIRA APTS SITE


DRAINS SOUTH TO
EX. STORM SEWER




**Routing Diagram for 24132 EXISTING**
Prepared by Civil Site Group, Printed 6/5/2024

## Rainfall Events Listing

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 1y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 2.50 | 2 |
| 2 | 2y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 2.88 | 2 |
| 3 | 10y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 4.29 | 2 |
| 4 | 100y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 7.42 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 2.081 | 80 | >75% Grass cover, Good, HSG D (EX1, EX2) |
| 0.239 | 98 | Paved parking, HSG D (EX1, EX2) |
| **2.320** | **82** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 0.000 | HSG C | |
| 2.320 | HSG D | EX1, EX2 |
| 0.000 | Other | |
| **2.320** | | **TOTAL AREA** |

## Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 0.000 | 2.081 | 0.000 | 2.081 | >75% Grass cover, Good | EX1, EX2 |
| 0.000 | 0.000 | 0.000 | 0.239 | 0.000 | 0.239 | Paved parking | EX1, EX2 |
| **0.000** | **0.000** | **0.000** | **2.320** | **0.000** | **2.320** | **TOTAL AREA** | |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment EX1: DRAINS SOUTH TO** Runoff Area=61,214 sf 15.89% Impervious Runoff Depth=1.11"
Tc=6.0 min CN=WQ Runoff=2.76 cfs 0.130 af

**Subcatchment EX2: DRAINS NORTH TO** Runoff Area=39,843 sf 1.72% Impervious Runoff Depth=0.91"
Tc=6.0 min CN=WQ Runoff=1.54 cfs 0.070 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.199 af Average Runoff Depth = 1.03"**
**89.69% Pervious = 2.081 ac 10.31% Impervious = 0.239 ac**

## Summary for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

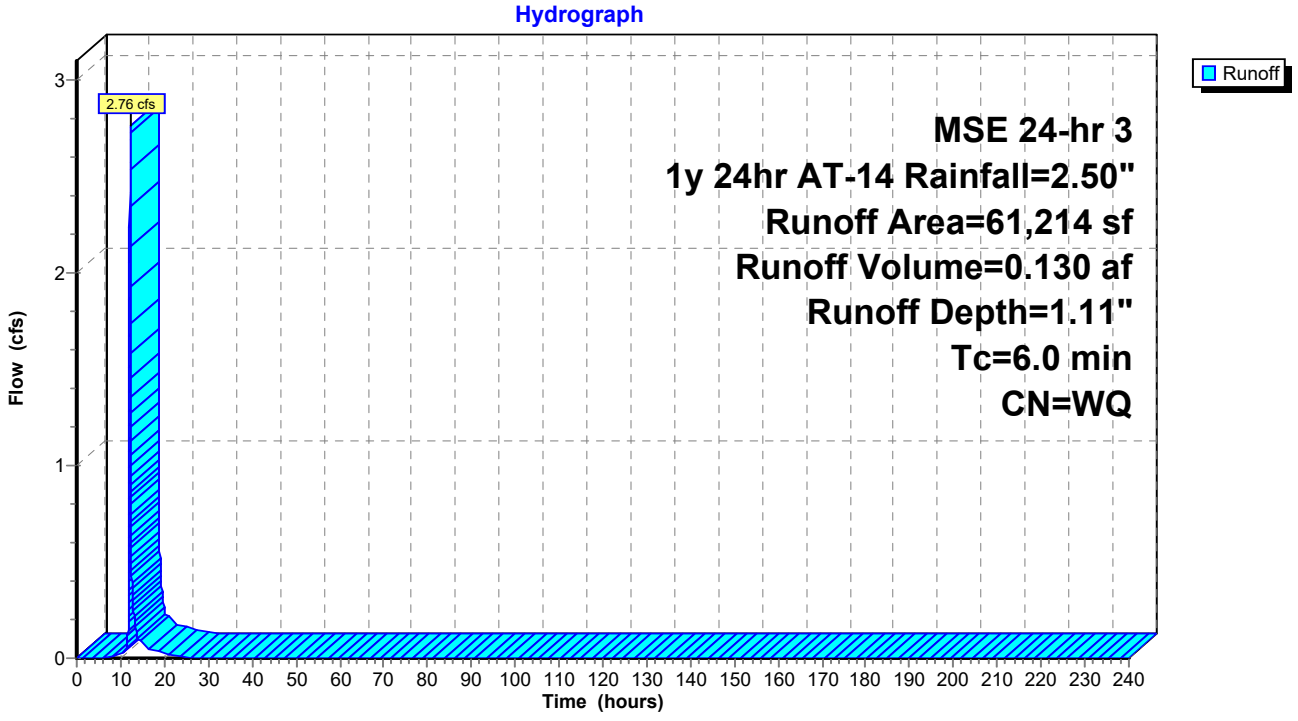
Runoff = 2.76 cfs @ 12.14 hrs, Volume= 0.130 af, Depth= 1.11"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1y 24hr AT-14 Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 9,729 | 98 | Paved parking, HSG D |
| 51,485 | 80 | >75% Grass cover, Good, HSG D |
| 61,214 | | Weighted Average |
| 51,485 | | 84.11% Pervious Area |
| 9,729 | | 15.89% Impervious Area |

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

## Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.09 | 0.00 | 0.00 |
| 10.00 | 0.34 | 0.00 | **0.02** |
| 15.00 | 2.24 | 0.87 | **0.08** |
| 20.00 | **2.43** | **1.01** | 0.03 |
| 25.00 | **2.50** | **1.06** | 0.00 |
| 30.00 | 2.50 | 1.06 | 0.00 |
| 35.00 | 2.50 | 1.06 | 0.00 |
| 40.00 | 2.50 | 1.06 | 0.00 |
| 45.00 | 2.50 | 1.06 | 0.00 |
| 50.00 | 2.50 | 1.06 | 0.00 |
| 55.00 | 2.50 | 1.06 | 0.00 |
| 60.00 | 2.50 | 1.06 | 0.00 |
| 65.00 | 2.50 | 1.06 | 0.00 |
| 70.00 | 2.50 | 1.06 | 0.00 |
| 75.00 | 2.50 | 1.06 | 0.00 |
| 80.00 | 2.50 | 1.06 | 0.00 |
| 85.00 | 2.50 | 1.06 | 0.00 |
| 90.00 | 2.50 | 1.06 | 0.00 |
| 95.00 | 2.50 | 1.06 | 0.00 |
| 100.00 | 2.50 | 1.06 | 0.00 |
| 105.00 | 2.50 | 1.06 | 0.00 |
| 110.00 | 2.50 | 1.06 | 0.00 |
| 115.00 | 2.50 | 1.06 | 0.00 |
| 120.00 | 2.50 | 1.06 | 0.00 |
| 125.00 | 2.50 | 1.06 | 0.00 |
| 130.00 | 2.50 | 1.06 | 0.00 |
| 135.00 | 2.50 | 1.06 | 0.00 |
| 140.00 | 2.50 | 1.06 | 0.00 |
| 145.00 | 2.50 | 1.06 | 0.00 |
| 150.00 | 2.50 | 1.06 | 0.00 |
| 155.00 | 2.50 | 1.06 | 0.00 |
| 160.00 | 2.50 | 1.06 | 0.00 |
| 165.00 | 2.50 | 1.06 | 0.00 |
| 170.00 | 2.50 | 1.06 | 0.00 |
| 175.00 | 2.50 | 1.06 | 0.00 |
| 180.00 | 2.50 | 1.06 | 0.00 |
| 185.00 | 2.50 | 1.06 | 0.00 |
| 190.00 | 2.50 | 1.06 | 0.00 |
| 195.00 | 2.50 | 1.06 | 0.00 |
| 200.00 | 2.50 | 1.06 | 0.00 |
| 205.00 | 2.50 | 1.06 | 0.00 |
| 210.00 | 2.50 | 1.06 | 0.00 |
| 215.00 | 2.50 | 1.06 | 0.00 |
| 220.00 | 2.50 | 1.06 | 0.00 |
| 225.00 | 2.50 | 1.06 | 0.00 |
| 230.00 | 2.50 | 1.06 | 0.00 |
| 235.00 | 2.50 | 1.06 | 0.00 |
| 240.00 | 2.50 | 1.06 | 0.00 |

## Summary for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

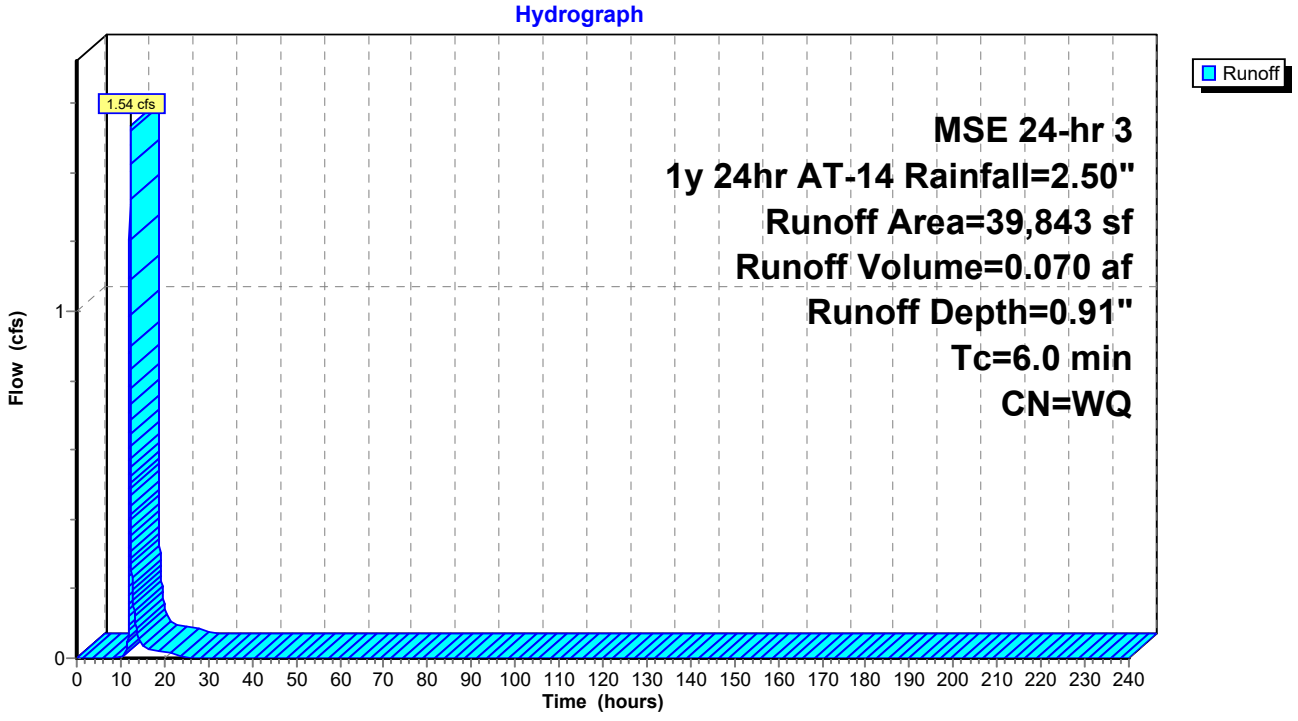
Runoff = 1.54 cfs @ 12.14 hrs, Volume= 0.070 af, Depth= 0.91"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1y 24hr AT-14 Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 687 | 98 | Paved parking, HSG D |
| 39,156 | 80 | >75% Grass cover, Good, HSG D |
| 39,843 | | Weighted Average |
| 39,156 | | 98.28% Pervious Area |
| 687 | | 1.72% Impervious Area |

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

## Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE



## Hydrograph for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.09 | 0.00 | 0.00 |
| 10.00 | 0.34 | 0.00 | **0.00** |
| 15.00 | 2.24 | 0.72 | **0.05** |
| 20.00 | **2.43** | **0.84** | 0.02 |
| 25.00 | **2.50** | **0.89** | 0.00 |
| 30.00 | 2.50 | 0.89 | 0.00 |
| 35.00 | 2.50 | 0.89 | 0.00 |
| 40.00 | 2.50 | 0.89 | 0.00 |
| 45.00 | 2.50 | 0.89 | 0.00 |
| 50.00 | 2.50 | 0.89 | 0.00 |
| 55.00 | 2.50 | 0.89 | 0.00 |
| 60.00 | 2.50 | 0.89 | 0.00 |
| 65.00 | 2.50 | 0.89 | 0.00 |
| 70.00 | 2.50 | 0.89 | 0.00 |
| 75.00 | 2.50 | 0.89 | 0.00 |
| 80.00 | 2.50 | 0.89 | 0.00 |
| 85.00 | 2.50 | 0.89 | 0.00 |
| 90.00 | 2.50 | 0.89 | 0.00 |
| 95.00 | 2.50 | 0.89 | 0.00 |
| 100.00 | 2.50 | 0.89 | 0.00 |
| 105.00 | 2.50 | 0.89 | 0.00 |
| 110.00 | 2.50 | 0.89 | 0.00 |
| 115.00 | 2.50 | 0.89 | 0.00 |
| 120.00 | 2.50 | 0.89 | 0.00 |
| 125.00 | 2.50 | 0.89 | 0.00 |
| 130.00 | 2.50 | 0.89 | 0.00 |
| 135.00 | 2.50 | 0.89 | 0.00 |
| 140.00 | 2.50 | 0.89 | 0.00 |
| 145.00 | 2.50 | 0.89 | 0.00 |
| 150.00 | 2.50 | 0.89 | 0.00 |
| 155.00 | 2.50 | 0.89 | 0.00 |
| 160.00 | 2.50 | 0.89 | 0.00 |
| 165.00 | 2.50 | 0.89 | 0.00 |
| 170.00 | 2.50 | 0.89 | 0.00 |
| 175.00 | 2.50 | 0.89 | 0.00 |
| 180.00 | 2.50 | 0.89 | 0.00 |
| 185.00 | 2.50 | 0.89 | 0.00 |
| 190.00 | 2.50 | 0.89 | 0.00 |
| 195.00 | 2.50 | 0.89 | 0.00 |
| 200.00 | 2.50 | 0.89 | 0.00 |
| 205.00 | 2.50 | 0.89 | 0.00 |
| 210.00 | 2.50 | 0.89 | 0.00 |
| 215.00 | 2.50 | 0.89 | 0.00 |
| 220.00 | 2.50 | 0.89 | 0.00 |
| 225.00 | 2.50 | 0.89 | 0.00 |
| 230.00 | 2.50 | 0.89 | 0.00 |
| 235.00 | 2.50 | 0.89 | 0.00 |
| 240.00 | 2.50 | 0.89 | 0.00 |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment EX1: DRAINS SOUTH TO** Runoff Area=61,214 sf 15.89% Impervious Runoff Depth=1.40"
Tc=6.0 min CN=WQ Runoff=3.50 cfs 0.164 af

**Subcatchment EX2: DRAINS NORTH TO** Runoff Area=39,843 sf 1.72% Impervious Runoff Depth=1.19"
Tc=6.0 min CN=WQ Runoff=2.01 cfs 0.090 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.254 af Average Runoff Depth = 1.31"**
**89.69% Pervious = 2.081 ac 10.31% Impervious = 0.239 ac**

## Summary for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

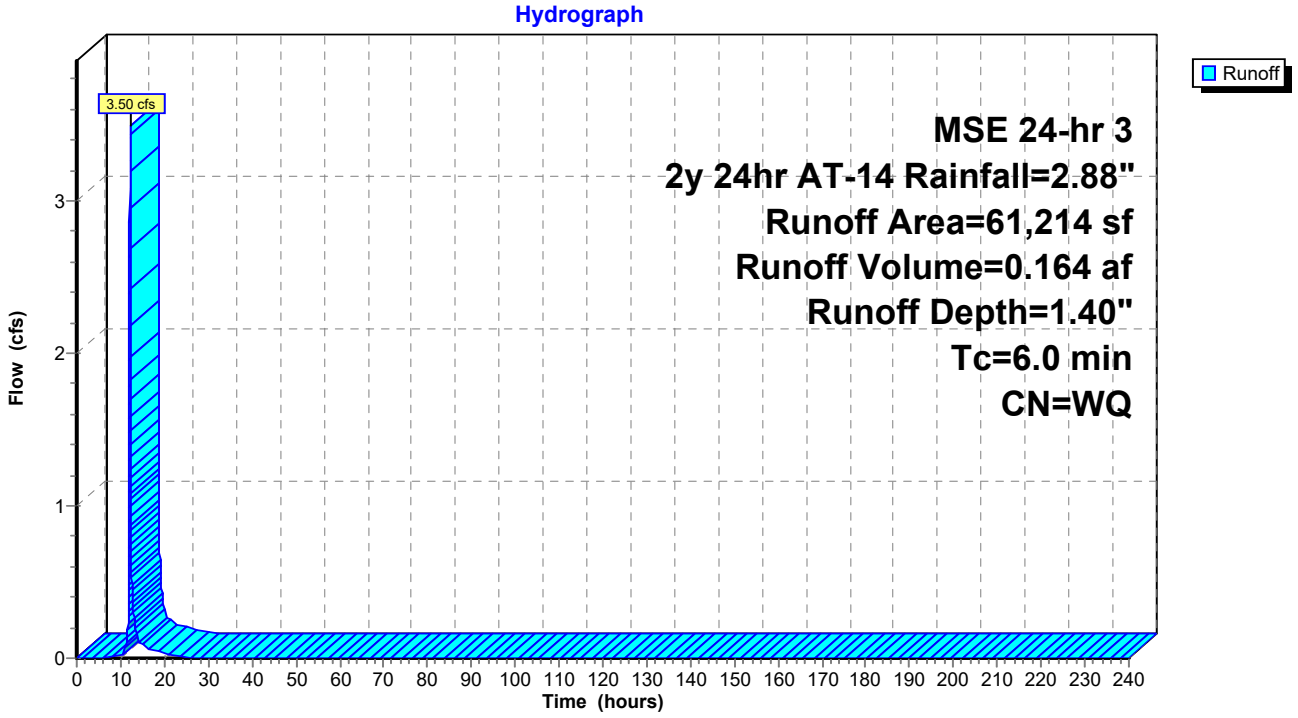
Runoff = 3.50 cfs @ 12.13 hrs, Volume= 0.164 af, Depth= 1.40"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.88"

| Area (sf) | CN | Description |
|---|---|---|
| 9,729 | 98 | Paved parking, HSG D |
| 51,485 | 80 | >75% Grass cover, Good, HSG D |
| 61,214 | | Weighted Average |
| 51,485 | | 84.11% Pervious Area |
| 9,729 | | 15.89% Impervious Area |

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

## Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.11 | 0.00 | 0.00 |
| 10.00 | 0.40 | 0.00 | **0.02** |
| 15.00 | 2.58 | 1.12 | **0.10** |
| 20.00 | **2.80** | **1.29** | 0.03 |
| 25.00 | **2.88** | **1.35** | 0.00 |
| 30.00 | 2.88 | 1.35 | 0.00 |
| 35.00 | 2.88 | 1.35 | 0.00 |
| 40.00 | 2.88 | 1.35 | 0.00 |
| 45.00 | 2.88 | 1.35 | 0.00 |
| 50.00 | 2.88 | 1.35 | 0.00 |
| 55.00 | 2.88 | 1.35 | 0.00 |
| 60.00 | 2.88 | 1.35 | 0.00 |
| 65.00 | 2.88 | 1.35 | 0.00 |
| 70.00 | 2.88 | 1.35 | 0.00 |
| 75.00 | 2.88 | 1.35 | 0.00 |
| 80.00 | 2.88 | 1.35 | 0.00 |
| 85.00 | 2.88 | 1.35 | 0.00 |
| 90.00 | 2.88 | 1.35 | 0.00 |
| 95.00 | 2.88 | 1.35 | 0.00 |
| 100.00 | 2.88 | 1.35 | 0.00 |
| 105.00 | 2.88 | 1.35 | 0.00 |
| 110.00 | 2.88 | 1.35 | 0.00 |
| 115.00 | 2.88 | 1.35 | 0.00 |
| 120.00 | 2.88 | 1.35 | 0.00 |
| 125.00 | 2.88 | 1.35 | 0.00 |
| 130.00 | 2.88 | 1.35 | 0.00 |
| 135.00 | 2.88 | 1.35 | 0.00 |
| 140.00 | 2.88 | 1.35 | 0.00 |
| 145.00 | 2.88 | 1.35 | 0.00 |
| 150.00 | 2.88 | 1.35 | 0.00 |
| 155.00 | 2.88 | 1.35 | 0.00 |
| 160.00 | 2.88 | 1.35 | 0.00 |
| 165.00 | 2.88 | 1.35 | 0.00 |
| 170.00 | 2.88 | 1.35 | 0.00 |
| 175.00 | 2.88 | 1.35 | 0.00 |
| 180.00 | 2.88 | 1.35 | 0.00 |
| 185.00 | 2.88 | 1.35 | 0.00 |
| 190.00 | 2.88 | 1.35 | 0.00 |
| 195.00 | 2.88 | 1.35 | 0.00 |
| 200.00 | 2.88 | 1.35 | 0.00 |
| 205.00 | 2.88 | 1.35 | 0.00 |
| 210.00 | 2.88 | 1.35 | 0.00 |
| 215.00 | 2.88 | 1.35 | 0.00 |
| 220.00 | 2.88 | 1.35 | 0.00 |
| 225.00 | 2.88 | 1.35 | 0.00 |
| 230.00 | 2.88 | 1.35 | 0.00 |
| 235.00 | 2.88 | 1.35 | 0.00 |
| 240.00 | 2.88 | 1.35 | 0.00 |

## Summary for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

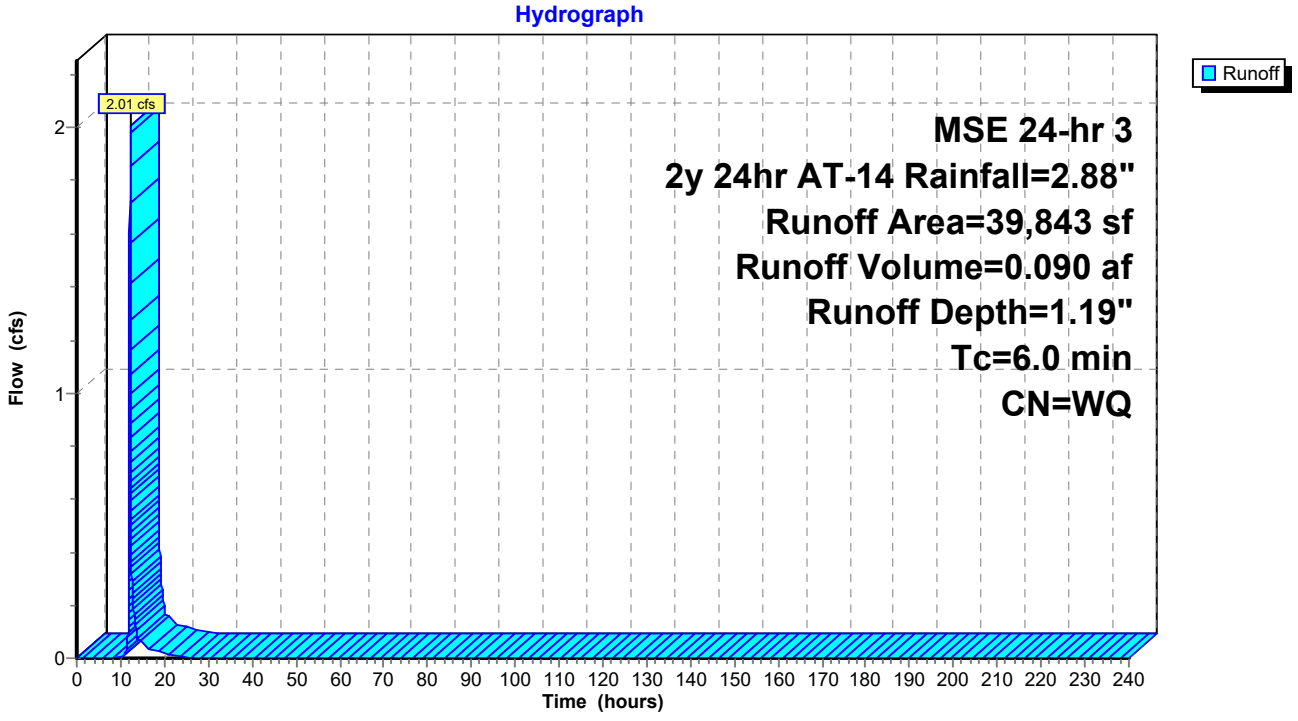
Runoff = 2.01 cfs @ 12.14 hrs, Volume= 0.090 af, Depth= 1.19"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.88"

| Area (sf) | CN | Description |
|---|---|---|
| 687 | 98 | Paved parking, HSG D |
| 39,156 | 80 | >75% Grass cover, Good, HSG D |
| 39,843 | | Weighted Average |
| 39,156 | | 98.28% Pervious Area |
| 687 | | 1.72% Impervious Area |

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

## Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE



## Hydrograph for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.11 | 0.00 | 0.00 |
| 10.00 | 0.40 | 0.00 | **0.00** |
| 15.00 | 2.58 | 0.95 | **0.06** |
| 20.00 | **2.80** | **1.11** | 0.02 |
| 25.00 | **2.88** | **1.16** | 0.00 |
| 30.00 | 2.88 | 1.16 | 0.00 |
| 35.00 | 2.88 | 1.16 | 0.00 |
| 40.00 | 2.88 | 1.16 | 0.00 |
| 45.00 | 2.88 | 1.16 | 0.00 |
| 50.00 | 2.88 | 1.16 | 0.00 |
| 55.00 | 2.88 | 1.16 | 0.00 |
| 60.00 | 2.88 | 1.16 | 0.00 |
| 65.00 | 2.88 | 1.16 | 0.00 |
| 70.00 | 2.88 | 1.16 | 0.00 |
| 75.00 | 2.88 | 1.16 | 0.00 |
| 80.00 | 2.88 | 1.16 | 0.00 |
| 85.00 | 2.88 | 1.16 | 0.00 |
| 90.00 | 2.88 | 1.16 | 0.00 |
| 95.00 | 2.88 | 1.16 | 0.00 |
| 100.00 | 2.88 | 1.16 | 0.00 |
| 105.00 | 2.88 | 1.16 | 0.00 |
| 110.00 | 2.88 | 1.16 | 0.00 |
| 115.00 | 2.88 | 1.16 | 0.00 |
| 120.00 | 2.88 | 1.16 | 0.00 |
| 125.00 | 2.88 | 1.16 | 0.00 |
| 130.00 | 2.88 | 1.16 | 0.00 |
| 135.00 | 2.88 | 1.16 | 0.00 |
| 140.00 | 2.88 | 1.16 | 0.00 |
| 145.00 | 2.88 | 1.16 | 0.00 |
| 150.00 | 2.88 | 1.16 | 0.00 |
| 155.00 | 2.88 | 1.16 | 0.00 |
| 160.00 | 2.88 | 1.16 | 0.00 |
| 165.00 | 2.88 | 1.16 | 0.00 |
| 170.00 | 2.88 | 1.16 | 0.00 |
| 175.00 | 2.88 | 1.16 | 0.00 |
| 180.00 | 2.88 | 1.16 | 0.00 |
| 185.00 | 2.88 | 1.16 | 0.00 |
| 190.00 | 2.88 | 1.16 | 0.00 |
| 195.00 | 2.88 | 1.16 | 0.00 |
| 200.00 | 2.88 | 1.16 | 0.00 |
| 205.00 | 2.88 | 1.16 | 0.00 |
| 210.00 | 2.88 | 1.16 | 0.00 |
| 215.00 | 2.88 | 1.16 | 0.00 |
| 220.00 | 2.88 | 1.16 | 0.00 |
| 225.00 | 2.88 | 1.16 | 0.00 |
| 230.00 | 2.88 | 1.16 | 0.00 |
| 235.00 | 2.88 | 1.16 | 0.00 |
| 240.00 | 2.88 | 1.16 | 0.00 |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment EX1: DRAINS SOUTH TO** Runoff Area=61,214 sf 15.89% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=WQ Runoff=6.43 cfs 0.300 af

**Subcatchment EX2: DRAINS NORTH TO** Runoff Area=39,843 sf 1.72% Impervious Runoff Depth=2.31"
Tc=6.0 min CN=WQ Runoff=3.91 cfs 0.176 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.477 af Average Runoff Depth = 2.47"**
**89.69% Pervious = 2.081 ac 10.31% Impervious = 0.239 ac**

## Summary for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

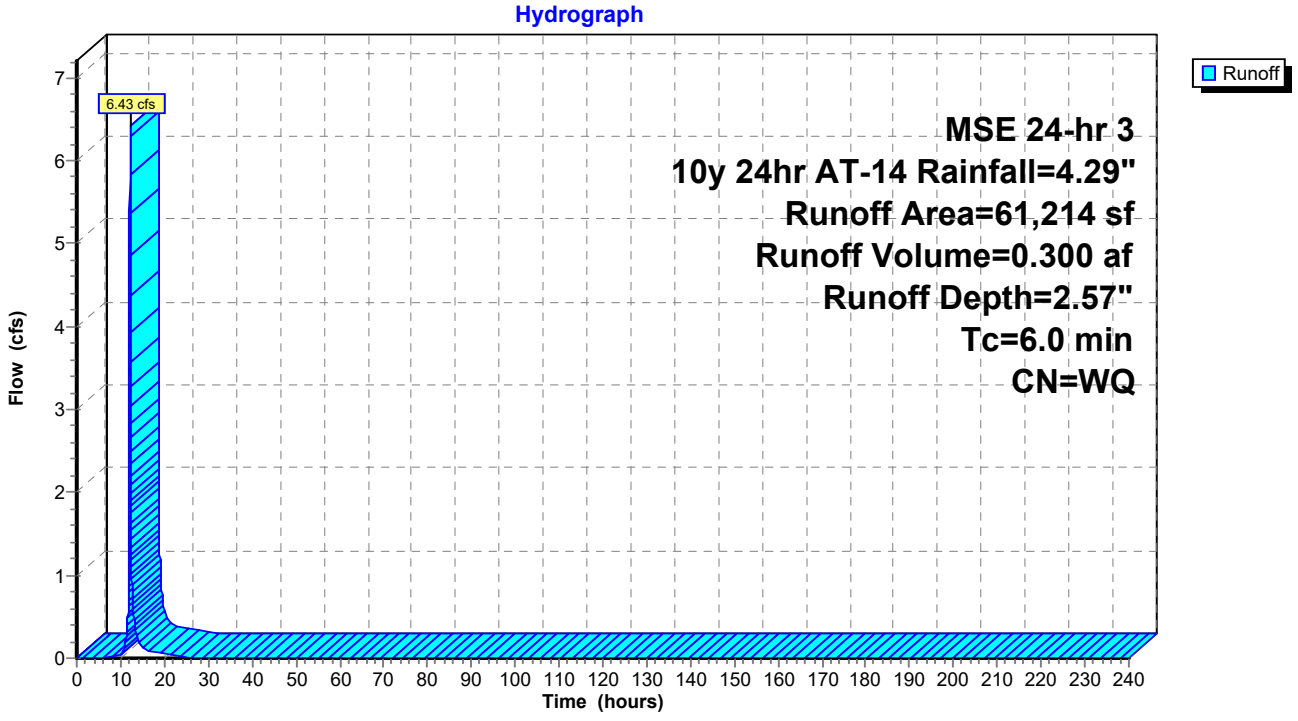
Runoff = 6.43 cfs @ 12.13 hrs, Volume= 0.300 af, Depth= 2.57"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.29"

| Area (sf) | CN | Description |
|---|---|---|
| 9,729 | 98 | Paved parking, HSG D |
| 51,485 | 80 | >75% Grass cover, Good, HSG D |
| 61,214 | | Weighted Average |
| 51,485 | | 84.11% Pervious Area |
| 9,729 | | 15.89% Impervious Area |

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

## Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.16 | 0.00 | 0.01 |
| 10.00 | 0.59 | 0.01 | **0.04** |
| 15.00 | 3.85 | 2.15 | **0.17** |
| 20.00 | **4.18** | **2.44** | 0.06 |
| 25.00 | **4.29** | **2.54** | 0.00 |
| 30.00 | 4.29 | 2.54 | 0.00 |
| 35.00 | 4.29 | 2.54 | 0.00 |
| 40.00 | 4.29 | 2.54 | 0.00 |
| 45.00 | 4.29 | 2.54 | 0.00 |
| 50.00 | 4.29 | 2.54 | 0.00 |
| 55.00 | 4.29 | 2.54 | 0.00 |
| 60.00 | 4.29 | 2.54 | 0.00 |
| 65.00 | 4.29 | 2.54 | 0.00 |
| 70.00 | 4.29 | 2.54 | 0.00 |
| 75.00 | 4.29 | 2.54 | 0.00 |
| 80.00 | 4.29 | 2.54 | 0.00 |
| 85.00 | 4.29 | 2.54 | 0.00 |
| 90.00 | 4.29 | 2.54 | 0.00 |
| 95.00 | 4.29 | 2.54 | 0.00 |
| 100.00 | 4.29 | 2.54 | 0.00 |
| 105.00 | 4.29 | 2.54 | 0.00 |
| 110.00 | 4.29 | 2.54 | 0.00 |
| 115.00 | 4.29 | 2.54 | 0.00 |
| 120.00 | 4.29 | 2.54 | 0.00 |
| 125.00 | 4.29 | 2.54 | 0.00 |
| 130.00 | 4.29 | 2.54 | 0.00 |
| 135.00 | 4.29 | 2.54 | 0.00 |
| 140.00 | 4.29 | 2.54 | 0.00 |
| 145.00 | 4.29 | 2.54 | 0.00 |
| 150.00 | 4.29 | 2.54 | 0.00 |
| 155.00 | 4.29 | 2.54 | 0.00 |
| 160.00 | 4.29 | 2.54 | 0.00 |
| 165.00 | 4.29 | 2.54 | 0.00 |
| 170.00 | 4.29 | 2.54 | 0.00 |
| 175.00 | 4.29 | 2.54 | 0.00 |
| 180.00 | 4.29 | 2.54 | 0.00 |
| 185.00 | 4.29 | 2.54 | 0.00 |
| 190.00 | 4.29 | 2.54 | 0.00 |
| 195.00 | 4.29 | 2.54 | 0.00 |
| 200.00 | 4.29 | 2.54 | 0.00 |
| 205.00 | 4.29 | 2.54 | 0.00 |
| 210.00 | 4.29 | 2.54 | 0.00 |
| 215.00 | 4.29 | 2.54 | 0.00 |
| 220.00 | 4.29 | 2.54 | 0.00 |
| 225.00 | 4.29 | 2.54 | 0.00 |
| 230.00 | 4.29 | 2.54 | 0.00 |
| 235.00 | 4.29 | 2.54 | 0.00 |
| 240.00 | 4.29 | 2.54 | 0.00 |

## Summary for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

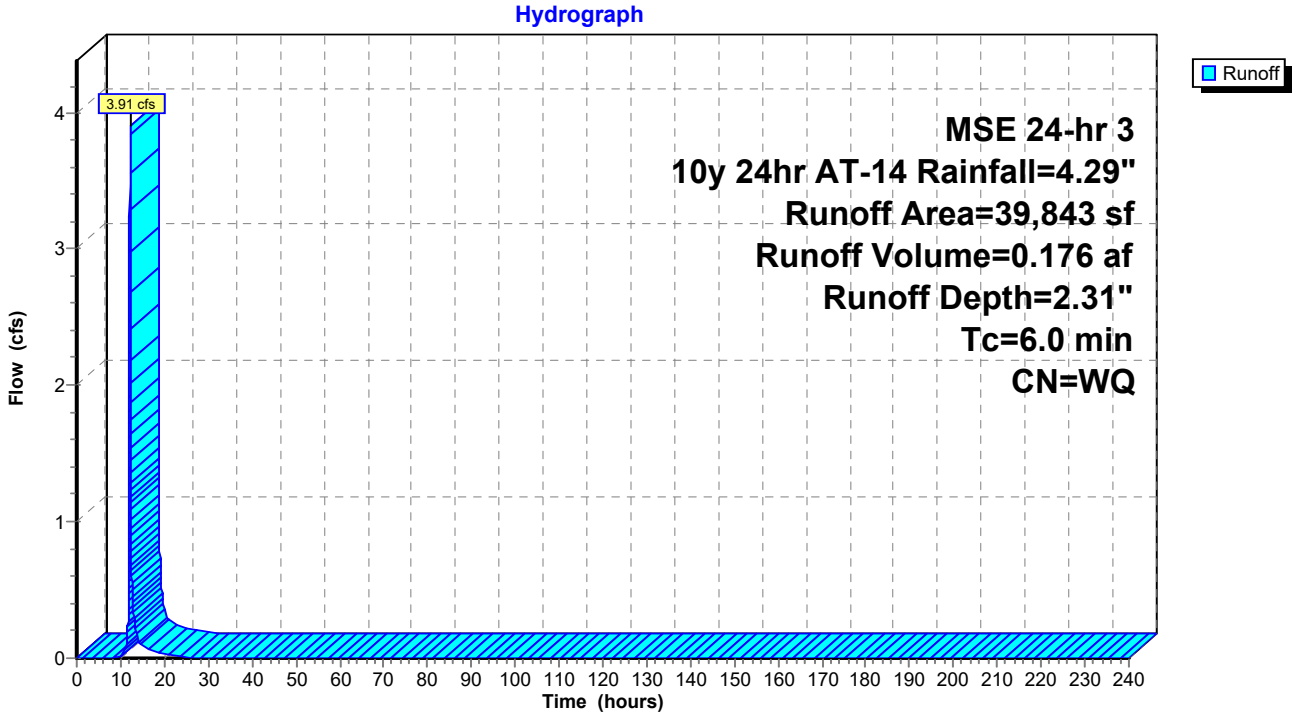
Runoff = 3.91 cfs @ 12.13 hrs, Volume= 0.176 af, Depth= 2.31"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.29"

| Area (sf) | CN | Description |
|---|---|---|
| 687 | 98 | Paved parking, HSG D |
| 39,156 | 80 | >75% Grass cover, Good, HSG D |
| 39,843 | | Weighted Average |
| 39,156 | | 98.28% Pervious Area |
| 687 | | 1.72% Impervious Area |

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

## Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE



## Hydrograph for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.16 | 0.00 | 0.00 |
| 10.00 | 0.59 | 0.00 | **0.01** |
| 15.00 | 3.85 | 1.92 | **0.11** |
| 20.00 | **4.18** | **2.19** | 0.04 |
| 25.00 | **4.29** | **2.28** | 0.00 |
| 30.00 | 4.29 | 2.28 | 0.00 |
| 35.00 | 4.29 | 2.28 | 0.00 |
| 40.00 | 4.29 | 2.28 | 0.00 |
| 45.00 | 4.29 | 2.28 | 0.00 |
| 50.00 | 4.29 | 2.28 | 0.00 |
| 55.00 | 4.29 | 2.28 | 0.00 |
| 60.00 | 4.29 | 2.28 | 0.00 |
| 65.00 | 4.29 | 2.28 | 0.00 |
| 70.00 | 4.29 | 2.28 | 0.00 |
| 75.00 | 4.29 | 2.28 | 0.00 |
| 80.00 | 4.29 | 2.28 | 0.00 |
| 85.00 | 4.29 | 2.28 | 0.00 |
| 90.00 | 4.29 | 2.28 | 0.00 |
| 95.00 | 4.29 | 2.28 | 0.00 |
| 100.00 | 4.29 | 2.28 | 0.00 |
| 105.00 | 4.29 | 2.28 | 0.00 |
| 110.00 | 4.29 | 2.28 | 0.00 |
| 115.00 | 4.29 | 2.28 | 0.00 |
| 120.00 | 4.29 | 2.28 | 0.00 |
| 125.00 | 4.29 | 2.28 | 0.00 |
| 130.00 | 4.29 | 2.28 | 0.00 |
| 135.00 | 4.29 | 2.28 | 0.00 |
| 140.00 | 4.29 | 2.28 | 0.00 |
| 145.00 | 4.29 | 2.28 | 0.00 |
| 150.00 | 4.29 | 2.28 | 0.00 |
| 155.00 | 4.29 | 2.28 | 0.00 |
| 160.00 | 4.29 | 2.28 | 0.00 |
| 165.00 | 4.29 | 2.28 | 0.00 |
| 170.00 | 4.29 | 2.28 | 0.00 |
| 175.00 | 4.29 | 2.28 | 0.00 |
| 180.00 | 4.29 | 2.28 | 0.00 |
| 185.00 | 4.29 | 2.28 | 0.00 |
| 190.00 | 4.29 | 2.28 | 0.00 |
| 195.00 | 4.29 | 2.28 | 0.00 |
| 200.00 | 4.29 | 2.28 | 0.00 |
| 205.00 | 4.29 | 2.28 | 0.00 |
| 210.00 | 4.29 | 2.28 | 0.00 |
| 215.00 | 4.29 | 2.28 | 0.00 |
| 220.00 | 4.29 | 2.28 | 0.00 |
| 225.00 | 4.29 | 2.28 | 0.00 |
| 230.00 | 4.29 | 2.28 | 0.00 |
| 235.00 | 4.29 | 2.28 | 0.00 |
| 240.00 | 4.29 | 2.28 | 0.00 |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment EX1: DRAINS SOUTH TO** Runoff Area=61,214 sf 15.89% Impervious Runoff Depth=5.42"
Tc=6.0 min CN=WQ Runoff=13.28 cfs 0.634 af

**Subcatchment EX2: DRAINS NORTH TO** Runoff Area=39,843 sf 1.72% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=WQ Runoff=8.39 cfs 0.390 af

**Total Runoff Area = 2.320 ac Runoff Volume = 1.025 af Average Runoff Depth = 5.30"**
**89.69% Pervious = 2.081 ac 10.31% Impervious = 0.239 ac**

## Summary for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

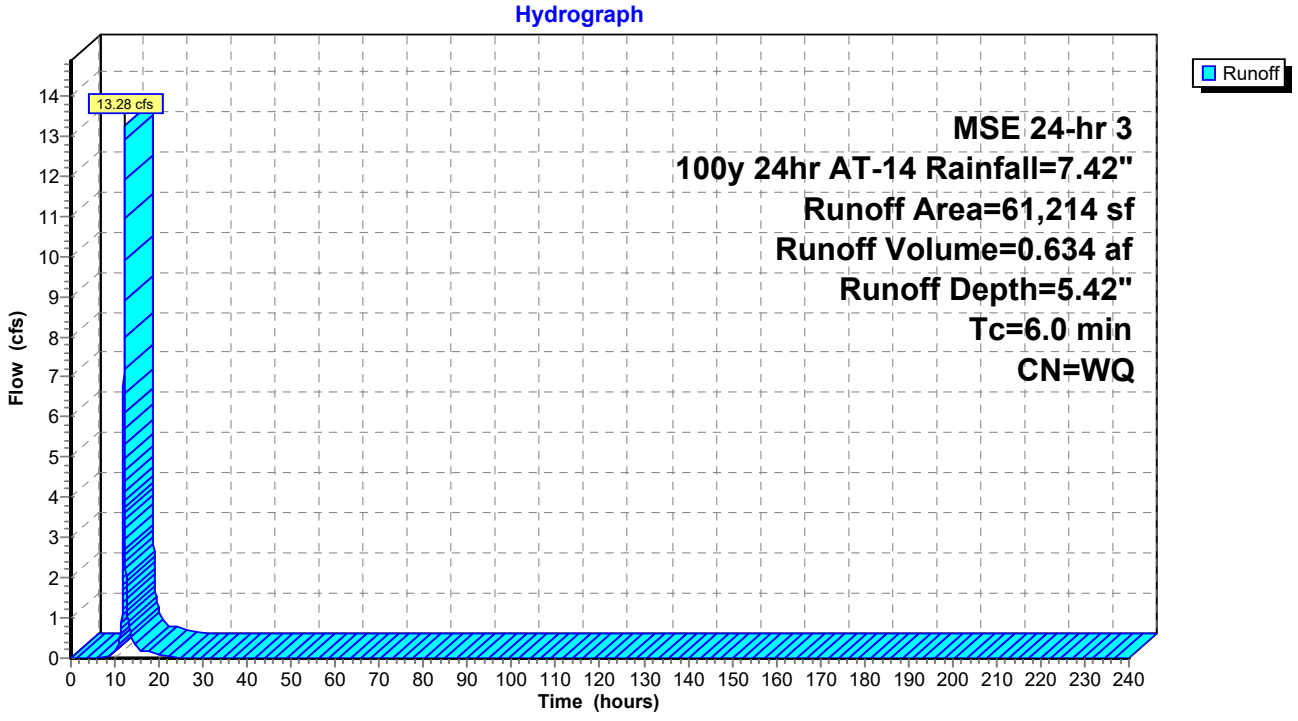
Runoff = 13.28 cfs @ 12.13 hrs, Volume= 0.634 af, Depth= 5.42"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.42"

| Area (sf) | CN | Description |
|---|---|---|
| 9,729 | 98 | Paved parking, HSG D |
| 51,485 | 80 | >75% Grass cover, Good, HSG D |
| 61,214 | | Weighted Average |
| 51,485 | | 84.11% Pervious Area |
| 9,729 | | 15.89% Impervious Area |

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

## Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment EX1: DRAINS SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.28 | 0.00 | 0.02 |
| 10.00 | 1.02 | 0.14 | **0.16** |
| 15.00 | 6.66 | 4.70 | **0.32** |
| 20.00 | **7.23** | **5.24** | 0.10 |
| 25.00 | **7.42** | **5.43** | 0.00 |
| 30.00 | 7.42 | 5.43 | 0.00 |
| 35.00 | 7.42 | 5.43 | 0.00 |
| 40.00 | 7.42 | 5.43 | 0.00 |
| 45.00 | 7.42 | 5.43 | 0.00 |
| 50.00 | 7.42 | 5.43 | 0.00 |
| 55.00 | 7.42 | 5.43 | 0.00 |
| 60.00 | 7.42 | 5.43 | 0.00 |
| 65.00 | 7.42 | 5.43 | 0.00 |
| 70.00 | 7.42 | 5.43 | 0.00 |
| 75.00 | 7.42 | 5.43 | 0.00 |
| 80.00 | 7.42 | 5.43 | 0.00 |
| 85.00 | 7.42 | 5.43 | 0.00 |
| 90.00 | 7.42 | 5.43 | 0.00 |
| 95.00 | 7.42 | 5.43 | 0.00 |
| 100.00 | 7.42 | 5.43 | 0.00 |
| 105.00 | 7.42 | 5.43 | 0.00 |
| 110.00 | 7.42 | 5.43 | 0.00 |
| 115.00 | 7.42 | 5.43 | 0.00 |
| 120.00 | 7.42 | 5.43 | 0.00 |
| 125.00 | 7.42 | 5.43 | 0.00 |
| 130.00 | 7.42 | 5.43 | 0.00 |
| 135.00 | 7.42 | 5.43 | 0.00 |
| 140.00 | 7.42 | 5.43 | 0.00 |
| 145.00 | 7.42 | 5.43 | 0.00 |
| 150.00 | 7.42 | 5.43 | 0.00 |
| 155.00 | 7.42 | 5.43 | 0.00 |
| 160.00 | 7.42 | 5.43 | 0.00 |
| 165.00 | 7.42 | 5.43 | 0.00 |
| 170.00 | 7.42 | 5.43 | 0.00 |
| 175.00 | 7.42 | 5.43 | 0.00 |
| 180.00 | 7.42 | 5.43 | 0.00 |
| 185.00 | 7.42 | 5.43 | 0.00 |
| 190.00 | 7.42 | 5.43 | 0.00 |
| 195.00 | 7.42 | 5.43 | 0.00 |
| 200.00 | 7.42 | 5.43 | 0.00 |
| 205.00 | 7.42 | 5.43 | 0.00 |
| 210.00 | 7.42 | 5.43 | 0.00 |
| 215.00 | 7.42 | 5.43 | 0.00 |
| 220.00 | 7.42 | 5.43 | 0.00 |
| 225.00 | 7.42 | 5.43 | 0.00 |
| 230.00 | 7.42 | 5.43 | 0.00 |
| 235.00 | 7.42 | 5.43 | 0.00 |
| 240.00 | 7.42 | 5.43 | 0.00 |

## Summary for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

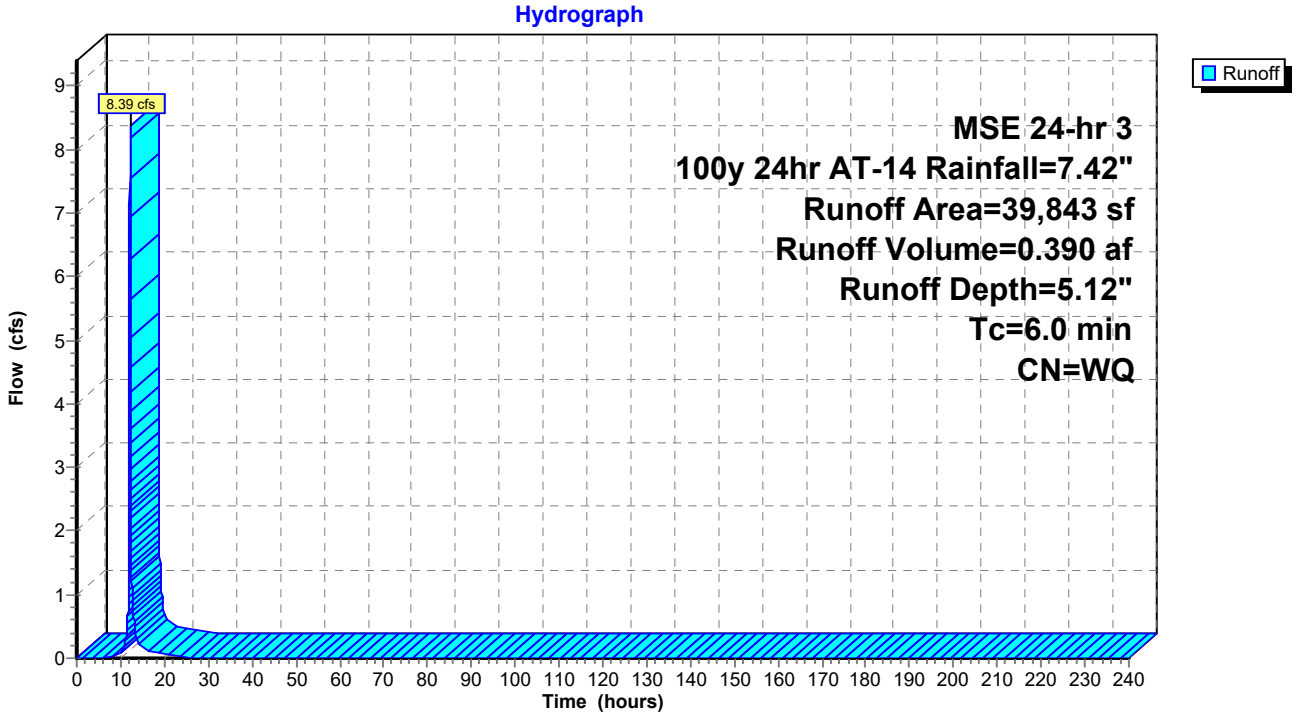
Runoff = 8.39 cfs @ 12.13 hrs, Volume= 0.390 af, Depth= 5.12"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.42"

| Area (sf) | CN | Description |
|---|---|---|
| 687 | 98 | Paved parking, HSG D |
| 39,156 | 80 | >75% Grass cover, Good, HSG D |
| 39,843 | | Weighted Average |
| 39,156 | | 98.28% Pervious Area |
| 687 | | 1.72% Impervious Area |

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

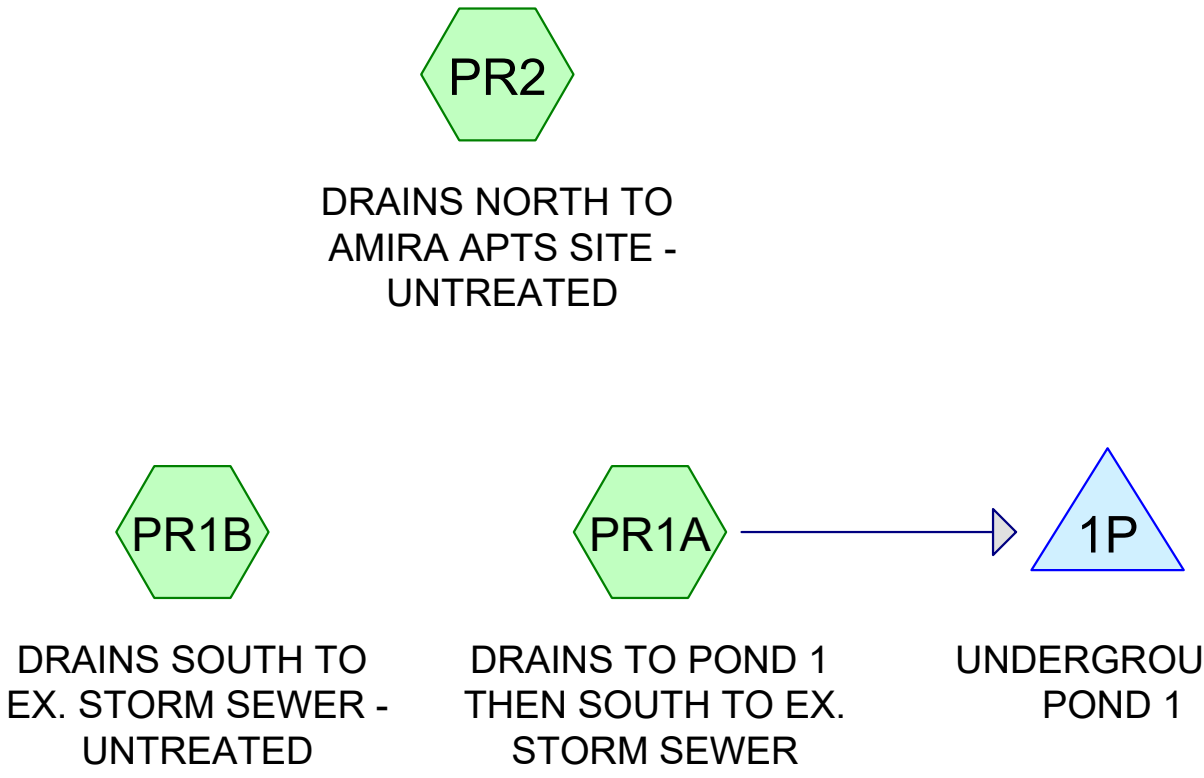
## Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

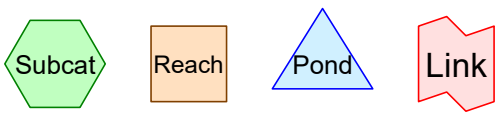


## Hydrograph for Subcatchment EX2: DRAINS NORTH TO AMIRA APTS SITE

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.28 | 0.00 | 0.00 |
| 10.00 | 1.02 | 0.09 | **0.08** |
| 15.00 | 6.66 | 4.38 | **0.20** |
| 20.00 | **7.23** | **4.90** | 0.07 |
| 25.00 | **7.42** | **5.08** | 0.00 |
| 30.00 | 7.42 | 5.08 | 0.00 |
| 35.00 | 7.42 | 5.08 | 0.00 |
| 40.00 | 7.42 | 5.08 | 0.00 |
| 45.00 | 7.42 | 5.08 | 0.00 |
| 50.00 | 7.42 | 5.08 | 0.00 |
| 55.00 | 7.42 | 5.08 | 0.00 |
| 60.00 | 7.42 | 5.08 | 0.00 |
| 65.00 | 7.42 | 5.08 | 0.00 |
| 70.00 | 7.42 | 5.08 | 0.00 |
| 75.00 | 7.42 | 5.08 | 0.00 |
| 80.00 | 7.42 | 5.08 | 0.00 |
| 85.00 | 7.42 | 5.08 | 0.00 |
| 90.00 | 7.42 | 5.08 | 0.00 |
| 95.00 | 7.42 | 5.08 | 0.00 |
| 100.00 | 7.42 | 5.08 | 0.00 |
| 105.00 | 7.42 | 5.08 | 0.00 |
| 110.00 | 7.42 | 5.08 | 0.00 |
| 115.00 | 7.42 | 5.08 | 0.00 |
| 120.00 | 7.42 | 5.08 | 0.00 |
| 125.00 | 7.42 | 5.08 | 0.00 |
| 130.00 | 7.42 | 5.08 | 0.00 |
| 135.00 | 7.42 | 5.08 | 0.00 |
| 140.00 | 7.42 | 5.08 | 0.00 |
| 145.00 | 7.42 | 5.08 | 0.00 |
| 150.00 | 7.42 | 5.08 | 0.00 |
| 155.00 | 7.42 | 5.08 | 0.00 |
| 160.00 | 7.42 | 5.08 | 0.00 |
| 165.00 | 7.42 | 5.08 | 0.00 |
| 170.00 | 7.42 | 5.08 | 0.00 |
| 175.00 | 7.42 | 5.08 | 0.00 |
| 180.00 | 7.42 | 5.08 | 0.00 |
| 185.00 | 7.42 | 5.08 | 0.00 |
| 190.00 | 7.42 | 5.08 | 0.00 |
| 195.00 | 7.42 | 5.08 | 0.00 |
| 200.00 | 7.42 | 5.08 | 0.00 |
| 205.00 | 7.42 | 5.08 | 0.00 |
| 210.00 | 7.42 | 5.08 | 0.00 |
| 215.00 | 7.42 | 5.08 | 0.00 |
| 220.00 | 7.42 | 5.08 | 0.00 |
| 225.00 | 7.42 | 5.08 | 0.00 |
| 230.00 | 7.42 | 5.08 | 0.00 |
| 235.00 | 7.42 | 5.08 | 0.00 |
| 240.00 | 7.42 | 5.08 | 0.00 |

# PROPOSED CONDITIONS




**Routing Diagram for 24132 PROPOSED**
Prepared by Civil Site Group, Printed 6/5/2024

## Rainfall Events Listing

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.1" RAINFALL | MSE 24-hr | 3 | Default | 24.00 | 1 | 1.10 | 2 |
| 2 | 1.5" RAINFALL | MSE 24-hr | 3 | Default | 24.00 | 1 | 1.50 | 2 |
| 3 | 1y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 2.50 | 2 |
| 4 | 2y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 2.88 | 2 |
| 5 | 10y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 4.29 | 2 |
| 6 | 100y 24hr AT-14 | MSE 24-hr | 3 | Default | 24.00 | 1 | 7.42 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.752 | 80 | >75% Grass cover, Good, HSG D (PR1A, PR1B, PR2) |
| 1.568 | 98 | Paved parking, HSG D (PR1A, PR1B, PR2) |
| **2.320** | **92** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 0.000 | HSG C | |
| 2.320 | HSG D | PR1A, PR1B, PR2 |
| 0.000 | Other | |
| **2.320** | | **TOTAL AREA** |

## Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 0.000 | 0.752 | 0.000 | 0.752 | >75% Grass cover, Good | PR1A, PR1B, PR2 |
| 0.000 | 0.000 | 0.000 | 1.568 | 0.000 | 1.568 | Paved parking | PR1A, PR1B, PR2 |
| **0.000** | **0.000** | **0.000** | **2.320** | **0.000** | **2.320** | **TOTAL AREA** | |

## Pipe Listing (all nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Width (inches) | Diam/Height (inches) | Inside-Fill (inches) | Node Name |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1P | 961.90 | 961.38 | 103.0 | 0.0050 | 0.012 | 0.0 | 15.0 | 0.0 | |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment PR1A: DRAINS TO POND 1** Runoff Area=73,474 sf 83.48% Impervious Runoff Depth=0.76"
Tc=6.0 min CN=WQ Runoff=2.18 cfs 0.107 af

**Subcatchment PR1B: DRAINS SOUTH TO** Runoff Area=14,493 sf 28.85% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=WQ Runoff=0.17 cfs 0.009 af

**Subcatchment PR2: DRAINS NORTH TO** Runoff Area=13,090 sf 21.37% Impervious Runoff Depth=0.28"
Tc=6.0 min CN=WQ Runoff=0.13 cfs 0.007 af

**Pond 1P: UNDERGROUND POND 1** Peak Elev=966.05' Storage=9,627 cf Inflow=2.18 cfs 0.107 af
Outflow=0.44 cfs 0.107 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.123 af Average Runoff Depth = 0.64"**
**32.40% Pervious = 0.752 ac 67.60% Impervious = 1.568 ac**

## Summary for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

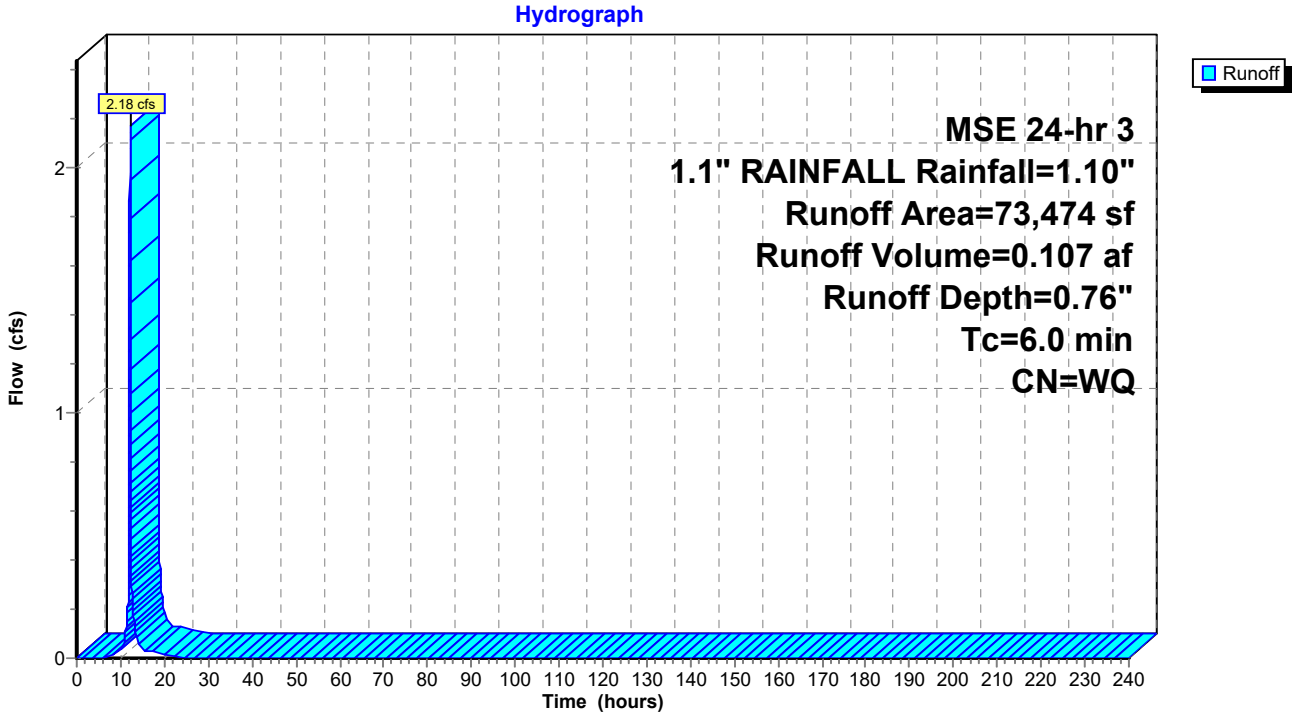
Runoff = 2.18 cfs @ 12.13 hrs, Volume= 0.107 af, Depth= 0.76"
Routed to Pond 1P : UNDERGROUND POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1.1" RAINFALL Rainfall=1.10"

| Area (sf) | CN | Description |
|---|---|---|
| 61,334 | 98 | Paved parking, HSG D |
| 12,140 | 80 | >75% Grass cover, Good, HSG D |
| 73,474 | | Weighted Average |
| 12,140 | | 16.52% Pervious Area |
| 61,334 | | 83.48% Impervious Area |

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

### Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.04 | 0.00 | 0.00 |
| 10.00 | 0.15 | 0.00 | **0.03** |
| 15.00 | 0.99 | 0.55 | **0.05** |
| 20.00 | **1.07** | **0.63** | 0.02 |
| 25.00 | **1.10** | **0.65** | 0.00 |
| 30.00 | 1.10 | 0.65 | 0.00 |
| 35.00 | 1.10 | 0.65 | 0.00 |
| 40.00 | 1.10 | 0.65 | 0.00 |
| 45.00 | 1.10 | 0.65 | 0.00 |
| 50.00 | 1.10 | 0.65 | 0.00 |
| 55.00 | 1.10 | 0.65 | 0.00 |
| 60.00 | 1.10 | 0.65 | 0.00 |
| 65.00 | 1.10 | 0.65 | 0.00 |
| 70.00 | 1.10 | 0.65 | 0.00 |
| 75.00 | 1.10 | 0.65 | 0.00 |
| 80.00 | 1.10 | 0.65 | 0.00 |
| 85.00 | 1.10 | 0.65 | 0.00 |
| 90.00 | 1.10 | 0.65 | 0.00 |
| 95.00 | 1.10 | 0.65 | 0.00 |
| 100.00 | 1.10 | 0.65 | 0.00 |
| 105.00 | 1.10 | 0.65 | 0.00 |
| 110.00 | 1.10 | 0.65 | 0.00 |
| 115.00 | 1.10 | 0.65 | 0.00 |
| 120.00 | 1.10 | 0.65 | 0.00 |
| 125.00 | 1.10 | 0.65 | 0.00 |
| 130.00 | 1.10 | 0.65 | 0.00 |
| 135.00 | 1.10 | 0.65 | 0.00 |
| 140.00 | 1.10 | 0.65 | 0.00 |
| 145.00 | 1.10 | 0.65 | 0.00 |
| 150.00 | 1.10 | 0.65 | 0.00 |
| 155.00 | 1.10 | 0.65 | 0.00 |
| 160.00 | 1.10 | 0.65 | 0.00 |
| 165.00 | 1.10 | 0.65 | 0.00 |
| 170.00 | 1.10 | 0.65 | 0.00 |
| 175.00 | 1.10 | 0.65 | 0.00 |
| 180.00 | 1.10 | 0.65 | 0.00 |
| 185.00 | 1.10 | 0.65 | 0.00 |
| 190.00 | 1.10 | 0.65 | 0.00 |
| 195.00 | 1.10 | 0.65 | 0.00 |
| 200.00 | 1.10 | 0.65 | 0.00 |
| 205.00 | 1.10 | 0.65 | 0.00 |
| 210.00 | 1.10 | 0.65 | 0.00 |
| 215.00 | 1.10 | 0.65 | 0.00 |
| 220.00 | 1.10 | 0.65 | 0.00 |
| 225.00 | 1.10 | 0.65 | 0.00 |
| 230.00 | 1.10 | 0.65 | 0.00 |
| 235.00 | 1.10 | 0.65 | 0.00 |
| 240.00 | 1.10 | 0.65 | 0.00 |

## Summary for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

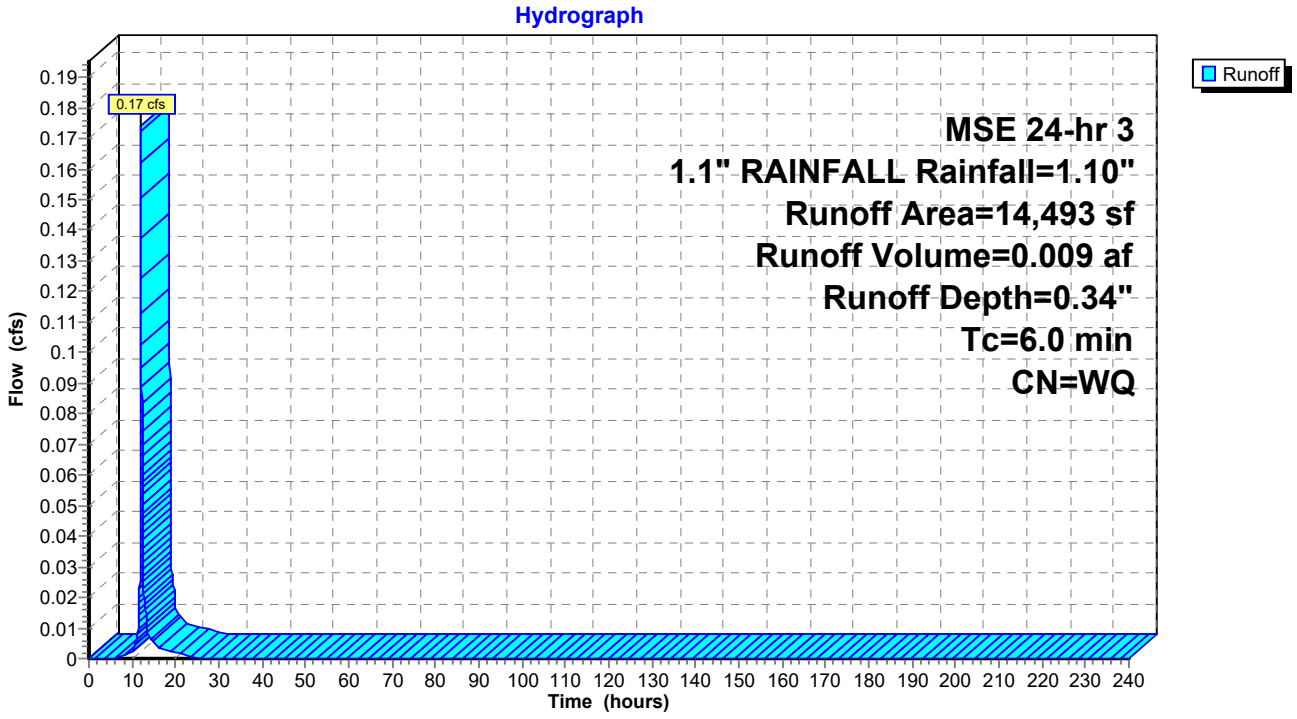
Runoff = 0.17 cfs @ 12.14 hrs, Volume= 0.009 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1.1" RAINFALL Rainfall=1.10"

| Area (sf) | CN | Description |
|---|---|---|
| 4,181 | 98 | Paved parking, HSG D |
| 10,312 | 80 | >75% Grass cover, Good, HSG D |
| 14,493 | | Weighted Average |
| 10,312 | | 71.15% Pervious Area |
| 4,181 | | 28.85% Impervious Area |

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

### Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED



## Hydrograph for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.04 | 0.00 | 0.00 |
| 10.00 | 0.15 | 0.00 | **0.00** |
| 15.00 | 0.99 | 0.17 | **0.01** |
| 20.00 | **1.07** | **0.21** | 0.00 |
| 25.00 | **1.10** | **0.22** | 0.00 |
| 30.00 | 1.10 | 0.22 | 0.00 |
| 35.00 | 1.10 | 0.22 | 0.00 |
| 40.00 | 1.10 | 0.22 | 0.00 |
| 45.00 | 1.10 | 0.22 | 0.00 |
| 50.00 | 1.10 | 0.22 | 0.00 |
| 55.00 | 1.10 | 0.22 | 0.00 |
| 60.00 | 1.10 | 0.22 | 0.00 |
| 65.00 | 1.10 | 0.22 | 0.00 |
| 70.00 | 1.10 | 0.22 | 0.00 |
| 75.00 | 1.10 | 0.22 | 0.00 |
| 80.00 | 1.10 | 0.22 | 0.00 |
| 85.00 | 1.10 | 0.22 | 0.00 |
| 90.00 | 1.10 | 0.22 | 0.00 |
| 95.00 | 1.10 | 0.22 | 0.00 |
| 100.00 | 1.10 | 0.22 | 0.00 |
| 105.00 | 1.10 | 0.22 | 0.00 |
| 110.00 | 1.10 | 0.22 | 0.00 |
| 115.00 | 1.10 | 0.22 | 0.00 |
| 120.00 | 1.10 | 0.22 | 0.00 |
| 125.00 | 1.10 | 0.22 | 0.00 |
| 130.00 | 1.10 | 0.22 | 0.00 |
| 135.00 | 1.10 | 0.22 | 0.00 |
| 140.00 | 1.10 | 0.22 | 0.00 |
| 145.00 | 1.10 | 0.22 | 0.00 |
| 150.00 | 1.10 | 0.22 | 0.00 |
| 155.00 | 1.10 | 0.22 | 0.00 |
| 160.00 | 1.10 | 0.22 | 0.00 |
| 165.00 | 1.10 | 0.22 | 0.00 |
| 170.00 | 1.10 | 0.22 | 0.00 |
| 175.00 | 1.10 | 0.22 | 0.00 |
| 180.00 | 1.10 | 0.22 | 0.00 |
| 185.00 | 1.10 | 0.22 | 0.00 |
| 190.00 | 1.10 | 0.22 | 0.00 |
| 195.00 | 1.10 | 0.22 | 0.00 |
| 200.00 | 1.10 | 0.22 | 0.00 |
| 205.00 | 1.10 | 0.22 | 0.00 |
| 210.00 | 1.10 | 0.22 | 0.00 |
| 215.00 | 1.10 | 0.22 | 0.00 |
| 220.00 | 1.10 | 0.22 | 0.00 |
| 225.00 | 1.10 | 0.22 | 0.00 |
| 230.00 | 1.10 | 0.22 | 0.00 |
| 235.00 | 1.10 | 0.22 | 0.00 |
| 240.00 | 1.10 | 0.22 | 0.00 |

## Summary for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

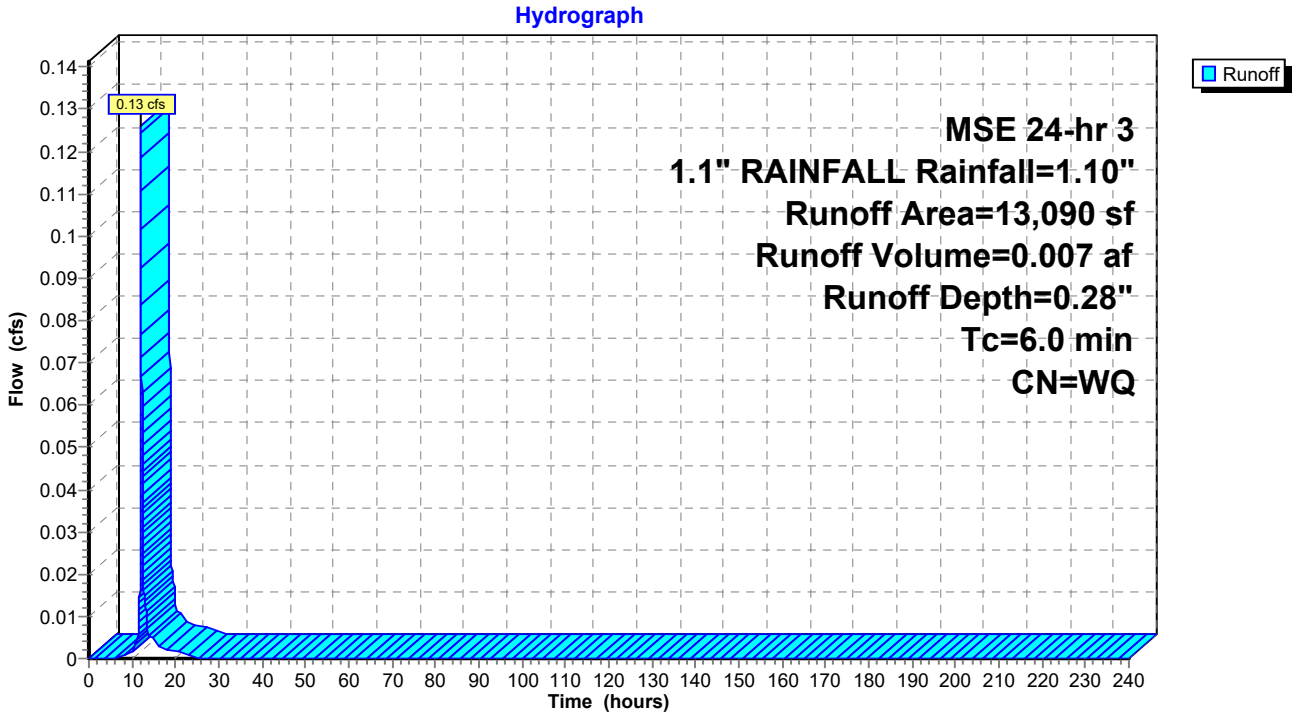
Runoff = 0.13 cfs @ 12.14 hrs, Volume= 0.007 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1.1" RAINFALL Rainfall=1.10"

| Area (sf) | CN | Description |
|---|---|---|
| 2,797 | 98 | Paved parking, HSG D |
| 10,293 | 80 | >75% Grass cover, Good, HSG D |
| 13,090 | | Weighted Average |
| 10,293 | | 78.63% Pervious Area |
| 2,797 | | 21.37% Impervious Area |

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

## Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED



## Hydrograph for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.04 | 0.00 | 0.00 |
| 10.00 | 0.15 | 0.00 | **0.00** |
| 15.00 | 0.99 | 0.15 | **0.00** |
| 20.00 | **1.07** | **0.18** | 0.00 |
| 25.00 | **1.10** | **0.20** | 0.00 |
| 30.00 | 1.10 | 0.20 | 0.00 |
| 35.00 | 1.10 | 0.20 | 0.00 |
| 40.00 | 1.10 | 0.20 | 0.00 |
| 45.00 | 1.10 | 0.20 | 0.00 |
| 50.00 | 1.10 | 0.20 | 0.00 |
| 55.00 | 1.10 | 0.20 | 0.00 |
| 60.00 | 1.10 | 0.20 | 0.00 |
| 65.00 | 1.10 | 0.20 | 0.00 |
| 70.00 | 1.10 | 0.20 | 0.00 |
| 75.00 | 1.10 | 0.20 | 0.00 |
| 80.00 | 1.10 | 0.20 | 0.00 |
| 85.00 | 1.10 | 0.20 | 0.00 |
| 90.00 | 1.10 | 0.20 | 0.00 |
| 95.00 | 1.10 | 0.20 | 0.00 |
| 100.00 | 1.10 | 0.20 | 0.00 |
| 105.00 | 1.10 | 0.20 | 0.00 |
| 110.00 | 1.10 | 0.20 | 0.00 |
| 115.00 | 1.10 | 0.20 | 0.00 |
| 120.00 | 1.10 | 0.20 | 0.00 |
| 125.00 | 1.10 | 0.20 | 0.00 |
| 130.00 | 1.10 | 0.20 | 0.00 |
| 135.00 | 1.10 | 0.20 | 0.00 |
| 140.00 | 1.10 | 0.20 | 0.00 |
| 145.00 | 1.10 | 0.20 | 0.00 |
| 150.00 | 1.10 | 0.20 | 0.00 |
| 155.00 | 1.10 | 0.20 | 0.00 |
| 160.00 | 1.10 | 0.20 | 0.00 |
| 165.00 | 1.10 | 0.20 | 0.00 |
| 170.00 | 1.10 | 0.20 | 0.00 |
| 175.00 | 1.10 | 0.20 | 0.00 |
| 180.00 | 1.10 | 0.20 | 0.00 |
| 185.00 | 1.10 | 0.20 | 0.00 |
| 190.00 | 1.10 | 0.20 | 0.00 |
| 195.00 | 1.10 | 0.20 | 0.00 |
| 200.00 | 1.10 | 0.20 | 0.00 |
| 205.00 | 1.10 | 0.20 | 0.00 |
| 210.00 | 1.10 | 0.20 | 0.00 |
| 215.00 | 1.10 | 0.20 | 0.00 |
| 220.00 | 1.10 | 0.20 | 0.00 |
| 225.00 | 1.10 | 0.20 | 0.00 |
| 230.00 | 1.10 | 0.20 | 0.00 |
| 235.00 | 1.10 | 0.20 | 0.00 |
| 240.00 | 1.10 | 0.20 | 0.00 |

## Summary for Pond 1P: UNDERGROUND POND 1

Inflow Area = 1.687 ac, 83.48% Impervious, Inflow Depth = 0.76" for 1.1" RAINFALL event
Inflow = 2.18 cfs @ 12.13 hrs, Volume= 0.107 af
Outflow = 0.44 cfs @ 12.40 hrs, Volume= 0.107 af, Atten= 80%, Lag= 16.2 min
Primary = 0.44 cfs @ 12.40 hrs, Volume= 0.107 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Starting Elev= 965.40' Surf.Area= 4,484 sf Storage= 7,467 cf
Peak Elev= 966.05' @ 12.40 hrs Surf.Area= 4,484 sf Storage= 9,627 cf (2,159 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 132.9 min ( 908.9 - 776.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1A | 962.40' | 0 cf | **19.00'W x 236.00'L x 7.50'H Field A**<br>33,630 cf Overall - 18,242 cf Embedded = 15,388 cf x 0.0% Voids |
| #2A | 962.40' | 18,242 cf | **CMP Round 84** x 22 Inside #1<br>Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf<br>Overall Size= 84.0"W x 84.0"H x 20.00'L<br>22 Chambers in 2 Rows<br>17.00' Header x 38.48 sf x 2 = 1,308.5 cf Inside |
| | | 18,242 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 961.90' | **15.0" Round Culvert**<br>L= 103.0' RCP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 961.90' / 961.38' S= 0.0050 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Device 1 | 965.40' | **5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 966.40' | **16.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.44 cfs @ 12.40 hrs HW=966.05' (Free Discharge)
└**1=Culvert** (Passes 0.44 cfs of 9.41 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.44 cfs @ 3.21 fps)
  └**3=Orifice/Grate** ( Controls 0.00 cfs)

## Pond 1P: UNDERGROUND POND 1 - Chamber Wizard Field A

**Chamber Model = CMP Round 84 (Round Corrugated Metal Pipe)**
Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf
Overall Size= 84.0"W x 84.0"H x 20.00'L

84.0" Wide + 36.0" Spacing = 120.0" C-C Row Spacing

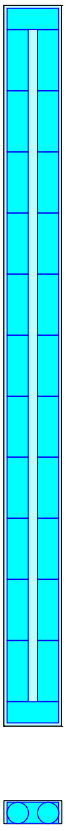
11 Chambers/Row x 20.00' Long +7.00' Header x 2 = 234.00' Row Length +12.0" End Stone x 2 = 236.00' Base Length
2 Rows x 84.0" Wide + 36.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.00' Base Width
84.0" Chamber Height + 6.0" Stone Cover = 7.50' Field Height

22 Chambers x 769.7 cf + 17.00' Header x 38.48 sf x 2 = 18,241.7 cf Chamber Storage

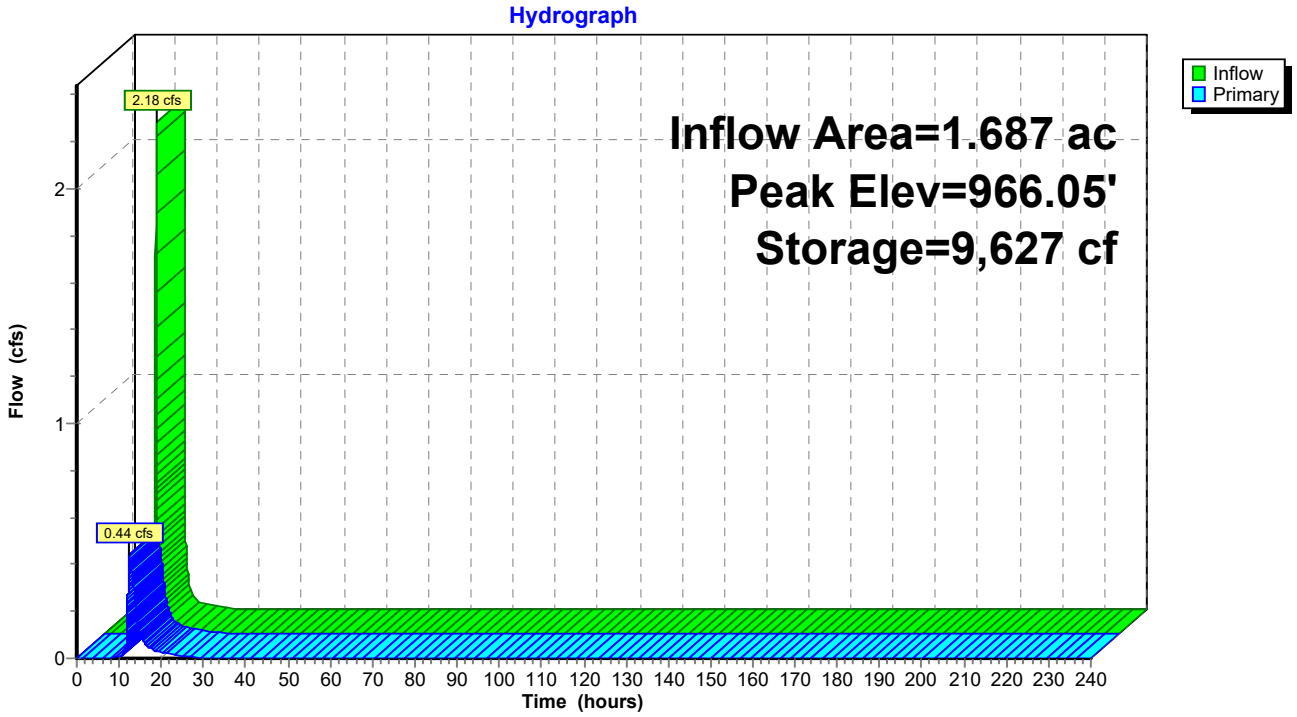
33,630.0 cf Field - 18,241.7 cf Chambers = 15,388.3 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 18,241.7 cf = 0.419 af
Overall Storage Efficiency = 54.2%
Overall System Size = 236.00' x 19.00' x 7.50'

22 Chambers
1,245.6 cy Field
569.9 cy Stone



## Pond 1P: UNDERGROUND POND 1



## Hydrograph for Pond 1P: UNDERGROUND POND 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | 0.00 | 7,467 | 965.40 | 0.00 |
| 5.00 | 0.00 | 7,467 | 965.40 | 0.00 |
| 10.00 | **0.03** | **7,621** | **965.45** | **0.01** |
| 15.00 | **0.05** | **8,165** | **965.61** | **0.11** |
| 20.00 | 0.02 | 7,769 | 965.49 | 0.02 |
| 25.00 | 0.00 | 7,635 | 965.45 | 0.01 |
| 30.00 | 0.00 | 7,535 | 965.42 | 0.00 |
| 35.00 | 0.00 | 7,507 | 965.41 | 0.00 |
| 40.00 | 0.00 | 7,499 | 965.41 | 0.00 |
| 45.00 | 0.00 | 7,494 | 965.41 | 0.00 |
| 50.00 | 0.00 | 7,490 | 965.41 | 0.00 |
| 55.00 | 0.00 | 7,487 | 965.41 | 0.00 |
| 60.00 | 0.00 | 7,484 | 965.41 | 0.00 |
| 65.00 | 0.00 | 7,482 | 965.40 | 0.00 |
| 70.00 | 0.00 | 7,480 | 965.40 | 0.00 |
| 75.00 | 0.00 | 7,478 | 965.40 | 0.00 |
| 80.00 | 0.00 | 7,476 | 965.40 | 0.00 |
| 85.00 | 0.00 | 7,475 | 965.40 | 0.00 |
| 90.00 | 0.00 | 7,474 | 965.40 | 0.00 |
| 95.00 | 0.00 | 7,473 | 965.40 | 0.00 |
| 100.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 105.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 110.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 115.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 120.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 125.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 130.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 135.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 140.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 145.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 150.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 155.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 160.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 165.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 170.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 175.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 180.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 185.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 190.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 195.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 200.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 205.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 210.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 215.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 220.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 225.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 230.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 235.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 240.00 | 0.00 | 7,468 | 965.40 | 0.00 |

## Stage-Area-Storage for Pond 1P: UNDERGROUND POND 1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---|---|---|---|---|---|
| 962.40 | 0 | 965.00 | 6,168 | 967.60 | 14,531 |
| 962.45 | 12 | 965.05 | 6,328 | 967.65 | 14,675 |
| 962.50 | 52 | 965.10 | 6,490 | 967.70 | 14,818 |
| 962.55 | 96 | 965.15 | 6,652 | 967.75 | 14,960 |
| 962.60 | 148 | 965.20 | 6,814 | 967.80 | 15,100 |
| 962.65 | 207 | 965.25 | 6,977 | 967.85 | 15,239 |
| 962.70 | 271 | 965.30 | 7,140 | 967.90 | 15,376 |
| 962.75 | 341 | 965.35 | 7,303 | 967.95 | 15,511 |
| 962.80 | 416 | 965.40 | 7,467 | 968.00 | 15,644 |
| 962.85 | 495 | 965.45 | 7,632 | 968.05 | 15,776 |
| 962.90 | 578 | 965.50 | 7,797 | 968.10 | 15,906 |
| 962.95 | 666 | 965.55 | 7,961 | 968.15 | 16,034 |
| 963.00 | 757 | 965.60 | 8,127 | 968.20 | 16,160 |
| 963.05 | 851 | 965.65 | 8,292 | 968.25 | 16,284 |
| 963.10 | 949 | 965.70 | 8,458 | 968.30 | 16,406 |
| 963.15 | 1,050 | 965.75 | 8,623 | 968.35 | 16,526 |
| 963.20 | 1,155 | 965.80 | 8,789 | 968.40 | 16,643 |
| 963.25 | 1,262 | 965.85 | 8,955 | 968.45 | 16,758 |
| 963.30 | 1,371 | 965.90 | 9,121 | 968.50 | 16,870 |
| 963.35 | 1,484 | 965.95 | 9,287 | 968.55 | 16,980 |
| 963.40 | 1,599 | 966.00 | 9,453 | 968.60 | 17,087 |
| 963.45 | 1,716 | 966.05 | 9,618 | 968.65 | 17,191 |
| 963.50 | 1,835 | 966.10 | 9,784 | 968.70 | 17,292 |
| 963.55 | 1,957 | 966.15 | 9,950 | 968.75 | 17,390 |
| 963.60 | 2,081 | 966.20 | 10,115 | 968.80 | 17,485 |
| 963.65 | 2,207 | 966.25 | 10,280 | 968.85 | 17,576 |
| 963.70 | 2,335 | 966.30 | 10,445 | 968.90 | 17,663 |
| 963.75 | 2,465 | 966.35 | 10,610 | 968.95 | 17,747 |
| 963.80 | 2,597 | 966.40 | 10,774 | 969.00 | 17,826 |
| 963.85 | 2,731 | 966.45 | 10,938 | 969.05 | 17,901 |
| 963.90 | 2,866 | 966.50 | 11,102 | 969.10 | 17,970 |
| 963.95 | 3,003 | 966.55 | 11,265 | 969.15 | 18,035 |
| 964.00 | 3,142 | 966.60 | 11,428 | 969.20 | 18,093 |
| 964.05 | 3,282 | 966.65 | 11,590 | 969.25 | 18,145 |
| 964.10 | 3,423 | 966.70 | 11,752 | 969.30 | 18,189 |
| 964.15 | 3,566 | 966.75 | 11,913 | 969.35 | 18,222 |
| 964.20 | 3,711 | 966.80 | 12,074 | 969.40 | **18,242** |
| 964.25 | 3,856 | 966.85 | 12,234 | 969.45 | 18,242 |
| 964.30 | 4,003 | 966.90 | 12,393 | 969.50 | 18,242 |
| 964.35 | 4,151 | 966.95 | 12,552 | 969.55 | 18,242 |
| 964.40 | 4,301 | 967.00 | 12,710 | 969.60 | 18,242 |
| 964.45 | 4,451 | 967.05 | 12,867 | 969.65 | 18,242 |
| 964.50 | 4,603 | 967.10 | 13,023 | 969.70 | 18,242 |
| 964.55 | 4,755 | 967.15 | 13,178 | 969.75 | 18,242 |
| 964.60 | 4,909 | 967.20 | 13,333 | 969.80 | 18,242 |
| 964.65 | 5,063 | 967.25 | 13,486 | 969.85 | 18,242 |
| 964.70 | 5,219 | 967.30 | 13,639 | 969.90 | 18,242 |
| 964.75 | 5,375 | 967.35 | 13,791 | | |
| 964.80 | 5,532 | 967.40 | 13,941 | | |
| 964.85 | 5,690 | 967.45 | 14,090 | | |
| 964.90 | 5,849 | 967.50 | 14,238 | | |
| 964.95 | 6,008 | 967.55 | 14,385 | | |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment PR1A: DRAINS TO POND 1** Runoff Area=73,474 sf 83.48% Impervious Runoff Depth=1.12"
Tc=6.0 min CN=WQ Runoff=3.15 cfs 0.157 af

**Subcatchment PR1B: DRAINS SOUTH TO** Runoff Area=14,493 sf 28.85% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=WQ Runoff=0.32 cfs 0.016 af

**Subcatchment PR2: DRAINS NORTH TO** Runoff Area=13,090 sf 21.37% Impervious Runoff Depth=0.50"
Tc=6.0 min CN=WQ Runoff=0.25 cfs 0.012 af

**Pond 1P: UNDERGROUND POND 1** Peak Elev=966.35' Storage=10,619 cf Inflow=3.15 cfs 0.157 af
Outflow=0.57 cfs 0.157 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.185 af Average Runoff Depth = 0.96"**
**32.40% Pervious = 0.752 ac 67.60% Impervious = 1.568 ac**

## Summary for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

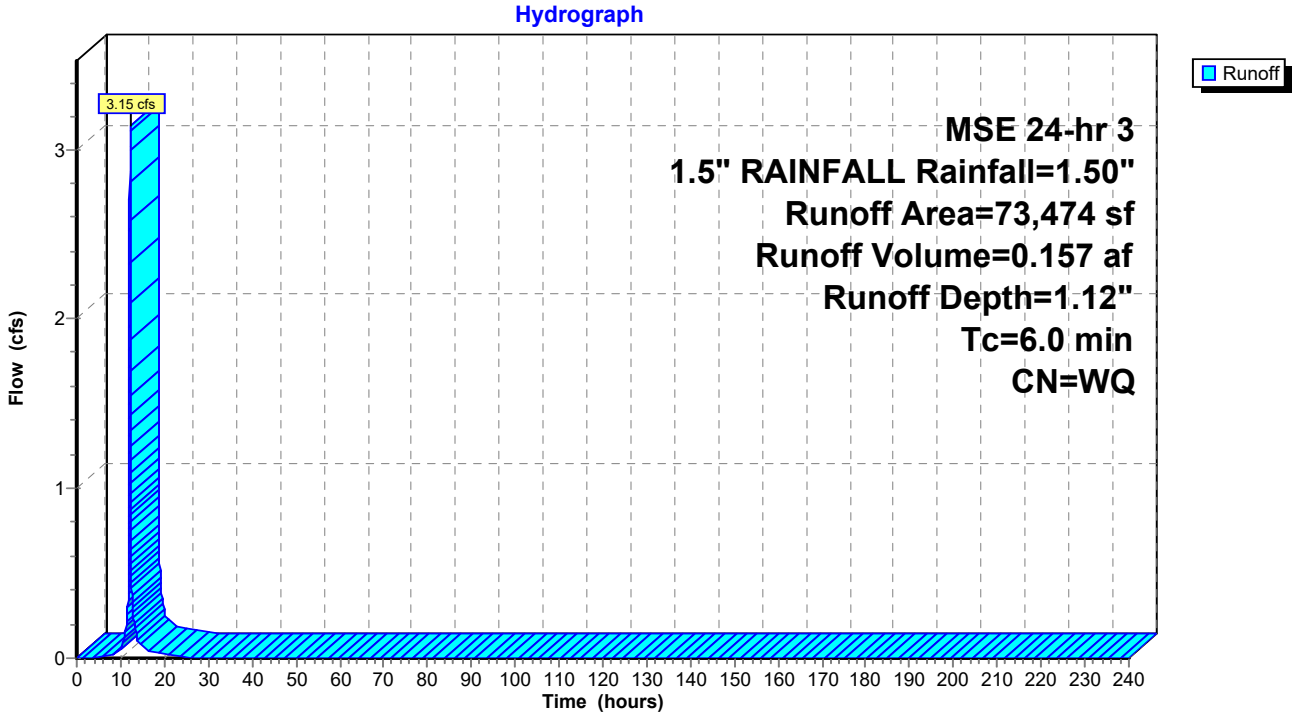
Runoff = 3.15 cfs @ 12.13 hrs, Volume= 0.157 af, Depth= 1.12"
Routed to Pond 1P : UNDERGROUND POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1.5" RAINFALL Rainfall=1.50"

| Area (sf) | CN | Description |
|---|---|---|
| 61,334 | 98 | Paved parking, HSG D |
| 12,140 | 80 | >75% Grass cover, Good, HSG D |
| 73,474 | | Weighted Average |
| 12,140 | | 16.52% Pervious Area |
| 61,334 | | 83.48% Impervious Area |

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

## Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.06 | 0.00 | 0.00 |
| 10.00 | 0.21 | 0.02 | **0.05** |
| 15.00 | 1.35 | 0.87 | **0.07** |
| 20.00 | **1.46** | **0.98** | 0.02 |
| 25.00 | **1.50** | **1.01** | 0.00 |
| 30.00 | 1.50 | 1.01 | 0.00 |
| 35.00 | 1.50 | 1.01 | 0.00 |
| 40.00 | 1.50 | 1.01 | 0.00 |
| 45.00 | 1.50 | 1.01 | 0.00 |
| 50.00 | 1.50 | 1.01 | 0.00 |
| 55.00 | 1.50 | 1.01 | 0.00 |
| 60.00 | 1.50 | 1.01 | 0.00 |
| 65.00 | 1.50 | 1.01 | 0.00 |
| 70.00 | 1.50 | 1.01 | 0.00 |
| 75.00 | 1.50 | 1.01 | 0.00 |
| 80.00 | 1.50 | 1.01 | 0.00 |
| 85.00 | 1.50 | 1.01 | 0.00 |
| 90.00 | 1.50 | 1.01 | 0.00 |
| 95.00 | 1.50 | 1.01 | 0.00 |
| 100.00 | 1.50 | 1.01 | 0.00 |
| 105.00 | 1.50 | 1.01 | 0.00 |
| 110.00 | 1.50 | 1.01 | 0.00 |
| 115.00 | 1.50 | 1.01 | 0.00 |
| 120.00 | 1.50 | 1.01 | 0.00 |
| 125.00 | 1.50 | 1.01 | 0.00 |
| 130.00 | 1.50 | 1.01 | 0.00 |
| 135.00 | 1.50 | 1.01 | 0.00 |
| 140.00 | 1.50 | 1.01 | 0.00 |
| 145.00 | 1.50 | 1.01 | 0.00 |
| 150.00 | 1.50 | 1.01 | 0.00 |
| 155.00 | 1.50 | 1.01 | 0.00 |
| 160.00 | 1.50 | 1.01 | 0.00 |
| 165.00 | 1.50 | 1.01 | 0.00 |
| 170.00 | 1.50 | 1.01 | 0.00 |
| 175.00 | 1.50 | 1.01 | 0.00 |
| 180.00 | 1.50 | 1.01 | 0.00 |
| 185.00 | 1.50 | 1.01 | 0.00 |
| 190.00 | 1.50 | 1.01 | 0.00 |
| 195.00 | 1.50 | 1.01 | 0.00 |
| 200.00 | 1.50 | 1.01 | 0.00 |
| 205.00 | 1.50 | 1.01 | 0.00 |
| 210.00 | 1.50 | 1.01 | 0.00 |
| 215.00 | 1.50 | 1.01 | 0.00 |
| 220.00 | 1.50 | 1.01 | 0.00 |
| 225.00 | 1.50 | 1.01 | 0.00 |
| 230.00 | 1.50 | 1.01 | 0.00 |
| 235.00 | 1.50 | 1.01 | 0.00 |
| 240.00 | 1.50 | 1.01 | 0.00 |

## Summary for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

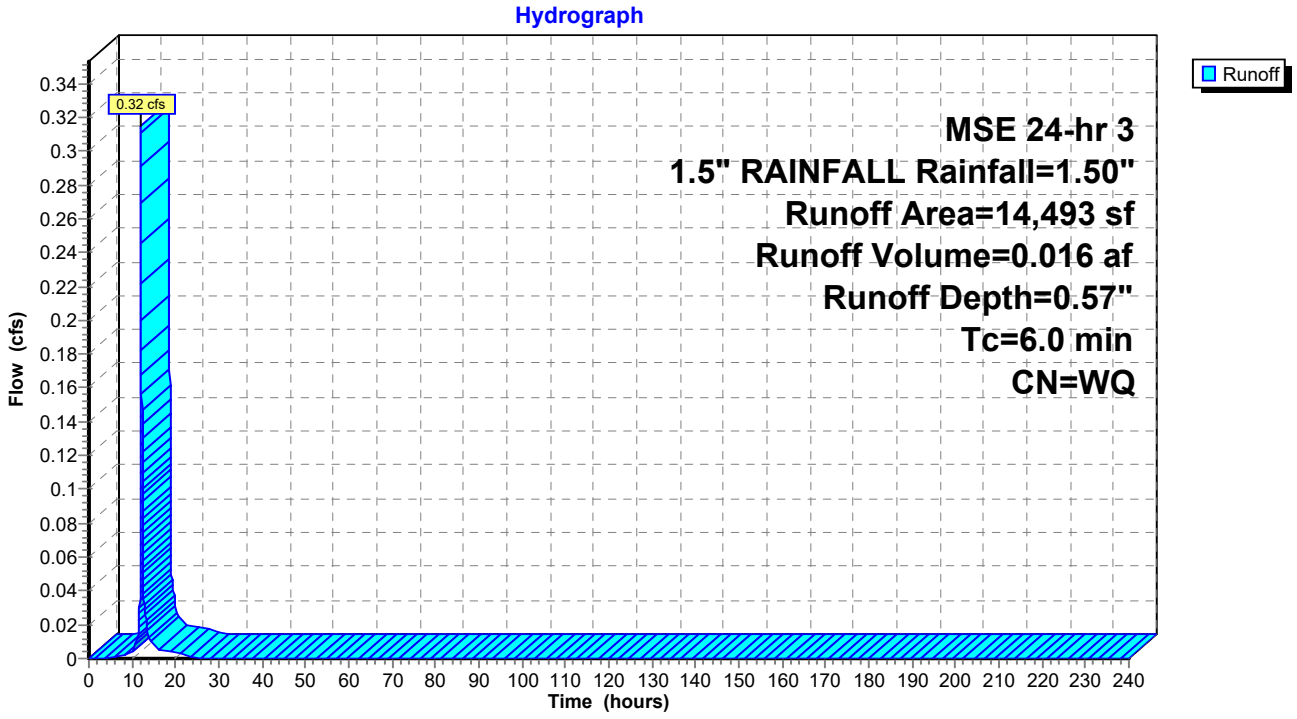
Runoff = 0.32 cfs @ 12.14 hrs, Volume= 0.016 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1.5" RAINFALL Rainfall=1.50"

| Area (sf) | CN | Description |
|---|---|---|
| 4,181 | 98 | Paved parking, HSG D |
| 10,312 | 80 | >75% Grass cover, Good, HSG D |
| 14,493 | | Weighted Average |
| 10,312 | | 71.15% Pervious Area |
| 4,181 | | 28.85% Impervious Area |

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

## Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED



## Hydrograph for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.06 | 0.00 | 0.00 |
| 10.00 | 0.21 | 0.00 | **0.00** |
| 15.00 | 1.35 | 0.36 | **0.01** |
| 20.00 | **1.46** | **0.43** | 0.00 |
| 25.00 | **1.50** | **0.45** | 0.00 |
| 30.00 | 1.50 | 0.45 | 0.00 |
| 35.00 | 1.50 | 0.45 | 0.00 |
| 40.00 | 1.50 | 0.45 | 0.00 |
| 45.00 | 1.50 | 0.45 | 0.00 |
| 50.00 | 1.50 | 0.45 | 0.00 |
| 55.00 | 1.50 | 0.45 | 0.00 |
| 60.00 | 1.50 | 0.45 | 0.00 |
| 65.00 | 1.50 | 0.45 | 0.00 |
| 70.00 | 1.50 | 0.45 | 0.00 |
| 75.00 | 1.50 | 0.45 | 0.00 |
| 80.00 | 1.50 | 0.45 | 0.00 |
| 85.00 | 1.50 | 0.45 | 0.00 |
| 90.00 | 1.50 | 0.45 | 0.00 |
| 95.00 | 1.50 | 0.45 | 0.00 |
| 100.00 | 1.50 | 0.45 | 0.00 |
| 105.00 | 1.50 | 0.45 | 0.00 |
| 110.00 | 1.50 | 0.45 | 0.00 |
| 115.00 | 1.50 | 0.45 | 0.00 |
| 120.00 | 1.50 | 0.45 | 0.00 |
| 125.00 | 1.50 | 0.45 | 0.00 |
| 130.00 | 1.50 | 0.45 | 0.00 |
| 135.00 | 1.50 | 0.45 | 0.00 |
| 140.00 | 1.50 | 0.45 | 0.00 |
| 145.00 | 1.50 | 0.45 | 0.00 |
| 150.00 | 1.50 | 0.45 | 0.00 |
| 155.00 | 1.50 | 0.45 | 0.00 |
| 160.00 | 1.50 | 0.45 | 0.00 |
| 165.00 | 1.50 | 0.45 | 0.00 |
| 170.00 | 1.50 | 0.45 | 0.00 |
| 175.00 | 1.50 | 0.45 | 0.00 |
| 180.00 | 1.50 | 0.45 | 0.00 |
| 185.00 | 1.50 | 0.45 | 0.00 |
| 190.00 | 1.50 | 0.45 | 0.00 |
| 195.00 | 1.50 | 0.45 | 0.00 |
| 200.00 | 1.50 | 0.45 | 0.00 |
| 205.00 | 1.50 | 0.45 | 0.00 |
| 210.00 | 1.50 | 0.45 | 0.00 |
| 215.00 | 1.50 | 0.45 | 0.00 |
| 220.00 | 1.50 | 0.45 | 0.00 |
| 225.00 | 1.50 | 0.45 | 0.00 |
| 230.00 | 1.50 | 0.45 | 0.00 |
| 235.00 | 1.50 | 0.45 | 0.00 |
| 240.00 | 1.50 | 0.45 | 0.00 |

## Summary for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

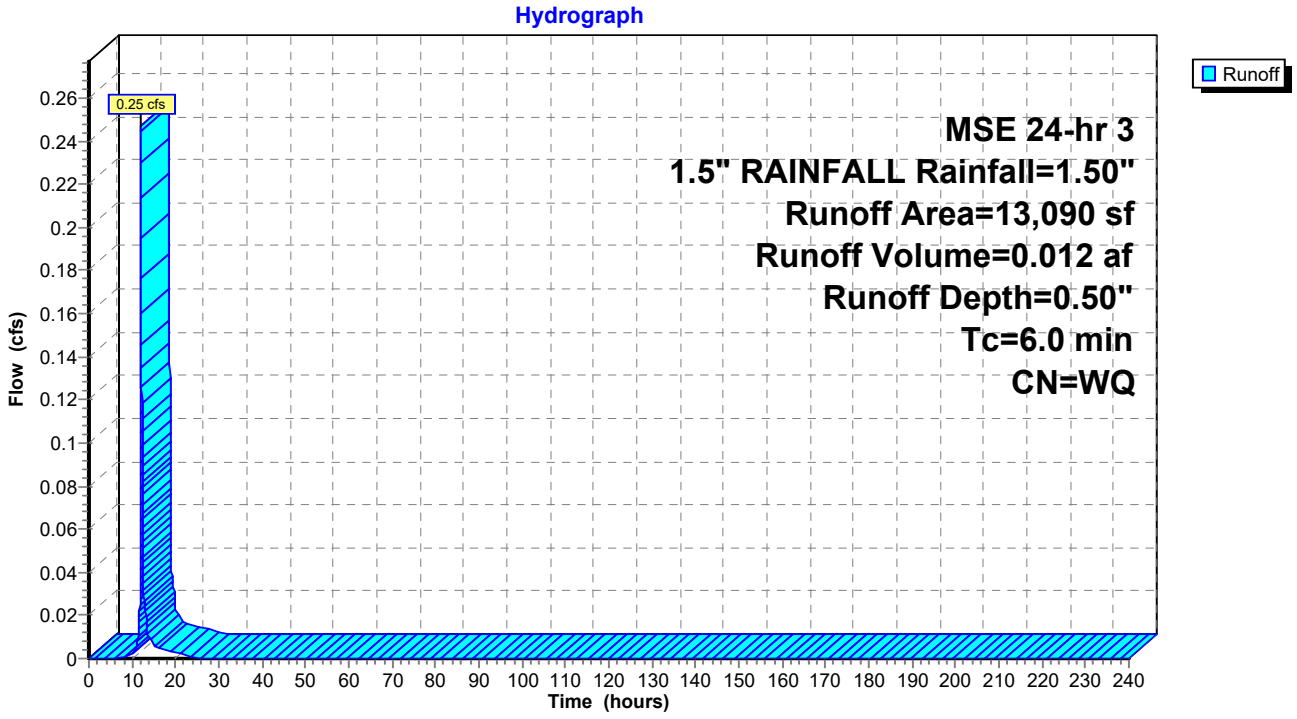
Runoff = 0.25 cfs @ 12.14 hrs, Volume= 0.012 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1.5" RAINFALL Rainfall=1.50"

| Area (sf) | CN | Description |
|---|---|---|
| 2,797 | 98 | Paved parking, HSG D |
| 10,293 | 80 | >75% Grass cover, Good, HSG D |
| 13,090 | | Weighted Average |
| 10,293 | | 78.63% Pervious Area |
| 2,797 | | 21.37% Impervious Area |

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

## Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED



## Hydrograph for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.06 | 0.00 | 0.00 |
| 10.00 | 0.21 | 0.00 | **0.00** |
| 15.00 | 1.35 | 0.32 | **0.01** |
| 20.00 | **1.46** | **0.39** | 0.00 |
| 25.00 | **1.50** | **0.41** | 0.00 |
| 30.00 | 1.50 | 0.41 | 0.00 |
| 35.00 | 1.50 | 0.41 | 0.00 |
| 40.00 | 1.50 | 0.41 | 0.00 |
| 45.00 | 1.50 | 0.41 | 0.00 |
| 50.00 | 1.50 | 0.41 | 0.00 |
| 55.00 | 1.50 | 0.41 | 0.00 |
| 60.00 | 1.50 | 0.41 | 0.00 |
| 65.00 | 1.50 | 0.41 | 0.00 |
| 70.00 | 1.50 | 0.41 | 0.00 |
| 75.00 | 1.50 | 0.41 | 0.00 |
| 80.00 | 1.50 | 0.41 | 0.00 |
| 85.00 | 1.50 | 0.41 | 0.00 |
| 90.00 | 1.50 | 0.41 | 0.00 |
| 95.00 | 1.50 | 0.41 | 0.00 |
| 100.00 | 1.50 | 0.41 | 0.00 |
| 105.00 | 1.50 | 0.41 | 0.00 |
| 110.00 | 1.50 | 0.41 | 0.00 |
| 115.00 | 1.50 | 0.41 | 0.00 |
| 120.00 | 1.50 | 0.41 | 0.00 |
| 125.00 | 1.50 | 0.41 | 0.00 |
| 130.00 | 1.50 | 0.41 | 0.00 |
| 135.00 | 1.50 | 0.41 | 0.00 |
| 140.00 | 1.50 | 0.41 | 0.00 |
| 145.00 | 1.50 | 0.41 | 0.00 |
| 150.00 | 1.50 | 0.41 | 0.00 |
| 155.00 | 1.50 | 0.41 | 0.00 |
| 160.00 | 1.50 | 0.41 | 0.00 |
| 165.00 | 1.50 | 0.41 | 0.00 |
| 170.00 | 1.50 | 0.41 | 0.00 |
| 175.00 | 1.50 | 0.41 | 0.00 |
| 180.00 | 1.50 | 0.41 | 0.00 |
| 185.00 | 1.50 | 0.41 | 0.00 |
| 190.00 | 1.50 | 0.41 | 0.00 |
| 195.00 | 1.50 | 0.41 | 0.00 |
| 200.00 | 1.50 | 0.41 | 0.00 |
| 205.00 | 1.50 | 0.41 | 0.00 |
| 210.00 | 1.50 | 0.41 | 0.00 |
| 215.00 | 1.50 | 0.41 | 0.00 |
| 220.00 | 1.50 | 0.41 | 0.00 |
| 225.00 | 1.50 | 0.41 | 0.00 |
| 230.00 | 1.50 | 0.41 | 0.00 |
| 235.00 | 1.50 | 0.41 | 0.00 |
| 240.00 | 1.50 | 0.41 | 0.00 |

## Summary for Pond 1P: UNDERGROUND POND 1

Inflow Area = 1.687 ac, 83.48% Impervious, Inflow Depth = 1.12" for 1.5" RAINFALL event
Inflow = 3.15 cfs @ 12.13 hrs, Volume= 0.157 af
Outflow = 0.57 cfs @ 12.44 hrs, Volume= 0.157 af, Atten= 82%, Lag= 18.3 min
Primary = 0.57 cfs @ 12.44 hrs, Volume= 0.157 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Starting Elev= 965.40' Surf.Area= 4,484 sf Storage= 7,467 cf
Peak Elev= 966.35' @ 12.44 hrs Surf.Area= 4,484 sf Storage= 10,619 cf (3,152 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 121.0 min ( 890.9 - 769.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1A | 962.40' | 0 cf | **19.00'W x 236.00'L x 7.50'H Field A**<br>33,630 cf Overall - 18,242 cf Embedded = 15,388 cf x 0.0% Voids |
| #2A | 962.40' | 18,242 cf | **CMP Round 84** x 22 Inside #1<br>Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf<br>Overall Size= 84.0"W x 84.0"H x 20.00'L<br>22 Chambers in 2 Rows<br>17.00' Header x 38.48 sf x 2 = 1,308.5 cf Inside |
| | | 18,242 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 961.90' | **15.0" Round Culvert**<br>L= 103.0' RCP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 961.90' / 961.38' S= 0.0050 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Device 1 | 965.40' | **5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 966.40' | **16.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |

**Primary OutFlow** Max=0.57 cfs @ 12.44 hrs HW=966.35' (Free Discharge)
└**1=Culvert** (Passes 0.57 cfs of 9.82 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 4.15 fps)
  └**3=Orifice/Grate** ( Controls 0.00 cfs)

## Pond 1P: UNDERGROUND POND 1 - Chamber Wizard Field A

**Chamber Model = CMP Round 84 (Round Corrugated Metal Pipe)**
Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf
Overall Size= 84.0"W x 84.0"H x 20.00'L

84.0" Wide + 36.0" Spacing = 120.0" C-C Row Spacing

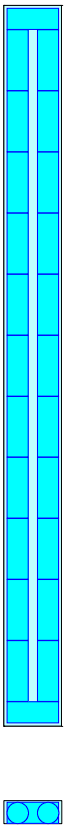
11 Chambers/Row x 20.00' Long +7.00' Header x 2 = 234.00' Row Length +12.0" End Stone x 2 = 236.00' Base Length
2 Rows x 84.0" Wide + 36.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.00' Base Width
84.0" Chamber Height + 6.0" Stone Cover = 7.50' Field Height

22 Chambers x 769.7 cf + 17.00' Header x 38.48 sf x 2 = 18,241.7 cf Chamber Storage

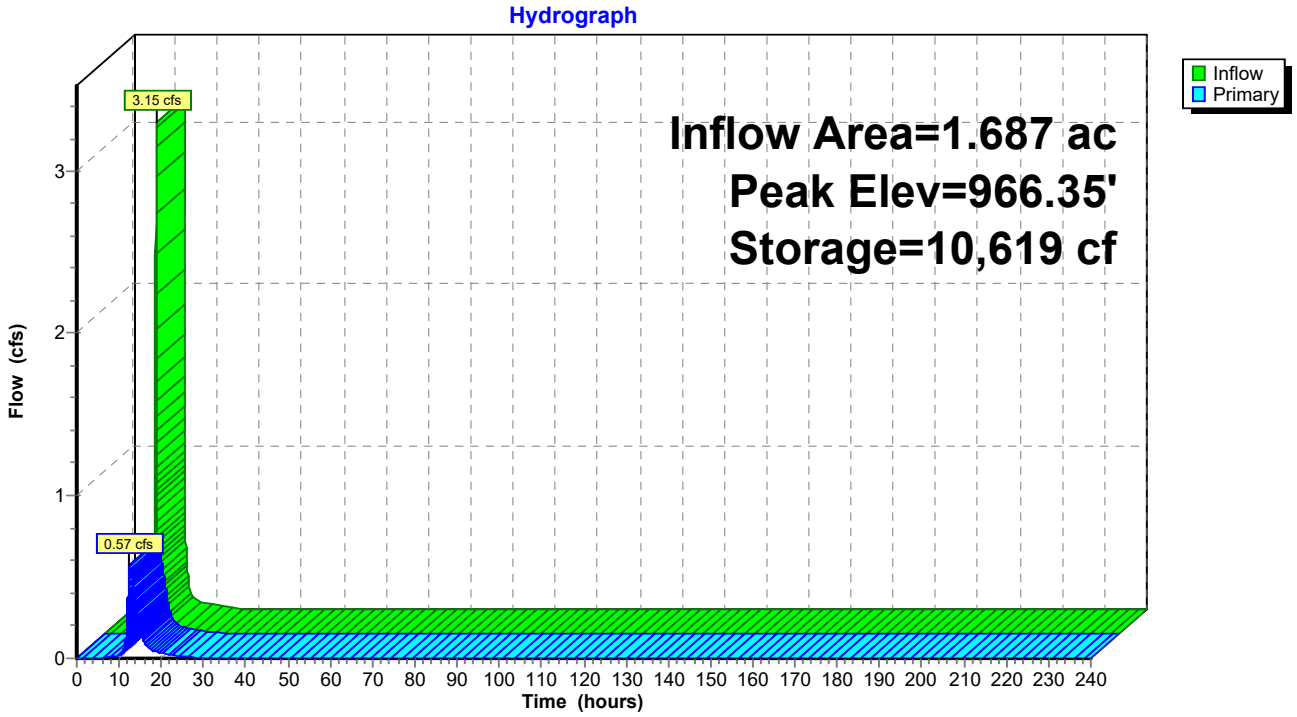
33,630.0 cf Field - 18,241.7 cf Chambers = 15,388.3 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 18,241.7 cf = 0.419 af
Overall Storage Efficiency = 54.2%
Overall System Size = 236.00' x 19.00' x 7.50'

22 Chambers
1,245.6 cy Field
569.9 cy Stone



## Pond 1P: UNDERGROUND POND 1



## Hydrograph for Pond 1P: UNDERGROUND POND 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | 0.00 | 7,467 | 965.40 | 0.00 |
| 5.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 10.00 | **0.05** | **7,738** | **965.48** | **0.02** |
| 15.00 | **0.07** | **8,422** | **965.69** | **0.19** |
| 20.00 | 0.02 | 7,823 | 965.51 | 0.03 |
| 25.00 | 0.00 | 7,661 | 965.46 | 0.01 |
| 30.00 | 0.00 | 7,542 | 965.42 | 0.00 |
| 35.00 | 0.00 | 7,509 | 965.41 | 0.00 |
| 40.00 | 0.00 | 7,500 | 965.41 | 0.00 |
| 45.00 | 0.00 | 7,495 | 965.41 | 0.00 |
| 50.00 | 0.00 | 7,491 | 965.41 | 0.00 |
| 55.00 | 0.00 | 7,487 | 965.41 | 0.00 |
| 60.00 | 0.00 | 7,485 | 965.41 | 0.00 |
| 65.00 | 0.00 | 7,482 | 965.40 | 0.00 |
| 70.00 | 0.00 | 7,480 | 965.40 | 0.00 |
| 75.00 | 0.00 | 7,478 | 965.40 | 0.00 |
| 80.00 | 0.00 | 7,476 | 965.40 | 0.00 |
| 85.00 | 0.00 | 7,475 | 965.40 | 0.00 |
| 90.00 | 0.00 | 7,474 | 965.40 | 0.00 |
| 95.00 | 0.00 | 7,473 | 965.40 | 0.00 |
| 100.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 105.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 110.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 115.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 120.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 125.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 130.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 135.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 140.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 145.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 150.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 155.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 160.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 165.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 170.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 175.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 180.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 185.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 190.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 195.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 200.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 205.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 210.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 215.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 220.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 225.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 230.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 235.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 240.00 | 0.00 | 7,468 | 965.40 | 0.00 |

## Stage-Area-Storage for Pond 1P: UNDERGROUND POND 1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---|---|---|---|---|---|
| 962.40 | 0 | 965.00 | 6,168 | 967.60 | 14,531 |
| 962.45 | 12 | 965.05 | 6,328 | 967.65 | 14,675 |
| 962.50 | 52 | 965.10 | 6,490 | 967.70 | 14,818 |
| 962.55 | 96 | 965.15 | 6,652 | 967.75 | 14,960 |
| 962.60 | 148 | 965.20 | 6,814 | 967.80 | 15,100 |
| 962.65 | 207 | 965.25 | 6,977 | 967.85 | 15,239 |
| 962.70 | 271 | 965.30 | 7,140 | 967.90 | 15,376 |
| 962.75 | 341 | 965.35 | 7,303 | 967.95 | 15,511 |
| 962.80 | 416 | 965.40 | 7,467 | 968.00 | 15,644 |
| 962.85 | 495 | 965.45 | 7,632 | 968.05 | 15,776 |
| 962.90 | 578 | 965.50 | 7,797 | 968.10 | 15,906 |
| 962.95 | 666 | 965.55 | 7,961 | 968.15 | 16,034 |
| 963.00 | 757 | 965.60 | 8,127 | 968.20 | 16,160 |
| 963.05 | 851 | 965.65 | 8,292 | 968.25 | 16,284 |
| 963.10 | 949 | 965.70 | 8,458 | 968.30 | 16,406 |
| 963.15 | 1,050 | 965.75 | 8,623 | 968.35 | 16,526 |
| 963.20 | 1,155 | 965.80 | 8,789 | 968.40 | 16,643 |
| 963.25 | 1,262 | 965.85 | 8,955 | 968.45 | 16,758 |
| 963.30 | 1,371 | 965.90 | 9,121 | 968.50 | 16,870 |
| 963.35 | 1,484 | 965.95 | 9,287 | 968.55 | 16,980 |
| 963.40 | 1,599 | 966.00 | 9,453 | 968.60 | 17,087 |
| 963.45 | 1,716 | 966.05 | 9,618 | 968.65 | 17,191 |
| 963.50 | 1,835 | 966.10 | 9,784 | 968.70 | 17,292 |
| 963.55 | 1,957 | 966.15 | 9,950 | 968.75 | 17,390 |
| 963.60 | 2,081 | 966.20 | 10,115 | 968.80 | 17,485 |
| 963.65 | 2,207 | 966.25 | 10,280 | 968.85 | 17,576 |
| 963.70 | 2,335 | 966.30 | 10,445 | 968.90 | 17,663 |
| 963.75 | 2,465 | 966.35 | 10,610 | 968.95 | 17,747 |
| 963.80 | 2,597 | 966.40 | 10,774 | 969.00 | 17,826 |
| 963.85 | 2,731 | 966.45 | 10,938 | 969.05 | 17,901 |
| 963.90 | 2,866 | 966.50 | 11,102 | 969.10 | 17,970 |
| 963.95 | 3,003 | 966.55 | 11,265 | 969.15 | 18,035 |
| 964.00 | 3,142 | 966.60 | 11,428 | 969.20 | 18,093 |
| 964.05 | 3,282 | 966.65 | 11,590 | 969.25 | 18,145 |
| 964.10 | 3,423 | 966.70 | 11,752 | 969.30 | 18,189 |
| 964.15 | 3,566 | 966.75 | 11,913 | 969.35 | 18,222 |
| 964.20 | 3,711 | 966.80 | 12,074 | 969.40 | **18,242** |
| 964.25 | 3,856 | 966.85 | 12,234 | 969.45 | 18,242 |
| 964.30 | 4,003 | 966.90 | 12,393 | 969.50 | 18,242 |
| 964.35 | 4,151 | 966.95 | 12,552 | 969.55 | 18,242 |
| 964.40 | 4,301 | 967.00 | 12,710 | 969.60 | 18,242 |
| 964.45 | 4,451 | 967.05 | 12,867 | 969.65 | 18,242 |
| 964.50 | 4,603 | 967.10 | 13,023 | 969.70 | 18,242 |
| 964.55 | 4,755 | 967.15 | 13,178 | 969.75 | 18,242 |
| 964.60 | 4,909 | 967.20 | 13,333 | 969.80 | 18,242 |
| 964.65 | 5,063 | 967.25 | 13,486 | 969.85 | 18,242 |
| 964.70 | 5,219 | 967.30 | 13,639 | 969.90 | 18,242 |
| 964.75 | 5,375 | 967.35 | 13,791 | | |
| 964.80 | 5,532 | 967.40 | 13,941 | | |
| 964.85 | 5,690 | 967.45 | 14,090 | | |
| 964.90 | 5,849 | 967.50 | 14,238 | | |
| 964.95 | 6,008 | 967.55 | 14,385 | | |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment PR1A: DRAINS TO POND 1** Runoff Area=73,474 sf 83.48% Impervious Runoff Depth=2.04"
Tc=6.0 min CN=WQ Runoff=5.63 cfs 0.287 af

**Subcatchment PR1B: DRAINS SOUTH TO** Runoff Area=14,493 sf 28.85% Impervious Runoff Depth=1.29"
Tc=6.0 min CN=WQ Runoff=0.74 cfs 0.036 af

**Subcatchment PR2: DRAINS NORTH TO** Runoff Area=13,090 sf 21.37% Impervious Runoff Depth=1.18"
Tc=6.0 min CN=WQ Runoff=0.62 cfs 0.030 af

**Pond 1P: UNDERGROUND POND 1** Peak Elev=966.93' Storage=12,475 cf Inflow=5.63 cfs 0.287 af
Outflow=2.02 cfs 0.287 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.352 af Average Runoff Depth = 1.82"**
**32.40% Pervious = 0.752 ac 67.60% Impervious = 1.568 ac**

## Summary for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

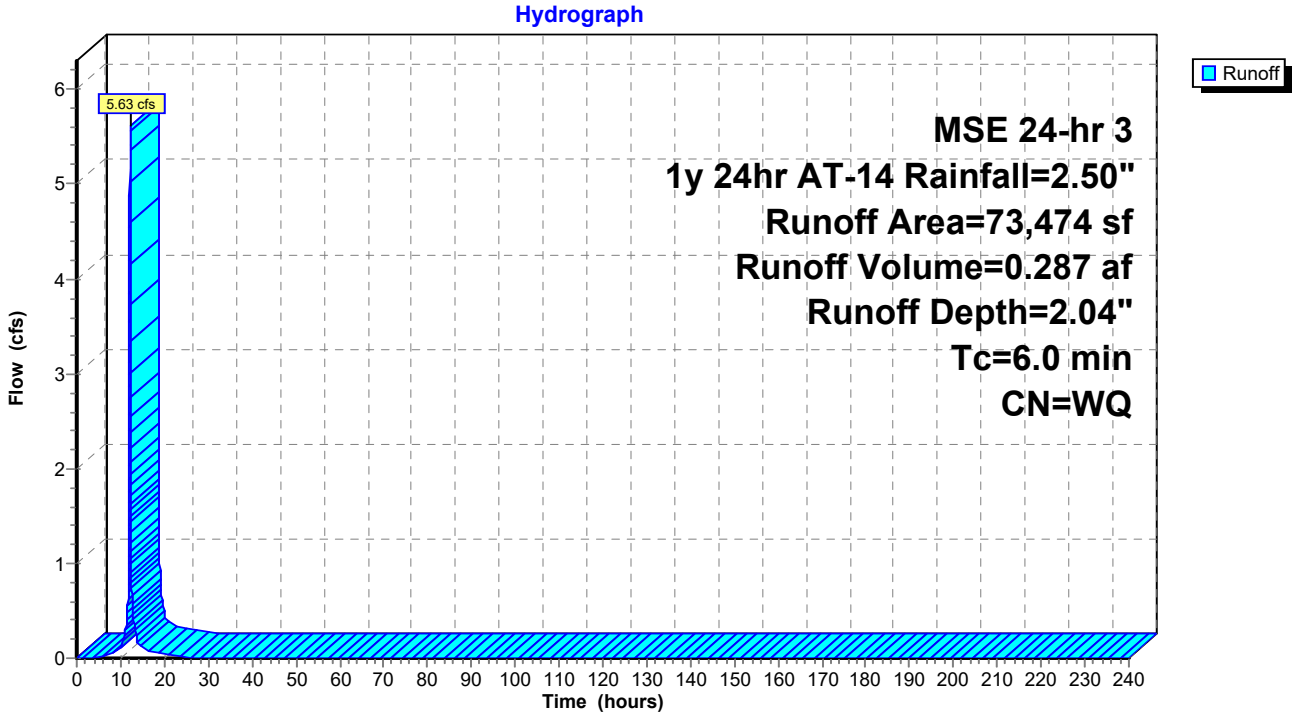
Runoff = 5.63 cfs @ 12.13 hrs, Volume= 0.287 af, Depth= 2.04"
Routed to Pond 1P : UNDERGROUND POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1y 24hr AT-14 Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 61,334 | 98 | Paved parking, HSG D |
| 12,140 | 80 | >75% Grass cover, Good, HSG D |
| 73,474 | | Weighted Average |
| 12,140 | | 16.52% Pervious Area |
| 61,334 | | 83.48% Impervious Area |

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

### Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.09 | 0.00 | 0.02 |
| 10.00 | 0.34 | 0.07 | **0.11** |
| 15.00 | 2.24 | 1.71 | **0.13** |
| 20.00 | **2.43** | **1.90** | 0.04 |
| 25.00 | **2.50** | **1.96** | 0.00 |
| 30.00 | 2.50 | 1.96 | 0.00 |
| 35.00 | 2.50 | 1.96 | 0.00 |
| 40.00 | 2.50 | 1.96 | 0.00 |
| 45.00 | 2.50 | 1.96 | 0.00 |
| 50.00 | 2.50 | 1.96 | 0.00 |
| 55.00 | 2.50 | 1.96 | 0.00 |
| 60.00 | 2.50 | 1.96 | 0.00 |
| 65.00 | 2.50 | 1.96 | 0.00 |
| 70.00 | 2.50 | 1.96 | 0.00 |
| 75.00 | 2.50 | 1.96 | 0.00 |
| 80.00 | 2.50 | 1.96 | 0.00 |
| 85.00 | 2.50 | 1.96 | 0.00 |
| 90.00 | 2.50 | 1.96 | 0.00 |
| 95.00 | 2.50 | 1.96 | 0.00 |
| 100.00 | 2.50 | 1.96 | 0.00 |
| 105.00 | 2.50 | 1.96 | 0.00 |
| 110.00 | 2.50 | 1.96 | 0.00 |
| 115.00 | 2.50 | 1.96 | 0.00 |
| 120.00 | 2.50 | 1.96 | 0.00 |
| 125.00 | 2.50 | 1.96 | 0.00 |
| 130.00 | 2.50 | 1.96 | 0.00 |
| 135.00 | 2.50 | 1.96 | 0.00 |
| 140.00 | 2.50 | 1.96 | 0.00 |
| 145.00 | 2.50 | 1.96 | 0.00 |
| 150.00 | 2.50 | 1.96 | 0.00 |
| 155.00 | 2.50 | 1.96 | 0.00 |
| 160.00 | 2.50 | 1.96 | 0.00 |
| 165.00 | 2.50 | 1.96 | 0.00 |
| 170.00 | 2.50 | 1.96 | 0.00 |
| 175.00 | 2.50 | 1.96 | 0.00 |
| 180.00 | 2.50 | 1.96 | 0.00 |
| 185.00 | 2.50 | 1.96 | 0.00 |
| 190.00 | 2.50 | 1.96 | 0.00 |
| 195.00 | 2.50 | 1.96 | 0.00 |
| 200.00 | 2.50 | 1.96 | 0.00 |
| 205.00 | 2.50 | 1.96 | 0.00 |
| 210.00 | 2.50 | 1.96 | 0.00 |
| 215.00 | 2.50 | 1.96 | 0.00 |
| 220.00 | 2.50 | 1.96 | 0.00 |
| 225.00 | 2.50 | 1.96 | 0.00 |
| 230.00 | 2.50 | 1.96 | 0.00 |
| 235.00 | 2.50 | 1.96 | 0.00 |
| 240.00 | 2.50 | 1.96 | 0.00 |

## Summary for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

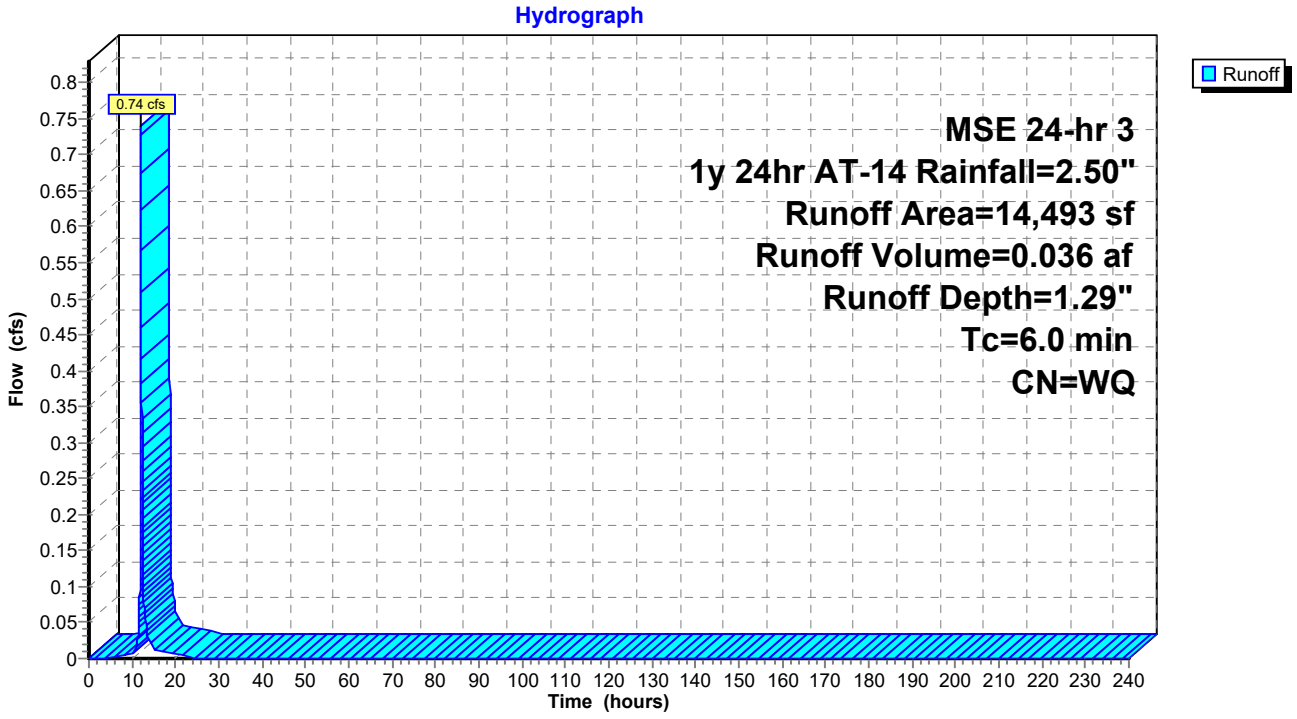
Runoff = 0.74 cfs @ 12.13 hrs, Volume= 0.036 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1y 24hr AT-14 Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 4,181 | 98 | Paved parking, HSG D |
| 10,312 | 80 | >75% Grass cover, Good, HSG D |
| 14,493 | | Weighted Average |
| 10,312 | | 71.15% Pervious Area |
| 4,181 | | 28.85% Impervious Area |

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

## Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED



## Hydrograph for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.09 | 0.00 | 0.00 |
| 10.00 | 0.34 | 0.00 | **0.01** |
| 15.00 | 2.24 | 0.98 | **0.02** |
| 20.00 | **2.43** | **1.13** | 0.01 |
| 25.00 | **2.50** | **1.18** | 0.00 |
| 30.00 | 2.50 | 1.18 | 0.00 |
| 35.00 | 2.50 | 1.18 | 0.00 |
| 40.00 | 2.50 | 1.18 | 0.00 |
| 45.00 | 2.50 | 1.18 | 0.00 |
| 50.00 | 2.50 | 1.18 | 0.00 |
| 55.00 | 2.50 | 1.18 | 0.00 |
| 60.00 | 2.50 | 1.18 | 0.00 |
| 65.00 | 2.50 | 1.18 | 0.00 |
| 70.00 | 2.50 | 1.18 | 0.00 |
| 75.00 | 2.50 | 1.18 | 0.00 |
| 80.00 | 2.50 | 1.18 | 0.00 |
| 85.00 | 2.50 | 1.18 | 0.00 |
| 90.00 | 2.50 | 1.18 | 0.00 |
| 95.00 | 2.50 | 1.18 | 0.00 |
| 100.00 | 2.50 | 1.18 | 0.00 |
| 105.00 | 2.50 | 1.18 | 0.00 |
| 110.00 | 2.50 | 1.18 | 0.00 |
| 115.00 | 2.50 | 1.18 | 0.00 |
| 120.00 | 2.50 | 1.18 | 0.00 |
| 125.00 | 2.50 | 1.18 | 0.00 |
| 130.00 | 2.50 | 1.18 | 0.00 |
| 135.00 | 2.50 | 1.18 | 0.00 |
| 140.00 | 2.50 | 1.18 | 0.00 |
| 145.00 | 2.50 | 1.18 | 0.00 |
| 150.00 | 2.50 | 1.18 | 0.00 |
| 155.00 | 2.50 | 1.18 | 0.00 |
| 160.00 | 2.50 | 1.18 | 0.00 |
| 165.00 | 2.50 | 1.18 | 0.00 |
| 170.00 | 2.50 | 1.18 | 0.00 |
| 175.00 | 2.50 | 1.18 | 0.00 |
| 180.00 | 2.50 | 1.18 | 0.00 |
| 185.00 | 2.50 | 1.18 | 0.00 |
| 190.00 | 2.50 | 1.18 | 0.00 |
| 195.00 | 2.50 | 1.18 | 0.00 |
| 200.00 | 2.50 | 1.18 | 0.00 |
| 205.00 | 2.50 | 1.18 | 0.00 |
| 210.00 | 2.50 | 1.18 | 0.00 |
| 215.00 | 2.50 | 1.18 | 0.00 |
| 220.00 | 2.50 | 1.18 | 0.00 |
| 225.00 | 2.50 | 1.18 | 0.00 |
| 230.00 | 2.50 | 1.18 | 0.00 |
| 235.00 | 2.50 | 1.18 | 0.00 |
| 240.00 | 2.50 | 1.18 | 0.00 |

## Summary for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

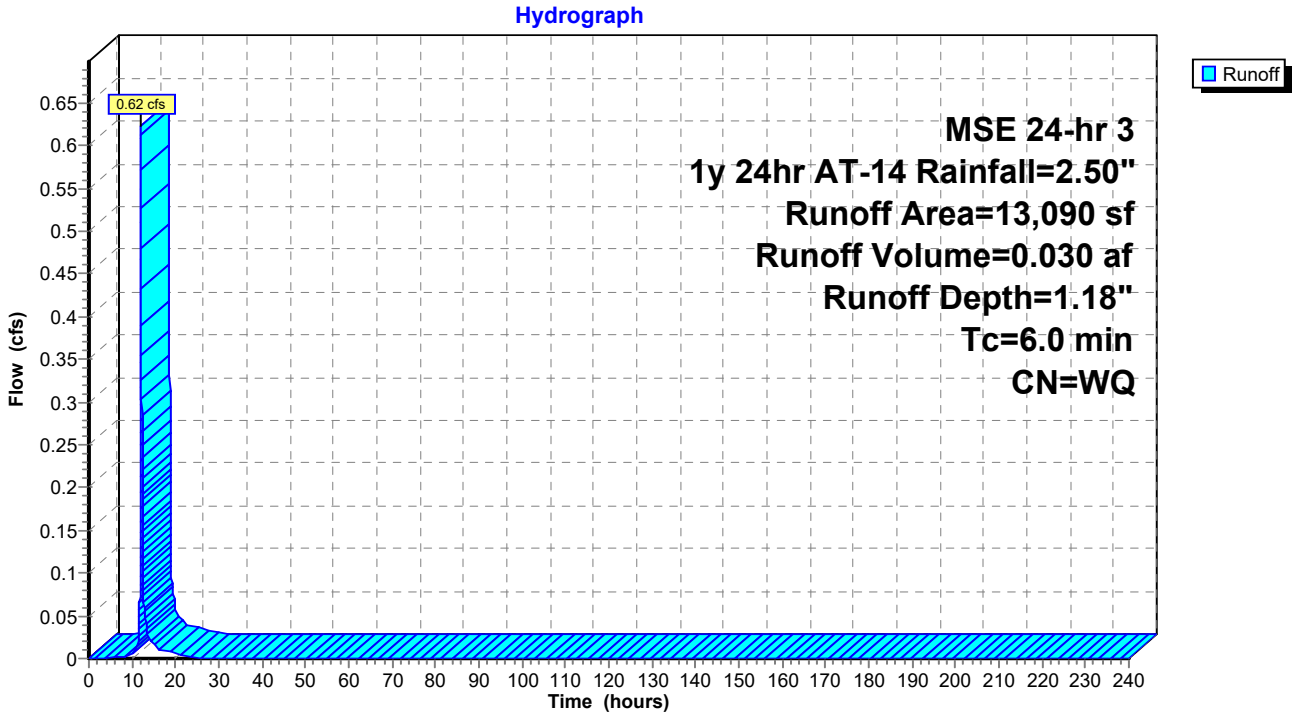
Runoff = 0.62 cfs @ 12.13 hrs, Volume= 0.030 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 1y 24hr AT-14 Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 2,797 | 98 | Paved parking, HSG D |
| 10,293 | 80 | >75% Grass cover, Good, HSG D |
| 13,090 | | Weighted Average |
| 10,293 | | 78.63% Pervious Area |
| 2,797 | | 21.37% Impervious Area |

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

## Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED



## Hydrograph for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.09 | 0.00 | 0.00 |
| 10.00 | 0.34 | 0.00 | **0.00** |
| 15.00 | 2.24 | 0.92 | **0.02** |
| 20.00 | **2.43** | **1.07** | 0.01 |
| 25.00 | **2.50** | **1.12** | 0.00 |
| 30.00 | 2.50 | 1.12 | 0.00 |
| 35.00 | 2.50 | 1.12 | 0.00 |
| 40.00 | 2.50 | 1.12 | 0.00 |
| 45.00 | 2.50 | 1.12 | 0.00 |
| 50.00 | 2.50 | 1.12 | 0.00 |
| 55.00 | 2.50 | 1.12 | 0.00 |
| 60.00 | 2.50 | 1.12 | 0.00 |
| 65.00 | 2.50 | 1.12 | 0.00 |
| 70.00 | 2.50 | 1.12 | 0.00 |
| 75.00 | 2.50 | 1.12 | 0.00 |
| 80.00 | 2.50 | 1.12 | 0.00 |
| 85.00 | 2.50 | 1.12 | 0.00 |
| 90.00 | 2.50 | 1.12 | 0.00 |
| 95.00 | 2.50 | 1.12 | 0.00 |
| 100.00 | 2.50 | 1.12 | 0.00 |
| 105.00 | 2.50 | 1.12 | 0.00 |
| 110.00 | 2.50 | 1.12 | 0.00 |
| 115.00 | 2.50 | 1.12 | 0.00 |
| 120.00 | 2.50 | 1.12 | 0.00 |
| 125.00 | 2.50 | 1.12 | 0.00 |
| 130.00 | 2.50 | 1.12 | 0.00 |
| 135.00 | 2.50 | 1.12 | 0.00 |
| 140.00 | 2.50 | 1.12 | 0.00 |
| 145.00 | 2.50 | 1.12 | 0.00 |
| 150.00 | 2.50 | 1.12 | 0.00 |
| 155.00 | 2.50 | 1.12 | 0.00 |
| 160.00 | 2.50 | 1.12 | 0.00 |
| 165.00 | 2.50 | 1.12 | 0.00 |
| 170.00 | 2.50 | 1.12 | 0.00 |
| 175.00 | 2.50 | 1.12 | 0.00 |
| 180.00 | 2.50 | 1.12 | 0.00 |
| 185.00 | 2.50 | 1.12 | 0.00 |
| 190.00 | 2.50 | 1.12 | 0.00 |
| 195.00 | 2.50 | 1.12 | 0.00 |
| 200.00 | 2.50 | 1.12 | 0.00 |
| 205.00 | 2.50 | 1.12 | 0.00 |
| 210.00 | 2.50 | 1.12 | 0.00 |
| 215.00 | 2.50 | 1.12 | 0.00 |
| 220.00 | 2.50 | 1.12 | 0.00 |
| 225.00 | 2.50 | 1.12 | 0.00 |
| 230.00 | 2.50 | 1.12 | 0.00 |
| 235.00 | 2.50 | 1.12 | 0.00 |
| 240.00 | 2.50 | 1.12 | 0.00 |

## Summary for Pond 1P: UNDERGROUND POND 1

Inflow Area = 1.687 ac, 83.48% Impervious, Inflow Depth = 2.04" for 1y 24hr AT-14 event
Inflow = 5.63 cfs @ 12.13 hrs, Volume= 0.287 af
Outflow = 2.02 cfs @ 12.26 hrs, Volume= 0.287 af, Atten= 64%, Lag= 8.1 min
Primary = 2.02 cfs @ 12.26 hrs, Volume= 0.287 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Starting Elev= 965.40' Surf.Area= 4,484 sf Storage= 7,467 cf
Peak Elev= 966.93' @ 12.26 hrs Surf.Area= 4,484 sf Storage= 12,475 cf (5,007 cf above start)

Plug-Flow detention time= 376.1 min calculated for 0.116 af (40% of inflow)
Center-of-Mass det. time= 96.4 min ( 857.4 - 761.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1A | 962.40' | 0 cf | **19.00'W x 236.00'L x 7.50'H Field A**<br>33,630 cf Overall - 18,242 cf Embedded = 15,388 cf x 0.0% Voids |
| #2A | 962.40' | 18,242 cf | **CMP Round 84** x 22 Inside #1<br>Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf<br>Overall Size= 84.0"W x 84.0"H x 20.00'L<br>22 Chambers in 2 Rows<br>17.00' Header x 38.48 sf x 2 = 1,308.5 cf Inside |
| | | 18,242 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 961.90' | **15.0" Round Culvert**<br>L= 103.0' RCP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 961.90' / 961.38' S= 0.0050 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Device 1 | 965.40' | **5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 966.40' | **16.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |

**Primary OutFlow** Max=2.02 cfs @ 12.26 hrs HW=966.93' (Free Discharge)
└─**1=Culvert** (Passes 2.02 cfs of 10.54 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.75 cfs @ 5.53 fps)
  └─**3=Orifice/Grate** (Orifice Controls 1.26 cfs @ 2.47 fps)

## Pond 1P: UNDERGROUND POND 1 - Chamber Wizard Field A

**Chamber Model = CMP Round 84 (Round Corrugated Metal Pipe)**
Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf
Overall Size= 84.0"W x 84.0"H x 20.00'L

84.0" Wide + 36.0" Spacing = 120.0" C-C Row Spacing

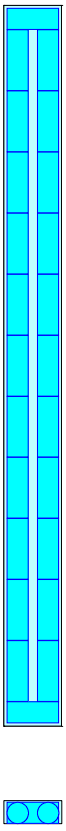
11 Chambers/Row x 20.00' Long +7.00' Header x 2 = 234.00' Row Length +12.0" End Stone x 2 = 236.00' Base Length
2 Rows x 84.0" Wide + 36.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.00' Base Width
84.0" Chamber Height + 6.0" Stone Cover = 7.50' Field Height

22 Chambers x 769.7 cf + 17.00' Header x 38.48 sf x 2 = 18,241.7 cf Chamber Storage

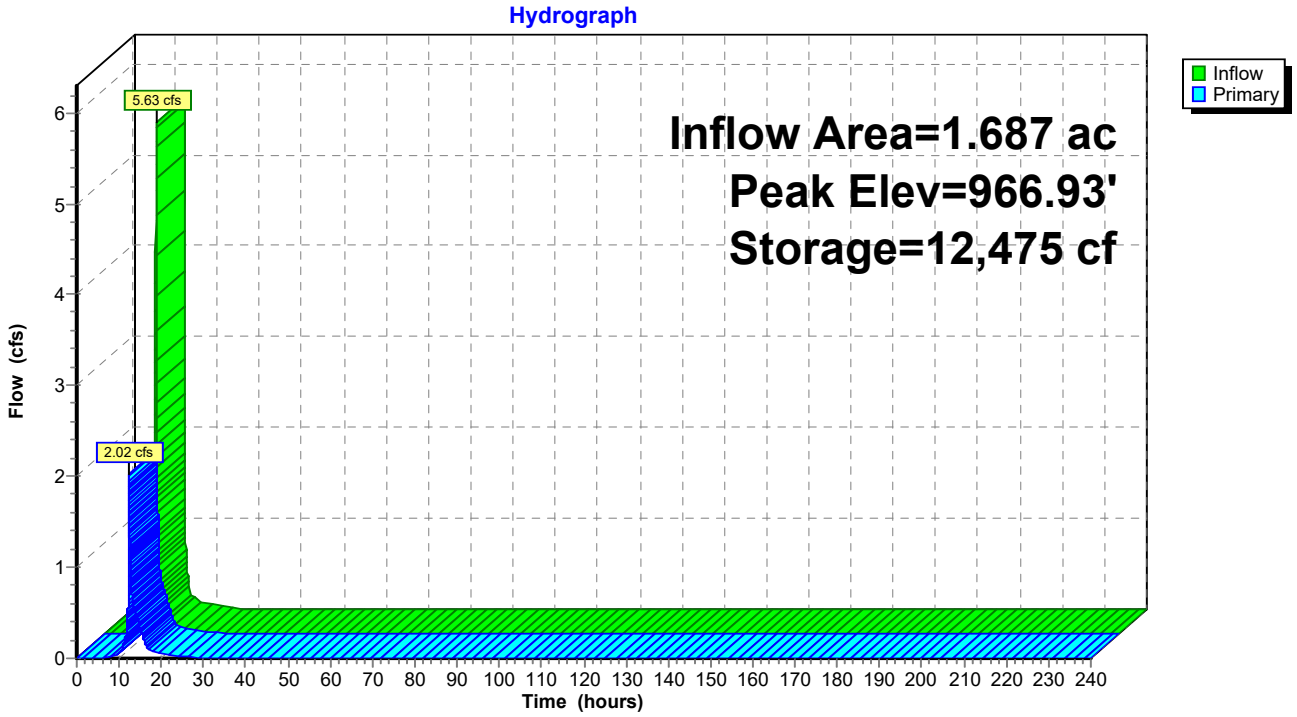
33,630.0 cf Field - 18,241.7 cf Chambers = 15,388.3 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 18,241.7 cf = 0.419 af
Overall Storage Efficiency = 54.2%
Overall System Size = 236.00' x 19.00' x 7.50'

22 Chambers
1,245.6 cy Field
569.9 cy Stone



## Pond 1P: UNDERGROUND POND 1



## Hydrograph for Pond 1P: UNDERGROUND POND 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | 0.00 | 7,467 | 965.40 | 0.00 |
| 5.00 | 0.02 | 7,516 | 965.41 | 0.00 |
| 10.00 | **0.11** | **7,987** | **965.56** | **0.06** |
| 15.00 | **0.13** | **9,009** | **965.87** | **0.33** |
| 20.00 | 0.04 | 7,941 | 965.54 | 0.05 |
| 25.00 | 0.00 | 7,702 | 965.47 | 0.01 |
| 30.00 | 0.00 | 7,553 | 965.43 | 0.00 |
| 35.00 | 0.00 | 7,512 | 965.41 | 0.00 |
| 40.00 | 0.00 | 7,501 | 965.41 | 0.00 |
| 45.00 | 0.00 | 7,496 | 965.41 | 0.00 |
| 50.00 | 0.00 | 7,492 | 965.41 | 0.00 |
| 55.00 | 0.00 | 7,488 | 965.41 | 0.00 |
| 60.00 | 0.00 | 7,485 | 965.41 | 0.00 |
| 65.00 | 0.00 | 7,482 | 965.40 | 0.00 |
| 70.00 | 0.00 | 7,480 | 965.40 | 0.00 |
| 75.00 | 0.00 | 7,478 | 965.40 | 0.00 |
| 80.00 | 0.00 | 7,477 | 965.40 | 0.00 |
| 85.00 | 0.00 | 7,475 | 965.40 | 0.00 |
| 90.00 | 0.00 | 7,474 | 965.40 | 0.00 |
| 95.00 | 0.00 | 7,473 | 965.40 | 0.00 |
| 100.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 105.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 110.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 115.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 120.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 125.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 130.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 135.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 140.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 145.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 150.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 155.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 160.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 165.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 170.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 175.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 180.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 185.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 190.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 195.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 200.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 205.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 210.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 215.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 220.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 225.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 230.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 235.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 240.00 | 0.00 | 7,468 | 965.40 | 0.00 |

## Stage-Area-Storage for Pond 1P: UNDERGROUND POND 1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---|---|---|---|---|---|
| 962.40 | 0 | 965.00 | 6,168 | 967.60 | 14,531 |
| 962.45 | 12 | 965.05 | 6,328 | 967.65 | 14,675 |
| 962.50 | 52 | 965.10 | 6,490 | 967.70 | 14,818 |
| 962.55 | 96 | 965.15 | 6,652 | 967.75 | 14,960 |
| 962.60 | 148 | 965.20 | 6,814 | 967.80 | 15,100 |
| 962.65 | 207 | 965.25 | 6,977 | 967.85 | 15,239 |
| 962.70 | 271 | 965.30 | 7,140 | 967.90 | 15,376 |
| 962.75 | 341 | 965.35 | 7,303 | 967.95 | 15,511 |
| 962.80 | 416 | 965.40 | 7,467 | 968.00 | 15,644 |
| 962.85 | 495 | 965.45 | 7,632 | 968.05 | 15,776 |
| 962.90 | 578 | 965.50 | 7,797 | 968.10 | 15,906 |
| 962.95 | 666 | 965.55 | 7,961 | 968.15 | 16,034 |
| 963.00 | 757 | 965.60 | 8,127 | 968.20 | 16,160 |
| 963.05 | 851 | 965.65 | 8,292 | 968.25 | 16,284 |
| 963.10 | 949 | 965.70 | 8,458 | 968.30 | 16,406 |
| 963.15 | 1,050 | 965.75 | 8,623 | 968.35 | 16,526 |
| 963.20 | 1,155 | 965.80 | 8,789 | 968.40 | 16,643 |
| 963.25 | 1,262 | 965.85 | 8,955 | 968.45 | 16,758 |
| 963.30 | 1,371 | 965.90 | 9,121 | 968.50 | 16,870 |
| 963.35 | 1,484 | 965.95 | 9,287 | 968.55 | 16,980 |
| 963.40 | 1,599 | 966.00 | 9,453 | 968.60 | 17,087 |
| 963.45 | 1,716 | 966.05 | 9,618 | 968.65 | 17,191 |
| 963.50 | 1,835 | 966.10 | 9,784 | 968.70 | 17,292 |
| 963.55 | 1,957 | 966.15 | 9,950 | 968.75 | 17,390 |
| 963.60 | 2,081 | 966.20 | 10,115 | 968.80 | 17,485 |
| 963.65 | 2,207 | 966.25 | 10,280 | 968.85 | 17,576 |
| 963.70 | 2,335 | 966.30 | 10,445 | 968.90 | 17,663 |
| 963.75 | 2,465 | 966.35 | 10,610 | 968.95 | 17,747 |
| 963.80 | 2,597 | 966.40 | 10,774 | 969.00 | 17,826 |
| 963.85 | 2,731 | 966.45 | 10,938 | 969.05 | 17,901 |
| 963.90 | 2,866 | 966.50 | 11,102 | 969.10 | 17,970 |
| 963.95 | 3,003 | 966.55 | 11,265 | 969.15 | 18,035 |
| 964.00 | 3,142 | 966.60 | 11,428 | 969.20 | 18,093 |
| 964.05 | 3,282 | 966.65 | 11,590 | 969.25 | 18,145 |
| 964.10 | 3,423 | 966.70 | 11,752 | 969.30 | 18,189 |
| 964.15 | 3,566 | 966.75 | 11,913 | 969.35 | 18,222 |
| 964.20 | 3,711 | 966.80 | 12,074 | 969.40 | **18,242** |
| 964.25 | 3,856 | 966.85 | 12,234 | 969.45 | 18,242 |
| 964.30 | 4,003 | 966.90 | 12,393 | 969.50 | 18,242 |
| 964.35 | 4,151 | 966.95 | 12,552 | 969.55 | 18,242 |
| 964.40 | 4,301 | 967.00 | 12,710 | 969.60 | 18,242 |
| 964.45 | 4,451 | 967.05 | 12,867 | 969.65 | 18,242 |
| 964.50 | 4,603 | 967.10 | 13,023 | 969.70 | 18,242 |
| 964.55 | 4,755 | 967.15 | 13,178 | 969.75 | 18,242 |
| 964.60 | 4,909 | 967.20 | 13,333 | 969.80 | 18,242 |
| 964.65 | 5,063 | 967.25 | 13,486 | 969.85 | 18,242 |
| 964.70 | 5,219 | 967.30 | 13,639 | 969.90 | 18,242 |
| 964.75 | 5,375 | 967.35 | 13,791 | | |
| 964.80 | 5,532 | 967.40 | 13,941 | | |
| 964.85 | 5,690 | 967.45 | 14,090 | | |
| 964.90 | 5,849 | 967.50 | 14,238 | | |
| 964.95 | 6,008 | 967.55 | 14,385 | | |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment PR1A: DRAINS TO POND 1** Runoff Area=73,474 sf 83.48% Impervious Runoff Depth=2.40"
Tc=6.0 min CN=WQ Runoff=6.58 cfs 0.338 af

**Subcatchment PR1B: DRAINS SOUTH TO** Runoff Area=14,493 sf 28.85% Impervious Runoff Depth=1.59"
Tc=6.0 min CN=WQ Runoff=0.92 cfs 0.044 af

**Subcatchment PR2: DRAINS NORTH TO** Runoff Area=13,090 sf 21.37% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=WQ Runoff=0.78 cfs 0.037 af

**Pond 1P: UNDERGROUND POND 1** Peak Elev=967.10' Storage=13,012 cf Inflow=6.58 cfs 0.338 af
Outflow=2.90 cfs 0.338 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.419 af Average Runoff Depth = 2.17"**
**32.40% Pervious = 0.752 ac 67.60% Impervious = 1.568 ac**

## Summary for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

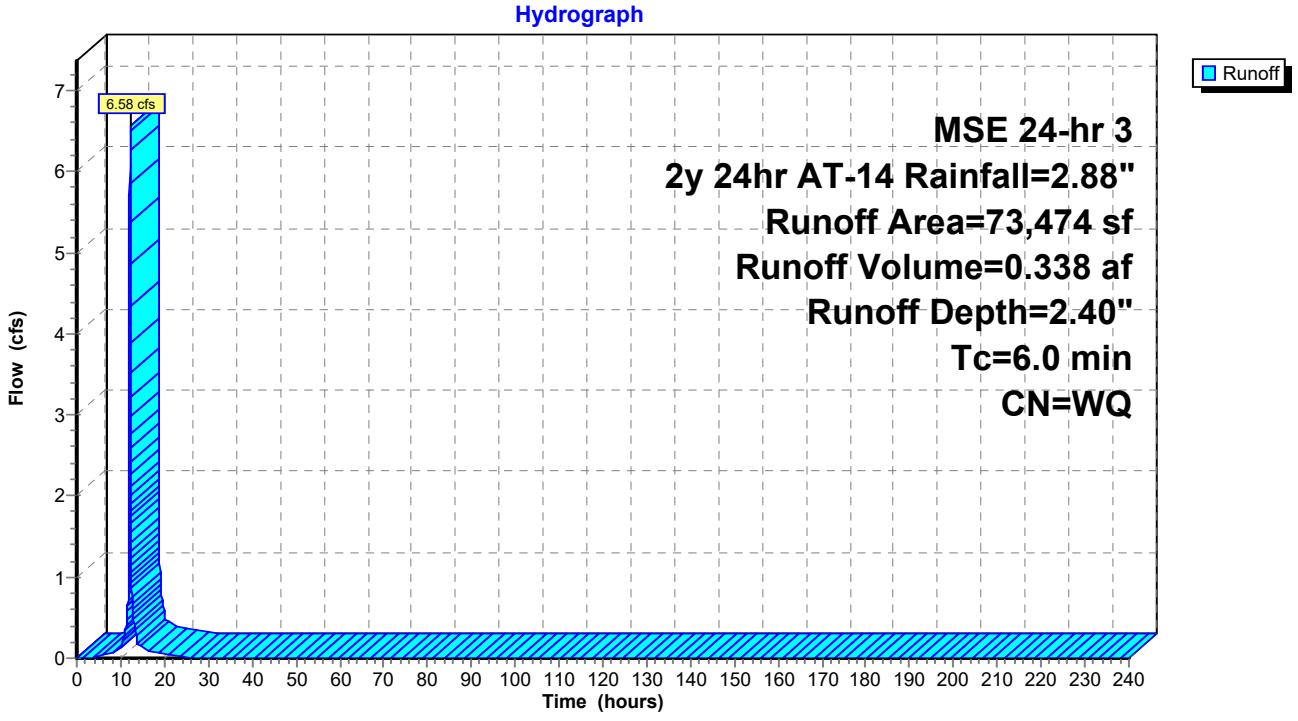
Runoff = 6.58 cfs @ 12.13 hrs, Volume= 0.338 af, Depth= 2.40"
Routed to Pond 1P : UNDERGROUND POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.88"

| Area (sf) | CN | Description |
|---|---|---|
| 61,334 | 98 | Paved parking, HSG D |
| 12,140 | 80 | >75% Grass cover, Good, HSG D |
| 73,474 | | Weighted Average |
| 12,140 | | 16.52% Pervious Area |
| 61,334 | | 83.48% Impervious Area |

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

### Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.11 | 0.00 | 0.02 |
| 10.00 | 0.40 | 0.10 | **0.13** |
| 15.00 | 2.58 | 2.04 | **0.15** |
| 20.00 | **2.80** | **2.26** | 0.05 |
| 25.00 | **2.88** | **2.33** | 0.00 |
| 30.00 | 2.88 | 2.33 | 0.00 |
| 35.00 | 2.88 | 2.33 | 0.00 |
| 40.00 | 2.88 | 2.33 | 0.00 |
| 45.00 | 2.88 | 2.33 | 0.00 |
| 50.00 | 2.88 | 2.33 | 0.00 |
| 55.00 | 2.88 | 2.33 | 0.00 |
| 60.00 | 2.88 | 2.33 | 0.00 |
| 65.00 | 2.88 | 2.33 | 0.00 |
| 70.00 | 2.88 | 2.33 | 0.00 |
| 75.00 | 2.88 | 2.33 | 0.00 |
| 80.00 | 2.88 | 2.33 | 0.00 |
| 85.00 | 2.88 | 2.33 | 0.00 |
| 90.00 | 2.88 | 2.33 | 0.00 |
| 95.00 | 2.88 | 2.33 | 0.00 |
| 100.00 | 2.88 | 2.33 | 0.00 |
| 105.00 | 2.88 | 2.33 | 0.00 |
| 110.00 | 2.88 | 2.33 | 0.00 |
| 115.00 | 2.88 | 2.33 | 0.00 |
| 120.00 | 2.88 | 2.33 | 0.00 |
| 125.00 | 2.88 | 2.33 | 0.00 |
| 130.00 | 2.88 | 2.33 | 0.00 |
| 135.00 | 2.88 | 2.33 | 0.00 |
| 140.00 | 2.88 | 2.33 | 0.00 |
| 145.00 | 2.88 | 2.33 | 0.00 |
| 150.00 | 2.88 | 2.33 | 0.00 |
| 155.00 | 2.88 | 2.33 | 0.00 |
| 160.00 | 2.88 | 2.33 | 0.00 |
| 165.00 | 2.88 | 2.33 | 0.00 |
| 170.00 | 2.88 | 2.33 | 0.00 |
| 175.00 | 2.88 | 2.33 | 0.00 |
| 180.00 | 2.88 | 2.33 | 0.00 |
| 185.00 | 2.88 | 2.33 | 0.00 |
| 190.00 | 2.88 | 2.33 | 0.00 |
| 195.00 | 2.88 | 2.33 | 0.00 |
| 200.00 | 2.88 | 2.33 | 0.00 |
| 205.00 | 2.88 | 2.33 | 0.00 |
| 210.00 | 2.88 | 2.33 | 0.00 |
| 215.00 | 2.88 | 2.33 | 0.00 |
| 220.00 | 2.88 | 2.33 | 0.00 |
| 225.00 | 2.88 | 2.33 | 0.00 |
| 230.00 | 2.88 | 2.33 | 0.00 |
| 235.00 | 2.88 | 2.33 | 0.00 |
| 240.00 | 2.88 | 2.33 | 0.00 |

## Summary for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

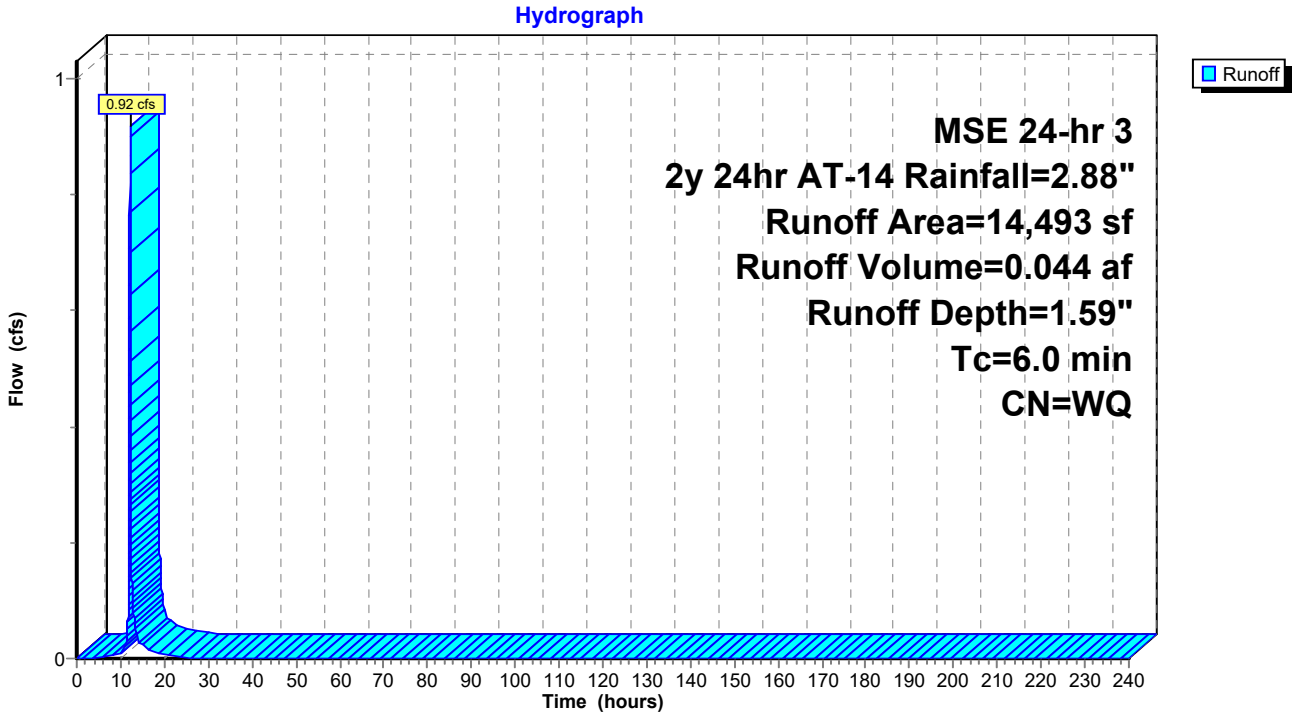
Runoff = 0.92 cfs @ 12.13 hrs, Volume= 0.044 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.88"

| Area (sf) | CN | Description |
|---|---|---|
| 4,181 | 98 | Paved parking, HSG D |
| 10,312 | 80 | >75% Grass cover, Good, HSG D |
| 14,493 | | Weighted Average |
| 10,312 | | 71.15% Pervious Area |
| 4,181 | | 28.85% Impervious Area |

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

## Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED



## Hydrograph for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.11 | 0.00 | 0.00 |
| 10.00 | 0.40 | 0.00 | **0.01** |
| 15.00 | 2.58 | 1.25 | **0.02** |
| 20.00 | **2.80** | **1.43** | 0.01 |
| 25.00 | **2.88** | **1.49** | 0.00 |
| 30.00 | 2.88 | 1.49 | 0.00 |
| 35.00 | 2.88 | 1.49 | 0.00 |
| 40.00 | 2.88 | 1.49 | 0.00 |
| 45.00 | 2.88 | 1.49 | 0.00 |
| 50.00 | 2.88 | 1.49 | 0.00 |
| 55.00 | 2.88 | 1.49 | 0.00 |
| 60.00 | 2.88 | 1.49 | 0.00 |
| 65.00 | 2.88 | 1.49 | 0.00 |
| 70.00 | 2.88 | 1.49 | 0.00 |
| 75.00 | 2.88 | 1.49 | 0.00 |
| 80.00 | 2.88 | 1.49 | 0.00 |
| 85.00 | 2.88 | 1.49 | 0.00 |
| 90.00 | 2.88 | 1.49 | 0.00 |
| 95.00 | 2.88 | 1.49 | 0.00 |
| 100.00 | 2.88 | 1.49 | 0.00 |
| 105.00 | 2.88 | 1.49 | 0.00 |
| 110.00 | 2.88 | 1.49 | 0.00 |
| 115.00 | 2.88 | 1.49 | 0.00 |
| 120.00 | 2.88 | 1.49 | 0.00 |
| 125.00 | 2.88 | 1.49 | 0.00 |
| 130.00 | 2.88 | 1.49 | 0.00 |
| 135.00 | 2.88 | 1.49 | 0.00 |
| 140.00 | 2.88 | 1.49 | 0.00 |
| 145.00 | 2.88 | 1.49 | 0.00 |
| 150.00 | 2.88 | 1.49 | 0.00 |
| 155.00 | 2.88 | 1.49 | 0.00 |
| 160.00 | 2.88 | 1.49 | 0.00 |
| 165.00 | 2.88 | 1.49 | 0.00 |
| 170.00 | 2.88 | 1.49 | 0.00 |
| 175.00 | 2.88 | 1.49 | 0.00 |
| 180.00 | 2.88 | 1.49 | 0.00 |
| 185.00 | 2.88 | 1.49 | 0.00 |
| 190.00 | 2.88 | 1.49 | 0.00 |
| 195.00 | 2.88 | 1.49 | 0.00 |
| 200.00 | 2.88 | 1.49 | 0.00 |
| 205.00 | 2.88 | 1.49 | 0.00 |
| 210.00 | 2.88 | 1.49 | 0.00 |
| 215.00 | 2.88 | 1.49 | 0.00 |
| 220.00 | 2.88 | 1.49 | 0.00 |
| 225.00 | 2.88 | 1.49 | 0.00 |
| 230.00 | 2.88 | 1.49 | 0.00 |
| 235.00 | 2.88 | 1.49 | 0.00 |
| 240.00 | 2.88 | 1.49 | 0.00 |

## Summary for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

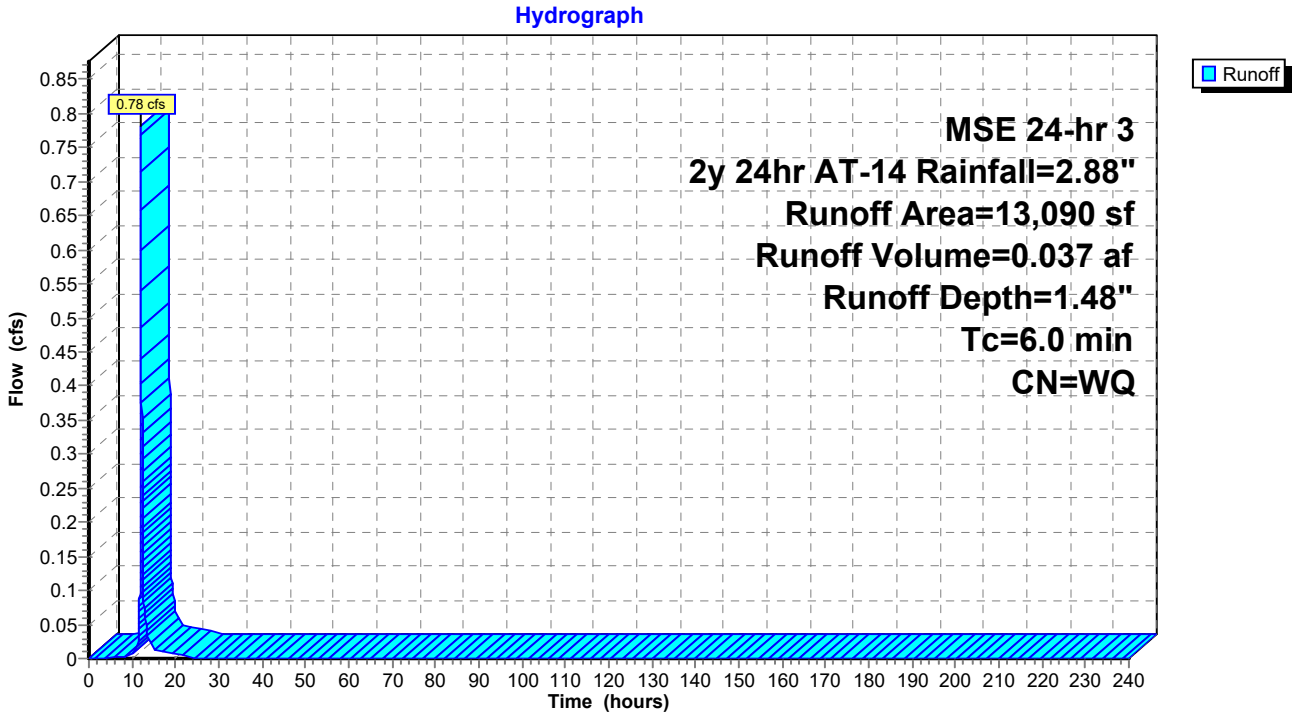
Runoff = 0.78 cfs @ 12.13 hrs, Volume= 0.037 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.88"

| Area (sf) | CN | Description |
|---|---|---|
| 2,797 | 98 | Paved parking, HSG D |
| 10,293 | 80 | >75% Grass cover, Good, HSG D |
| 13,090 | | Weighted Average |
| 10,293 | | 78.63% Pervious Area |
| 2,797 | | 21.37% Impervious Area |

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

## Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED



## Hydrograph for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.11 | 0.00 | 0.00 |
| 10.00 | 0.40 | 0.00 | **0.01** |
| 15.00 | 2.58 | 1.18 | **0.02** |
| 20.00 | **2.80** | **1.36** | 0.01 |
| 25.00 | **2.88** | **1.42** | 0.00 |
| 30.00 | 2.88 | 1.42 | 0.00 |
| 35.00 | 2.88 | 1.42 | 0.00 |
| 40.00 | 2.88 | 1.42 | 0.00 |
| 45.00 | 2.88 | 1.42 | 0.00 |
| 50.00 | 2.88 | 1.42 | 0.00 |
| 55.00 | 2.88 | 1.42 | 0.00 |
| 60.00 | 2.88 | 1.42 | 0.00 |
| 65.00 | 2.88 | 1.42 | 0.00 |
| 70.00 | 2.88 | 1.42 | 0.00 |
| 75.00 | 2.88 | 1.42 | 0.00 |
| 80.00 | 2.88 | 1.42 | 0.00 |
| 85.00 | 2.88 | 1.42 | 0.00 |
| 90.00 | 2.88 | 1.42 | 0.00 |
| 95.00 | 2.88 | 1.42 | 0.00 |
| 100.00 | 2.88 | 1.42 | 0.00 |
| 105.00 | 2.88 | 1.42 | 0.00 |
| 110.00 | 2.88 | 1.42 | 0.00 |
| 115.00 | 2.88 | 1.42 | 0.00 |
| 120.00 | 2.88 | 1.42 | 0.00 |
| 125.00 | 2.88 | 1.42 | 0.00 |
| 130.00 | 2.88 | 1.42 | 0.00 |
| 135.00 | 2.88 | 1.42 | 0.00 |
| 140.00 | 2.88 | 1.42 | 0.00 |
| 145.00 | 2.88 | 1.42 | 0.00 |
| 150.00 | 2.88 | 1.42 | 0.00 |
| 155.00 | 2.88 | 1.42 | 0.00 |
| 160.00 | 2.88 | 1.42 | 0.00 |
| 165.00 | 2.88 | 1.42 | 0.00 |
| 170.00 | 2.88 | 1.42 | 0.00 |
| 175.00 | 2.88 | 1.42 | 0.00 |
| 180.00 | 2.88 | 1.42 | 0.00 |
| 185.00 | 2.88 | 1.42 | 0.00 |
| 190.00 | 2.88 | 1.42 | 0.00 |
| 195.00 | 2.88 | 1.42 | 0.00 |
| 200.00 | 2.88 | 1.42 | 0.00 |
| 205.00 | 2.88 | 1.42 | 0.00 |
| 210.00 | 2.88 | 1.42 | 0.00 |
| 215.00 | 2.88 | 1.42 | 0.00 |
| 220.00 | 2.88 | 1.42 | 0.00 |
| 225.00 | 2.88 | 1.42 | 0.00 |
| 230.00 | 2.88 | 1.42 | 0.00 |
| 235.00 | 2.88 | 1.42 | 0.00 |
| 240.00 | 2.88 | 1.42 | 0.00 |

## Summary for Pond 1P: UNDERGROUND POND 1

Inflow Area = 1.687 ac, 83.48% Impervious, Inflow Depth = 2.40" for 2y 24hr AT-14 event
Inflow = 6.58 cfs @ 12.13 hrs, Volume= 0.338 af
Outflow = 2.90 cfs @ 12.23 hrs, Volume= 0.338 af, Atten= 56%, Lag= 6.3 min
Primary = 2.90 cfs @ 12.23 hrs, Volume= 0.338 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Starting Elev= 965.40' Surf.Area= 4,484 sf Storage= 7,467 cf
Peak Elev= 967.10' @ 12.23 hrs Surf.Area= 4,484 sf Storage= 13,012 cf (5,545 cf above start)

Plug-Flow detention time= 312.8 min calculated for 0.166 af (49% of inflow)
Center-of-Mass det. time= 88.9 min ( 847.6 - 758.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1A | 962.40' | 0 cf | **19.00'W x 236.00'L x 7.50'H Field A**<br>33,630 cf Overall - 18,242 cf Embedded = 15,388 cf x 0.0% Voids |
| #2A | 962.40' | 18,242 cf | **CMP Round 84** x 22 Inside #1<br>Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf<br>Overall Size= 84.0"W x 84.0"H x 20.00'L<br>22 Chambers in 2 Rows<br>17.00' Header x 38.48 sf x 2 = 1,308.5 cf Inside |
| | | 18,242 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 961.90' | **15.0" Round Culvert**<br>L= 103.0' RCP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 961.90' / 961.38' S= 0.0050 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Device 1 | 965.40' | **5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 966.40' | **16.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |

**Primary OutFlow** Max=2.90 cfs @ 12.23 hrs HW=967.10' (Free Discharge)
└─**1=Culvert** (Passes 2.90 cfs of 10.75 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.80 cfs @ 5.87 fps)
  └─**3=Orifice/Grate** (Orifice Controls 2.10 cfs @ 2.84 fps)

## Pond 1P: UNDERGROUND POND 1 - Chamber Wizard Field A

**Chamber Model = CMP Round 84 (Round Corrugated Metal Pipe)**
Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf
Overall Size= 84.0"W x 84.0"H x 20.00'L

84.0" Wide + 36.0" Spacing = 120.0" C-C Row Spacing

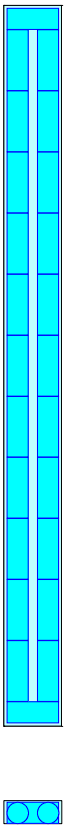
11 Chambers/Row x 20.00' Long +7.00' Header x 2 = 234.00' Row Length +12.0" End Stone x 2 = 236.00' Base Length
2 Rows x 84.0" Wide + 36.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.00' Base Width
84.0" Chamber Height + 6.0" Stone Cover = 7.50' Field Height

22 Chambers x 769.7 cf + 17.00' Header x 38.48 sf x 2 = 18,241.7 cf Chamber Storage

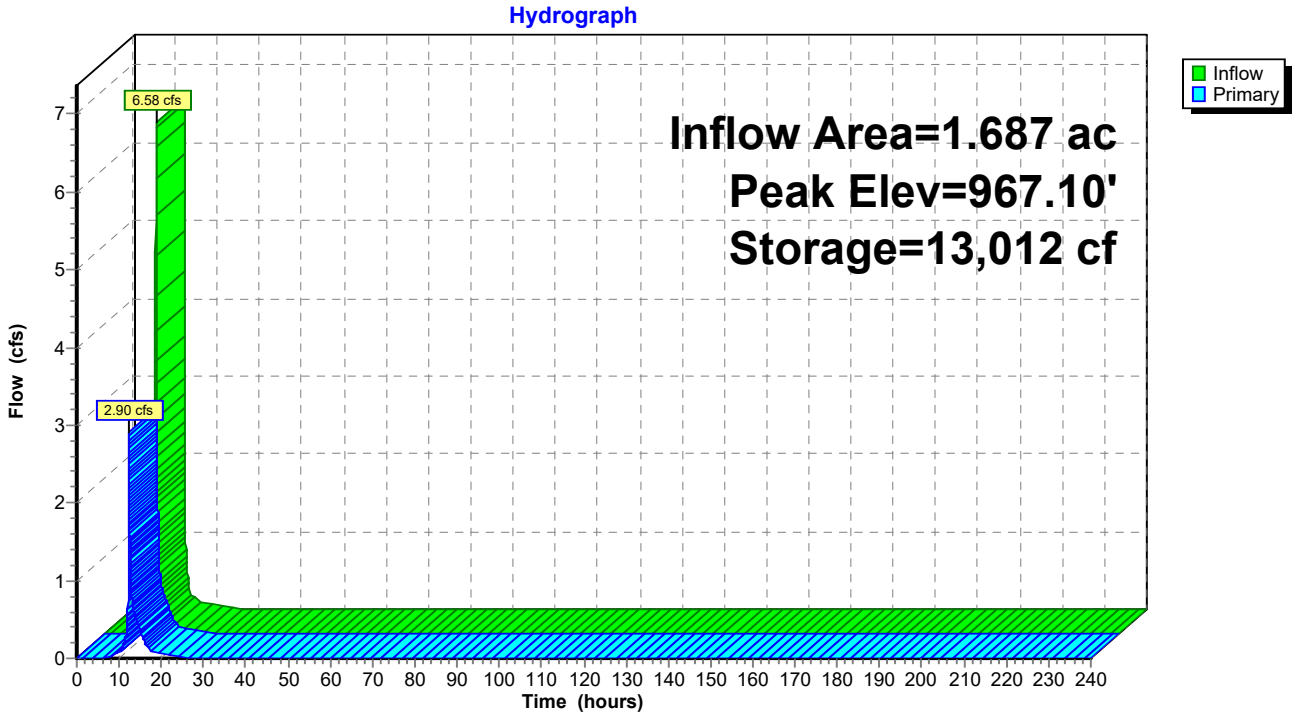
33,630.0 cf Field - 18,241.7 cf Chambers = 15,388.3 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 18,241.7 cf = 0.419 af
Overall Storage Efficiency = 54.2%
Overall System Size = 236.00' x 19.00' x 7.50'

22 Chambers
1,245.6 cy Field
569.9 cy Stone



## Pond 1P: UNDERGROUND POND 1



## Hydrograph for Pond 1P: UNDERGROUND POND 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | 0.00 | 7,467 | 965.40 | 0.00 |
| 5.00 | 0.02 | 7,541 | 965.42 | 0.00 |
| 10.00 | **0.13** | **8,063** | **965.58** | **0.08** |
| 15.00 | **0.15** | **9,162** | **965.91** | **0.36** |
| 20.00 | 0.05 | 7,976 | 965.55 | 0.06 |
| 25.00 | 0.00 | 7,714 | 965.47 | 0.02 |
| 30.00 | 0.00 | 7,556 | 965.43 | 0.00 |
| 35.00 | 0.00 | 7,513 | 965.41 | 0.00 |
| 40.00 | 0.00 | 7,501 | 965.41 | 0.00 |
| 45.00 | 0.00 | 7,496 | 965.41 | 0.00 |
| 50.00 | 0.00 | 7,492 | 965.41 | 0.00 |
| 55.00 | 0.00 | 7,488 | 965.41 | 0.00 |
| 60.00 | 0.00 | 7,485 | 965.41 | 0.00 |
| 65.00 | 0.00 | 7,483 | 965.40 | 0.00 |
| 70.00 | 0.00 | 7,480 | 965.40 | 0.00 |
| 75.00 | 0.00 | 7,478 | 965.40 | 0.00 |
| 80.00 | 0.00 | 7,477 | 965.40 | 0.00 |
| 85.00 | 0.00 | 7,475 | 965.40 | 0.00 |
| 90.00 | 0.00 | 7,474 | 965.40 | 0.00 |
| 95.00 | 0.00 | 7,473 | 965.40 | 0.00 |
| 100.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 105.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 110.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 115.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 120.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 125.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 130.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 135.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 140.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 145.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 150.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 155.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 160.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 165.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 170.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 175.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 180.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 185.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 190.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 195.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 200.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 205.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 210.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 215.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 220.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 225.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 230.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 235.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 240.00 | 0.00 | 7,468 | 965.40 | 0.00 |

## Stage-Area-Storage for Pond 1P: UNDERGROUND POND 1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---|---|---|---|---|---|
| 962.40 | 0 | 965.00 | 6,168 | 967.60 | 14,531 |
| 962.45 | 12 | 965.05 | 6,328 | 967.65 | 14,675 |
| 962.50 | 52 | 965.10 | 6,490 | 967.70 | 14,818 |
| 962.55 | 96 | 965.15 | 6,652 | 967.75 | 14,960 |
| 962.60 | 148 | 965.20 | 6,814 | 967.80 | 15,100 |
| 962.65 | 207 | 965.25 | 6,977 | 967.85 | 15,239 |
| 962.70 | 271 | 965.30 | 7,140 | 967.90 | 15,376 |
| 962.75 | 341 | 965.35 | 7,303 | 967.95 | 15,511 |
| 962.80 | 416 | 965.40 | 7,467 | 968.00 | 15,644 |
| 962.85 | 495 | 965.45 | 7,632 | 968.05 | 15,776 |
| 962.90 | 578 | 965.50 | 7,797 | 968.10 | 15,906 |
| 962.95 | 666 | 965.55 | 7,961 | 968.15 | 16,034 |
| 963.00 | 757 | 965.60 | 8,127 | 968.20 | 16,160 |
| 963.05 | 851 | 965.65 | 8,292 | 968.25 | 16,284 |
| 963.10 | 949 | 965.70 | 8,458 | 968.30 | 16,406 |
| 963.15 | 1,050 | 965.75 | 8,623 | 968.35 | 16,526 |
| 963.20 | 1,155 | 965.80 | 8,789 | 968.40 | 16,643 |
| 963.25 | 1,262 | 965.85 | 8,955 | 968.45 | 16,758 |
| 963.30 | 1,371 | 965.90 | 9,121 | 968.50 | 16,870 |
| 963.35 | 1,484 | 965.95 | 9,287 | 968.55 | 16,980 |
| 963.40 | 1,599 | 966.00 | 9,453 | 968.60 | 17,087 |
| 963.45 | 1,716 | 966.05 | 9,618 | 968.65 | 17,191 |
| 963.50 | 1,835 | 966.10 | 9,784 | 968.70 | 17,292 |
| 963.55 | 1,957 | 966.15 | 9,950 | 968.75 | 17,390 |
| 963.60 | 2,081 | 966.20 | 10,115 | 968.80 | 17,485 |
| 963.65 | 2,207 | 966.25 | 10,280 | 968.85 | 17,576 |
| 963.70 | 2,335 | 966.30 | 10,445 | 968.90 | 17,663 |
| 963.75 | 2,465 | 966.35 | 10,610 | 968.95 | 17,747 |
| 963.80 | 2,597 | 966.40 | 10,774 | 969.00 | 17,826 |
| 963.85 | 2,731 | 966.45 | 10,938 | 969.05 | 17,901 |
| 963.90 | 2,866 | 966.50 | 11,102 | 969.10 | 17,970 |
| 963.95 | 3,003 | 966.55 | 11,265 | 969.15 | 18,035 |
| 964.00 | 3,142 | 966.60 | 11,428 | 969.20 | 18,093 |
| 964.05 | 3,282 | 966.65 | 11,590 | 969.25 | 18,145 |
| 964.10 | 3,423 | 966.70 | 11,752 | 969.30 | 18,189 |
| 964.15 | 3,566 | 966.75 | 11,913 | 969.35 | 18,222 |
| 964.20 | 3,711 | 966.80 | 12,074 | 969.40 | **18,242** |
| 964.25 | 3,856 | 966.85 | 12,234 | 969.45 | 18,242 |
| 964.30 | 4,003 | 966.90 | 12,393 | 969.50 | 18,242 |
| 964.35 | 4,151 | 966.95 | 12,552 | 969.55 | 18,242 |
| 964.40 | 4,301 | 967.00 | 12,710 | 969.60 | 18,242 |
| 964.45 | 4,451 | 967.05 | 12,867 | 969.65 | 18,242 |
| 964.50 | 4,603 | 967.10 | 13,023 | 969.70 | 18,242 |
| 964.55 | 4,755 | 967.15 | 13,178 | 969.75 | 18,242 |
| 964.60 | 4,909 | 967.20 | 13,333 | 969.80 | 18,242 |
| 964.65 | 5,063 | 967.25 | 13,486 | 969.85 | 18,242 |
| 964.70 | 5,219 | 967.30 | 13,639 | 969.90 | 18,242 |
| 964.75 | 5,375 | 967.35 | 13,791 | | |
| 964.80 | 5,532 | 967.40 | 13,941 | | |
| 964.85 | 5,690 | 967.45 | 14,090 | | |
| 964.90 | 5,849 | 967.50 | 14,238 | | |
| 964.95 | 6,008 | 967.55 | 14,385 | | |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment PR1A: DRAINS TO POND 1** Runoff Area=73,474 sf 83.48% Impervious Runoff Depth=3.76"
Tc=6.0 min CN=WQ Runoff=10.16 cfs 0.529 af

**Subcatchment PR1B: DRAINS SOUTH TO** Runoff Area=14,493 sf 28.85% Impervious Runoff Depth=2.79"
Tc=6.0 min CN=WQ Runoff=1.61 cfs 0.077 af

**Subcatchment PR2: DRAINS NORTH TO** Runoff Area=13,090 sf 21.37% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=WQ Runoff=1.41 cfs 0.067 af

**Pond 1P: UNDERGROUND POND 1** Peak Elev=967.67' Storage=14,720 cf Inflow=10.16 cfs 0.529 af
Outflow=6.18 cfs 0.529 af

**Total Runoff Area = 2.320 ac Runoff Volume = 0.673 af Average Runoff Depth = 3.48"**
**32.40% Pervious = 0.752 ac 67.60% Impervious = 1.568 ac**

## Summary for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

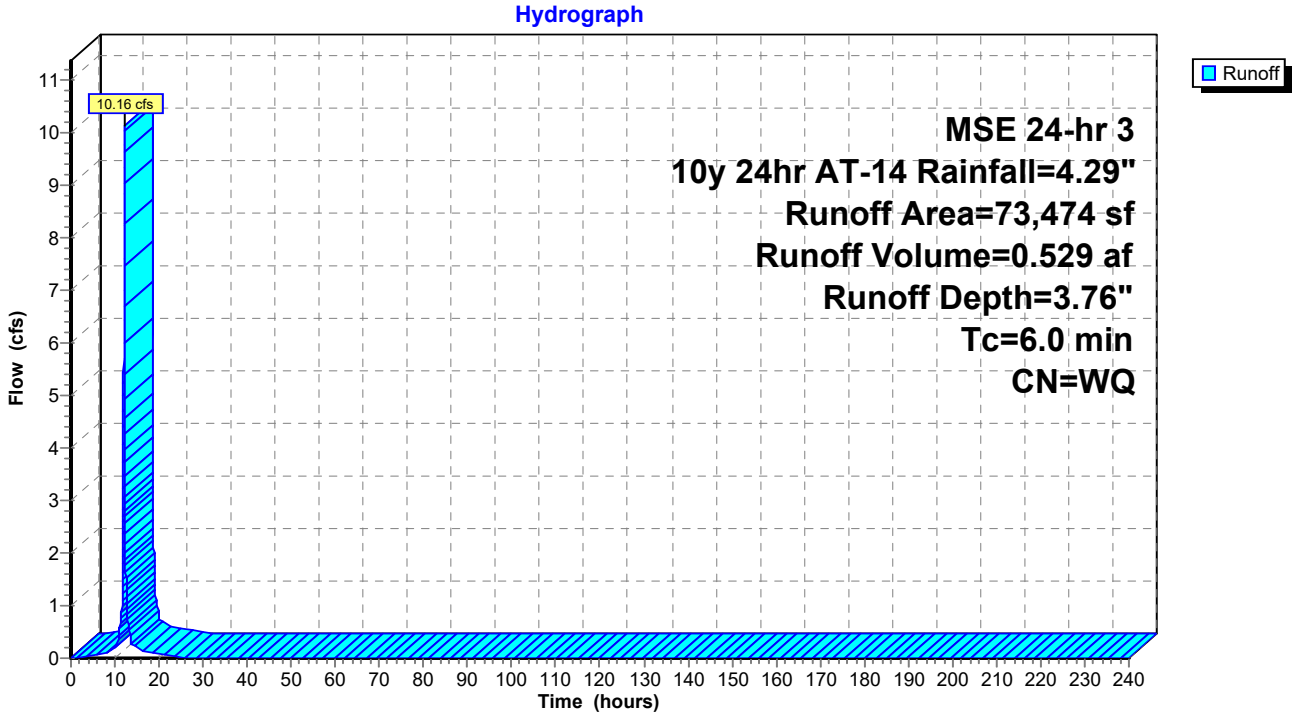
Runoff = 10.16 cfs @ 12.13 hrs, Volume= 0.529 af, Depth= 3.76"
Routed to Pond 1P : UNDERGROUND POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.29"

| Area (sf) | CN | Description |
|---|---|---|
| 61,334 | 98 | Paved parking, HSG D |
| 12,140 | 80 | >75% Grass cover, Good, HSG D |
| 73,474 | | Weighted Average |
| 12,140 | | 16.52% Pervious Area |
| 61,334 | | 83.48% Impervious Area |

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

### Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.16 | 0.01 | 0.04 |
| 10.00 | 0.59 | 0.23 | **0.21** |
| 15.00 | 3.85 | 3.28 | **0.23** |
| 20.00 | **4.18** | **3.61** | 0.08 |
| 25.00 | **4.29** | **3.72** | 0.00 |
| 30.00 | 4.29 | 3.72 | 0.00 |
| 35.00 | 4.29 | 3.72 | 0.00 |
| 40.00 | 4.29 | 3.72 | 0.00 |
| 45.00 | 4.29 | 3.72 | 0.00 |
| 50.00 | 4.29 | 3.72 | 0.00 |
| 55.00 | 4.29 | 3.72 | 0.00 |
| 60.00 | 4.29 | 3.72 | 0.00 |
| 65.00 | 4.29 | 3.72 | 0.00 |
| 70.00 | 4.29 | 3.72 | 0.00 |
| 75.00 | 4.29 | 3.72 | 0.00 |
| 80.00 | 4.29 | 3.72 | 0.00 |
| 85.00 | 4.29 | 3.72 | 0.00 |
| 90.00 | 4.29 | 3.72 | 0.00 |
| 95.00 | 4.29 | 3.72 | 0.00 |
| 100.00 | 4.29 | 3.72 | 0.00 |
| 105.00 | 4.29 | 3.72 | 0.00 |
| 110.00 | 4.29 | 3.72 | 0.00 |
| 115.00 | 4.29 | 3.72 | 0.00 |
| 120.00 | 4.29 | 3.72 | 0.00 |
| 125.00 | 4.29 | 3.72 | 0.00 |
| 130.00 | 4.29 | 3.72 | 0.00 |
| 135.00 | 4.29 | 3.72 | 0.00 |
| 140.00 | 4.29 | 3.72 | 0.00 |
| 145.00 | 4.29 | 3.72 | 0.00 |
| 150.00 | 4.29 | 3.72 | 0.00 |
| 155.00 | 4.29 | 3.72 | 0.00 |
| 160.00 | 4.29 | 3.72 | 0.00 |
| 165.00 | 4.29 | 3.72 | 0.00 |
| 170.00 | 4.29 | 3.72 | 0.00 |
| 175.00 | 4.29 | 3.72 | 0.00 |
| 180.00 | 4.29 | 3.72 | 0.00 |
| 185.00 | 4.29 | 3.72 | 0.00 |
| 190.00 | 4.29 | 3.72 | 0.00 |
| 195.00 | 4.29 | 3.72 | 0.00 |
| 200.00 | 4.29 | 3.72 | 0.00 |
| 205.00 | 4.29 | 3.72 | 0.00 |
| 210.00 | 4.29 | 3.72 | 0.00 |
| 215.00 | 4.29 | 3.72 | 0.00 |
| 220.00 | 4.29 | 3.72 | 0.00 |
| 225.00 | 4.29 | 3.72 | 0.00 |
| 230.00 | 4.29 | 3.72 | 0.00 |
| 235.00 | 4.29 | 3.72 | 0.00 |
| 240.00 | 4.29 | 3.72 | 0.00 |

## Summary for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

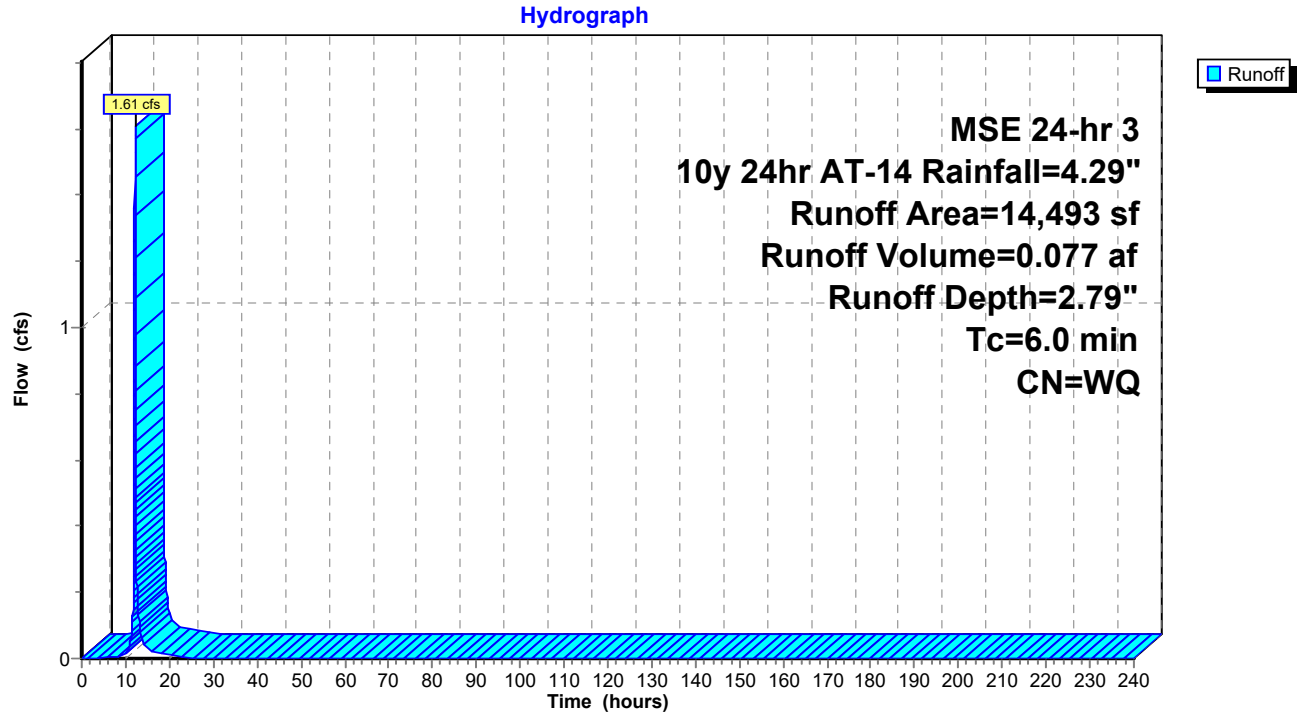
Runoff = 1.61 cfs @ 12.13 hrs, Volume= 0.077 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.29"

| Area (sf) | CN | Description |
|---|---|---|
| 4,181 | 98 | Paved parking, HSG D |
| 10,312 | 80 | >75% Grass cover, Good, HSG D |
| 14,493 | | Weighted Average |
| 10,312 | | 71.15% Pervious Area |
| 4,181 | | 28.85% Impervious Area |

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

## Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED



## Hydrograph for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.16 | 0.00 | 0.00 |
| 10.00 | 0.59 | 0.03 | **0.02** |
| 15.00 | 3.85 | 2.32 | **0.04** |
| 20.00 | **4.18** | **2.62** | 0.01 |
| 25.00 | **4.29** | **2.72** | 0.00 |
| 30.00 | 4.29 | 2.72 | 0.00 |
| 35.00 | 4.29 | 2.72 | 0.00 |
| 40.00 | 4.29 | 2.72 | 0.00 |
| 45.00 | 4.29 | 2.72 | 0.00 |
| 50.00 | 4.29 | 2.72 | 0.00 |
| 55.00 | 4.29 | 2.72 | 0.00 |
| 60.00 | 4.29 | 2.72 | 0.00 |
| 65.00 | 4.29 | 2.72 | 0.00 |
| 70.00 | 4.29 | 2.72 | 0.00 |
| 75.00 | 4.29 | 2.72 | 0.00 |
| 80.00 | 4.29 | 2.72 | 0.00 |
| 85.00 | 4.29 | 2.72 | 0.00 |
| 90.00 | 4.29 | 2.72 | 0.00 |
| 95.00 | 4.29 | 2.72 | 0.00 |
| 100.00 | 4.29 | 2.72 | 0.00 |
| 105.00 | 4.29 | 2.72 | 0.00 |
| 110.00 | 4.29 | 2.72 | 0.00 |
| 115.00 | 4.29 | 2.72 | 0.00 |
| 120.00 | 4.29 | 2.72 | 0.00 |
| 125.00 | 4.29 | 2.72 | 0.00 |
| 130.00 | 4.29 | 2.72 | 0.00 |
| 135.00 | 4.29 | 2.72 | 0.00 |
| 140.00 | 4.29 | 2.72 | 0.00 |
| 145.00 | 4.29 | 2.72 | 0.00 |
| 150.00 | 4.29 | 2.72 | 0.00 |
| 155.00 | 4.29 | 2.72 | 0.00 |
| 160.00 | 4.29 | 2.72 | 0.00 |
| 165.00 | 4.29 | 2.72 | 0.00 |
| 170.00 | 4.29 | 2.72 | 0.00 |
| 175.00 | 4.29 | 2.72 | 0.00 |
| 180.00 | 4.29 | 2.72 | 0.00 |
| 185.00 | 4.29 | 2.72 | 0.00 |
| 190.00 | 4.29 | 2.72 | 0.00 |
| 195.00 | 4.29 | 2.72 | 0.00 |
| 200.00 | 4.29 | 2.72 | 0.00 |
| 205.00 | 4.29 | 2.72 | 0.00 |
| 210.00 | 4.29 | 2.72 | 0.00 |
| 215.00 | 4.29 | 2.72 | 0.00 |
| 220.00 | 4.29 | 2.72 | 0.00 |
| 225.00 | 4.29 | 2.72 | 0.00 |
| 230.00 | 4.29 | 2.72 | 0.00 |
| 235.00 | 4.29 | 2.72 | 0.00 |
| 240.00 | 4.29 | 2.72 | 0.00 |

## Summary for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

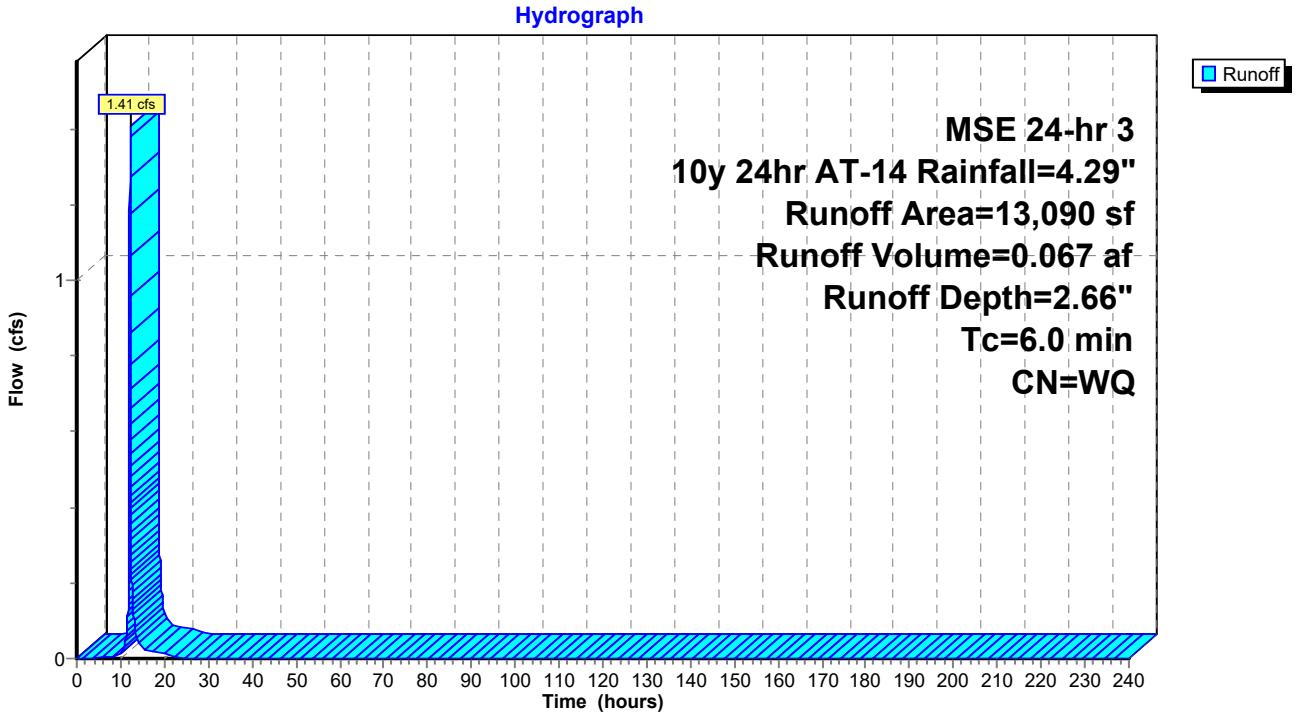
Runoff = 1.41 cfs @ 12.13 hrs, Volume= 0.067 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.29"

| Area (sf) | CN | Description |
|---|---|---|
| 2,797 | 98 | Paved parking, HSG D |
| 10,293 | 80 | >75% Grass cover, Good, HSG D |
| 13,090 | | Weighted Average |
| 10,293 | | 78.63% Pervious Area |
| 2,797 | | 21.37% Impervious Area |

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

## Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED



## Hydrograph for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.16 | 0.00 | 0.00 |
| 10.00 | 0.59 | 0.02 | **0.01** |
| 15.00 | 3.85 | 2.24 | **0.04** |
| 20.00 | **4.18** | **2.53** | 0.01 |
| 25.00 | **4.29** | **2.63** | 0.00 |
| 30.00 | 4.29 | 2.63 | 0.00 |
| 35.00 | 4.29 | 2.63 | 0.00 |
| 40.00 | 4.29 | 2.63 | 0.00 |
| 45.00 | 4.29 | 2.63 | 0.00 |
| 50.00 | 4.29 | 2.63 | 0.00 |
| 55.00 | 4.29 | 2.63 | 0.00 |
| 60.00 | 4.29 | 2.63 | 0.00 |
| 65.00 | 4.29 | 2.63 | 0.00 |
| 70.00 | 4.29 | 2.63 | 0.00 |
| 75.00 | 4.29 | 2.63 | 0.00 |
| 80.00 | 4.29 | 2.63 | 0.00 |
| 85.00 | 4.29 | 2.63 | 0.00 |
| 90.00 | 4.29 | 2.63 | 0.00 |
| 95.00 | 4.29 | 2.63 | 0.00 |
| 100.00 | 4.29 | 2.63 | 0.00 |
| 105.00 | 4.29 | 2.63 | 0.00 |
| 110.00 | 4.29 | 2.63 | 0.00 |
| 115.00 | 4.29 | 2.63 | 0.00 |
| 120.00 | 4.29 | 2.63 | 0.00 |
| 125.00 | 4.29 | 2.63 | 0.00 |
| 130.00 | 4.29 | 2.63 | 0.00 |
| 135.00 | 4.29 | 2.63 | 0.00 |
| 140.00 | 4.29 | 2.63 | 0.00 |
| 145.00 | 4.29 | 2.63 | 0.00 |
| 150.00 | 4.29 | 2.63 | 0.00 |
| 155.00 | 4.29 | 2.63 | 0.00 |
| 160.00 | 4.29 | 2.63 | 0.00 |
| 165.00 | 4.29 | 2.63 | 0.00 |
| 170.00 | 4.29 | 2.63 | 0.00 |
| 175.00 | 4.29 | 2.63 | 0.00 |
| 180.00 | 4.29 | 2.63 | 0.00 |
| 185.00 | 4.29 | 2.63 | 0.00 |
| 190.00 | 4.29 | 2.63 | 0.00 |
| 195.00 | 4.29 | 2.63 | 0.00 |
| 200.00 | 4.29 | 2.63 | 0.00 |
| 205.00 | 4.29 | 2.63 | 0.00 |
| 210.00 | 4.29 | 2.63 | 0.00 |
| 215.00 | 4.29 | 2.63 | 0.00 |
| 220.00 | 4.29 | 2.63 | 0.00 |
| 225.00 | 4.29 | 2.63 | 0.00 |
| 230.00 | 4.29 | 2.63 | 0.00 |
| 235.00 | 4.29 | 2.63 | 0.00 |
| 240.00 | 4.29 | 2.63 | 0.00 |

## Summary for Pond 1P: UNDERGROUND POND 1

Inflow Area = 1.687 ac, 83.48% Impervious, Inflow Depth = 3.76" for 10y 24hr AT-14 event
Inflow = 10.16 cfs @ 12.13 hrs, Volume= 0.529 af
Outflow = 6.18 cfs @ 12.20 hrs, Volume= 0.529 af, Atten= 39%, Lag= 4.1 min
Primary = 6.18 cfs @ 12.20 hrs, Volume= 0.529 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Starting Elev= 965.40' Surf.Area= 4,484 sf Storage= 7,467 cf
Peak Elev= 967.67' @ 12.20 hrs Surf.Area= 4,484 sf Storage= 14,720 cf (7,252 cf above start)

Plug-Flow detention time= 214.1 min calculated for 0.357 af (68% of inflow)
Center-of-Mass det. time= 71.2 min ( 824.2 - 753.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1A | 962.40' | 0 cf | **19.00'W x 236.00'L x 7.50'H Field A**<br>33,630 cf Overall - 18,242 cf Embedded = 15,388 cf x 0.0% Voids |
| #2A | 962.40' | 18,242 cf | **CMP Round 84** x 22 Inside #1<br>Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf<br>Overall Size= 84.0"W x 84.0"H x 20.00'L<br>22 Chambers in 2 Rows<br>17.00' Header x 38.48 sf x 2 = 1,308.5 cf Inside |
| | | 18,242 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 961.90' | **15.0" Round Culvert**<br>L= 103.0' RCP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 961.90' / 961.38' S= 0.0050 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Device 1 | 965.40' | **5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 966.40' | **16.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |

**Primary OutFlow** Max=6.18 cfs @ 12.20 hrs HW=967.66' (Free Discharge)
└**1=Culvert** (Passes 6.18 cfs of 11.42 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.94 cfs @ 6.90 fps)
  └**3=Orifice/Grate** (Orifice Controls 5.24 cfs @ 3.83 fps)

## Pond 1P: UNDERGROUND POND 1 - Chamber Wizard Field A

**Chamber Model = CMP Round 84 (Round Corrugated Metal Pipe)**
Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf
Overall Size= 84.0"W x 84.0"H x 20.00'L

84.0" Wide + 36.0" Spacing = 120.0" C-C Row Spacing

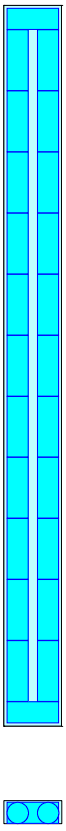
11 Chambers/Row x 20.00' Long +7.00' Header x 2 = 234.00' Row Length +12.0" End Stone x 2 = 236.00' Base Length
2 Rows x 84.0" Wide + 36.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.00' Base Width
84.0" Chamber Height + 6.0" Stone Cover = 7.50' Field Height

22 Chambers x 769.7 cf + 17.00' Header x 38.48 sf x 2 = 18,241.7 cf Chamber Storage

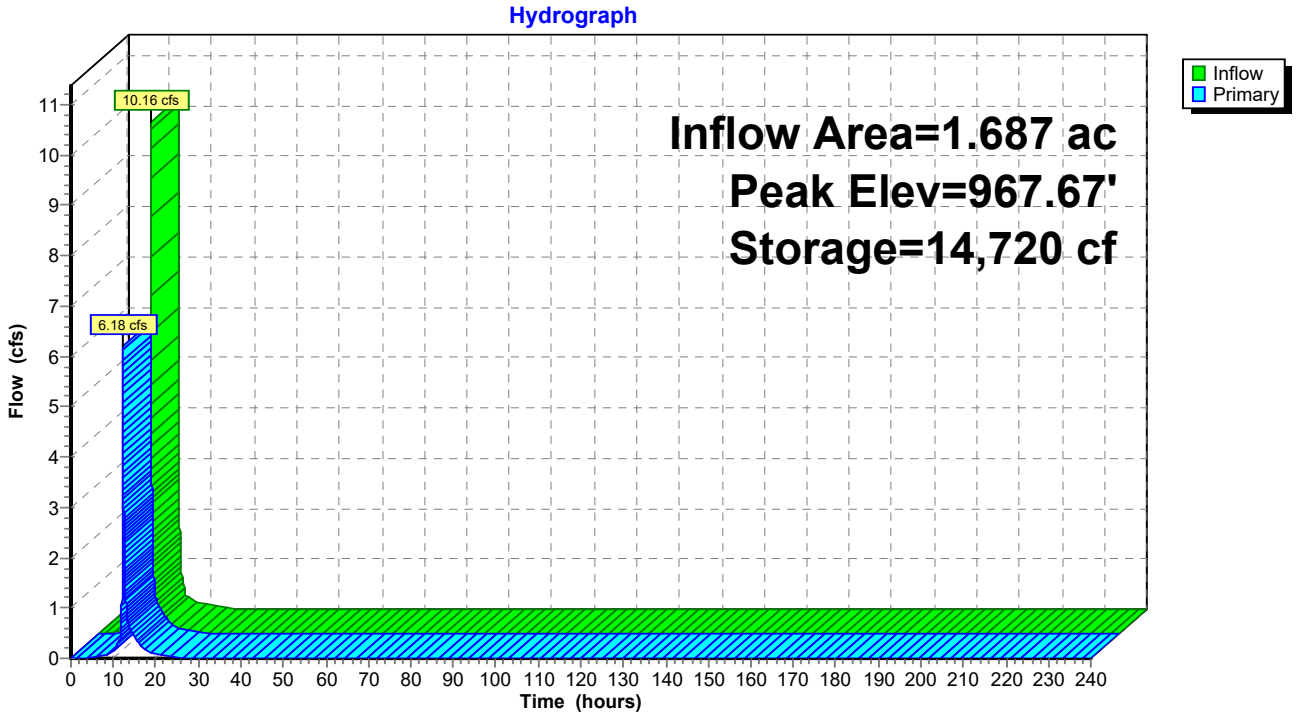
33,630.0 cf Field - 18,241.7 cf Chambers = 15,388.3 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 18,241.7 cf = 0.419 af
Overall Storage Efficiency = 54.2%
Overall System Size = 236.00' x 19.00' x 7.50'

22 Chambers
1,245.6 cy Field
569.9 cy Stone



## Pond 1P: UNDERGROUND POND 1



## Hydrograph for Pond 1P: UNDERGROUND POND 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | 0.00 | 7,467 | 965.40 | 0.00 |
| 5.00 | 0.04 | 7,650 | 965.46 | 0.01 |
| 10.00 | **0.21** | **8,309** | **965.66** | **0.15** |
| 15.00 | **0.23** | **9,660** | **966.06** | **0.44** |
| 20.00 | 0.08 | 8,099 | 965.59 | 0.09 |
| 25.00 | 0.00 | 7,753 | 965.49 | 0.02 |
| 30.00 | 0.00 | 7,566 | 965.43 | 0.01 |
| 35.00 | 0.00 | 7,516 | 965.41 | 0.00 |
| 40.00 | 0.00 | 7,502 | 965.41 | 0.00 |
| 45.00 | 0.00 | 7,496 | 965.41 | 0.00 |
| 50.00 | 0.00 | 7,492 | 965.41 | 0.00 |
| 55.00 | 0.00 | 7,489 | 965.41 | 0.00 |
| 60.00 | 0.00 | 7,485 | 965.41 | 0.00 |
| 65.00 | 0.00 | 7,483 | 965.40 | 0.00 |
| 70.00 | 0.00 | 7,481 | 965.40 | 0.00 |
| 75.00 | 0.00 | 7,479 | 965.40 | 0.00 |
| 80.00 | 0.00 | 7,477 | 965.40 | 0.00 |
| 85.00 | 0.00 | 7,476 | 965.40 | 0.00 |
| 90.00 | 0.00 | 7,474 | 965.40 | 0.00 |
| 95.00 | 0.00 | 7,473 | 965.40 | 0.00 |
| 100.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 105.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 110.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 115.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 120.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 125.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 130.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 135.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 140.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 145.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 150.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 155.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 160.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 165.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 170.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 175.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 180.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 185.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 190.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 195.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 200.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 205.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 210.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 215.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 220.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 225.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 230.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 235.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 240.00 | 0.00 | 7,468 | 965.40 | 0.00 |

## Stage-Area-Storage for Pond 1P: UNDERGROUND POND 1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---|---|---|---|---|---|
| 962.40 | 0 | 965.00 | 6,168 | 967.60 | 14,531 |
| 962.45 | 12 | 965.05 | 6,328 | 967.65 | 14,675 |
| 962.50 | 52 | 965.10 | 6,490 | 967.70 | 14,818 |
| 962.55 | 96 | 965.15 | 6,652 | 967.75 | 14,960 |
| 962.60 | 148 | 965.20 | 6,814 | 967.80 | 15,100 |
| 962.65 | 207 | 965.25 | 6,977 | 967.85 | 15,239 |
| 962.70 | 271 | 965.30 | 7,140 | 967.90 | 15,376 |
| 962.75 | 341 | 965.35 | 7,303 | 967.95 | 15,511 |
| 962.80 | 416 | 965.40 | 7,467 | 968.00 | 15,644 |
| 962.85 | 495 | 965.45 | 7,632 | 968.05 | 15,776 |
| 962.90 | 578 | 965.50 | 7,797 | 968.10 | 15,906 |
| 962.95 | 666 | 965.55 | 7,961 | 968.15 | 16,034 |
| 963.00 | 757 | 965.60 | 8,127 | 968.20 | 16,160 |
| 963.05 | 851 | 965.65 | 8,292 | 968.25 | 16,284 |
| 963.10 | 949 | 965.70 | 8,458 | 968.30 | 16,406 |
| 963.15 | 1,050 | 965.75 | 8,623 | 968.35 | 16,526 |
| 963.20 | 1,155 | 965.80 | 8,789 | 968.40 | 16,643 |
| 963.25 | 1,262 | 965.85 | 8,955 | 968.45 | 16,758 |
| 963.30 | 1,371 | 965.90 | 9,121 | 968.50 | 16,870 |
| 963.35 | 1,484 | 965.95 | 9,287 | 968.55 | 16,980 |
| 963.40 | 1,599 | 966.00 | 9,453 | 968.60 | 17,087 |
| 963.45 | 1,716 | 966.05 | 9,618 | 968.65 | 17,191 |
| 963.50 | 1,835 | 966.10 | 9,784 | 968.70 | 17,292 |
| 963.55 | 1,957 | 966.15 | 9,950 | 968.75 | 17,390 |
| 963.60 | 2,081 | 966.20 | 10,115 | 968.80 | 17,485 |
| 963.65 | 2,207 | 966.25 | 10,280 | 968.85 | 17,576 |
| 963.70 | 2,335 | 966.30 | 10,445 | 968.90 | 17,663 |
| 963.75 | 2,465 | 966.35 | 10,610 | 968.95 | 17,747 |
| 963.80 | 2,597 | 966.40 | 10,774 | 969.00 | 17,826 |
| 963.85 | 2,731 | 966.45 | 10,938 | 969.05 | 17,901 |
| 963.90 | 2,866 | 966.50 | 11,102 | 969.10 | 17,970 |
| 963.95 | 3,003 | 966.55 | 11,265 | 969.15 | 18,035 |
| 964.00 | 3,142 | 966.60 | 11,428 | 969.20 | 18,093 |
| 964.05 | 3,282 | 966.65 | 11,590 | 969.25 | 18,145 |
| 964.10 | 3,423 | 966.70 | 11,752 | 969.30 | 18,189 |
| 964.15 | 3,566 | 966.75 | 11,913 | 969.35 | 18,222 |
| 964.20 | 3,711 | 966.80 | 12,074 | 969.40 | **18,242** |
| 964.25 | 3,856 | 966.85 | 12,234 | 969.45 | 18,242 |
| 964.30 | 4,003 | 966.90 | 12,393 | 969.50 | 18,242 |
| 964.35 | 4,151 | 966.95 | 12,552 | 969.55 | 18,242 |
| 964.40 | 4,301 | 967.00 | 12,710 | 969.60 | 18,242 |
| 964.45 | 4,451 | 967.05 | 12,867 | 969.65 | 18,242 |
| 964.50 | 4,603 | 967.10 | 13,023 | 969.70 | 18,242 |
| 964.55 | 4,755 | 967.15 | 13,178 | 969.75 | 18,242 |
| 964.60 | 4,909 | 967.20 | 13,333 | 969.80 | 18,242 |
| 964.65 | 5,063 | 967.25 | 13,486 | 969.85 | 18,242 |
| 964.70 | 5,219 | 967.30 | 13,639 | 969.90 | 18,242 |
| 964.75 | 5,375 | 967.35 | 13,791 | | |
| 964.80 | 5,532 | 967.40 | 13,941 | | |
| 964.85 | 5,690 | 967.45 | 14,090 | | |
| 964.90 | 5,849 | 967.50 | 14,238 | | |
| 964.95 | 6,008 | 967.55 | 14,385 | | |

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

**Subcatchment PR1A: DRAINS TO POND 1** Runoff Area=73,474 sf 83.48% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=WQ Runoff=18.15 cfs 0.961 af

**Subcatchment PR1B: DRAINS SOUTH TO** Runoff Area=14,493 sf 28.85% Impervious Runoff Depth=5.69"
Tc=6.0 min CN=WQ Runoff=3.23 cfs 0.158 af

**Subcatchment PR2: DRAINS NORTH TO** Runoff Area=13,090 sf 21.37% Impervious Runoff Depth=5.53"
Tc=6.0 min CN=WQ Runoff=2.87 cfs 0.139 af

**Pond 1P: UNDERGROUND POND 1** Peak Elev=969.30' Storage=18,187 cf Inflow=18.15 cfs 0.961 af
Outflow=11.30 cfs 0.961 af

**Total Runoff Area = 2.320 ac Runoff Volume = 1.257 af Average Runoff Depth = 6.50"**
**32.40% Pervious = 0.752 ac 67.60% Impervious = 1.568 ac**

## Summary for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

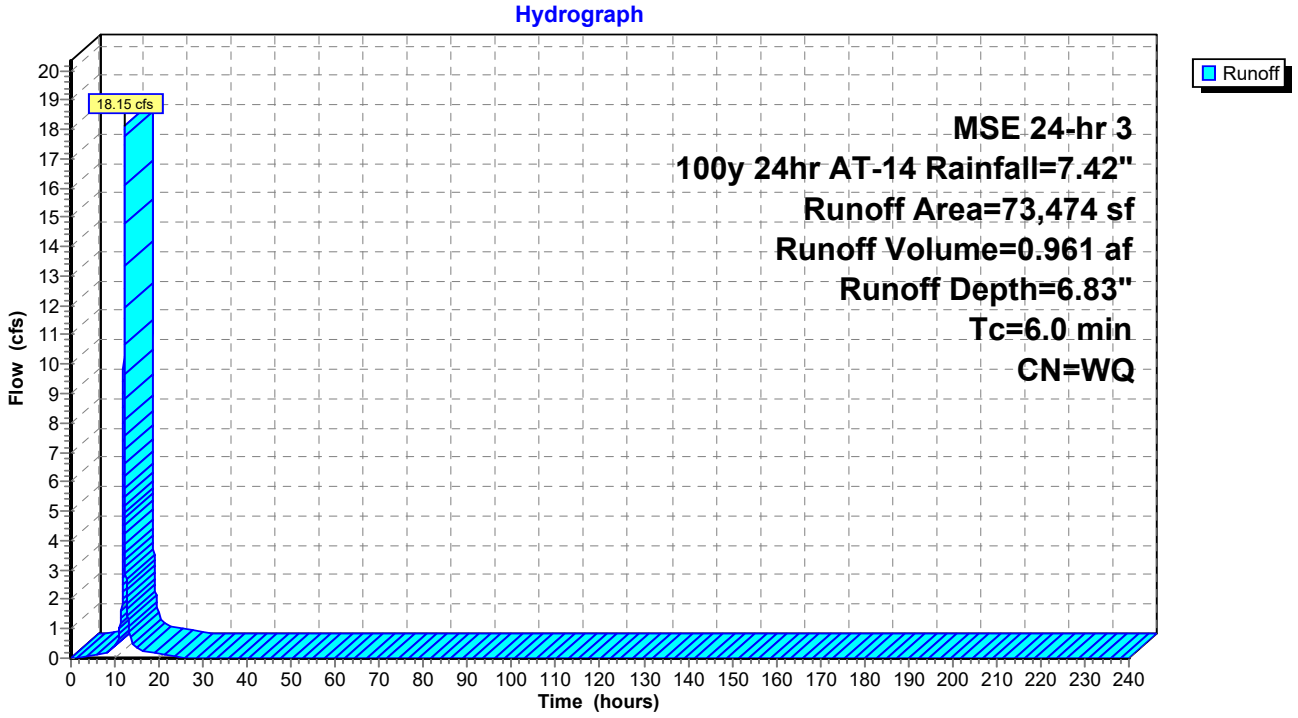
Runoff = 18.15 cfs @ 12.13 hrs, Volume= 0.961 af, Depth= 6.83"
Routed to Pond 1P : UNDERGROUND POND 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.42"

| Area (sf) | CN | Description |
|---|---|---|
| 61,334 | 98 | Paved parking, HSG D |
| 12,140 | 80 | >75% Grass cover, Good, HSG D |
| 73,474 | | Weighted Average |
| 12,140 | | 16.52% Pervious Area |
| 61,334 | | 83.48% Impervious Area |

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

## Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER



## Hydrograph for Subcatchment PR1A: DRAINS TO POND 1 THEN SOUTH TO EX. STORM SEWER

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.28 | 0.04 | 0.10 |
| 10.00 | 1.02 | 0.58 | **0.39** |
| 15.00 | 6.66 | 6.06 | **0.40** |
| 20.00 | **7.23** | **6.63** | 0.13 |
| 25.00 | **7.42** | **6.82** | 0.00 |
| 30.00 | 7.42 | 6.82 | 0.00 |
| 35.00 | 7.42 | 6.82 | 0.00 |
| 40.00 | 7.42 | 6.82 | 0.00 |
| 45.00 | 7.42 | 6.82 | 0.00 |
| 50.00 | 7.42 | 6.82 | 0.00 |
| 55.00 | 7.42 | 6.82 | 0.00 |
| 60.00 | 7.42 | 6.82 | 0.00 |
| 65.00 | 7.42 | 6.82 | 0.00 |
| 70.00 | 7.42 | 6.82 | 0.00 |
| 75.00 | 7.42 | 6.82 | 0.00 |
| 80.00 | 7.42 | 6.82 | 0.00 |
| 85.00 | 7.42 | 6.82 | 0.00 |
| 90.00 | 7.42 | 6.82 | 0.00 |
| 95.00 | 7.42 | 6.82 | 0.00 |
| 100.00 | 7.42 | 6.82 | 0.00 |
| 105.00 | 7.42 | 6.82 | 0.00 |
| 110.00 | 7.42 | 6.82 | 0.00 |
| 115.00 | 7.42 | 6.82 | 0.00 |
| 120.00 | 7.42 | 6.82 | 0.00 |
| 125.00 | 7.42 | 6.82 | 0.00 |
| 130.00 | 7.42 | 6.82 | 0.00 |
| 135.00 | 7.42 | 6.82 | 0.00 |
| 140.00 | 7.42 | 6.82 | 0.00 |
| 145.00 | 7.42 | 6.82 | 0.00 |
| 150.00 | 7.42 | 6.82 | 0.00 |
| 155.00 | 7.42 | 6.82 | 0.00 |
| 160.00 | 7.42 | 6.82 | 0.00 |
| 165.00 | 7.42 | 6.82 | 0.00 |
| 170.00 | 7.42 | 6.82 | 0.00 |
| 175.00 | 7.42 | 6.82 | 0.00 |
| 180.00 | 7.42 | 6.82 | 0.00 |
| 185.00 | 7.42 | 6.82 | 0.00 |
| 190.00 | 7.42 | 6.82 | 0.00 |
| 195.00 | 7.42 | 6.82 | 0.00 |
| 200.00 | 7.42 | 6.82 | 0.00 |
| 205.00 | 7.42 | 6.82 | 0.00 |
| 210.00 | 7.42 | 6.82 | 0.00 |
| 215.00 | 7.42 | 6.82 | 0.00 |
| 220.00 | 7.42 | 6.82 | 0.00 |
| 225.00 | 7.42 | 6.82 | 0.00 |
| 230.00 | 7.42 | 6.82 | 0.00 |
| 235.00 | 7.42 | 6.82 | 0.00 |
| 240.00 | 7.42 | 6.82 | 0.00 |

## Summary for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

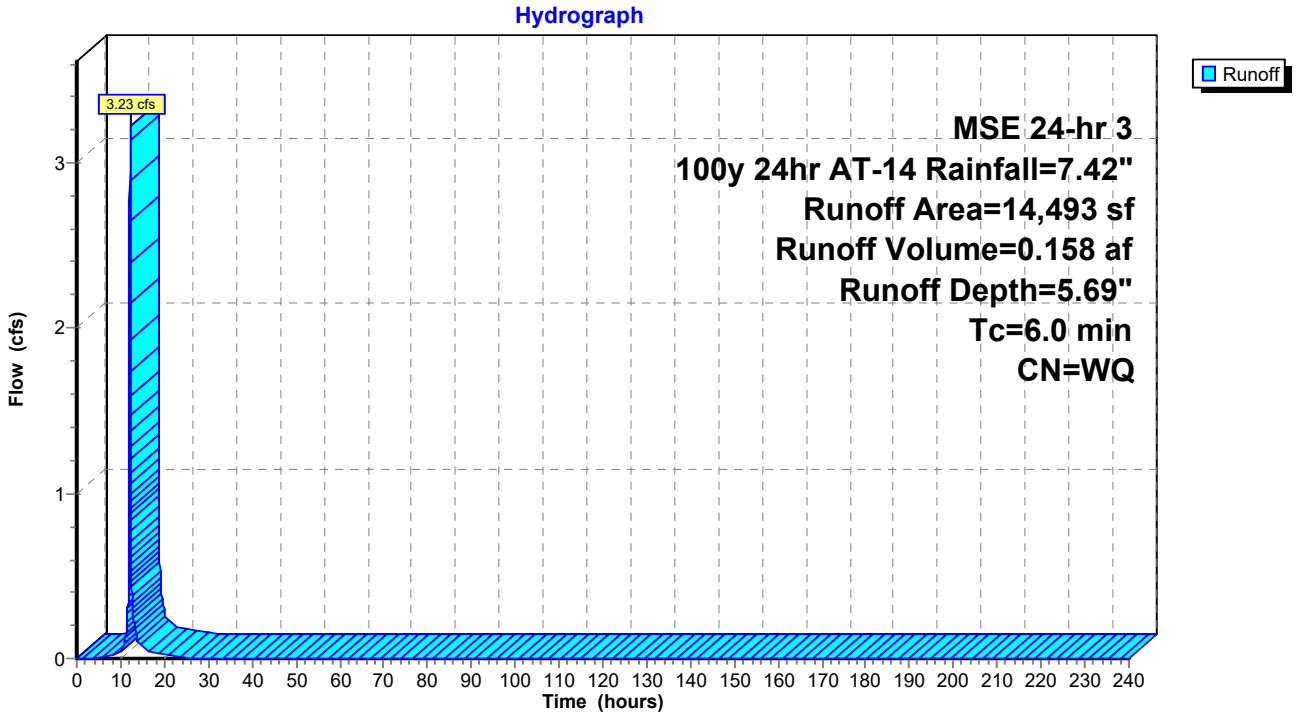
Runoff = 3.23 cfs @ 12.13 hrs, Volume= 0.158 af, Depth= 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.42"

| Area (sf) | CN | Description |
|---|---|---|
| 4,181 | 98 | Paved parking, HSG D |
| 10,312 | 80 | >75% Grass cover, Good, HSG D |
| 14,493 | | Weighted Average |
| 10,312 | | 71.15% Pervious Area |
| 4,181 | | 28.85% Impervious Area |

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

## Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED



## Hydrograph for Subcatchment PR1B: DRAINS SOUTH TO EX. STORM SEWER - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.28 | 0.00 | 0.01 |
| 10.00 | 1.02 | 0.18 | **0.04** |
| 15.00 | 6.66 | 4.92 | **0.08** |
| 20.00 | **7.23** | **5.47** | 0.03 |
| 25.00 | **7.42** | **5.65** | 0.00 |
| 30.00 | 7.42 | 5.65 | 0.00 |
| 35.00 | 7.42 | 5.65 | 0.00 |
| 40.00 | 7.42 | 5.65 | 0.00 |
| 45.00 | 7.42 | 5.65 | 0.00 |
| 50.00 | 7.42 | 5.65 | 0.00 |
| 55.00 | 7.42 | 5.65 | 0.00 |
| 60.00 | 7.42 | 5.65 | 0.00 |
| 65.00 | 7.42 | 5.65 | 0.00 |
| 70.00 | 7.42 | 5.65 | 0.00 |
| 75.00 | 7.42 | 5.65 | 0.00 |
| 80.00 | 7.42 | 5.65 | 0.00 |
| 85.00 | 7.42 | 5.65 | 0.00 |
| 90.00 | 7.42 | 5.65 | 0.00 |
| 95.00 | 7.42 | 5.65 | 0.00 |
| 100.00 | 7.42 | 5.65 | 0.00 |
| 105.00 | 7.42 | 5.65 | 0.00 |
| 110.00 | 7.42 | 5.65 | 0.00 |
| 115.00 | 7.42 | 5.65 | 0.00 |
| 120.00 | 7.42 | 5.65 | 0.00 |
| 125.00 | 7.42 | 5.65 | 0.00 |
| 130.00 | 7.42 | 5.65 | 0.00 |
| 135.00 | 7.42 | 5.65 | 0.00 |
| 140.00 | 7.42 | 5.65 | 0.00 |
| 145.00 | 7.42 | 5.65 | 0.00 |
| 150.00 | 7.42 | 5.65 | 0.00 |
| 155.00 | 7.42 | 5.65 | 0.00 |
| 160.00 | 7.42 | 5.65 | 0.00 |
| 165.00 | 7.42 | 5.65 | 0.00 |
| 170.00 | 7.42 | 5.65 | 0.00 |
| 175.00 | 7.42 | 5.65 | 0.00 |
| 180.00 | 7.42 | 5.65 | 0.00 |
| 185.00 | 7.42 | 5.65 | 0.00 |
| 190.00 | 7.42 | 5.65 | 0.00 |
| 195.00 | 7.42 | 5.65 | 0.00 |
| 200.00 | 7.42 | 5.65 | 0.00 |
| 205.00 | 7.42 | 5.65 | 0.00 |
| 210.00 | 7.42 | 5.65 | 0.00 |
| 215.00 | 7.42 | 5.65 | 0.00 |
| 220.00 | 7.42 | 5.65 | 0.00 |
| 225.00 | 7.42 | 5.65 | 0.00 |
| 230.00 | 7.42 | 5.65 | 0.00 |
| 235.00 | 7.42 | 5.65 | 0.00 |
| 240.00 | 7.42 | 5.65 | 0.00 |

## Summary for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

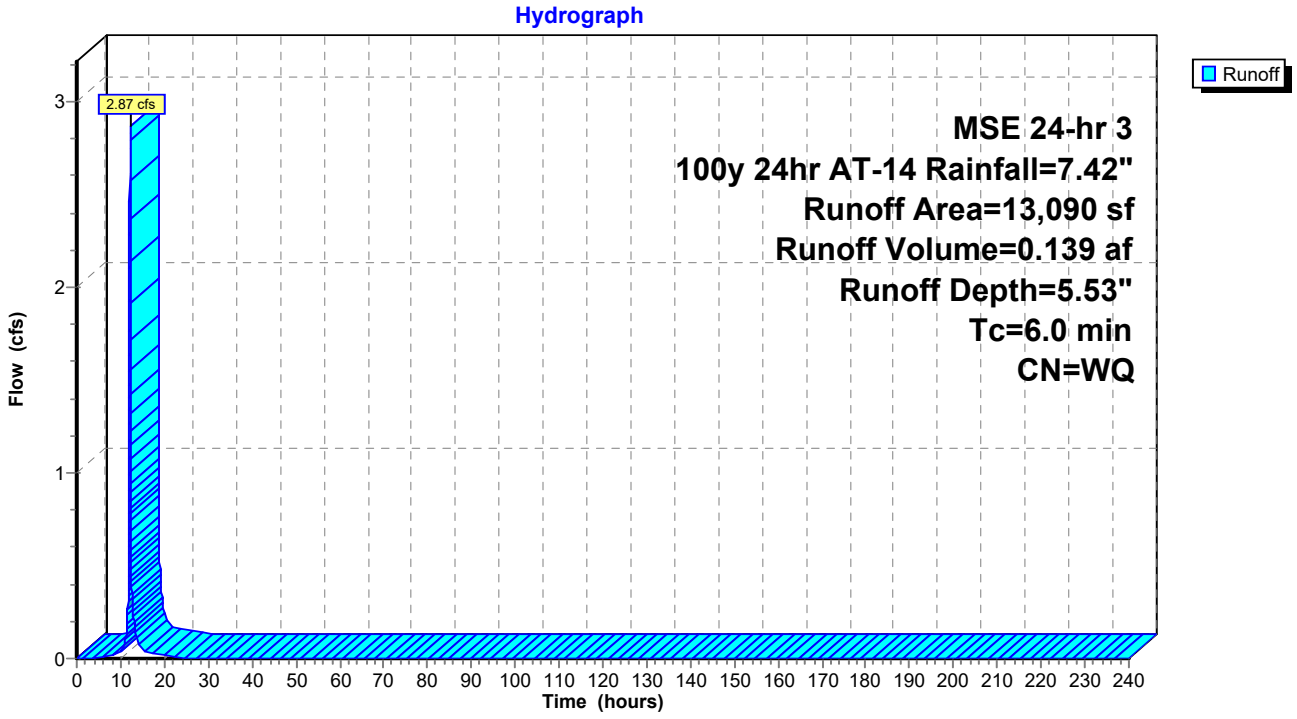
Runoff = 2.87 cfs @ 12.13 hrs, Volume= 0.139 af, Depth= 5.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.42"

| Area (sf) | CN | Description |
|---|---|---|
| 2,797 | 98 | Paved parking, HSG D |
| 10,293 | 80 | >75% Grass cover, Good, HSG D |
| 13,090 | | Weighted Average |
| 10,293 | | 78.63% Pervious Area |
| 2,797 | | 21.37% Impervious Area |

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

## Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED



## Hydrograph for Subcatchment PR2: DRAINS NORTH TO AMIRA APTS SITE - UNTREATED

| Time (hours) | Precip. (inches) | Excess (inches) | Runoff (cfs) |
|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 0.28 | 0.00 | 0.00 |
| 10.00 | 1.02 | 0.16 | **0.04** |
| 15.00 | 6.66 | 4.81 | **0.07** |
| 20.00 | **7.23** | **5.36** | 0.02 |
| 25.00 | **7.42** | **5.54** | 0.00 |
| 30.00 | 7.42 | 5.54 | 0.00 |
| 35.00 | 7.42 | 5.54 | 0.00 |
| 40.00 | 7.42 | 5.54 | 0.00 |
| 45.00 | 7.42 | 5.54 | 0.00 |
| 50.00 | 7.42 | 5.54 | 0.00 |
| 55.00 | 7.42 | 5.54 | 0.00 |
| 60.00 | 7.42 | 5.54 | 0.00 |
| 65.00 | 7.42 | 5.54 | 0.00 |
| 70.00 | 7.42 | 5.54 | 0.00 |
| 75.00 | 7.42 | 5.54 | 0.00 |
| 80.00 | 7.42 | 5.54 | 0.00 |
| 85.00 | 7.42 | 5.54 | 0.00 |
| 90.00 | 7.42 | 5.54 | 0.00 |
| 95.00 | 7.42 | 5.54 | 0.00 |
| 100.00 | 7.42 | 5.54 | 0.00 |
| 105.00 | 7.42 | 5.54 | 0.00 |
| 110.00 | 7.42 | 5.54 | 0.00 |
| 115.00 | 7.42 | 5.54 | 0.00 |
| 120.00 | 7.42 | 5.54 | 0.00 |
| 125.00 | 7.42 | 5.54 | 0.00 |
| 130.00 | 7.42 | 5.54 | 0.00 |
| 135.00 | 7.42 | 5.54 | 0.00 |
| 140.00 | 7.42 | 5.54 | 0.00 |
| 145.00 | 7.42 | 5.54 | 0.00 |
| 150.00 | 7.42 | 5.54 | 0.00 |
| 155.00 | 7.42 | 5.54 | 0.00 |
| 160.00 | 7.42 | 5.54 | 0.00 |
| 165.00 | 7.42 | 5.54 | 0.00 |
| 170.00 | 7.42 | 5.54 | 0.00 |
| 175.00 | 7.42 | 5.54 | 0.00 |
| 180.00 | 7.42 | 5.54 | 0.00 |
| 185.00 | 7.42 | 5.54 | 0.00 |
| 190.00 | 7.42 | 5.54 | 0.00 |
| 195.00 | 7.42 | 5.54 | 0.00 |
| 200.00 | 7.42 | 5.54 | 0.00 |
| 205.00 | 7.42 | 5.54 | 0.00 |
| 210.00 | 7.42 | 5.54 | 0.00 |
| 215.00 | 7.42 | 5.54 | 0.00 |
| 220.00 | 7.42 | 5.54 | 0.00 |
| 225.00 | 7.42 | 5.54 | 0.00 |
| 230.00 | 7.42 | 5.54 | 0.00 |
| 235.00 | 7.42 | 5.54 | 0.00 |
| 240.00 | 7.42 | 5.54 | 0.00 |

## Summary for Pond 1P: UNDERGROUND POND 1

Inflow Area = 1.687 ac, 83.48% Impervious, Inflow Depth = 6.83" for 100y 24hr AT-14 event
Inflow = 18.15 cfs @ 12.13 hrs, Volume= 0.961 af
Outflow = 11.30 cfs @ 12.20 hrs, Volume= 0.961 af, Atten= 38%, Lag= 4.0 min
Primary = 11.30 cfs @ 12.20 hrs, Volume= 0.961 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Starting Elev= 965.40' Surf.Area= 4,484 sf Storage= 7,467 cf
Peak Elev= 969.30' @ 12.20 hrs Surf.Area= 4,484 sf Storage= 18,187 cf (10,719 cf above start)

Plug-Flow detention time= 154.6 min calculated for 0.789 af (82% of inflow)
Center-of-Mass det. time= 54.7 min ( 801.0 - 746.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1A | 962.40' | 0 cf | **19.00'W x 236.00'L x 7.50'H Field A**<br>33,630 cf Overall - 18,242 cf Embedded = 15,388 cf x 0.0% Voids |
| #2A | 962.40' | 18,242 cf | **CMP Round 84** x 22 Inside #1<br>Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf<br>Overall Size= 84.0"W x 84.0"H x 20.00'L<br>22 Chambers in 2 Rows<br>17.00' Header x 38.48 sf x 2 = 1,308.5 cf Inside |
| | | 18,242 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 961.90' | **15.0" Round Culvert**<br>L= 103.0' RCP, mitered to conform to fill, Ke= 0.700<br>Inlet / Outlet Invert= 961.90' / 961.38' S= 0.0050 '/' Cc= 0.900<br>n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf |
| #2 | Device 1 | 965.40' | **5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #3 | Device 1 | 966.40' | **16.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |

**Primary OutFlow** Max=11.29 cfs @ 12.20 hrs HW=969.29' (Free Discharge)
└**1=Culvert** (Passes 11.29 cfs of 13.13 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.26 cfs @ 9.24 fps)
  └**3=Orifice/Grate** (Orifice Controls 10.03 cfs @ 7.18 fps)

## Pond 1P: UNDERGROUND POND 1 - Chamber Wizard Field A

**Chamber Model = CMP Round 84 (Round Corrugated Metal Pipe)**
Effective Size= 84.0"W x 84.0"H => 38.48 sf x 20.00'L = 769.7 cf
Overall Size= 84.0"W x 84.0"H x 20.00'L

84.0" Wide + 36.0" Spacing = 120.0" C-C Row Spacing

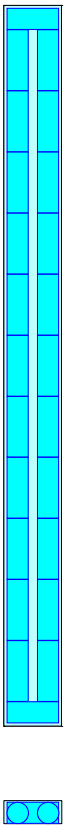
11 Chambers/Row x 20.00' Long +7.00' Header x 2 = 234.00' Row Length +12.0" End Stone x 2 = 236.00' Base Length
2 Rows x 84.0" Wide + 36.0" Spacing x 1 + 12.0" Side Stone x 2 = 19.00' Base Width
84.0" Chamber Height + 6.0" Stone Cover = 7.50' Field Height

22 Chambers x 769.7 cf + 17.00' Header x 38.48 sf x 2 = 18,241.7 cf Chamber Storage

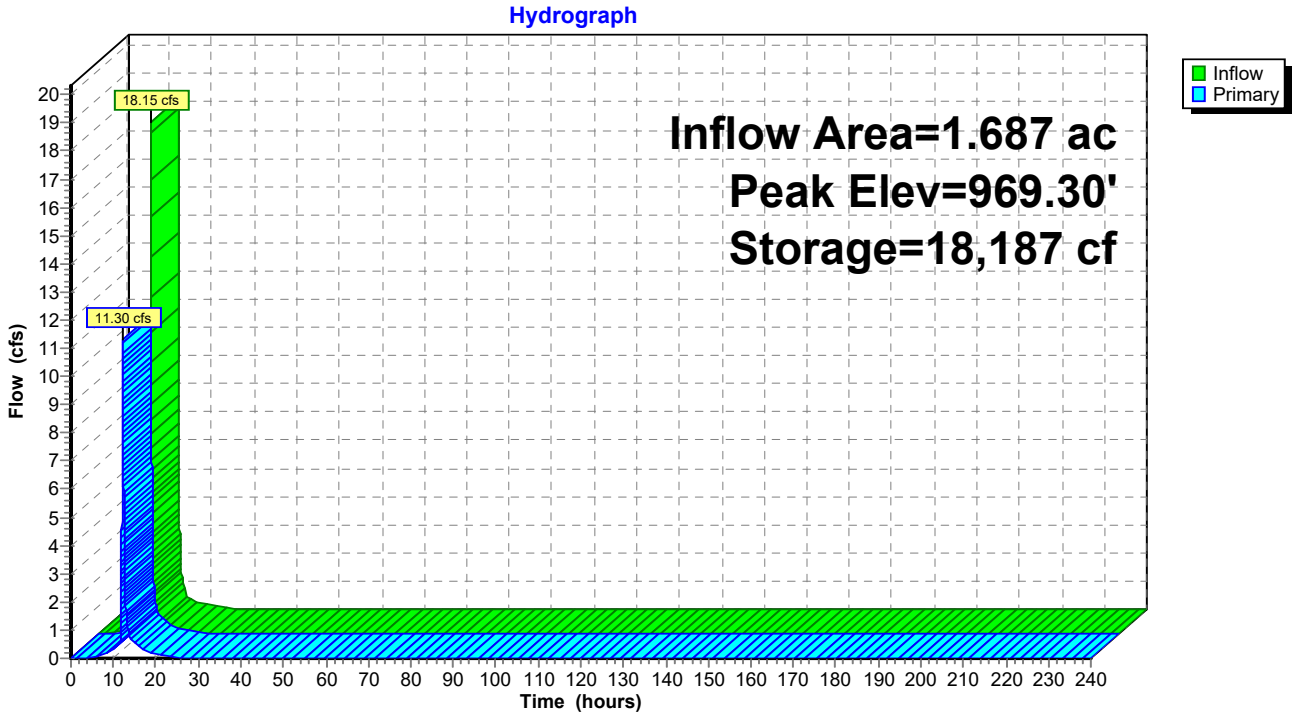
33,630.0 cf Field - 18,241.7 cf Chambers = 15,388.3 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 18,241.7 cf = 0.419 af
Overall Storage Efficiency = 54.2%
Overall System Size = 236.00' x 19.00' x 7.50'

22 Chambers
1,245.6 cy Field
569.9 cy Stone



## Pond 1P: UNDERGROUND POND 1



## Hydrograph for Pond 1P: UNDERGROUND POND 1

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | 0.00 | 7,467 | 965.40 | 0.00 |
| 5.00 | 0.10 | 7,918 | 965.54 | 0.05 |
| 10.00 | **0.39** | **8,808** | **965.81** | **0.29** |
| 15.00 | **0.40** | **10,518** | **966.32** | **0.55** |
| 20.00 | 0.13 | 8,343 | 965.67 | 0.16 |
| 25.00 | 0.00 | 7,818 | 965.51 | 0.03 |
| 30.00 | 0.00 | 7,580 | 965.43 | 0.01 |
| 35.00 | 0.00 | 7,519 | 965.42 | 0.00 |
| 40.00 | 0.00 | 7,503 | 965.41 | 0.00 |
| 45.00 | 0.00 | 7,497 | 965.41 | 0.00 |
| 50.00 | 0.00 | 7,493 | 965.41 | 0.00 |
| 55.00 | 0.00 | 7,489 | 965.41 | 0.00 |
| 60.00 | 0.00 | 7,486 | 965.41 | 0.00 |
| 65.00 | 0.00 | 7,483 | 965.40 | 0.00 |
| 70.00 | 0.00 | 7,481 | 965.40 | 0.00 |
| 75.00 | 0.00 | 7,479 | 965.40 | 0.00 |
| 80.00 | 0.00 | 7,477 | 965.40 | 0.00 |
| 85.00 | 0.00 | 7,476 | 965.40 | 0.00 |
| 90.00 | 0.00 | 7,475 | 965.40 | 0.00 |
| 95.00 | 0.00 | 7,473 | 965.40 | 0.00 |
| 100.00 | 0.00 | 7,473 | 965.40 | 0.00 |
| 105.00 | 0.00 | 7,472 | 965.40 | 0.00 |
| 110.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 115.00 | 0.00 | 7,471 | 965.40 | 0.00 |
| 120.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 125.00 | 0.00 | 7,470 | 965.40 | 0.00 |
| 130.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 135.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 140.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 145.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 150.00 | 0.00 | 7,469 | 965.40 | 0.00 |
| 155.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 160.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 165.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 170.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 175.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 180.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 185.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 190.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 195.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 200.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 205.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 210.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 215.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 220.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 225.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 230.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 235.00 | 0.00 | 7,468 | 965.40 | 0.00 |
| 240.00 | 0.00 | 7,468 | 965.40 | 0.00 |

## Stage-Area-Storage for Pond 1P: UNDERGROUND POND 1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---|---|---|---|---|---|
| 962.40 | 0 | 965.00 | 6,168 | 967.60 | 14,531 |
| 962.45 | 12 | 965.05 | 6,328 | 967.65 | 14,675 |
| 962.50 | 52 | 965.10 | 6,490 | 967.70 | 14,818 |
| 962.55 | 96 | 965.15 | 6,652 | 967.75 | 14,960 |
| 962.60 | 148 | 965.20 | 6,814 | 967.80 | 15,100 |
| 962.65 | 207 | 965.25 | 6,977 | 967.85 | 15,239 |
| 962.70 | 271 | 965.30 | 7,140 | 967.90 | 15,376 |
| 962.75 | 341 | 965.35 | 7,303 | 967.95 | 15,511 |
| 962.80 | 416 | 965.40 | 7,467 | 968.00 | 15,644 |
| 962.85 | 495 | 965.45 | 7,632 | 968.05 | 15,776 |
| 962.90 | 578 | 965.50 | 7,797 | 968.10 | 15,906 |
| 962.95 | 666 | 965.55 | 7,961 | 968.15 | 16,034 |
| 963.00 | 757 | 965.60 | 8,127 | 968.20 | 16,160 |
| 963.05 | 851 | 965.65 | 8,292 | 968.25 | 16,284 |
| 963.10 | 949 | 965.70 | 8,458 | 968.30 | 16,406 |
| 963.15 | 1,050 | 965.75 | 8,623 | 968.35 | 16,526 |
| 963.20 | 1,155 | 965.80 | 8,789 | 968.40 | 16,643 |
| 963.25 | 1,262 | 965.85 | 8,955 | 968.45 | 16,758 |
| 963.30 | 1,371 | 965.90 | 9,121 | 968.50 | 16,870 |
| 963.35 | 1,484 | 965.95 | 9,287 | 968.55 | 16,980 |
| 963.40 | 1,599 | 966.00 | 9,453 | 968.60 | 17,087 |
| 963.45 | 1,716 | 966.05 | 9,618 | 968.65 | 17,191 |
| 963.50 | 1,835 | 966.10 | 9,784 | 968.70 | 17,292 |
| 963.55 | 1,957 | 966.15 | 9,950 | 968.75 | 17,390 |
| 963.60 | 2,081 | 966.20 | 10,115 | 968.80 | 17,485 |
| 963.65 | 2,207 | 966.25 | 10,280 | 968.85 | 17,576 |
| 963.70 | 2,335 | 966.30 | 10,445 | 968.90 | 17,663 |
| 963.75 | 2,465 | 966.35 | 10,610 | 968.95 | 17,747 |
| 963.80 | 2,597 | 966.40 | 10,774 | 969.00 | 17,826 |
| 963.85 | 2,731 | 966.45 | 10,938 | 969.05 | 17,901 |
| 963.90 | 2,866 | 966.50 | 11,102 | 969.10 | 17,970 |
| 963.95 | 3,003 | 966.55 | 11,265 | 969.15 | 18,035 |
| 964.00 | 3,142 | 966.60 | 11,428 | 969.20 | 18,093 |
| 964.05 | 3,282 | 966.65 | 11,590 | 969.25 | 18,145 |
| 964.10 | 3,423 | 966.70 | 11,752 | 969.30 | 18,189 |
| 964.15 | 3,566 | 966.75 | 11,913 | 969.35 | 18,222 |
| 964.20 | 3,711 | 966.80 | 12,074 | 969.40 | **18,242** |
| 964.25 | 3,856 | 966.85 | 12,234 | 969.45 | 18,242 |
| 964.30 | 4,003 | 966.90 | 12,393 | 969.50 | 18,242 |
| 964.35 | 4,151 | 966.95 | 12,552 | 969.55 | 18,242 |
| 964.40 | 4,301 | 967.00 | 12,710 | 969.60 | 18,242 |
| 964.45 | 4,451 | 967.05 | 12,867 | 969.65 | 18,242 |
| 964.50 | 4,603 | 967.10 | 13,023 | 969.70 | 18,242 |
| 964.55 | 4,755 | 967.15 | 13,178 | 969.75 | 18,242 |
| 964.60 | 4,909 | 967.20 | 13,333 | 969.80 | 18,242 |
| 964.65 | 5,063 | 967.25 | 13,486 | 969.85 | 18,242 |
| 964.70 | 5,219 | 967.30 | 13,639 | 969.90 | 18,242 |
| 964.75 | 5,375 | 967.35 | 13,791 | | |
| 964.80 | 5,532 | 967.40 | 13,941 | | |
| 964.85 | 5,690 | 967.45 | 14,090 | | |
| 964.90 | 5,849 | 967.50 | 14,238 | | |
| 964.95 | 6,008 | 967.55 | 14,385 | | |