PLANNING
ENGINEERING
IMPLEMENTATION

February 04, 2023

City of Lee's Summit
220 SE Green St
Lee's Summit, MO 64063

Re: Westlake Hardware
Lot 2, Market Street Center
Final Stormwater Management Plan

Phelps Engineering, Inc. is pleased to submit this Final Stormwater Management Plan for the above referenced project. The proposed project includes a new Westlake Hardware store constructed on Lot 2, Market Street Center.

Future development on Lot 2, Market Street Center was previously approved as part of the Final Stormwater Management Plan titled "Market Street Center Lot 1, Lot 2, and Tract A" dated April 6, 2022, by Phelps Engineering, Inc. The previously approved Final Stormwater Management Plan is attached to this report for reference.

As part of the previously approved Final Stormwater Management Plan, Lot 2 was assumed to be developed with 1.78 acres of impervious area. The proposed Westlake Hardware development results in 1.64 acres of impervious area.

As part of the previously approved Final Stormwater Management Plan, all of the impervious area from Lot 2 was assumed to discharge into the existing detention basin on Tract A. The proposed Westlake Hardware development will route all of the impervious area into the existing detention basin on Tract A.

The proposed development of Lot 2, Market Street Center, as part of the Westlake Hardware project, is in full compliance with the previously approved Final Stormwater Management Plan titled "Market Street Center Lot 1, Lot 2, and Tract A" dated April 6, 2022, by Phelps Engineering, Inc. Therefore, no additional analysis is required.

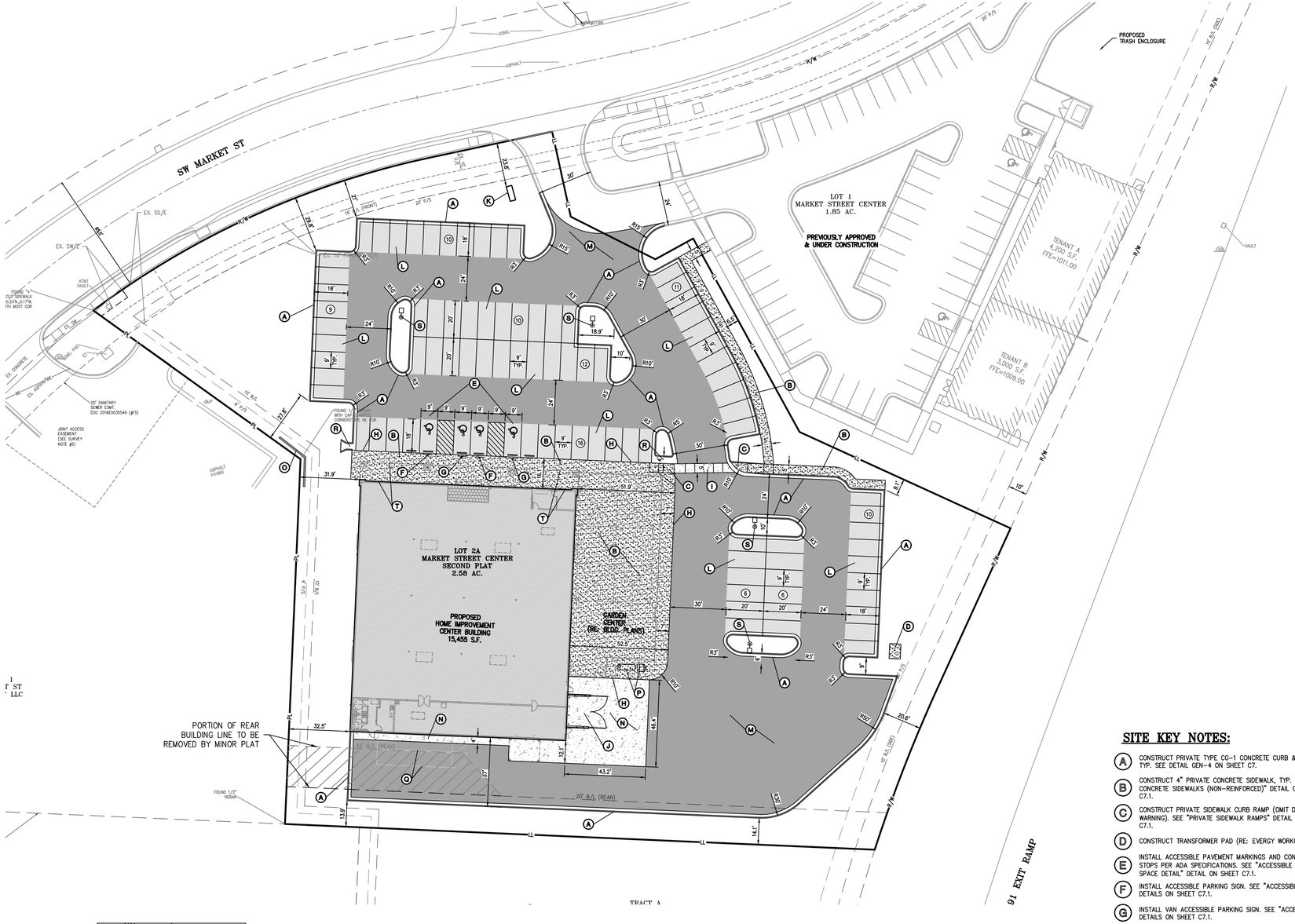
Conclusion

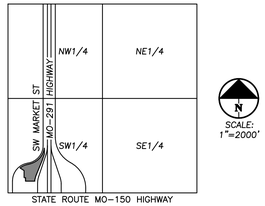
This completes Phelps Engineering's submittal of the Final Stormwater Management Plan for the Westlake Hardware development on Lot 2, Market Street Center. Please feel free to contact PEI at (913) 393-1155 if you require additional information.

Sincerely,

Judd D. Claussen, P.E.

Phelps Engineering Inc.





VICINITY MAP
SEC. 29-47-31

LEGEND

- PL — PROPERTY LINE
- LL — LOT LINE
- R/W — RIGHT-OF-WAY
- 2' CURB & GUTTER
- 6" CURB
- B/L — BUILDING SETBACK LINE
- P/S — PARKING SETBACK LINE
- HEAVY DUTY ASPHALT PAVEMENT
- STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED BUILDING
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK

BUILDING & LOT DATA

Zoning	CP-2
Lot 2A	
Site Area	2.58 Ac.
Retail Building	
No. of Stories	1 Story
Building S.F.	15,455 S.F.
Building Footprint	15,455 S.F.
FAR / Building Coverage	0.1374
Impervious Area	1.64 Ac. (64%)
Open Space	0.94 Ac. (36%)

PARKING SUMMARY

Lot 2A	
Parking Required:	
Retail Sales (5 / 1,000 S.F.)	
Total Required Parking	78 Spaces
Parking Provided	
Standard Parking Provided	86 Spaces
Accessible Parking Spaces Provided	4 Spaces
Total Provided Parking	90 Spaces
Parking Lot, Aisles, and Drives Area	48,292 SF
Parking Lot Landscape Islands, Strips, Planting Areas	32,538 SF (67%)

UTILITY NOTES:
VISUAL INDICATIONS OF UTILITIES ARE AS SHOWN. UNDERGROUND LOCATIONS SHOWN, AS FURNISHED BY THEIR LESSORS, ARE APPROXIMATE AND SHOULD BE VERIFIED IN THE FIELD AT THE TIME OF CONSTRUCTION. FOR ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES CALL 811.

811 Know what's below. Call before you dig.

LEGAL DESCRIPTION:

LOT 2A, MARKET STREET CENTER SECOND PLAT, A PLATTED SUBDIVISION OF LAND IN THE CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI.

AREA = ±2.58 ACRES / ± 112,481 SQ.FT.

SITE PLAN NOTES:

1. All construction materials and procedures on this project shall conform to the latest revision of the following governing requirements, incorporated herein by reference:
A) City ordinances & O.S.H.A. Regulations.
B) The City of Lee's Summit Technical Specifications and Municipal Code.

2. The contractor shall have one (1) signed copy of the plans (approved by the City) and one (1) copy of the appropriate Design and Construction Standards and Specifications at the job site at all times.

3. The contractor will be responsible for securing all permits, bonds and insurance required by the contract documents, City of Lee's Summit, Missouri, and all other governing agencies (including local, county, state and federal authorities) having jurisdiction over the work proposed by these construction documents. The cost for all permits, bonds and insurance shall be the contractors responsibility and shall be included in the bid for the work.

4. The contractor is responsible for coordination of his and his sub-contractor's work. The contractor shall assume all responsibility for protecting and maintaining his work during the construction period and between the various trades/sub-contractors constructing the work.

5. The demolition and removal(or relocation) of existing pavement, curbs, structures, utilities, and all other features necessary to construct the proposed improvements, shall be performed by the contractor. All waste material removed during construction shall be disposed off the project site. The contractor shall be responsible for all permits for hauling and disposing of waste material. The disposal of waste material shall be in accordance with all local, state and federal regulations.

6. Contractor shall be responsible for all relocations, including but not limited to, all utilities, storm drainage, sanitary sewer services, signs, traffic signals & poles, etc. as required. All work shall be in accordance with governing authorities specifications and shall be approved by such. All cost shall be included in base bid.

7. All existing utilities indicated on the drawings are according to the best information available to the Engineer; however, all utilities actually existing may not be shown. The contractor shall be responsible for contacting all utility companies for an exact field location of each utility prior to any construction. All underground utilities shall be protected at the contractor's expense. All utilities, shown and unshown, damaged through the negligence of the contractor shall be repaired or replaced by the contractor at his expense.

8. The contractor will be responsible for all damage to existing utilities, pavement, fences, structures and other features not designated for removal. The contractor shall repair all damages at his expense.

9. The contractor shall verify the flow lines of all existing storm or sanitary sewer connections and utility crossings prior to the start of construction. Notify the engineer of any discrepancies.

10. SAFETY NOTICE TO CONTRACTOR: In accordance with generally accepted construction practices, the contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. Any construction observation by the engineer of the contractor's performance is not intended to include review of the adequacy of the contractor's safety measures, in, on or near the construction site.

11. Refer to the building plans for site lighting electrical requirements, including conduits, pole bases, pull boxes, etc.

SITE DIMENSION NOTES:

1. BUILDING TIES SHOWN ARE TO THE OUTSIDE FACE OF PROPOSED WALLS. THE SUBCONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR SPECIFIC DIMENSIONS AND LAYOUT INFORMATION FOR THE BUILDINGS.

2. ALL DIMENSIONS SHOWN FOR THE PARKING LOT AND CURBS ARE MEASURED FORM BACK OF CURB TO BACK OF CURB.

PAVEMENT MARKING AND SIGNAGE NOTES:

1. PARKING STALL MARKING STRIPES SHALL BE FOUR INCH (4") WIDE WHITE STRIPES. DIRECTIONAL ARROW AND HANDICAP STALL MARKINGS SHALL BE FURNISHED AT LOCATIONS SHOWN ON PLANS.

2. HANDICAP PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO ALL FEDERAL (AMERICANS WITH DISABILITIES ACT) AND STATE LAWS AND REGULATIONS.

3. TRAFFIC CONTROL DEVICES AND PAVEMENT MARKINGS SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

4. STOP SIGNS SHALL BE PROVIDED AT ALL LOCATIONS AS SHOWN ON PLANS AND SHALL CONFORM TO THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES". SIGNS SHALL BE 18" X 12", 18 GAUGE STEEL AND SHALL BE ENGINEER GRADE REFLECTIVE.

5. TRAFFIC CONTROL AND PAVEMENT MARKINGS SHALL BE PAINTED WITH A WHITE SHERWIN WILLIAMS S-W TRAFFIC MARKING SERIES B-29Y2 OR APPROVED EQUAL. THE PAVEMENT MARKING SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. APPLY ON A CLEAN, DRY SURFACE AND AT A SURFACE TEMPERATURE OF NOT LESS THAN 70°F AND THE AMBIENT AIR TEMPERATURE SHALL NOT BE LESS THAN 60°F AND RISING. TWO COATS SHALL BE APPLIED.

ZONING:

THIS PROPERTY IS ZONED CP-2, DEFINED AS PLANNED COMMUNITY COMMERCIAL DISTRICT.

OIL-GAS WELLS:

ACCORDING TO THE MISSOURI DEPARTMENT OF NATURAL RESOURCES STATE OIL & GAS COUNCIL WELLS, LOCATED AT www.dnr.mo.gov/geology/geosrv/oilandgas.htm, THERE ARE NO OIL OR GAS WELLS ON THE PROPERTY SHOWN HEREON.

PRE-CONSTRUCTION MEETING NOTE:

THE CONTRACTOR SHALL CONTACT THE CITY'S DEVELOPMENT SERVICES ENGINEERING INSPECTION TO SCHEDULE A PRE-CONSTRUCTION MEETING WITH A FIELD ENGINEERING INSPECTOR PRIOR TO ANY LAND DISTURBANCE WORK AT (816) 969-1200.

FIRE ACCESS ROAD NOTE:

ALL FIRE ACCESS LANES SHALL BE HEAVY DUTY ASPHALT CAPABLE OF SUPPORTING 75,000-POUNDS.

SITE KEY NOTES:

- (A) CONSTRUCT PRIVATE TYPE CG-1 CONCRETE CURB & GUTTER, TYP. SEE DETAIL GEN-4 ON SHEET C7.
- (B) CONSTRUCT 4" PRIVATE CONCRETE SIDEWALK, TYP. SEE "PRIVATE CONCRETE SIDEWALKS (NON-REINFORCED)" DETAIL ON SHEET C7.1.
- (C) CONSTRUCT PRIVATE SIDEWALK CURB RAMP (OMIT DETECTABLE WARNING). SEE "PRIVATE SIDEWALK RAMPS" DETAIL ON SHEET C7.1.
- (D) CONSTRUCT TRANSFORMER PAD (RE: EVERGY WORKORDER).
- (E) INSTALL ACCESSIBLE PAVEMENT MARKINGS AND CONCRETE WHEEL STOPS PER ADA SPECIFICATIONS. SEE "ACCESSIBLE PARKING SPACE DETAIL" DETAIL ON SHEET C7.1.
- (F) INSTALL ACCESSIBLE PARKING SIGN. SEE "ACCESSIBLE SIGN" DETAILS ON SHEET C7.1.
- (G) INSTALL VAN ACCESSIBLE PARKING SIGN. SEE "ACCESSIBLE SIGN" DETAILS ON SHEET C7.1.
- (H) CONSTRUCT PRIVATE TURN DOWN SIDEWALK AT ALL LOCATIONS WHERE SIDEWALK IS ADJACENT TO PAVED AREA. SEE "TURN DOWN SIDEWALK DETAIL" ON SHEET C7. SEE GRADING PLAN FOR SIDEWALK AND PAVEMENT ELEVATIONS.
- (I) INSTALL SCORED CONCRETED CROSSWALK. SEE "CROSSWALK DETAIL" ON SHEET C7.1,
- (J) INSTALL TRASH ENCLOSURE (RE: ARCH PLANS).
- (K) INSTALL MONUMENT SIGN (RE: ARCH PLANS).
- (L) INSTALL STANDARD ASPHALT PAVEMENT. SEE "STANDARD ASPHALT PAVING" DETAIL ON SHEET C7.
- (M) INSTALL HEAVY DUTY ASPHALT PAVEMENT. SEE "HEAVY DUTY ASPHALT PAVING" DETAIL ON SHEET C7.
- (N) INSTALL CONCRETE PAVEMENT. SEE "CONCRETE PAVING" DETAIL ON SHEET C7.
- (O) INSTALL LANDSCAPE RETAINING WALL. SEE "LANDSCAPE RETAINING WALL" DETAIL ON SHEET C7.2.
- (P) PROPOSED PROPANE TANK AND FILLING AREA (RE: BUILDING PLANS)
- (Q) PROPOSED CONTAINER STORAGE (RE: BUILDING PLANS)
- (R) CONSTRUCT CONCRETE FLUME. SEE "CONCRETE FLUME" DETAIL ON SHEET C7.
- (S) PROPOSED PARKING LOT LIGHT POLE (RE: MEP PLANS).
- (T) CONSTRUCT 6" PRIVATE CONCRETE SIDEWALK UNDER FRONT CANOPY, TYP. SEE "PRIVATE CONCRETE SIDEWALKS (NON-REINFORCED)" DETAIL ON SHEET C7.1.

N

SCALE: 1"=20'
0' 20' 40'

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STATE OF MISSOURI
JUDD DAVID CLAUSSEN
NUMBER PE-39850
02/04/23
PROFESSIONAL ENGINEER

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

data
drawn by
checked by
revisions △

SITE PLAN

sheet number
C1

drawing type
PDP

project number
22185

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Final Stormwater Management Plan

Market Street Center
Lot 1, Lot 2, and Tract A

M291 and SW Market Street
Lee's Summit, Missouri

Prepared by:

PLANNING
ENGINEERING
IMPLEMENTATION

PHELPS ENGINEERING, INC
1270 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
Fax (913) 393-1166
www.phelpsengineering.com

Developer: Foresight Real Estate Services, LLC
105 N. Stewart Ct, Suite 225
Liberty, MO 64068

PEI #210639
April 6, 2022

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A. Site Soil Conditions

- NRCS Web Soil Survey

B. Existing Hydraulic Model

- Existing Drainage Map A1
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C. Proposed Hydraulic Model

- Proposed Drainage Map A1
- WQV Calculation
- Proposed Detention Basin Details
- Proposed HydroCAD Model

D. Previously Approved Reports

- Walmart Supercenter No. 4590-01 Final Stormwater Report
- Firestone Complete Auto Care Final Stormwater Report

1. EXECUTIVE SUMMARY

This report is a final stormwater management plan for the proposed Market Street Center development prepared by Phelps Engineering, Inc.

The proposed site is bounded by SW Market Street to the north, Missouri Highway 291 to the east, an existing commercial development to the west, and an existing commercial development to the south. The proposed development is approximately 5.03 acres and consists of 1 commercial building and parking lot. The existing site consists of undeveloped open space.

The property lies within Zone X, defined as areas determined to be outside the 0.2% annual chance floodplain, as shown on the flood insurance rate map prepared by the Federal Emergency Management Agency for the City of Lee's Summit, Community No. 290172, Jackson County, Missouri, Map No. 29095C0291G, and dated January 20, 2017.

See the Vicinity Map below.

2. SITE SOIL CONDITIONS

Soils data for the property was determined using the NRCS Web Soil Survey for Jackson County. The property consists of Arisburg-Urban land complex, Udarents-Urban land-Sampsel complex, Arisburg silt loam, and Sampsel silty clay loam, which designates the site as Type C Hydrologic Soil Group (HSG). The site watershed soil properties and the Existing Drainage Map can be found in Appendix A of this report.

3. STORMWATER DETENTION AND BMP REQUIREMENTS

Stormwater design criteria are in accordance with City of Lee's, Missouri Technical Specifications and Design Criteria.

Stormwater detention and BMPs shall be provided per APWA 5608.4.C.1, comprehensive control measures, as follows:

- Post-development peak discharge rates from the site shall not exceed those indicated below:
  - 50% storm peak rate less than or equal to 0.5 cfs per site acre
  - 10% storm peak rate less than or equal to 2.0 cfs per site acre
  - 1% storm peak rate less than or equal to 3.0 cfs per site acre

- 40-hour extended detention of runoff from the local 90% mean annual event (1.37"/24-hour rainfall).

4. EXISTING SITE CONDITIONS

The existing site consists of undeveloped open space. See Appendix B for the existing drainage map. The existing site drainage patterns are as follows:

- A portion of the site surface drains easterly directly to the MODOT Highway 291 right of way where it is captured and conveyed southerly via the existing right of way drainage ditch.

- A portion of the site surface drains southerly to an existing swale along the southern property line. The existing swale conveys stormwater easterly to the MODOT Highway 291 right of way where it is captured and conveyed southerly via the existing right of way drainage ditch.

- The remainder of the site drainage is conveyed via an existing drainage ditch flowing southeasterly through the site. The existing drainage ditch provides existing detention via a berm and 12" outlet pipe. The 12" outlet

pipe discharges directly to the MODOT Highway 291 right of way at the southeast corner of the site.

All runoff from the existing site is routed to the existing MODOT Highway 291 right of way drainage ditch which conveys stormwater southerly away from the site. This results in a single point of interest for the site detention analysis located at the southeast corner of the site within the MODOT drainage ditch.

5. EXISTING OFF-SITE RUNON

There are three point discharges from off-site drainage areas that shall be routed through the site. See Appendix B for the existing drainage map. The existing off-site drainage areas are as follows:

- An existing 36” storm sewer conveys stormwater from a portion of the Market Street right of way and existing commercial development located west of Market Street to the southwest corner of the site. The existing 36” storm sewer outlets into the existing ditch which runs along the southern edge of the existing site and discharges to the MODOT Highway 291 right of way. The tributary area for the existing 36” storm sewer is as follows:
    - 4.20 acres of exiting commercial development with no upstream detention.
- An existing 12” storm sewer conveys stormwater from a portion of the Firestone Complete Auto Care property to the west edge of the site. The existing 12” storm sewer outlets into the existing ditch which runs along the western and southern edge of the existing site and discharges to the MODOT Highway 291 right of way. The tributary area for the existing 12” storm sewer is as follows:
    - 1.02 acres from the Firestone Complete Auto Care property which is routed through the existing Firestone Complete Auto Care detention basin.
- An existing 48” storm sewer conveys stormwater from a portion of the Market Street right of way, a portion of the Walmart property, and a portion of the Firestone Complete Auto Care property to the north edge of the site. The existing 48” storm sewer outlets into the existing ditch which runs southeast through the site and acts as existing detention and discharges to the MODOT Highway 291 right of way. The tributary area for the existing 48” storm sewer is as follows:

- 12.23 acres from the Walmart property which is routed through existing Walmart detention basin #1.

- 0.54 acres from the Walmart property which bypasses existing Walmart detention basin #1 and is released directly into the Market Street right of way.

- 0.22 acres of runoff from the Firestone Complete Auto Care which bypasses the existing Firestone Complete Auto Care detention basin and is released directly into the Market Street right of way.

- 1.50 acres of runoff from the existing Market Street right of way.

6. EXISTING HYDRAULIC ANALYSIS

The existing conditions of the site and the existing off-site runon were analyzed using HydroCAD to determine the existing runoff at point of interest #1. The drainage areas, CNs, times of concentration, detention basin stage/storage, and detention system outlets for the existing Walmart and Firestone Complete Auto Care properties were taken directly from their approved final stormwater reports which have been included in Appendix D of this report. As-built conditions were used for the Firestone Complete Auto Care detention basin and outlet structure.

For all other areas, composite CNs were determined using SCS TR-55 methods. A minimum time of concentration of 5 minutes was utilized for all other drainage areas. The SCS Type II 24 hour duration storm event was utilized for the stormwater analysis.

The existing drainage characteristics and composite curve numbers are shown in Table 1 below. See Appendix B for the Existing Drainage Map.

Table 1 – Existing Runoff Conditions

Drainage Sub-Basin	Total (acres)	Composite CN	Time of Conc. (min)
Ex Onsite Bypass	4.53	74	5.0
Ex. Onsite Detention	0.50	74	5.0
Walmart Bypass	0.54	84	5.0
Walmart Detention	12.23	82	24.9
Firestone Bypass	0.22	88	5.0
Firestone Detention	1.02	88	5.0
Market Street RW	1.50	94	5.0
West Commercial Plus RW	4.20	94	5.0

Using HydroCAD, the existing 2-year, 10-year, and 100-year peak discharges were determined at point of interest #1 and are shown below. See Appendix B for existing HydroCAD calculations.

Table 2 – Existing Hydraulic Results

Storm Event	Point of Interest #1 Peak Discharge (cfs)
2-Year	37.66
10-Year	61.80
100-Year	94.73

7. PROPOSED CONDITIONS

The proposed development consists of a single proposed office building and parking lot, resulting in 0.75 acres of impervious area. A future development is planned on Lot 2. This development was assumed to consist of 1.78 acres of future impervious area and was included in this analysis.

The proposed development will capture and route stormwater via a new private underground enclosed storm sewer system. Stormwater runoff will be routed to a proposed detention basin at the southern extent of the site. The proposed detention basin will discharge to the existing MODOT Highway 291 right of way ditch at the southeast corner of the site, matching the existing conditions. The three point discharges from off-site drainage areas will be routed through the

proposed detention basin and treated as “pass through” drainage for the analysis.

A total of 4.05 acres of runoff from the site will be routed to the detention basin. This includes all proposed and future impervious area. A total of 0.83 acres of runoff from the northern, eastern, and southern perimeter of the site will “free release” directly off the site to the existing MODOT Highway 291 right of way ditch. The “free release” area consists entirely of pervious area. A waiver to the Design and Construction Manual shall be submitted for this area.

See Appendix C of this report for Proposed Drainage Map.

8. PROPOSED STORMWATER TREATMENT DESIGN

Stormwater BMPs shall be provided per APWA 5608.4.C.1, comprehensive control measures, as follows:

- 40-hour extended detention of runoff from the local 90% mean annual event (1.37”/24-hour rainfall).

The proposed detention basin will capture and treat 4.05 acres of runoff from the site. This will be accomplished by holding and releasing the water quality volume of a minimum of 40-hours.

The required water quality volume (WQv) is calculated below:

WQv (inches) = P * Rv

P = Rainfall event in inches = 1.37 inches

Rv = Volumetric runoff coefficient = 0.05 + 0.009*(I)

I = Percent site impervious (%)

Treatment Drainage Area	4.05 acres
Impervious Area	2.33 acres (57.5%)

WQv = 1.37 * (0.05 + 0.009 * 57.5) = 0.78 in

WQv = 0.78 in. * 4.05 acres * 43,560 / 12 = 11,467 cf

The proposed detention basin stage storage data is shown below. The proposed detention basin provides storage for the water quality volume at an elevation of 998.50. At this elevation, the proposed detention bas has a total storage volume equal to 11,814 cf.

Table 3 – Proposed Detention Basin Stage/Storage

Elevation	Surface Area (sf)	Storage Volume (cf)
996	0	0
997	5,095	2,548
998	6,517	8,354
999	8,135	15,680
1,000	9,810	24,652
1,001	11,528	35,321
1,002	13,346	47,758
1,003	14,829	61,846

The water quality volume will be released over 40 hours by utilizing a 1.5” orifice. A 4” perforated riser will be installed at the low point in the detention basin. A 4” outlet pipe will run from the perforated riser to the outlet control area inlet. A 4” end cap with a 1.5” drilled orifice opening will be installed on the 4” outlet pipe inside the outlet control area inlet. There will no additional openings in the outlet control area inlet below elevation 998.50. See Appendix C for the water quality volume 40 hour drawdown orifice sizing calculation.

9. PROPOSED HYDRAULIC DESIGN

The proposed conditions of the site and the existing off-site runon were analyzed using HydroCAD to determine the proposed runoff at point of interest #1. The proposed drainage characteristics and composite curve numbers are shown in Table 1 below. See Appendix C for the Proposed Drainage Map.

Table 4 – Proposed Runoff Conditions

Drainage Sub-Basin	Total (acres)	Composite CN	Time of Conc. (min)
Pro. Onsite Bypass	0.98	74	5.0
Pro. Onsite Detention	4.05	88	5.0
Walmart Bypass	0.54	84	5.0
Walmart Detention	12.23	82	24.9
Firestone Bypass	0.22	88	5.0
Firestone Detention	1.02	88	5.0
Market Street RW	1.50	94	5.0
West Commercial Plus RW	4.20	94	5.0

The proposed outlet control area inlet consists of the following orifice openings:

Elevation	Opening
• 995.50	1.5” diameter on 4” storm drain
• 998.50	140” x 6”
• 1000.00	92” x 6”
• 1000.90	64” x 6”

A 48” outlet pipe will convey discharge from the outlet control area inlet to the discharge point at the southeast corner of the site. See Appendix C for proposed outlet structure details.

Using HydroCAD, the proposed 2-year, 10-year, and 100-year detention basin results and site peak discharges at point of interest #1 were determined. See Table 5 below. See Appendix C for existing HydroCAD calculations.

Table 5 – Proposed Hydraulic Results

	Onsite Detention Inflow (cfs)	Offsite Detention Inflow (cfs) “Pass Thru”	Total Detention Inflow (cfs)	Detention Outflow (cfs)	WSEL (ft.)	Storage (cf)	POI #1 Peak Discharge (cfs)
2-Year	16.54	30.21	46.75	32.14	1,000.04	25,005	33.87
10-Year	27.90	47.97	75.87	55.99	1,000.90	34,128	59.80
100-Year	42.91	73.73	116.64	85.81	1,001.95	47,045	92.26

10. DETENTION RESULTS

Existing vs Proposed Results

The proposed design results in a decrease in flow at point of interest #1 for the 2-year, 10-year and 100-year events as shown below.

Table 6 – POI #1 Existing vs Proposed

	Existing Peak Discharge (cfs)	Proposed Peak Discharge (cfs)
2-Year	37.66	33.87
10-Year	61.80	59.80
100-Year	94.73	92.26

APWA 5608.4.C.1 Comprehensive Control Results

The proposed design results in peak discharge rates from the basin less than the maximum allowable per APWA 5608.4.C.1, comprehensive control measures as shown below.

Table 7 – APWA Release Rates Summary

	Site Area[1] (acre)	Allowable Peak Rate (cfs/acre)	Allowable Peak Discharge (cfs)	Detention Outflow (cfs)	Offsite Detention Inflow (cfs) "Pass Thru"	Detention Outflow Attributed to Site (cfs)
2-Year	4.05	0.5	***2.03***	32.14	30.21	***1.93***
10-Year	4.05	2.0	***8.10***	55.99	47.97	***8.02***
100-Year	4.05	3.0	***12.15***	85.81	73.73	***12.08***

[1] – Site area excludes the proposed "free release" area.

11. CONCLUSION

The proposed design meets the requirements of the City of Lee's Summit, Missouri and APWA 5600.

This report and attached appendices complete Phelps Engineering Inc.'s submittal of the Final Stormwater Management Plan for Market Street Center. Please feel free to contact PEI at (913) 393-1155 if you require additional information.

Sincerely,

PHELPS ENGINEERING, INC.

Judd D. Claussen, P.E.

Enclosures

APPENDIX A

A. Site Soil Conditions

- NRCS Web Soil Survey

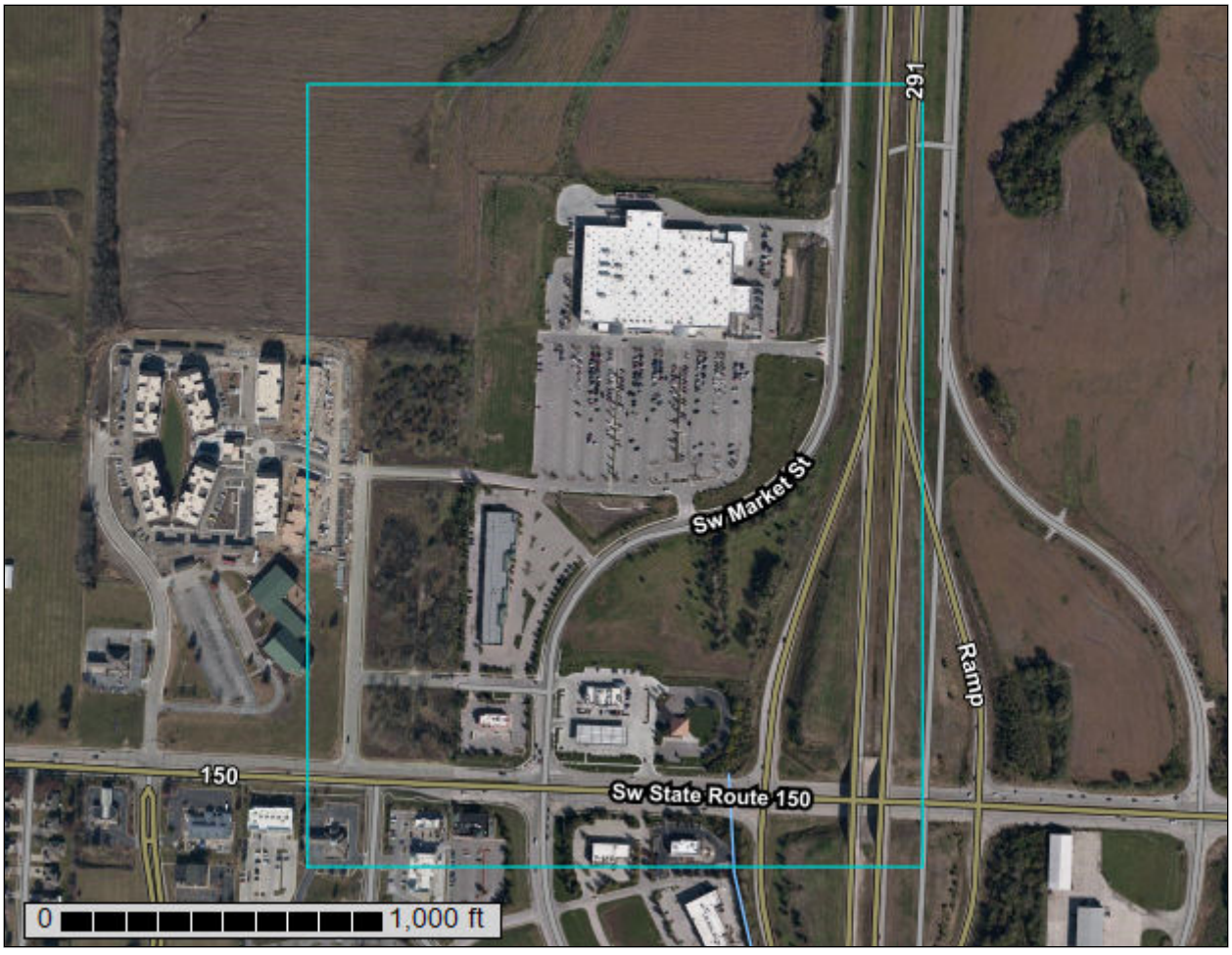
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Jackson County, Missouri



October 4, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

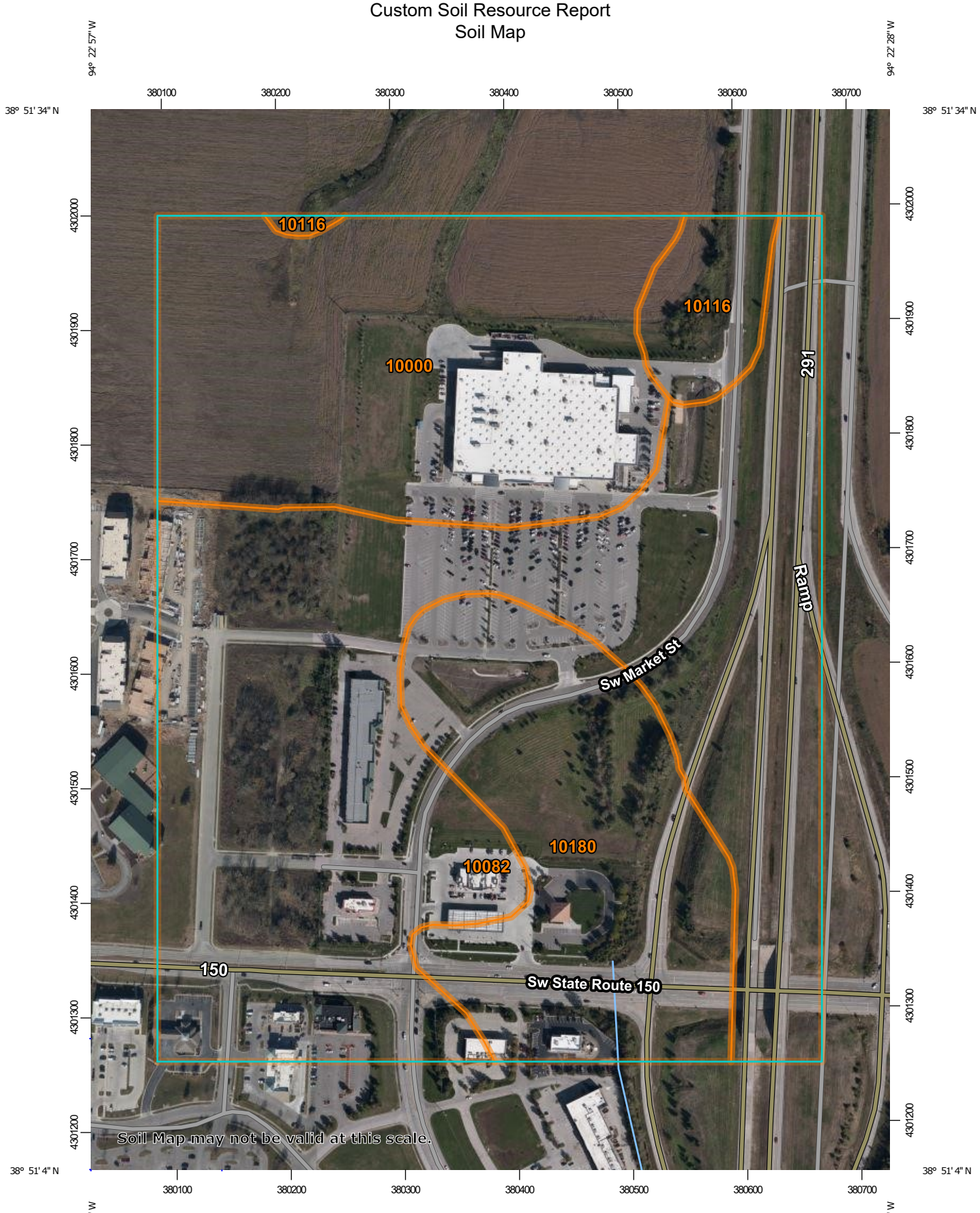
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:4,510 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 23, Sep 1, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 6, 2019—Nov 16, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10000	Arisburg silt loam, 1 to 5 percent slopes	27.9	26.2%
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	54.1	50.7%
10116	Sampsel silty clay loam, 2 to 5 percent slopes	4.0	3.7%
10180	Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes	20.7	19.4%
Totals for Area of Interest		**106.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Jackson County, Missouri

10000—Arisburg silt loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w22b
Elevation: 610 to 1,130 feet
Mean annual precipitation: 39 to 43 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 177 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arisburg and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arisburg

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silt loam
A - 6 to 13 inches: silt loam
Bt - 13 to 19 inches: silty clay loam
Btg - 19 to 56 inches: silty clay loam
BCg - 56 to 79 inches: silty clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R107BY007MO - Loess Upland Prairie
Hydric soil rating: No

Minor Components

Sharpsburg

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R109XY002MO - Loess Upland Prairie
Hydric soil rating: No

Greenton

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R109XY002MO - Loess Upland Prairie
Hydric soil rating: No

Haig

Percent of map unit: 3 percent
Landform: Flats
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R109XY001MO - Claypan Summit Prairie
Hydric soil rating: Yes

10082—Arisburg-Urban land complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w7ld
Elevation: 750 to 1,130 feet
Mean annual precipitation: 39 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 177 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arisburg and similar soils: 61 percent
Urban land: 30 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arisburg

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silt loam
A - 6 to 13 inches: silt loam
Bt - 13 to 19 inches: silty clay loam
Btg - 19 to 56 inches: silty clay loam
BCg - 56 to 79 inches: silty clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R107BY007MO - Loess Upland Prairie
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Sampsel

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Concave
Ecological site: R109XY010MO - Interbedded Sedimentary Upland Savanna
Hydric soil rating: Yes

Greenton

Percent of map unit: 3 percent

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R109XY002MO - Loess Upland Prairie
Hydric soil rating: No

Sharpsburg

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R109XY002MO - Loess Upland Prairie
Hydric soil rating: No

10116—Sampsel silty clay loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2qkzy
Elevation: 600 to 900 feet
Mean annual precipitation: 33 to 41 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 177 to 220 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sampsel and similar soils: 95 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sampsel

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Convex, concave
Parent material: Residuum weathered from shale

Typical profile

Ap - 0 to 11 inches: silty clay loam
Bt - 11 to 80 inches: silty clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained

Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: R109XY010MO - Interbedded Sedimentary Upland Savanna
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No

10180—Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes

Map Unit Setting
National map unit symbol: 1n85h
Elevation: 600 to 900 feet
Mean annual precipitation: 33 to 43 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 175 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Udarents and similar soils: 41 percent
Urban land: 39 percent
Sampsel and similar soils: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udarents

Setting
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mine spoil or earthy fill

Typical profile
C1 - 0 to 5 inches: silt loam
C2 - 5 to 80 inches: silty clay loam

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R107BY002MO - Deep Loess Upland Prairie
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Across-slope shape: Convex

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Sampsel

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from shale

Typical profile

Ap - 0 to 13 inches: silty clay loam
Bt - 13 to 80 inches: silty clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: R109XY010MO - Interbedded Sedimentary Upland Savanna
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

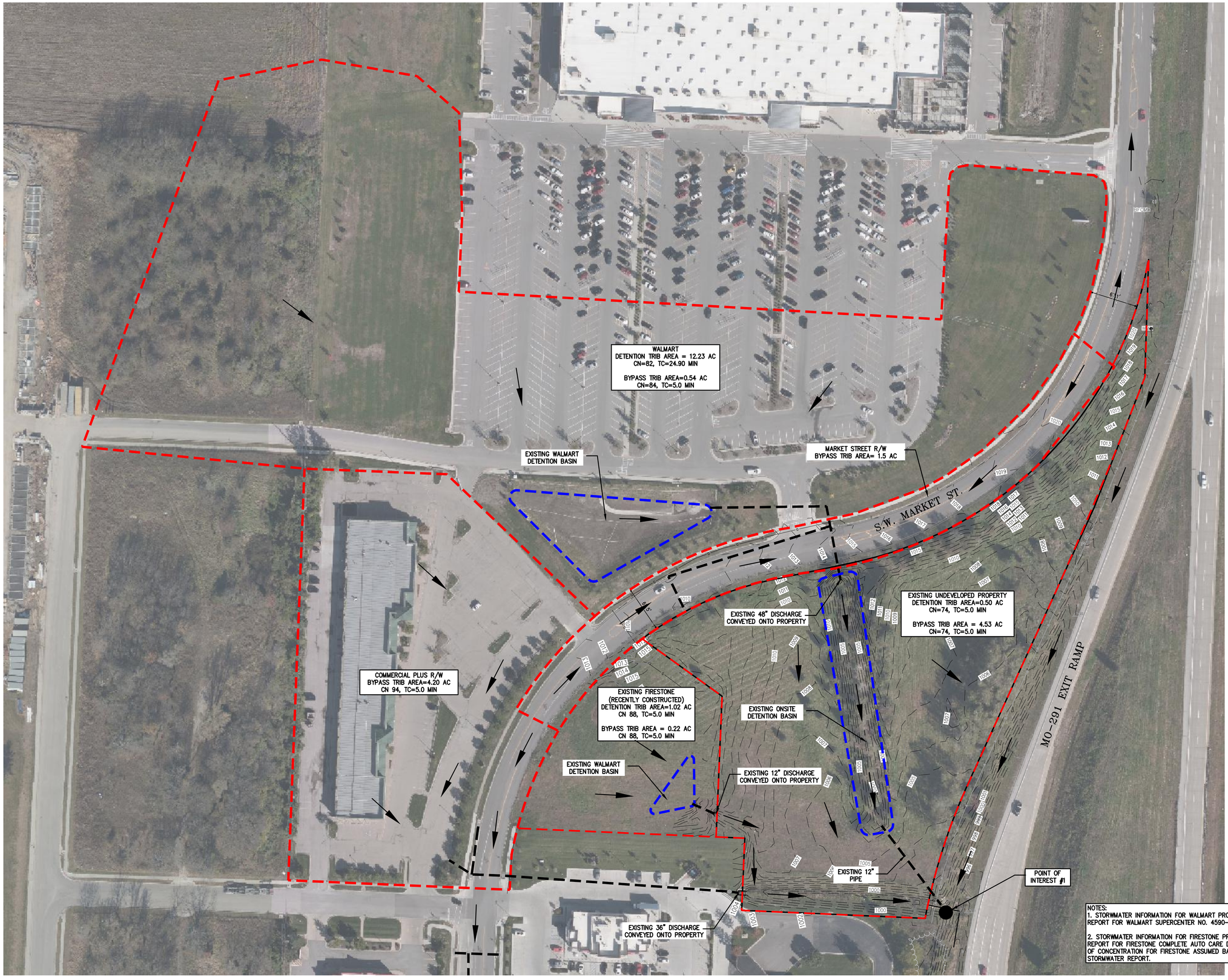
United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX B

B. Existing Hydraulic Model

- Existing Drainage Map A1
- Existing HydroCAD Model



NOTES:
1. STORMWATER INFORMATION FOR WALMART PROPERTY FROM APPROVED STORMWATER REPORT FOR WALMART SUPERCENTER NO. 4590-01 DATED NOVEMBER 25, 2015

2. STORMWATER INFORMATION FOR FIRESTONE PROPERTY FROM APPROVED STORMWATER REPORT FOR FIRESTONE COMPLETE AUTO CARE DATED MAY 01, 2020. BYPASS CN AND TIME OF CONCENTRATION FOR FIRESTONE ASSUMED BASED ON AVAILABLE INFORMATION FROM STORMWATER REPORT.

STATE OF MISSOURI
JUDD DAVID CLAUSSEN
NUMBER PE-2010
3/15/22
REGISTERED PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1270 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
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www.phelpsengineering.com

PLANNING
ENGINEERING
IMPLEMENTATION

EXISTING DRAINAGE MAP

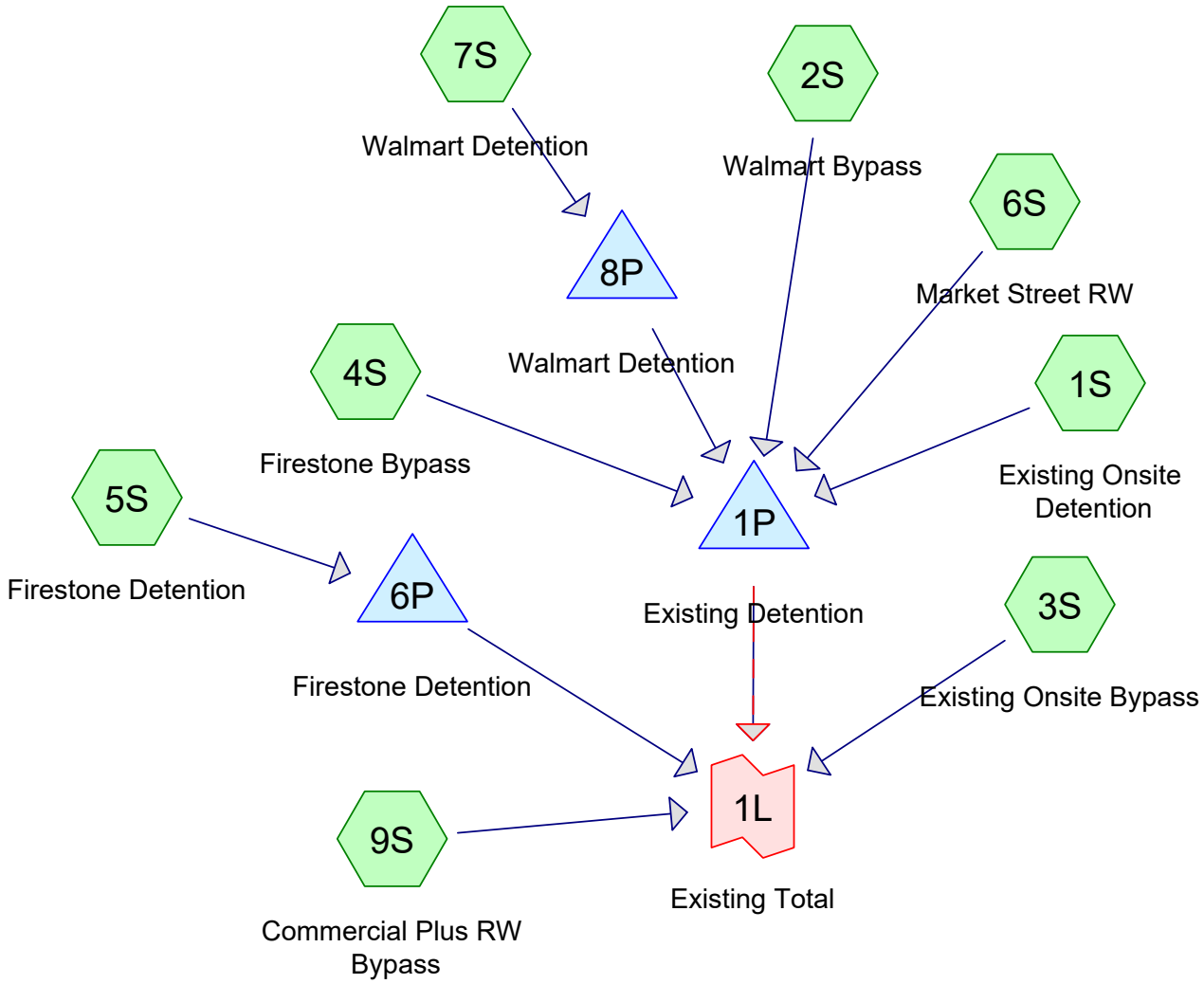
MARKET STREET CENTER
M291 AND SW MARKET STREET
CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App.
1.	03-16-22	REVISED PER CITY COMMENTS	SNH	DAF

PROJECT NO. 210639
DATE: 10-14-21 DRAWN: MRR
CHECKED: DAF APPROVED: JDC
CERTIFICATE OF AUTHORIZATION
KANSAS LAND SURVEYING - LS-82
KANSAS ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007003208

SHEET
B1

\\PHELPS-SERVER\Projects\P\210639\Stormwater\EXISTING CONDITIONS.dwg Layout:1 Mar 16, 2022 - 9:30pm Daniel Finn



Subcat Reach Pond Link

Routing Diagram for Existing

Prepared by {enter your company name here}, Printed 3/16/2022

HydroCAD® 10.10-6a s/n 09856 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	Jackson - 10 YR	Type II 24-hr		Default	24.00	1	5.30	2
2	Jackson - 100 YR	Type II 24-hr		Default	24.00	1	7.70	2
3	Jackson - 2 YR	Type II 24-hr		Default	24.00	1	3.50	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.540	84	(2S)
1.240	88	(4S, 5S)
5.700	94	(6S, 9S)
12.230	82	(7S)
5.030	74	>75% Grass cover, Good, HSG C (1S, 3S)
24.740	**83**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
5.030	HSG C	1S, 3S
0.000	HSG D	
19.710	Other	2S, 4S, 5S, 6S, 7S, 9S
24.740		**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	0.000	19.710	19.710		2S, 4S, 5S, 6S, 7S, 9S
0.000	0.000	5.030	0.000	0.000	5.030	>75% Grass cover, Good	1S, 3S
0.000	**0.000**	**5.030**	**0.000**	**19.710**	**24.740**	**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)
1	1P	1,000.57	998.96	129.0	0.0125	0.013	0.0	12.0	0.0
2	6P	1,009.50	1,009.35	30.0	0.0050	0.013	0.0	12.0	0.0
3	8P	1,004.83	1,004.48	87.0	0.0040	0.013	0.0	30.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Onsite Detention Runoff Area=0.500 ac 0.00% Impervious Runoff Depth=2.61"
Tc=5.0 min CN=74 Runoff=2.42 cfs 0.109 af

Subcatchment 2S: Walmart Bypass Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=3.55"
Tc=5.0 min CN=84 Runoff=3.43 cfs 0.160 af

Subcatchment 3S: Existing Onsite Bypass Runoff Area=4.530 ac 0.00% Impervious Runoff Depth=2.61"
Tc=5.0 min CN=74 Runoff=21.90 cfs 0.984 af

Subcatchment 4S: Firestone Bypass Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=3.95"
Tc=5.0 min CN=88 Runoff=1.52 cfs 0.073 af

Subcatchment 5S: Firestone Detention Runoff Area=1.020 ac 0.00% Impervious Runoff Depth=3.95"
Tc=5.0 min CN=88 Runoff=7.03 cfs 0.336 af

Subcatchment 6S: Market Street RW Runoff Area=1.500 ac 0.00% Impervious Runoff Depth=4.60"
Tc=5.0 min CN=94 Runoff=11.31 cfs 0.576 af

Subcatchment 7S: Walmart Detention Runoff Area=12.230 ac 0.00% Impervious Runoff Depth=3.35"
Tc=24.9 min CN=82 Runoff=39.89 cfs 3.413 af

Subcatchment 9S: Commercial Plus RW Runoff Area=4.200 ac 0.00% Impervious Runoff Depth=4.60"
Tc=5.0 min CN=94 Runoff=31.68 cfs 1.611 af

Pond 1P: Existing Detention Peak Elev=1,003.72' Storage=6,144 cf Inflow=18.66 cfs 3.614 af
Primary=8.69 cfs 3.614 af Secondary=0.00 cfs 0.000 af Outflow=8.69 cfs 3.614 af

Pond 6P: Firestone Detention Peak Elev=1,013.70' Storage=9,947 cf Inflow=7.03 cfs 0.336 af
Outflow=0.21 cfs 0.214 af

Pond 8P: Walmart Detention Peak Elev=1,012.92' Storage=77,205 cf Inflow=39.89 cfs 3.413 af
Outflow=6.83 cfs 2.698 af

Link 1L: Existing Total Inflow=61.80 cfs 6.423 af
Primary=61.80 cfs 6.423 af

Total Runoff Area = 24.740 ac Runoff Volume = 7.260 af Average Runoff Depth = 3.52"
100.00% Pervious = 24.740 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Existing Onsite Detention

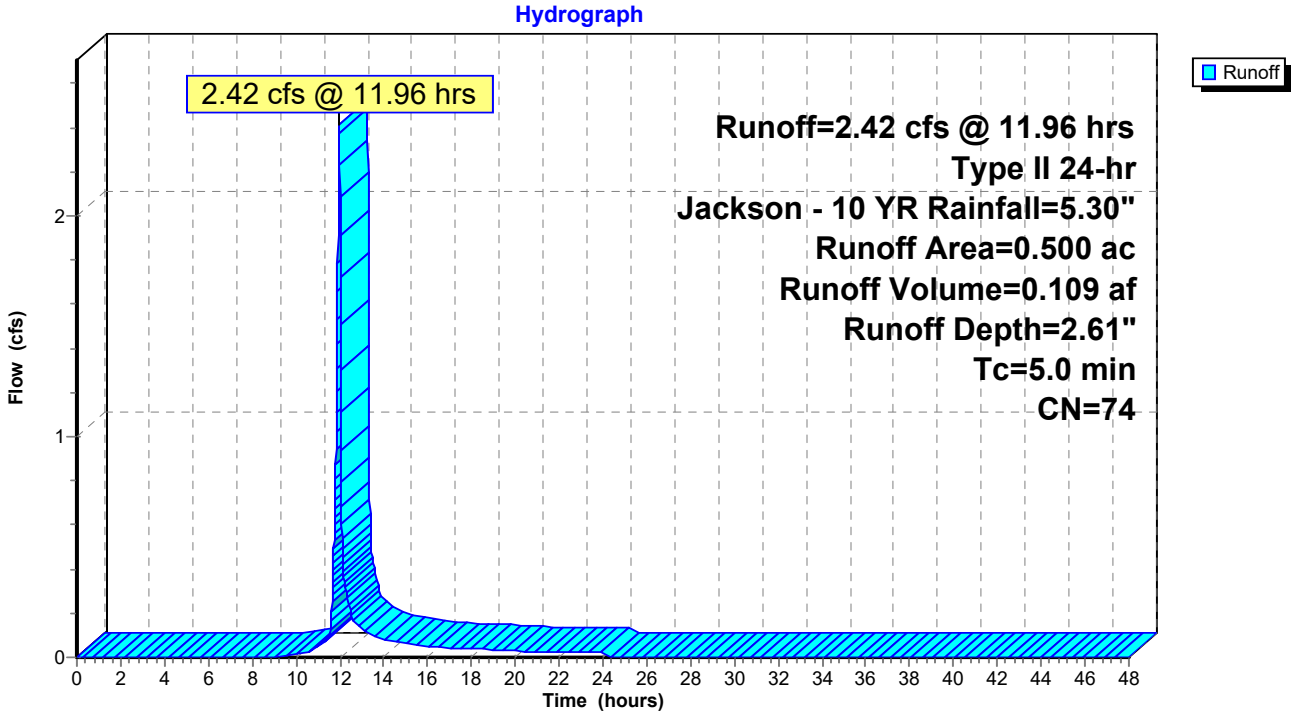
Runoff = 2.42 cfs @ 11.96 hrs, Volume= 0.109 af, Depth= 2.61"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

Area (ac)	CN	Description
0.500	74	>75% Grass cover, Good, HSG C
0.500		100.00% Pervious Area

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

Subcatchment 1S: Existing Onsite Detention



Hydrograph for Subcatchment 1S: Existing Onsite Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.00
5.50	0.38	0.00	0.00
6.00	0.42	0.00	0.00
6.50	0.47	0.00	0.00
7.00	0.52	0.00	0.00
7.50	0.58	0.00	0.00
8.00	0.64	0.00	0.00
8.50	0.70	0.00	0.00
9.00	0.78	0.00	0.00
9.50	0.86	0.01	0.01
10.00	0.96	0.02	0.01
10.50	1.08	0.04	0.02
11.00	1.25	0.07	0.04
11.50	1.50	0.15	**0.10**
12.00	3.51	1.25	**2.09**
12.50	3.90	1.52	0.20
13.00	4.09	1.66	0.13
13.50	4.23	1.77	0.10
14.00	4.35	1.85	0.08
14.50	4.44	1.93	0.07
15.00	4.52	1.99	0.06
15.50	4.60	2.05	0.06
16.00	4.66	2.10	0.05
16.50	4.72	2.15	0.05
17.00	4.78	2.19	0.04
17.50	4.83	2.23	0.04
18.00	4.88	2.27	0.04
18.50	4.93	2.31	0.04
19.00	4.97	2.34	0.03
19.50	5.01	2.37	0.03
20.00	5.05	2.40	0.03
20.50	5.08	2.43	0.03
21.00	5.11	2.45	0.03
21.50	5.15	2.48	0.03
22.00	5.18	2.51	0.03
22.50	5.21	2.53	0.03
23.00	5.24	2.56	0.02
23.50	5.27	2.58	0.02
24.00	**5.30**	**2.61**	0.02
24.50	5.30	2.61	0.00
25.00	5.30	2.61	0.00
25.50	5.30	2.61	0.00
26.00	5.30	2.61	0.00
26.50	5.30	2.61	0.00
27.00	5.30	2.61	0.00
27.50	5.30	2.61	0.00
28.00	5.30	2.61	0.00
28.50	5.30	2.61	0.00
29.00	5.30	2.61	0.00
29.50	5.30	2.61	0.00
30.00	5.30	2.61	0.00
30.50	5.30	2.61	0.00
31.00	5.30	2.61	0.00
31.50	5.30	2.61	0.00
32.00	5.30	2.61	0.00
32.50	5.30	2.61	0.00
33.00	5.30	2.61	0.00
33.50	5.30	2.61	0.00
34.00	5.30	2.61	0.00
34.50	5.30	2.61	0.00
35.00	5.30	2.61	0.00
35.50	5.30	2.61	0.00
36.00	5.30	2.61	0.00
36.50	5.30	2.61	0.00
37.00	5.30	2.61	0.00
37.50	5.30	2.61	0.00
38.00	5.30	2.61	0.00
38.50	5.30	2.61	0.00
39.00	5.30	2.61	0.00
39.50	5.30	2.61	0.00
40.00	5.30	2.61	0.00
40.50	5.30	2.61	0.00
41.00	5.30	2.61	0.00
41.50	5.30	2.61	0.00
42.00	5.30	2.61	0.00
42.50	5.30	2.61	0.00
43.00	5.30	2.61	0.00
43.50	5.30	2.61	0.00
44.00	5.30	2.61	0.00
44.50	5.30	2.61	0.00
45.00	5.30	2.61	0.00
45.50	5.30	2.61	0.00
46.00	5.30	2.61	0.00
46.50	5.30	2.61	0.00
47.00	5.30	2.61	0.00
47.50	5.30	2.61	0.00
48.00	5.30	2.61	0.00

Summary for Subcatchment 2S: Walmart Bypass

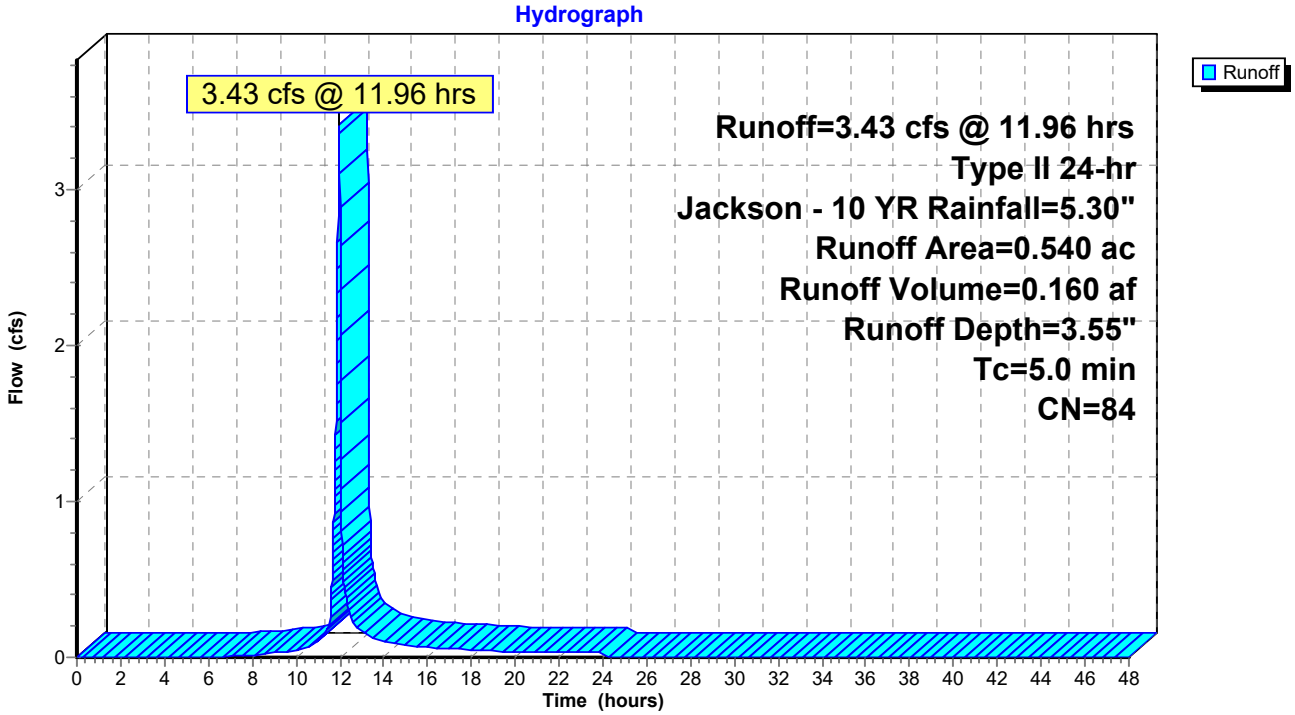
Runoff = 3.43 cfs @ 11.96 hrs, Volume= 0.160 af, Depth= 3.55"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.540	84	
	0.540		100.00% Pervious Area

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

Subcatchment 2S: Walmart Bypass



Hydrograph for Subcatchment 2S: Walmart Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	5.30	3.55	0.00
0.50	0.03	0.00	0.00	27.00	5.30	3.55	0.00
1.00	0.06	0.00	0.00	27.50	5.30	3.55	0.00
1.50	0.09	0.00	0.00	28.00	5.30	3.55	0.00
2.00	0.12	0.00	0.00	28.50	5.30	3.55	0.00
2.50	0.15	0.00	0.00	29.00	5.30	3.55	0.00
3.00	0.18	0.00	0.00	29.50	5.30	3.55	0.00
3.50	0.22	0.00	0.00	30.00	5.30	3.55	0.00
4.00	0.25	0.00	0.00	30.50	5.30	3.55	0.00
4.50	0.29	0.00	0.00	31.00	5.30	3.55	0.00
5.00	0.33	0.00	0.00	31.50	5.30	3.55	0.00
5.50	0.38	0.00	0.00	32.00	5.30	3.55	0.00
6.00	0.42	0.00	0.00	32.50	5.30	3.55	0.00
6.50	0.47	0.00	0.00	33.00	5.30	3.55	0.00
7.00	0.52	0.01	0.01	33.50	5.30	3.55	0.00
7.50	0.58	0.02	0.01	34.00	5.30	3.55	0.00
8.00	0.64	0.03	0.01	34.50	5.30	3.55	0.00
8.50	0.70	0.05	0.02	35.00	5.30	3.55	0.00
9.00	0.78	0.07	0.03	35.50	5.30	3.55	0.00
9.50	0.86	0.10	0.03	36.00	5.30	3.55	0.00
10.00	0.96	0.13	0.05	36.50	5.30	3.55	0.00
10.50	1.08	0.19	0.07	37.00	5.30	3.55	0.00
11.00	1.25	0.27	0.10	37.50	5.30	3.55	0.00
11.50	1.50	0.41	**0.19**	38.00	5.30	3.55	0.00
12.00	3.51	1.95	**2.89**	38.50	5.30	3.55	0.00
12.50	3.90	2.28	0.26	39.00	5.30	3.55	0.00
13.00	4.09	2.45	0.17	39.50	5.30	3.55	0.00
13.50	4.23	2.58	0.13	40.00	5.30	3.55	0.00
14.00	4.35	2.68	0.10	40.50	5.30	3.55	0.00
14.50	4.44	2.76	0.09	41.00	5.30	3.55	0.00
15.00	4.52	2.84	0.08	41.50	5.30	3.55	0.00
15.50	4.60	2.91	0.07	42.00	5.30	3.55	0.00
16.00	4.66	2.96	0.06	42.50	5.30	3.55	0.00
16.50	4.72	3.02	0.06	43.00	5.30	3.55	0.00
17.00	4.78	3.07	0.05	43.50	5.30	3.55	0.00
17.50	4.83	3.12	0.05	44.00	5.30	3.55	0.00
18.00	4.88	3.16	0.05	44.50	5.30	3.55	0.00
18.50	4.93	3.20	0.04	45.00	5.30	3.55	0.00
19.00	4.97	3.24	0.04	45.50	5.30	3.55	0.00
19.50	5.01	3.28	0.04	46.00	5.30	3.55	0.00
20.00	5.05	3.31	0.03	46.50	5.30	3.55	0.00
20.50	5.08	3.34	0.03	47.00	5.30	3.55	0.00
21.00	5.11	3.37	0.03	47.50	5.30	3.55	0.00
21.50	5.15	3.40	0.03	48.00	5.30	3.55	0.00
22.00	5.18	3.43	0.03				
22.50	5.21	3.46	0.03				
23.00	5.24	3.49	0.03				
23.50	5.27	3.52	0.03				
24.00	**5.30**	**3.55**	0.03				
24.50	5.30	3.55	0.00				
25.00	5.30	3.55	0.00				
25.50	5.30	3.55	0.00				
26.00	5.30	3.55	0.00				

Summary for Subcatchment 3S: Existing Onsite Bypass

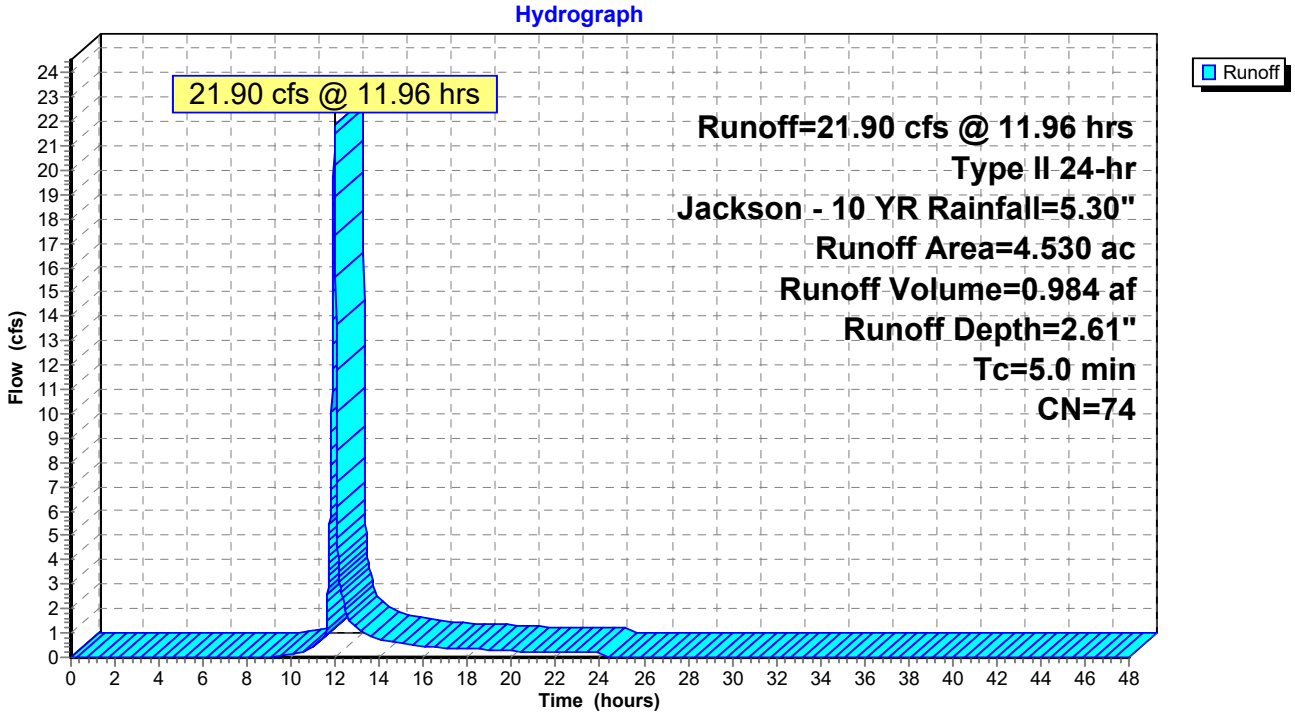
Runoff = 21.90 cfs @ 11.96 hrs, Volume= 0.984 af, Depth= 2.61"
Routed to Link 1L : Existing Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

Area (ac)	CN	Description
4.530	74	>75% Grass cover, Good, HSG C
4.530		100.00% Pervious Area

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

Subcatchment 3S: Existing Onsite Bypass



Hydrograph for Subcatchment 3S: Existing Onsite Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.00
5.50	0.38	0.00	0.00
6.00	0.42	0.00	0.00
6.50	0.47	0.00	0.00
7.00	0.52	0.00	0.00
7.50	0.58	0.00	0.00
8.00	0.64	0.00	0.00
8.50	0.70	0.00	0.00
9.00	0.78	0.00	0.03
9.50	0.86	0.01	0.06
10.00	0.96	0.02	0.12
10.50	1.08	0.04	0.21
11.00	1.25	0.07	0.40
11.50	1.50	0.15	**0.87**
12.00	3.51	1.25	**18.93**
12.50	3.90	1.52	1.83
13.00	4.09	1.66	1.16
13.50	4.23	1.77	0.89
14.00	4.35	1.85	0.71
14.50	4.44	1.93	0.63
15.00	4.52	1.99	0.57
15.50	4.60	2.05	0.51
16.00	4.66	2.10	0.44
16.50	4.72	2.15	0.42
17.00	4.78	2.19	0.39
17.50	4.83	2.23	0.37
18.00	4.88	2.27	0.35
18.50	4.93	2.31	0.33
19.00	4.97	2.34	0.30
19.50	5.01	2.37	0.28
20.00	5.05	2.40	0.26
20.50	5.08	2.43	0.25
21.00	5.11	2.45	0.24
21.50	5.15	2.48	0.24
22.00	5.18	2.51	0.23
22.50	5.21	2.53	0.23
23.00	5.24	2.56	0.23
23.50	5.27	2.58	0.22
24.00	**5.30**	**2.61**	0.22
24.50	5.30	2.61	0.00
25.00	5.30	2.61	0.00
25.50	5.30	2.61	0.00
26.00	5.30	2.61	0.00
26.50	5.30	2.61	0.00
27.00	5.30	2.61	0.00
27.50	5.30	2.61	0.00
28.00	5.30	2.61	0.00
28.50	5.30	2.61	0.00
29.00	5.30	2.61	0.00
29.50	5.30	2.61	0.00
30.00	5.30	2.61	0.00
30.50	5.30	2.61	0.00
31.00	5.30	2.61	0.00
31.50	5.30	2.61	0.00
32.00	5.30	2.61	0.00
32.50	5.30	2.61	0.00
33.00	5.30	2.61	0.00
33.50	5.30	2.61	0.00
34.00	5.30	2.61	0.00
34.50	5.30	2.61	0.00
35.00	5.30	2.61	0.00
35.50	5.30	2.61	0.00
36.00	5.30	2.61	0.00
36.50	5.30	2.61	0.00
37.00	5.30	2.61	0.00
37.50	5.30	2.61	0.00
38.00	5.30	2.61	0.00
38.50	5.30	2.61	0.00
39.00	5.30	2.61	0.00
39.50	5.30	2.61	0.00
40.00	5.30	2.61	0.00
40.50	5.30	2.61	0.00
41.00	5.30	2.61	0.00
41.50	5.30	2.61	0.00
42.00	5.30	2.61	0.00
42.50	5.30	2.61	0.00
43.00	5.30	2.61	0.00
43.50	5.30	2.61	0.00
44.00	5.30	2.61	0.00
44.50	5.30	2.61	0.00
45.00	5.30	2.61	0.00
45.50	5.30	2.61	0.00
46.00	5.30	2.61	0.00
46.50	5.30	2.61	0.00
47.00	5.30	2.61	0.00
47.50	5.30	2.61	0.00
48.00	5.30	2.61	0.00

Summary for Subcatchment 4S: Firestone Bypass

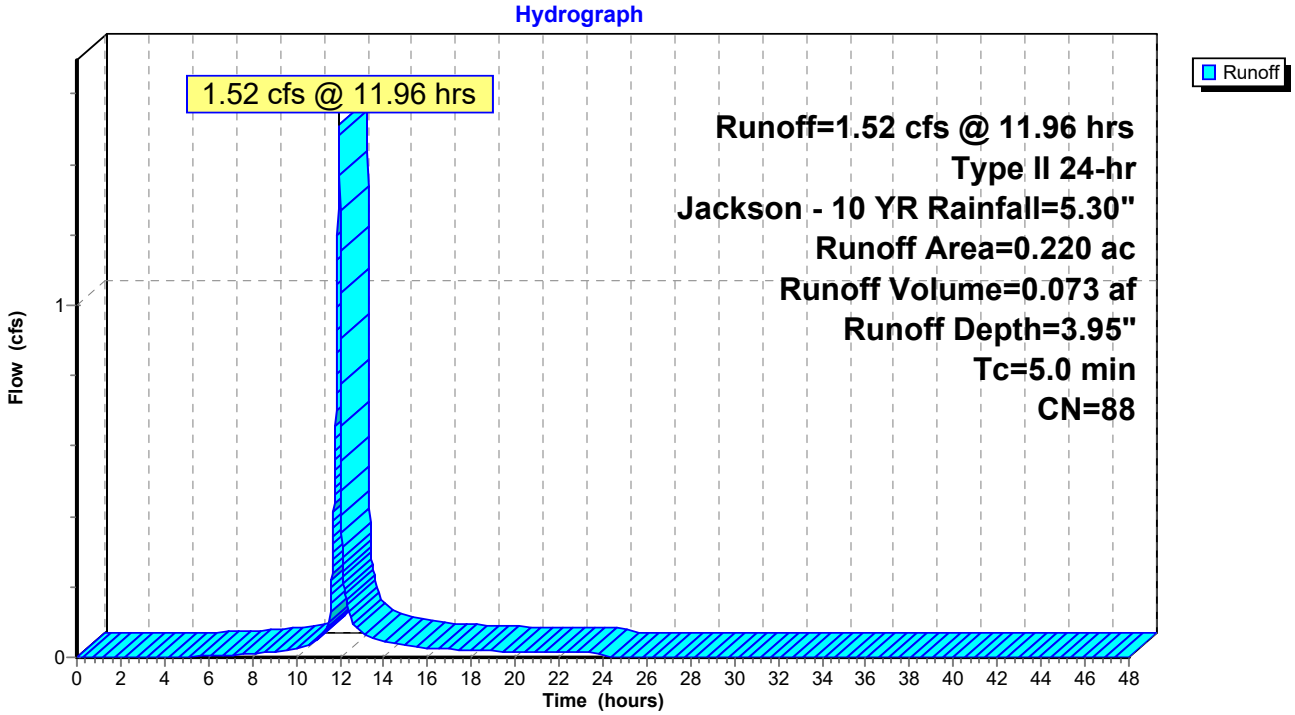
Runoff = 1.52 cfs @ 11.96 hrs, Volume= 0.073 af, Depth= 3.95"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.220	88	
	0.220		100.00% Pervious Area

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

Subcatchment 4S: Firestone Bypass



Hydrograph for Subcatchment 4S: Firestone Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.00
5.50	0.38	0.01	0.00
6.00	0.42	0.02	0.00
6.50	0.47	0.03	0.01
7.00	0.52	0.04	0.01
7.50	0.58	0.06	0.01
8.00	0.64	0.08	0.01
8.50	0.70	0.10	0.01
9.00	0.78	0.14	0.02
9.50	0.86	0.18	0.02
10.00	0.96	0.23	0.03
10.50	1.08	0.30	0.04
11.00	1.25	0.41	0.05
11.50	1.50	0.58	**0.09**
12.00	3.51	2.28	**1.27**
12.50	3.90	2.63	0.11
13.00	4.09	2.81	0.07
13.50	4.23	2.95	0.05
14.00	4.35	3.05	0.04
14.50	4.44	3.14	0.04
15.00	4.52	3.22	0.03
15.50	4.60	3.29	0.03
16.00	4.66	3.35	0.03
16.50	4.72	3.41	0.02
17.00	4.78	3.46	0.02
17.50	4.83	3.51	0.02
18.00	4.88	3.56	0.02
18.50	4.93	3.60	0.02
19.00	4.97	3.64	0.02
19.50	5.01	3.68	0.02
20.00	5.05	3.71	0.01
20.50	5.08	3.74	0.01
21.00	5.11	3.78	0.01
21.50	5.15	3.81	0.01
22.00	5.18	3.84	0.01
22.50	5.21	3.87	0.01
23.00	5.24	3.90	0.01
23.50	5.27	3.93	0.01
24.00	**5.30**	**3.95**	0.01
24.50	5.30	3.95	0.00
25.00	5.30	3.95	0.00
25.50	5.30	3.95	0.00
26.00	5.30	3.95	0.00
26.50	5.30	3.95	0.00
27.00	5.30	3.95	0.00
27.50	5.30	3.95	0.00
28.00	5.30	3.95	0.00
28.50	5.30	3.95	0.00
29.00	5.30	3.95	0.00
29.50	5.30	3.95	0.00
30.00	5.30	3.95	0.00
30.50	5.30	3.95	0.00
31.00	5.30	3.95	0.00
31.50	5.30	3.95	0.00
32.00	5.30	3.95	0.00
32.50	5.30	3.95	0.00
33.00	5.30	3.95	0.00
33.50	5.30	3.95	0.00
34.00	5.30	3.95	0.00
34.50	5.30	3.95	0.00
35.00	5.30	3.95	0.00
35.50	5.30	3.95	0.00
36.00	5.30	3.95	0.00
36.50	5.30	3.95	0.00
37.00	5.30	3.95	0.00
37.50	5.30	3.95	0.00
38.00	5.30	3.95	0.00
38.50	5.30	3.95	0.00
39.00	5.30	3.95	0.00
39.50	5.30	3.95	0.00
40.00	5.30	3.95	0.00
40.50	5.30	3.95	0.00
41.00	5.30	3.95	0.00
41.50	5.30	3.95	0.00
42.00	5.30	3.95	0.00
42.50	5.30	3.95	0.00
43.00	5.30	3.95	0.00
43.50	5.30	3.95	0.00
44.00	5.30	3.95	0.00
44.50	5.30	3.95	0.00
45.00	5.30	3.95	0.00
45.50	5.30	3.95	0.00
46.00	5.30	3.95	0.00
46.50	5.30	3.95	0.00
47.00	5.30	3.95	0.00
47.50	5.30	3.95	0.00
48.00	5.30	3.95	0.00

Summary for Subcatchment 5S: Firestone Detention

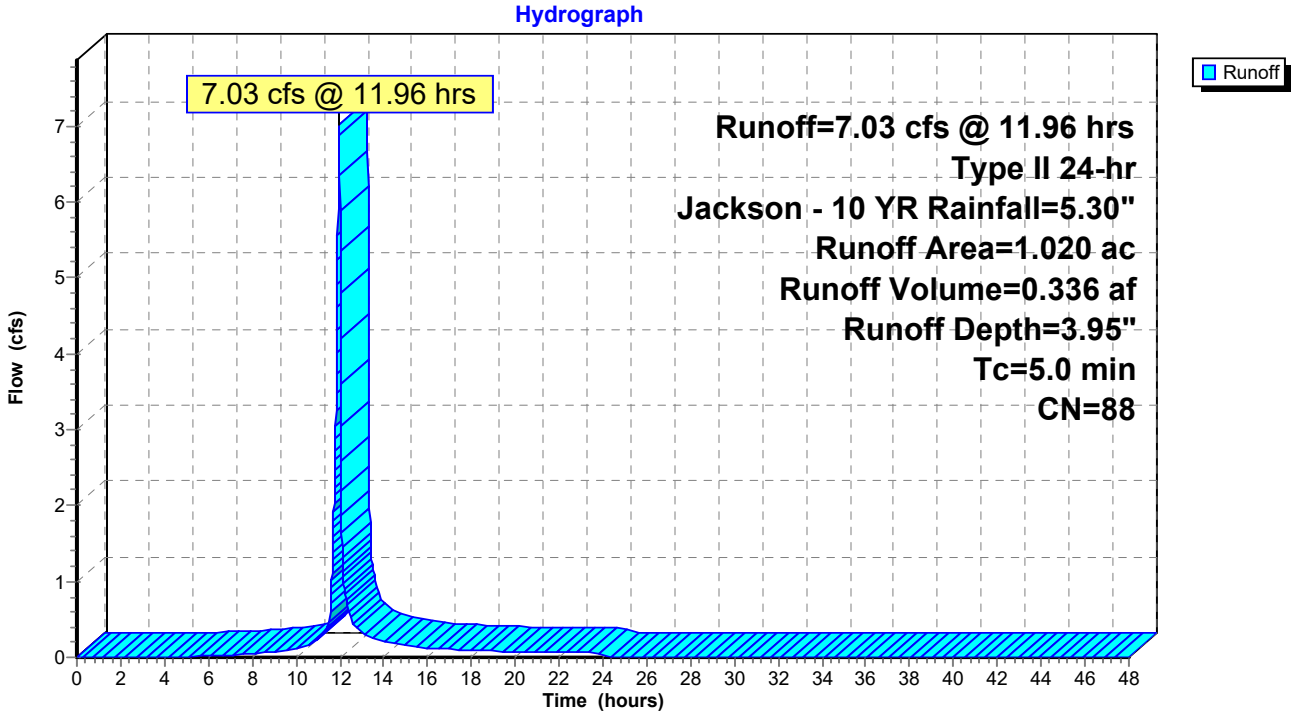
Runoff = 7.03 cfs @ 11.96 hrs, Volume= 0.336 af, Depth= 3.95"
Routed to Pond 6P : Firestone Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	1.020	88	
	1.020		100.00% Pervious Area

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

Subcatchment 5S: Firestone Detention



Hydrograph for Subcatchment 5S: Firestone Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	5.30	3.95	0.00
0.50	0.03	0.00	0.00	27.00	5.30	3.95	0.00
1.00	0.06	0.00	0.00	27.50	5.30	3.95	0.00
1.50	0.09	0.00	0.00	28.00	5.30	3.95	0.00
2.00	0.12	0.00	0.00	28.50	5.30	3.95	0.00
2.50	0.15	0.00	0.00	29.00	5.30	3.95	0.00
3.00	0.18	0.00	0.00	29.50	5.30	3.95	0.00
3.50	0.22	0.00	0.00	30.00	5.30	3.95	0.00
4.00	0.25	0.00	0.00	30.50	5.30	3.95	0.00
4.50	0.29	0.00	0.00	31.00	5.30	3.95	0.00
5.00	0.33	0.00	0.01	31.50	5.30	3.95	0.00
5.50	0.38	0.01	0.01	32.00	5.30	3.95	0.00
6.00	0.42	0.02	0.02	32.50	5.30	3.95	0.00
6.50	0.47	0.03	0.02	33.00	5.30	3.95	0.00
7.00	0.52	0.04	0.03	33.50	5.30	3.95	0.00
7.50	0.58	0.06	0.04	34.00	5.30	3.95	0.00
8.00	0.64	0.08	0.04	34.50	5.30	3.95	0.00
8.50	0.70	0.10	0.06	35.00	5.30	3.95	0.00
9.00	0.78	0.14	0.08	35.50	5.30	3.95	0.00
9.50	0.86	0.18	0.09	36.00	5.30	3.95	0.00
10.00	0.96	0.23	0.12	36.50	5.30	3.95	0.00
10.50	1.08	0.30	0.16	37.00	5.30	3.95	0.00
11.00	1.25	0.41	0.24	37.50	5.30	3.95	0.00
11.50	1.50	0.58	**0.44**	38.00	5.30	3.95	0.00
12.00	3.51	2.28	**5.89**	38.50	5.30	3.95	0.00
12.50	3.90	2.63	0.53	39.00	5.30	3.95	0.00
13.00	4.09	2.81	0.33	39.50	5.30	3.95	0.00
13.50	4.23	2.95	0.25	40.00	5.30	3.95	0.00
14.00	4.35	3.05	0.20	40.50	5.30	3.95	0.00
14.50	4.44	3.14	0.17	41.00	5.30	3.95	0.00
15.00	4.52	3.22	0.16	41.50	5.30	3.95	0.00
15.50	4.60	3.29	0.14	42.00	5.30	3.95	0.00
16.00	4.66	3.35	0.12	42.50	5.30	3.95	0.00
16.50	4.72	3.41	0.11	43.00	5.30	3.95	0.00
17.00	4.78	3.46	0.11	43.50	5.30	3.95	0.00
17.50	4.83	3.51	0.10	44.00	5.30	3.95	0.00
18.00	4.88	3.56	0.09	44.50	5.30	3.95	0.00
18.50	4.93	3.60	0.09	45.00	5.30	3.95	0.00
19.00	4.97	3.64	0.08	45.50	5.30	3.95	0.00
19.50	5.01	3.68	0.07	46.00	5.30	3.95	0.00
20.00	5.05	3.71	0.07	46.50	5.30	3.95	0.00
20.50	5.08	3.74	0.07	47.00	5.30	3.95	0.00
21.00	5.11	3.78	0.07	47.50	5.30	3.95	0.00
21.50	5.15	3.81	0.06	48.00	5.30	3.95	0.00
22.00	5.18	3.84	0.06				
22.50	5.21	3.87	0.06				
23.00	5.24	3.90	0.06				
23.50	5.27	3.93	0.06				
24.00	**5.30**	**3.95**	0.06				
24.50	5.30	3.95	0.00				
25.00	5.30	3.95	0.00				
25.50	5.30	3.95	0.00				
26.00	5.30	3.95	0.00				

Summary for Subcatchment 6S: Market Street RW

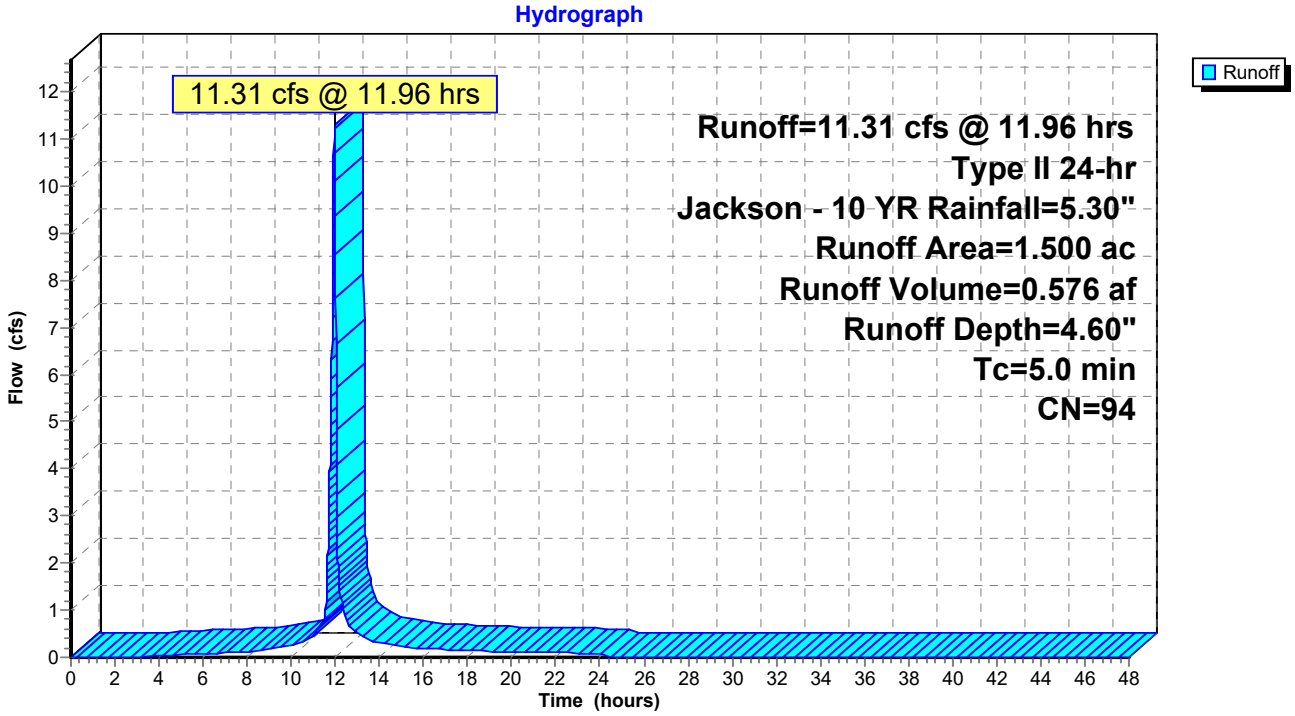
Runoff = 11.31 cfs @ 11.96 hrs, Volume= 0.576 af, Depth= 4.60"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	1.500	94	
	1.500		100.00% Pervious Area

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

Subcatchment 6S: Market Street RW



Hydrograph for Subcatchment 6S: Market Street RW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	5.30	4.60	0.00
0.50	0.03	0.00	0.00	27.00	5.30	4.60	0.00
1.00	0.06	0.00	0.00	27.50	5.30	4.60	0.00
1.50	0.09	0.00	0.00	28.00	5.30	4.60	0.00
2.00	0.12	0.00	0.00	28.50	5.30	4.60	0.00
2.50	0.15	0.00	0.00	29.00	5.30	4.60	0.00
3.00	0.18	0.00	0.01	29.50	5.30	4.60	0.00
3.50	0.22	0.01	0.02	30.00	5.30	4.60	0.00
4.00	0.25	0.02	0.03	30.50	5.30	4.60	0.00
4.50	0.29	0.03	0.04	31.00	5.30	4.60	0.00
5.00	0.33	0.05	0.05	31.50	5.30	4.60	0.00
5.50	0.38	0.07	0.06	32.00	5.30	4.60	0.00
6.00	0.42	0.09	0.08	32.50	5.30	4.60	0.00
6.50	0.47	0.12	0.09	33.00	5.30	4.60	0.00
7.00	0.52	0.15	0.10	33.50	5.30	4.60	0.00
7.50	0.58	0.19	0.11	34.00	5.30	4.60	0.00
8.00	0.64	0.23	0.12	34.50	5.30	4.60	0.00
8.50	0.70	0.27	0.15	35.00	5.30	4.60	0.00
9.00	0.78	0.33	0.19	35.50	5.30	4.60	0.00
9.50	0.86	0.39	0.20	36.00	5.30	4.60	0.00
10.00	0.96	0.47	0.25	36.50	5.30	4.60	0.00
10.50	1.08	0.57	0.34	37.00	5.30	4.60	0.00
11.00	1.25	0.71	0.48	37.50	5.30	4.60	0.00
11.50	1.50	0.94	**0.81**	38.00	5.30	4.60	0.00
12.00	3.51	2.85	**9.38**	38.50	5.30	4.60	0.00
12.50	3.90	3.22	0.82	39.00	5.30	4.60	0.00
13.00	4.09	3.41	0.51	39.50	5.30	4.60	0.00
13.50	4.23	3.55	0.39	40.00	5.30	4.60	0.00
14.00	4.35	3.66	0.30	40.50	5.30	4.60	0.00
14.50	4.44	3.76	0.27	41.00	5.30	4.60	0.00
15.00	4.52	3.84	0.24	41.50	5.30	4.60	0.00
15.50	4.60	3.91	0.21	42.00	5.30	4.60	0.00
16.00	4.66	3.98	0.19	42.50	5.30	4.60	0.00
16.50	4.72	4.04	0.17	43.00	5.30	4.60	0.00
17.00	4.78	4.09	0.16	43.50	5.30	4.60	0.00
17.50	4.83	4.14	0.15	44.00	5.30	4.60	0.00
18.00	4.88	4.19	0.14	44.50	5.30	4.60	0.00
18.50	4.93	4.24	0.13	45.00	5.30	4.60	0.00
19.00	4.97	4.28	0.12	45.50	5.30	4.60	0.00
19.50	5.01	4.32	0.11	46.00	5.30	4.60	0.00
20.00	5.05	4.35	0.10	46.50	5.30	4.60	0.00
20.50	5.08	4.39	0.10	47.00	5.30	4.60	0.00
21.00	5.11	4.42	0.10	47.50	5.30	4.60	0.00
21.50	5.15	4.45	0.10	48.00	5.30	4.60	0.00
22.00	5.18	4.48	0.10				
22.50	5.21	4.51	0.09				
23.00	5.24	4.55	0.09				
23.50	5.27	4.58	0.09				
24.00	**5.30**	**4.60**	0.09				
24.50	5.30	4.60	0.00				
25.00	5.30	4.60	0.00				
25.50	5.30	4.60	0.00				
26.00	5.30	4.60	0.00				

Summary for Subcatchment 7S: Walmart Detention

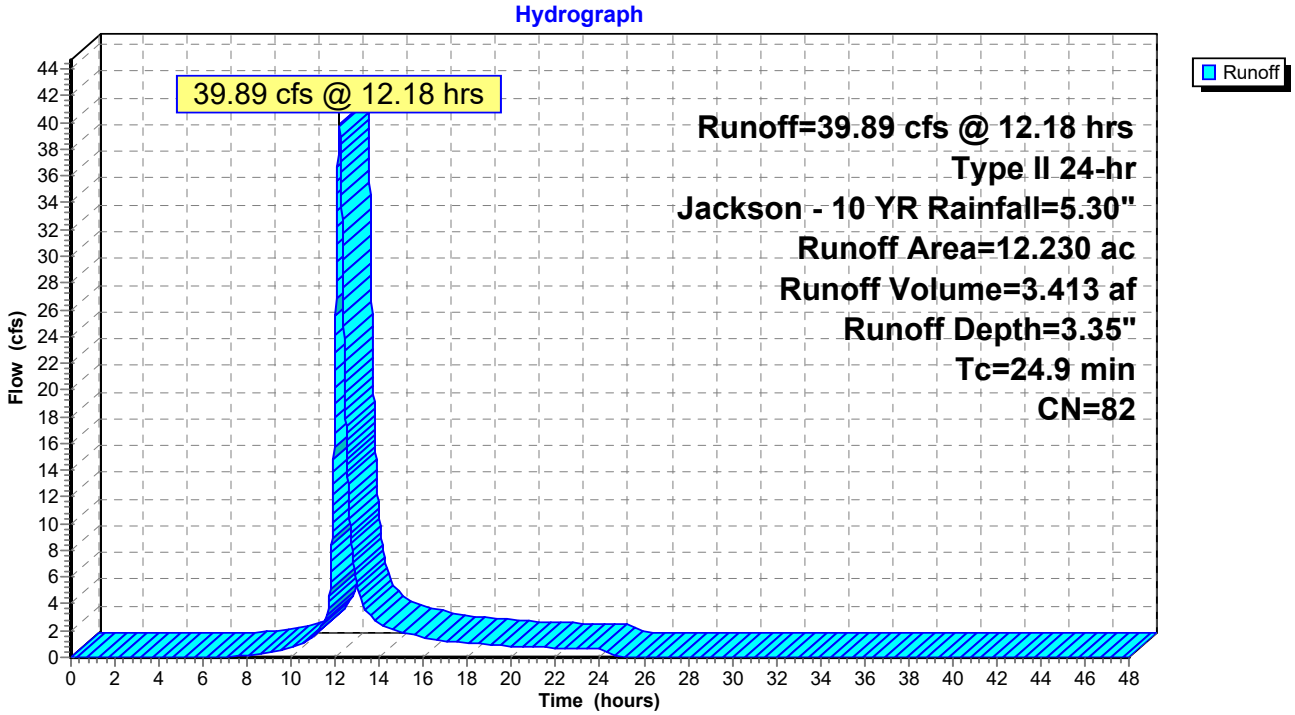
Runoff = 39.89 cfs @ 12.18 hrs, Volume= 3.413 af, Depth= 3.35"
Routed to Pond 8P : Walmart Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	12.230	82	
	12.230		100.00% Pervious Area

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

Subcatchment 7S: Walmart Detention



Hydrograph for Subcatchment 7S: Walmart Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.00
5.50	0.38	0.00	0.00
6.00	0.42	0.00	0.00
6.50	0.47	0.00	0.01
7.00	0.52	0.00	0.05
7.50	0.58	0.01	0.11
8.00	0.64	0.02	0.18
8.50	0.70	0.03	0.26
9.00	0.78	0.05	0.39
9.50	0.86	0.07	0.54
10.00	0.96	0.10	0.70
10.50	1.08	0.15	1.01
11.00	1.25	0.22	1.56
11.50	1.50	0.35	2.71
12.00	3.51	1.79	**22.82**
12.50	3.90	2.11	**16.21**
13.00	4.09	2.28	5.20
13.50	4.23	2.40	3.30
14.00	4.35	2.50	2.55
14.50	4.44	2.58	2.09
15.00	4.52	2.66	1.87
15.50	4.60	2.72	1.68
16.00	4.66	2.78	1.48
16.50	4.72	2.83	1.32
17.00	4.78	2.88	1.24
17.50	4.83	2.93	1.17
18.00	4.88	2.97	1.10
18.50	4.93	3.01	1.03
19.00	4.97	3.05	0.96
19.50	5.01	3.09	0.89
20.00	5.05	3.12	0.82
20.50	5.08	3.15	0.76
21.00	5.11	3.18	0.74
21.50	5.15	3.21	0.73
22.00	5.18	3.24	0.72
22.50	5.21	3.27	0.70
23.00	5.24	3.29	0.69
23.50	5.27	3.32	0.67
24.00	**5.30**	**3.35**	0.66
24.50	5.30	3.35	0.14
25.00	5.30	3.35	0.01
25.50	5.30	3.35	0.00
26.00	5.30	3.35	0.00
26.50	5.30	3.35	0.00
27.00	5.30	3.35	0.00
27.50	5.30	3.35	0.00
28.00	5.30	3.35	0.00
28.50	5.30	3.35	0.00
29.00	5.30	3.35	0.00
29.50	5.30	3.35	0.00
30.00	5.30	3.35	0.00
30.50	5.30	3.35	0.00
31.00	5.30	3.35	0.00
31.50	5.30	3.35	0.00
32.00	5.30	3.35	0.00
32.50	5.30	3.35	0.00
33.00	5.30	3.35	0.00
33.50	5.30	3.35	0.00
34.00	5.30	3.35	0.00
34.50	5.30	3.35	0.00
35.00	5.30	3.35	0.00
35.50	5.30	3.35	0.00
36.00	5.30	3.35	0.00
36.50	5.30	3.35	0.00
37.00	5.30	3.35	0.00
37.50	5.30	3.35	0.00
38.00	5.30	3.35	0.00
38.50	5.30	3.35	0.00
39.00	5.30	3.35	0.00
39.50	5.30	3.35	0.00
40.00	5.30	3.35	0.00
40.50	5.30	3.35	0.00
41.00	5.30	3.35	0.00
41.50	5.30	3.35	0.00
42.00	5.30	3.35	0.00
42.50	5.30	3.35	0.00
43.00	5.30	3.35	0.00
43.50	5.30	3.35	0.00
44.00	5.30	3.35	0.00
44.50	5.30	3.35	0.00
45.00	5.30	3.35	0.00
45.50	5.30	3.35	0.00
46.00	5.30	3.35	0.00
46.50	5.30	3.35	0.00
47.00	5.30	3.35	0.00
47.50	5.30	3.35	0.00
48.00	5.30	3.35	0.00

Summary for Subcatchment 9S: Commercial Plus RW Bypass

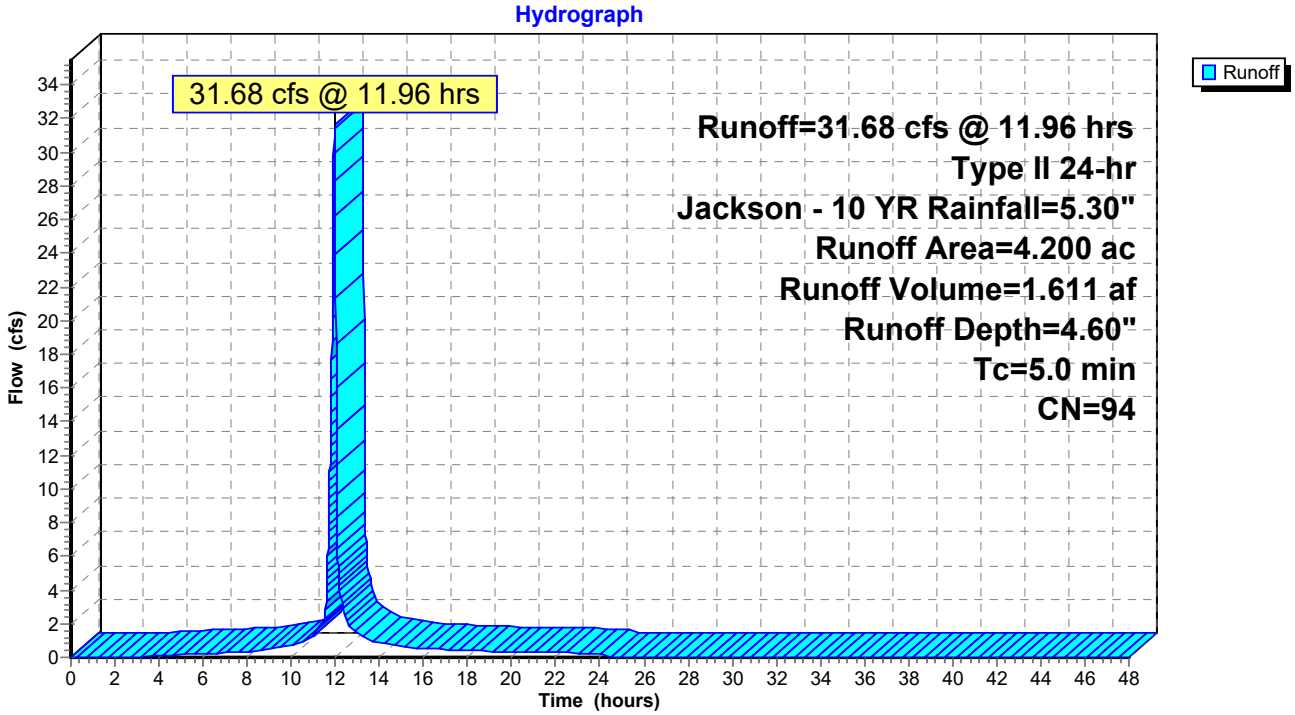
Runoff = 31.68 cfs @ 11.96 hrs, Volume= 1.611 af, Depth= 4.60"
Routed to Link 1L : Existing Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	4.200	94	
	4.200		100.00% Pervious Area

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

Subcatchment 9S: Commercial Plus RW Bypass



Hydrograph for Subcatchment 9S: Commercial Plus RW Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.01
3.00	0.18	0.00	0.04
3.50	0.22	0.01	0.07
4.00	0.25	0.02	0.09
4.50	0.29	0.03	0.12
5.00	0.33	0.05	0.15
5.50	0.38	0.07	0.18
6.00	0.42	0.09	0.21
6.50	0.47	0.12	0.24
7.00	0.52	0.15	0.27
7.50	0.58	0.19	0.30
8.00	0.64	0.23	0.34
8.50	0.70	0.27	0.42
9.00	0.78	0.33	0.53
9.50	0.86	0.39	0.56
10.00	0.96	0.47	0.70
10.50	1.08	0.57	0.94
11.00	1.25	0.71	1.34
11.50	1.50	0.94	**2.26**
12.00	3.51	2.85	**26.26**
12.50	3.90	3.22	2.30
13.00	4.09	3.41	1.43
13.50	4.23	3.55	1.08
14.00	4.35	3.66	0.85
14.50	4.44	3.76	0.75
15.00	4.52	3.84	0.67
15.50	4.60	3.91	0.60
16.00	4.66	3.98	0.52
16.50	4.72	4.04	0.49
17.00	4.78	4.09	0.46
17.50	4.83	4.14	0.43
18.00	4.88	4.19	0.40
18.50	4.93	4.24	0.38
19.00	4.97	4.28	0.35
19.50	5.01	4.32	0.32
20.00	5.05	4.35	0.29
20.50	5.08	4.39	0.28
21.00	5.11	4.42	0.28
21.50	5.15	4.45	0.27
22.00	5.18	4.48	0.27
22.50	5.21	4.51	0.26
23.00	5.24	4.55	0.26
23.50	5.27	4.58	0.25
24.00	**5.30**	**4.60**	0.24
24.50	5.30	4.60	0.00
25.00	5.30	4.60	0.00
25.50	5.30	4.60	0.00
26.00	5.30	4.60	0.00
26.50	5.30	4.60	0.00
27.00	5.30	4.60	0.00
27.50	5.30	4.60	0.00
28.00	5.30	4.60	0.00
28.50	5.30	4.60	0.00
29.00	5.30	4.60	0.00
29.50	5.30	4.60	0.00
30.00	5.30	4.60	0.00
30.50	5.30	4.60	0.00
31.00	5.30	4.60	0.00
31.50	5.30	4.60	0.00
32.00	5.30	4.60	0.00
32.50	5.30	4.60	0.00
33.00	5.30	4.60	0.00
33.50	5.30	4.60	0.00
34.00	5.30	4.60	0.00
34.50	5.30	4.60	0.00
35.00	5.30	4.60	0.00
35.50	5.30	4.60	0.00
36.00	5.30	4.60	0.00
36.50	5.30	4.60	0.00
37.00	5.30	4.60	0.00
37.50	5.30	4.60	0.00
38.00	5.30	4.60	0.00
38.50	5.30	4.60	0.00
39.00	5.30	4.60	0.00
39.50	5.30	4.60	0.00
40.00	5.30	4.60	0.00
40.50	5.30	4.60	0.00
41.00	5.30	4.60	0.00
41.50	5.30	4.60	0.00
42.00	5.30	4.60	0.00
42.50	5.30	4.60	0.00
43.00	5.30	4.60	0.00
43.50	5.30	4.60	0.00
44.00	5.30	4.60	0.00
44.50	5.30	4.60	0.00
45.00	5.30	4.60	0.00
45.50	5.30	4.60	0.00
46.00	5.30	4.60	0.00
46.50	5.30	4.60	0.00
47.00	5.30	4.60	0.00
47.50	5.30	4.60	0.00
48.00	5.30	4.60	0.00

Summary for Pond 1P: Existing Detention

Inflow Area = 14.990 ac, 0.00% Impervious, Inflow Depth = 2.89" for Jackson - 10 YR event
Inflow = 18.66 cfs @ 11.96 hrs, Volume= 3.614 af
Outflow = 8.69 cfs @ 12.05 hrs, Volume= 3.614 af, Atten= 53%, Lag= 5.3 min
Primary = 8.69 cfs @ 12.05 hrs, Volume= 3.614 af
Routed to Link 1L : Existing Total
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : Existing Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,003.72' @ 12.05 hrs Surf.Area= 5,889 sf Storage= 6,144 cf

Plug-Flow detention time= 3.5 min calculated for 3.613 af (100% of inflow)
Center-of-Mass det. time= 3.5 min (931.3 - 927.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,000.50'	25,061 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

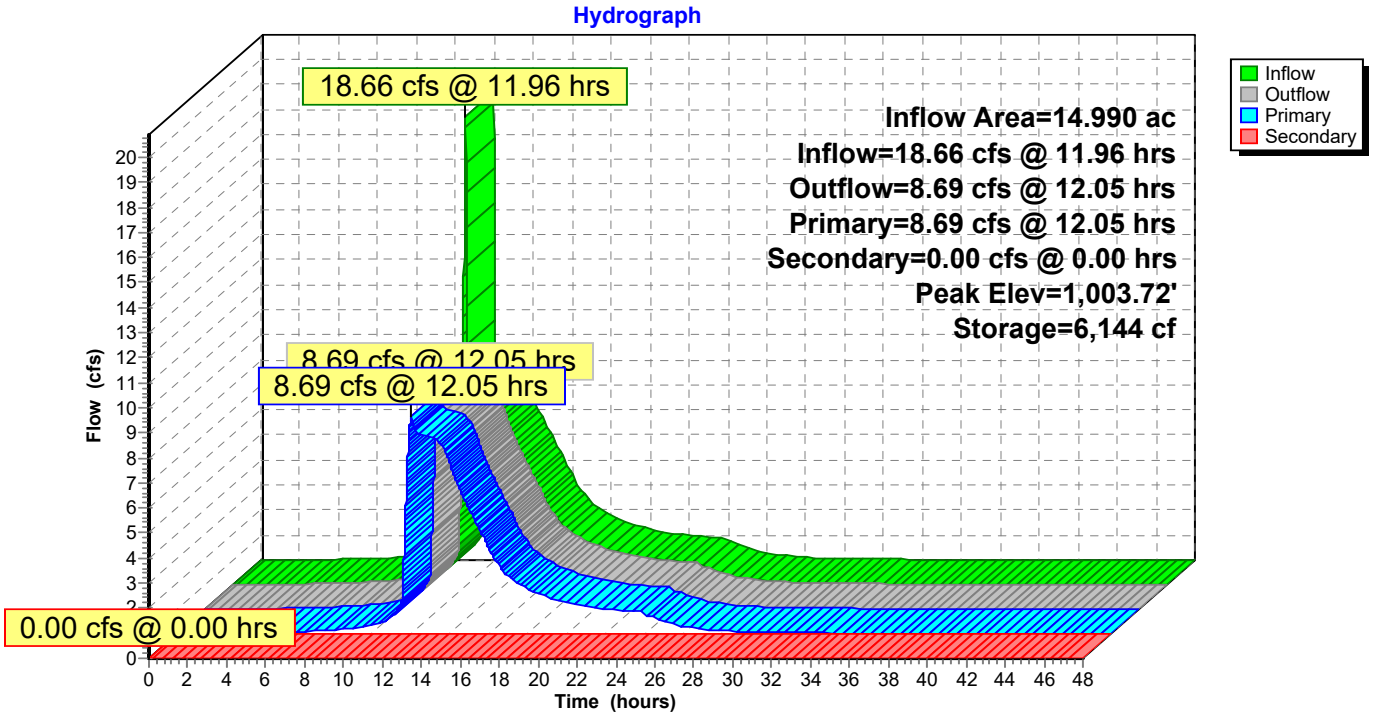
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,000.50	0	0	0
1,002.00	741	556	556
1,003.00	3,603	2,172	2,728
1,004.00	6,778	5,191	7,918
1,005.00	9,485	8,132	16,050
1,006.00	8,537	9,011	25,061

Device	Routing	Invert	Outlet Devices
#0	Secondary	1,006.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	1,000.57'	**12.0" Round Culvert** L= 129.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,000.57' / 998.96' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	1,005.00'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

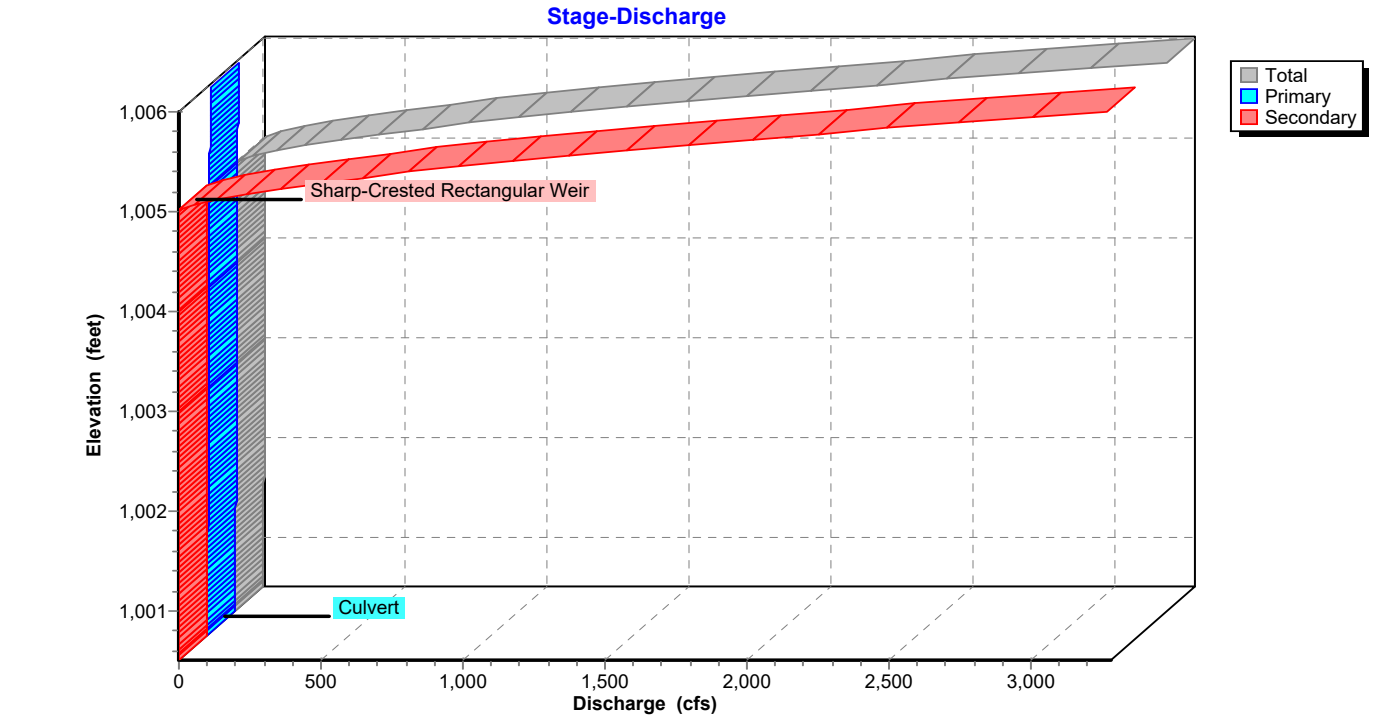
Primary OutFlow Max=8.69 cfs @ 12.05 hrs HW=1,003.72' (Free Discharge)
1=Culvert (Barrel Controls 8.69 cfs @ 7.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,000.50' (Free Discharge)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

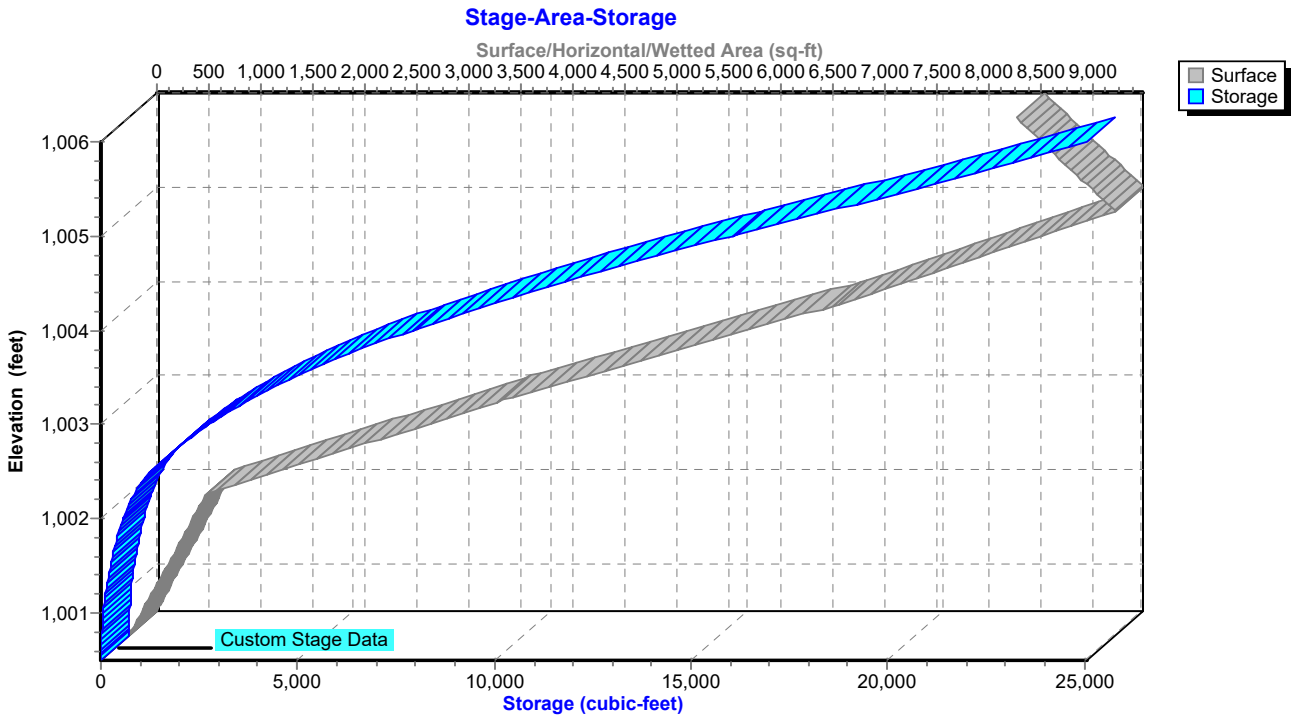
Pond 1P: Existing Detention



Pond 1P: Existing Detention



Pond 1P: Existing Detention



Hydrograph for Pond 1P: Existing Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	1,000.50	0.00	0.00	**0.00**
1.00	0.00	0	1,000.50	0.00	0.00	0.00
2.00	0.00	0	1,000.50	0.00	0.00	0.00
3.00	0.01	4	1,000.62	0.01	0.01	0.00
4.00	0.03	5	1,000.65	0.03	0.03	0.00
5.00	0.05	7	1,000.67	0.05	0.05	0.00
6.00	0.08	10	1,000.69	0.08	0.08	0.00
7.00	0.11	12	1,000.72	0.11	0.11	0.00
8.00	0.14	14	1,000.74	0.14	0.14	0.00
9.00	0.24	21	1,000.79	0.23	0.23	0.00
10.00	0.33	28	1,000.83	0.33	0.33	0.00
11.00	**0.68**	50	1,000.95	0.67	0.67	0.00
12.00	**15.63**	**5,556**	**1,003.62**	**8.56**	**8.56**	0.00
13.00	7.66	**3,130**	**1,003.11**	**7.89**	**7.89**	0.00
14.00	6.35	1,357	1,002.53	6.83	6.83	0.00
15.00	4.93	494	1,001.91	5.01	5.01	0.00
16.00	3.42	271	1,001.55	3.47	3.47	0.00
17.00	2.32	172	1,001.33	2.34	2.34	0.00
18.00	1.80	131	1,001.23	1.80	1.80	0.00
19.00	1.48	107	1,001.16	1.49	1.49	0.00
20.00	1.25	91	1,001.11	1.25	1.25	0.00
21.00	1.09	79	1,001.07	1.09	1.09	0.00
22.00	0.99	73	1,001.04	0.99	0.99	0.00
23.00	0.93	68	1,001.02	0.93	0.93	0.00
24.00	0.88	65	1,001.01	0.88	0.88	0.00
25.00	0.50	39	1,000.90	0.50	0.50	0.00
26.00	0.29	25	1,000.82	0.30	0.30	0.00
27.00	0.19	18	1,000.77	0.19	0.19	0.00
28.00	0.13	13	1,000.73	0.13	0.13	0.00
29.00	0.09	10	1,000.70	0.09	0.09	0.00
30.00	0.07	9	1,000.69	0.07	0.07	0.00
31.00	0.06	8	1,000.68	0.06	0.06	0.00
32.00	0.05	7	1,000.67	0.05	0.05	0.00
33.00	0.04	6	1,000.65	0.04	0.04	0.00
34.00	0.03	5	1,000.64	0.03	0.03	0.00
35.00	0.02	5	1,000.63	0.02	0.02	0.00
36.00	0.02	4	1,000.63	0.02	0.02	0.00
37.00	0.01	4	1,000.62	0.01	0.01	0.00
38.00	0.01	3	1,000.62	0.01	0.01	0.00
39.00	0.01	3	1,000.61	0.01	0.01	0.00
40.00	0.01	3	1,000.61	0.01	0.01	0.00
41.00	0.01	3	1,000.60	0.01	0.01	0.00
42.00	0.00	2	1,000.60	0.00	0.00	0.00
43.00	0.00	2	1,000.59	0.00	0.00	0.00
44.00	0.00	2	1,000.59	0.00	0.00	0.00
45.00	0.00	2	1,000.58	0.00	0.00	0.00
46.00	0.00	2	1,000.58	0.00	0.00	0.00
47.00	0.00	2	1,000.58	0.00	0.00	0.00
48.00	0.00	2	1,000.58	0.00	0.00	0.00

Stage-Discharge for Pond 1P: Existing Detention

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
1,000.50	0.00	0.00	0.00
1,000.60	0.00	0.00	0.00
1,000.70	0.08	0.08	0.00
1,000.80	0.25	0.25	0.00
1,000.90	0.51	0.51	0.00
1,001.00	0.83	0.83	0.00
1,001.10	1.23	1.23	0.00
1,001.20	1.68	1.68	0.00
1,001.30	2.16	2.16	0.00
1,001.40	2.68	2.68	0.00
1,001.50	3.21	3.21	0.00
1,001.60	3.74	3.74	0.00
1,001.70	4.22	4.22	0.00
1,001.80	4.62	4.62	0.00
1,001.90	4.96	4.96	0.00
1,002.00	5.30	5.30	0.00
1,002.10	5.62	5.62	0.00
1,002.20	5.92	5.92	0.00
1,002.30	6.21	6.21	0.00
1,002.40	6.49	6.49	0.00
1,002.50	6.75	6.75	0.00
1,002.60	7.00	7.00	0.00
1,002.70	7.25	7.25	0.00
1,002.80	7.46	7.46	0.00
1,002.90	7.61	7.61	0.00
1,003.00	7.75	7.75	0.00
1,003.10	7.88	7.88	0.00
1,003.20	8.02	8.02	0.00
1,003.30	8.15	8.15	0.00
1,003.40	8.28	8.28	0.00
1,003.50	8.41	8.41	0.00
1,003.60	8.54	8.54	0.00
1,003.70	8.66	8.66	0.00
1,003.80	8.79	8.79	0.00
1,003.90	8.91	8.91	0.00
1,004.00	9.03	9.03	0.00
1,004.10	9.15	9.15	0.00
1,004.20	9.26	9.26	0.00
1,004.30	9.38	9.38	0.00
1,004.40	9.49	9.49	0.00
1,004.50	9.61	9.61	0.00
1,004.60	9.72	9.72	0.00
1,004.70	9.83	9.83	0.00
1,004.80	9.94	9.94	0.00
1,004.90	10.04	10.04	0.00
1,005.00	10.15	10.15	0.00
1,005.10	113.66	10.26	103.40
1,005.20	302.83	10.36	292.47
1,005.30	547.75	10.46	537.28
1,005.40	837.75	10.57	827.19
1,005.50	1,166.67	10.67	1,156.00
1,005.60	1,530.34	10.77	1,519.58
1,005.70	1,925.71	10.87	1,914.85
1,005.80	2,350.41	10.97	2,339.45
1,005.90	2,802.54	11.06	2,791.47
1,006.00	**3,280.51**	**11.16**	**3,269.35**

Stage-Area-Storage for Pond 1P: Existing Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,000.50	0	0
1,000.60	49	2
1,000.70	99	10
1,000.80	148	22
1,000.90	198	40
1,001.00	247	62
1,001.10	296	89
1,001.20	346	121
1,001.30	395	158
1,001.40	445	200
1,001.50	494	247
1,001.60	543	299
1,001.70	593	356
1,001.80	642	417
1,001.90	692	484
1,002.00	741	556
1,002.10	1,027	644
1,002.20	1,313	761
1,002.30	1,600	907
1,002.40	1,886	1,081
1,002.50	2,172	1,284
1,002.60	2,458	1,516
1,002.70	2,744	1,776
1,002.80	3,031	2,064
1,002.90	3,317	2,382
1,003.00	3,603	2,728
1,003.10	3,921	3,104
1,003.20	4,238	3,512
1,003.30	4,555	3,952
1,003.40	4,873	4,423
1,003.50	5,191	4,926
1,003.60	5,508	5,461
1,003.70	5,826	6,028
1,003.80	6,143	6,626
1,003.90	6,460	7,256
1,004.00	6,778	7,918
1,004.10	7,049	8,610
1,004.20	7,319	9,328
1,004.30	7,590	10,073
1,004.40	7,861	10,846
1,004.50	8,132	11,646
1,004.60	8,402	12,472
1,004.70	8,673	13,326
1,004.80	8,944	14,207
1,004.90	9,214	15,115
1,005.00	**9,485**	16,050
1,005.10	9,390	16,994
1,005.20	9,295	17,928
1,005.30	9,201	18,853
1,005.40	9,106	19,768
1,005.50	9,011	20,674
1,005.60	8,916	21,570
1,005.70	8,821	22,457
1,005.80	8,727	23,334
1,005.90	8,632	24,202
1,006.00	8,537	**25,061**

Summary for Pond 6P: Firestone Detention

Inflow Area = 1.020 ac, 0.00% Impervious, Inflow Depth = 3.95" for Jackson - 10 YR event
Inflow = 7.03 cfs @ 11.96 hrs, Volume= 0.336 af
Outflow = 0.21 cfs @ 13.92 hrs, Volume= 0.214 af, Atten= 97%, Lag= 117.6 min
Primary = 0.21 cfs @ 13.92 hrs, Volume= 0.214 af
Routed to Link 1L : Existing Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,013.70' @ 13.92 hrs Surf.Area= 4,137 sf Storage= 9,947 cf

Plug-Flow detention time= 813.7 min calculated for 0.214 af (64% of inflow)
Center-of-Mass det. time= 711.4 min (1,503.2 - 791.7)

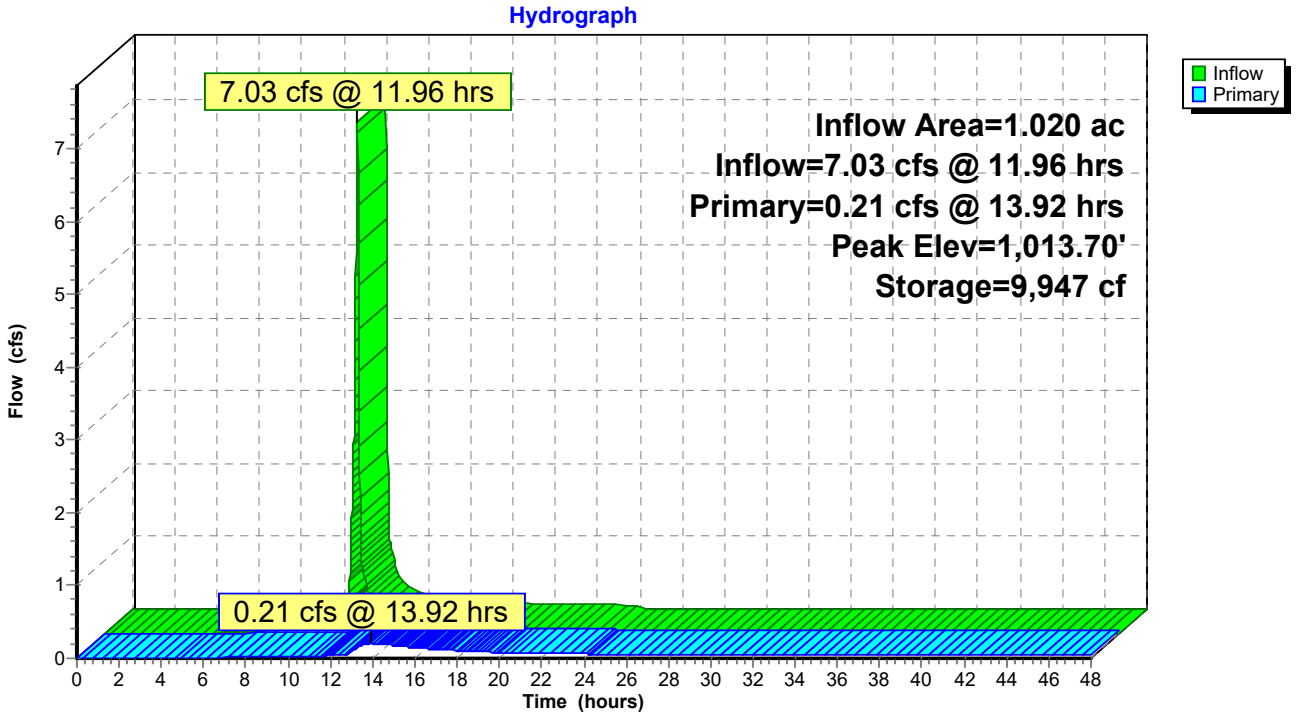
Volume	Invert	Avail.Storage	Storage Description
#1	1,009.54'	22,002 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,009.54	0	0	0
1,010.00	909	209	209
1,011.00	2,085	1,497	1,706
1,012.00	2,776	2,431	4,137
1,013.00	3,504	3,140	7,277
1,014.00	4,409	3,957	11,233
1,015.00	5,525	4,967	16,200
1,016.00	6,079	5,802	22,002

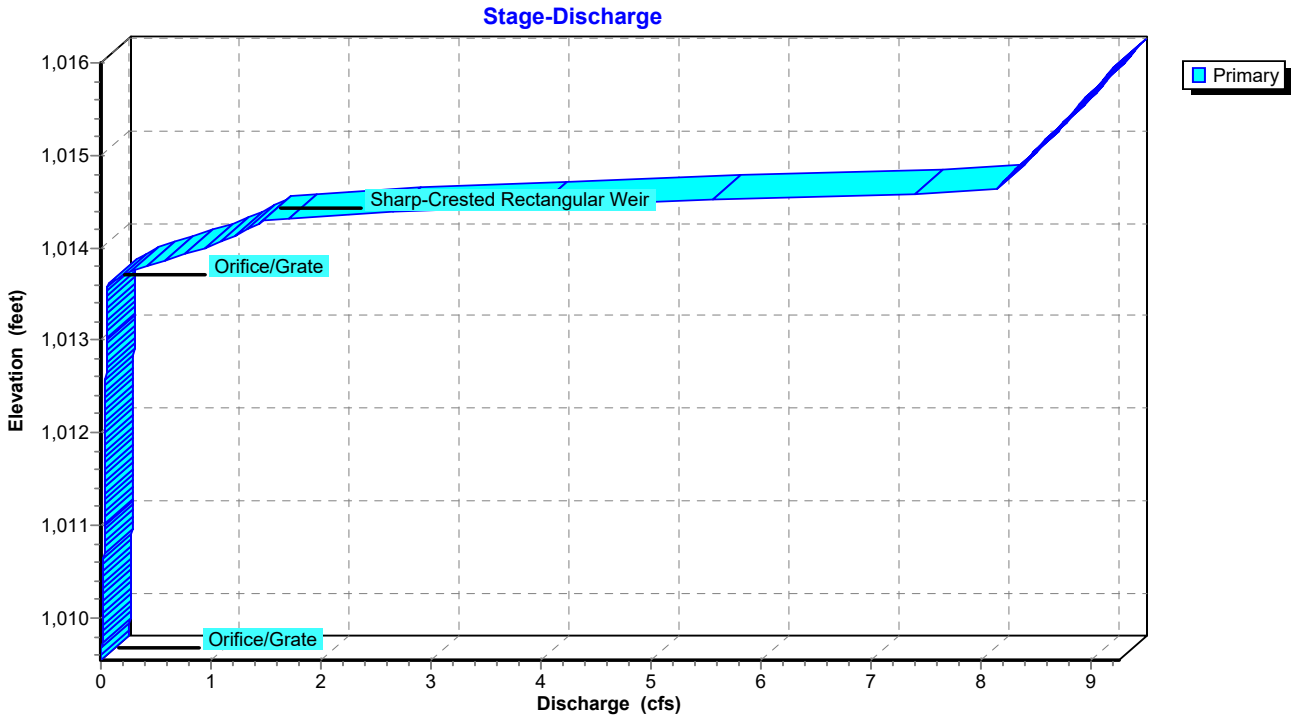
Device	Routing	Invert	Outlet Devices
#1	Primary	1,009.50'	**12.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,009.50' / 1,009.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,009.54'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,013.57'	**12.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,014.29'	**11.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.20 cfs @ 13.92 hrs HW=1,013.70' (Free Discharge)
└**1=Culvert** (Passes 0.20 cfs of 7.27 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.77 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.15 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

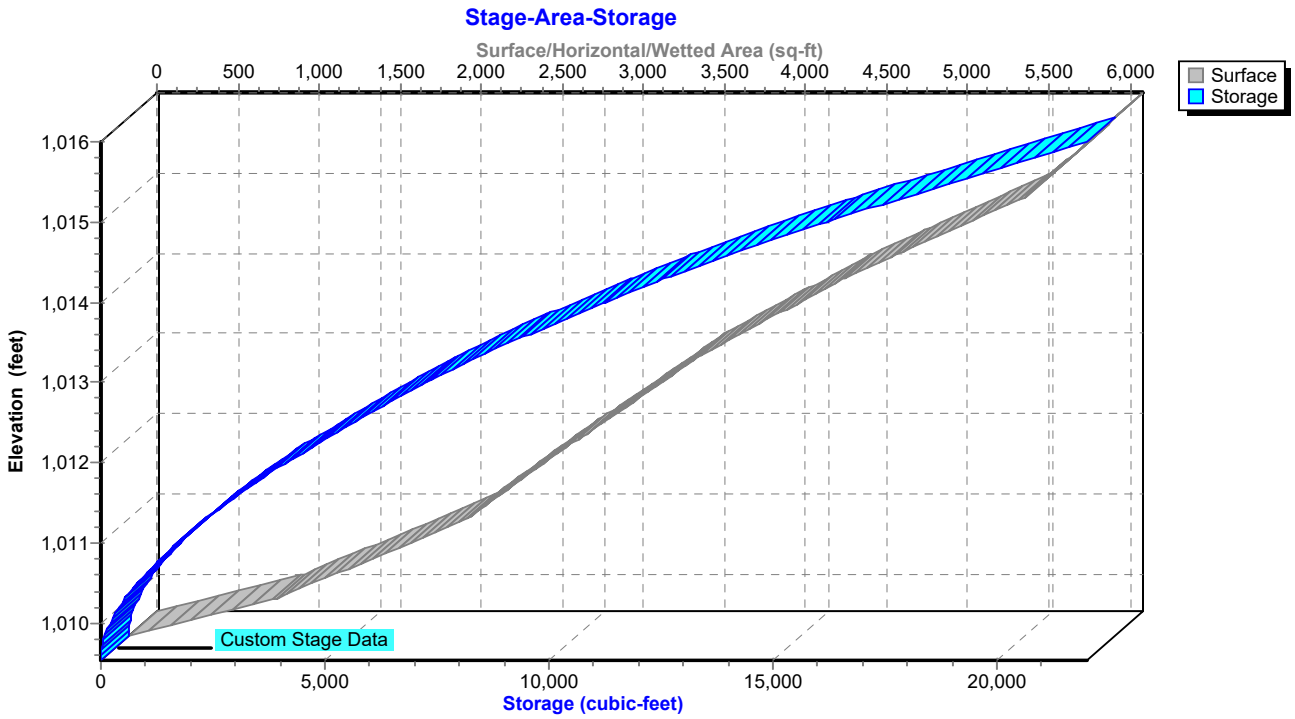
Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Hydrograph for Pond 6P: Firestone Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,009.54	0.00
1.00	0.00	0	1,009.54	0.00
2.00	0.00	0	1,009.54	0.00
3.00	0.00	0	1,009.54	0.00
4.00	0.00	0	1,009.54	0.00
5.00	0.01	4	1,009.60	0.00
6.00	0.02	24	1,009.69	0.01
7.00	0.03	72	1,009.81	0.01
8.00	0.04	155	1,009.94	0.02
9.00	0.08	308	1,010.10	0.02
10.00	0.12	566	1,010.32	0.02
11.00	**0.24**	1,088	1,010.67	0.03
12.00	**5.89**	6,822	1,012.87	0.05
13.00	0.33	**9,664**	**1,013.63**	**0.10**
14.00	0.20	**9,946**	**1,013.70**	**0.20**
15.00	0.16	9,882	1,013.68	0.18
16.00	0.12	9,800	1,013.66	0.15
17.00	0.11	9,724	1,013.64	0.12
18.00	0.09	9,673	1,013.63	0.11
19.00	0.08	9,629	1,013.62	0.09
20.00	0.07	9,587	1,013.61	0.08
21.00	0.07	9,552	1,013.60	0.07
22.00	0.06	9,525	1,013.60	0.07
23.00	0.06	9,503	1,013.59	0.07
24.00	0.06	9,484	1,013.59	0.06
25.00	0.00	9,303	1,013.54	0.05
26.00	0.00	9,116	1,013.49	0.05
27.00	0.00	8,929	1,013.45	0.05
28.00	0.00	8,744	1,013.40	0.05
29.00	0.00	8,560	1,013.35	0.05
30.00	0.00	8,377	1,013.30	0.05
31.00	0.00	8,195	1,013.25	0.05
32.00	0.00	8,015	1,013.21	0.05
33.00	0.00	7,835	1,013.16	0.05
34.00	0.00	7,657	1,013.11	0.05
35.00	0.00	7,480	1,013.06	0.05
36.00	0.00	7,305	1,013.01	0.05
37.00	0.00	7,130	1,012.96	0.05
38.00	0.00	6,957	1,012.91	0.05
39.00	0.00	6,785	1,012.86	0.05
40.00	0.00	6,615	1,012.81	0.05
41.00	0.00	6,446	1,012.76	0.05
42.00	0.00	6,278	1,012.71	0.05
43.00	0.00	6,112	1,012.66	0.05
44.00	0.00	5,947	1,012.60	0.05
45.00	0.00	5,783	1,012.55	0.05
46.00	0.00	5,621	1,012.50	0.04
47.00	0.00	5,460	1,012.45	0.04
48.00	0.00	5,300	1,012.40	0.04

Stage-Discharge for Pond 6P: Firestone Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,009.54	0.00	1,012.19	0.04	1,014.84	8.32
1,009.59	0.00	1,012.24	0.04	1,014.89	8.36
1,009.64	0.01	1,012.29	0.04	1,014.94	8.41
1,009.69	0.01	1,012.34	0.04	1,014.99	8.45
1,009.74	0.01	1,012.39	0.04	1,015.04	8.49
1,009.79	0.01	1,012.44	0.04	1,015.09	8.53
1,009.84	0.01	1,012.49	0.04	1,015.14	8.57
1,009.89	0.01	1,012.54	0.05	1,015.19	8.62
1,009.94	0.02	1,012.59	0.05	1,015.24	8.66
1,009.99	0.02	1,012.64	0.05	1,015.29	8.70
1,010.04	0.02	1,012.69	0.05	1,015.34	8.74
1,010.09	0.02	1,012.74	0.05	1,015.39	8.78
1,010.14	0.02	1,012.79	0.05	1,015.44	8.82
1,010.19	0.02	1,012.84	0.05	1,015.49	8.86
1,010.24	0.02	1,012.89	0.05	1,015.54	8.90
1,010.29	0.02	1,012.94	0.05	1,015.59	8.94
1,010.34	0.02	1,012.99	0.05	1,015.64	8.98
1,010.39	0.02	1,013.04	0.05	1,015.69	9.02
1,010.44	0.02	1,013.09	0.05	1,015.74	9.06
1,010.49	0.03	1,013.14	0.05	1,015.79	9.10
1,010.54	0.03	1,013.19	0.05	1,015.84	9.14
1,010.59	0.03	1,013.24	0.05	1,015.89	9.18
1,010.64	0.03	1,013.29	0.05	1,015.94	9.22
1,010.69	0.03	1,013.34	0.05	1,015.99	**9.26**
1,010.74	0.03	1,013.39	0.05		
1,010.79	0.03	1,013.44	0.05		
1,010.84	0.03	1,013.49	0.05		
1,010.89	0.03	1,013.54	0.05		
1,010.94	0.03	1,013.59	0.06		
1,010.99	0.03	1,013.64	0.11		
1,011.04	0.03	1,013.69	0.19		
1,011.09	0.03	1,013.74	0.28		
1,011.14	0.03	1,013.79	0.39		
1,011.19	0.03	1,013.84	0.50		
1,011.24	0.03	1,013.89	0.64		
1,011.29	0.03	1,013.94	0.78		
1,011.34	0.03	1,013.99	0.93		
1,011.39	0.04	1,014.04	1.05		
1,011.44	0.04	1,014.09	1.15		
1,011.49	0.04	1,014.14	1.24		
1,011.54	0.04	1,014.19	1.33		
1,011.59	0.04	1,014.24	1.41		
1,011.64	0.04	1,014.29	1.48		
1,011.69	0.04	1,014.34	1.95		
1,011.74	0.04	1,014.39	2.75		
1,011.79	0.04	1,014.44	3.77		
1,011.84	0.04	1,014.49	4.95		
1,011.89	0.04	1,014.54	6.28		
1,011.94	0.04	1,014.59	7.74		
1,011.99	0.04	1,014.64	8.15		
1,012.04	0.04	1,014.69	8.19		
1,012.09	0.04	1,014.74	8.23		
1,012.14	0.04	1,014.79	8.28		

Stage-Area-Storage for Pond 6P: Firestone Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,009.54	0	0
1,009.64	198	10
1,009.74	395	40
1,009.84	593	89
1,009.94	790	158
1,010.04	956	246
1,010.14	1,074	348
1,010.24	1,191	461
1,010.34	1,309	586
1,010.44	1,426	723
1,010.54	1,544	871
1,010.64	1,662	1,032
1,010.74	1,779	1,204
1,010.84	1,897	1,388
1,010.94	2,014	1,583
1,011.04	2,113	1,790
1,011.14	2,182	2,005
1,011.24	2,251	2,226
1,011.34	2,320	2,455
1,011.44	2,389	2,690
1,011.54	2,458	2,933
1,011.64	2,527	3,182
1,011.74	2,596	3,438
1,011.84	2,665	3,701
1,011.94	2,735	3,971
1,012.04	2,805	4,248
1,012.14	2,878	4,532
1,012.24	2,951	4,824
1,012.34	3,024	5,122
1,012.44	3,096	5,428
1,012.54	3,169	5,742
1,012.64	3,242	6,062
1,012.74	3,315	6,390
1,012.84	3,388	6,725
1,012.94	3,460	7,068
1,013.04	3,540	7,417
1,013.14	3,631	7,776
1,013.24	3,721	8,144
1,013.34	3,812	8,520
1,013.44	3,902	8,906
1,013.54	3,993	9,301
1,013.64	4,083	9,704
1,013.74	4,174	10,117
1,013.84	4,264	10,539
1,013.94	4,355	10,970
1,014.04	4,454	11,410
1,014.14	4,565	11,861
1,014.24	4,677	12,323
1,014.34	4,788	12,797
1,014.44	4,900	13,281
1,014.54	5,012	13,777
1,014.64	5,123	14,283
1,014.74	5,235	14,801
1,014.84	5,346	15,330
1,014.94	5,458	15,871
1,015.04	5,547	16,422
1,015.14	5,603	16,979
1,015.24	5,658	17,542
1,015.34	5,713	18,111
1,015.44	5,769	18,685
1,015.54	5,824	19,264
1,015.64	5,880	19,850
1,015.74	5,935	20,440
1,015.84	5,990	21,037
1,015.94	**6,046**	**21,638**

Summary for Pond 8P: Walmart Detention

Inflow Area = 12.230 ac, 0.00% Impervious, Inflow Depth = 3.35" for Jackson - 10 YR event
Inflow = 39.89 cfs @ 12.18 hrs, Volume= 3.413 af
Outflow = 6.83 cfs @ 12.83 hrs, Volume= 2.698 af, Atten= 83%, Lag= 39.3 min
Primary = 6.83 cfs @ 12.83 hrs, Volume= 2.698 af
Routed to Pond 1P : Existing Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,012.92' @ 12.83 hrs Surf.Area= 20,624 sf Storage= 77,205 cf

Plug-Flow detention time= 232.5 min calculated for 2.697 af (79% of inflow)
Center-of-Mass det. time= 148.6 min (977.0 - 828.4)

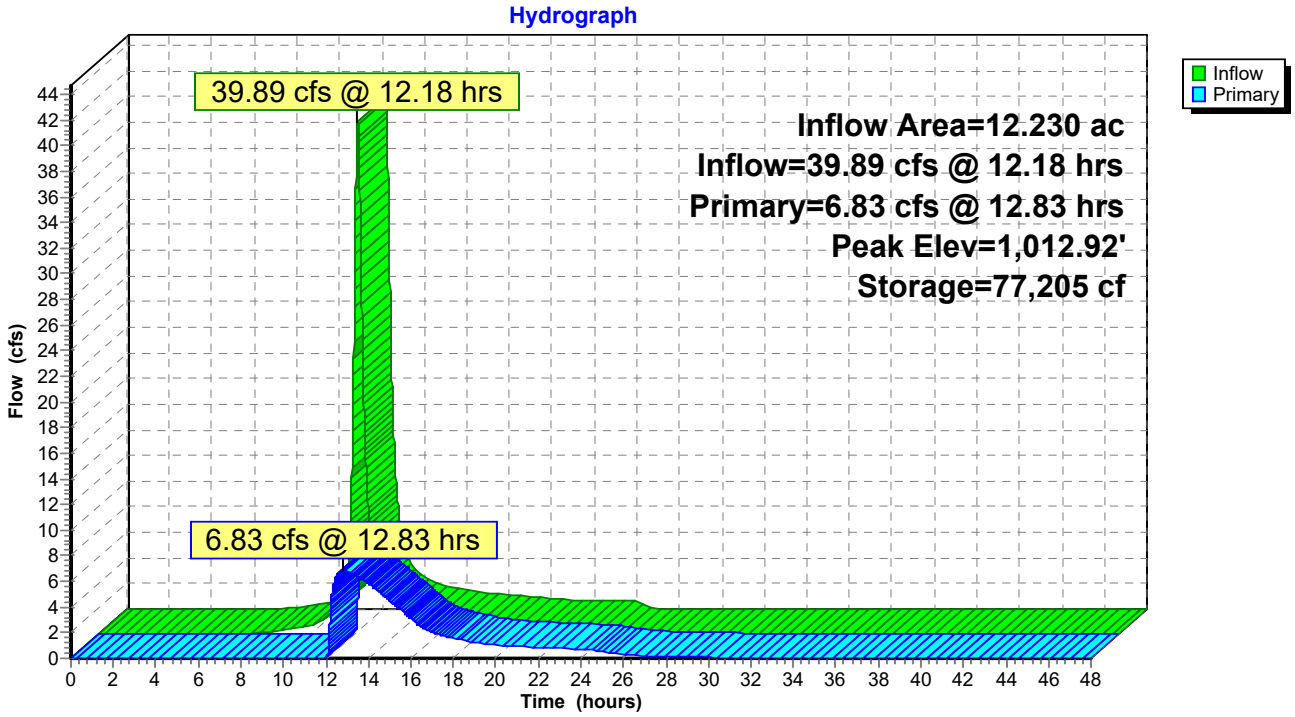
Volume	Invert	Avail.Storage	Storage Description
#1	1,005.00'	150,049 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,005.00	0	0	0
1,006.00	627	314	314
1,007.00	1,983	1,305	1,619
1,008.00	5,044	3,514	5,132
1,009.00	10,030	7,537	12,669
1,010.00	14,662	12,346	25,015
1,010.40	15,976	6,128	31,143
1,011.00	17,049	9,908	41,050
1,011.46	17,886	8,035	49,085
1,012.00	18,879	9,927	59,012
1,013.00	20,773	19,826	78,838
1,014.00	22,710	21,742	100,579
1,015.00	24,723	23,717	124,296
1,016.00	26,783	25,753	150,049

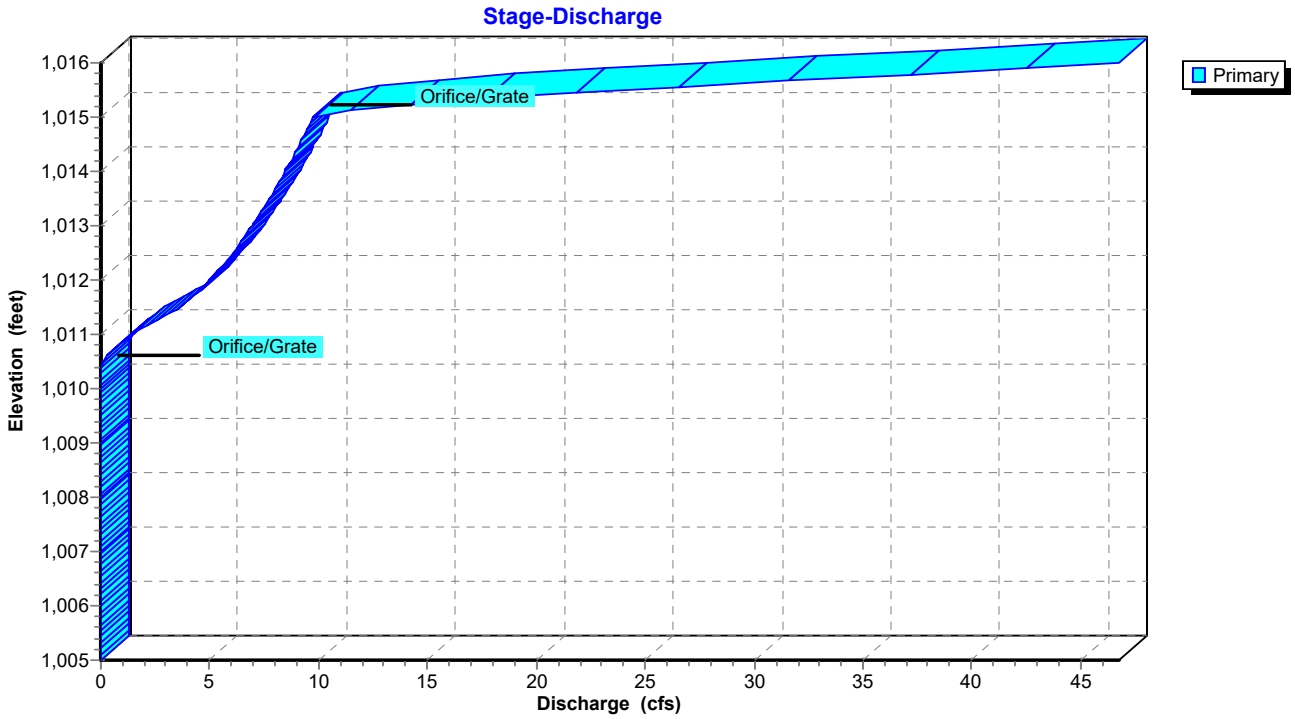
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.83'	**30.0" Round Culvert** L= 87.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,004.83' / 1,004.48' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	1,010.40'	**12.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,015.00'	**144.0" W x 10.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.83 cfs @ 12.83 hrs HW=1,012.92' (Free Discharge)
↑**1=Culvert** (Passes 6.83 cfs of 61.82 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 6.83 cfs @ 6.83 fps)
3=Orifice/Grate (Controls 0.00 cfs)

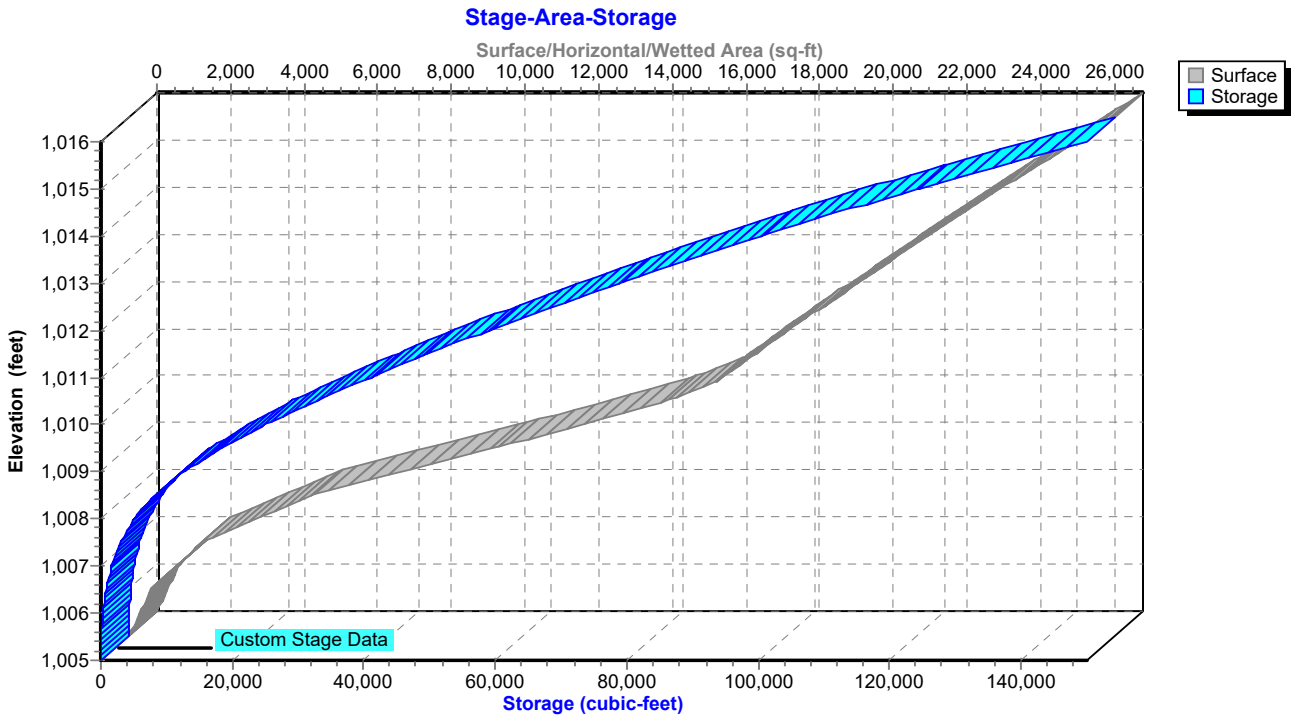
Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Hydrograph for Pond 8P: Walmart Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,005.00	0.00
1.00	0.00	0	1,005.00	0.00
2.00	0.00	0	1,005.00	0.00
3.00	0.00	0	1,005.00	0.00
4.00	0.00	0	1,005.00	0.00
5.00	0.00	0	1,005.00	0.00
6.00	0.00	0	1,005.00	0.00
7.00	0.05	48	1,005.39	0.00
8.00	0.18	450	1,006.18	0.00
9.00	0.39	1,413	1,006.89	0.00
10.00	0.70	3,356	1,007.60	0.00
11.00	1.56	7,137	1,008.34	0.00
12.00	**22.82**	**24,319**	**1,009.95**	**0.00**
13.00	**5.20**	**76,675**	**1,012.90**	**6.78**
14.00	2.55	66,291	1,012.38	5.83
15.00	1.87	55,316	1,011.80	4.51
16.00	1.48	47,606	1,011.38	3.10
17.00	1.24	43,424	1,011.14	2.04
18.00	1.10	41,291	1,011.01	1.55
19.00	0.96	39,982	1,010.94	1.26
20.00	0.82	38,995	1,010.88	1.07
21.00	0.74	38,216	1,010.83	0.91
22.00	0.72	37,729	1,010.80	0.83
23.00	0.69	37,397	1,010.78	0.77
24.00	0.66	37,146	1,010.77	0.72
25.00	0.01	35,774	1,010.69	0.50
26.00	0.00	34,399	1,010.60	0.29
27.00	0.00	33,537	1,010.55	0.19
28.00	0.00	32,969	1,010.51	0.13
29.00	0.00	32,589	1,010.49	0.09
30.00	0.00	32,294	1,010.47	0.07
31.00	0.00	32,060	1,010.46	0.06
32.00	0.00	31,873	1,010.45	0.05
33.00	0.00	31,725	1,010.44	0.04
34.00	0.00	31,606	1,010.43	0.03
35.00	0.00	31,512	1,010.42	0.02
36.00	0.00	31,437	1,010.42	0.02
37.00	0.00	31,377	1,010.41	0.01
38.00	0.00	31,329	1,010.41	0.01
39.00	0.00	31,291	1,010.41	0.01
40.00	0.00	31,261	1,010.41	0.01
41.00	0.00	31,237	1,010.41	0.01
42.00	0.00	31,218	1,010.40	0.00
43.00	0.00	31,202	1,010.40	0.00
44.00	0.00	31,190	1,010.40	0.00
45.00	0.00	31,181	1,010.40	0.00
46.00	0.00	31,173	1,010.40	0.00
47.00	0.00	31,167	1,010.40	0.00
48.00	0.00	31,162	1,010.40	0.00

Stage-Discharge for Pond 8P: Walmart Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,005.00	0.00	1,010.30	0.00	1,015.60	28.34
1,005.10	0.00	1,010.40	0.00	1,015.70	33.10
1,005.20	0.00	1,010.50	0.10	1,015.80	38.22
1,005.30	0.00	1,010.60	0.29	1,015.90	42.99
1,005.40	0.00	1,010.70	0.53	1,016.00	**46.77**
1,005.50	0.00	1,010.80	0.81		
1,005.60	0.00	1,010.90	1.13		
1,005.70	0.00	1,011.00	1.49		
1,005.80	0.00	1,011.10	1.88		
1,005.90	0.00	1,011.20	2.30		
1,006.00	0.00	1,011.30	2.74		
1,006.10	0.00	1,011.40	3.21		
1,006.20	0.00	1,011.50	3.60		
1,006.30	0.00	1,011.60	3.93		
1,006.40	0.00	1,011.70	4.23		
1,006.50	0.00	1,011.80	4.51		
1,006.60	0.00	1,011.90	4.76		
1,006.70	0.00	1,012.00	5.00		
1,006.80	0.00	1,012.10	5.24		
1,006.90	0.00	1,012.20	5.46		
1,007.00	0.00	1,012.30	5.67		
1,007.10	0.00	1,012.40	5.87		
1,007.20	0.00	1,012.50	6.07		
1,007.30	0.00	1,012.60	6.25		
1,007.40	0.00	1,012.70	6.44		
1,007.50	0.00	1,012.80	6.62		
1,007.60	0.00	1,012.90	6.79		
1,007.70	0.00	1,013.00	6.96		
1,007.80	0.00	1,013.10	7.13		
1,007.90	0.00	1,013.20	7.29		
1,008.00	0.00	1,013.30	7.45		
1,008.10	0.00	1,013.40	7.60		
1,008.20	0.00	1,013.50	7.75		
1,008.30	0.00	1,013.60	7.90		
1,008.40	0.00	1,013.70	8.05		
1,008.50	0.00	1,013.80	8.19		
1,008.60	0.00	1,013.90	8.33		
1,008.70	0.00	1,014.00	8.47		
1,008.80	0.00	1,014.10	8.60		
1,008.90	0.00	1,014.20	8.74		
1,009.00	0.00	1,014.30	8.87		
1,009.10	0.00	1,014.40	9.00		
1,009.20	0.00	1,014.50	9.13		
1,009.30	0.00	1,014.60	9.25		
1,009.40	0.00	1,014.70	9.38		
1,009.50	0.00	1,014.80	9.50		
1,009.60	0.00	1,014.90	9.62		
1,009.70	0.00	1,015.00	9.74		
1,009.80	0.00	1,015.10	11.08		
1,009.90	0.00	1,015.20	13.42		
1,010.00	0.00	1,015.30	16.42		
1,010.10	0.00	1,015.40	19.95		
1,010.20	0.00	1,015.50	23.94		

Stage-Area-Storage for Pond 8P: Walmart Detention

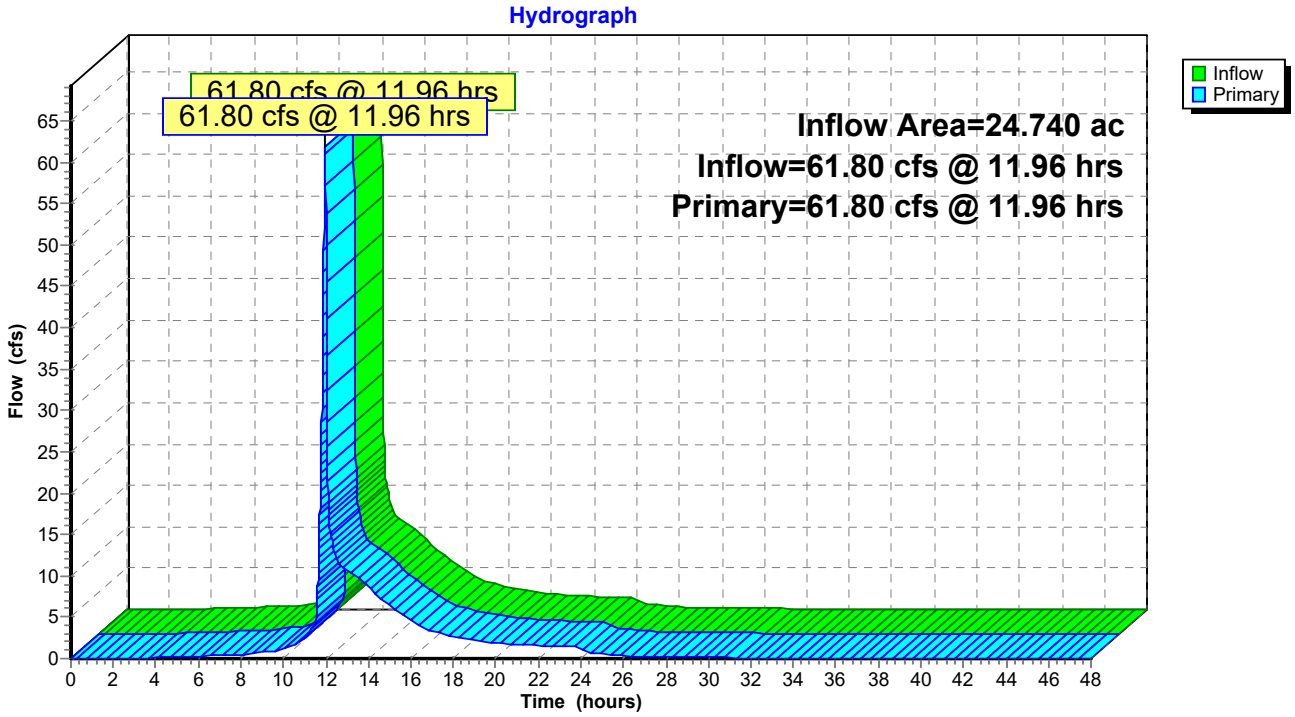
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,005.00	0	0
1,005.20	125	13
1,005.40	251	50
1,005.60	376	113
1,005.80	502	201
1,006.00	627	314
1,006.20	898	466
1,006.40	1,169	673
1,006.60	1,441	934
1,006.80	1,712	1,249
1,007.00	1,983	1,619
1,007.20	2,595	2,076
1,007.40	3,207	2,657
1,007.60	3,820	3,359
1,007.80	4,432	4,184
1,008.00	5,044	5,132
1,008.20	6,041	6,241
1,008.40	7,038	7,548
1,008.60	8,036	9,056
1,008.80	9,033	10,763
1,009.00	10,030	12,669
1,009.20	10,956	14,768
1,009.40	11,883	17,052
1,009.60	12,809	19,521
1,009.80	13,736	22,175
1,010.00	14,662	25,015
1,010.20	15,319	28,013
1,010.40	15,976	31,143
1,010.60	16,334	34,374
1,010.80	16,691	37,676
1,011.00	17,049	41,050
1,011.20	17,413	44,496
1,011.40	17,777	48,015
1,011.60	18,143	51,607
1,011.80	18,511	55,273
1,012.00	18,879	59,012
1,012.20	19,258	62,825
1,012.40	19,637	66,715
1,012.60	20,015	70,680
1,012.80	20,394	74,721
1,013.00	20,773	78,838
1,013.20	21,160	83,031
1,013.40	21,548	87,302
1,013.60	21,935	91,650
1,013.80	22,323	96,076
1,014.00	22,710	100,579
1,014.20	23,113	105,161
1,014.40	23,515	109,824
1,014.60	23,918	114,568
1,014.80	24,320	119,391
1,015.00	24,723	124,296
1,015.20	25,135	129,282
1,015.40	25,547	134,350
1,015.60	25,959	139,500
1,015.80	26,371	144,733
1,016.00	**26,783**	**150,049**

Summary for Link 1L: Existing Total

Inflow Area = 24.740 ac, 0.00% Impervious, Inflow Depth > 3.12" for Jackson - 10 YR event
Inflow = 61.80 cfs @ 11.96 hrs, Volume= 6.423 af
Primary = 61.80 cfs @ 11.96 hrs, Volume= 6.423 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Existing Total



Hydrograph for Link 1L: Existing Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.50	0.29	0.00	0.29
0.50	0.00	0.00	0.00	27.00	0.25	0.00	0.25
1.00	0.00	0.00	0.00	27.50	0.21	0.00	0.21
1.50	0.00	0.00	0.00	28.00	0.18	0.00	0.18
2.00	0.00	0.00	0.00	28.50	0.16	0.00	0.16
2.50	0.02	0.00	0.02	29.00	0.14	0.00	0.14
3.00	0.05	0.00	0.05	29.50	0.13	0.00	0.13
3.50	0.09	0.00	0.09	30.00	0.12	0.00	0.12
4.00	0.12	0.00	0.12	30.50	0.12	0.00	0.12
4.50	0.16	0.00	0.16	31.00	0.11	0.00	0.11
5.00	0.21	0.00	0.21	31.50	0.10	0.00	0.10
5.50	0.25	0.00	0.25	32.00	0.10	0.00	0.10
6.00	0.30	0.00	0.30	32.50	0.09	0.00	0.09
6.50	0.35	0.00	0.35	33.00	0.09	0.00	0.09
7.00	0.40	0.00	0.40	33.50	0.08	0.00	0.08
7.50	0.45	0.00	0.45	34.00	0.08	0.00	0.08
8.00	0.49	0.00	0.49	34.50	0.08	0.00	0.08
8.50	0.62	0.00	0.62	35.00	0.07	0.00	0.07
9.00	0.80	0.00	0.80	35.50	0.07	0.00	0.07
9.50	0.90	0.00	0.90	36.00	0.07	0.00	0.07
10.00	1.17	0.00	1.17	36.50	0.07	0.00	0.07
10.50	1.63	0.00	1.63	37.00	0.06	0.00	0.06
11.00	2.43	0.00	2.43	37.50	0.06	0.00	0.06
11.50	**4.33**	0.00	**4.33**	38.00	0.06	0.00	0.06
12.00	**53.79**	0.00	**53.79**	38.50	0.06	0.00	0.06
12.50	12.15	0.00	12.15	39.00	0.06	0.00	0.06
13.00	10.59	0.00	10.59	39.50	0.06	0.00	0.06
13.50	9.77	0.00	9.77	40.00	0.05	0.00	0.05
14.00	8.60	0.00	8.60	40.50	0.05	0.00	0.05
14.50	7.44	0.00	7.44	41.00	0.05	0.00	0.05
15.00	6.43	0.00	6.43	41.50	0.05	0.00	0.05
15.50	5.52	0.00	5.52	42.00	0.05	0.00	0.05
16.00	4.58	0.00	4.58	42.50	0.05	0.00	0.05
16.50	3.82	0.00	3.82	43.00	0.05	0.00	0.05
17.00	3.31	0.00	3.31	43.50	0.05	0.00	0.05
17.50	2.95	0.00	2.95	44.00	0.05	0.00	0.05
18.00	2.66	0.00	2.66	44.50	0.05	0.00	0.05
18.50	2.43	0.00	2.43	45.00	0.05	0.00	0.05
19.00	2.23	0.00	2.23	45.50	0.05	0.00	0.05
19.50	2.05	0.00	2.05	46.00	0.05	0.00	0.05
20.00	1.88	0.00	1.88	46.50	0.05	0.00	0.05
20.50	1.77	0.00	1.77	47.00	0.05	0.00	0.05
21.00	1.68	0.00	1.68	47.50	0.05	0.00	0.05
21.50	1.62	0.00	1.62	48.00	0.05	0.00	0.05
22.00	1.56	0.00	1.56				
22.50	1.52	0.00	1.52				
23.00	1.48	0.00	1.48				
23.50	1.44	0.00	1.44				
24.00	1.40	0.00	1.40				
24.50	0.70	0.00	0.70				
25.00	0.55	0.00	0.55				
25.50	0.43	0.00	0.43				
26.00	0.35	0.00	0.35				

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Onsite Detention Runoff Area=0.500 ac 0.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=74 Runoff=4.24 cfs 0.194 af

Subcatchment 2S: Walmart Bypass Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=5.81"
Tc=5.0 min CN=84 Runoff=5.44 cfs 0.261 af

Subcatchment 3S: Existing Onsite Bypass Runoff Area=4.530 ac 0.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=74 Runoff=38.41 cfs 1.758 af

Subcatchment 4S: Firestone Bypass Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=6.28"
Tc=5.0 min CN=88 Runoff=2.33 cfs 0.115 af

Subcatchment 5S: Firestone Detention Runoff Area=1.020 ac 0.00% Impervious Runoff Depth=6.28"
Tc=5.0 min CN=88 Runoff=10.81 cfs 0.533 af

Subcatchment 6S: Market Street RW Runoff Area=1.500 ac 0.00% Impervious Runoff Depth=6.98"
Tc=5.0 min CN=94 Runoff=16.73 cfs 0.873 af

Subcatchment 7S: Walmart Detention Runoff Area=12.230 ac 0.00% Impervious Runoff Depth=5.58"
Tc=24.9 min CN=82 Runoff=65.61 cfs 5.682 af

Subcatchment 9S: Commercial Plus RW Runoff Area=4.200 ac 0.00% Impervious Runoff Depth=6.98"
Tc=5.0 min CN=94 Runoff=46.85 cfs 2.444 af

Pond 1P: Existing Detention Peak Elev=1,005.01' Storage=16,169 cf Inflow=30.96 cfs 6.410 af
Primary=10.16 cfs 6.148 af Secondary=5.64 cfs 0.262 af Outflow=15.80 cfs 6.410 af

Pond 6P: Firestone Detention Peak Elev=1,014.33' Storage=12,727 cf Inflow=10.81 cfs 0.533 af
Outflow=1.79 cfs 0.410 af

Pond 8P: Walmart Detention Peak Elev=1,015.23' Storage=129,948 cf Inflow=65.61 cfs 5.682 af
Outflow=14.17 cfs 4.967 af

Link 1L: Existing Total Inflow=94.73 cfs 11.023 af
Primary=94.73 cfs 11.023 af

Total Runoff Area = 24.740 ac Runoff Volume = 11.862 af Average Runoff Depth = 5.75"
100.00% Pervious = 24.740 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Existing Onsite Detention

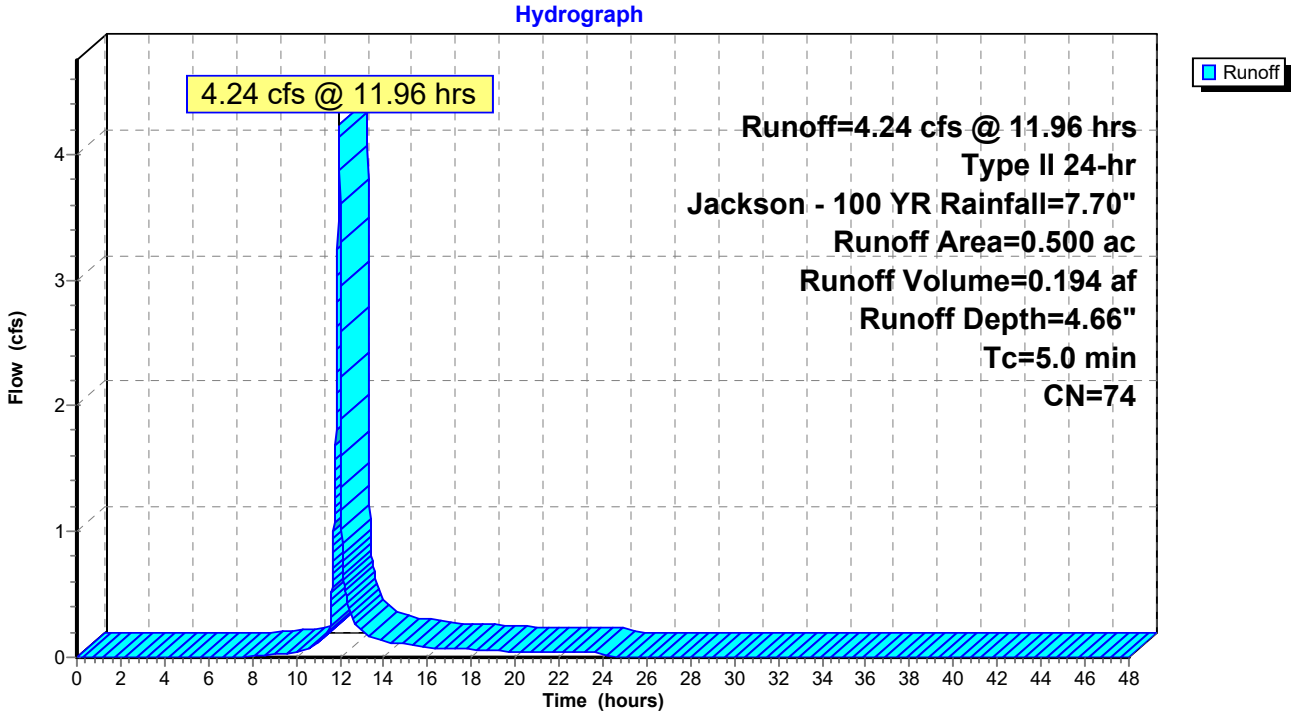
Runoff = 4.24 cfs @ 11.96 hrs, Volume= 0.194 af, Depth= 4.66"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

Area (ac)	CN	Description
0.500	74	>75% Grass cover, Good, HSG C
0.500		100.00% Pervious Area

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

Subcatchment 1S: Existing Onsite Detention



Hydrograph for Subcatchment 1S: Existing Onsite Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.00	0.00
4.50	0.43	0.00	0.00
5.00	0.49	0.00	0.00
5.50	0.55	0.00	0.00
6.00	0.62	0.00	0.00
6.50	0.69	0.00	0.00
7.00	0.76	0.00	0.00
7.50	0.84	0.01	0.01
8.00	0.92	0.01	0.01
8.50	1.02	0.03	0.02
9.00	1.13	0.05	0.02
9.50	1.26	0.08	0.03
10.00	1.39	0.11	0.04
10.50	1.57	0.17	0.07
11.00	1.81	0.27	0.11
11.50	2.18	0.44	**0.21**
12.00	5.11	2.45	**3.61**
12.50	5.66	2.90	0.34
13.00	5.94	3.14	0.21
13.50	6.15	3.31	0.16
14.00	6.31	3.45	0.13
14.50	6.45	3.57	0.11
15.00	6.57	3.67	0.10
15.50	6.68	3.77	0.09
16.00	6.78	3.85	0.08
16.50	6.86	3.92	0.07
17.00	6.94	3.99	0.07
17.50	7.02	4.06	0.07
18.00	7.09	4.12	0.06
18.50	7.16	4.18	0.06
19.00	7.22	4.24	0.05
19.50	7.28	4.29	0.05
20.00	7.33	4.33	0.05
20.50	7.38	4.38	0.04
21.00	7.43	4.42	0.04
21.50	7.48	4.46	0.04
22.00	7.52	4.50	0.04
22.50	7.57	4.54	0.04
23.00	7.61	4.58	0.04
23.50	7.66	4.62	0.04
24.00	**7.70**	**4.66**	0.04
24.50	7.70	4.66	0.00
25.00	7.70	4.66	0.00
25.50	7.70	4.66	0.00
26.00	7.70	4.66	0.00
26.50	7.70	4.66	0.00
27.00	7.70	4.66	0.00
27.50	7.70	4.66	0.00
28.00	7.70	4.66	0.00
28.50	7.70	4.66	0.00
29.00	7.70	4.66	0.00
29.50	7.70	4.66	0.00
30.00	7.70	4.66	0.00
30.50	7.70	4.66	0.00
31.00	7.70	4.66	0.00
31.50	7.70	4.66	0.00
32.00	7.70	4.66	0.00
32.50	7.70	4.66	0.00
33.00	7.70	4.66	0.00
33.50	7.70	4.66	0.00
34.00	7.70	4.66	0.00
34.50	7.70	4.66	0.00
35.00	7.70	4.66	0.00
35.50	7.70	4.66	0.00
36.00	7.70	4.66	0.00
36.50	7.70	4.66	0.00
37.00	7.70	4.66	0.00
37.50	7.70	4.66	0.00
38.00	7.70	4.66	0.00
38.50	7.70	4.66	0.00
39.00	7.70	4.66	0.00
39.50	7.70	4.66	0.00
40.00	7.70	4.66	0.00
40.50	7.70	4.66	0.00
41.00	7.70	4.66	0.00
41.50	7.70	4.66	0.00
42.00	7.70	4.66	0.00
42.50	7.70	4.66	0.00
43.00	7.70	4.66	0.00
43.50	7.70	4.66	0.00
44.00	7.70	4.66	0.00
44.50	7.70	4.66	0.00
45.00	7.70	4.66	0.00
45.50	7.70	4.66	0.00
46.00	7.70	4.66	0.00
46.50	7.70	4.66	0.00
47.00	7.70	4.66	0.00
47.50	7.70	4.66	0.00
48.00	7.70	4.66	0.00

Summary for Subcatchment 2S: Walmart Bypass

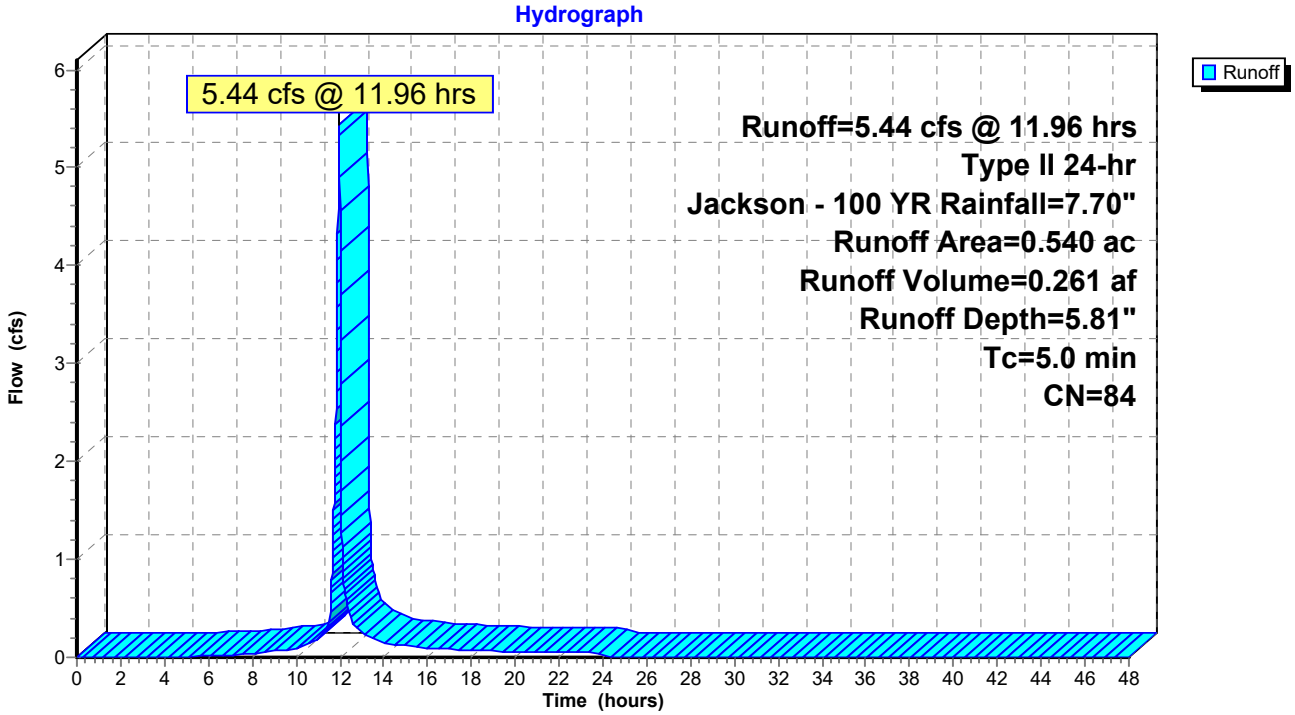
Runoff = 5.44 cfs @ 11.96 hrs, Volume= 0.261 af, Depth= 5.81"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	0.540	84	
	0.540		100.00% Pervious Area

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

Subcatchment 2S: Walmart Bypass



Hydrograph for Subcatchment 2S: Walmart Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.00	0.00
4.50	0.43	0.00	0.00
5.00	0.49	0.01	0.01
5.50	0.55	0.01	0.01
6.00	0.62	0.03	0.01
6.50	0.69	0.04	0.02
7.00	0.76	0.06	0.02
7.50	0.84	0.09	0.03
8.00	0.92	0.12	0.04
8.50	1.02	0.16	0.05
9.00	1.13	0.21	0.06
9.50	1.26	0.27	0.07
10.00	1.39	0.35	0.09
10.50	1.57	0.46	0.13
11.00	1.81	0.61	0.19
11.50	2.18	0.87	**0.34**
12.00	5.11	3.37	**4.56**
12.50	5.66	3.88	0.41
13.00	5.94	4.14	0.25
13.50	6.15	4.34	0.19
14.00	6.31	4.49	0.15
14.50	6.45	4.62	0.13
15.00	6.57	4.73	0.12
15.50	6.68	4.84	0.11
16.00	6.78	4.93	0.09
16.50	6.86	5.01	0.09
17.00	6.94	5.09	0.08
17.50	7.02	5.16	0.08
18.00	7.09	5.23	0.07
18.50	7.16	5.29	0.07
19.00	7.22	5.35	0.06
19.50	7.28	5.40	0.06
20.00	7.33	5.45	0.05
20.50	7.38	5.50	0.05
21.00	7.43	5.55	0.05
21.50	7.48	5.59	0.05
22.00	7.52	5.64	0.05
22.50	7.57	5.68	0.05
23.00	7.61	5.72	0.05
23.50	7.66	5.77	0.05
24.00	**7.70**	**5.81**	0.04
24.50	7.70	5.81	0.00
25.00	7.70	5.81	0.00
25.50	7.70	5.81	0.00
26.00	7.70	5.81	0.00
26.50	7.70	5.81	0.00
27.00	7.70	5.81	0.00
27.50	7.70	5.81	0.00
28.00	7.70	5.81	0.00
28.50	7.70	5.81	0.00
29.00	7.70	5.81	0.00
29.50	7.70	5.81	0.00
30.00	7.70	5.81	0.00
30.50	7.70	5.81	0.00
31.00	7.70	5.81	0.00
31.50	7.70	5.81	0.00
32.00	7.70	5.81	0.00
32.50	7.70	5.81	0.00
33.00	7.70	5.81	0.00
33.50	7.70	5.81	0.00
34.00	7.70	5.81	0.00
34.50	7.70	5.81	0.00
35.00	7.70	5.81	0.00
35.50	7.70	5.81	0.00
36.00	7.70	5.81	0.00
36.50	7.70	5.81	0.00
37.00	7.70	5.81	0.00
37.50	7.70	5.81	0.00
38.00	7.70	5.81	0.00
38.50	7.70	5.81	0.00
39.00	7.70	5.81	0.00
39.50	7.70	5.81	0.00
40.00	7.70	5.81	0.00
40.50	7.70	5.81	0.00
41.00	7.70	5.81	0.00
41.50	7.70	5.81	0.00
42.00	7.70	5.81	0.00
42.50	7.70	5.81	0.00
43.00	7.70	5.81	0.00
43.50	7.70	5.81	0.00
44.00	7.70	5.81	0.00
44.50	7.70	5.81	0.00
45.00	7.70	5.81	0.00
45.50	7.70	5.81	0.00
46.00	7.70	5.81	0.00
46.50	7.70	5.81	0.00
47.00	7.70	5.81	0.00
47.50	7.70	5.81	0.00
48.00	7.70	5.81	0.00

Summary for Subcatchment 3S: Existing Onsite Bypass

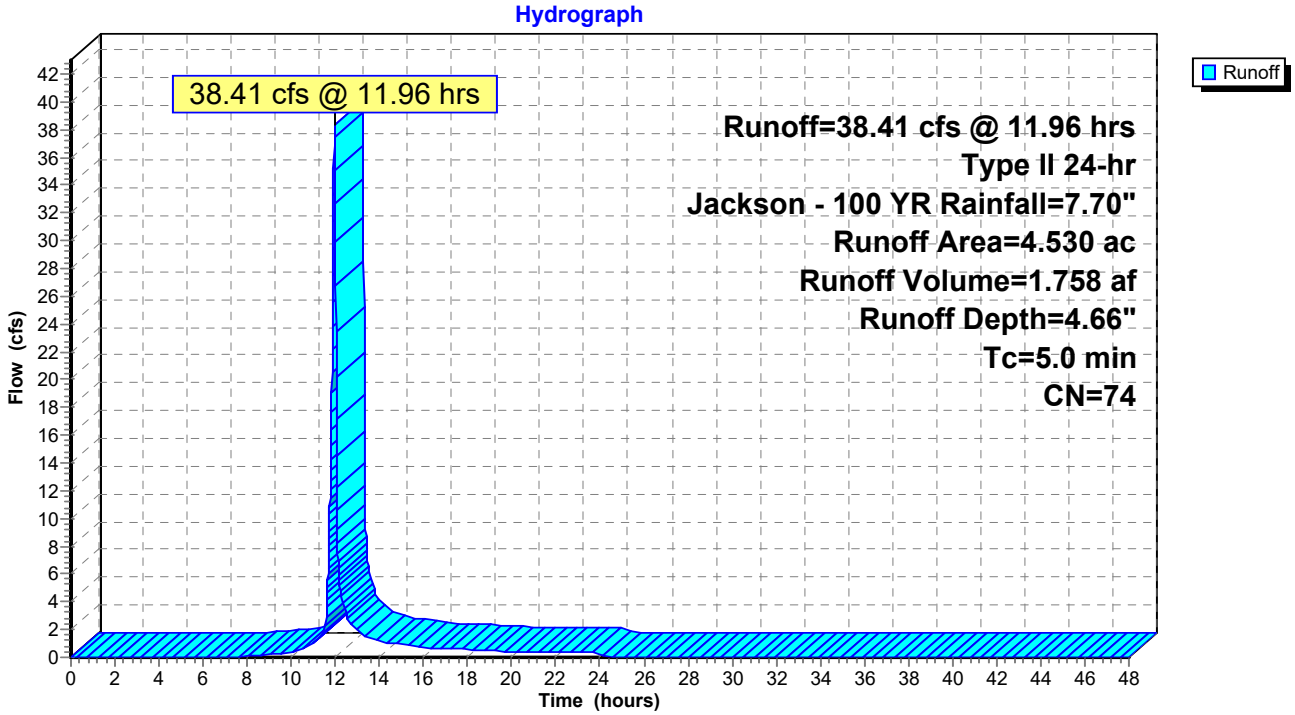
Runoff = 38.41 cfs @ 11.96 hrs, Volume= 1.758 af, Depth= 4.66"
Routed to Link 1L : Existing Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

Area (ac)	CN	Description
4.530	74	>75% Grass cover, Good, HSG C
4.530		100.00% Pervious Area

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

Subcatchment 3S: Existing Onsite Bypass



Hydrograph for Subcatchment 3S: Existing Onsite Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.00	0.00
4.50	0.43	0.00	0.00
5.00	0.49	0.00	0.00
5.50	0.55	0.00	0.00
6.00	0.62	0.00	0.00
6.50	0.69	0.00	0.00
7.00	0.76	0.00	0.02
7.50	0.84	0.01	0.05
8.00	0.92	0.01	0.08
8.50	1.02	0.03	0.14
9.00	1.13	0.05	0.22
9.50	1.26	0.08	0.28
10.00	1.39	0.11	0.40
10.50	1.57	0.17	0.61
11.00	1.81	0.27	1.00
11.50	2.18	0.44	**1.94**
12.00	5.11	2.45	**32.69**
12.50	5.66	2.90	3.04
13.00	5.94	3.14	1.92
13.50	6.15	3.31	1.46
14.00	6.31	3.45	1.15
14.50	6.45	3.57	1.02
15.00	6.57	3.67	0.92
15.50	6.68	3.77	0.82
16.00	6.78	3.85	0.72
16.50	6.86	3.92	0.67
17.00	6.94	3.99	0.63
17.50	7.02	4.06	0.60
18.00	7.09	4.12	0.56
18.50	7.16	4.18	0.52
19.00	7.22	4.24	0.48
19.50	7.28	4.29	0.45
20.00	7.33	4.33	0.41
20.50	7.38	4.38	0.40
21.00	7.43	4.42	0.39
21.50	7.48	4.46	0.38
22.00	7.52	4.50	0.37
22.50	7.57	4.54	0.37
23.00	7.61	4.58	0.36
23.50	7.66	4.62	0.35
24.00	**7.70**	**4.66**	0.34
24.50	7.70	4.66	0.00
25.00	7.70	4.66	0.00
25.50	7.70	4.66	0.00
26.00	7.70	4.66	0.00
26.50	7.70	4.66	0.00
27.00	7.70	4.66	0.00
27.50	7.70	4.66	0.00
28.00	7.70	4.66	0.00
28.50	7.70	4.66	0.00
29.00	7.70	4.66	0.00
29.50	7.70	4.66	0.00
30.00	7.70	4.66	0.00
30.50	7.70	4.66	0.00
31.00	7.70	4.66	0.00
31.50	7.70	4.66	0.00
32.00	7.70	4.66	0.00
32.50	7.70	4.66	0.00
33.00	7.70	4.66	0.00
33.50	7.70	4.66	0.00
34.00	7.70	4.66	0.00
34.50	7.70	4.66	0.00
35.00	7.70	4.66	0.00
35.50	7.70	4.66	0.00
36.00	7.70	4.66	0.00
36.50	7.70	4.66	0.00
37.00	7.70	4.66	0.00
37.50	7.70	4.66	0.00
38.00	7.70	4.66	0.00
38.50	7.70	4.66	0.00
39.00	7.70	4.66	0.00
39.50	7.70	4.66	0.00
40.00	7.70	4.66	0.00
40.50	7.70	4.66	0.00
41.00	7.70	4.66	0.00
41.50	7.70	4.66	0.00
42.00	7.70	4.66	0.00
42.50	7.70	4.66	0.00
43.00	7.70	4.66	0.00
43.50	7.70	4.66	0.00
44.00	7.70	4.66	0.00
44.50	7.70	4.66	0.00
45.00	7.70	4.66	0.00
45.50	7.70	4.66	0.00
46.00	7.70	4.66	0.00
46.50	7.70	4.66	0.00
47.00	7.70	4.66	0.00
47.50	7.70	4.66	0.00
48.00	7.70	4.66	0.00

Summary for Subcatchment 4S: Firestone Bypass

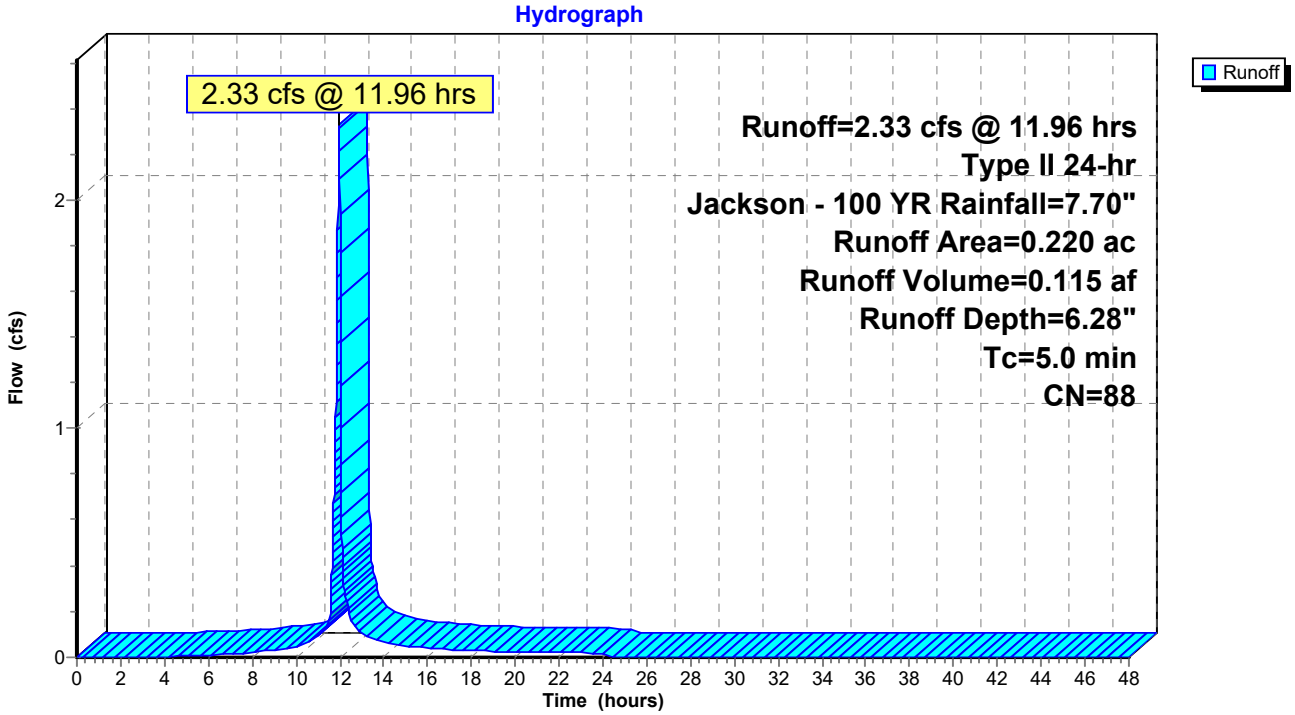
Runoff = 2.33 cfs @ 11.96 hrs, Volume= 0.115 af, Depth= 6.28"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	0.220	88	
	0.220		100.00% Pervious Area

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

Subcatchment 4S: Firestone Bypass



Hydrograph for Subcatchment 4S: Firestone Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.01	0.00
4.50	0.43	0.02	0.00
5.00	0.49	0.03	0.01
5.50	0.55	0.05	0.01
6.00	0.62	0.07	0.01
6.50	0.69	0.10	0.01
7.00	0.76	0.13	0.02
7.50	0.84	0.17	0.02
8.00	0.92	0.21	0.02
8.50	1.02	0.26	0.03
9.00	1.13	0.33	0.03
9.50	1.26	0.41	0.04
10.00	1.39	0.51	0.05
10.50	1.57	0.63	0.06
11.00	1.81	0.81	0.09
11.50	2.18	1.11	**0.16**
12.00	5.11	3.77	**1.94**
12.50	5.66	4.30	0.17
13.00	5.94	4.57	0.11
13.50	6.15	4.77	0.08
14.00	6.31	4.93	0.06
14.50	6.45	5.06	0.06
15.00	6.57	5.18	0.05
15.50	6.68	5.28	0.04
16.00	6.78	5.38	0.04
16.50	6.86	5.46	0.04
17.00	6.94	5.54	0.03
17.50	7.02	5.61	0.03
18.00	7.09	5.68	0.03
18.50	7.16	5.75	0.03
19.00	7.22	5.81	0.03
19.50	7.28	5.86	0.02
20.00	7.33	5.91	0.02
20.50	7.38	5.96	0.02
21.00	7.43	6.01	0.02
21.50	7.48	6.06	0.02
22.00	7.52	6.10	0.02
22.50	7.57	6.15	0.02
23.00	7.61	6.19	0.02
23.50	7.66	6.23	0.02
24.00	**7.70**	**6.28**	0.02
24.50	7.70	6.28	0.00
25.00	7.70	6.28	0.00
25.50	7.70	6.28	0.00
26.00	7.70	6.28	0.00
26.50	7.70	6.28	0.00
27.00	7.70	6.28	0.00
27.50	7.70	6.28	0.00
28.00	7.70	6.28	0.00
28.50	7.70	6.28	0.00
29.00	7.70	6.28	0.00
29.50	7.70	6.28	0.00
30.00	7.70	6.28	0.00
30.50	7.70	6.28	0.00
31.00	7.70	6.28	0.00
31.50	7.70	6.28	0.00
32.00	7.70	6.28	0.00
32.50	7.70	6.28	0.00
33.00	7.70	6.28	0.00
33.50	7.70	6.28	0.00
34.00	7.70	6.28	0.00
34.50	7.70	6.28	0.00
35.00	7.70	6.28	0.00
35.50	7.70	6.28	0.00
36.00	7.70	6.28	0.00
36.50	7.70	6.28	0.00
37.00	7.70	6.28	0.00
37.50	7.70	6.28	0.00
38.00	7.70	6.28	0.00
38.50	7.70	6.28	0.00
39.00	7.70	6.28	0.00
39.50	7.70	6.28	0.00
40.00	7.70	6.28	0.00
40.50	7.70	6.28	0.00
41.00	7.70	6.28	0.00
41.50	7.70	6.28	0.00
42.00	7.70	6.28	0.00
42.50	7.70	6.28	0.00
43.00	7.70	6.28	0.00
43.50	7.70	6.28	0.00
44.00	7.70	6.28	0.00
44.50	7.70	6.28	0.00
45.00	7.70	6.28	0.00
45.50	7.70	6.28	0.00
46.00	7.70	6.28	0.00
46.50	7.70	6.28	0.00
47.00	7.70	6.28	0.00
47.50	7.70	6.28	0.00
48.00	7.70	6.28	0.00

Summary for Subcatchment 5S: Firestone Detention

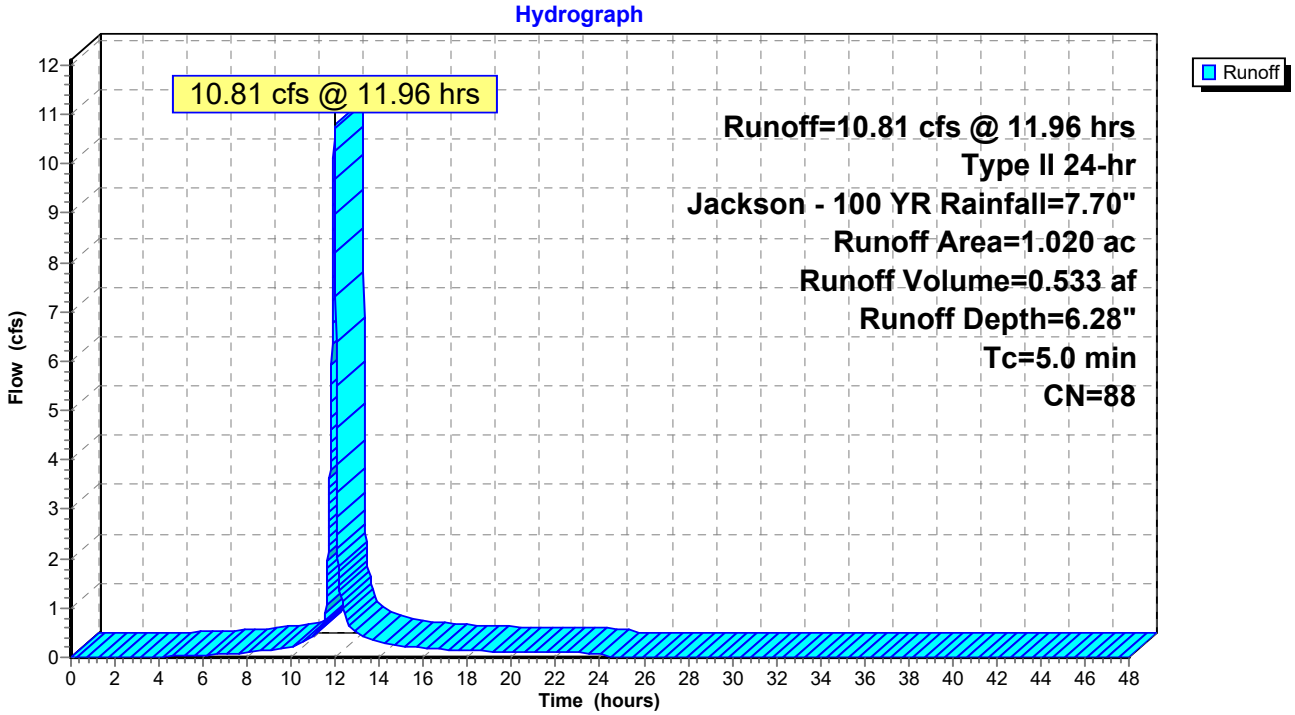
Runoff = 10.81 cfs @ 11.96 hrs, Volume= 0.533 af, Depth= 6.28"
Routed to Pond 6P : Firestone Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	1.020	88	
	1.020		100.00% Pervious Area

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

Subcatchment 5S: Firestone Detention



Hydrograph for Subcatchment 5S: Firestone Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.01
4.00	0.37	0.01	0.01
4.50	0.43	0.02	0.02
5.00	0.49	0.03	0.03
5.50	0.55	0.05	0.04
6.00	0.62	0.07	0.05
6.50	0.69	0.10	0.06
7.00	0.76	0.13	0.07
7.50	0.84	0.17	0.08
8.00	0.92	0.21	0.09
8.50	1.02	0.26	0.12
9.00	1.13	0.33	0.15
9.50	1.26	0.41	0.17
10.00	1.39	0.51	0.21
10.50	1.57	0.63	0.29
11.00	1.81	0.81	0.42
11.50	2.18	1.11	**0.73**
12.00	5.11	3.77	**8.99**
12.50	5.66	4.30	0.79
13.00	5.94	4.57	0.50
13.50	6.15	4.77	0.38
14.00	6.31	4.93	0.29
14.50	6.45	5.06	0.26
15.00	6.57	5.18	0.23
15.50	6.68	5.28	0.21
16.00	6.78	5.38	0.18
16.50	6.86	5.46	0.17
17.00	6.94	5.54	0.16
17.50	7.02	5.61	0.15
18.00	7.09	5.68	0.14
18.50	7.16	5.75	0.13
19.00	7.22	5.81	0.12
19.50	7.28	5.86	0.11
20.00	7.33	5.91	0.10
20.50	7.38	5.96	0.10
21.00	7.43	6.01	0.10
21.50	7.48	6.06	0.09
22.00	7.52	6.10	0.09
22.50	7.57	6.15	0.09
23.00	7.61	6.19	0.09
23.50	7.66	6.23	0.09
24.00	**7.70**	**6.28**	0.09
24.50	7.70	6.28	0.00
25.00	7.70	6.28	0.00
25.50	7.70	6.28	0.00
26.00	7.70	6.28	0.00
26.50	7.70	6.28	0.00
27.00	7.70	6.28	0.00
27.50	7.70	6.28	0.00
28.00	7.70	6.28	0.00
28.50	7.70	6.28	0.00
29.00	7.70	6.28	0.00
29.50	7.70	6.28	0.00
30.00	7.70	6.28	0.00
30.50	7.70	6.28	0.00
31.00	7.70	6.28	0.00
31.50	7.70	6.28	0.00
32.00	7.70	6.28	0.00
32.50	7.70	6.28	0.00
33.00	7.70	6.28	0.00
33.50	7.70	6.28	0.00
34.00	7.70	6.28	0.00
34.50	7.70	6.28	0.00
35.00	7.70	6.28	0.00
35.50	7.70	6.28	0.00
36.00	7.70	6.28	0.00
36.50	7.70	6.28	0.00
37.00	7.70	6.28	0.00
37.50	7.70	6.28	0.00
38.00	7.70	6.28	0.00
38.50	7.70	6.28	0.00
39.00	7.70	6.28	0.00
39.50	7.70	6.28	0.00
40.00	7.70	6.28	0.00
40.50	7.70	6.28	0.00
41.00	7.70	6.28	0.00
41.50	7.70	6.28	0.00
42.00	7.70	6.28	0.00
42.50	7.70	6.28	0.00
43.00	7.70	6.28	0.00
43.50	7.70	6.28	0.00
44.00	7.70	6.28	0.00
44.50	7.70	6.28	0.00
45.00	7.70	6.28	0.00
45.50	7.70	6.28	0.00
46.00	7.70	6.28	0.00
46.50	7.70	6.28	0.00
47.00	7.70	6.28	0.00
47.50	7.70	6.28	0.00
48.00	7.70	6.28	0.00

Summary for Subcatchment 6S: Market Street RW

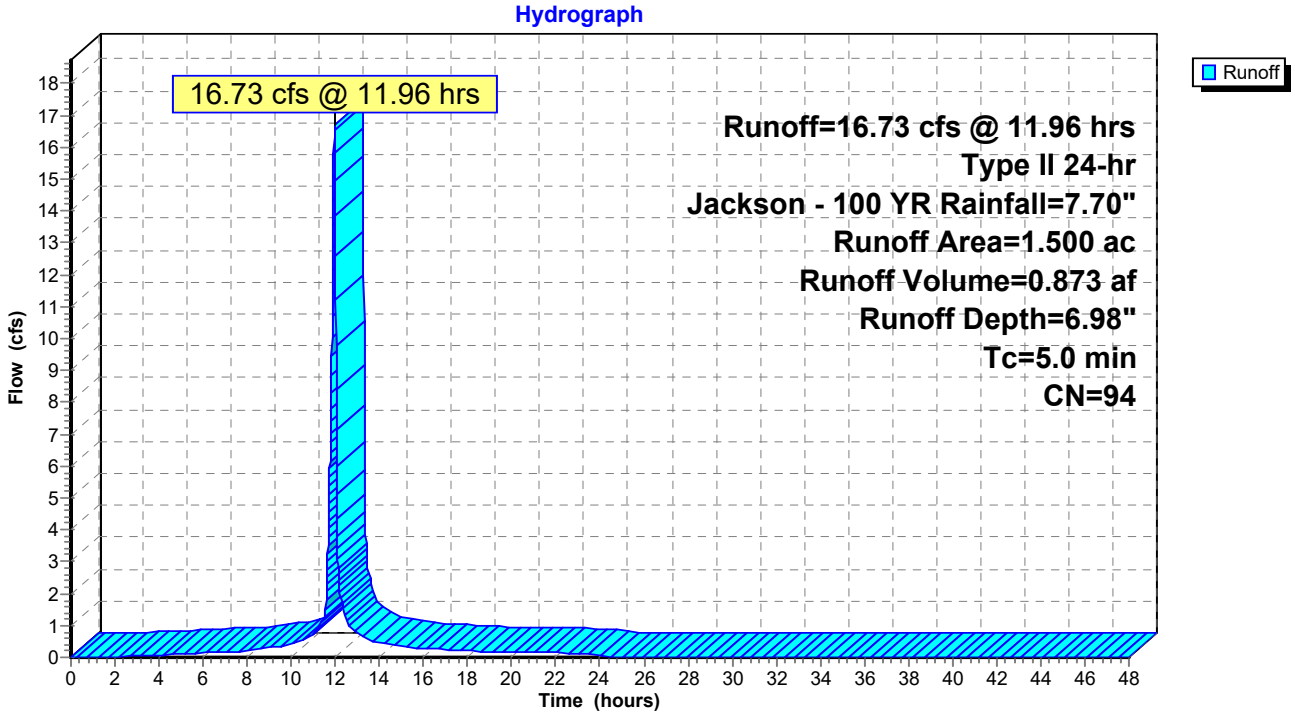
Runoff = 16.73 cfs @ 11.96 hrs, Volume= 0.873 af, Depth= 6.98"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	1.500	94	
	1.500		100.00% Pervious Area

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

Subcatchment 6S: Market Street RW



Hydrograph for Subcatchment 6S: Market Street RW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.01
2.50	0.22	0.01	0.03
3.00	0.27	0.02	0.05
3.50	0.32	0.04	0.06
4.00	0.37	0.07	0.08
4.50	0.43	0.09	0.09
5.00	0.49	0.13	0.11
5.50	0.55	0.17	0.12
6.00	0.62	0.21	0.14
6.50	0.69	0.26	0.16
7.00	0.76	0.32	0.17
7.50	0.84	0.38	0.19
8.00	0.92	0.44	0.20
8.50	1.02	0.52	0.25
9.00	1.13	0.61	0.31
9.50	1.26	0.72	0.32
10.00	1.39	0.84	0.40
10.50	1.57	1.00	0.53
11.00	1.81	1.22	0.74
11.50	2.18	1.56	**1.23**
12.00	5.11	4.41	**13.84**
12.50	5.66	4.96	1.21
13.00	5.94	5.24	0.75
13.50	6.15	5.45	0.57
14.00	6.31	5.61	0.44
14.50	6.45	5.74	0.39
15.00	6.57	5.86	0.35
15.50	6.68	5.97	0.31
16.00	6.78	6.07	0.27
16.50	6.86	6.15	0.25
17.00	6.94	6.23	0.24
17.50	7.02	6.31	0.22
18.00	7.09	6.38	0.21
18.50	7.16	6.45	0.20
19.00	7.22	6.51	0.18
19.50	7.28	6.56	0.17
20.00	7.33	6.62	0.15
20.50	7.38	6.67	0.15
21.00	7.43	6.71	0.15
21.50	7.48	6.76	0.14
22.00	7.52	6.81	0.14
22.50	7.57	6.85	0.14
23.00	7.61	6.90	0.13
23.50	7.66	6.94	0.13
24.00	**7.70**	**6.98**	0.13
24.50	7.70	6.98	0.00
25.00	7.70	6.98	0.00
25.50	7.70	6.98	0.00
26.00	7.70	6.98	0.00
26.50	7.70	6.98	0.00
27.00	7.70	6.98	0.00
27.50	7.70	6.98	0.00
28.00	7.70	6.98	0.00
28.50	7.70	6.98	0.00
29.00	7.70	6.98	0.00
29.50	7.70	6.98	0.00
30.00	7.70	6.98	0.00
30.50	7.70	6.98	0.00
31.00	7.70	6.98	0.00
31.50	7.70	6.98	0.00
32.00	7.70	6.98	0.00
32.50	7.70	6.98	0.00
33.00	7.70	6.98	0.00
33.50	7.70	6.98	0.00
34.00	7.70	6.98	0.00
34.50	7.70	6.98	0.00
35.00	7.70	6.98	0.00
35.50	7.70	6.98	0.00
36.00	7.70	6.98	0.00
36.50	7.70	6.98	0.00
37.00	7.70	6.98	0.00
37.50	7.70	6.98	0.00
38.00	7.70	6.98	0.00
38.50	7.70	6.98	0.00
39.00	7.70	6.98	0.00
39.50	7.70	6.98	0.00
40.00	7.70	6.98	0.00
40.50	7.70	6.98	0.00
41.00	7.70	6.98	0.00
41.50	7.70	6.98	0.00
42.00	7.70	6.98	0.00
42.50	7.70	6.98	0.00
43.00	7.70	6.98	0.00
43.50	7.70	6.98	0.00
44.00	7.70	6.98	0.00
44.50	7.70	6.98	0.00
45.00	7.70	6.98	0.00
45.50	7.70	6.98	0.00
46.00	7.70	6.98	0.00
46.50	7.70	6.98	0.00
47.00	7.70	6.98	0.00
47.50	7.70	6.98	0.00
48.00	7.70	6.98	0.00

Summary for Subcatchment 7S: Walmart Detention

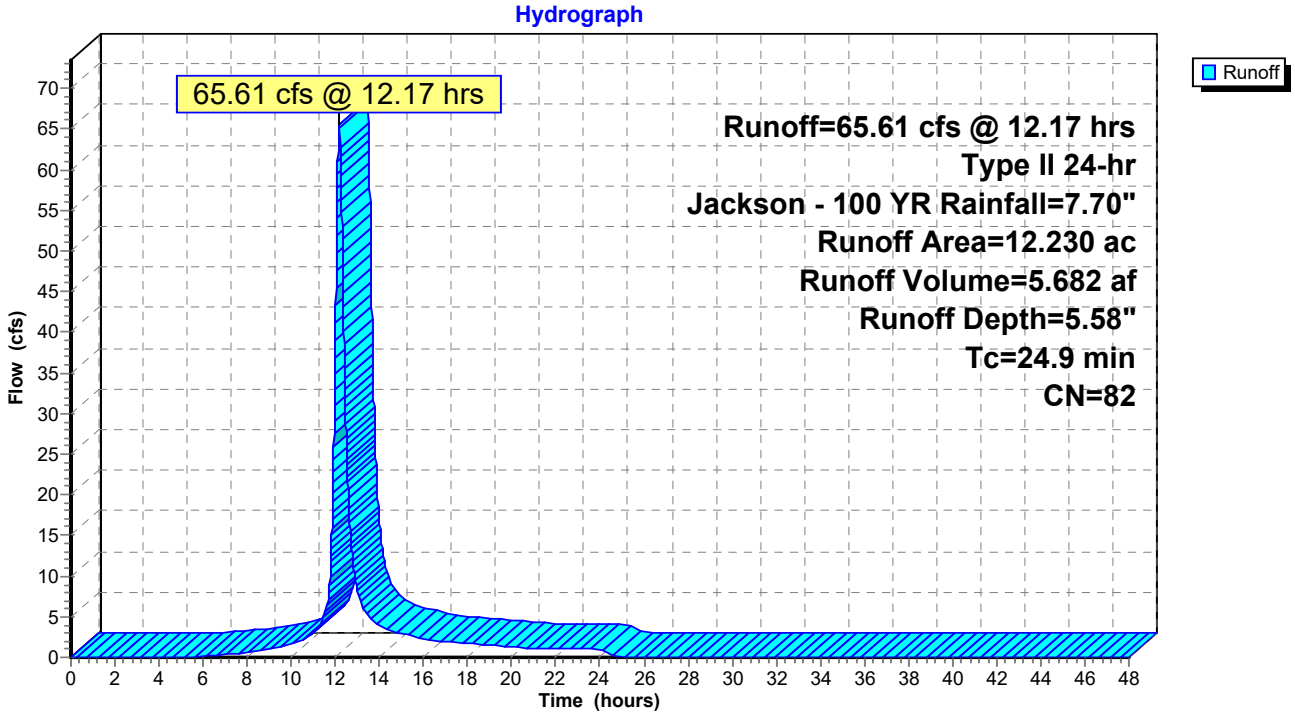
Runoff = 65.61 cfs @ 12.17 hrs, Volume= 5.682 af, Depth= 5.58"
Routed to Pond 8P : Walmart Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	12.230	82	
	12.230		100.00% Pervious Area

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

Subcatchment 7S: Walmart Detention



Hydrograph for Subcatchment 7S: Walmart Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.00	0.00
4.50	0.43	0.00	0.00
5.00	0.49	0.00	0.01
5.50	0.55	0.01	0.08
6.00	0.62	0.01	0.17
6.50	0.69	0.03	0.27
7.00	0.76	0.04	0.37
7.50	0.84	0.06	0.48
8.00	0.92	0.09	0.60
8.50	1.02	0.12	0.76
9.00	1.13	0.17	1.03
9.50	1.26	0.22	1.30
10.00	1.39	0.29	1.57
10.50	1.57	0.39	2.16
11.00	1.81	0.53	3.15
11.50	2.18	0.77	5.16
12.00	5.11	3.17	**39.00**
12.50	5.66	3.68	**26.00**
13.00	5.94	3.94	8.15
13.50	6.15	4.13	5.13
14.00	6.31	4.28	3.94
14.50	6.45	4.40	3.22
15.00	6.57	4.52	2.88
15.50	6.68	4.62	2.58
16.00	6.78	4.71	2.27
16.50	6.86	4.79	2.03
17.00	6.94	4.86	1.91
17.50	7.02	4.93	1.80
18.00	7.09	5.00	1.69
18.50	7.16	5.06	1.58
19.00	7.22	5.12	1.47
19.50	7.28	5.18	1.36
20.00	7.33	5.23	1.25
20.50	7.38	5.27	1.16
21.00	7.43	5.32	1.14
21.50	7.48	5.36	1.11
22.00	7.52	5.41	1.09
22.50	7.57	5.45	1.07
23.00	7.61	5.49	1.05
23.50	7.66	5.53	1.03
24.00	**7.70**	**5.58**	1.01
24.50	7.70	5.58	0.21
25.00	7.70	5.58	0.01
25.50	7.70	5.58	0.00
26.00	7.70	5.58	0.00
26.50	7.70	5.58	0.00
27.00	7.70	5.58	0.00
27.50	7.70	5.58	0.00
28.00	7.70	5.58	0.00
28.50	7.70	5.58	0.00
29.00	7.70	5.58	0.00
29.50	7.70	5.58	0.00
30.00	7.70	5.58	0.00
30.50	7.70	5.58	0.00
31.00	7.70	5.58	0.00
31.50	7.70	5.58	0.00
32.00	7.70	5.58	0.00
32.50	7.70	5.58	0.00
33.00	7.70	5.58	0.00
33.50	7.70	5.58	0.00
34.00	7.70	5.58	0.00
34.50	7.70	5.58	0.00
35.00	7.70	5.58	0.00
35.50	7.70	5.58	0.00
36.00	7.70	5.58	0.00
36.50	7.70	5.58	0.00
37.00	7.70	5.58	0.00
37.50	7.70	5.58	0.00
38.00	7.70	5.58	0.00
38.50	7.70	5.58	0.00
39.00	7.70	5.58	0.00
39.50	7.70	5.58	0.00
40.00	7.70	5.58	0.00
40.50	7.70	5.58	0.00
41.00	7.70	5.58	0.00
41.50	7.70	5.58	0.00
42.00	7.70	5.58	0.00
42.50	7.70	5.58	0.00
43.00	7.70	5.58	0.00
43.50	7.70	5.58	0.00
44.00	7.70	5.58	0.00
44.50	7.70	5.58	0.00
45.00	7.70	5.58	0.00
45.50	7.70	5.58	0.00
46.00	7.70	5.58	0.00
46.50	7.70	5.58	0.00
47.00	7.70	5.58	0.00
47.50	7.70	5.58	0.00
48.00	7.70	5.58	0.00

Summary for Subcatchment 9S: Commercial Plus RW Bypass

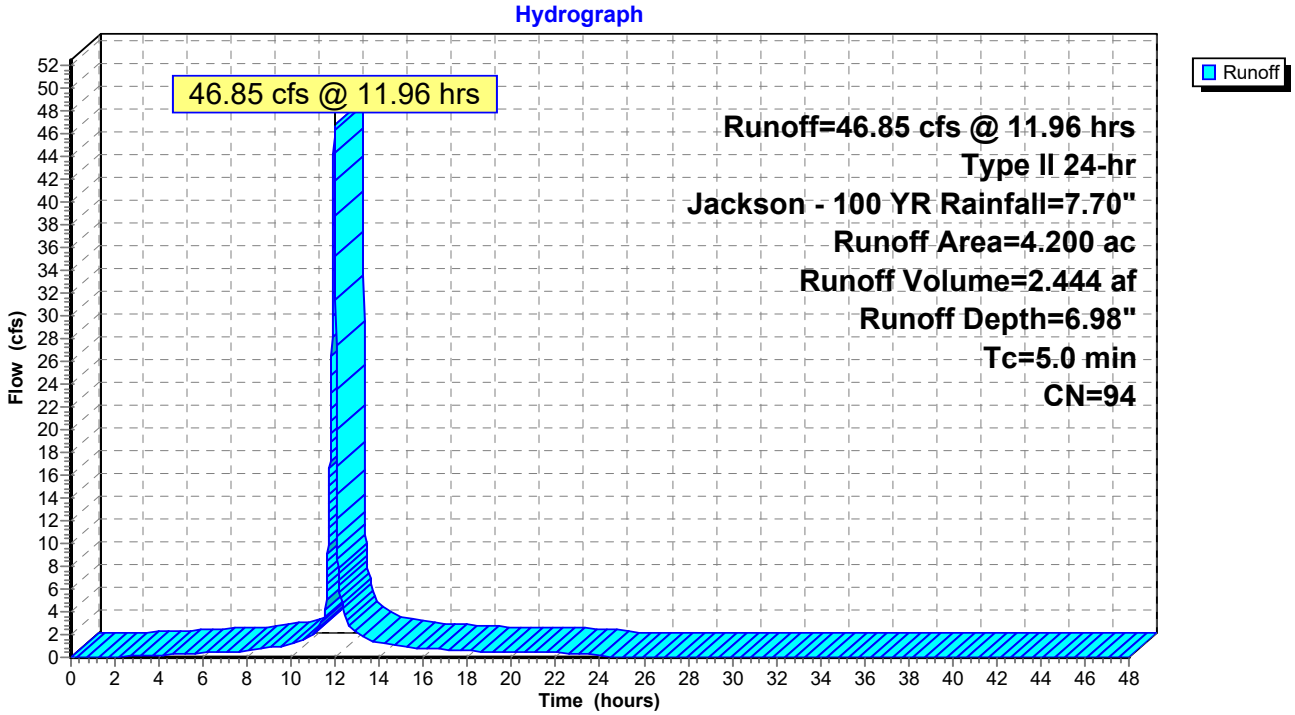
Runoff = 46.85 cfs @ 11.96 hrs, Volume= 2.444 af, Depth= 6.98"
Routed to Link 1L : Existing Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	4.200	94	
	4.200		100.00% Pervious Area

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

Subcatchment 9S: Commercial Plus RW Bypass



Hydrograph for Subcatchment 9S: Commercial Plus RW Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.04
2.50	0.22	0.01	0.09
3.00	0.27	0.02	0.13
3.50	0.32	0.04	0.17
4.00	0.37	0.07	0.21
4.50	0.43	0.09	0.25
5.00	0.49	0.13	0.30
5.50	0.55	0.17	0.35
6.00	0.62	0.21	0.39
6.50	0.69	0.26	0.44
7.00	0.76	0.32	0.48
7.50	0.84	0.38	0.53
8.00	0.92	0.44	0.57
8.50	1.02	0.52	0.70
9.00	1.13	0.61	0.86
9.50	1.26	0.72	0.90
10.00	1.39	0.84	1.12
10.50	1.57	1.00	1.48
11.00	1.81	1.22	2.07
11.50	2.18	1.56	**3.45**
12.00	5.11	4.41	**38.74**
12.50	5.66	4.96	3.37
13.00	5.94	5.24	2.10
13.50	6.15	5.45	1.59
14.00	6.31	5.61	1.25
14.50	6.45	5.74	1.10
15.00	6.57	5.86	0.99
15.50	6.68	5.97	0.87
16.00	6.78	6.07	0.76
16.50	6.86	6.15	0.71
17.00	6.94	6.23	0.67
17.50	7.02	6.31	0.63
18.00	7.09	6.38	0.59
18.50	7.16	6.45	0.55
19.00	7.22	6.51	0.51
19.50	7.28	6.56	0.47
20.00	7.33	6.62	0.43
20.50	7.38	6.67	0.41
21.00	7.43	6.71	0.41
21.50	7.48	6.76	0.40
22.00	7.52	6.81	0.39
22.50	7.57	6.85	0.38
23.00	7.61	6.90	0.37
23.50	7.66	6.94	0.37
24.00	**7.70**	**6.98**	0.36
24.50	7.70	6.98	0.00
25.00	7.70	6.98	0.00
25.50	7.70	6.98	0.00
26.00	7.70	6.98	0.00
26.50	7.70	6.98	0.00
27.00	7.70	6.98	0.00
27.50	7.70	6.98	0.00
28.00	7.70	6.98	0.00
28.50	7.70	6.98	0.00
29.00	7.70	6.98	0.00
29.50	7.70	6.98	0.00
30.00	7.70	6.98	0.00
30.50	7.70	6.98	0.00
31.00	7.70	6.98	0.00
31.50	7.70	6.98	0.00
32.00	7.70	6.98	0.00
32.50	7.70	6.98	0.00
33.00	7.70	6.98	0.00
33.50	7.70	6.98	0.00
34.00	7.70	6.98	0.00
34.50	7.70	6.98	0.00
35.00	7.70	6.98	0.00
35.50	7.70	6.98	0.00
36.00	7.70	6.98	0.00
36.50	7.70	6.98	0.00
37.00	7.70	6.98	0.00
37.50	7.70	6.98	0.00
38.00	7.70	6.98	0.00
38.50	7.70	6.98	0.00
39.00	7.70	6.98	0.00
39.50	7.70	6.98	0.00
40.00	7.70	6.98	0.00
40.50	7.70	6.98	0.00
41.00	7.70	6.98	0.00
41.50	7.70	6.98	0.00
42.00	7.70	6.98	0.00
42.50	7.70	6.98	0.00
43.00	7.70	6.98	0.00
43.50	7.70	6.98	0.00
44.00	7.70	6.98	0.00
44.50	7.70	6.98	0.00
45.00	7.70	6.98	0.00
45.50	7.70	6.98	0.00
46.00	7.70	6.98	0.00
46.50	7.70	6.98	0.00
47.00	7.70	6.98	0.00
47.50	7.70	6.98	0.00
48.00	7.70	6.98	0.00

Summary for Pond 1P: Existing Detention

[79] Warning: Submerged Pond 8P Primary device # 1 INLET by 0.18'

Inflow Area = 14.990 ac, 0.00% Impervious, Inflow Depth = 5.13" for Jackson - 100 YR event
Inflow = 30.96 cfs @ 11.96 hrs, Volume= 6.410 af
Outflow = 15.80 cfs @ 12.71 hrs, Volume= 6.410 af, Atten= 49%, Lag= 44.8 min
Primary = 10.16 cfs @ 12.71 hrs, Volume= 6.148 af
Routed to Link 1L : Existing Total
Secondary = 5.64 cfs @ 12.71 hrs, Volume= 0.262 af
Routed to Link 1L : Existing Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,005.01' @ 12.71 hrs Surf.Area= 9,473 sf Storage= 16,169 cf

Plug-Flow detention time= 14.0 min calculated for 6.409 af (100% of inflow)
Center-of-Mass det. time= 14.0 min (937.4 - 923.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,000.50'	25,061 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

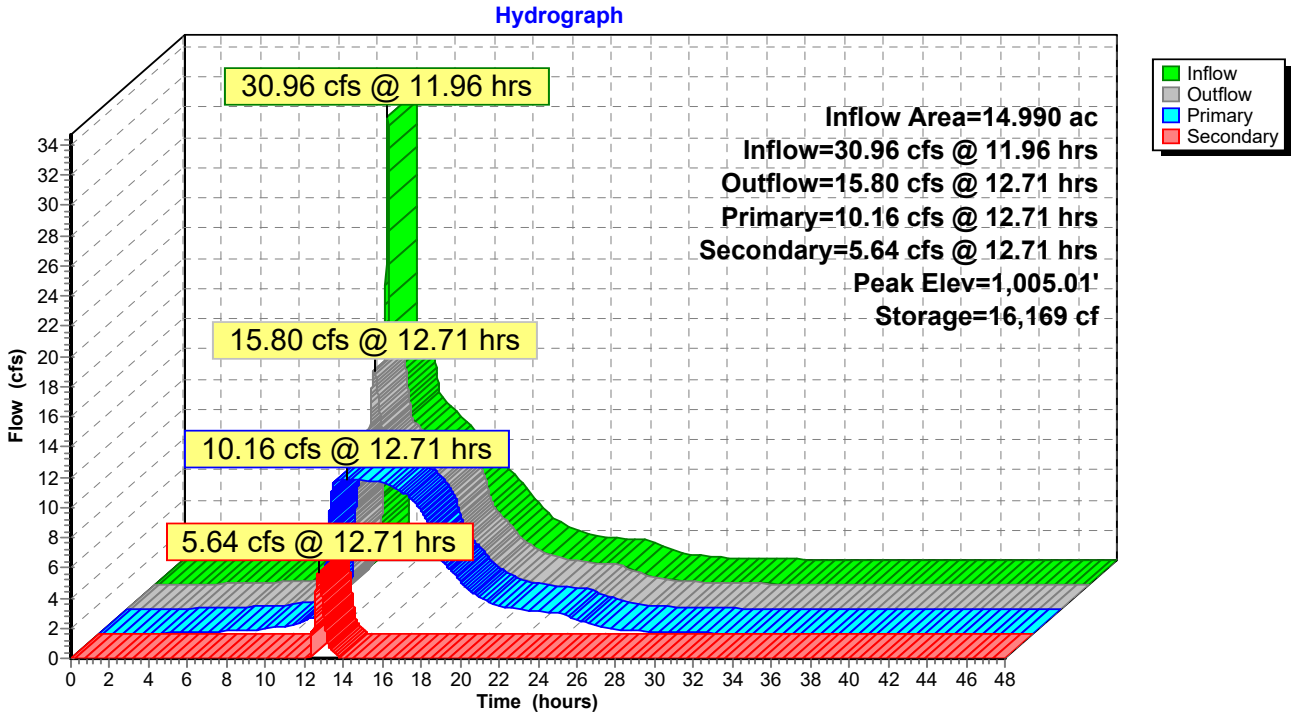
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,000.50	0	0	0
1,002.00	741	556	556
1,003.00	3,603	2,172	2,728
1,004.00	6,778	5,191	7,918
1,005.00	9,485	8,132	16,050
1,006.00	8,537	9,011	25,061

Device	Routing	Invert	Outlet Devices
#0	Secondary	1,006.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	1,000.57'	**12.0" Round Culvert** L= 129.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,000.57' / 998.96' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	1,005.00'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

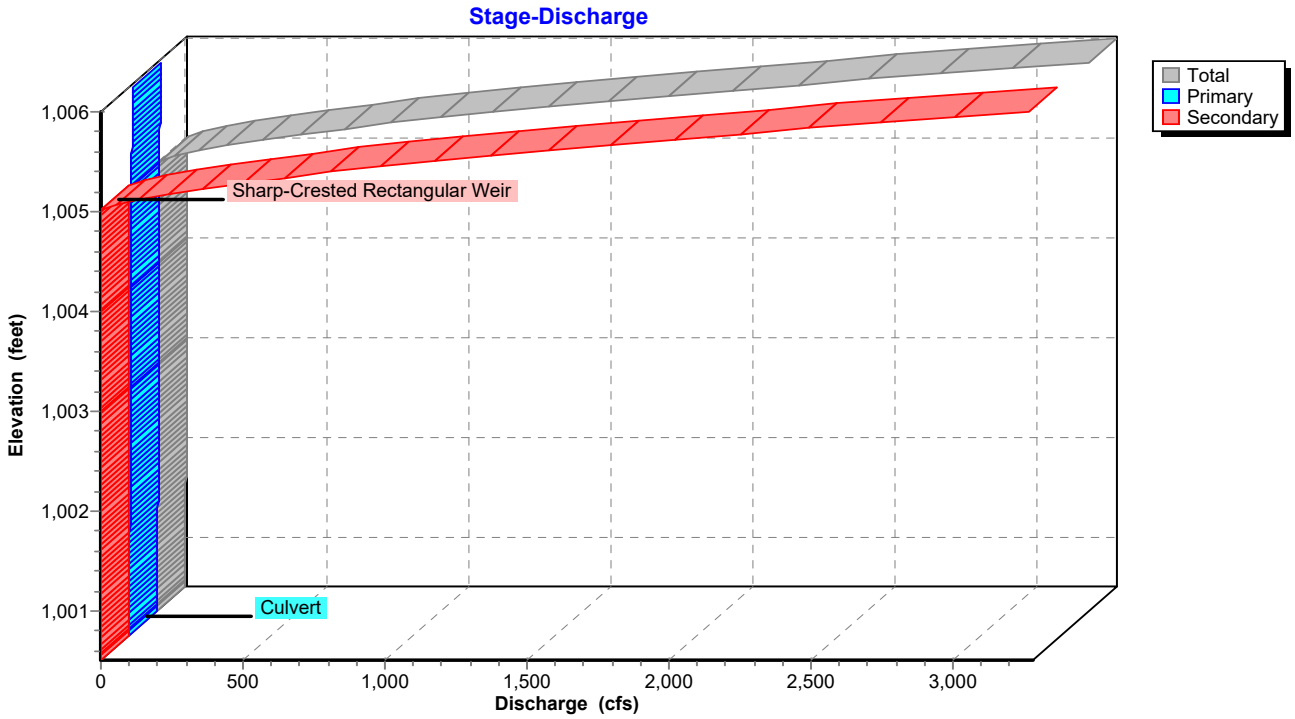
Primary OutFlow Max=10.16 cfs @ 12.71 hrs HW=1,005.01' (Free Discharge)
1=Culvert (Barrel Controls 10.16 cfs @ 8.28 fps)

Secondary OutFlow Max=4.60 cfs @ 12.71 hrs HW=1,005.01' (Free Discharge)
2=Sharp-Crested Rectangular Weir (Weir Controls 4.60 cfs @ 0.37 fps)

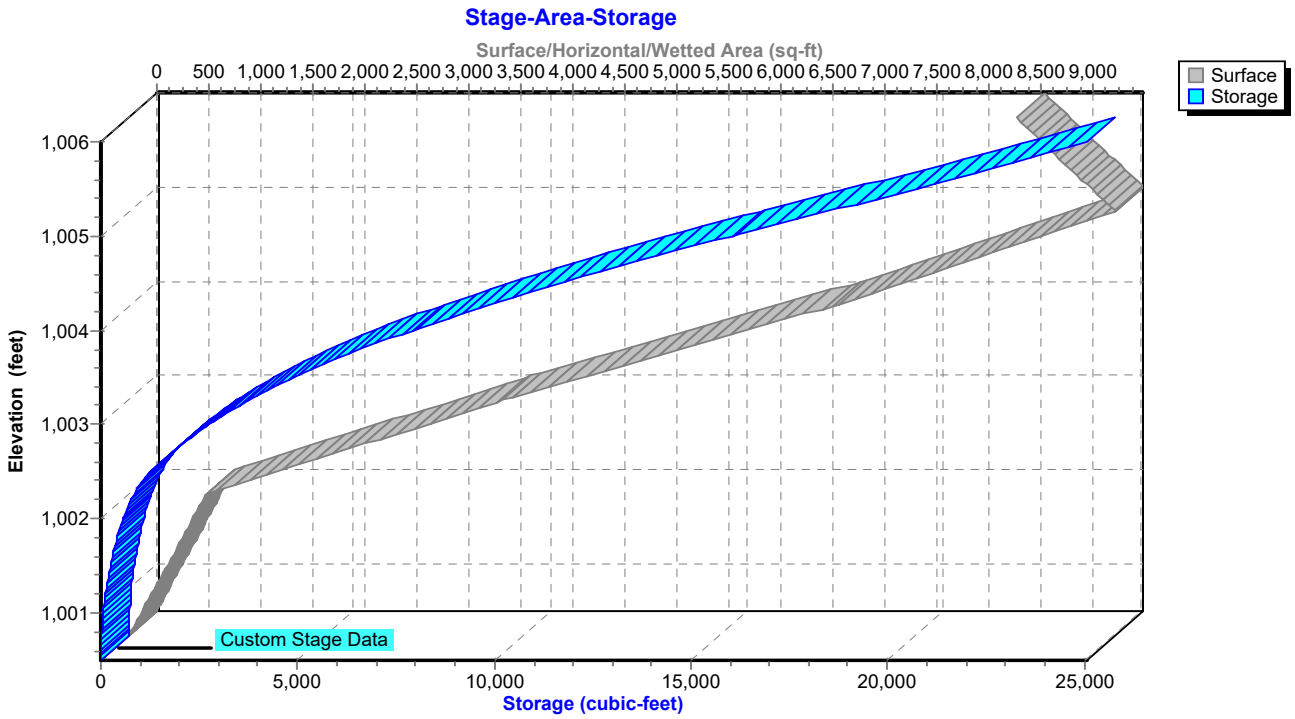
Pond 1P: Existing Detention



Pond 1P: Existing Detention



Pond 1P: Existing Detention



Hydrograph for Pond 1P: Existing Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	1,000.50	0.00	0.00	0.00
1.00	0.00	0	1,000.50	0.00	0.00	0.00
2.00	0.01	4	1,000.62	0.01	0.01	0.00
3.00	0.05	7	1,000.67	0.05	0.05	0.00
4.00	0.08	9	1,000.69	0.08	0.08	0.00
5.00	0.12	13	1,000.73	0.12	0.12	0.00
6.00	0.17	16	1,000.75	0.16	0.16	0.00
7.00	0.21	19	1,000.78	0.21	0.21	0.00
8.00	0.27	23	1,000.80	0.27	0.27	0.00
9.00	0.43	34	1,000.87	0.42	0.42	0.00
10.00	0.58	44	1,000.92	0.58	0.58	0.00
11.00	**1.13**	81	1,001.07	1.12	1.12	0.00
12.00	**27.33**	**12,370**	**1,004.59**	**9.70**	**9.70**	**0.00**
13.00	12.85	**16,131**	**1,005.01**	**12.96**	**10.16**	**2.80**
14.00	9.89	15,966	1,004.99	10.14	10.14	0.00
15.00	8.60	13,231	1,004.69	9.82	9.82	0.00
16.00	7.18	7,663	1,003.96	8.98	8.98	0.00
17.00	5.72	1,430	1,002.56	6.91	6.91	0.00
18.00	4.26	370	1,001.72	4.33	4.33	0.00
19.00	2.89	220	1,001.44	2.91	2.91	0.00
20.00	2.13	156	1,001.29	2.14	2.14	0.00
21.00	1.73	126	1,001.21	1.74	1.74	0.00
22.00	1.53	111	1,001.17	1.53	1.53	0.00
23.00	1.41	102	1,001.14	1.41	1.41	0.00
24.00	1.32	96	1,001.12	1.33	1.33	0.00
25.00	0.72	54	1,000.97	0.72	0.72	0.00
26.00	0.40	33	1,000.86	0.41	0.41	0.00
27.00	0.25	22	1,000.80	0.25	0.25	0.00
28.00	0.16	16	1,000.75	0.17	0.17	0.00
29.00	0.11	12	1,000.72	0.11	0.11	0.00
30.00	0.08	10	1,000.70	0.08	0.08	0.00
31.00	0.07	9	1,000.68	0.07	0.07	0.00
32.00	0.05	7	1,000.67	0.05	0.05	0.00
33.00	0.04	7	1,000.66	0.04	0.04	0.00
34.00	0.03	6	1,000.65	0.03	0.03	0.00
35.00	0.03	5	1,000.64	0.03	0.03	0.00
36.00	0.02	4	1,000.63	0.02	0.02	0.00
37.00	0.02	4	1,000.62	0.02	0.02	0.00
38.00	0.01	4	1,000.62	0.01	0.01	0.00
39.00	0.01	3	1,000.62	0.01	0.01	0.00
40.00	0.01	3	1,000.61	0.01	0.01	0.00
41.00	0.01	3	1,000.61	0.01	0.01	0.00
42.00	0.01	3	1,000.60	0.01	0.01	0.00
43.00	0.00	2	1,000.59	0.00	0.00	0.00
44.00	0.00	2	1,000.59	0.00	0.00	0.00
45.00	0.00	2	1,000.59	0.00	0.00	0.00
46.00	0.00	2	1,000.58	0.00	0.00	0.00
47.00	0.00	2	1,000.58	0.00	0.00	0.00
48.00	0.00	2	1,000.58	0.00	0.00	0.00

Stage-Discharge for Pond 1P: Existing Detention

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
1,000.50	0.00	0.00	0.00
1,000.60	0.00	0.00	0.00
1,000.70	0.08	0.08	0.00
1,000.80	0.25	0.25	0.00
1,000.90	0.51	0.51	0.00
1,001.00	0.83	0.83	0.00
1,001.10	1.23	1.23	0.00
1,001.20	1.68	1.68	0.00
1,001.30	2.16	2.16	0.00
1,001.40	2.68	2.68	0.00
1,001.50	3.21	3.21	0.00
1,001.60	3.74	3.74	0.00
1,001.70	4.22	4.22	0.00
1,001.80	4.62	4.62	0.00
1,001.90	4.96	4.96	0.00
1,002.00	5.30	5.30	0.00
1,002.10	5.62	5.62	0.00
1,002.20	5.92	5.92	0.00
1,002.30	6.21	6.21	0.00
1,002.40	6.49	6.49	0.00
1,002.50	6.75	6.75	0.00
1,002.60	7.00	7.00	0.00
1,002.70	7.25	7.25	0.00
1,002.80	7.46	7.46	0.00
1,002.90	7.61	7.61	0.00
1,003.00	7.75	7.75	0.00
1,003.10	7.88	7.88	0.00
1,003.20	8.02	8.02	0.00
1,003.30	8.15	8.15	0.00
1,003.40	8.28	8.28	0.00
1,003.50	8.41	8.41	0.00
1,003.60	8.54	8.54	0.00
1,003.70	8.66	8.66	0.00
1,003.80	8.79	8.79	0.00
1,003.90	8.91	8.91	0.00
1,004.00	9.03	9.03	0.00
1,004.10	9.15	9.15	0.00
1,004.20	9.26	9.26	0.00
1,004.30	9.38	9.38	0.00
1,004.40	9.49	9.49	0.00
1,004.50	9.61	9.61	0.00
1,004.60	9.72	9.72	0.00
1,004.70	9.83	9.83	0.00
1,004.80	9.94	9.94	0.00
1,004.90	10.04	10.04	0.00
1,005.00	10.15	10.15	0.00
1,005.10	113.66	10.26	103.40
1,005.20	302.83	10.36	292.47
1,005.30	547.75	10.46	537.28
1,005.40	837.75	10.57	827.19
1,005.50	1,166.67	10.67	1,156.00
1,005.60	1,530.34	10.77	1,519.58
1,005.70	1,925.71	10.87	1,914.85
1,005.80	2,350.41	10.97	2,339.45
1,005.90	2,802.54	11.06	2,791.47
1,006.00	**3,280.51**	**11.16**	**3,269.35**

Stage-Area-Storage for Pond 1P: Existing Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,000.50	0	0
1,000.60	49	2
1,000.70	99	10
1,000.80	148	22
1,000.90	198	40
1,001.00	247	62
1,001.10	296	89
1,001.20	346	121
1,001.30	395	158
1,001.40	445	200
1,001.50	494	247
1,001.60	543	299
1,001.70	593	356
1,001.80	642	417
1,001.90	692	484
1,002.00	741	556
1,002.10	1,027	644
1,002.20	1,313	761
1,002.30	1,600	907
1,002.40	1,886	1,081
1,002.50	2,172	1,284
1,002.60	2,458	1,516
1,002.70	2,744	1,776
1,002.80	3,031	2,064
1,002.90	3,317	2,382
1,003.00	3,603	2,728
1,003.10	3,921	3,104
1,003.20	4,238	3,512
1,003.30	4,555	3,952
1,003.40	4,873	4,423
1,003.50	5,191	4,926
1,003.60	5,508	5,461
1,003.70	5,826	6,028
1,003.80	6,143	6,626
1,003.90	6,460	7,256
1,004.00	6,778	7,918
1,004.10	7,049	8,610
1,004.20	7,319	9,328
1,004.30	7,590	10,073
1,004.40	7,861	10,846
1,004.50	8,132	11,646
1,004.60	8,402	12,472
1,004.70	8,673	13,326
1,004.80	8,944	14,207
1,004.90	9,214	15,115
1,005.00	**9,485**	16,050
1,005.10	9,390	16,994
1,005.20	9,295	17,928
1,005.30	9,201	18,853
1,005.40	9,106	19,768
1,005.50	9,011	20,674
1,005.60	8,916	21,570
1,005.70	8,821	22,457
1,005.80	8,727	23,334
1,005.90	8,632	24,202
1,006.00	8,537	**25,061**

Summary for Pond 6P: Firestone Detention

Inflow Area = 1.020 ac, 0.00% Impervious, Inflow Depth = 6.28" for Jackson - 100 YR event
Inflow = 10.81 cfs @ 11.96 hrs, Volume= 0.533 af
Outflow = 1.79 cfs @ 12.13 hrs, Volume= 0.410 af, Atten= 83%, Lag= 10.1 min
Primary = 1.79 cfs @ 12.13 hrs, Volume= 0.410 af
Routed to Link 1L : Existing Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,014.33' @ 12.13 hrs Surf.Area= 4,772 sf Storage= 12,727 cf

Plug-Flow detention time= 486.8 min calculated for 0.410 af (77% of inflow)
Center-of-Mass det. time= 401.3 min (1,180.3 - 779.0)

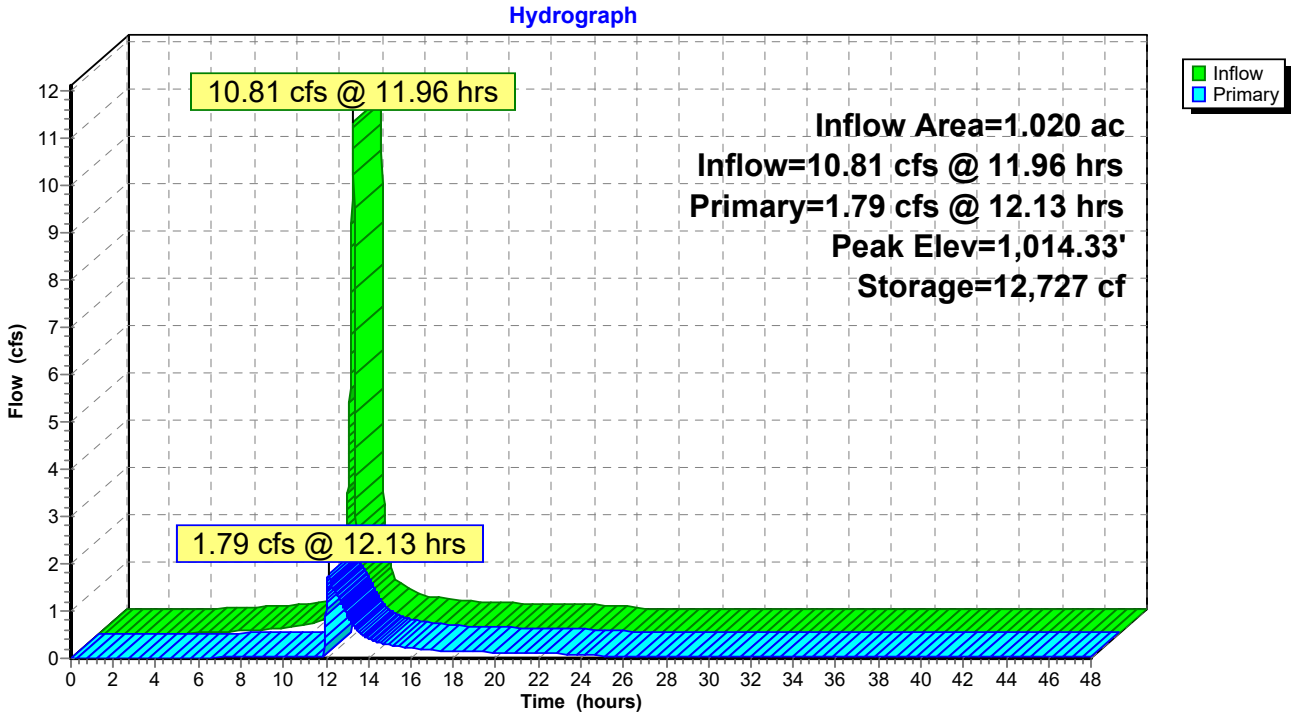
Volume	Invert	Avail.Storage	Storage Description
#1	1,009.54'	22,002 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,009.54	0	0	0
1,010.00	909	209	209
1,011.00	2,085	1,497	1,706
1,012.00	2,776	2,431	4,137
1,013.00	3,504	3,140	7,277
1,014.00	4,409	3,957	11,233
1,015.00	5,525	4,967	16,200
1,016.00	6,079	5,802	22,002

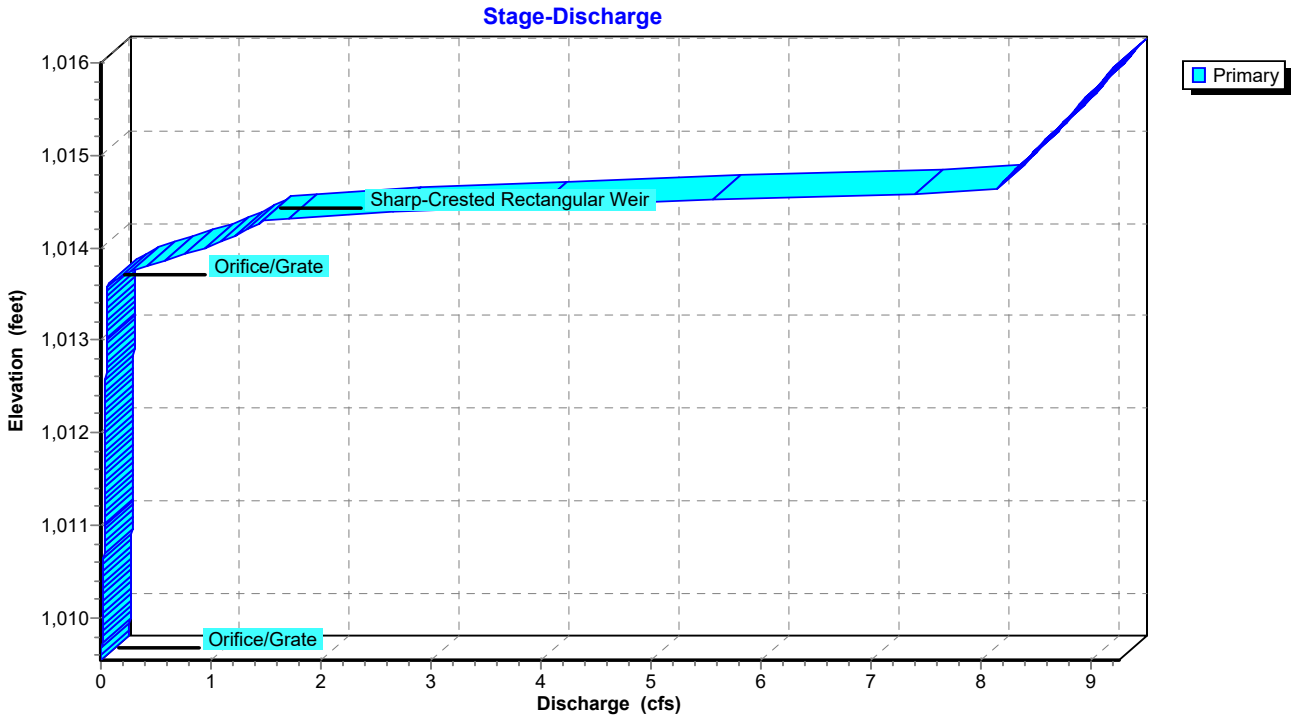
Device	Routing	Invert	Outlet Devices
#1	Primary	1,009.50'	**12.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,009.50' / 1,009.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,009.54'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,013.57'	**12.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,014.29'	**11.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.77 cfs @ 12.13 hrs HW=1,014.33' (Free Discharge)
└**1=Culvert** (Passes 1.77 cfs of 7.86 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.49 fps)
├**3=Orifice/Grate** (Orifice Controls 1.47 cfs @ 3.54 fps)
└**4=Sharp-Crested Rectangular Weir** (Weir Controls 0.24 cfs @ 0.61 fps)

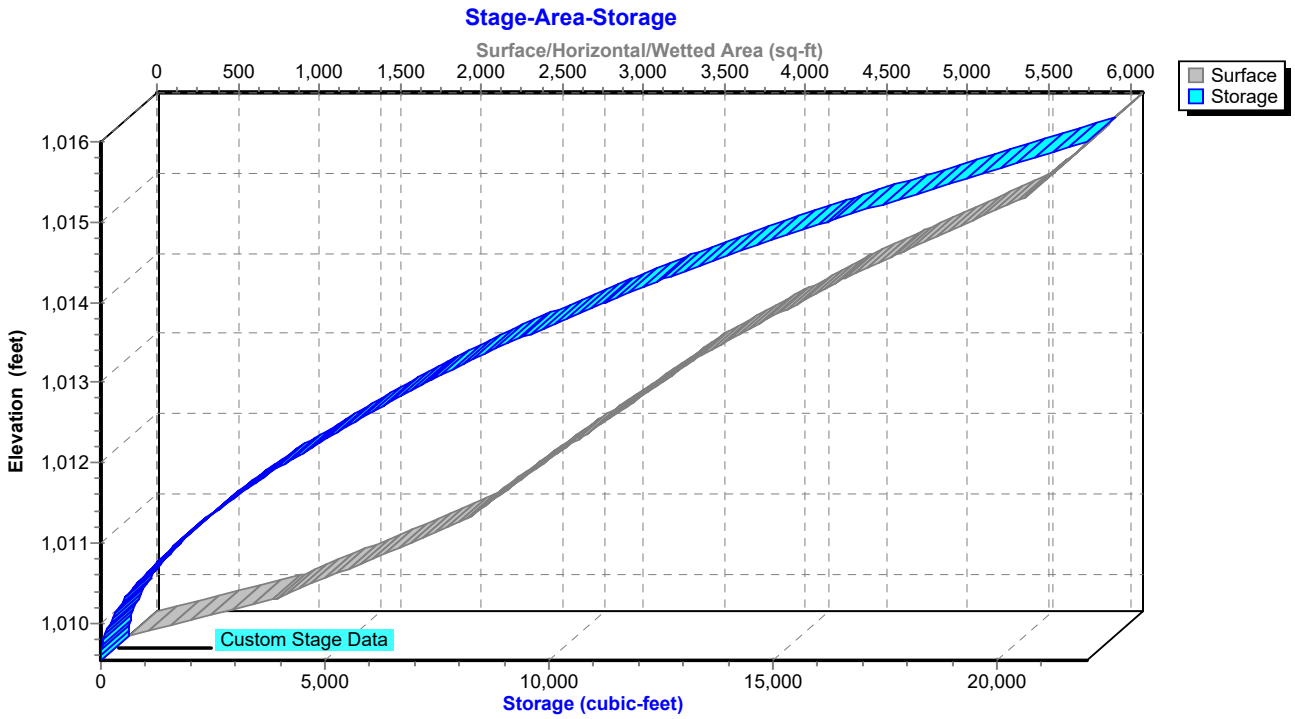
Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Hydrograph for Pond 6P: Firestone Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,009.54	0.00
1.00	0.00	0	1,009.54	0.00
2.00	0.00	0	1,009.54	0.00
3.00	0.00	0	1,009.54	0.00
4.00	0.01	11	1,009.64	0.01
5.00	0.03	56	1,009.78	0.01
6.00	0.05	151	1,009.93	0.02
7.00	0.07	306	1,010.10	0.02
8.00	0.09	527	1,010.29	0.02
9.00	0.15	874	1,010.54	0.03
10.00	0.21	1,401	1,010.85	0.03
11.00	**0.42**	2,369	1,011.30	0.03
12.00	**8.99**	**11,416**	**1,014.04**	**1.05**
13.00	0.50	**11,208**	**1,013.99**	**0.94**
14.00	0.29	10,382	1,013.80	0.41
15.00	0.23	10,117	1,013.74	0.28
16.00	0.18	9,975	1,013.71	0.22
17.00	0.16	9,882	1,013.68	0.18
18.00	0.14	9,826	1,013.67	0.16
19.00	0.12	9,769	1,013.66	0.14
20.00	0.10	9,709	1,013.64	0.12
21.00	0.10	9,666	1,013.63	0.10
22.00	0.09	9,644	1,013.63	0.10
23.00	0.09	9,628	1,013.62	0.09
24.00	0.09	9,615	1,013.62	0.09
25.00	0.00	9,398	1,013.56	0.05
26.00	0.00	9,210	1,013.52	0.05
27.00	0.00	9,023	1,013.47	0.05
28.00	0.00	8,837	1,013.42	0.05
29.00	0.00	8,653	1,013.37	0.05
30.00	0.00	8,469	1,013.33	0.05
31.00	0.00	8,287	1,013.28	0.05
32.00	0.00	8,105	1,013.23	0.05
33.00	0.00	7,926	1,013.18	0.05
34.00	0.00	7,747	1,013.13	0.05
35.00	0.00	7,569	1,013.08	0.05
36.00	0.00	7,393	1,013.03	0.05
37.00	0.00	7,218	1,012.98	0.05
38.00	0.00	7,044	1,012.93	0.05
39.00	0.00	6,872	1,012.88	0.05
40.00	0.00	6,701	1,012.83	0.05
41.00	0.00	6,531	1,012.78	0.05
42.00	0.00	6,362	1,012.73	0.05
43.00	0.00	6,195	1,012.68	0.05
44.00	0.00	6,030	1,012.63	0.05
45.00	0.00	5,865	1,012.58	0.05
46.00	0.00	5,702	1,012.53	0.05
47.00	0.00	5,541	1,012.48	0.04
48.00	0.00	5,381	1,012.42	0.04

Stage-Discharge for Pond 6P: Firestone Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,009.54	0.00	1,012.19	0.04	1,014.84	8.32
1,009.59	0.00	1,012.24	0.04	1,014.89	8.36
1,009.64	0.01	1,012.29	0.04	1,014.94	8.41
1,009.69	0.01	1,012.34	0.04	1,014.99	8.45
1,009.74	0.01	1,012.39	0.04	1,015.04	8.49
1,009.79	0.01	1,012.44	0.04	1,015.09	8.53
1,009.84	0.01	1,012.49	0.04	1,015.14	8.57
1,009.89	0.01	1,012.54	0.05	1,015.19	8.62
1,009.94	0.02	1,012.59	0.05	1,015.24	8.66
1,009.99	0.02	1,012.64	0.05	1,015.29	8.70
1,010.04	0.02	1,012.69	0.05	1,015.34	8.74
1,010.09	0.02	1,012.74	0.05	1,015.39	8.78
1,010.14	0.02	1,012.79	0.05	1,015.44	8.82
1,010.19	0.02	1,012.84	0.05	1,015.49	8.86
1,010.24	0.02	1,012.89	0.05	1,015.54	8.90
1,010.29	0.02	1,012.94	0.05	1,015.59	8.94
1,010.34	0.02	1,012.99	0.05	1,015.64	8.98
1,010.39	0.02	1,013.04	0.05	1,015.69	9.02
1,010.44	0.02	1,013.09	0.05	1,015.74	9.06
1,010.49	0.03	1,013.14	0.05	1,015.79	9.10
1,010.54	0.03	1,013.19	0.05	1,015.84	9.14
1,010.59	0.03	1,013.24	0.05	1,015.89	9.18
1,010.64	0.03	1,013.29	0.05	1,015.94	9.22
1,010.69	0.03	1,013.34	0.05	1,015.99	**9.26**
1,010.74	0.03	1,013.39	0.05		
1,010.79	0.03	1,013.44	0.05		
1,010.84	0.03	1,013.49	0.05		
1,010.89	0.03	1,013.54	0.05		
1,010.94	0.03	1,013.59	0.06		
1,010.99	0.03	1,013.64	0.11		
1,011.04	0.03	1,013.69	0.19		
1,011.09	0.03	1,013.74	0.28		
1,011.14	0.03	1,013.79	0.39		
1,011.19	0.03	1,013.84	0.50		
1,011.24	0.03	1,013.89	0.64		
1,011.29	0.03	1,013.94	0.78		
1,011.34	0.03	1,013.99	0.93		
1,011.39	0.04	1,014.04	1.05		
1,011.44	0.04	1,014.09	1.15		
1,011.49	0.04	1,014.14	1.24		
1,011.54	0.04	1,014.19	1.33		
1,011.59	0.04	1,014.24	1.41		
1,011.64	0.04	1,014.29	1.48		
1,011.69	0.04	1,014.34	1.95		
1,011.74	0.04	1,014.39	2.75		
1,011.79	0.04	1,014.44	3.77		
1,011.84	0.04	1,014.49	4.95		
1,011.89	0.04	1,014.54	6.28		
1,011.94	0.04	1,014.59	7.74		
1,011.99	0.04	1,014.64	8.15		
1,012.04	0.04	1,014.69	8.19		
1,012.09	0.04	1,014.74	8.23		
1,012.14	0.04	1,014.79	8.28		

Stage-Area-Storage for Pond 6P: Firestone Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,009.54	0	0
1,009.64	198	10
1,009.74	395	40
1,009.84	593	89
1,009.94	790	158
1,010.04	956	246
1,010.14	1,074	348
1,010.24	1,191	461
1,010.34	1,309	586
1,010.44	1,426	723
1,010.54	1,544	871
1,010.64	1,662	1,032
1,010.74	1,779	1,204
1,010.84	1,897	1,388
1,010.94	2,014	1,583
1,011.04	2,113	1,790
1,011.14	2,182	2,005
1,011.24	2,251	2,226
1,011.34	2,320	2,455
1,011.44	2,389	2,690
1,011.54	2,458	2,933
1,011.64	2,527	3,182
1,011.74	2,596	3,438
1,011.84	2,665	3,701
1,011.94	2,735	3,971
1,012.04	2,805	4,248
1,012.14	2,878	4,532
1,012.24	2,951	4,824
1,012.34	3,024	5,122
1,012.44	3,096	5,428
1,012.54	3,169	5,742
1,012.64	3,242	6,062
1,012.74	3,315	6,390
1,012.84	3,388	6,725
1,012.94	3,460	7,068
1,013.04	3,540	7,417
1,013.14	3,631	7,776
1,013.24	3,721	8,144
1,013.34	3,812	8,520
1,013.44	3,902	8,906
1,013.54	3,993	9,301
1,013.64	4,083	9,704
1,013.74	4,174	10,117
1,013.84	4,264	10,539
1,013.94	4,355	10,970
1,014.04	4,454	11,410
1,014.14	4,565	11,861
1,014.24	4,677	12,323
1,014.34	4,788	12,797
1,014.44	4,900	13,281
1,014.54	5,012	13,777
1,014.64	5,123	14,283
1,014.74	5,235	14,801
1,014.84	5,346	15,330
1,014.94	5,458	15,871
1,015.04	5,547	16,422
1,015.14	5,603	16,979
1,015.24	5,658	17,542
1,015.34	5,713	18,111
1,015.44	5,769	18,685
1,015.54	5,824	19,264
1,015.64	5,880	19,850
1,015.74	5,935	20,440
1,015.84	5,990	21,037
1,015.94	**6,046**	**21,638**

Summary for Pond 8P: Walmart Detention

Inflow Area = 12.230 ac, 0.00% Impervious, Inflow Depth = 5.58" for Jackson - 100 YR event
Inflow = 65.61 cfs @ 12.17 hrs, Volume= 5.682 af
Outflow = 14.17 cfs @ 12.71 hrs, Volume= 4.967 af, Atten= 78%, Lag= 32.3 min
Primary = 14.17 cfs @ 12.71 hrs, Volume= 4.967 af
Routed to Pond 1P : Existing Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,015.23' @ 12.71 hrs Surf.Area= 25,190 sf Storage= 129,948 cf

Plug-Flow detention time= 213.4 min calculated for 4.966 af (87% of inflow)
Center-of-Mass det. time= 153.2 min (967.1 - 813.9)

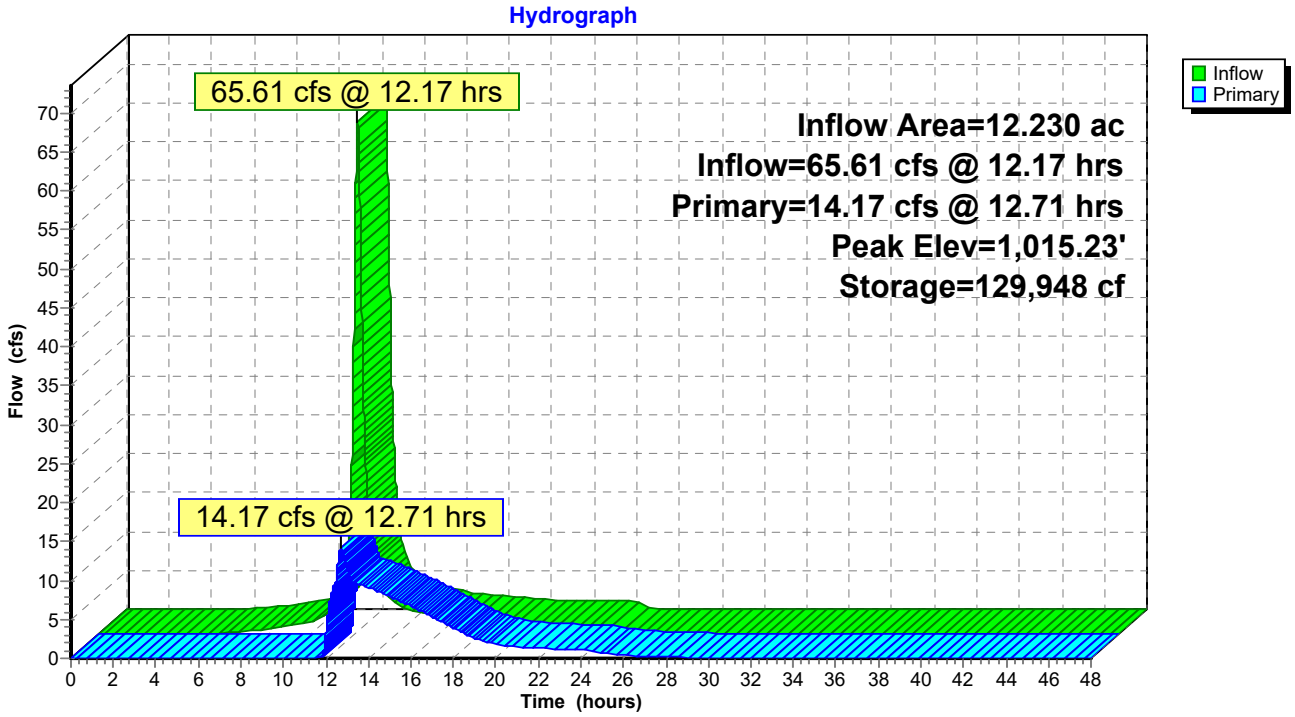
Volume	Invert	Avail.Storage	Storage Description
#1	1,005.00'	150,049 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,005.00	0	0	0
1,006.00	627	314	314
1,007.00	1,983	1,305	1,619
1,008.00	5,044	3,514	5,132
1,009.00	10,030	7,537	12,669
1,010.00	14,662	12,346	25,015
1,010.40	15,976	6,128	31,143
1,011.00	17,049	9,908	41,050
1,011.46	17,886	8,035	49,085
1,012.00	18,879	9,927	59,012
1,013.00	20,773	19,826	78,838
1,014.00	22,710	21,742	100,579
1,015.00	24,723	23,717	124,296
1,016.00	26,783	25,753	150,049

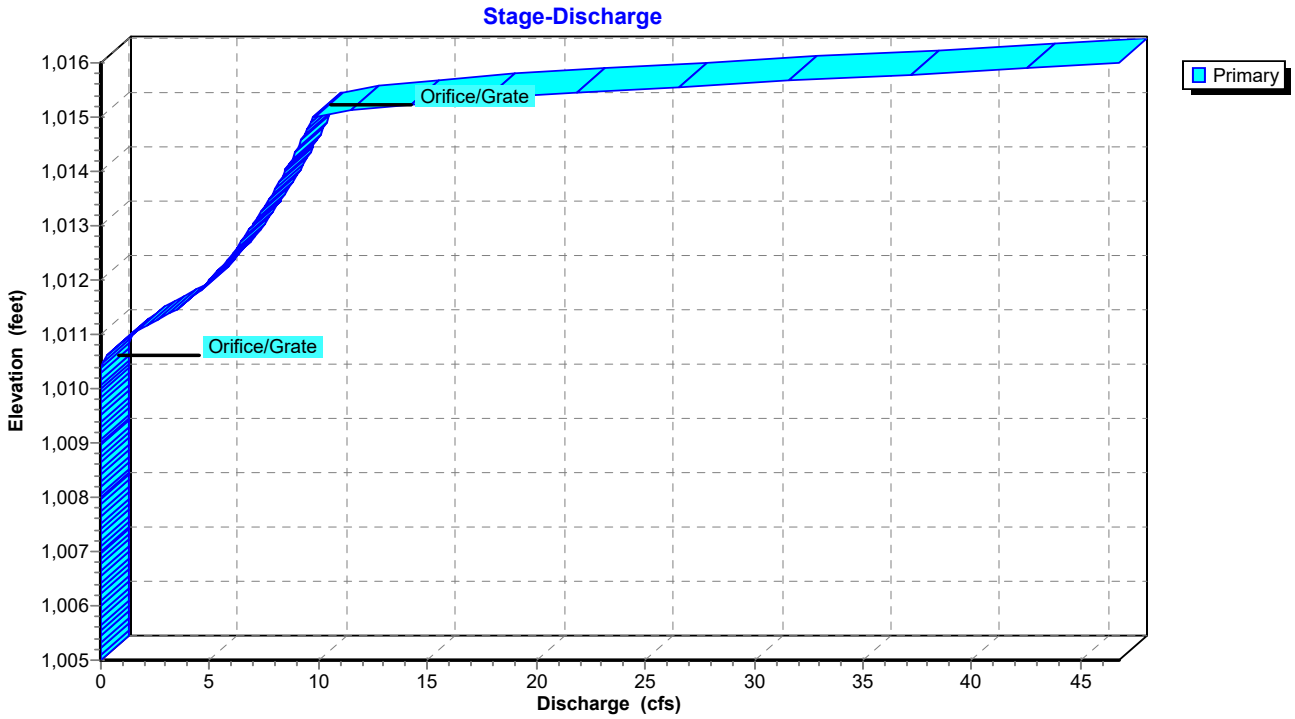
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.83'	**30.0" Round Culvert** L= 87.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,004.83' / 1,004.48' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	1,010.40'	**12.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,015.00'	**144.0" W x 10.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=14.16 cfs @ 12.71 hrs HW=1,015.23' (Free Discharge)
└**1=Culvert** (Passes 14.16 cfs of 71.48 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 10.01 cfs @ 10.01 fps)
  └**3=Orifice/Grate** (Orifice Controls 4.15 cfs @ 1.53 fps)

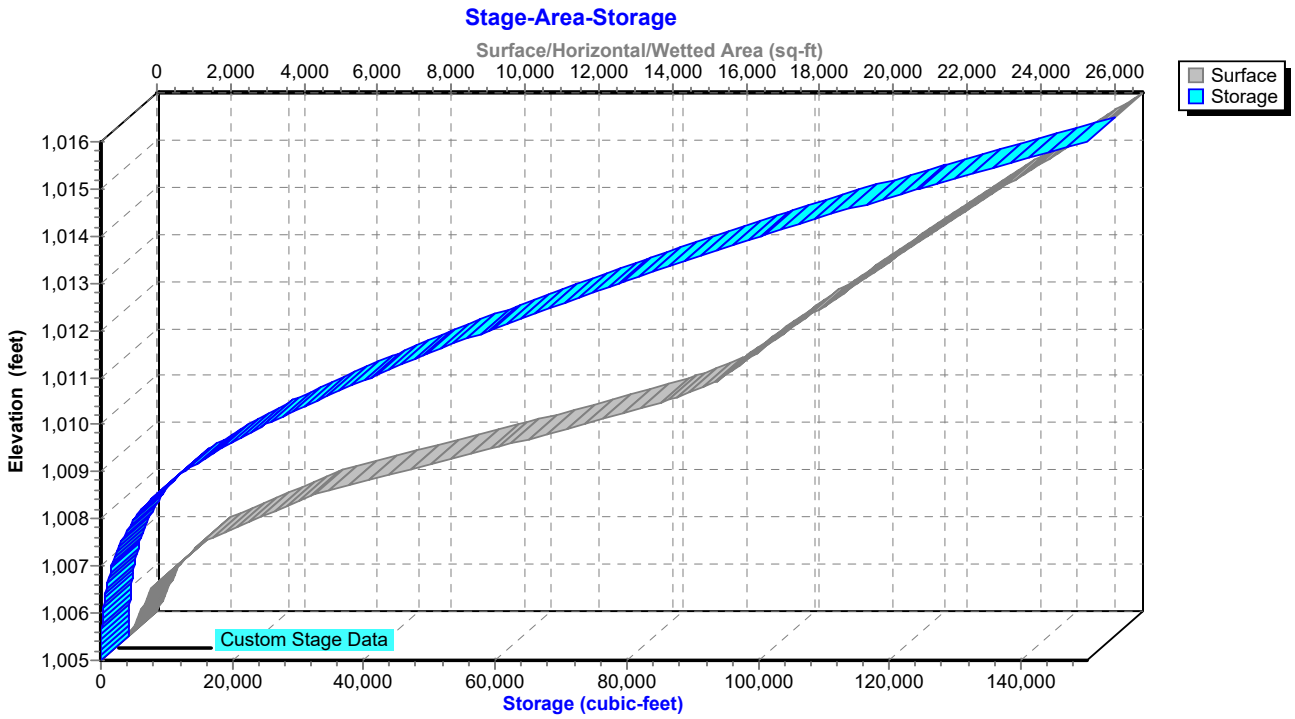
Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Hydrograph for Pond 8P: Walmart Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,005.00	0.00
1.00	0.00	0	1,005.00	0.00
2.00	0.00	0	1,005.00	0.00
3.00	0.00	0	1,005.00	0.00
4.00	0.00	0	1,005.00	0.00
5.00	0.01	3	1,005.09	0.00
6.00	0.17	309	1,005.99	0.00
7.00	0.37	1,282	1,006.82	0.00
8.00	0.60	3,021	1,007.51	0.00
9.00	1.03	5,819	1,008.13	0.00
10.00	1.57	10,481	1,008.77	0.00
11.00	3.15	18,463	1,009.52	0.00
12.00	**39.00**	**48,829**	**1,011.45**	**3.39**
13.00	**8.15**	**127,322**	**1,015.12**	**11.53**
14.00	3.94	111,776	1,014.48	9.11
15.00	2.88	92,814	1,013.65	7.98
16.00	2.27	75,648	1,012.85	6.70
17.00	1.91	61,428	1,012.13	5.29
18.00	1.69	51,377	1,011.59	3.89
19.00	1.47	45,550	1,011.26	2.56
20.00	1.25	42,636	1,011.09	1.85
21.00	1.14	40,954	1,010.99	1.47
22.00	1.09	40,051	1,010.94	1.28
23.00	1.05	39,512	1,010.91	1.17
24.00	1.01	39,136	1,010.89	1.10
25.00	0.01	37,107	1,010.77	0.72
26.00	0.00	35,169	1,010.65	0.40
27.00	0.00	34,031	1,010.58	0.25
28.00	0.00	33,295	1,010.53	0.16
29.00	0.00	32,810	1,010.50	0.11
30.00	0.00	32,470	1,010.48	0.08
31.00	0.00	32,200	1,010.47	0.07
32.00	0.00	31,985	1,010.45	0.05
33.00	0.00	31,813	1,010.44	0.04
34.00	0.00	31,677	1,010.43	0.03
35.00	0.00	31,568	1,010.43	0.03
36.00	0.00	31,482	1,010.42	0.02
37.00	0.00	31,413	1,010.42	0.02
38.00	0.00	31,358	1,010.41	0.01
39.00	0.00	31,314	1,010.41	0.01
40.00	0.00	31,279	1,010.41	0.01
41.00	0.00	31,251	1,010.41	0.01
42.00	0.00	31,229	1,010.41	0.01
43.00	0.00	31,212	1,010.40	0.00
44.00	0.00	31,198	1,010.40	0.00
45.00	0.00	31,186	1,010.40	0.00
46.00	0.00	31,177	1,010.40	0.00
47.00	0.00	31,170	1,010.40	0.00
48.00	0.00	31,165	1,010.40	0.00

Stage-Discharge for Pond 8P: Walmart Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,005.00	0.00	1,010.30	0.00	1,015.60	28.34
1,005.10	0.00	1,010.40	0.00	1,015.70	33.10
1,005.20	0.00	1,010.50	0.10	1,015.80	38.22
1,005.30	0.00	1,010.60	0.29	1,015.90	42.99
1,005.40	0.00	1,010.70	0.53	1,016.00	**46.77**
1,005.50	0.00	1,010.80	0.81		
1,005.60	0.00	1,010.90	1.13		
1,005.70	0.00	1,011.00	1.49		
1,005.80	0.00	1,011.10	1.88		
1,005.90	0.00	1,011.20	2.30		
1,006.00	0.00	1,011.30	2.74		
1,006.10	0.00	1,011.40	3.21		
1,006.20	0.00	1,011.50	3.60		
1,006.30	0.00	1,011.60	3.93		
1,006.40	0.00	1,011.70	4.23		
1,006.50	0.00	1,011.80	4.51		
1,006.60	0.00	1,011.90	4.76		
1,006.70	0.00	1,012.00	5.00		
1,006.80	0.00	1,012.10	5.24		
1,006.90	0.00	1,012.20	5.46		
1,007.00	0.00	1,012.30	5.67		
1,007.10	0.00	1,012.40	5.87		
1,007.20	0.00	1,012.50	6.07		
1,007.30	0.00	1,012.60	6.25		
1,007.40	0.00	1,012.70	6.44		
1,007.50	0.00	1,012.80	6.62		
1,007.60	0.00	1,012.90	6.79		
1,007.70	0.00	1,013.00	6.96		
1,007.80	0.00	1,013.10	7.13		
1,007.90	0.00	1,013.20	7.29		
1,008.00	0.00	1,013.30	7.45		
1,008.10	0.00	1,013.40	7.60		
1,008.20	0.00	1,013.50	7.75		
1,008.30	0.00	1,013.60	7.90		
1,008.40	0.00	1,013.70	8.05		
1,008.50	0.00	1,013.80	8.19		
1,008.60	0.00	1,013.90	8.33		
1,008.70	0.00	1,014.00	8.47		
1,008.80	0.00	1,014.10	8.60		
1,008.90	0.00	1,014.20	8.74		
1,009.00	0.00	1,014.30	8.87		
1,009.10	0.00	1,014.40	9.00		
1,009.20	0.00	1,014.50	9.13		
1,009.30	0.00	1,014.60	9.25		
1,009.40	0.00	1,014.70	9.38		
1,009.50	0.00	1,014.80	9.50		
1,009.60	0.00	1,014.90	9.62		
1,009.70	0.00	1,015.00	9.74		
1,009.80	0.00	1,015.10	11.08		
1,009.90	0.00	1,015.20	13.42		
1,010.00	0.00	1,015.30	16.42		
1,010.10	0.00	1,015.40	19.95		
1,010.20	0.00	1,015.50	23.94		

Stage-Area-Storage for Pond 8P: Walmart Detention

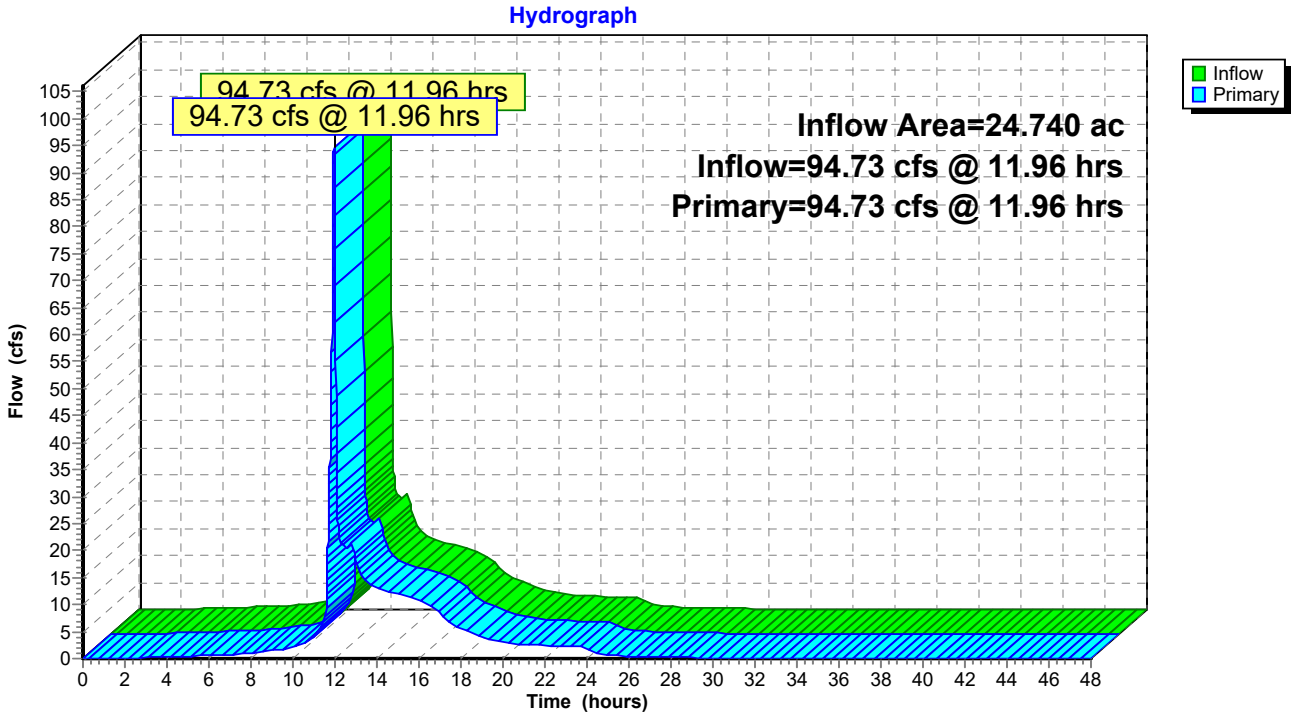
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,005.00	0	0
1,005.20	125	13
1,005.40	251	50
1,005.60	376	113
1,005.80	502	201
1,006.00	627	314
1,006.20	898	466
1,006.40	1,169	673
1,006.60	1,441	934
1,006.80	1,712	1,249
1,007.00	1,983	1,619
1,007.20	2,595	2,076
1,007.40	3,207	2,657
1,007.60	3,820	3,359
1,007.80	4,432	4,184
1,008.00	5,044	5,132
1,008.20	6,041	6,241
1,008.40	7,038	7,548
1,008.60	8,036	9,056
1,008.80	9,033	10,763
1,009.00	10,030	12,669
1,009.20	10,956	14,768
1,009.40	11,883	17,052
1,009.60	12,809	19,521
1,009.80	13,736	22,175
1,010.00	14,662	25,015
1,010.20	15,319	28,013
1,010.40	15,976	31,143
1,010.60	16,334	34,374
1,010.80	16,691	37,676
1,011.00	17,049	41,050
1,011.20	17,413	44,496
1,011.40	17,777	48,015
1,011.60	18,143	51,607
1,011.80	18,511	55,273
1,012.00	18,879	59,012
1,012.20	19,258	62,825
1,012.40	19,637	66,715
1,012.60	20,015	70,680
1,012.80	20,394	74,721
1,013.00	20,773	78,838
1,013.20	21,160	83,031
1,013.40	21,548	87,302
1,013.60	21,935	91,650
1,013.80	22,323	96,076
1,014.00	22,710	100,579
1,014.20	23,113	105,161
1,014.40	23,515	109,824
1,014.60	23,918	114,568
1,014.80	24,320	119,391
1,015.00	24,723	124,296
1,015.20	25,135	129,282
1,015.40	25,547	134,350
1,015.60	25,959	139,500
1,015.80	26,371	144,733
1,016.00	**26,783**	**150,049**

Summary for Link 1L: Existing Total

Inflow Area = 24.740 ac, 0.00% Impervious, Inflow Depth > 5.35" for Jackson - 100 YR event
Inflow = 94.73 cfs @ 11.96 hrs, Volume= 11.023 af
Primary = 94.73 cfs @ 11.96 hrs, Volume= 11.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Existing Total



Hydrograph for Link 1L: Existing Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.50	0.36	0.00	0.36
0.50	0.00	0.00	0.00	27.00	0.30	0.00	0.30
1.00	0.00	0.00	0.00	27.50	0.26	0.00	0.26
1.50	0.00	0.00	0.00	28.00	0.22	0.00	0.22
2.00	0.05	0.00	0.05	28.50	0.19	0.00	0.19
2.50	0.12	0.00	0.12	29.00	0.16	0.00	0.16
3.00	0.18	0.00	0.18	29.50	0.15	0.00	0.15
3.50	0.24	0.00	0.24	30.00	0.14	0.00	0.14
4.00	0.29	0.00	0.29	30.50	0.13	0.00	0.13
4.50	0.36	0.00	0.36	31.00	0.12	0.00	0.12
5.00	0.43	0.00	0.43	31.50	0.11	0.00	0.11
5.50	0.50	0.00	0.50	32.00	0.10	0.00	0.10
6.00	0.57	0.00	0.57	32.50	0.10	0.00	0.10
6.50	0.64	0.00	0.64	33.00	0.09	0.00	0.09
7.00	0.73	0.00	0.73	33.50	0.09	0.00	0.09
7.50	0.84	0.00	0.84	34.00	0.08	0.00	0.08
8.00	0.94	0.00	0.94	34.50	0.08	0.00	0.08
8.50	1.20	0.00	1.20	35.00	0.08	0.00	0.08
9.00	1.53	0.00	1.53	35.50	0.07	0.00	0.07
9.50	1.67	0.00	1.67	36.00	0.07	0.00	0.07
10.00	2.12	0.00	2.12	36.50	0.07	0.00	0.07
10.50	2.90	0.00	2.90	37.00	0.07	0.00	0.07
11.00	4.22	0.00	4.22	37.50	0.06	0.00	0.06
11.50	**7.34**	0.00	**7.34**	38.00	0.06	0.00	0.06
12.00	**82.18**	0.00	**82.18**	38.50	0.06	0.00	0.06
12.50	19.81	0.00	19.81	39.00	0.06	0.00	0.06
13.00	17.91	0.00	17.91	39.50	0.06	0.00	0.06
13.50	14.20	0.00	14.20	40.00	0.06	0.00	0.06
14.00	12.96	0.00	12.96	40.50	0.05	0.00	0.05
14.50	12.49	0.00	12.49	41.00	0.05	0.00	0.05
15.00	12.01	0.00	12.01	41.50	0.05	0.00	0.05
15.50	11.42	0.00	11.42	42.00	0.05	0.00	0.05
16.00	10.68	0.00	10.68	42.50	0.05	0.00	0.05
16.50	9.84	0.00	9.84	43.00	0.05	0.00	0.05
17.00	8.39	0.00	8.39	43.50	0.05	0.00	0.05
17.50	6.48	0.00	6.48	44.00	0.05	0.00	0.05
18.00	5.63	0.00	5.63	44.50	0.05	0.00	0.05
18.50	4.79	0.00	4.79	45.00	0.05	0.00	0.05
19.00	4.04	0.00	4.04	45.50	0.05	0.00	0.05
19.50	3.50	0.00	3.50	46.00	0.05	0.00	0.05
20.00	3.09	0.00	3.09	46.50	0.05	0.00	0.05
20.50	2.82	0.00	2.82	47.00	0.05	0.00	0.05
21.00	2.64	0.00	2.64	47.50	0.05	0.00	0.05
21.50	2.50	0.00	2.50	48.00	0.05	0.00	0.05
22.00	2.39	0.00	2.39				
22.50	2.31	0.00	2.31				
23.00	2.24	0.00	2.24				
23.50	2.17	0.00	2.17				
24.00	2.12	0.00	2.12				
24.50	1.04	0.00	1.04				
25.00	0.78	0.00	0.78				
25.50	0.59	0.00	0.59				
26.00	0.46	0.00	0.46				

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Onsite Detention Runoff Area=0.500 ac 0.00% Impervious Runoff Depth=1.24"
Tc=5.0 min CN=74 Runoff=1.15 cfs 0.052 af

Subcatchment 2S: Walmart Bypass Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=1.94"
Tc=5.0 min CN=84 Runoff=1.92 cfs 0.087 af

Subcatchment 3S: Existing Onsite Bypass Runoff Area=4.530 ac 0.00% Impervious Runoff Depth=1.24"
Tc=5.0 min CN=74 Runoff=10.43 cfs 0.468 af

Subcatchment 4S: Firestone Bypass Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=88 Runoff=0.90 cfs 0.042 af

Subcatchment 5S: Firestone Detention Runoff Area=1.020 ac 0.00% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=88 Runoff=4.17 cfs 0.193 af

Subcatchment 6S: Market Street RW Runoff Area=1.500 ac 0.00% Impervious Runoff Depth=2.84"
Tc=5.0 min CN=94 Runoff=7.20 cfs 0.354 af

Subcatchment 7S: Walmart Detention Runoff Area=12.230 ac 0.00% Impervious Runoff Depth=1.78"
Tc=24.9 min CN=82 Runoff=21.20 cfs 1.817 af

Subcatchment 9S: Commercial Plus RW Runoff Area=4.200 ac 0.00% Impervious Runoff Depth=2.84"
Tc=5.0 min CN=94 Runoff=20.16 cfs 0.992 af

Pond 1P: Existing Detention Peak Elev=1,002.82' Storage=2,139 cf Inflow=11.16 cfs 1.636 af
Primary=7.50 cfs 1.636 af Secondary=0.00 cfs 0.000 af Outflow=7.50 cfs 1.636 af

Pond 6P: Firestone Detention Peak Elev=1,012.70' Storage=6,249 cf Inflow=4.17 cfs 0.193 af
Outflow=0.05 cfs 0.133 af

Pond 8P: Walmart Detention Peak Elev=1,011.20' Storage=44,415 cf Inflow=21.20 cfs 1.817 af
Outflow=2.28 cfs 1.101 af

Link 1L: Existing Total Inflow=37.66 cfs 3.230 af
Primary=37.66 cfs 3.230 af

Total Runoff Area = 24.740 ac Runoff Volume = 4.005 af Average Runoff Depth = 1.94"
100.00% Pervious = 24.740 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Existing Onsite Detention

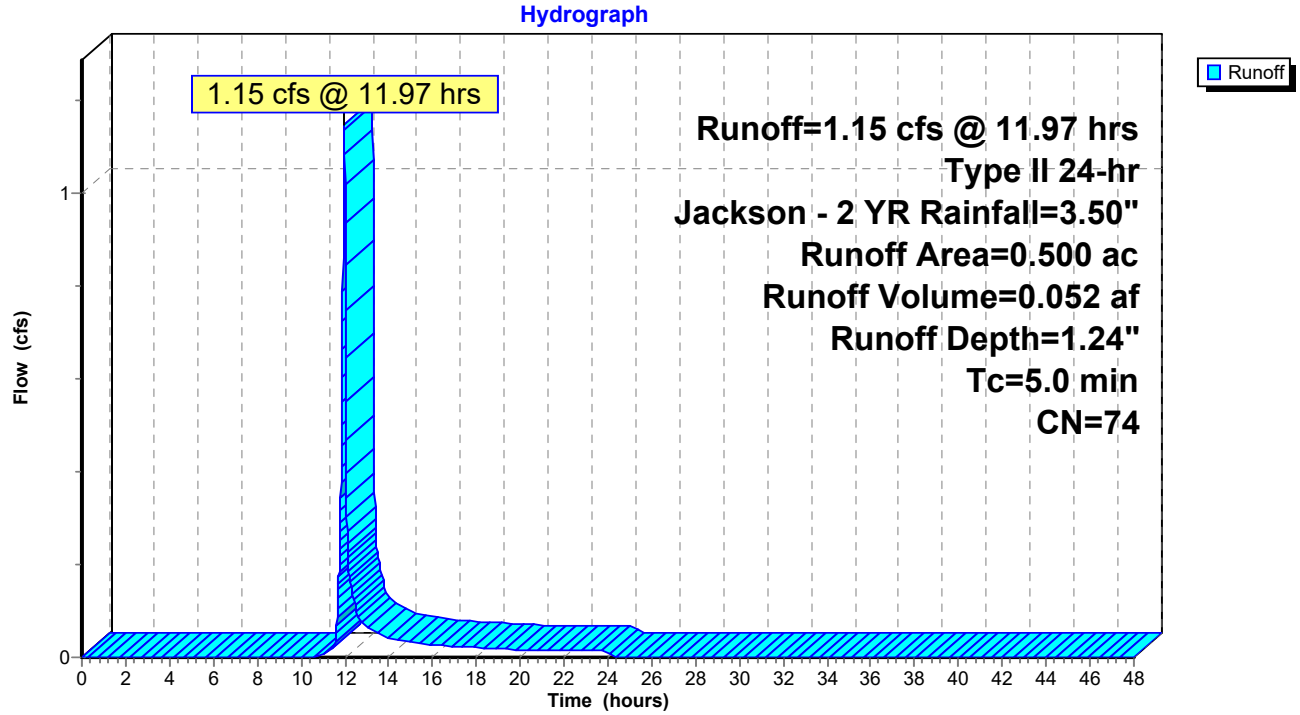
Runoff = 1.15 cfs @ 11.97 hrs, Volume= 0.052 af, Depth= 1.24"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

Area (ac)	CN	Description
0.500	74	>75% Grass cover, Good, HSG C
0.500		100.00% Pervious Area

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

Subcatchment 1S: Existing Onsite Detention



Hydrograph for Subcatchment 1S: Existing Onsite Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.50	1.24	0.00
0.50	0.02	0.00	0.00	27.00	3.50	1.24	0.00
1.00	0.04	0.00	0.00	27.50	3.50	1.24	0.00
1.50	0.06	0.00	0.00	28.00	3.50	1.24	0.00
2.00	0.08	0.00	0.00	28.50	3.50	1.24	0.00
2.50	0.10	0.00	0.00	29.00	3.50	1.24	0.00
3.00	0.12	0.00	0.00	29.50	3.50	1.24	0.00
3.50	0.14	0.00	0.00	30.00	3.50	1.24	0.00
4.00	0.17	0.00	0.00	30.50	3.50	1.24	0.00
4.50	0.19	0.00	0.00	31.00	3.50	1.24	0.00
5.00	0.22	0.00	0.00	31.50	3.50	1.24	0.00
5.50	0.25	0.00	0.00	32.00	3.50	1.24	0.00
6.00	0.28	0.00	0.00	32.50	3.50	1.24	0.00
6.50	0.31	0.00	0.00	33.00	3.50	1.24	0.00
7.00	0.35	0.00	0.00	33.50	3.50	1.24	0.00
7.50	0.38	0.00	0.00	34.00	3.50	1.24	0.00
8.00	0.42	0.00	0.00	34.50	3.50	1.24	0.00
8.50	0.46	0.00	0.00	35.00	3.50	1.24	0.00
9.00	0.51	0.00	0.00	35.50	3.50	1.24	0.00
9.50	0.57	0.00	0.00	36.00	3.50	1.24	0.00
10.00	0.63	0.00	0.00	36.50	3.50	1.24	0.00
10.50	0.71	0.00	0.00	37.00	3.50	1.24	0.00
11.00	0.82	0.00	0.01	37.50	3.50	1.24	0.00
11.50	0.99	0.02	**0.03**	38.00	3.50	1.24	0.00
12.00	2.32	0.51	**1.02**	38.50	3.50	1.24	0.00
12.50	2.57	0.65	0.11	39.00	3.50	1.24	0.00
13.00	2.70	0.73	0.07	39.50	3.50	1.24	0.00
13.50	2.80	0.78	0.05	40.00	3.50	1.24	0.00
14.00	2.87	0.83	0.04	40.50	3.50	1.24	0.00
14.50	2.93	0.87	0.04	41.00	3.50	1.24	0.00
15.00	2.99	0.90	0.03	41.50	3.50	1.24	0.00
15.50	3.04	0.93	0.03	42.00	3.50	1.24	0.00
16.00	3.08	0.96	0.03	42.50	3.50	1.24	0.00
16.50	3.12	0.98	0.03	43.00	3.50	1.24	0.00
17.00	3.16	1.01	0.02	43.50	3.50	1.24	0.00
17.50	3.19	1.03	0.02	44.00	3.50	1.24	0.00
18.00	3.22	1.05	0.02	44.50	3.50	1.24	0.00
18.50	3.25	1.07	0.02	45.00	3.50	1.24	0.00
19.00	3.28	1.09	0.02	45.50	3.50	1.24	0.00
19.50	3.31	1.11	0.02	46.00	3.50	1.24	0.00
20.00	3.33	1.13	0.02	46.50	3.50	1.24	0.00
20.50	3.35	1.14	0.02	47.00	3.50	1.24	0.00
21.00	3.38	1.16	0.01	47.50	3.50	1.24	0.00
21.50	3.40	1.17	0.01	48.00	3.50	1.24	0.00
22.00	3.42	1.18	0.01				
22.50	3.44	1.20	0.01				
23.00	3.46	1.21	0.01				
23.50	3.48	1.23	0.01				
24.00	**3.50**	**1.24**	0.01				
24.50	3.50	1.24	0.00				
25.00	3.50	1.24	0.00				
25.50	3.50	1.24	0.00				
26.00	3.50	1.24	0.00				

Summary for Subcatchment 2S: Walmart Bypass

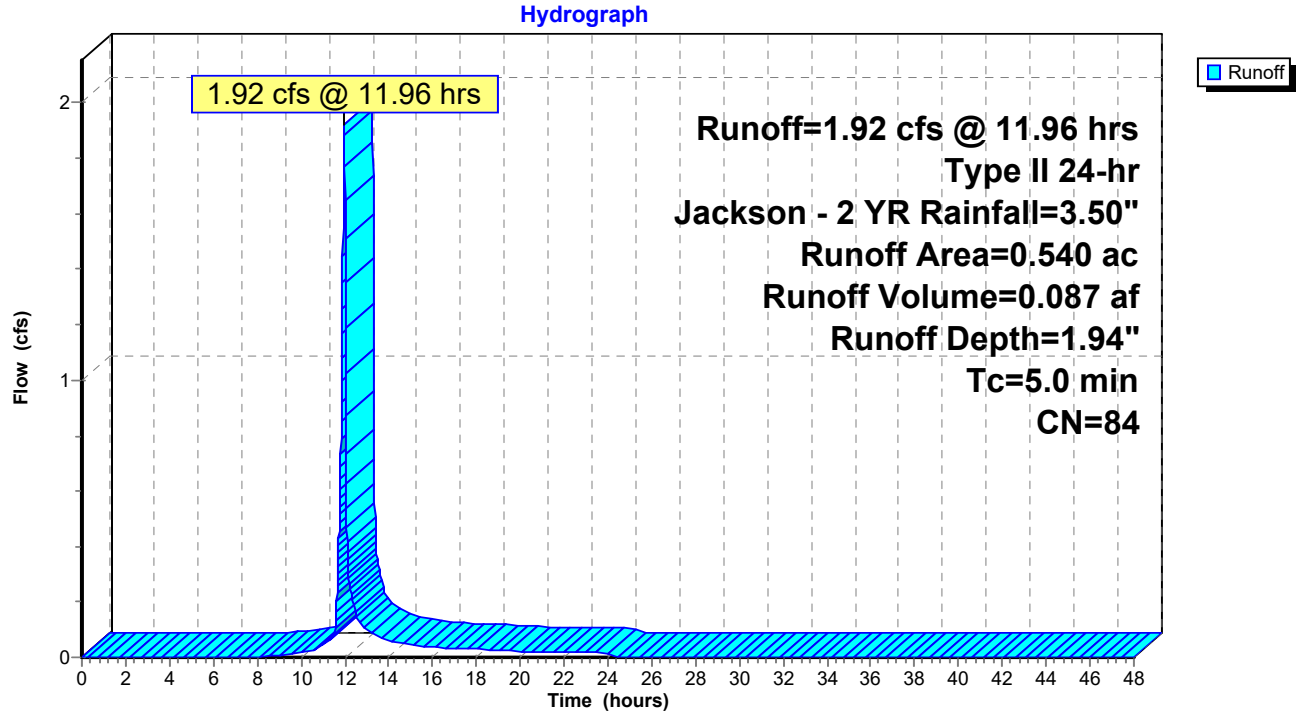
Runoff = 1.92 cfs @ 11.96 hrs, Volume= 0.087 af, Depth= 1.94"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	0.540	84	
	0.540		100.00% Pervious Area

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

Subcatchment 2S: Walmart Bypass



Hydrograph for Subcatchment 2S: Walmart Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.00
7.50	0.38	0.00	0.00
8.00	0.42	0.00	0.00
8.50	0.46	0.00	0.00
9.00	0.51	0.01	0.01
9.50	0.57	0.02	0.01
10.00	0.63	0.03	0.02
10.50	0.71	0.05	0.03
11.00	0.82	0.08	0.04
11.50	0.99	0.15	**0.09**
12.00	2.32	0.98	**1.65**
12.50	2.57	1.17	0.16
13.00	2.70	1.27	0.10
13.50	2.80	1.35	0.08
14.00	2.87	1.41	0.06
14.50	2.93	1.46	0.05
15.00	2.99	1.51	0.05
15.50	3.04	1.55	0.04
16.00	3.08	1.58	0.04
16.50	3.12	1.61	0.03
17.00	3.16	1.65	0.03
17.50	3.19	1.67	0.03
18.00	3.22	1.70	0.03
18.50	3.25	1.73	0.03
19.00	3.28	1.75	0.03
19.50	3.31	1.77	0.02
20.00	3.33	1.79	0.02
20.50	3.35	1.81	0.02
21.00	3.38	1.83	0.02
21.50	3.40	1.85	0.02
22.00	3.42	1.87	0.02
22.50	3.44	1.89	0.02
23.00	3.46	1.90	0.02
23.50	3.48	1.92	0.02
24.00	**3.50**	**1.94**	0.02
24.50	3.50	1.94	0.00
25.00	3.50	1.94	0.00
25.50	3.50	1.94	0.00
26.00	3.50	1.94	0.00
26.50	3.50	1.94	0.00
27.00	3.50	1.94	0.00
27.50	3.50	1.94	0.00
28.00	3.50	1.94	0.00
28.50	3.50	1.94	0.00
29.00	3.50	1.94	0.00
29.50	3.50	1.94	0.00
30.00	3.50	1.94	0.00
30.50	3.50	1.94	0.00
31.00	3.50	1.94	0.00
31.50	3.50	1.94	0.00
32.00	3.50	1.94	0.00
32.50	3.50	1.94	0.00
33.00	3.50	1.94	0.00
33.50	3.50	1.94	0.00
34.00	3.50	1.94	0.00
34.50	3.50	1.94	0.00
35.00	3.50	1.94	0.00
35.50	3.50	1.94	0.00
36.00	3.50	1.94	0.00
36.50	3.50	1.94	0.00
37.00	3.50	1.94	0.00
37.50	3.50	1.94	0.00
38.00	3.50	1.94	0.00
38.50	3.50	1.94	0.00
39.00	3.50	1.94	0.00
39.50	3.50	1.94	0.00
40.00	3.50	1.94	0.00
40.50	3.50	1.94	0.00
41.00	3.50	1.94	0.00
41.50	3.50	1.94	0.00
42.00	3.50	1.94	0.00
42.50	3.50	1.94	0.00
43.00	3.50	1.94	0.00
43.50	3.50	1.94	0.00
44.00	3.50	1.94	0.00
44.50	3.50	1.94	0.00
45.00	3.50	1.94	0.00
45.50	3.50	1.94	0.00
46.00	3.50	1.94	0.00
46.50	3.50	1.94	0.00
47.00	3.50	1.94	0.00
47.50	3.50	1.94	0.00
48.00	3.50	1.94	0.00

Summary for Subcatchment 3S: Existing Onsite Bypass

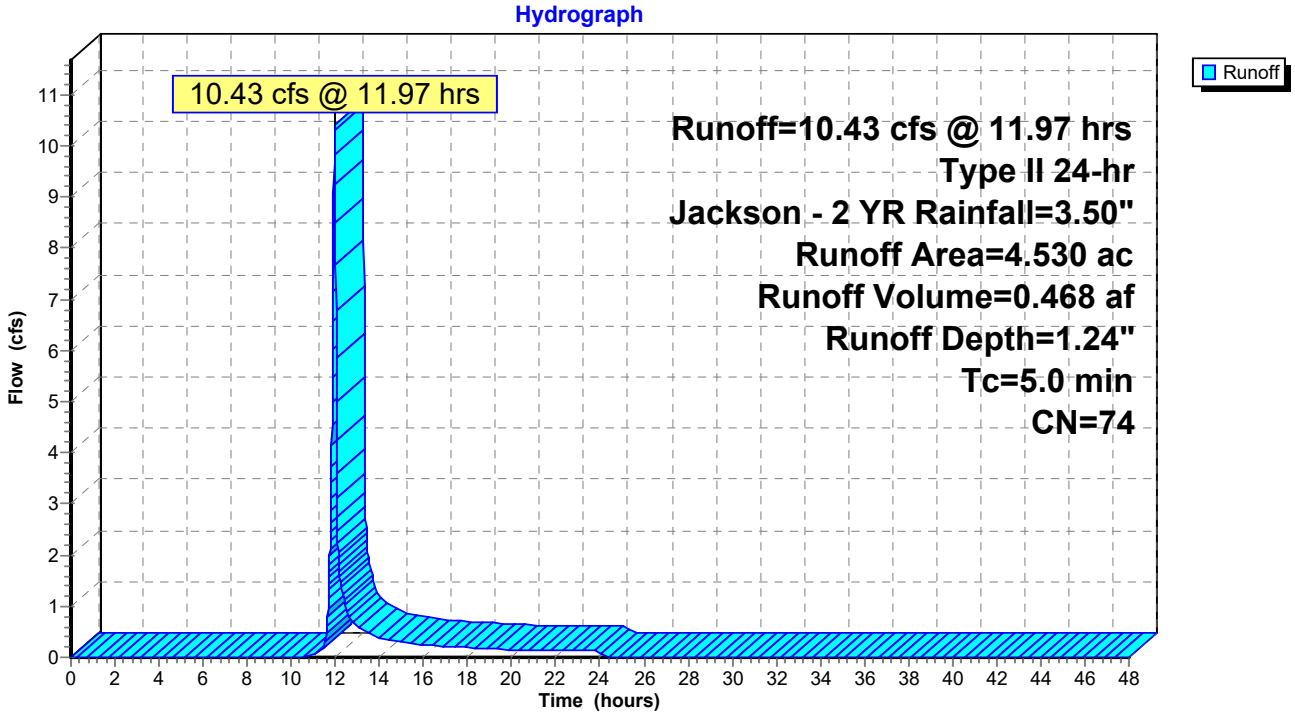
Runoff = 10.43 cfs @ 11.97 hrs, Volume= 0.468 af, Depth= 1.24"
Routed to Link 1L : Existing Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

Area (ac)	CN	Description
4.530	74	>75% Grass cover, Good, HSG C
4.530		100.00% Pervious Area

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

Subcatchment 3S: Existing Onsite Bypass



Hydrograph for Subcatchment 3S: Existing Onsite Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.50	1.24	0.00
0.50	0.02	0.00	0.00	27.00	3.50	1.24	0.00
1.00	0.04	0.00	0.00	27.50	3.50	1.24	0.00
1.50	0.06	0.00	0.00	28.00	3.50	1.24	0.00
2.00	0.08	0.00	0.00	28.50	3.50	1.24	0.00
2.50	0.10	0.00	0.00	29.00	3.50	1.24	0.00
3.00	0.12	0.00	0.00	29.50	3.50	1.24	0.00
3.50	0.14	0.00	0.00	30.00	3.50	1.24	0.00
4.00	0.17	0.00	0.00	30.50	3.50	1.24	0.00
4.50	0.19	0.00	0.00	31.00	3.50	1.24	0.00
5.00	0.22	0.00	0.00	31.50	3.50	1.24	0.00
5.50	0.25	0.00	0.00	32.00	3.50	1.24	0.00
6.00	0.28	0.00	0.00	32.50	3.50	1.24	0.00
6.50	0.31	0.00	0.00	33.00	3.50	1.24	0.00
7.00	0.35	0.00	0.00	33.50	3.50	1.24	0.00
7.50	0.38	0.00	0.00	34.00	3.50	1.24	0.00
8.00	0.42	0.00	0.00	34.50	3.50	1.24	0.00
8.50	0.46	0.00	0.00	35.00	3.50	1.24	0.00
9.00	0.51	0.00	0.00	35.50	3.50	1.24	0.00
9.50	0.57	0.00	0.00	36.00	3.50	1.24	0.00
10.00	0.63	0.00	0.00	36.50	3.50	1.24	0.00
10.50	0.71	0.00	0.00	37.00	3.50	1.24	0.00
11.00	0.82	0.00	0.06	37.50	3.50	1.24	0.00
11.50	0.99	0.02	**0.24**	38.00	3.50	1.24	0.00
12.00	2.32	0.51	**9.23**	38.50	3.50	1.24	0.00
12.50	2.57	0.65	0.95	39.00	3.50	1.24	0.00
13.00	2.70	0.73	0.61	39.50	3.50	1.24	0.00
13.50	2.80	0.78	0.48	40.00	3.50	1.24	0.00
14.00	2.87	0.83	0.38	40.50	3.50	1.24	0.00
14.50	2.93	0.87	0.34	41.00	3.50	1.24	0.00
15.00	2.99	0.90	0.31	41.50	3.50	1.24	0.00
15.50	3.04	0.93	0.28	42.00	3.50	1.24	0.00
16.00	3.08	0.96	0.24	42.50	3.50	1.24	0.00
16.50	3.12	0.98	0.23	43.00	3.50	1.24	0.00
17.00	3.16	1.01	0.22	43.50	3.50	1.24	0.00
17.50	3.19	1.03	0.20	44.00	3.50	1.24	0.00
18.00	3.22	1.05	0.19	44.50	3.50	1.24	0.00
18.50	3.25	1.07	0.18	45.00	3.50	1.24	0.00
19.00	3.28	1.09	0.17	45.50	3.50	1.24	0.00
19.50	3.31	1.11	0.15	46.00	3.50	1.24	0.00
20.00	3.33	1.13	0.14	46.50	3.50	1.24	0.00
20.50	3.35	1.14	0.14	47.00	3.50	1.24	0.00
21.00	3.38	1.16	0.14	47.50	3.50	1.24	0.00
21.50	3.40	1.17	0.13	48.00	3.50	1.24	0.00
22.00	3.42	1.18	0.13				
22.50	3.44	1.20	0.13				
23.00	3.46	1.21	0.13				
23.50	3.48	1.23	0.12				
24.00	**3.50**	**1.24**	0.12				
24.50	3.50	1.24	0.00				
25.00	3.50	1.24	0.00				
25.50	3.50	1.24	0.00				
26.00	3.50	1.24	0.00				

Summary for Subcatchment 4S: Firestone Bypass

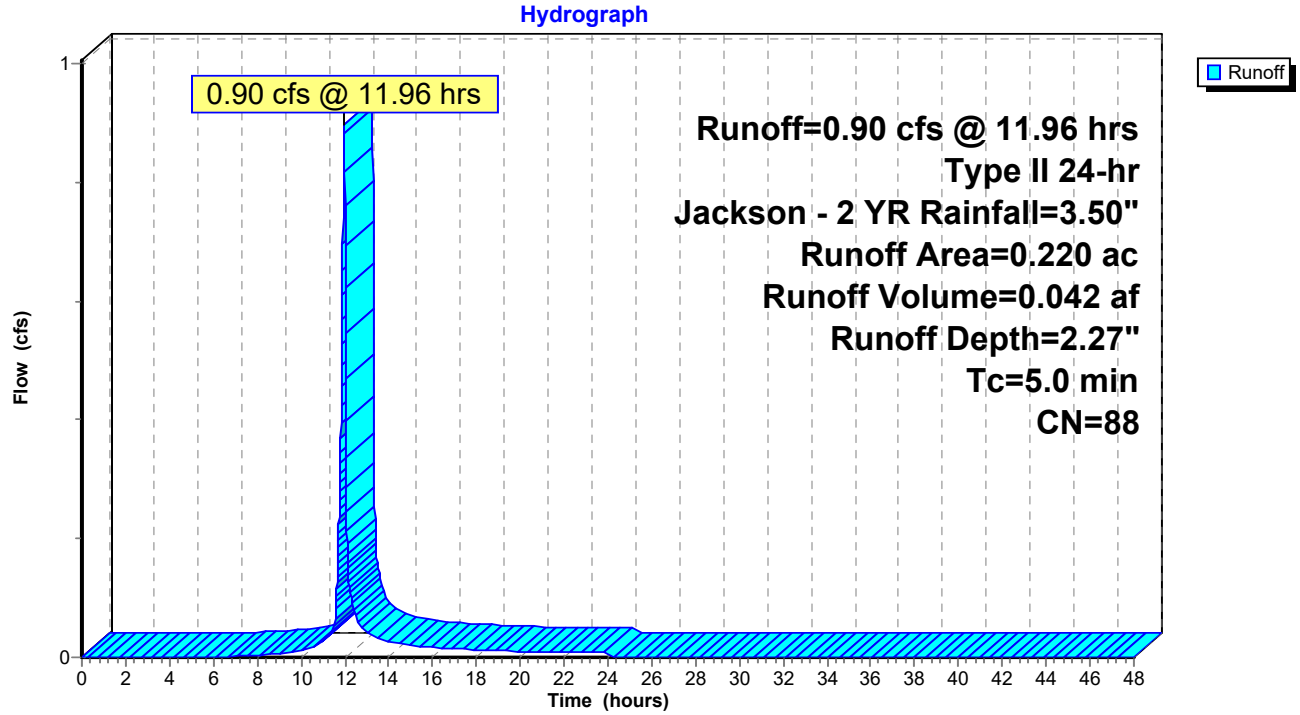
Runoff = 0.90 cfs @ 11.96 hrs, Volume= 0.042 af, Depth= 2.27"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	0.220	88	
	0.220		100.00% Pervious Area

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

Subcatchment 4S: Firestone Bypass



Hydrograph for Subcatchment 4S: Firestone Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.00
7.50	0.38	0.01	0.00
8.00	0.42	0.01	0.00
8.50	0.46	0.02	0.00
9.00	0.51	0.04	0.01
9.50	0.57	0.05	0.01
10.00	0.63	0.08	0.01
10.50	0.71	0.11	0.02
11.00	0.82	0.16	0.03
11.50	0.99	0.25	**0.05**
12.00	2.32	1.23	**0.76**
12.50	2.57	1.44	0.07
13.00	2.70	1.56	0.04
13.50	2.80	1.64	0.03
14.00	2.87	1.70	0.03
14.50	2.93	1.76	0.02
15.00	2.99	1.81	0.02
15.50	3.04	1.85	0.02
16.00	3.08	1.89	0.02
16.50	3.12	1.92	0.02
17.00	3.16	1.96	0.01
17.50	3.19	1.99	0.01
18.00	3.22	2.02	0.01
18.50	3.25	2.05	0.01
19.00	3.28	2.07	0.01
19.50	3.31	2.09	0.01
20.00	3.33	2.12	0.01
20.50	3.35	2.14	0.01
21.00	3.38	2.16	0.01
21.50	3.40	2.18	0.01
22.00	3.42	2.20	0.01
22.50	3.44	2.21	0.01
23.00	3.46	2.23	0.01
23.50	3.48	2.25	0.01
24.00	**3.50**	**2.27**	0.01
24.50	3.50	2.27	0.00
25.00	3.50	2.27	0.00
25.50	3.50	2.27	0.00
26.00	3.50	2.27	0.00
26.50	3.50	2.27	0.00
27.00	3.50	2.27	0.00
27.50	3.50	2.27	0.00
28.00	3.50	2.27	0.00
28.50	3.50	2.27	0.00
29.00	3.50	2.27	0.00
29.50	3.50	2.27	0.00
30.00	3.50	2.27	0.00
30.50	3.50	2.27	0.00
31.00	3.50	2.27	0.00
31.50	3.50	2.27	0.00
32.00	3.50	2.27	0.00
32.50	3.50	2.27	0.00
33.00	3.50	2.27	0.00
33.50	3.50	2.27	0.00
34.00	3.50	2.27	0.00
34.50	3.50	2.27	0.00
35.00	3.50	2.27	0.00
35.50	3.50	2.27	0.00
36.00	3.50	2.27	0.00
36.50	3.50	2.27	0.00
37.00	3.50	2.27	0.00
37.50	3.50	2.27	0.00
38.00	3.50	2.27	0.00
38.50	3.50	2.27	0.00
39.00	3.50	2.27	0.00
39.50	3.50	2.27	0.00
40.00	3.50	2.27	0.00
40.50	3.50	2.27	0.00
41.00	3.50	2.27	0.00
41.50	3.50	2.27	0.00
42.00	3.50	2.27	0.00
42.50	3.50	2.27	0.00
43.00	3.50	2.27	0.00
43.50	3.50	2.27	0.00
44.00	3.50	2.27	0.00
44.50	3.50	2.27	0.00
45.00	3.50	2.27	0.00
45.50	3.50	2.27	0.00
46.00	3.50	2.27	0.00
46.50	3.50	2.27	0.00
47.00	3.50	2.27	0.00
47.50	3.50	2.27	0.00
48.00	3.50	2.27	0.00

Summary for Subcatchment 5S: Firestone Detention

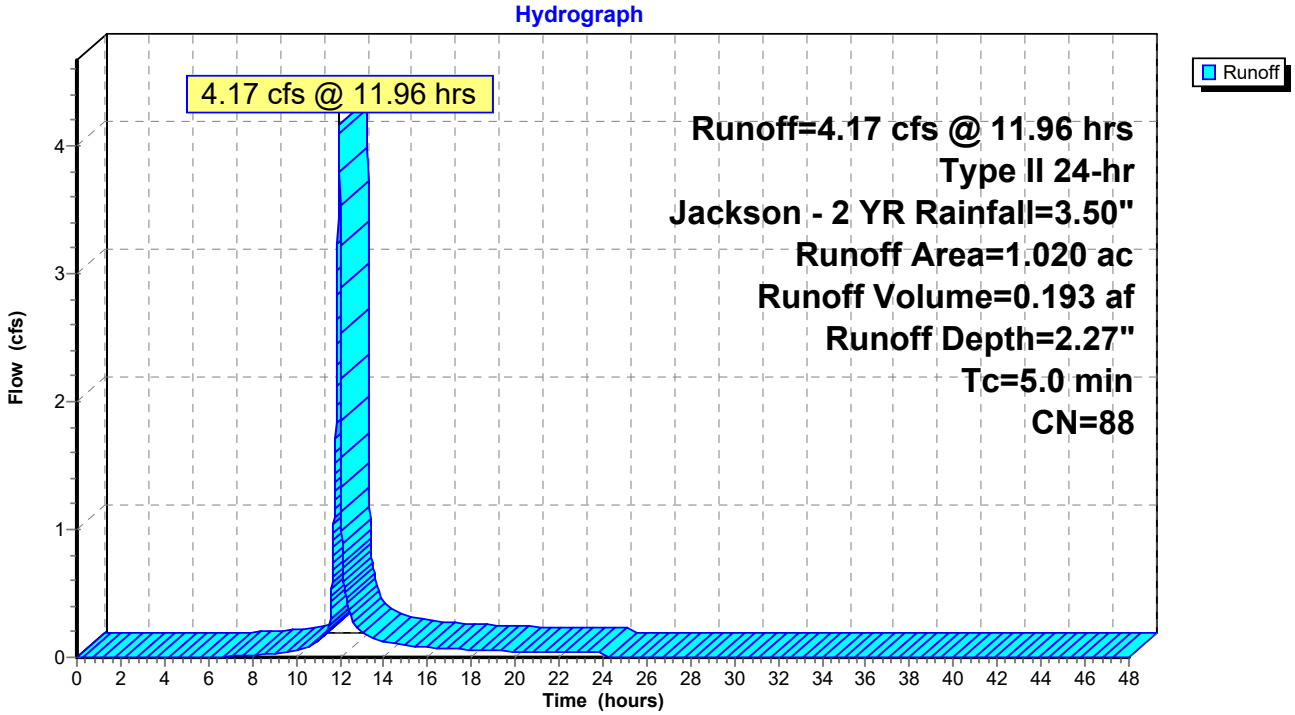
Runoff = 4.17 cfs @ 11.96 hrs, Volume= 0.193 af, Depth= 2.27"
Routed to Pond 6P : Firestone Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	1.020	88	
	1.020		100.00% Pervious Area

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

Subcatchment 5S: Firestone Detention



Hydrograph for Subcatchment 5S: Firestone Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.01
7.50	0.38	0.01	0.01
8.00	0.42	0.01	0.01
8.50	0.46	0.02	0.02
9.00	0.51	0.04	0.03
9.50	0.57	0.05	0.04
10.00	0.63	0.08	0.05
10.50	0.71	0.11	0.08
11.00	0.82	0.16	0.12
11.50	0.99	0.25	**0.23**
12.00	2.32	1.23	**3.53**
12.50	2.57	1.44	0.32
13.00	2.70	1.56	0.20
13.50	2.80	1.64	0.16
14.00	2.87	1.70	0.12
14.50	2.93	1.76	0.11
15.00	2.99	1.81	0.10
15.50	3.04	1.85	0.09
16.00	3.08	1.89	0.08
16.50	3.12	1.92	0.07
17.00	3.16	1.96	0.07
17.50	3.19	1.99	0.06
18.00	3.22	2.02	0.06
18.50	3.25	2.05	0.05
19.00	3.28	2.07	0.05
19.50	3.31	2.09	0.05
20.00	3.33	2.12	0.04
20.50	3.35	2.14	0.04
21.00	3.38	2.16	0.04
21.50	3.40	2.18	0.04
22.00	3.42	2.20	0.04
22.50	3.44	2.21	0.04
23.00	3.46	2.23	0.04
23.50	3.48	2.25	0.04
24.00	**3.50**	**2.27**	0.04
24.50	3.50	2.27	0.00
25.00	3.50	2.27	0.00
25.50	3.50	2.27	0.00
26.00	3.50	2.27	0.00
26.50	3.50	2.27	0.00
27.00	3.50	2.27	0.00
27.50	3.50	2.27	0.00
28.00	3.50	2.27	0.00
28.50	3.50	2.27	0.00
29.00	3.50	2.27	0.00
29.50	3.50	2.27	0.00
30.00	3.50	2.27	0.00
30.50	3.50	2.27	0.00
31.00	3.50	2.27	0.00
31.50	3.50	2.27	0.00
32.00	3.50	2.27	0.00
32.50	3.50	2.27	0.00
33.00	3.50	2.27	0.00
33.50	3.50	2.27	0.00
34.00	3.50	2.27	0.00
34.50	3.50	2.27	0.00
35.00	3.50	2.27	0.00
35.50	3.50	2.27	0.00
36.00	3.50	2.27	0.00
36.50	3.50	2.27	0.00
37.00	3.50	2.27	0.00
37.50	3.50	2.27	0.00
38.00	3.50	2.27	0.00
38.50	3.50	2.27	0.00
39.00	3.50	2.27	0.00
39.50	3.50	2.27	0.00
40.00	3.50	2.27	0.00
40.50	3.50	2.27	0.00
41.00	3.50	2.27	0.00
41.50	3.50	2.27	0.00
42.00	3.50	2.27	0.00
42.50	3.50	2.27	0.00
43.00	3.50	2.27	0.00
43.50	3.50	2.27	0.00
44.00	3.50	2.27	0.00
44.50	3.50	2.27	0.00
45.00	3.50	2.27	0.00
45.50	3.50	2.27	0.00
46.00	3.50	2.27	0.00
46.50	3.50	2.27	0.00
47.00	3.50	2.27	0.00
47.50	3.50	2.27	0.00
48.00	3.50	2.27	0.00

Summary for Subcatchment 6S: Market Street RW

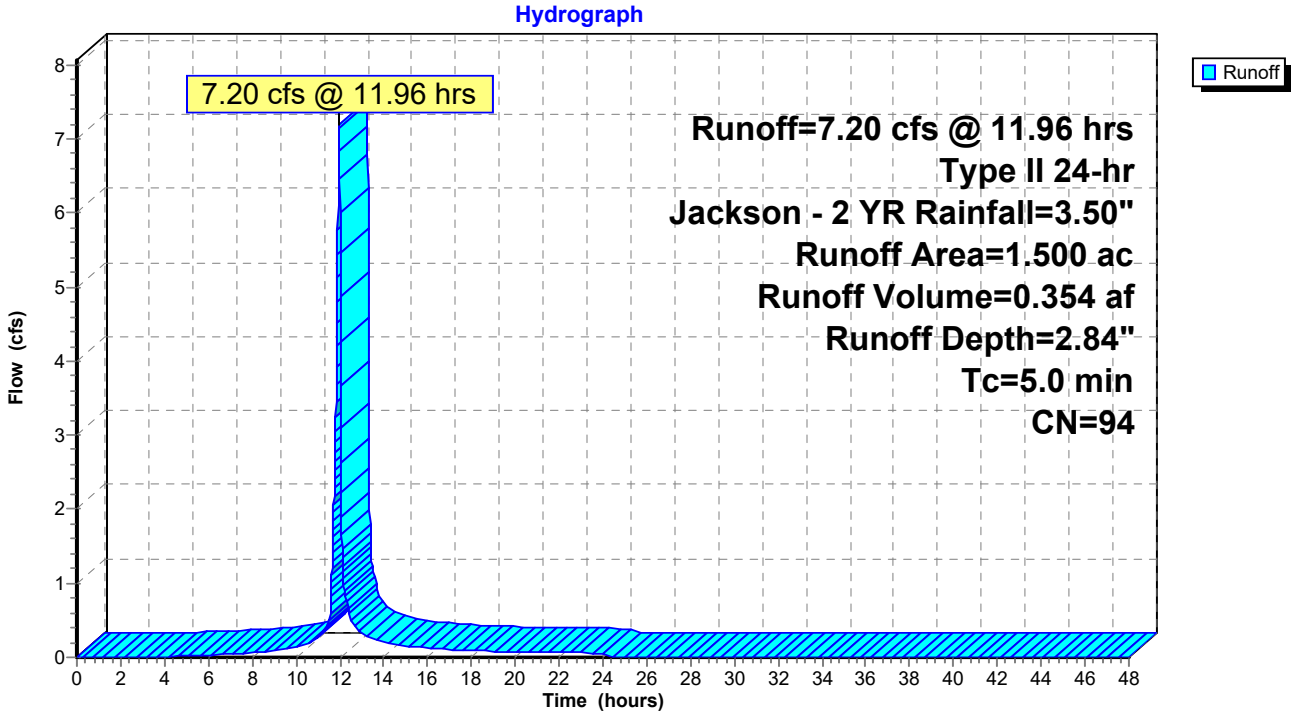
Runoff = 7.20 cfs @ 11.96 hrs, Volume= 0.354 af, Depth= 2.84"
Routed to Pond 1P : Existing Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	1.500	94	
	1.500		100.00% Pervious Area

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

Subcatchment 6S: Market Street RW



Hydrograph for Subcatchment 6S: Market Street RW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.50	2.84	0.00
0.50	0.02	0.00	0.00	27.00	3.50	2.84	0.00
1.00	0.04	0.00	0.00	27.50	3.50	2.84	0.00
1.50	0.06	0.00	0.00	28.00	3.50	2.84	0.00
2.00	0.08	0.00	0.00	28.50	3.50	2.84	0.00
2.50	0.10	0.00	0.00	29.00	3.50	2.84	0.00
3.00	0.12	0.00	0.00	29.50	3.50	2.84	0.00
3.50	0.14	0.00	0.00	30.00	3.50	2.84	0.00
4.00	0.17	0.00	0.01	30.50	3.50	2.84	0.00
4.50	0.19	0.01	0.01	31.00	3.50	2.84	0.00
5.00	0.22	0.01	0.02	31.50	3.50	2.84	0.00
5.50	0.25	0.02	0.03	32.00	3.50	2.84	0.00
6.00	0.28	0.03	0.03	32.50	3.50	2.84	0.00
6.50	0.31	0.04	0.04	33.00	3.50	2.84	0.00
7.00	0.35	0.06	0.05	33.50	3.50	2.84	0.00
7.50	0.38	0.07	0.05	34.00	3.50	2.84	0.00
8.00	0.42	0.09	0.06	34.50	3.50	2.84	0.00
8.50	0.46	0.12	0.08	35.00	3.50	2.84	0.00
9.00	0.51	0.15	0.10	35.50	3.50	2.84	0.00
9.50	0.57	0.18	0.11	36.00	3.50	2.84	0.00
10.00	0.63	0.22	0.14	36.50	3.50	2.84	0.00
10.50	0.71	0.28	0.19	37.00	3.50	2.84	0.00
11.00	0.82	0.36	0.28	37.50	3.50	2.84	0.00
11.50	0.99	0.50	**0.48**	38.00	3.50	2.84	0.00
12.00	2.32	1.70	**5.99**	38.50	3.50	2.84	0.00
12.50	2.57	1.94	0.53	39.00	3.50	2.84	0.00
13.00	2.70	2.06	0.33	39.50	3.50	2.84	0.00
13.50	2.80	2.15	0.25	40.00	3.50	2.84	0.00
14.00	2.87	2.22	0.20	40.50	3.50	2.84	0.00
14.50	2.93	2.28	0.17	41.00	3.50	2.84	0.00
15.00	2.99	2.34	0.16	41.50	3.50	2.84	0.00
15.50	3.04	2.39	0.14	42.00	3.50	2.84	0.00
16.00	3.08	2.43	0.12	42.50	3.50	2.84	0.00
16.50	3.12	2.47	0.11	43.00	3.50	2.84	0.00
17.00	3.16	2.50	0.11	43.50	3.50	2.84	0.00
17.50	3.19	2.54	0.10	44.00	3.50	2.84	0.00
18.00	3.22	2.57	0.09	44.50	3.50	2.84	0.00
18.50	3.25	2.60	0.09	45.00	3.50	2.84	0.00
19.00	3.28	2.62	0.08	45.50	3.50	2.84	0.00
19.50	3.31	2.65	0.07	46.00	3.50	2.84	0.00
20.00	3.33	2.67	0.07	46.50	3.50	2.84	0.00
20.50	3.35	2.69	0.07	47.00	3.50	2.84	0.00
21.00	3.38	2.72	0.06	47.50	3.50	2.84	0.00
21.50	3.40	2.74	0.06	48.00	3.50	2.84	0.00
22.00	3.42	2.76	0.06				
22.50	3.44	2.78	0.06				
23.00	3.46	2.80	0.06				
23.50	3.48	2.82	0.06				
24.00	**3.50**	**2.84**	0.06				
24.50	3.50	2.84	0.00				
25.00	3.50	2.84	0.00				
25.50	3.50	2.84	0.00				
26.00	3.50	2.84	0.00				

Summary for Subcatchment 7S: Walmart Detention

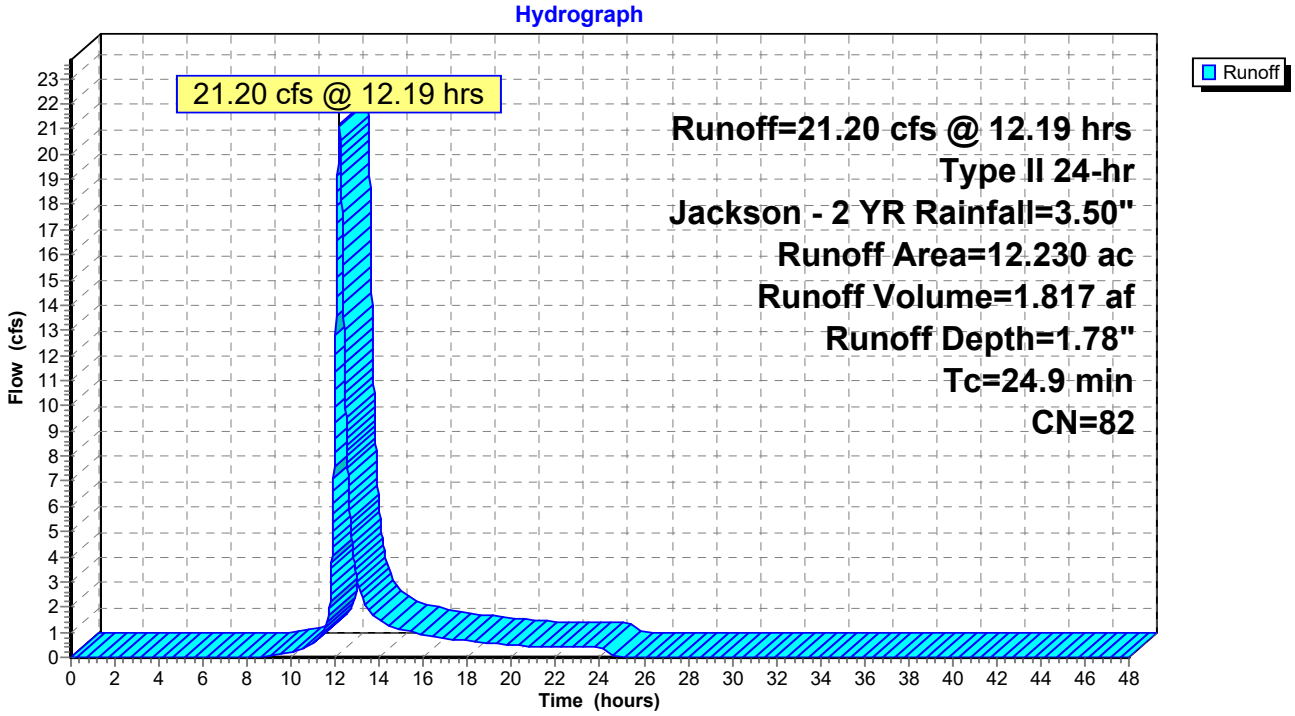
Runoff = 21.20 cfs @ 12.19 hrs, Volume= 1.817 af, Depth= 1.78"
Routed to Pond 8P : Walmart Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	12.230	82	
	12.230		100.00% Pervious Area

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

Subcatchment 7S: Walmart Detention



Hydrograph for Subcatchment 7S: Walmart Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.00
7.50	0.38	0.00	0.00
8.00	0.42	0.00	0.00
8.50	0.46	0.00	0.00
9.00	0.51	0.00	0.04
9.50	0.57	0.01	0.10
10.00	0.63	0.02	0.18
10.50	0.71	0.03	0.32
11.00	0.82	0.06	0.56
11.50	0.99	0.11	1.10
12.00	2.32	0.87	**11.35**
12.50	2.57	1.05	**8.97**
13.00	2.70	1.15	2.99
13.50	2.80	1.22	1.93
14.00	2.87	1.28	1.49
14.50	2.93	1.33	1.23
15.00	2.99	1.37	1.10
15.50	3.04	1.41	0.99
16.00	3.08	1.44	0.88
16.50	3.12	1.47	0.78
17.00	3.16	1.50	0.74
17.50	3.19	1.53	0.70
18.00	3.22	1.56	0.66
18.50	3.25	1.58	0.62
19.00	3.28	1.60	0.57
19.50	3.31	1.63	0.53
20.00	3.33	1.64	0.49
20.50	3.35	1.66	0.46
21.00	3.38	1.68	0.45
21.50	3.40	1.70	0.44
22.00	3.42	1.72	0.43
22.50	3.44	1.73	0.42
23.00	3.46	1.75	0.41
23.50	3.48	1.77	0.41
24.00	**3.50**	**1.78**	0.40
24.50	3.50	1.78	0.08
25.00	3.50	1.78	0.00
25.50	3.50	1.78	0.00
26.00	3.50	1.78	0.00
26.50	3.50	1.78	0.00
27.00	3.50	1.78	0.00
27.50	3.50	1.78	0.00
28.00	3.50	1.78	0.00
28.50	3.50	1.78	0.00
29.00	3.50	1.78	0.00
29.50	3.50	1.78	0.00
30.00	3.50	1.78	0.00
30.50	3.50	1.78	0.00
31.00	3.50	1.78	0.00
31.50	3.50	1.78	0.00
32.00	3.50	1.78	0.00
32.50	3.50	1.78	0.00
33.00	3.50	1.78	0.00
33.50	3.50	1.78	0.00
34.00	3.50	1.78	0.00
34.50	3.50	1.78	0.00
35.00	3.50	1.78	0.00
35.50	3.50	1.78	0.00
36.00	3.50	1.78	0.00
36.50	3.50	1.78	0.00
37.00	3.50	1.78	0.00
37.50	3.50	1.78	0.00
38.00	3.50	1.78	0.00
38.50	3.50	1.78	0.00
39.00	3.50	1.78	0.00
39.50	3.50	1.78	0.00
40.00	3.50	1.78	0.00
40.50	3.50	1.78	0.00
41.00	3.50	1.78	0.00
41.50	3.50	1.78	0.00
42.00	3.50	1.78	0.00
42.50	3.50	1.78	0.00
43.00	3.50	1.78	0.00
43.50	3.50	1.78	0.00
44.00	3.50	1.78	0.00
44.50	3.50	1.78	0.00
45.00	3.50	1.78	0.00
45.50	3.50	1.78	0.00
46.00	3.50	1.78	0.00
46.50	3.50	1.78	0.00
47.00	3.50	1.78	0.00
47.50	3.50	1.78	0.00
48.00	3.50	1.78	0.00

Summary for Subcatchment 9S: Commercial Plus RW Bypass

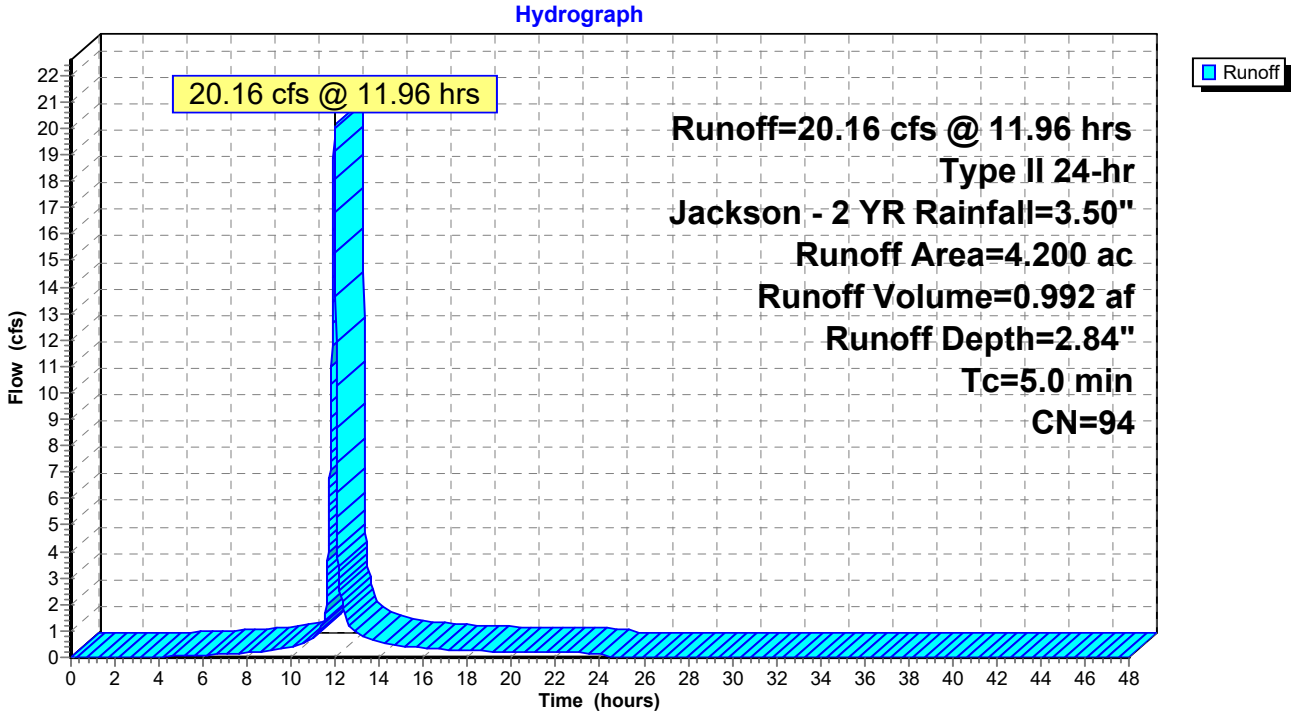
Runoff = 20.16 cfs @ 11.96 hrs, Volume= 0.992 af, Depth= 2.84"
Routed to Link 1L : Existing Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	4.200	94	
	4.200		100.00% Pervious Area

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

Subcatchment 9S: Commercial Plus RW Bypass



Hydrograph for Subcatchment 9S: Commercial Plus RW Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.01
4.00	0.17	0.00	0.02
4.50	0.19	0.01	0.04
5.00	0.22	0.01	0.05
5.50	0.25	0.02	0.07
6.00	0.28	0.03	0.09
6.50	0.31	0.04	0.11
7.00	0.35	0.06	0.13
7.50	0.38	0.07	0.15
8.00	0.42	0.09	0.17
8.50	0.46	0.12	0.22
9.00	0.51	0.15	0.28
9.50	0.57	0.18	0.31
10.00	0.63	0.22	0.39
10.50	0.71	0.28	0.54
11.00	0.82	0.36	0.78
11.50	0.99	0.50	**1.35**
12.00	2.32	1.70	**16.78**
12.50	2.57	1.94	1.48
13.00	2.70	2.06	0.93
13.50	2.80	2.15	0.70
14.00	2.87	2.22	0.55
14.50	2.93	2.28	0.49
15.00	2.99	2.34	0.44
15.50	3.04	2.39	0.39
16.00	3.08	2.43	0.34
16.50	3.12	2.47	0.32
17.00	3.16	2.50	0.30
17.50	3.19	2.54	0.28
18.00	3.22	2.57	0.26
18.50	3.25	2.60	0.24
19.00	3.28	2.62	0.23
19.50	3.31	2.65	0.21
20.00	3.33	2.67	0.19
20.50	3.35	2.69	0.18
21.00	3.38	2.72	0.18
21.50	3.40	2.74	0.18
22.00	3.42	2.76	0.17
22.50	3.44	2.78	0.17
23.00	3.46	2.80	0.17
23.50	3.48	2.82	0.16
24.00	**3.50**	**2.84**	0.16
24.50	3.50	2.84	0.00
25.00	3.50	2.84	0.00
25.50	3.50	2.84	0.00
26.00	3.50	2.84	0.00
26.50	3.50	2.84	0.00
27.00	3.50	2.84	0.00
27.50	3.50	2.84	0.00
28.00	3.50	2.84	0.00
28.50	3.50	2.84	0.00
29.00	3.50	2.84	0.00
29.50	3.50	2.84	0.00
30.00	3.50	2.84	0.00
30.50	3.50	2.84	0.00
31.00	3.50	2.84	0.00
31.50	3.50	2.84	0.00
32.00	3.50	2.84	0.00
32.50	3.50	2.84	0.00
33.00	3.50	2.84	0.00
33.50	3.50	2.84	0.00
34.00	3.50	2.84	0.00
34.50	3.50	2.84	0.00
35.00	3.50	2.84	0.00
35.50	3.50	2.84	0.00
36.00	3.50	2.84	0.00
36.50	3.50	2.84	0.00
37.00	3.50	2.84	0.00
37.50	3.50	2.84	0.00
38.00	3.50	2.84	0.00
38.50	3.50	2.84	0.00
39.00	3.50	2.84	0.00
39.50	3.50	2.84	0.00
40.00	3.50	2.84	0.00
40.50	3.50	2.84	0.00
41.00	3.50	2.84	0.00
41.50	3.50	2.84	0.00
42.00	3.50	2.84	0.00
42.50	3.50	2.84	0.00
43.00	3.50	2.84	0.00
43.50	3.50	2.84	0.00
44.00	3.50	2.84	0.00
44.50	3.50	2.84	0.00
45.00	3.50	2.84	0.00
45.50	3.50	2.84	0.00
46.00	3.50	2.84	0.00
46.50	3.50	2.84	0.00
47.00	3.50	2.84	0.00
47.50	3.50	2.84	0.00
48.00	3.50	2.84	0.00

Summary for Pond 1P: Existing Detention

Inflow Area = 14.990 ac, 0.00% Impervious, Inflow Depth = 1.31" for Jackson - 2 YR event
Inflow = 11.16 cfs @ 11.96 hrs, Volume= 1.636 af
Outflow = 7.50 cfs @ 12.02 hrs, Volume= 1.636 af, Atten= 33%, Lag= 3.8 min
Primary = 7.50 cfs @ 12.02 hrs, Volume= 1.636 af
Routed to Link 1L : Existing Total
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : Existing Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,002.82' @ 12.02 hrs Surf.Area= 3,100 sf Storage= 2,139 cf

Plug-Flow detention time= 1.5 min calculated for 1.636 af (100% of inflow)
Center-of-Mass det. time= 1.5 min (974.2 - 972.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,000.50'	25,061 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

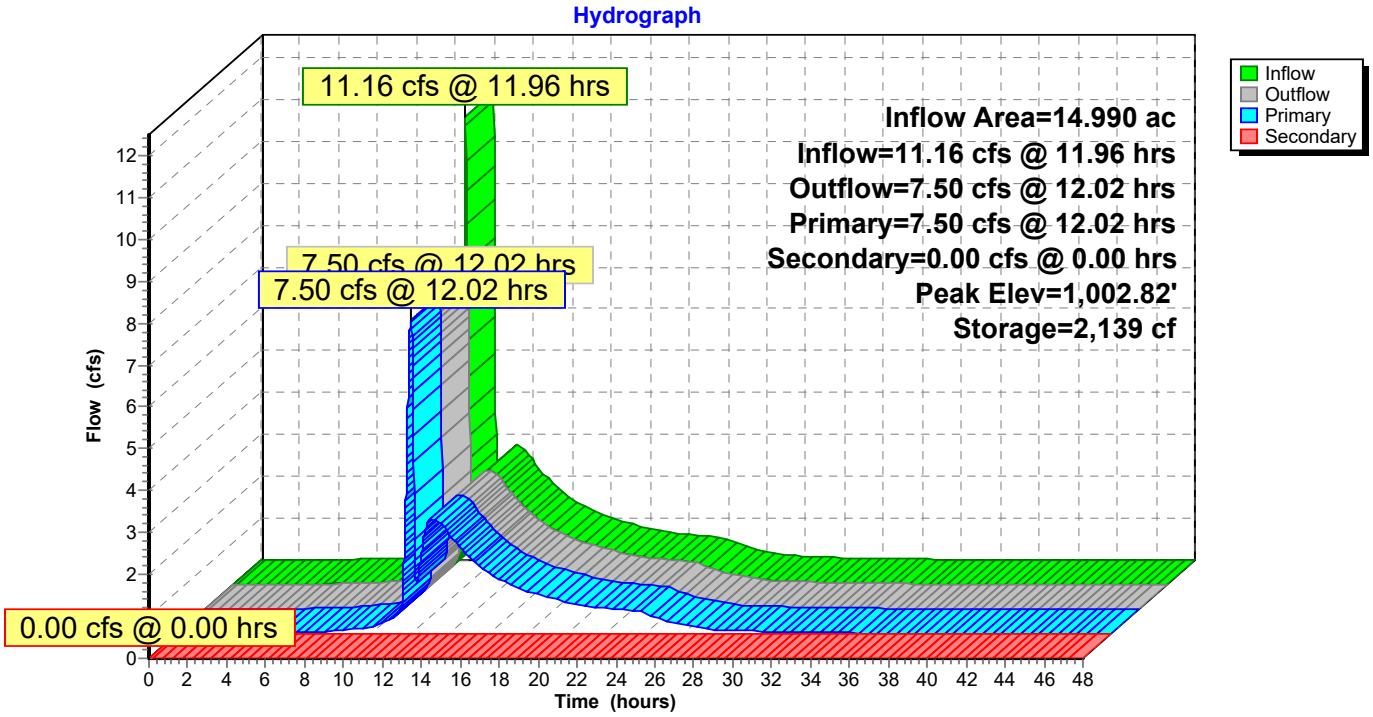
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,000.50	0	0	0
1,002.00	741	556	556
1,003.00	3,603	2,172	2,728
1,004.00	6,778	5,191	7,918
1,005.00	9,485	8,132	16,050
1,006.00	8,537	9,011	25,061

Device	Routing	Invert	Outlet Devices
#0	Secondary	1,006.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	1,000.57'	**12.0" Round Culvert** L= 129.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,000.57' / 998.96' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	1,005.00'	**1,000.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

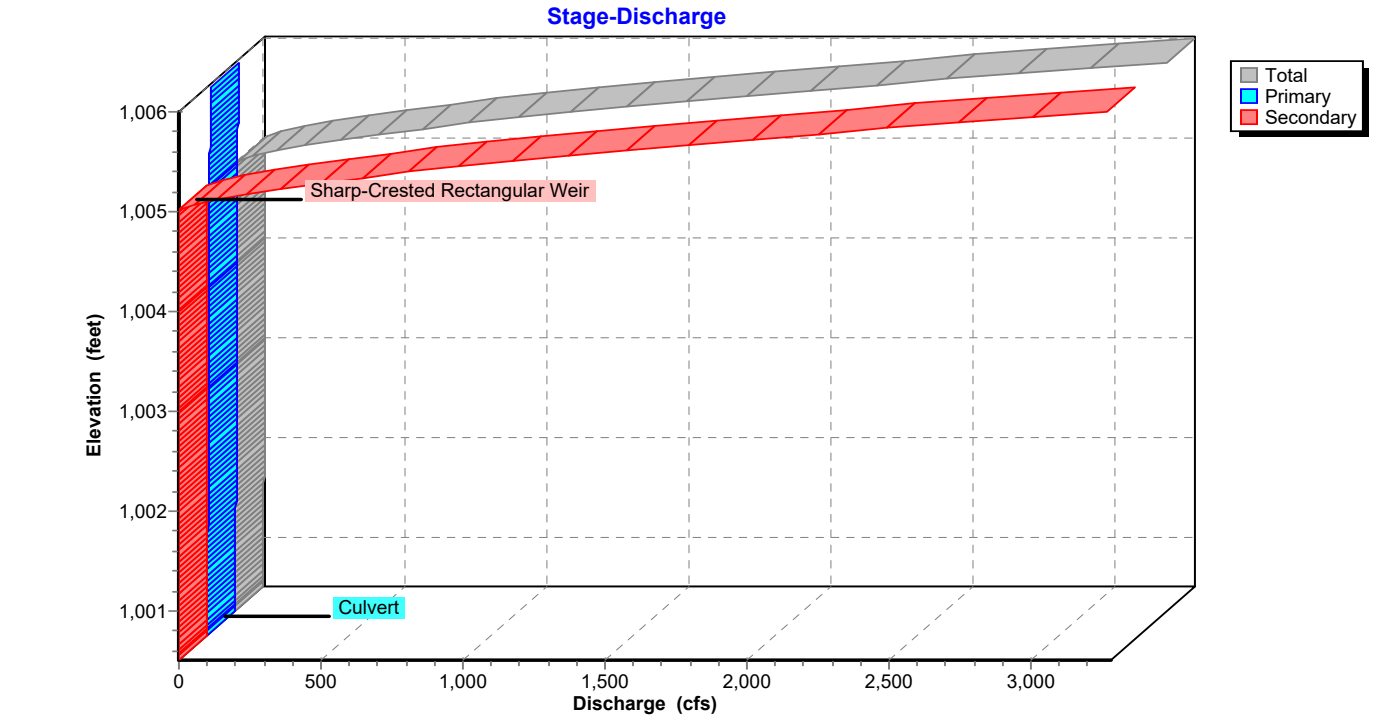
Primary OutFlow Max=7.50 cfs @ 12.02 hrs HW=1,002.82' (Free Discharge)
1=Culvert (Barrel Controls 7.50 cfs @ 6.11 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,000.50' (Free Discharge)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

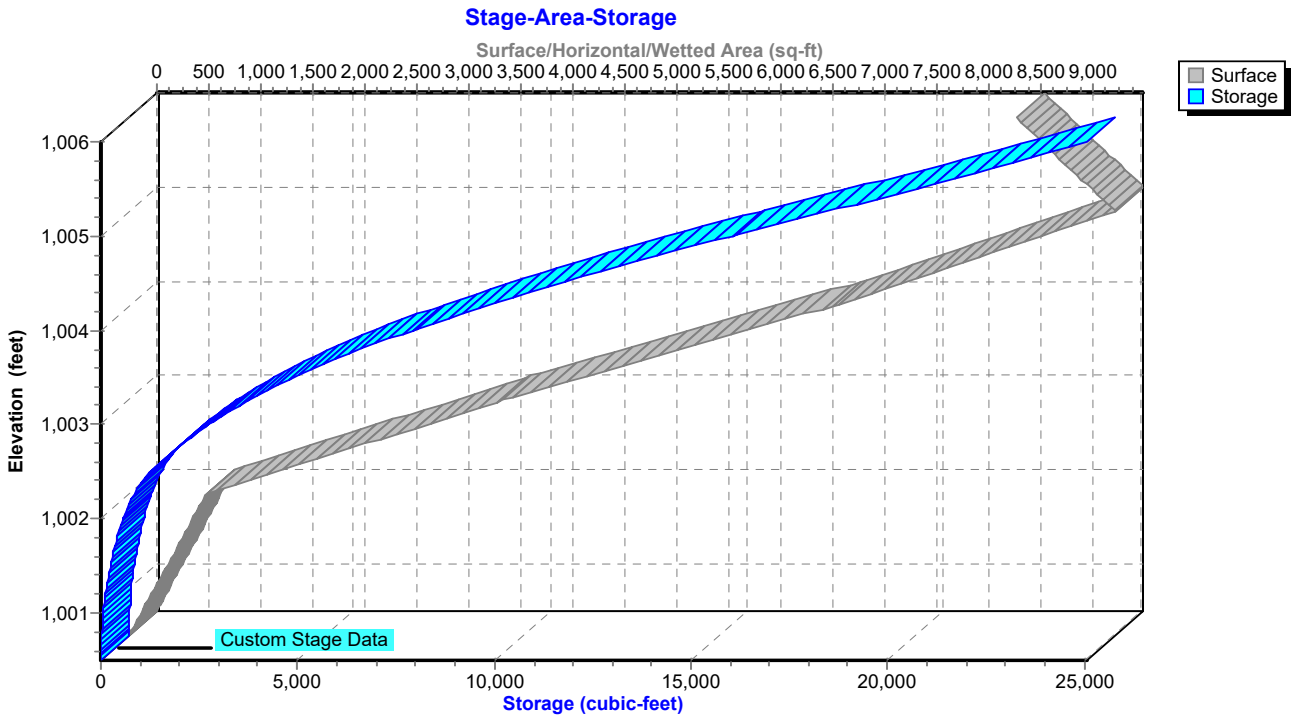
Pond 1P: Existing Detention



Pond 1P: Existing Detention



Pond 1P: Existing Detention



Hydrograph for Pond 1P: Existing Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	1,000.50	0.00	0.00	**0.00**
1.00	0.00	0	1,000.50	0.00	0.00	0.00
2.00	0.00	0	1,000.50	0.00	0.00	0.00
3.00	0.00	0	1,000.50	0.00	0.00	0.00
4.00	0.01	3	1,000.61	0.01	0.01	0.00
5.00	0.02	4	1,000.63	0.02	0.02	0.00
6.00	0.03	5	1,000.65	0.03	0.03	0.00
7.00	0.05	7	1,000.67	0.05	0.05	0.00
8.00	0.06	8	1,000.68	0.06	0.06	0.00
9.00	0.11	12	1,000.72	0.11	0.11	0.00
10.00	0.17	16	1,000.75	0.16	0.16	0.00
11.00	**0.35**	29	1,000.84	0.35	0.35	0.00
12.00	**9.42**	**2,060**	**1,002.80**	**7.46**	**7.46**	0.00
13.00	2.74	**204**	**1,001.41**	**2.73**	**2.73**	0.00
14.00	2.37	175	1,001.34	2.38	2.38	0.00
15.00	1.84	134	1,001.24	1.85	1.85	0.00
16.00	1.46	106	1,001.15	1.46	1.46	0.00
17.00	1.19	87	1,001.09	1.20	1.20	0.00
18.00	1.01	74	1,001.05	1.02	1.02	0.00
19.00	0.88	65	1,001.01	0.88	0.88	0.00
20.00	0.75	56	1,000.98	0.76	0.76	0.00
21.00	0.67	50	1,000.95	0.67	0.67	0.00
22.00	0.61	47	1,000.93	0.61	0.61	0.00
23.00	0.57	44	1,000.92	0.57	0.57	0.00
24.00	0.54	42	1,000.91	0.54	0.54	0.00
25.00	0.31	27	1,000.83	0.32	0.32	0.00
26.00	0.21	19	1,000.78	0.21	0.21	0.00
27.00	0.14	14	1,000.74	0.14	0.14	0.00
28.00	0.09	11	1,000.71	0.10	0.10	0.00
29.00	0.08	9	1,000.69	0.08	0.08	0.00
30.00	0.06	8	1,000.68	0.06	0.06	0.00
31.00	0.05	7	1,000.67	0.05	0.05	0.00
32.00	0.04	6	1,000.66	0.04	0.04	0.00
33.00	0.03	5	1,000.64	0.03	0.03	0.00
34.00	0.02	5	1,000.64	0.02	0.02	0.00
35.00	0.02	4	1,000.63	0.02	0.02	0.00
36.00	0.02	4	1,000.62	0.02	0.02	0.00
37.00	0.01	3	1,000.62	0.01	0.01	0.00
38.00	0.01	3	1,000.61	0.01	0.01	0.00
39.00	0.01	3	1,000.61	0.01	0.01	0.00
40.00	0.01	3	1,000.61	0.01	0.01	0.00
41.00	0.00	2	1,000.60	0.00	0.00	0.00
42.00	0.00	2	1,000.59	0.00	0.00	0.00
43.00	0.00	2	1,000.59	0.00	0.00	0.00
44.00	0.00	2	1,000.58	0.00	0.00	0.00
45.00	0.00	2	1,000.58	0.00	0.00	0.00
46.00	0.00	2	1,000.58	0.00	0.00	0.00
47.00	0.00	2	1,000.58	0.00	0.00	0.00
48.00	0.00	1	1,000.58	0.00	0.00	0.00

Stage-Discharge for Pond 1P: Existing Detention

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
1,000.50	0.00	0.00	0.00
1,000.60	0.00	0.00	0.00
1,000.70	0.08	0.08	0.00
1,000.80	0.25	0.25	0.00
1,000.90	0.51	0.51	0.00
1,001.00	0.83	0.83	0.00
1,001.10	1.23	1.23	0.00
1,001.20	1.68	1.68	0.00
1,001.30	2.16	2.16	0.00
1,001.40	2.68	2.68	0.00
1,001.50	3.21	3.21	0.00
1,001.60	3.74	3.74	0.00
1,001.70	4.22	4.22	0.00
1,001.80	4.62	4.62	0.00
1,001.90	4.96	4.96	0.00
1,002.00	5.30	5.30	0.00
1,002.10	5.62	5.62	0.00
1,002.20	5.92	5.92	0.00
1,002.30	6.21	6.21	0.00
1,002.40	6.49	6.49	0.00
1,002.50	6.75	6.75	0.00
1,002.60	7.00	7.00	0.00
1,002.70	7.25	7.25	0.00
1,002.80	7.46	7.46	0.00
1,002.90	7.61	7.61	0.00
1,003.00	7.75	7.75	0.00
1,003.10	7.88	7.88	0.00
1,003.20	8.02	8.02	0.00
1,003.30	8.15	8.15	0.00
1,003.40	8.28	8.28	0.00
1,003.50	8.41	8.41	0.00
1,003.60	8.54	8.54	0.00
1,003.70	8.66	8.66	0.00
1,003.80	8.79	8.79	0.00
1,003.90	8.91	8.91	0.00
1,004.00	9.03	9.03	0.00
1,004.10	9.15	9.15	0.00
1,004.20	9.26	9.26	0.00
1,004.30	9.38	9.38	0.00
1,004.40	9.49	9.49	0.00
1,004.50	9.61	9.61	0.00
1,004.60	9.72	9.72	0.00
1,004.70	9.83	9.83	0.00
1,004.80	9.94	9.94	0.00
1,004.90	10.04	10.04	0.00
1,005.00	10.15	10.15	0.00
1,005.10	113.66	10.26	103.40
1,005.20	302.83	10.36	292.47
1,005.30	547.75	10.46	537.28
1,005.40	837.75	10.57	827.19
1,005.50	1,166.67	10.67	1,156.00
1,005.60	1,530.34	10.77	1,519.58
1,005.70	1,925.71	10.87	1,914.85
1,005.80	2,350.41	10.97	2,339.45
1,005.90	2,802.54	11.06	2,791.47
1,006.00	**3,280.51**	**11.16**	**3,269.35**

Stage-Area-Storage for Pond 1P: Existing Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,000.50	0	0
1,000.60	49	2
1,000.70	99	10
1,000.80	148	22
1,000.90	198	40
1,001.00	247	62
1,001.10	296	89
1,001.20	346	121
1,001.30	395	158
1,001.40	445	200
1,001.50	494	247
1,001.60	543	299
1,001.70	593	356
1,001.80	642	417
1,001.90	692	484
1,002.00	741	556
1,002.10	1,027	644
1,002.20	1,313	761
1,002.30	1,600	907
1,002.40	1,886	1,081
1,002.50	2,172	1,284
1,002.60	2,458	1,516
1,002.70	2,744	1,776
1,002.80	3,031	2,064
1,002.90	3,317	2,382
1,003.00	3,603	2,728
1,003.10	3,921	3,104
1,003.20	4,238	3,512
1,003.30	4,555	3,952
1,003.40	4,873	4,423
1,003.50	5,191	4,926
1,003.60	5,508	5,461
1,003.70	5,826	6,028
1,003.80	6,143	6,626
1,003.90	6,460	7,256
1,004.00	6,778	7,918
1,004.10	7,049	8,610
1,004.20	7,319	9,328
1,004.30	7,590	10,073
1,004.40	7,861	10,846
1,004.50	8,132	11,646
1,004.60	8,402	12,472
1,004.70	8,673	13,326
1,004.80	8,944	14,207
1,004.90	9,214	15,115
1,005.00	**9,485**	16,050
1,005.10	9,390	16,994
1,005.20	9,295	17,928
1,005.30	9,201	18,853
1,005.40	9,106	19,768
1,005.50	9,011	20,674
1,005.60	8,916	21,570
1,005.70	8,821	22,457
1,005.80	8,727	23,334
1,005.90	8,632	24,202
1,006.00	8,537	**25,061**

Summary for Pond 6P: Firestone Detention

Inflow Area = 1.020 ac, 0.00% Impervious, Inflow Depth = 2.27" for Jackson - 2 YR event
Inflow = 4.17 cfs @ 11.96 hrs, Volume= 0.193 af
Outflow = 0.05 cfs @ 19.58 hrs, Volume= 0.133 af, Atten= 99%, Lag= 457.2 min
Primary = 0.05 cfs @ 19.58 hrs, Volume= 0.133 af
Routed to Link 1L : Existing Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,012.70' @ 19.58 hrs Surf.Area= 3,283 sf Storage= 6,249 cf

Plug-Flow detention time= 994.9 min calculated for 0.133 af (69% of inflow)
Center-of-Mass det. time= 894.6 min (1,702.0 - 807.4)

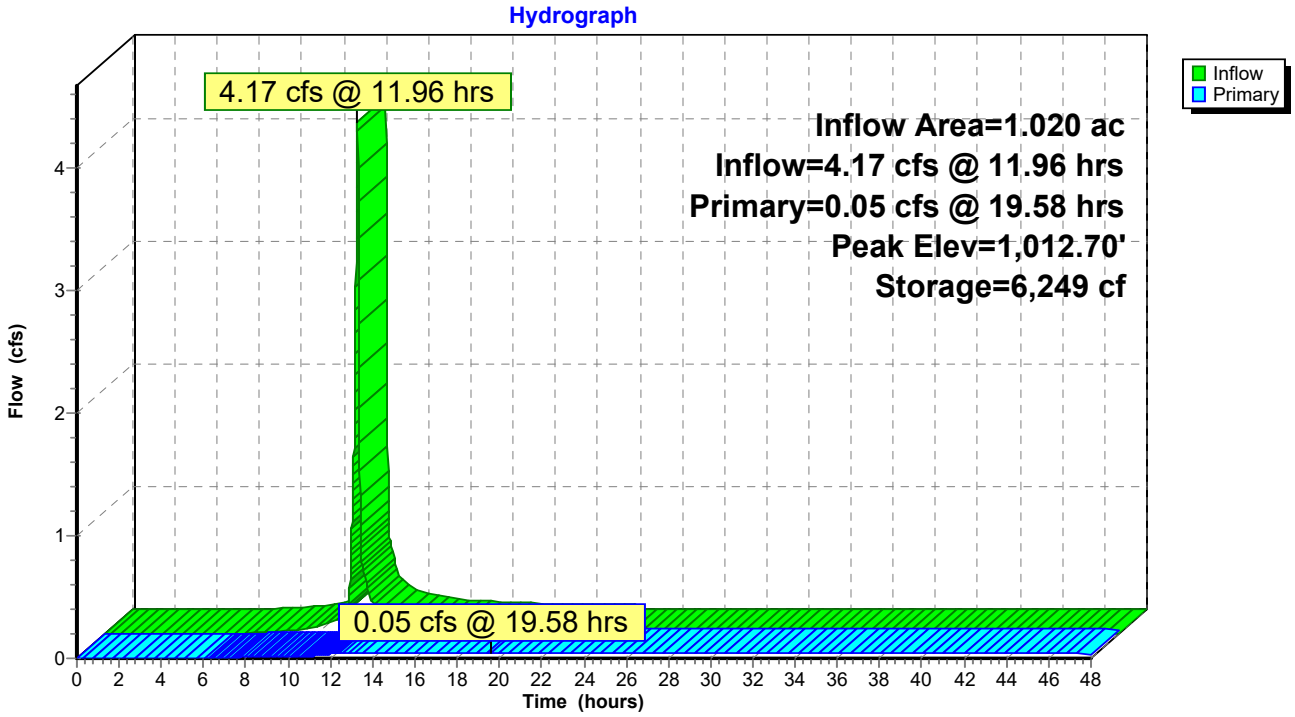
Volume	Invert	Avail.Storage	Storage Description
#1	1,009.54'	22,002 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,009.54	0	0	0
1,010.00	909	209	209
1,011.00	2,085	1,497	1,706
1,012.00	2,776	2,431	4,137
1,013.00	3,504	3,140	7,277
1,014.00	4,409	3,957	11,233
1,015.00	5,525	4,967	16,200
1,016.00	6,079	5,802	22,002

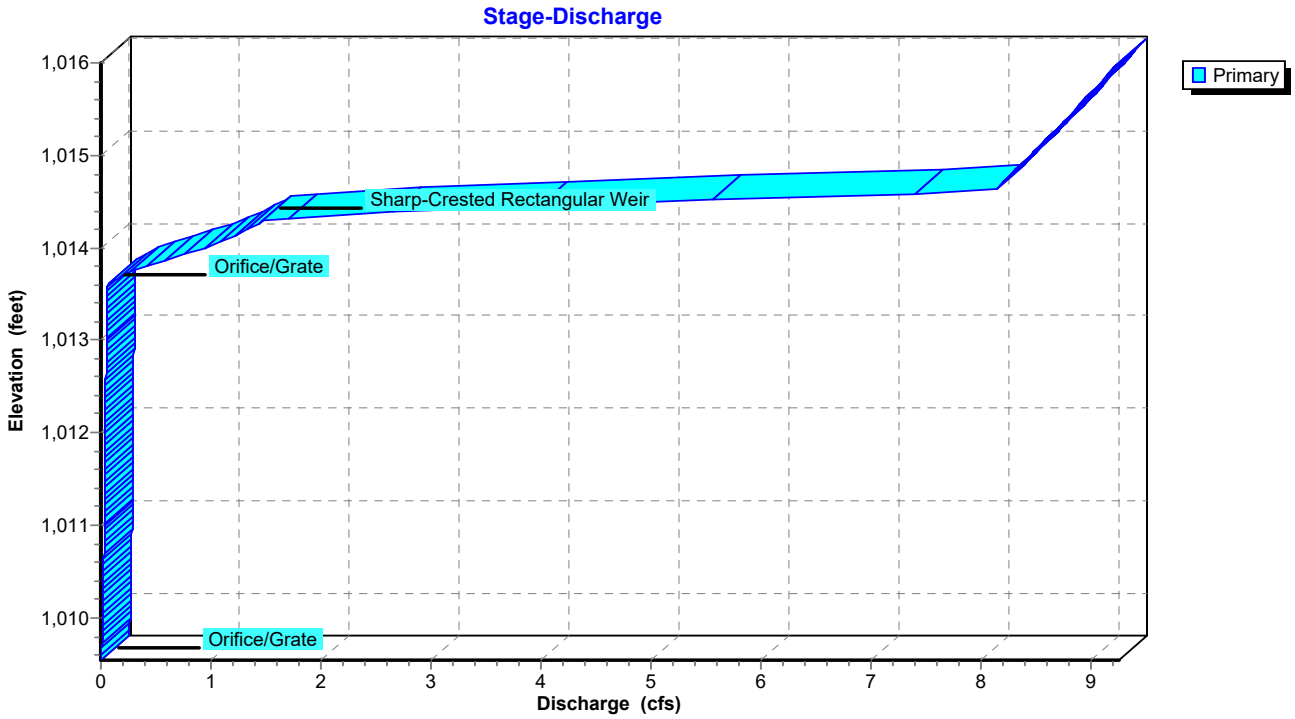
Device	Routing	Invert	Outlet Devices
#1	Primary	1,009.50'	**12.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,009.50' / 1,009.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,009.54'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,013.57'	**12.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,014.29'	**11.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.05 cfs @ 19.58 hrs HW=1,012.70' (Free Discharge)
└**1=Culvert** (Passes 0.05 cfs of 6.18 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.50 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

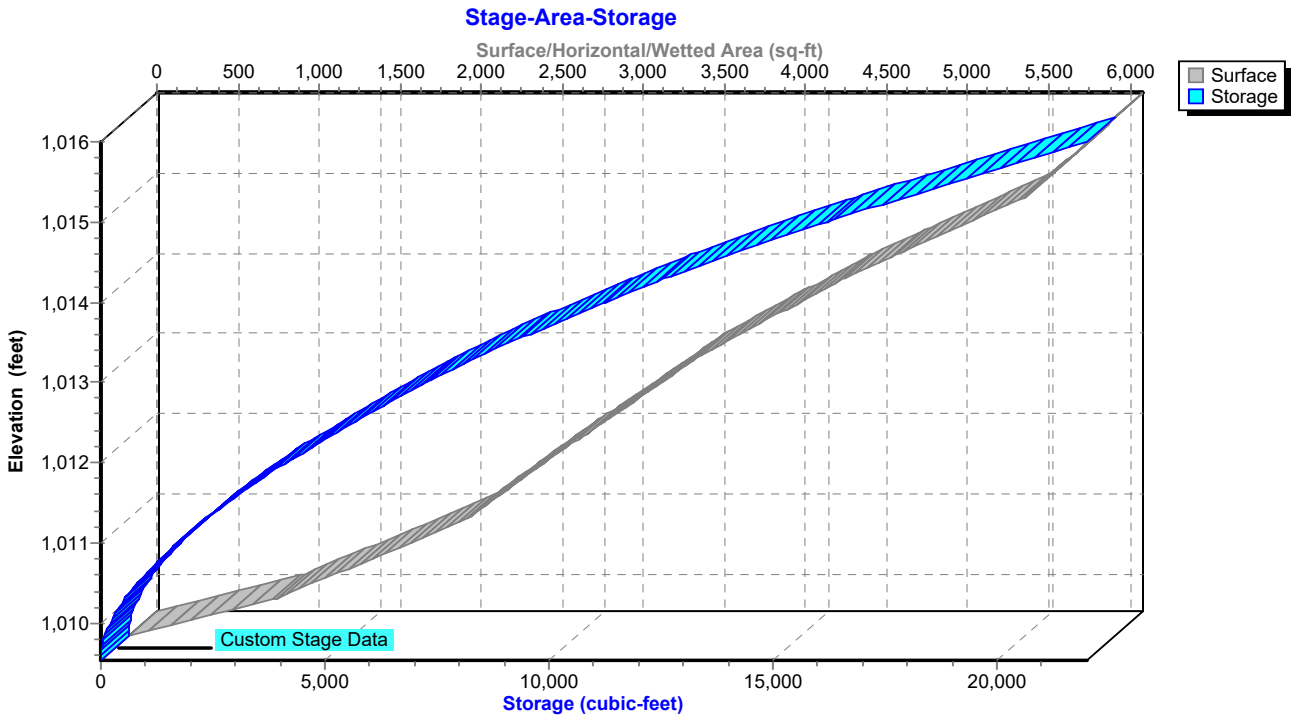
Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Hydrograph for Pond 6P: Firestone Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,009.54	0.00
1.00	0.00	0	1,009.54	0.00
2.00	0.00	0	1,009.54	0.00
3.00	0.00	0	1,009.54	0.00
4.00	0.00	0	1,009.54	0.00
5.00	0.00	0	1,009.54	0.00
6.00	0.00	0	1,009.54	0.00
7.00	0.01	5	1,009.61	0.00
8.00	0.01	20	1,009.68	0.01
9.00	0.03	61	1,009.79	0.01
10.00	0.05	151	1,009.93	0.02
11.00	**0.12**	373	1,010.16	0.02
12.00	**3.53**	3,581	1,011.79	0.04
13.00	0.20	5,283	1,012.39	0.04
14.00	0.12	5,689	1,012.52	0.05
15.00	0.10	5,917	1,012.59	0.05
16.00	0.08	6,064	1,012.64	0.05
17.00	0.07	6,153	1,012.67	0.05
18.00	0.06	6,213	1,012.69	0.05
19.00	0.05	**6,244**	**1,012.70**	**0.05**
20.00	0.04	**6,246**	**1,012.70**	**0.05**
21.00	0.04	6,230	1,012.69	0.05
22.00	0.04	6,207	1,012.68	0.05
23.00	0.04	6,180	1,012.68	0.05
24.00	0.04	6,147	1,012.67	0.05
25.00	0.00	5,992	1,012.62	0.05
26.00	0.00	5,828	1,012.57	0.05
27.00	0.00	5,665	1,012.52	0.04
28.00	0.00	5,504	1,012.46	0.04
29.00	0.00	5,344	1,012.41	0.04
30.00	0.00	5,186	1,012.36	0.04
31.00	0.00	5,029	1,012.31	0.04
32.00	0.00	4,873	1,012.26	0.04
33.00	0.00	4,720	1,012.20	0.04
34.00	0.00	4,567	1,012.15	0.04
35.00	0.00	4,416	1,012.10	0.04
36.00	0.00	4,267	1,012.05	0.04
37.00	0.00	4,120	1,011.99	0.04
38.00	0.00	3,974	1,011.94	0.04
39.00	0.00	3,829	1,011.89	0.04
40.00	0.00	3,686	1,011.83	0.04
41.00	0.00	3,545	1,011.78	0.04
42.00	0.00	3,406	1,011.73	0.04
43.00	0.00	3,268	1,011.67	0.04
44.00	0.00	3,133	1,011.62	0.04
45.00	0.00	2,998	1,011.57	0.04
46.00	0.00	2,866	1,011.51	0.04
47.00	0.00	2,736	1,011.46	0.04
48.00	0.00	2,607	1,011.40	0.04

Stage-Discharge for Pond 6P: Firestone Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,009.54	0.00	1,012.19	0.04	1,014.84	8.32
1,009.59	0.00	1,012.24	0.04	1,014.89	8.36
1,009.64	0.01	1,012.29	0.04	1,014.94	8.41
1,009.69	0.01	1,012.34	0.04	1,014.99	8.45
1,009.74	0.01	1,012.39	0.04	1,015.04	8.49
1,009.79	0.01	1,012.44	0.04	1,015.09	8.53
1,009.84	0.01	1,012.49	0.04	1,015.14	8.57
1,009.89	0.01	1,012.54	0.05	1,015.19	8.62
1,009.94	0.02	1,012.59	0.05	1,015.24	8.66
1,009.99	0.02	1,012.64	0.05	1,015.29	8.70
1,010.04	0.02	1,012.69	0.05	1,015.34	8.74
1,010.09	0.02	1,012.74	0.05	1,015.39	8.78
1,010.14	0.02	1,012.79	0.05	1,015.44	8.82
1,010.19	0.02	1,012.84	0.05	1,015.49	8.86
1,010.24	0.02	1,012.89	0.05	1,015.54	8.90
1,010.29	0.02	1,012.94	0.05	1,015.59	8.94
1,010.34	0.02	1,012.99	0.05	1,015.64	8.98
1,010.39	0.02	1,013.04	0.05	1,015.69	9.02
1,010.44	0.02	1,013.09	0.05	1,015.74	9.06
1,010.49	0.03	1,013.14	0.05	1,015.79	9.10
1,010.54	0.03	1,013.19	0.05	1,015.84	9.14
1,010.59	0.03	1,013.24	0.05	1,015.89	9.18
1,010.64	0.03	1,013.29	0.05	1,015.94	9.22
1,010.69	0.03	1,013.34	0.05	1,015.99	**9.26**
1,010.74	0.03	1,013.39	0.05		
1,010.79	0.03	1,013.44	0.05		
1,010.84	0.03	1,013.49	0.05		
1,010.89	0.03	1,013.54	0.05		
1,010.94	0.03	1,013.59	0.06		
1,010.99	0.03	1,013.64	0.11		
1,011.04	0.03	1,013.69	0.19		
1,011.09	0.03	1,013.74	0.28		
1,011.14	0.03	1,013.79	0.39		
1,011.19	0.03	1,013.84	0.50		
1,011.24	0.03	1,013.89	0.64		
1,011.29	0.03	1,013.94	0.78		
1,011.34	0.03	1,013.99	0.93		
1,011.39	0.04	1,014.04	1.05		
1,011.44	0.04	1,014.09	1.15		
1,011.49	0.04	1,014.14	1.24		
1,011.54	0.04	1,014.19	1.33		
1,011.59	0.04	1,014.24	1.41		
1,011.64	0.04	1,014.29	1.48		
1,011.69	0.04	1,014.34	1.95		
1,011.74	0.04	1,014.39	2.75		
1,011.79	0.04	1,014.44	3.77		
1,011.84	0.04	1,014.49	4.95		
1,011.89	0.04	1,014.54	6.28		
1,011.94	0.04	1,014.59	7.74		
1,011.99	0.04	1,014.64	8.15		
1,012.04	0.04	1,014.69	8.19		
1,012.09	0.04	1,014.74	8.23		
1,012.14	0.04	1,014.79	8.28		

Stage-Area-Storage for Pond 6P: Firestone Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,009.54	0	0
1,009.64	198	10
1,009.74	395	40
1,009.84	593	89
1,009.94	790	158
1,010.04	956	246
1,010.14	1,074	348
1,010.24	1,191	461
1,010.34	1,309	586
1,010.44	1,426	723
1,010.54	1,544	871
1,010.64	1,662	1,032
1,010.74	1,779	1,204
1,010.84	1,897	1,388
1,010.94	2,014	1,583
1,011.04	2,113	1,790
1,011.14	2,182	2,005
1,011.24	2,251	2,226
1,011.34	2,320	2,455
1,011.44	2,389	2,690
1,011.54	2,458	2,933
1,011.64	2,527	3,182
1,011.74	2,596	3,438
1,011.84	2,665	3,701
1,011.94	2,735	3,971
1,012.04	2,805	4,248
1,012.14	2,878	4,532
1,012.24	2,951	4,824
1,012.34	3,024	5,122
1,012.44	3,096	5,428
1,012.54	3,169	5,742
1,012.64	3,242	6,062
1,012.74	3,315	6,390
1,012.84	3,388	6,725
1,012.94	3,460	7,068
1,013.04	3,540	7,417
1,013.14	3,631	7,776
1,013.24	3,721	8,144
1,013.34	3,812	8,520
1,013.44	3,902	8,906
1,013.54	3,993	9,301
1,013.64	4,083	9,704
1,013.74	4,174	10,117
1,013.84	4,264	10,539
1,013.94	4,355	10,970
1,014.04	4,454	11,410
1,014.14	4,565	11,861
1,014.24	4,677	12,323
1,014.34	4,788	12,797
1,014.44	4,900	13,281
1,014.54	5,012	13,777
1,014.64	5,123	14,283
1,014.74	5,235	14,801
1,014.84	5,346	15,330
1,014.94	5,458	15,871
1,015.04	5,547	16,422
1,015.14	5,603	16,979
1,015.24	5,658	17,542
1,015.34	5,713	18,111
1,015.44	5,769	18,685
1,015.54	5,824	19,264
1,015.64	5,880	19,850
1,015.74	5,935	20,440
1,015.84	5,990	21,037
1,015.94	**6,046**	**21,638**

Summary for Pond 8P: Walmart Detention

Inflow Area = 12.230 ac, 0.00% Impervious, Inflow Depth = 1.78" for Jackson - 2 YR event
Inflow = 21.20 cfs @ 12.19 hrs, Volume= 1.817 af
Outflow = 2.28 cfs @ 13.25 hrs, Volume= 1.101 af, Atten= 89%, Lag= 63.8 min
Primary = 2.28 cfs @ 13.25 hrs, Volume= 1.101 af
Routed to Pond 1P : Existing Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,011.20' @ 13.25 hrs Surf.Area= 17,404 sf Storage= 44,415 cf

Plug-Flow detention time= 326.9 min calculated for 1.101 af (61% of inflow)
Center-of-Mass det. time= 212.3 min (1,058.6 - 846.3)

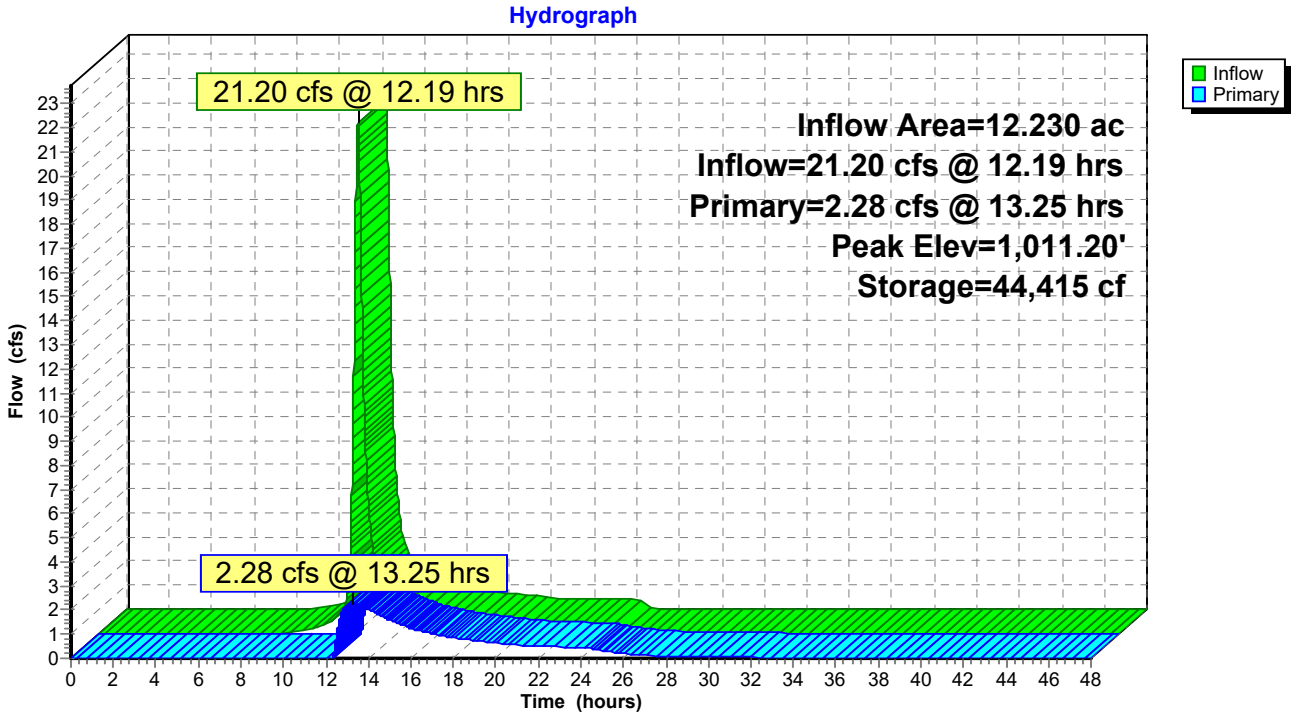
Volume	Invert	Avail.Storage	Storage Description
#1	1,005.00'	150,049 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,005.00	0	0	0
1,006.00	627	314	314
1,007.00	1,983	1,305	1,619
1,008.00	5,044	3,514	5,132
1,009.00	10,030	7,537	12,669
1,010.00	14,662	12,346	25,015
1,010.40	15,976	6,128	31,143
1,011.00	17,049	9,908	41,050
1,011.46	17,886	8,035	49,085
1,012.00	18,879	9,927	59,012
1,013.00	20,773	19,826	78,838
1,014.00	22,710	21,742	100,579
1,015.00	24,723	23,717	124,296
1,016.00	26,783	25,753	150,049

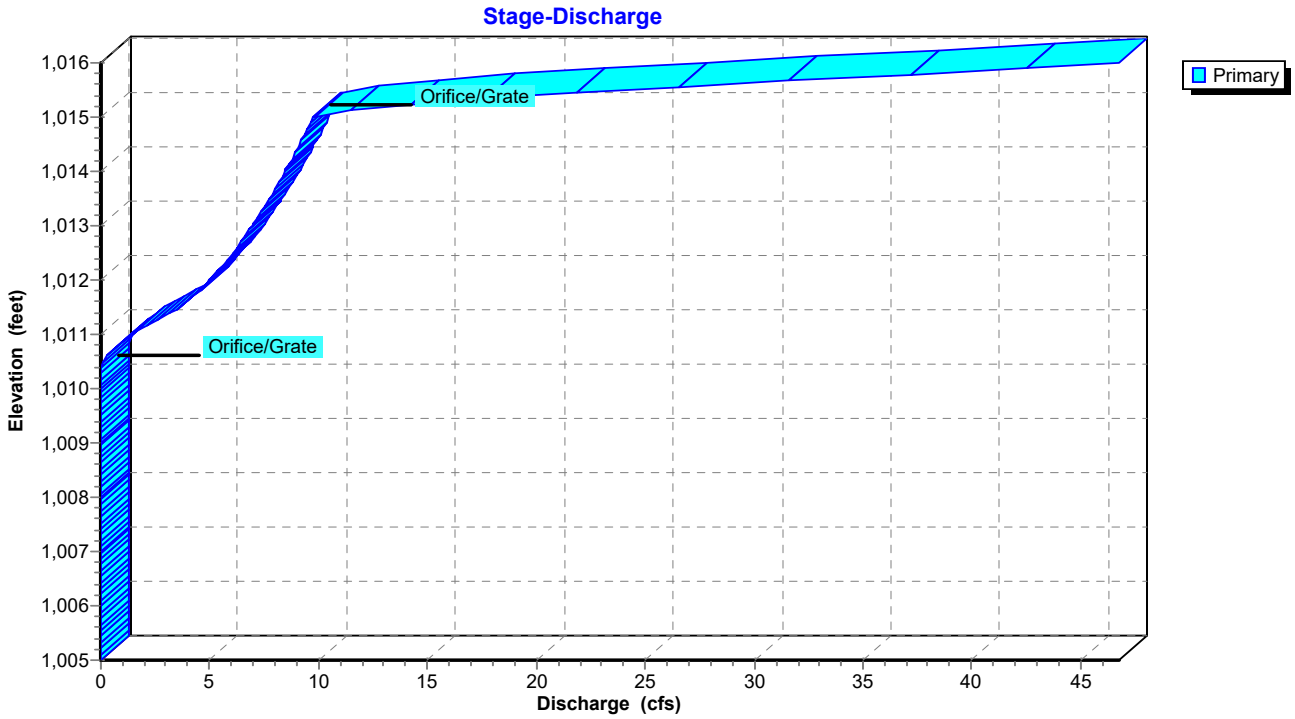
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.83'	**30.0" Round Culvert** L= 87.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,004.83' / 1,004.48' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	1,010.40'	**12.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,015.00'	**144.0" W x 10.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.28 cfs @ 13.25 hrs HW=1,011.20' (Free Discharge)
└**1=Culvert** (Passes 2.28 cfs of 53.27 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 2.28 cfs @ 2.86 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

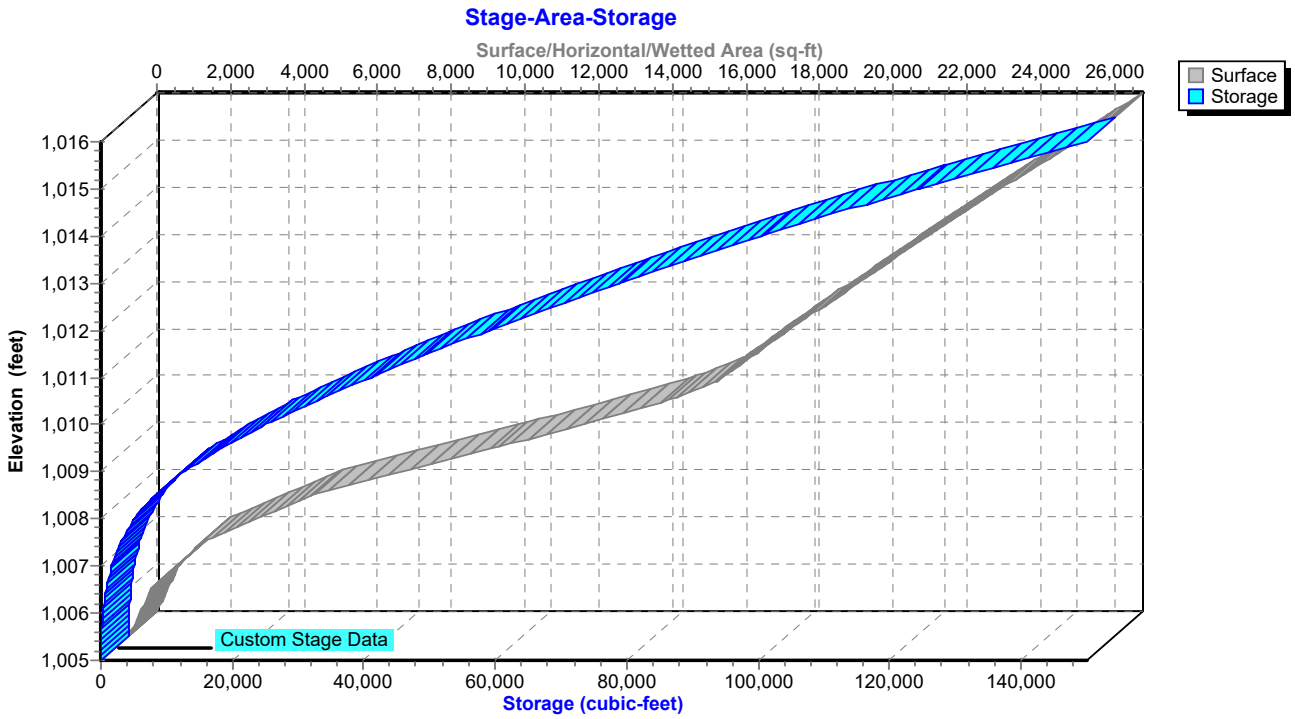
Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Hydrograph for Pond 8P: Walmart Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,005.00	0.00
1.00	0.00	0	1,005.00	0.00
2.00	0.00	0	1,005.00	0.00
3.00	0.00	0	1,005.00	0.00
4.00	0.00	0	1,005.00	0.00
5.00	0.00	0	1,005.00	0.00
6.00	0.00	0	1,005.00	0.00
7.00	0.00	0	1,005.00	0.00
8.00	0.00	0	1,005.00	0.00
9.00	0.04	31	1,005.31	0.00
10.00	0.18	409	1,006.13	0.00
11.00	0.56	1,607	1,006.99	0.00
12.00	**11.35**	9,238	1,008.62	0.00
13.00	**2.99**	**44,101**	**1,011.18**	**2.20**
14.00	1.49	**43,439**	**1,011.14**	**2.04**
15.00	1.10	41,457	1,011.02	1.58
16.00	0.88	39,944	1,010.93	1.26
17.00	0.74	38,733	1,010.86	1.02
18.00	0.66	37,902	1,010.81	0.86
19.00	0.57	37,251	1,010.77	0.74
20.00	0.49	36,683	1,010.74	0.64
21.00	0.45	36,197	1,010.71	0.56
22.00	0.43	35,863	1,010.69	0.51
23.00	0.41	35,623	1,010.68	0.47
24.00	0.40	35,439	1,010.66	0.44
25.00	0.00	34,566	1,010.61	0.31
26.00	0.00	33,648	1,010.56	0.21
27.00	0.00	33,042	1,010.52	0.14
28.00	0.00	32,640	1,010.49	0.09
29.00	0.00	32,336	1,010.47	0.08
30.00	0.00	32,093	1,010.46	0.06
31.00	0.00	31,900	1,010.45	0.05
32.00	0.00	31,746	1,010.44	0.04
33.00	0.00	31,623	1,010.43	0.03
34.00	0.00	31,525	1,010.42	0.02
35.00	0.00	31,447	1,010.42	0.02
36.00	0.00	31,385	1,010.42	0.02
37.00	0.00	31,336	1,010.41	0.01
38.00	0.00	31,297	1,010.41	0.01
39.00	0.00	31,265	1,010.41	0.01
40.00	0.00	31,240	1,010.41	0.01
41.00	0.00	31,220	1,010.40	0.00
42.00	0.00	31,205	1,010.40	0.00
43.00	0.00	31,192	1,010.40	0.00
44.00	0.00	31,182	1,010.40	0.00
45.00	0.00	31,174	1,010.40	0.00
46.00	0.00	31,168	1,010.40	0.00
47.00	0.00	31,162	1,010.40	0.00
48.00	0.00	31,158	1,010.40	0.00

Stage-Discharge for Pond 8P: Walmart Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,005.00	0.00	1,010.30	0.00	1,015.60	28.34
1,005.10	0.00	1,010.40	0.00	1,015.70	33.10
1,005.20	0.00	1,010.50	0.10	1,015.80	38.22
1,005.30	0.00	1,010.60	0.29	1,015.90	42.99
1,005.40	0.00	1,010.70	0.53	1,016.00	**46.77**
1,005.50	0.00	1,010.80	0.81		
1,005.60	0.00	1,010.90	1.13		
1,005.70	0.00	1,011.00	1.49		
1,005.80	0.00	1,011.10	1.88		
1,005.90	0.00	1,011.20	2.30		
1,006.00	0.00	1,011.30	2.74		
1,006.10	0.00	1,011.40	3.21		
1,006.20	0.00	1,011.50	3.60		
1,006.30	0.00	1,011.60	3.93		
1,006.40	0.00	1,011.70	4.23		
1,006.50	0.00	1,011.80	4.51		
1,006.60	0.00	1,011.90	4.76		
1,006.70	0.00	1,012.00	5.00		
1,006.80	0.00	1,012.10	5.24		
1,006.90	0.00	1,012.20	5.46		
1,007.00	0.00	1,012.30	5.67		
1,007.10	0.00	1,012.40	5.87		
1,007.20	0.00	1,012.50	6.07		
1,007.30	0.00	1,012.60	6.25		
1,007.40	0.00	1,012.70	6.44		
1,007.50	0.00	1,012.80	6.62		
1,007.60	0.00	1,012.90	6.79		
1,007.70	0.00	1,013.00	6.96		
1,007.80	0.00	1,013.10	7.13		
1,007.90	0.00	1,013.20	7.29		
1,008.00	0.00	1,013.30	7.45		
1,008.10	0.00	1,013.40	7.60		
1,008.20	0.00	1,013.50	7.75		
1,008.30	0.00	1,013.60	7.90		
1,008.40	0.00	1,013.70	8.05		
1,008.50	0.00	1,013.80	8.19		
1,008.60	0.00	1,013.90	8.33		
1,008.70	0.00	1,014.00	8.47		
1,008.80	0.00	1,014.10	8.60		
1,008.90	0.00	1,014.20	8.74		
1,009.00	0.00	1,014.30	8.87		
1,009.10	0.00	1,014.40	9.00		
1,009.20	0.00	1,014.50	9.13		
1,009.30	0.00	1,014.60	9.25		
1,009.40	0.00	1,014.70	9.38		
1,009.50	0.00	1,014.80	9.50		
1,009.60	0.00	1,014.90	9.62		
1,009.70	0.00	1,015.00	9.74		
1,009.80	0.00	1,015.10	11.08		
1,009.90	0.00	1,015.20	13.42		
1,010.00	0.00	1,015.30	16.42		
1,010.10	0.00	1,015.40	19.95		
1,010.20	0.00	1,015.50	23.94		

Stage-Area-Storage for Pond 8P: Walmart Detention

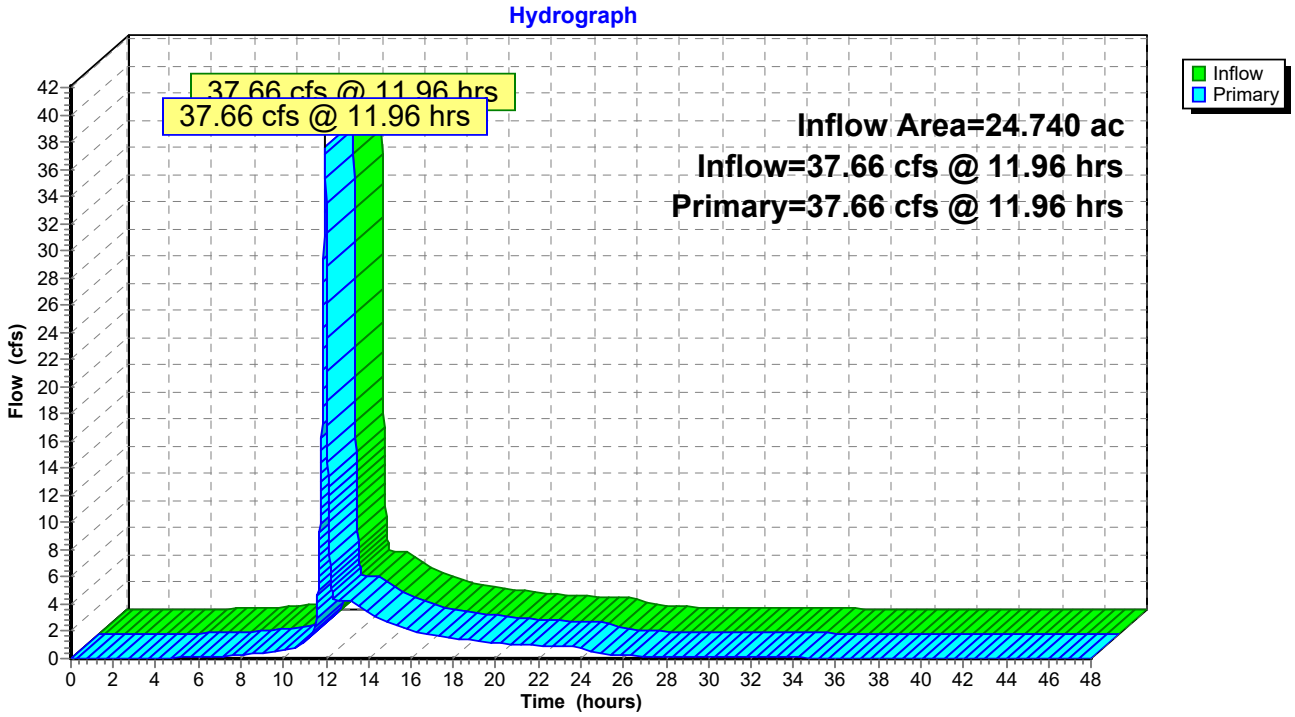
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,005.00	0	0
1,005.20	125	13
1,005.40	251	50
1,005.60	376	113
1,005.80	502	201
1,006.00	627	314
1,006.20	898	466
1,006.40	1,169	673
1,006.60	1,441	934
1,006.80	1,712	1,249
1,007.00	1,983	1,619
1,007.20	2,595	2,076
1,007.40	3,207	2,657
1,007.60	3,820	3,359
1,007.80	4,432	4,184
1,008.00	5,044	5,132
1,008.20	6,041	6,241
1,008.40	7,038	7,548
1,008.60	8,036	9,056
1,008.80	9,033	10,763
1,009.00	10,030	12,669
1,009.20	10,956	14,768
1,009.40	11,883	17,052
1,009.60	12,809	19,521
1,009.80	13,736	22,175
1,010.00	14,662	25,015
1,010.20	15,319	28,013
1,010.40	15,976	31,143
1,010.60	16,334	34,374
1,010.80	16,691	37,676
1,011.00	17,049	41,050
1,011.20	17,413	44,496
1,011.40	17,777	48,015
1,011.60	18,143	51,607
1,011.80	18,511	55,273
1,012.00	18,879	59,012
1,012.20	19,258	62,825
1,012.40	19,637	66,715
1,012.60	20,015	70,680
1,012.80	20,394	74,721
1,013.00	20,773	78,838
1,013.20	21,160	83,031
1,013.40	21,548	87,302
1,013.60	21,935	91,650
1,013.80	22,323	96,076
1,014.00	22,710	100,579
1,014.20	23,113	105,161
1,014.40	23,515	109,824
1,014.60	23,918	114,568
1,014.80	24,320	119,391
1,015.00	24,723	124,296
1,015.20	25,135	129,282
1,015.40	25,547	134,350
1,015.60	25,959	139,500
1,015.80	26,371	144,733
1,016.00	**26,783**	**150,049**

Summary for Link 1L: Existing Total

Inflow Area = 24.740 ac, 0.00% Impervious, Inflow Depth > 1.57" for Jackson - 2 YR event
Inflow = 37.66 cfs @ 11.96 hrs, Volume= 3.230 af
Primary = 37.66 cfs @ 11.96 hrs, Volume= 3.230 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Existing Total



Hydrograph for Link 1L: Existing Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.50	0.21	0.00	0.21
0.50	0.00	0.00	0.00	27.00	0.18	0.00	0.18
1.00	0.00	0.00	0.00	27.50	0.16	0.00	0.16
1.50	0.00	0.00	0.00	28.00	0.14	0.00	0.14
2.00	0.00	0.00	0.00	28.50	0.13	0.00	0.13
2.50	0.00	0.00	0.00	29.00	0.12	0.00	0.12
3.00	0.00	0.00	0.00	29.50	0.11	0.00	0.11
3.50	0.01	0.00	0.01	30.00	0.10	0.00	0.10
4.00	0.03	0.00	0.03	30.50	0.10	0.00	0.10
4.50	0.05	0.00	0.05	31.00	0.09	0.00	0.09
5.00	0.07	0.00	0.07	31.50	0.09	0.00	0.09
5.50	0.10	0.00	0.10	32.00	0.08	0.00	0.08
6.00	0.12	0.00	0.12	32.50	0.08	0.00	0.08
6.50	0.15	0.00	0.15	33.00	0.07	0.00	0.07
7.00	0.18	0.00	0.18	33.50	0.07	0.00	0.07
7.50	0.21	0.00	0.21	34.00	0.07	0.00	0.07
8.00	0.24	0.00	0.24	34.50	0.06	0.00	0.06
8.50	0.31	0.00	0.31	35.00	0.06	0.00	0.06
9.00	0.40	0.00	0.40	35.50	0.06	0.00	0.06
9.50	0.45	0.00	0.45	36.00	0.06	0.00	0.06
10.00	0.57	0.00	0.57	36.50	0.05	0.00	0.05
10.50	0.79	0.00	0.79	37.00	0.05	0.00	0.05
11.00	1.21	0.00	1.21	37.50	0.05	0.00	0.05
11.50	**2.25**	0.00	**2.25**	38.00	0.05	0.00	0.05
12.00	**33.51**	0.00	**33.51**	38.50	0.05	0.00	0.05
12.50	4.16	0.00	4.16	39.00	0.05	0.00	0.05
13.00	4.32	0.00	4.32	39.50	0.05	0.00	0.05
13.50	3.89	0.00	3.89	40.00	0.05	0.00	0.05
14.00	3.36	0.00	3.36	40.50	0.04	0.00	0.04
14.50	2.97	0.00	2.97	41.00	0.04	0.00	0.04
15.00	2.64	0.00	2.64	41.50	0.04	0.00	0.04
15.50	2.35	0.00	2.35	42.00	0.04	0.00	0.04
16.00	2.09	0.00	2.09	42.50	0.04	0.00	0.04
16.50	1.91	0.00	1.91	43.00	0.04	0.00	0.04
17.00	1.76	0.00	1.76	43.50	0.04	0.00	0.04
17.50	1.63	0.00	1.63	44.00	0.04	0.00	0.04
18.00	1.52	0.00	1.52	44.50	0.04	0.00	0.04
18.50	1.41	0.00	1.41	45.00	0.04	0.00	0.04
19.00	1.32	0.00	1.32	45.50	0.04	0.00	0.04
19.50	1.23	0.00	1.23	46.00	0.04	0.00	0.04
20.00	1.14	0.00	1.14	46.50	0.04	0.00	0.04
20.50	1.08	0.00	1.08	47.00	0.04	0.00	0.04
21.00	1.03	0.00	1.03	47.50	0.04	0.00	0.04
21.50	1.00	0.00	1.00	48.00	0.04	0.00	0.04
22.00	0.96	0.00	0.96				
22.50	0.94	0.00	0.94				
23.00	0.91	0.00	0.91				
23.50	0.89	0.00	0.89				
24.00	0.87	0.00	0.87				
24.50	0.45	0.00	0.45				
25.00	0.36	0.00	0.36				
25.50	0.30	0.00	0.30				
26.00	0.25	0.00	0.25				

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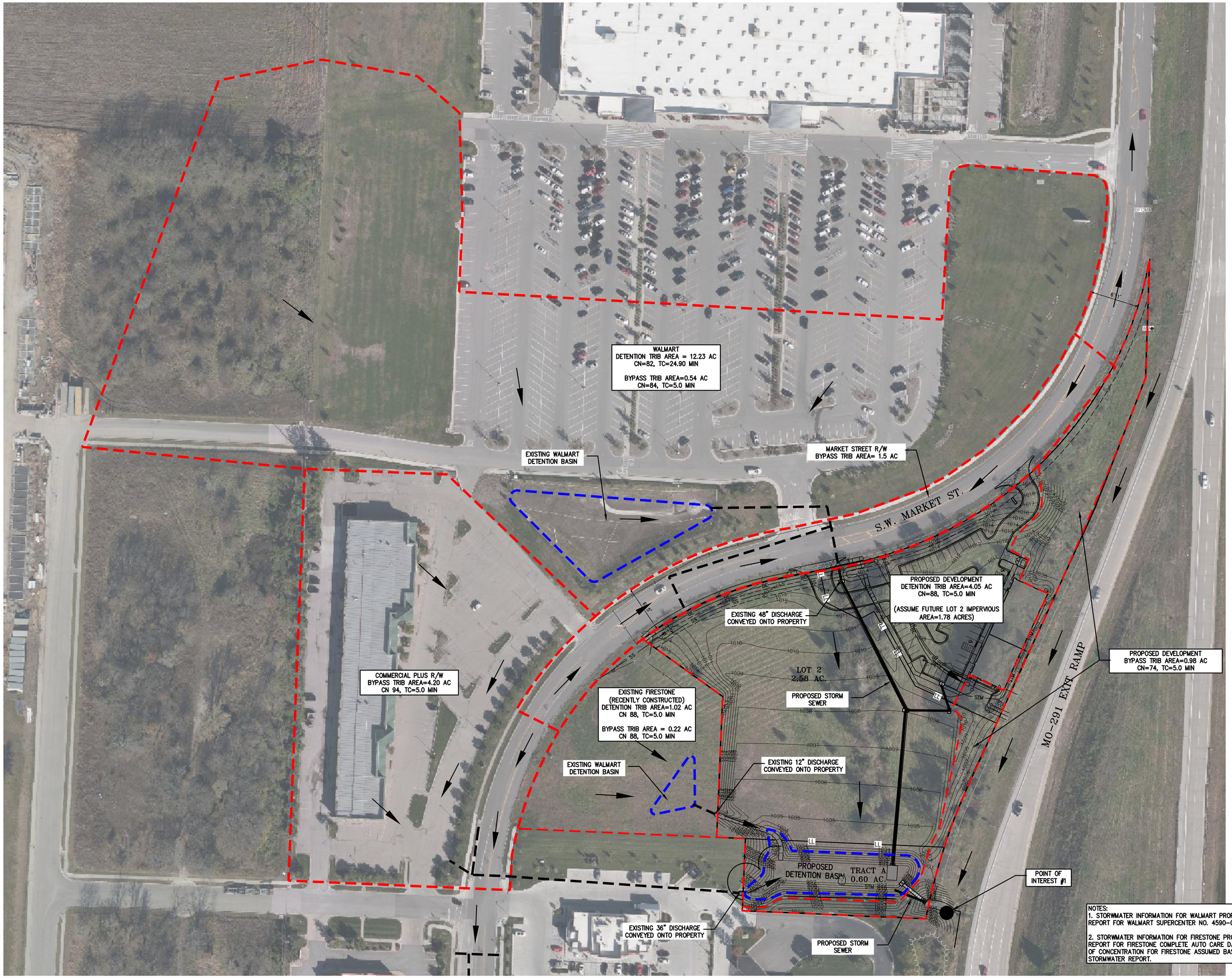
APPENDIX C

C. Proposed Hydraulic Model

- Proposed Drainage Map A1
- WQV Calculation
- Proposed Detention Basin Details
- Proposed HydroCAD Model



NOTES:
1. STORMWATER INFORMATION FOR WALMART PROPERTY FROM APPROVED STORMWATER REPORT FOR WALMART SUPERCENTER NO. 4590-01 DATED NOVEMBER 25, 2015

2. STORMWATER INFORMATION FOR FIRESTONE PROPERTY FROM APPROVED STORMWATER REPORT FOR FIRESTONE COMPLETE AUTO CARE DATED MAY 01, 2020. BYPASS CN AND TIME OF CONCENTRATION FOR FIRESTONE ASSUMED BASED ON AVAILABLE INFORMATION FROM STORMWATER REPORT.

STATE OF MISSOURI
JUDD DAVID CLAUSSEN
NUMBER PE-2010030850
4/06/22
REGIONAL ENGINEER

PHELPS ENGINEERING, INC.
1270 N. Winchester
Olathe, Kansas 66061
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Fax (913) 393-1066
www.phelpsengineering.com

PLANNING
ENGINEERING
IMPLEMENTATION

PROPOSED DRAINAGE MAP

MARKET STREET CENTER
M291 AND SW MARKET STREET
CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App.
1.	03-16-22	REVISED PER CITY COMMENTS	SNH	DAF
2.	04-06-22	REVISED PER CITY COMMENTS	SNH	DAF

PROJECT NO. 210639
DATE: 10-14-21 DRAWN: MRR
CHECKED: DAF APPROVED: JDC
CERTIFICATE OF AUTHORIZATION
KANSAS SURVEYING – LS-82
KANSAS ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007003328

SHEET
C1

\\PHELPS-SERVER\Projects\P\210639\Stormwater\PROPOSED CONDITIONS.dwg Layout:1 Apr 07, 2022 - 3:59pm Daniel Finn

Design Procedure Form: WQV 40 Hour Drawdown Calculations
Main Worksheet

Designer: DAF
ecked By: JDC
Company: Phelps Engineering, Inc
Date: 2/4/2022
Project: 291 and Market Street
Location: Lee's Summit MO

I. Basin Water Quality Volume

Step 1) Tributary area to EDW, A_T (ac) — A_T (ac) = 4.05

Step 2) Calculate WQv using methodology in Section 6 — WQv (ac-ft) = 0.26; WQv (cf) = 11,467

IIa. Water Quality Outlet Type

Step 1) Set water quality outlet type: — Outlet Type = 1

Type 1 = single orifice
Type 2 = perforated riser or plate
Type 3 = v-notch weir

Vb. Water Quality Pool Outlet, Single Orifice

Step 1) Depth of water quality volume above permanent pool, Z_{WQ} (ft) — Z_{WQ} (ft) = 2.5

Step 2) Average head of water quality volume over invert of orifice, H_{WQ} (ft)

$H_{WQ} = 0.5 * Z_{WQ}$ — H_{WQ} (ft) = 1.3

Step 3) Average water quality outflow rate, Q_{WQ} (cfs)

$Q_{WQ} = (WQv * 43,560)/(40 * 3,600)$ — Q_{WQ} (cfs) = 0.08

Step 4) Set value of orifice discharge coefficient, C_o

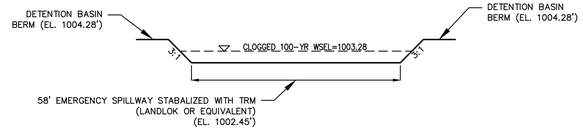
$C_o = 0.66$ when thickness of riser/weir plate is = or < orifice diameter
$C_o = 0.80$ when thickness of riser/weir plate is > orifice diameter — C_o = 0.66

Step 5) Water quality outlet orifice diameter (minimum of 4 inches), D_o (in)

$D_o = 12 * 2 * (Q_{WQ}/(C_o * \pi * (2 * g * H)^{0.5}))^{0.5}$ — D_o (in) = 1.57

(If orifice diameter < 4 inches, use outlet type 2 or 3) — 1.5"

Step 6) To size outlet orifice for EDW with an irregular stage-volume relationship, use the Single Orifice Worksheet



EMERGENCY SPILLWAY
TYPICAL SECTION

100-YEAR EMERGENCY SPILLWAY DESIGN

100-Year Inflow Q_{100}=*116.64* cfs
100-Year WSEL = 1001.95'

Emergency Spillway Elevation = 1002.45' (0.5 ft above 100-year WSEL)
Emergency Spillway Width = 50'

$Q = CLH^{1.5}$ 116.64 = (3.1)(50)$(H)^{1.5}$
Clogged 100-Year Emergency Spillway Flow Depth, H = 0.75'
Clogged 100-Year WSEL = 1003.20'

Detention Basin Berm Elevation = 1004.20' (1.0 ft above clogged 100-year WSEL)

Design Procedure Form: WQV 40 Hour Drawdown Calculations
Main Worksheet

Designer: DAF
Checked By: JDC
Company: Phelps Engineering, Inc
Date: 2/4/2022
Project: 291 and Market Street
Location: Lee's Summit MO

I. Basin Water Quality Volume

Step 1) Tributary area to EDW, A_T (ac) — A_T (ac) = 4.05

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Step 1) Depth of water quality volume above permanent pool, Z_{WQ} (ft) — Z_{WQ} (ft) = 2.5

Step 2) Average head of water quality volume over invert of orifice, H_{WQ} (ft)
$H_{WQ} = 0.5 * Z_{WQ}$ — H_{WQ} (ft) = 1.3

Step 3) Average water quality outflow rate, Q_{WQ} (cfs)
Q_{WQ} = (WQv* 43,560)/(40 * 3,600) — Q_{WQ} (cfs) = 0.08

Step 4) Set value of orifice discharge coefficient, C_o
C_o = 0.66 when thickness of riser/weir plate is = or < orifice diameter
C_o = 0.80 when thickness of riser/weir plate is > orifice diameter — C_o = 0.66

Step 5) Water quality outlet orifice diameter (minimum of 4 inches), D_o (in)
$D_o = 12 * 2 * (Q_{WQ}/(C_o * \pi * (2 * g * H)^{0.5}))^{0.5}$ — D_o (in) = 1.57
(If orifice diameter < 4 inches, use outlet type 2 or 3) — 1.5"

Step 6) To size outlet orifice for EDW with an irregular stage-volume relationship, use the Single Orifice Worksheet

Proposed Detention Basin Stage/Storage

Elevation	Surface Area (sf)	Storage Volume (cf)
996	0	0
997	5,095	2,548
998	6,517	8,354
999	8,135	15,680
1,000	9,810	24,652
1,001	11,528	35,321
1,002	13,346	47,758
1,003	14,829	61,846

APWA Release Rate Summary

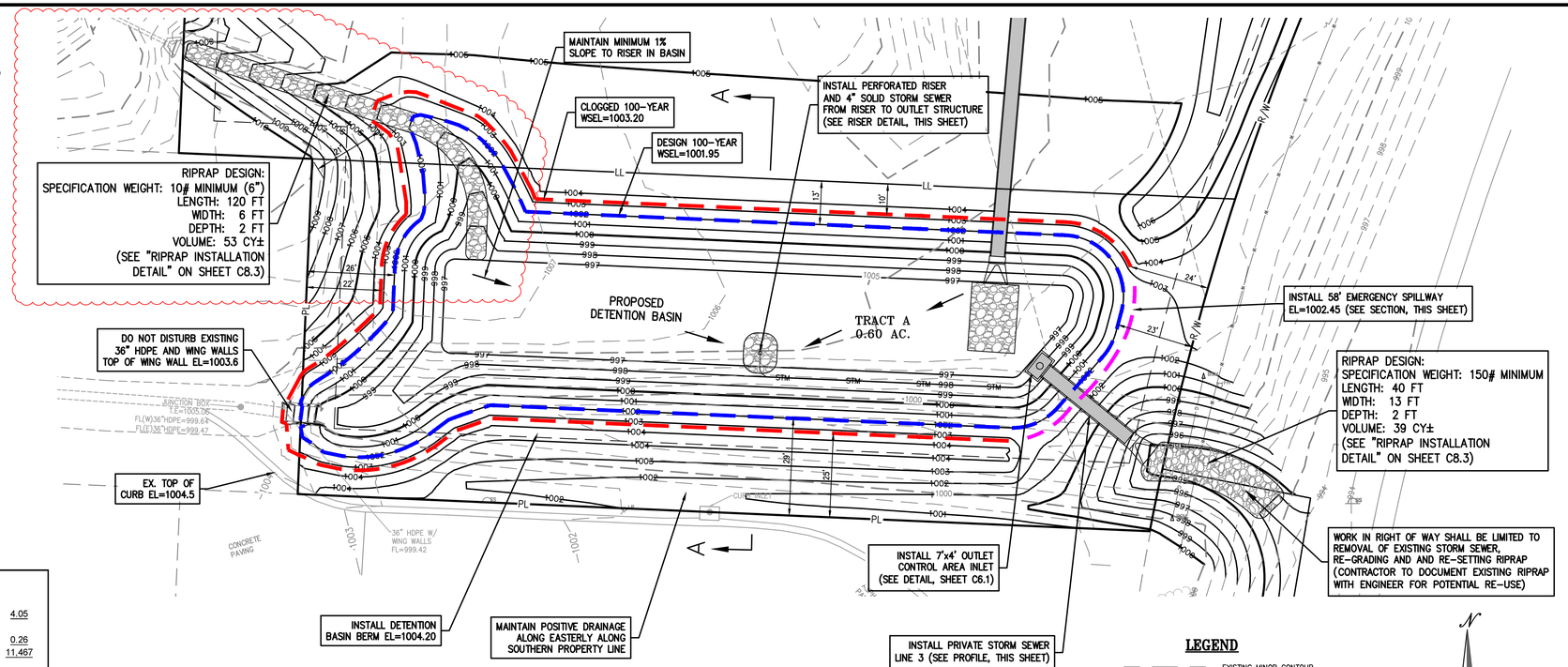
	Site Area[1] (acre)	Allowable Peak Rate (cfs/acre)	Allowable Peak Discharge (cfs)	Detention Outflow (cfs)	Offsite Detention Inflow (cfs) "Pass Thru"	Detention Outflow Attributed to Site (cfs)
2-Year	4.05	0.50	***2.03***	32.14	30.21	***1.93***
10-Year	4.05	2.00	***8.10***	55.99	47.97	***8.02***
100-Year	4.05	3.00	***12.15***	85.81	73.73	***12.08***

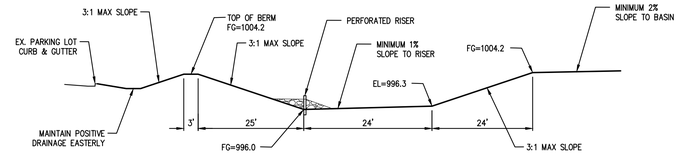
POI #1 Existing vs Proposed

	Existing Peak Discharge (cfs)	Proposed Peak Discharge (cfs)
2-Year	37.66	33.87
10-Year	61.80	59.80
100-Year	94.73	92.26

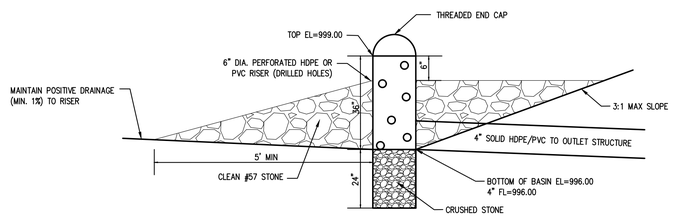
Proposed Hydraulic Results

	Onsite Detention Inflow (cfs)	Offsite Detention Inflow (cfs) "Pass Thru"	Total Detention Inflow (cfs)	Detention Outflow (cfs)	WSEL (ft.)	Storage (cf)	POI #1 Peak Discharge (cfs)
2-Year	16.54	30.21	46.75	32.14	1,000.04	25,005	33.87
10-Year	27.90	47.97	75.87	55.99	1,000.90	34,128	59.80
100-Year	42.91	73.73	116.64	85.81	1,001.95	47,045	92.26

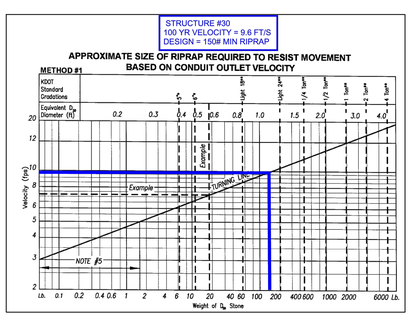




DETENTION BASIN SECTION A-A



RISER DETAIL (WEST VIEW)
Not To Scale



STRUCTURE #30 – RIPRAP SIZE CALCULATION

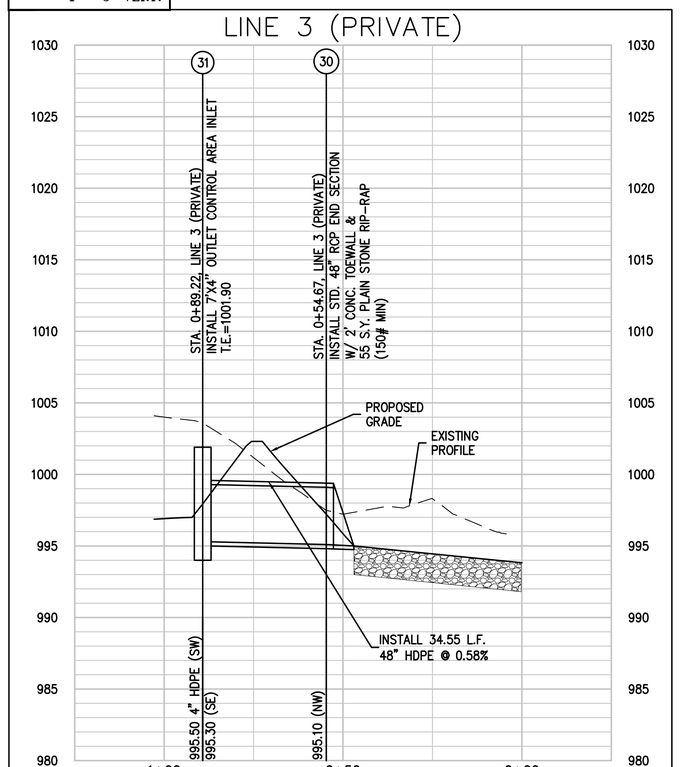
LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- 100-YEAR WSE
- CLOGGED 100-YEAR WSE
- EMERGENCY SPILLWAY
- PROPOSED STORM PIPE

N

SCALE: 1"=20'
0' 20' 40'

SCALE: 1"=20' HORIZ.
1"= 5' VERT.



STATE OF MISSOURI
JUDD DAVID CLAUSSEN
NUMBER PE-39850
4/06/22
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PLANNING ENGINEERING IMPLEMENTATION

EXTENDED DRY DETENTION BASIN

MARKET STREET CENTER
M291 AND SW MARKET STREET
CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App.
1.	03-16-22	REVISED PER CITY COMMENTS	SNH	DAF
2.	04-06-22	REVISED PER CITY COMMENTS	SNH	DAF

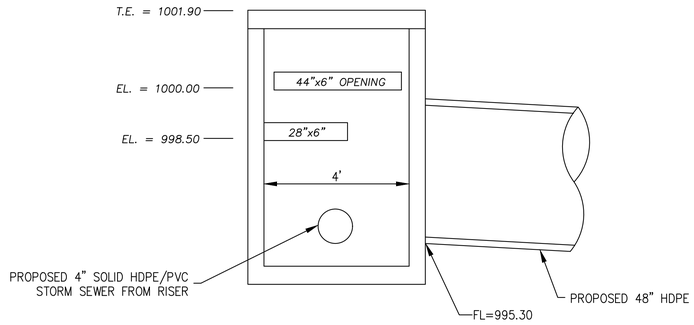
PROJECT NO. 21063.39
DATE: 10-14-21 DRAWN: RR
CHECKED: DAF APPROVED: JDC

CERTIFICATE OF AUTHORIZATION KANSAS SURVEYING – LS-82 ENGINEERING – E-391

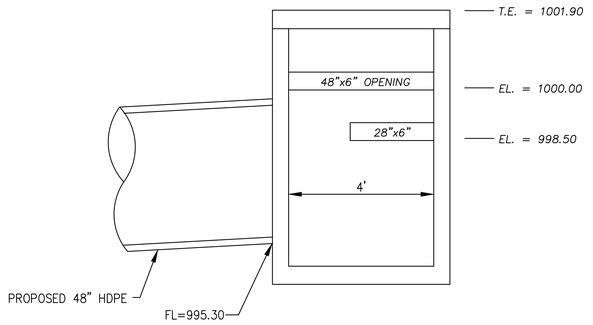
CERTIFICATE OF AUTHORIZATION LAND SURVEYING-2007001128 ENGINEERING-2007005038

SHEET
C6

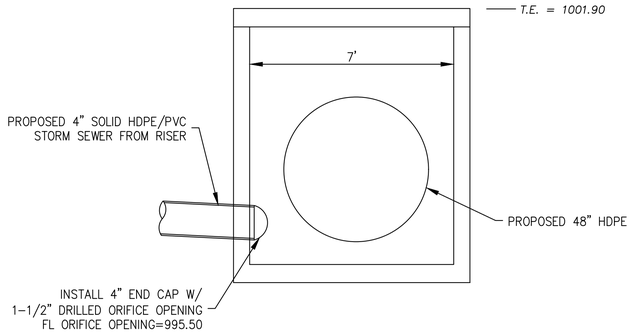
\\phelps-server\projects\P\21063\8\dwg\permit plans\DETENTION BASIN.dwg Layout:1 Apr 06, 2022 - 10:57pm Daniel Finn



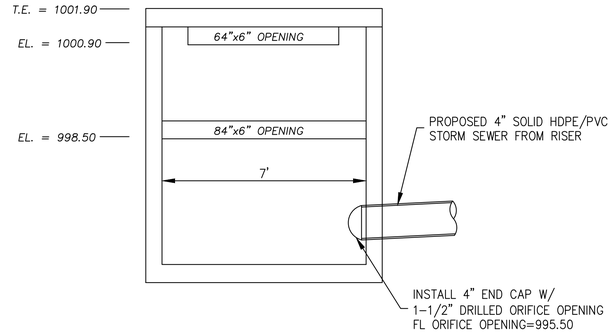
SPECIAL 7'x4' OUTLET CONTROL AREA INLET
SOUTHWEST WALL



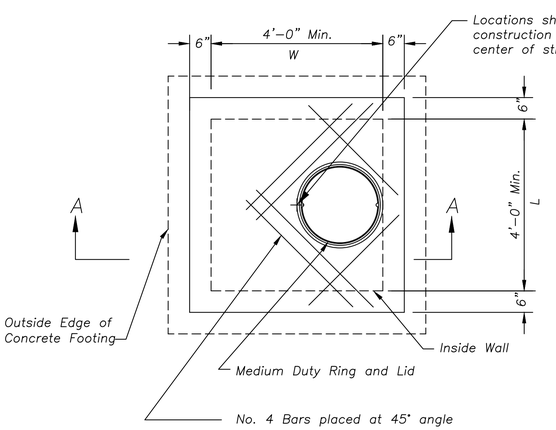
SPECIAL 7'x4' OUTLET CONTROL AREA INLET
NORTHEAST WALL



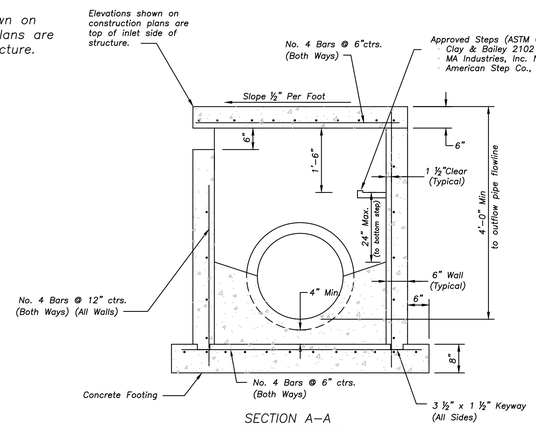
SPECIAL 7'x4' OUTLET CONTROL AREA INLET
SOUTHEAST WALL



SPECIAL 7'x4' OUTLET CONTROL AREA INLET
NORTHWEST WALL



Plan



SECTION A-A

OUTLET CONTROL DETAIL

SCALE: N.T.S.

Outlet Control Structure Notes

General

1. All storm sewer structures shall be pre-cast or poured in place. If pre-cast structures are used for publicly financed, maintained or administered construction, the tops shall be poured in place and the wall steel shall be left exposed to a height 2" below the finish top elevation, or as directed by the City Engineer.
2. Pre-cast shop drawings are to be approved by the City Engineer for publicly financed or administered projects. Pre-cast shop drawings for privately financed projects are to be submitted to the Engineering Services Division of the Planning and Development Services Department.
3. Do not scale these drawings for dimensions or clearances. Any questions regarding dimensions shall be brought to the attention of the City Engineer prior to construction.
4. The first dimension listed in the construction notes is the "L" dimension. The second dimension is the "W" dimension. The concrete thickness and reinforcement shown is for boxes with ("L"+"H") and ("W"+"H") less then or equal to 20. For boxes with either of these calculations greater than 20, a special design is required.

Concrete

5. Concrete used in this work shall be KCMMB4K, as approved by the Kansas City Metropolitan Materials Board, and shall meet the requirements of the **Lee's Summit** Municipal Code.
6. Concrete construction shall meet the applicable requirements of Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation, latest edition, except as modified in the **Lee's Summit** Municipal Code.
7. Inlet floors shall be shaped with non-reinforced concrete inverts to provide smooth flow.
8. Bevel all exposed edges with ¾" triangular molding.

Reinforcing Steel

9. Reinforcing steel shall be new billet, minimum Grade 60 as per ASTM A615, and shall be bent cold.
10. All dimensions relative to reinforcing steel are to centerline of bars. 2" clearance shall be provided throughout unless noted otherwise. Tolerance of +/- ⅛" shall be permitted.
11. All lap splices not shown shall be a minimum of 40 bar diameters in length.
12. All reinforcing steel shall be supported on fabricated steel bar supports @ 3'-0" maximum spacing.
13. All dowels shall be accurately placed and securely tied in place prior to placement of bottom slab concrete. Sticking of dowels into fresh or partially hardened concrete will not be acceptable.

Construction

14. The bottom slab shall be at least 24 hours old before placing sidewalk concrete. All sidewalk forms shall remain in place a minimum of 24 hours after sidewalls are poured before removal, and after removal shall be immediately treated with membrane curing compound.
15. Pipe connections to pre-cast structures shall have a minimum of 6" of concrete around the entire pipe within 2' of the structure.
16. Material selection and compaction requirements for backfill around structures shall be as specified in the Manual of Infrastructure Standards, as promulgated by the City Engineer.

STATE OF MISSOURI
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PLANNING
ENGINEERING
IMPLEMENTATION

OUTLET STRUCTURE DETAILS

MARKET STREET CENTER
M291 AND SW MARKET STREET
CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App.
1.	03-16-22	REVISED PER CITY COMMENTS	SNH	DAF
2.	04-06-22	REVISED PER CITY COMMENTS	SNH	DAF

PROJECT NO. 210639
DATE: 10-14-21 DRAWN:MRR
CHECKED: DAF APPROVED: JDC
CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING - LS-82
KANSAS ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128
ENGINEERING-2007005208

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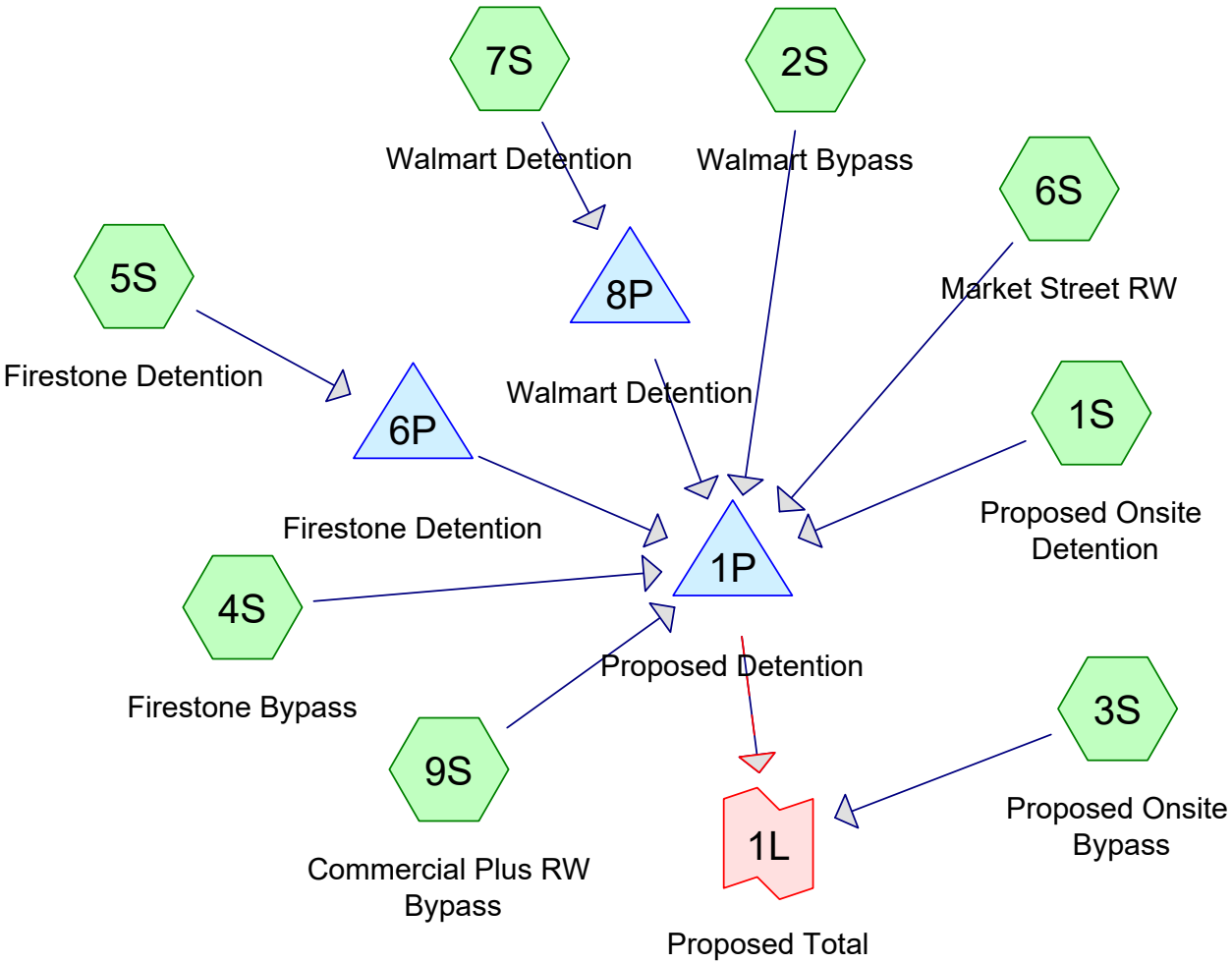


Subcat Reach Pond Link

Routing Diagram for Proposed

Prepared by {enter your company name here}, Printed 3/17/2022

HydroCAD® 10.10-6a s/n 09856 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	Jackson - 10 YR	Type II 24-hr		Default	24.00	1	5.30	2
2	Jackson - 100 YR	Type II 24-hr		Default	24.00	1	7.70	2
3	Jackson - 2 YR	Type II 24-hr		Default	24.00	1	3.50	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.540	84	(2S)
1.240	88	(4S, 5S)
5.700	94	(6S, 9S)
12.230	82	(7S)
2.700	74	>75% Grass cover, Good, HSG C (1S, 3S)
2.330	98	Paved parking, HSG D (1S)
24.740	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.700	HSG C	1S, 3S
2.330	HSG D	1S
19.710	Other	2S, 4S, 5S, 6S, 7S, 9S
24.740		**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	0.000	19.710	19.710		2S, 4S, 5S, 6S, 7S, 9S
0.000	0.000	2.700	0.000	0.000	2.700	>75% Grass cover, Good	1S, 3S
0.000	0.000	0.000	2.330	0.000	2.330	Paved parking	1S
0.000	**0.000**	**2.700**	**2.330**	**19.710**	**24.740**	**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)
1	1P	995.30	995.10	34.5	0.0058	0.013	0.0	48.0	0.0
2	6P	1,009.50	1,009.35	30.0	0.0050	0.013	0.0	12.0	0.0
3	8P	1,004.83	1,004.48	87.0	0.0040	0.013	0.0	30.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Proposed Onsite Runoff Area=4.050 ac 57.53% Impervious Runoff Depth=3.95"
Tc=5.0 min CN=88 Runoff=27.90 cfs 1.335 af

Subcatchment 2S: Walmart Bypass Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=3.55"
Tc=5.0 min CN=84 Runoff=3.43 cfs 0.160 af

Subcatchment 3S: Proposed Onsite Bypass Runoff Area=0.980 ac 0.00% Impervious Runoff Depth=2.61"
Tc=5.0 min CN=74 Runoff=4.74 cfs 0.213 af

Subcatchment 4S: Firestone Bypass Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=3.95"
Tc=5.0 min CN=88 Runoff=1.52 cfs 0.073 af

Subcatchment 5S: Firestone Detention Runoff Area=1.020 ac 0.00% Impervious Runoff Depth=3.95"
Tc=5.0 min CN=88 Runoff=7.03 cfs 0.336 af

Subcatchment 6S: Market Street RW Runoff Area=1.500 ac 0.00% Impervious Runoff Depth=4.60"
Tc=5.0 min CN=94 Runoff=11.31 cfs 0.576 af

Subcatchment 7S: Walmart Detention Runoff Area=12.230 ac 0.00% Impervious Runoff Depth=3.35"
Tc=24.9 min CN=82 Runoff=39.89 cfs 3.413 af

Subcatchment 9S: Commercial Plus RW Runoff Area=4.200 ac 0.00% Impervious Runoff Depth=4.60"
Tc=5.0 min CN=94 Runoff=31.68 cfs 1.611 af

Pond 1P: Proposed Detention Peak Elev=1,000.90' Storage=34,128 cf Inflow=75.87 cfs 6.666 af
Primary=55.99 cfs 6.447 af Secondary=0.00 cfs 0.000 af Outflow=55.99 cfs 6.447 af

Pond 6P: Firestone Detention Peak Elev=1,013.70' Storage=9,947 cf Inflow=7.03 cfs 0.336 af
Outflow=0.21 cfs 0.214 af

Pond 8P: Walmart Detention Peak Elev=1,012.92' Storage=77,205 cf Inflow=39.89 cfs 3.413 af
Outflow=6.83 cfs 2.698 af

Link 1L: Proposed Total Inflow=59.80 cfs 6.660 af
Primary=59.80 cfs 6.660 af

Total Runoff Area = 24.740 ac Runoff Volume = 7.716 af Average Runoff Depth = 3.74"
90.58% Pervious = 22.410 ac 9.42% Impervious = 2.330 ac

Summary for Subcatchment 1S: Proposed Onsite Detention

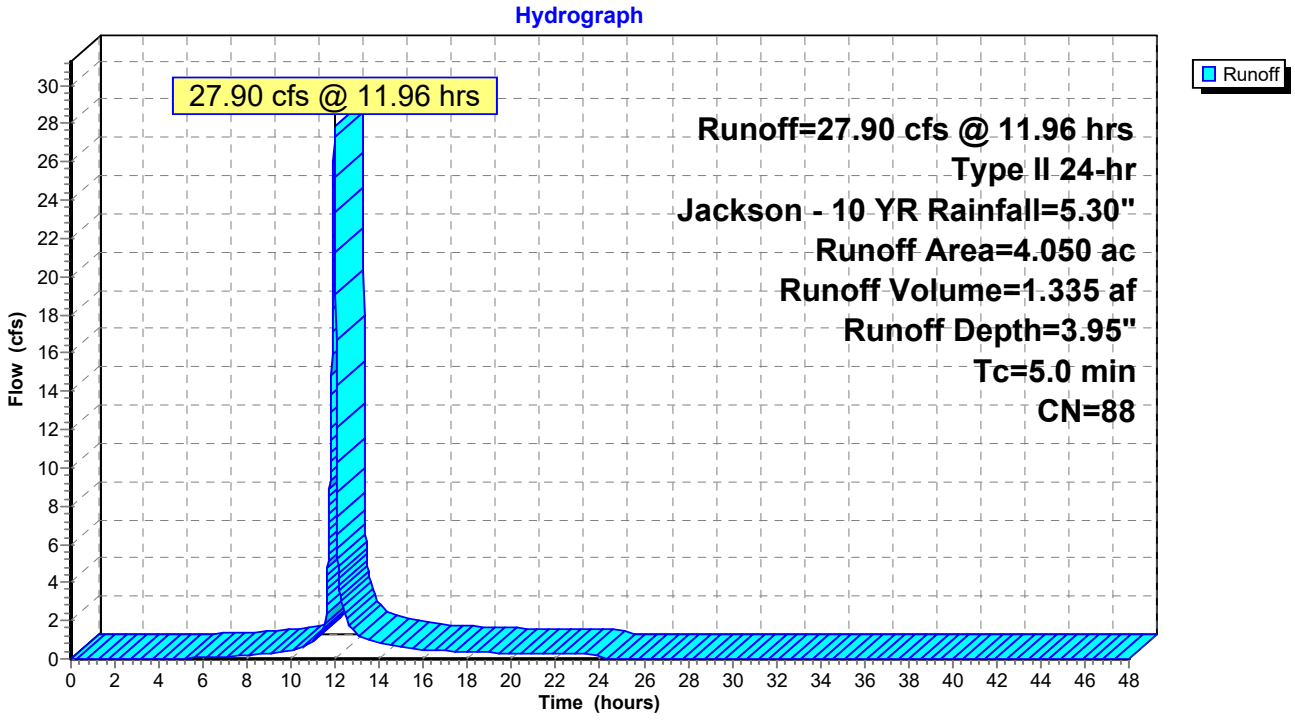
Runoff = 27.90 cfs @ 11.96 hrs, Volume= 1.335 af, Depth= 3.95"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

Area (ac)	CN	Description
1.720	74	>75% Grass cover, Good, HSG C
2.330	98	Paved parking, HSG D
4.050	88	Weighted Average
1.720		42.47% Pervious Area
2.330		57.53% Impervious Area

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

Subcatchment 1S: Proposed Onsite Detention



Hydrograph for Subcatchment 1S: Proposed Onsite Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.01
5.00	0.33	0.00	0.03
5.50	0.38	0.01	0.05
6.00	0.42	0.02	0.07
6.50	0.47	0.03	0.09
7.00	0.52	0.04	0.12
7.50	0.58	0.06	0.15
8.00	0.64	0.08	0.17
8.50	0.70	0.10	0.23
9.00	0.78	0.14	0.31
9.50	0.86	0.18	0.35
10.00	0.96	0.23	0.46
10.50	1.08	0.30	0.65
11.00	1.25	0.41	0.97
11.50	1.50	0.58	**1.74**
12.00	3.51	2.28	**23.37**
12.50	3.90	2.63	2.09
13.00	4.09	2.81	1.31
13.50	4.23	2.95	0.99
14.00	4.35	3.05	0.78
14.50	4.44	3.14	0.69
15.00	4.52	3.22	0.62
15.50	4.60	3.29	0.55
16.00	4.66	3.35	0.48
16.50	4.72	3.41	0.45
17.00	4.78	3.46	0.42
17.50	4.83	3.51	0.40
18.00	4.88	3.56	0.37
18.50	4.93	3.60	0.35
19.00	4.97	3.64	0.32
19.50	5.01	3.68	0.30
20.00	5.05	3.71	0.27
20.50	5.08	3.74	0.26
21.00	5.11	3.78	0.26
21.50	5.15	3.81	0.25
22.00	5.18	3.84	0.25
22.50	5.21	3.87	0.24
23.00	5.24	3.90	0.24
23.50	5.27	3.93	0.23
24.00	**5.30**	**3.95**	0.23
24.50	5.30	3.95	0.00
25.00	5.30	3.95	0.00
25.50	5.30	3.95	0.00
26.00	5.30	3.95	0.00
26.50	5.30	3.95	0.00
27.00	5.30	3.95	0.00
27.50	5.30	3.95	0.00
28.00	5.30	3.95	0.00
28.50	5.30	3.95	0.00
29.00	5.30	3.95	0.00
29.50	5.30	3.95	0.00
30.00	5.30	3.95	0.00
30.50	5.30	3.95	0.00
31.00	5.30	3.95	0.00
31.50	5.30	3.95	0.00
32.00	5.30	3.95	0.00
32.50	5.30	3.95	0.00
33.00	5.30	3.95	0.00
33.50	5.30	3.95	0.00
34.00	5.30	3.95	0.00
34.50	5.30	3.95	0.00
35.00	5.30	3.95	0.00
35.50	5.30	3.95	0.00
36.00	5.30	3.95	0.00
36.50	5.30	3.95	0.00
37.00	5.30	3.95	0.00
37.50	5.30	3.95	0.00
38.00	5.30	3.95	0.00
38.50	5.30	3.95	0.00
39.00	5.30	3.95	0.00
39.50	5.30	3.95	0.00
40.00	5.30	3.95	0.00
40.50	5.30	3.95	0.00
41.00	5.30	3.95	0.00
41.50	5.30	3.95	0.00
42.00	5.30	3.95	0.00
42.50	5.30	3.95	0.00
43.00	5.30	3.95	0.00
43.50	5.30	3.95	0.00
44.00	5.30	3.95	0.00
44.50	5.30	3.95	0.00
45.00	5.30	3.95	0.00
45.50	5.30	3.95	0.00
46.00	5.30	3.95	0.00
46.50	5.30	3.95	0.00
47.00	5.30	3.95	0.00
47.50	5.30	3.95	0.00
48.00	5.30	3.95	0.00

Summary for Subcatchment 2S: Walmart Bypass

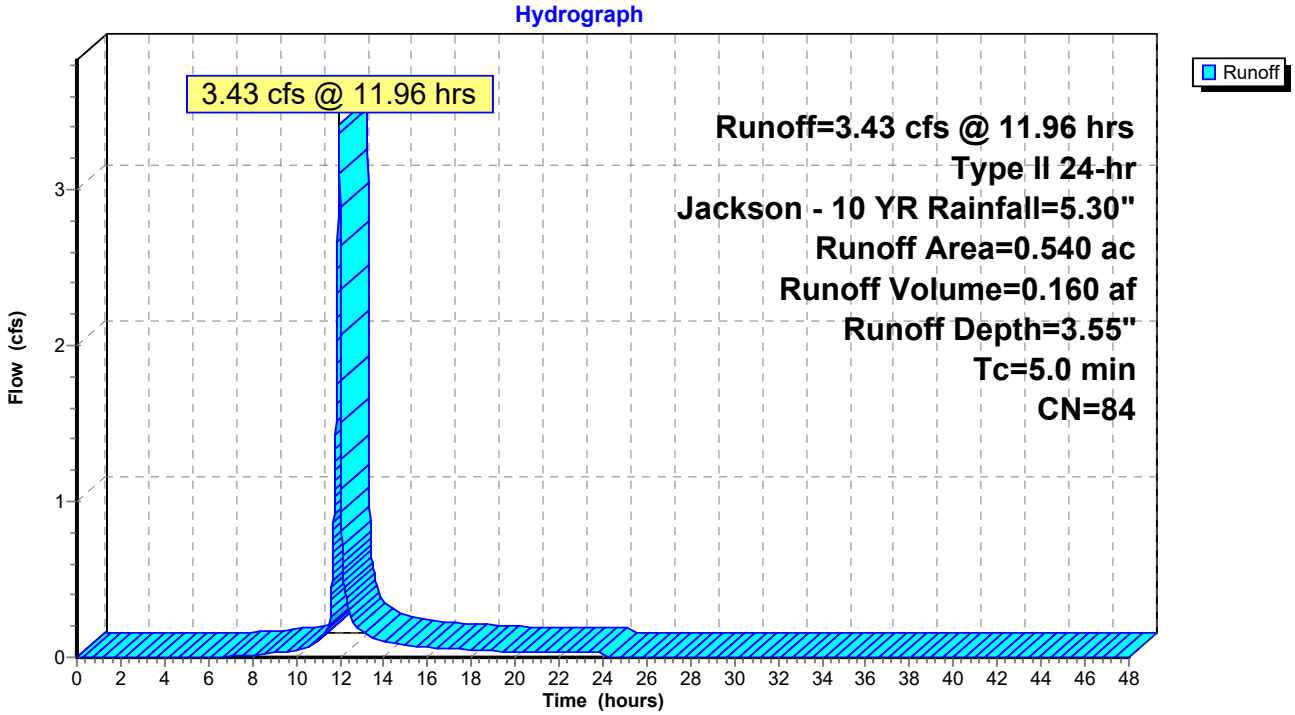
Runoff = 3.43 cfs @ 11.96 hrs, Volume= 0.160 af, Depth= 3.55"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.540	84	
	0.540		100.00% Pervious Area

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

Subcatchment 2S: Walmart Bypass



Hydrograph for Subcatchment 2S: Walmart Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.00
5.50	0.38	0.00	0.00
6.00	0.42	0.00	0.00
6.50	0.47	0.00	0.00
7.00	0.52	0.01	0.01
7.50	0.58	0.02	0.01
8.00	0.64	0.03	0.01
8.50	0.70	0.05	0.02
9.00	0.78	0.07	0.03
9.50	0.86	0.10	0.03
10.00	0.96	0.13	0.05
10.50	1.08	0.19	0.07
11.00	1.25	0.27	0.10
11.50	1.50	0.41	**0.19**
12.00	3.51	1.95	**2.89**
12.50	3.90	2.28	0.26
13.00	4.09	2.45	0.17
13.50	4.23	2.58	0.13
14.00	4.35	2.68	0.10
14.50	4.44	2.76	0.09
15.00	4.52	2.84	0.08
15.50	4.60	2.91	0.07
16.00	4.66	2.96	0.06
16.50	4.72	3.02	0.06
17.00	4.78	3.07	0.05
17.50	4.83	3.12	0.05
18.00	4.88	3.16	0.05
18.50	4.93	3.20	0.04
19.00	4.97	3.24	0.04
19.50	5.01	3.28	0.04
20.00	5.05	3.31	0.03
20.50	5.08	3.34	0.03
21.00	5.11	3.37	0.03
21.50	5.15	3.40	0.03
22.00	5.18	3.43	0.03
22.50	5.21	3.46	0.03
23.00	5.24	3.49	0.03
23.50	5.27	3.52	0.03
24.00	**5.30**	**3.55**	0.03
24.50	5.30	3.55	0.00
25.00	5.30	3.55	0.00
25.50	5.30	3.55	0.00
26.00	5.30	3.55	0.00
26.50	5.30	3.55	0.00
27.00	5.30	3.55	0.00
27.50	5.30	3.55	0.00
28.00	5.30	3.55	0.00
28.50	5.30	3.55	0.00
29.00	5.30	3.55	0.00
29.50	5.30	3.55	0.00
30.00	5.30	3.55	0.00
30.50	5.30	3.55	0.00
31.00	5.30	3.55	0.00
31.50	5.30	3.55	0.00
32.00	5.30	3.55	0.00
32.50	5.30	3.55	0.00
33.00	5.30	3.55	0.00
33.50	5.30	3.55	0.00
34.00	5.30	3.55	0.00
34.50	5.30	3.55	0.00
35.00	5.30	3.55	0.00
35.50	5.30	3.55	0.00
36.00	5.30	3.55	0.00
36.50	5.30	3.55	0.00
37.00	5.30	3.55	0.00
37.50	5.30	3.55	0.00
38.00	5.30	3.55	0.00
38.50	5.30	3.55	0.00
39.00	5.30	3.55	0.00
39.50	5.30	3.55	0.00
40.00	5.30	3.55	0.00
40.50	5.30	3.55	0.00
41.00	5.30	3.55	0.00
41.50	5.30	3.55	0.00
42.00	5.30	3.55	0.00
42.50	5.30	3.55	0.00
43.00	5.30	3.55	0.00
43.50	5.30	3.55	0.00
44.00	5.30	3.55	0.00
44.50	5.30	3.55	0.00
45.00	5.30	3.55	0.00
45.50	5.30	3.55	0.00
46.00	5.30	3.55	0.00
46.50	5.30	3.55	0.00
47.00	5.30	3.55	0.00
47.50	5.30	3.55	0.00
48.00	5.30	3.55	0.00

Summary for Subcatchment 3S: Proposed Onsite Bypass

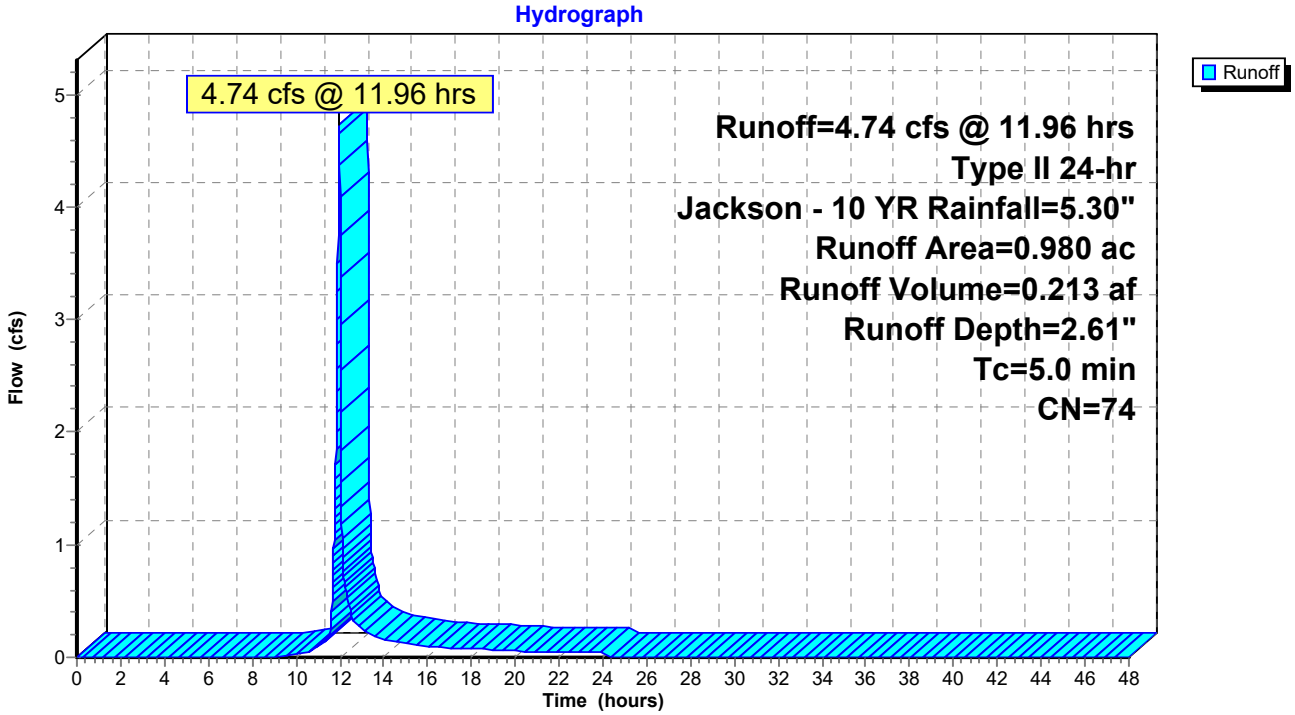
Runoff = 4.74 cfs @ 11.96 hrs, Volume= 0.213 af, Depth= 2.61"
Routed to Link 1L : Proposed Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

Area (ac)	CN	Description
0.980	74	>75% Grass cover, Good, HSG C
0.980		100.00% Pervious Area

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

Subcatchment 3S: Proposed Onsite Bypass



Hydrograph for Subcatchment 3S: Proposed Onsite Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	5.30	2.61	0.00
0.50	0.03	0.00	0.00	27.00	5.30	2.61	0.00
1.00	0.06	0.00	0.00	27.50	5.30	2.61	0.00
1.50	0.09	0.00	0.00	28.00	5.30	2.61	0.00
2.00	0.12	0.00	0.00	28.50	5.30	2.61	0.00
2.50	0.15	0.00	0.00	29.00	5.30	2.61	0.00
3.00	0.18	0.00	0.00	29.50	5.30	2.61	0.00
3.50	0.22	0.00	0.00	30.00	5.30	2.61	0.00
4.00	0.25	0.00	0.00	30.50	5.30	2.61	0.00
4.50	0.29	0.00	0.00	31.00	5.30	2.61	0.00
5.00	0.33	0.00	0.00	31.50	5.30	2.61	0.00
5.50	0.38	0.00	0.00	32.00	5.30	2.61	0.00
6.00	0.42	0.00	0.00	32.50	5.30	2.61	0.00
6.50	0.47	0.00	0.00	33.00	5.30	2.61	0.00
7.00	0.52	0.00	0.00	33.50	5.30	2.61	0.00
7.50	0.58	0.00	0.00	34.00	5.30	2.61	0.00
8.00	0.64	0.00	0.00	34.50	5.30	2.61	0.00
8.50	0.70	0.00	0.00	35.00	5.30	2.61	0.00
9.00	0.78	0.00	0.01	35.50	5.30	2.61	0.00
9.50	0.86	0.01	0.01	36.00	5.30	2.61	0.00
10.00	0.96	0.02	0.03	36.50	5.30	2.61	0.00
10.50	1.08	0.04	0.05	37.00	5.30	2.61	0.00
11.00	1.25	0.07	0.09	37.50	5.30	2.61	0.00
11.50	1.50	0.15	**0.19**	38.00	5.30	2.61	0.00
12.00	3.51	1.25	**4.09**	38.50	5.30	2.61	0.00
12.50	3.90	1.52	0.40	39.00	5.30	2.61	0.00
13.00	4.09	1.66	0.25	39.50	5.30	2.61	0.00
13.50	4.23	1.77	0.19	40.00	5.30	2.61	0.00
14.00	4.35	1.85	0.15	40.50	5.30	2.61	0.00
14.50	4.44	1.93	0.14	41.00	5.30	2.61	0.00
15.00	4.52	1.99	0.12	41.50	5.30	2.61	0.00
15.50	4.60	2.05	0.11	42.00	5.30	2.61	0.00
16.00	4.66	2.10	0.10	42.50	5.30	2.61	0.00
16.50	4.72	2.15	0.09	43.00	5.30	2.61	0.00
17.00	4.78	2.19	0.09	43.50	5.30	2.61	0.00
17.50	4.83	2.23	0.08	44.00	5.30	2.61	0.00
18.00	4.88	2.27	0.08	44.50	5.30	2.61	0.00
18.50	4.93	2.31	0.07	45.00	5.30	2.61	0.00
19.00	4.97	2.34	0.07	45.50	5.30	2.61	0.00
19.50	5.01	2.37	0.06	46.00	5.30	2.61	0.00
20.00	5.05	2.40	0.06	46.50	5.30	2.61	0.00
20.50	5.08	2.43	0.05	47.00	5.30	2.61	0.00
21.00	5.11	2.45	0.05	47.50	5.30	2.61	0.00
21.50	5.15	2.48	0.05	48.00	5.30	2.61	0.00
22.00	5.18	2.51	0.05				
22.50	5.21	2.53	0.05				
23.00	5.24	2.56	0.05				
23.50	5.27	2.58	0.05				
24.00	**5.30**	**2.61**	0.05				
24.50	5.30	2.61	0.00				
25.00	5.30	2.61	0.00				
25.50	5.30	2.61	0.00				
26.00	5.30	2.61	0.00				

Summary for Subcatchment 4S: Firestone Bypass

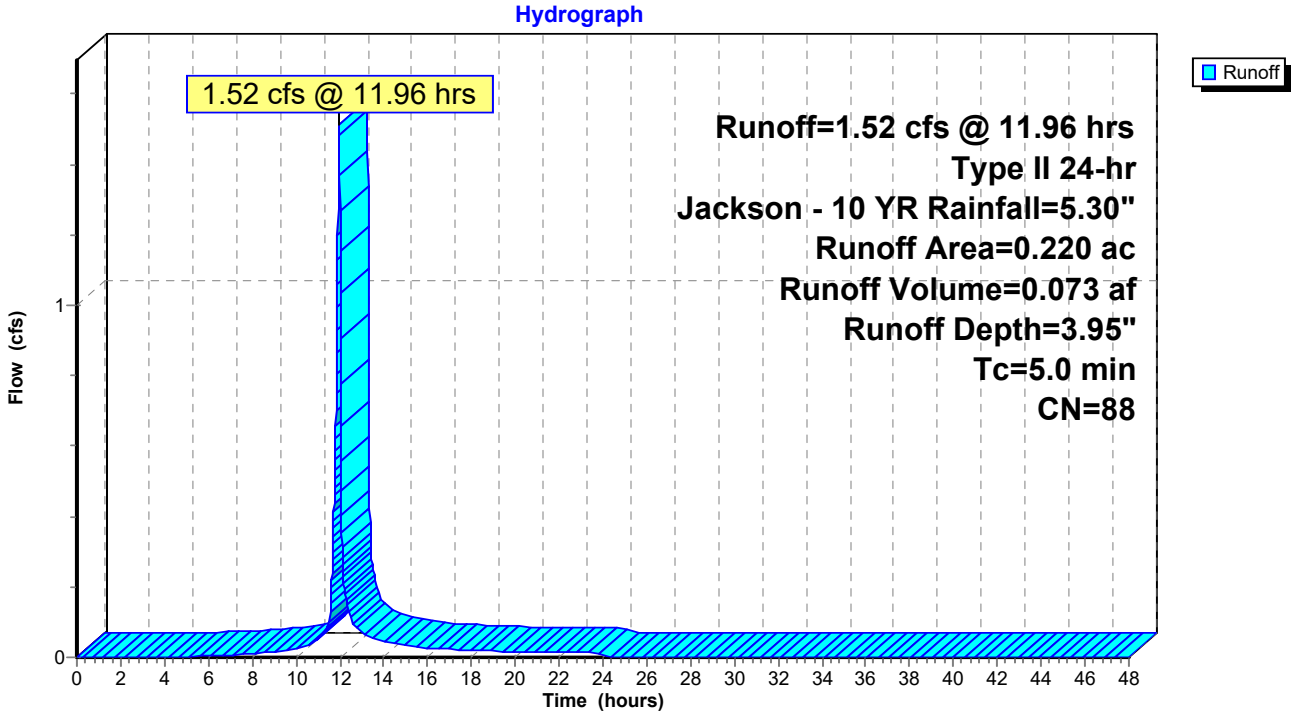
Runoff = 1.52 cfs @ 11.96 hrs, Volume= 0.073 af, Depth= 3.95"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.220	88	
	0.220		100.00% Pervious Area

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

Subcatchment 4S: Firestone Bypass



Hydrograph for Subcatchment 4S: Firestone Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.00
5.50	0.38	0.01	0.00
6.00	0.42	0.02	0.00
6.50	0.47	0.03	0.01
7.00	0.52	0.04	0.01
7.50	0.58	0.06	0.01
8.00	0.64	0.08	0.01
8.50	0.70	0.10	0.01
9.00	0.78	0.14	0.02
9.50	0.86	0.18	0.02
10.00	0.96	0.23	0.03
10.50	1.08	0.30	0.04
11.00	1.25	0.41	0.05
11.50	1.50	0.58	**0.09**
12.00	3.51	2.28	**1.27**
12.50	3.90	2.63	0.11
13.00	4.09	2.81	0.07
13.50	4.23	2.95	0.05
14.00	4.35	3.05	0.04
14.50	4.44	3.14	0.04
15.00	4.52	3.22	0.03
15.50	4.60	3.29	0.03
16.00	4.66	3.35	0.03
16.50	4.72	3.41	0.02
17.00	4.78	3.46	0.02
17.50	4.83	3.51	0.02
18.00	4.88	3.56	0.02
18.50	4.93	3.60	0.02
19.00	4.97	3.64	0.02
19.50	5.01	3.68	0.02
20.00	5.05	3.71	0.01
20.50	5.08	3.74	0.01
21.00	5.11	3.78	0.01
21.50	5.15	3.81	0.01
22.00	5.18	3.84	0.01
22.50	5.21	3.87	0.01
23.00	5.24	3.90	0.01
23.50	5.27	3.93	0.01
24.00	**5.30**	**3.95**	0.01
24.50	5.30	3.95	0.00
25.00	5.30	3.95	0.00
25.50	5.30	3.95	0.00
26.00	5.30	3.95	0.00
26.50	5.30	3.95	0.00
27.00	5.30	3.95	0.00
27.50	5.30	3.95	0.00
28.00	5.30	3.95	0.00
28.50	5.30	3.95	0.00
29.00	5.30	3.95	0.00
29.50	5.30	3.95	0.00
30.00	5.30	3.95	0.00
30.50	5.30	3.95	0.00
31.00	5.30	3.95	0.00
31.50	5.30	3.95	0.00
32.00	5.30	3.95	0.00
32.50	5.30	3.95	0.00
33.00	5.30	3.95	0.00
33.50	5.30	3.95	0.00
34.00	5.30	3.95	0.00
34.50	5.30	3.95	0.00
35.00	5.30	3.95	0.00
35.50	5.30	3.95	0.00
36.00	5.30	3.95	0.00
36.50	5.30	3.95	0.00
37.00	5.30	3.95	0.00
37.50	5.30	3.95	0.00
38.00	5.30	3.95	0.00
38.50	5.30	3.95	0.00
39.00	5.30	3.95	0.00
39.50	5.30	3.95	0.00
40.00	5.30	3.95	0.00
40.50	5.30	3.95	0.00
41.00	5.30	3.95	0.00
41.50	5.30	3.95	0.00
42.00	5.30	3.95	0.00
42.50	5.30	3.95	0.00
43.00	5.30	3.95	0.00
43.50	5.30	3.95	0.00
44.00	5.30	3.95	0.00
44.50	5.30	3.95	0.00
45.00	5.30	3.95	0.00
45.50	5.30	3.95	0.00
46.00	5.30	3.95	0.00
46.50	5.30	3.95	0.00
47.00	5.30	3.95	0.00
47.50	5.30	3.95	0.00
48.00	5.30	3.95	0.00

Summary for Subcatchment 5S: Firestone Detention

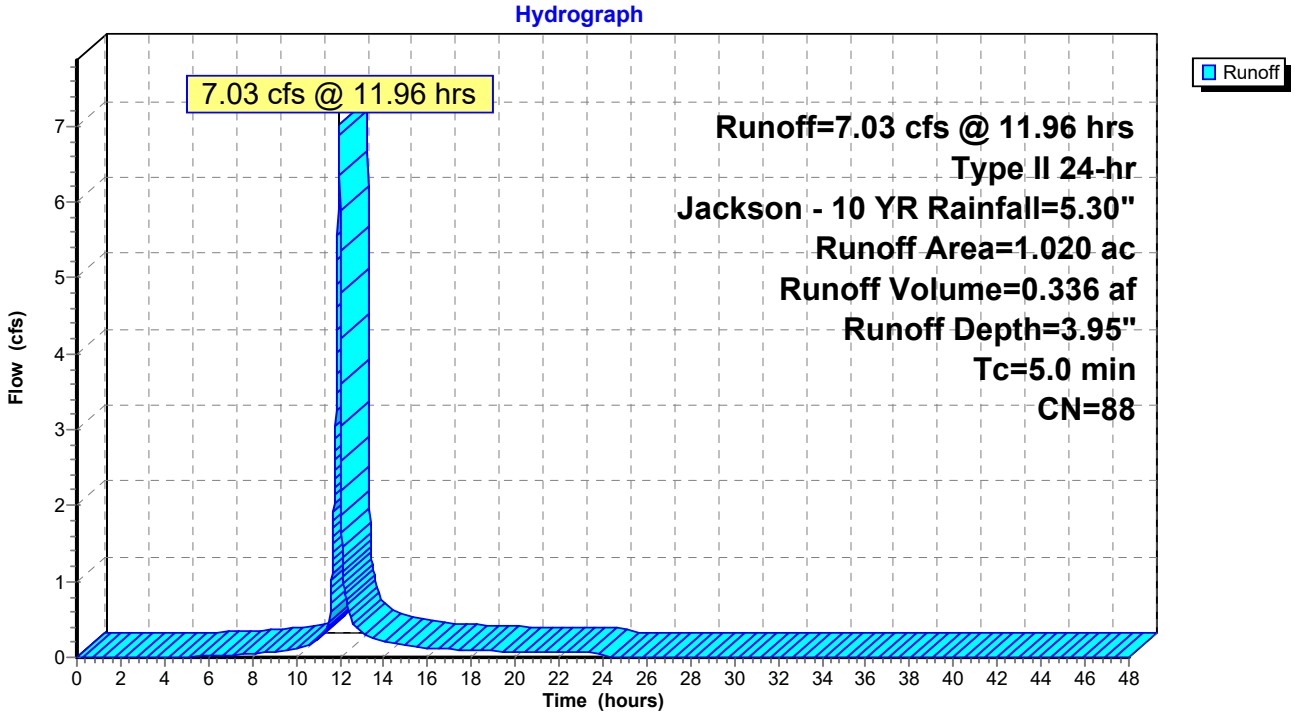
Runoff = 7.03 cfs @ 11.96 hrs, Volume= 0.336 af, Depth= 3.95"
Routed to Pond 6P : Firestone Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	1.020	88	
	1.020		100.00% Pervious Area

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

Subcatchment 5S: Firestone Detention



Hydrograph for Subcatchment 5S: Firestone Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.01
5.50	0.38	0.01	0.01
6.00	0.42	0.02	0.02
6.50	0.47	0.03	0.02
7.00	0.52	0.04	0.03
7.50	0.58	0.06	0.04
8.00	0.64	0.08	0.04
8.50	0.70	0.10	0.06
9.00	0.78	0.14	0.08
9.50	0.86	0.18	0.09
10.00	0.96	0.23	0.12
10.50	1.08	0.30	0.16
11.00	1.25	0.41	0.24
11.50	1.50	0.58	**0.44**
12.00	3.51	2.28	**5.89**
12.50	3.90	2.63	0.53
13.00	4.09	2.81	0.33
13.50	4.23	2.95	0.25
14.00	4.35	3.05	0.20
14.50	4.44	3.14	0.17
15.00	4.52	3.22	0.16
15.50	4.60	3.29	0.14
16.00	4.66	3.35	0.12
16.50	4.72	3.41	0.11
17.00	4.78	3.46	0.11
17.50	4.83	3.51	0.10
18.00	4.88	3.56	0.09
18.50	4.93	3.60	0.09
19.00	4.97	3.64	0.08
19.50	5.01	3.68	0.07
20.00	5.05	3.71	0.07
20.50	5.08	3.74	0.07
21.00	5.11	3.78	0.07
21.50	5.15	3.81	0.06
22.00	5.18	3.84	0.06
22.50	5.21	3.87	0.06
23.00	5.24	3.90	0.06
23.50	5.27	3.93	0.06
24.00	**5.30**	**3.95**	0.06
24.50	5.30	3.95	0.00
25.00	5.30	3.95	0.00
25.50	5.30	3.95	0.00
26.00	5.30	3.95	0.00
26.50	5.30	3.95	0.00
27.00	5.30	3.95	0.00
27.50	5.30	3.95	0.00
28.00	5.30	3.95	0.00
28.50	5.30	3.95	0.00
29.00	5.30	3.95	0.00
29.50	5.30	3.95	0.00
30.00	5.30	3.95	0.00
30.50	5.30	3.95	0.00
31.00	5.30	3.95	0.00
31.50	5.30	3.95	0.00
32.00	5.30	3.95	0.00
32.50	5.30	3.95	0.00
33.00	5.30	3.95	0.00
33.50	5.30	3.95	0.00
34.00	5.30	3.95	0.00
34.50	5.30	3.95	0.00
35.00	5.30	3.95	0.00
35.50	5.30	3.95	0.00
36.00	5.30	3.95	0.00
36.50	5.30	3.95	0.00
37.00	5.30	3.95	0.00
37.50	5.30	3.95	0.00
38.00	5.30	3.95	0.00
38.50	5.30	3.95	0.00
39.00	5.30	3.95	0.00
39.50	5.30	3.95	0.00
40.00	5.30	3.95	0.00
40.50	5.30	3.95	0.00
41.00	5.30	3.95	0.00
41.50	5.30	3.95	0.00
42.00	5.30	3.95	0.00
42.50	5.30	3.95	0.00
43.00	5.30	3.95	0.00
43.50	5.30	3.95	0.00
44.00	5.30	3.95	0.00
44.50	5.30	3.95	0.00
45.00	5.30	3.95	0.00
45.50	5.30	3.95	0.00
46.00	5.30	3.95	0.00
46.50	5.30	3.95	0.00
47.00	5.30	3.95	0.00
47.50	5.30	3.95	0.00
48.00	5.30	3.95	0.00

Summary for Subcatchment 6S: Market Street RW

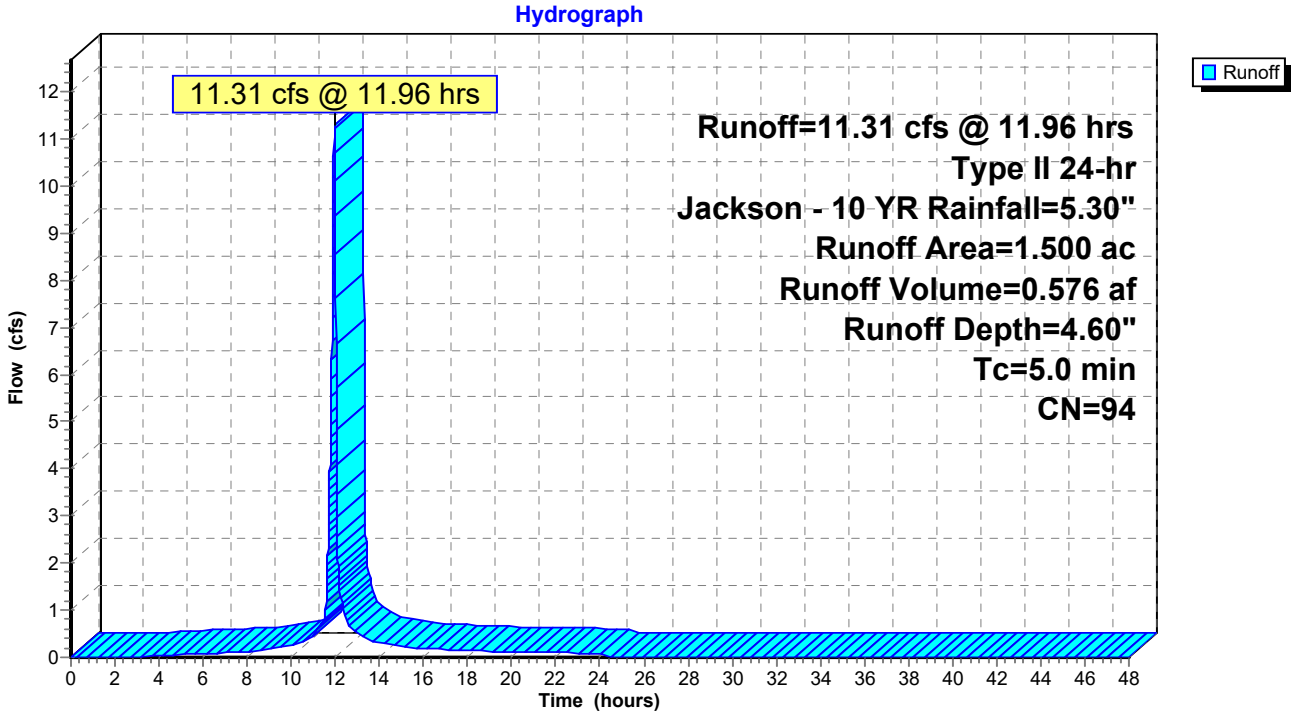
Runoff = 11.31 cfs @ 11.96 hrs, Volume= 0.576 af, Depth= 4.60"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	1.500	94	
	1.500		100.00% Pervious Area

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

Subcatchment 6S: Market Street RW



Hydrograph for Subcatchment 6S: Market Street RW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.01
3.50	0.22	0.01	0.02
4.00	0.25	0.02	0.03
4.50	0.29	0.03	0.04
5.00	0.33	0.05	0.05
5.50	0.38	0.07	0.06
6.00	0.42	0.09	0.08
6.50	0.47	0.12	0.09
7.00	0.52	0.15	0.10
7.50	0.58	0.19	0.11
8.00	0.64	0.23	0.12
8.50	0.70	0.27	0.15
9.00	0.78	0.33	0.19
9.50	0.86	0.39	0.20
10.00	0.96	0.47	0.25
10.50	1.08	0.57	0.34
11.00	1.25	0.71	0.48
11.50	1.50	0.94	**0.81**
12.00	3.51	2.85	**9.38**
12.50	3.90	3.22	0.82
13.00	4.09	3.41	0.51
13.50	4.23	3.55	0.39
14.00	4.35	3.66	0.30
14.50	4.44	3.76	0.27
15.00	4.52	3.84	0.24
15.50	4.60	3.91	0.21
16.00	4.66	3.98	0.19
16.50	4.72	4.04	0.17
17.00	4.78	4.09	0.16
17.50	4.83	4.14	0.15
18.00	4.88	4.19	0.14
18.50	4.93	4.24	0.13
19.00	4.97	4.28	0.12
19.50	5.01	4.32	0.11
20.00	5.05	4.35	0.10
20.50	5.08	4.39	0.10
21.00	5.11	4.42	0.10
21.50	5.15	4.45	0.10
22.00	5.18	4.48	0.10
22.50	5.21	4.51	0.09
23.00	5.24	4.55	0.09
23.50	5.27	4.58	0.09
24.00	**5.30**	**4.60**	0.09
24.50	5.30	4.60	0.00
25.00	5.30	4.60	0.00
25.50	5.30	4.60	0.00
26.00	5.30	4.60	0.00
26.50	5.30	4.60	0.00
27.00	5.30	4.60	0.00
27.50	5.30	4.60	0.00
28.00	5.30	4.60	0.00
28.50	5.30	4.60	0.00
29.00	5.30	4.60	0.00
29.50	5.30	4.60	0.00
30.00	5.30	4.60	0.00
30.50	5.30	4.60	0.00
31.00	5.30	4.60	0.00
31.50	5.30	4.60	0.00
32.00	5.30	4.60	0.00
32.50	5.30	4.60	0.00
33.00	5.30	4.60	0.00
33.50	5.30	4.60	0.00
34.00	5.30	4.60	0.00
34.50	5.30	4.60	0.00
35.00	5.30	4.60	0.00
35.50	5.30	4.60	0.00
36.00	5.30	4.60	0.00
36.50	5.30	4.60	0.00
37.00	5.30	4.60	0.00
37.50	5.30	4.60	0.00
38.00	5.30	4.60	0.00
38.50	5.30	4.60	0.00
39.00	5.30	4.60	0.00
39.50	5.30	4.60	0.00
40.00	5.30	4.60	0.00
40.50	5.30	4.60	0.00
41.00	5.30	4.60	0.00
41.50	5.30	4.60	0.00
42.00	5.30	4.60	0.00
42.50	5.30	4.60	0.00
43.00	5.30	4.60	0.00
43.50	5.30	4.60	0.00
44.00	5.30	4.60	0.00
44.50	5.30	4.60	0.00
45.00	5.30	4.60	0.00
45.50	5.30	4.60	0.00
46.00	5.30	4.60	0.00
46.50	5.30	4.60	0.00
47.00	5.30	4.60	0.00
47.50	5.30	4.60	0.00
48.00	5.30	4.60	0.00

Summary for Subcatchment 7S: Walmart Detention

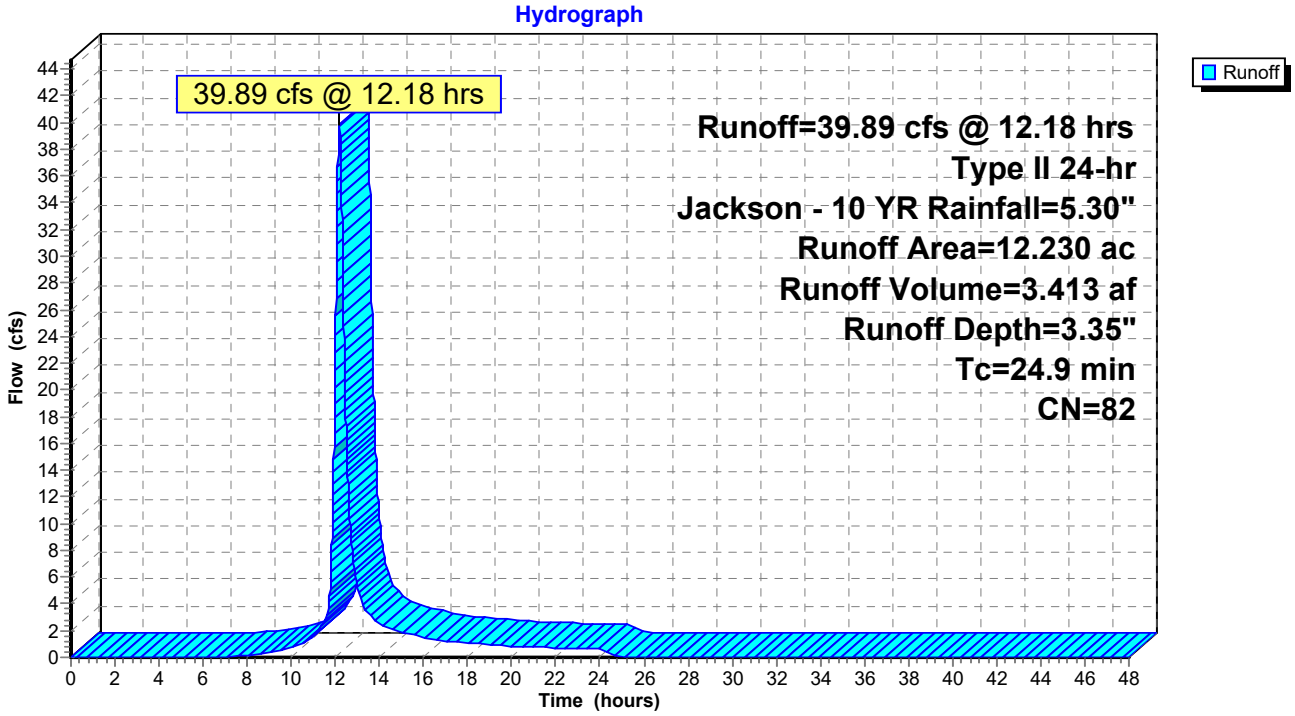
Runoff = 39.89 cfs @ 12.18 hrs, Volume= 3.413 af, Depth= 3.35"
Routed to Pond 8P : Walmart Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	12.230	82	
	12.230		100.00% Pervious Area

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

Subcatchment 7S: Walmart Detention



Hydrograph for Subcatchment 7S: Walmart Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.06	0.00	0.00
1.50	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.50	0.15	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.22	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.29	0.00	0.00
5.00	0.33	0.00	0.00
5.50	0.38	0.00	0.00
6.00	0.42	0.00	0.00
6.50	0.47	0.00	0.01
7.00	0.52	0.00	0.05
7.50	0.58	0.01	0.11
8.00	0.64	0.02	0.18
8.50	0.70	0.03	0.26
9.00	0.78	0.05	0.39
9.50	0.86	0.07	0.54
10.00	0.96	0.10	0.70
10.50	1.08	0.15	1.01
11.00	1.25	0.22	1.56
11.50	1.50	0.35	2.71
12.00	3.51	1.79	**22.82**
12.50	3.90	2.11	**16.21**
13.00	4.09	2.28	5.20
13.50	4.23	2.40	3.30
14.00	4.35	2.50	2.55
14.50	4.44	2.58	2.09
15.00	4.52	2.66	1.87
15.50	4.60	2.72	1.68
16.00	4.66	2.78	1.48
16.50	4.72	2.83	1.32
17.00	4.78	2.88	1.24
17.50	4.83	2.93	1.17
18.00	4.88	2.97	1.10
18.50	4.93	3.01	1.03
19.00	4.97	3.05	0.96
19.50	5.01	3.09	0.89
20.00	5.05	3.12	0.82
20.50	5.08	3.15	0.76
21.00	5.11	3.18	0.74
21.50	5.15	3.21	0.73
22.00	5.18	3.24	0.72
22.50	5.21	3.27	0.70
23.00	5.24	3.29	0.69
23.50	5.27	3.32	0.67
24.00	**5.30**	**3.35**	0.66
24.50	5.30	3.35	0.14
25.00	5.30	3.35	0.01
25.50	5.30	3.35	0.00
26.00	5.30	3.35	0.00
26.50	5.30	3.35	0.00
27.00	5.30	3.35	0.00
27.50	5.30	3.35	0.00
28.00	5.30	3.35	0.00
28.50	5.30	3.35	0.00
29.00	5.30	3.35	0.00
29.50	5.30	3.35	0.00
30.00	5.30	3.35	0.00
30.50	5.30	3.35	0.00
31.00	5.30	3.35	0.00
31.50	5.30	3.35	0.00
32.00	5.30	3.35	0.00
32.50	5.30	3.35	0.00
33.00	5.30	3.35	0.00
33.50	5.30	3.35	0.00
34.00	5.30	3.35	0.00
34.50	5.30	3.35	0.00
35.00	5.30	3.35	0.00
35.50	5.30	3.35	0.00
36.00	5.30	3.35	0.00
36.50	5.30	3.35	0.00
37.00	5.30	3.35	0.00
37.50	5.30	3.35	0.00
38.00	5.30	3.35	0.00
38.50	5.30	3.35	0.00
39.00	5.30	3.35	0.00
39.50	5.30	3.35	0.00
40.00	5.30	3.35	0.00
40.50	5.30	3.35	0.00
41.00	5.30	3.35	0.00
41.50	5.30	3.35	0.00
42.00	5.30	3.35	0.00
42.50	5.30	3.35	0.00
43.00	5.30	3.35	0.00
43.50	5.30	3.35	0.00
44.00	5.30	3.35	0.00
44.50	5.30	3.35	0.00
45.00	5.30	3.35	0.00
45.50	5.30	3.35	0.00
46.00	5.30	3.35	0.00
46.50	5.30	3.35	0.00
47.00	5.30	3.35	0.00
47.50	5.30	3.35	0.00
48.00	5.30	3.35	0.00

Summary for Subcatchment 9S: Commercial Plus RW Bypass

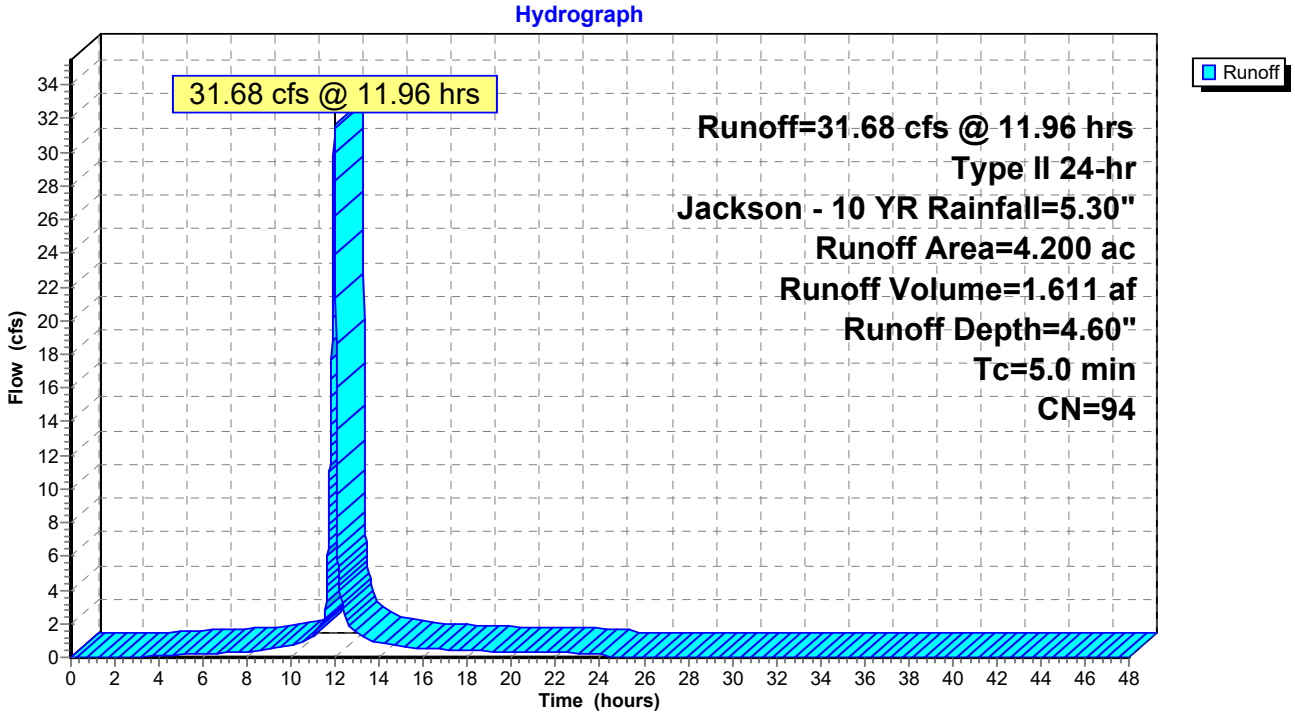
Runoff = 31.68 cfs @ 11.96 hrs, Volume= 1.611 af, Depth= 4.60"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 10 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	4.200	94	
	4.200		100.00% Pervious Area

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

Subcatchment 9S: Commercial Plus RW Bypass



Hydrograph for Subcatchment 9S: Commercial Plus RW Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	5.30	4.60	0.00
0.50	0.03	0.00	0.00	27.00	5.30	4.60	0.00
1.00	0.06	0.00	0.00	27.50	5.30	4.60	0.00
1.50	0.09	0.00	0.00	28.00	5.30	4.60	0.00
2.00	0.12	0.00	0.00	28.50	5.30	4.60	0.00
2.50	0.15	0.00	0.01	29.00	5.30	4.60	0.00
3.00	0.18	0.00	0.04	29.50	5.30	4.60	0.00
3.50	0.22	0.01	0.07	30.00	5.30	4.60	0.00
4.00	0.25	0.02	0.09	30.50	5.30	4.60	0.00
4.50	0.29	0.03	0.12	31.00	5.30	4.60	0.00
5.00	0.33	0.05	0.15	31.50	5.30	4.60	0.00
5.50	0.38	0.07	0.18	32.00	5.30	4.60	0.00
6.00	0.42	0.09	0.21	32.50	5.30	4.60	0.00
6.50	0.47	0.12	0.24	33.00	5.30	4.60	0.00
7.00	0.52	0.15	0.27	33.50	5.30	4.60	0.00
7.50	0.58	0.19	0.30	34.00	5.30	4.60	0.00
8.00	0.64	0.23	0.34	34.50	5.30	4.60	0.00
8.50	0.70	0.27	0.42	35.00	5.30	4.60	0.00
9.00	0.78	0.33	0.53	35.50	5.30	4.60	0.00
9.50	0.86	0.39	0.56	36.00	5.30	4.60	0.00
10.00	0.96	0.47	0.70	36.50	5.30	4.60	0.00
10.50	1.08	0.57	0.94	37.00	5.30	4.60	0.00
11.00	1.25	0.71	1.34	37.50	5.30	4.60	0.00
11.50	1.50	0.94	**2.26**	38.00	5.30	4.60	0.00
12.00	3.51	2.85	**26.26**	38.50	5.30	4.60	0.00
12.50	3.90	3.22	2.30	39.00	5.30	4.60	0.00
13.00	4.09	3.41	1.43	39.50	5.30	4.60	0.00
13.50	4.23	3.55	1.08	40.00	5.30	4.60	0.00
14.00	4.35	3.66	0.85	40.50	5.30	4.60	0.00
14.50	4.44	3.76	0.75	41.00	5.30	4.60	0.00
15.00	4.52	3.84	0.67	41.50	5.30	4.60	0.00
15.50	4.60	3.91	0.60	42.00	5.30	4.60	0.00
16.00	4.66	3.98	0.52	42.50	5.30	4.60	0.00
16.50	4.72	4.04	0.49	43.00	5.30	4.60	0.00
17.00	4.78	4.09	0.46	43.50	5.30	4.60	0.00
17.50	4.83	4.14	0.43	44.00	5.30	4.60	0.00
18.00	4.88	4.19	0.40	44.50	5.30	4.60	0.00
18.50	4.93	4.24	0.38	45.00	5.30	4.60	0.00
19.00	4.97	4.28	0.35	45.50	5.30	4.60	0.00
19.50	5.01	4.32	0.32	46.00	5.30	4.60	0.00
20.00	5.05	4.35	0.29	46.50	5.30	4.60	0.00
20.50	5.08	4.39	0.28	47.00	5.30	4.60	0.00
21.00	5.11	4.42	0.28	47.50	5.30	4.60	0.00
21.50	5.15	4.45	0.27	48.00	5.30	4.60	0.00
22.00	5.18	4.48	0.27				
22.50	5.21	4.51	0.26				
23.00	5.24	4.55	0.26				
23.50	5.27	4.58	0.25				
24.00	**5.30**	**4.60**	0.24				
24.50	5.30	4.60	0.00				
25.00	5.30	4.60	0.00				
25.50	5.30	4.60	0.00				
26.00	5.30	4.60	0.00				

Summary for Pond 1P: Proposed Detention

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 23.760 ac, 9.81% Impervious, Inflow Depth > 3.37" for Jackson - 10 YR event
Inflow = 75.87 cfs @ 11.96 hrs, Volume= 6.666 af
Outflow = 55.99 cfs @ 12.01 hrs, Volume= 6.447 af, Atten= 26%, Lag= 3.3 min
Primary = 55.99 cfs @ 12.01 hrs, Volume= 6.447 af
Routed to Link 1L : Proposed Total
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : Proposed Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,000.90' @ 12.01 hrs Surf.Area= 11,349 sf Storage= 34,128 cf

Plug-Flow detention time= 69.9 min calculated for 6.447 af (97% of inflow)
Center-of-Mass det. time= 35.9 min (917.8 - 881.9)

Volume	Invert	Avail.Storage	Storage Description
#1	996.00'	61,846 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

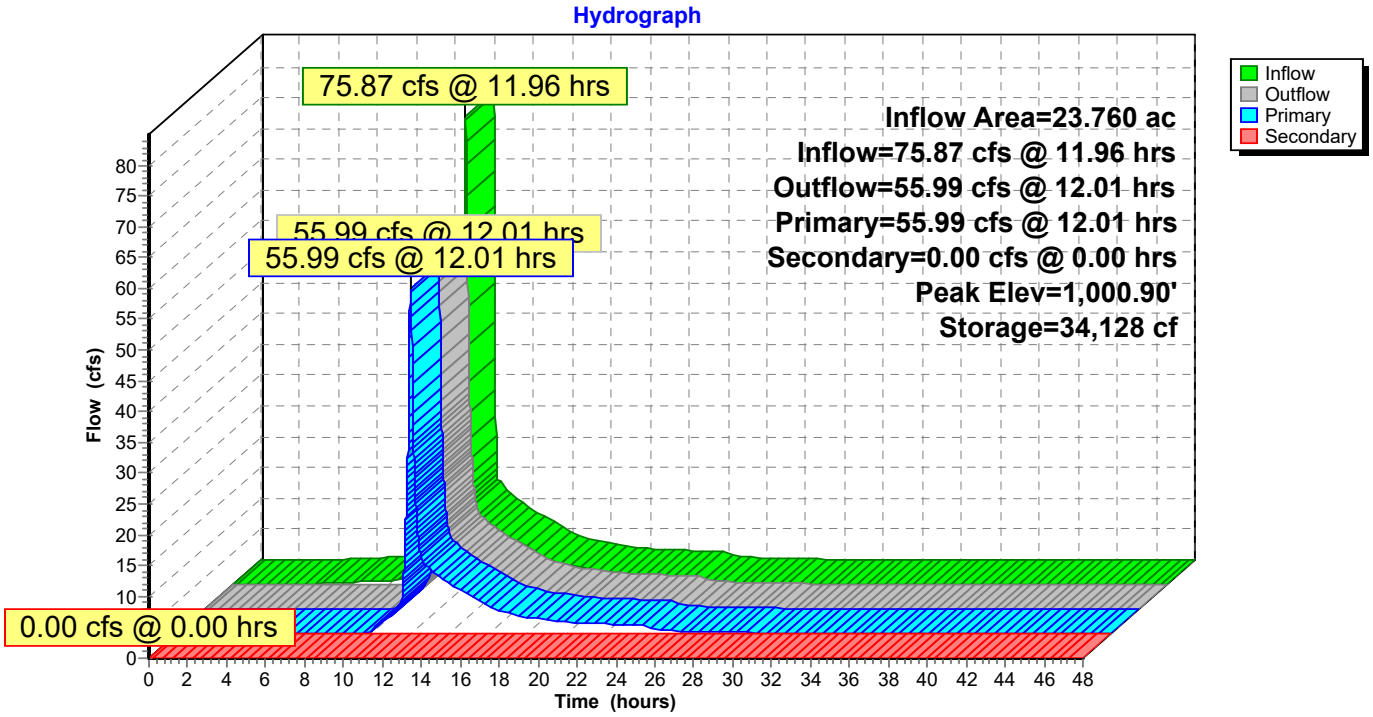
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
996.00	0	0	0
997.00	5,095	2,548	2,548
998.00	6,517	5,806	8,354
999.00	8,135	7,326	15,680
1,000.00	9,810	8,973	24,652
1,001.00	11,528	10,669	35,321
1,002.00	13,346	12,437	47,758
1,003.00	14,829	14,088	61,846

Device	Routing	Invert	Outlet Devices
#0	Secondary	1,003.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	995.30'	**48.0" Round Culvert** L= 34.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 995.30' / 995.10' S= 0.0058 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Device 1	995.50'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	998.50'	**140.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,000.00'	**92.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	1,000.90'	**64.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

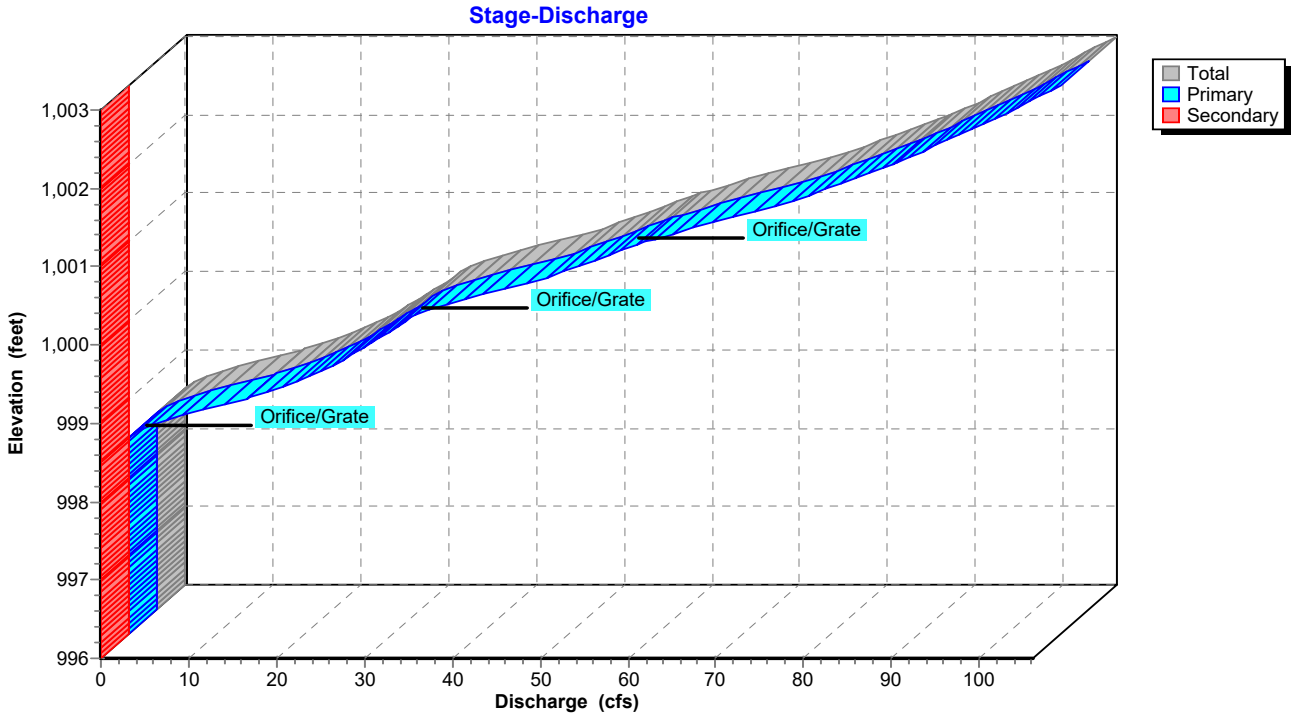
Primary OutFlow Max=55.95 cfs @ 12.01 hrs HW=1,000.89' (Free Discharge)
└─**1=Culvert** (Passes 55.95 cfs of 104.50 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.14 cfs @ 11.12 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 41.10 cfs @ 7.05 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 14.72 cfs @ 3.84 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=996.00' (Free Discharge)

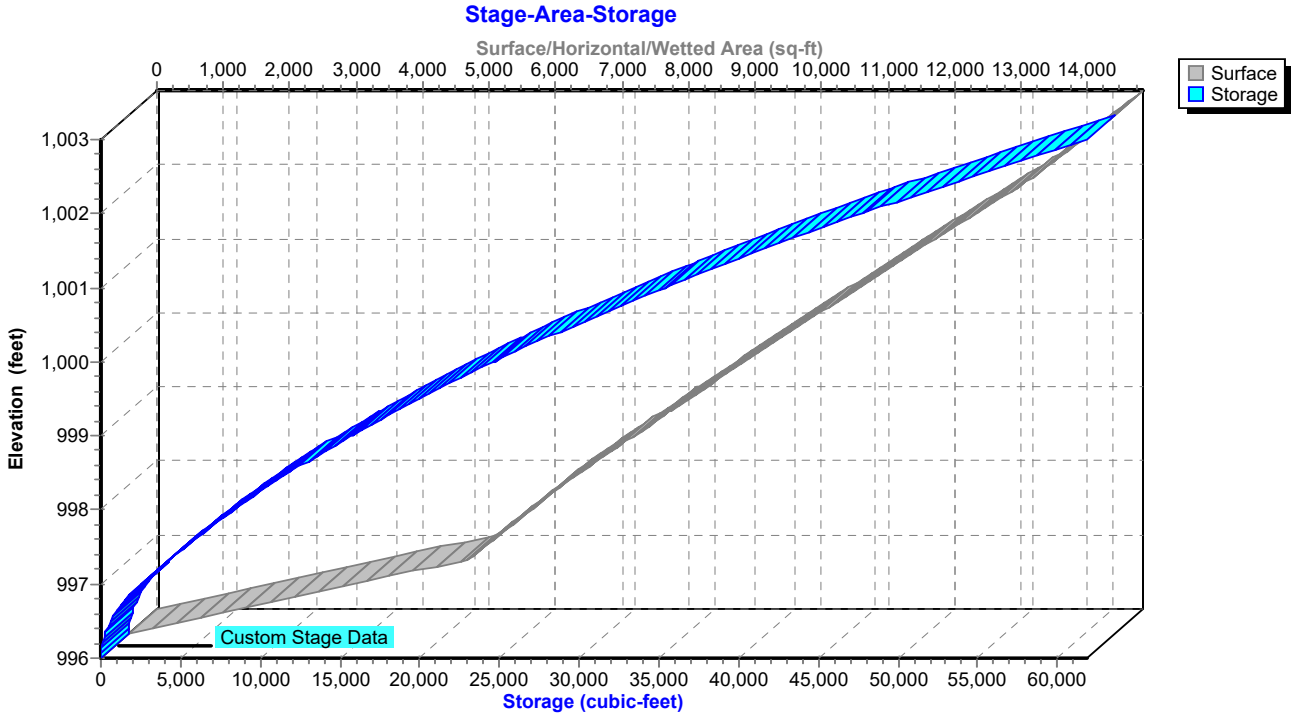
Pond 1P: Proposed Detention



Pond 1P: Proposed Detention



Pond 1P: Proposed Detention



Hydrograph for Pond 1P: Proposed Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	996.00	0.00	0.00	**0.00**
1.00	0.00	0	996.00	0.00	0.00	0.00
2.00	0.00	0	996.00	0.00	0.00	0.00
3.00	0.05	16	996.08	0.04	0.04	0.00
4.00	0.12	176	996.26	0.05	0.05	0.00
5.00	0.23	607	996.49	0.06	0.06	0.00
6.00	0.37	1,471	996.76	0.06	0.06	0.00
7.00	0.52	2,823	997.05	0.07	0.07	0.00
8.00	0.67	4,686	997.40	0.08	0.08	0.00
9.00	1.09	7,487	997.86	0.09	0.09	0.00
10.00	1.51	11,596	998.47	0.10	0.10	0.00
11.00	**2.97**	13,096	998.67	2.79	2.79	0.00
12.00	**63.21**	**33,957**	**1,000.88**	**55.66**	**55.66**	0.00
13.00	10.37	**15,085**	**998.93**	**10.55**	**10.55**	0.00
14.00	8.11	14,568	998.86	8.26	8.26	0.00
15.00	6.34	14,132	998.81	6.46	6.46	0.00
16.00	4.52	13,656	998.74	4.66	4.66	0.00
17.00	3.28	13,272	998.69	3.36	3.36	0.00
18.00	2.64	13,064	998.67	2.68	2.68	0.00
19.00	2.21	12,912	998.65	2.25	2.25	0.00
20.00	1.87	12,779	998.63	1.90	1.90	0.00
21.00	1.67	12,697	998.62	1.69	1.69	0.00
22.00	1.55	12,650	998.61	1.56	1.56	0.00
23.00	1.46	12,615	998.61	1.47	1.47	0.00
24.00	1.39	12,587	998.60	1.39	1.39	0.00
25.00	0.55	12,182	998.55	0.59	0.59	0.00
26.00	0.34	12,054	998.53	0.37	0.37	0.00
27.00	0.24	11,990	998.52	0.26	0.26	0.00
28.00	0.18	11,944	998.52	0.20	0.20	0.00
29.00	0.14	11,887	998.51	0.15	0.15	0.00
30.00	0.12	11,855	998.51	0.13	0.13	0.00
31.00	0.11	11,832	998.50	0.11	0.11	0.00
32.00	0.10	11,813	998.50	0.10	0.10	0.00
33.00	0.09	11,777	998.49	0.10	0.10	0.00
34.00	0.08	11,710	998.49	0.10	0.10	0.00
35.00	0.07	11,618	998.47	0.10	0.10	0.00
36.00	0.07	11,506	998.46	0.10	0.10	0.00
37.00	0.06	11,379	998.44	0.10	0.10	0.00
38.00	0.06	11,239	998.42	0.10	0.10	0.00
39.00	0.06	11,090	998.40	0.10	0.10	0.00
40.00	0.05	10,933	998.38	0.10	0.10	0.00
41.00	0.05	10,770	998.36	0.10	0.10	0.00
42.00	0.05	10,602	998.33	0.10	0.10	0.00
43.00	0.05	10,431	998.31	0.10	0.10	0.00
44.00	0.05	10,257	998.28	0.10	0.10	0.00
45.00	0.05	10,080	998.26	0.10	0.10	0.00
46.00	0.05	9,902	998.23	0.10	0.10	0.00
47.00	0.05	9,722	998.20	0.10	0.10	0.00
48.00	0.05	9,541	998.18	0.10	0.10	0.00

Stage-Discharge for Pond 1P: Proposed Detention

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
996.00	0.00	0.00	**0.00**
996.10	0.04	0.04	0.00
996.20	0.05	0.05	0.00
996.30	0.05	0.05	0.00
996.40	0.05	0.05	0.00
996.50	0.06	0.06	0.00
996.60	0.06	0.06	0.00
996.70	0.06	0.06	0.00
996.80	0.07	0.07	0.00
996.90	0.07	0.07	0.00
997.00	0.07	0.07	0.00
997.10	0.07	0.07	0.00
997.20	0.08	0.08	0.00
997.30	0.08	0.08	0.00
997.40	0.08	0.08	0.00
997.50	0.08	0.08	0.00
997.60	0.08	0.08	0.00
997.70	0.09	0.09	0.00
997.80	0.09	0.09	0.00
997.90	0.09	0.09	0.00
998.00	0.09	0.09	0.00
998.10	0.09	0.09	0.00
998.20	0.10	0.10	0.00
998.30	0.10	0.10	0.00
998.40	0.10	0.10	0.00
998.50	0.10	0.10	0.00
998.60	1.29	1.29	0.00
998.70	3.45	3.45	0.00
998.80	6.26	6.26	0.00
998.90	9.58	9.58	0.00
999.00	13.35	13.35	0.00
999.10	16.33	16.33	0.00
999.20	18.70	18.70	0.00
999.30	20.76	20.76	0.00
999.40	22.62	22.62	0.00
999.50	24.33	24.33	0.00
999.60	25.92	25.92	0.00
999.70	27.42	27.42	0.00
999.80	28.83	28.83	0.00
999.90	30.18	30.18	0.00
1,000.00	31.47	31.47	0.00
1,000.10	33.49	33.49	0.00
1,000.20	36.11	36.11	0.00
1,000.30	39.10	39.10	0.00
1,000.40	42.40	42.40	0.00
1,000.50	45.96	45.96	0.00
1,000.60	48.97	48.97	0.00
1,000.70	51.54	51.54	0.00
1,000.80	53.89	53.89	0.00
1,000.90	56.08	56.08	0.00
1,001.00	58.70	58.70	0.00
1,001.10	61.66	61.66	0.00
1,001.20	64.84	64.84	0.00
1,001.30	68.17	68.17	0.00
1,001.40	71.66	71.66	0.00
1,001.50	74.72	74.72	0.00
1,001.60	77.46	77.46	0.00
1,001.70	80.01	80.01	0.00
1,001.80	82.43	82.43	0.00
1,001.90	84.74	84.74	0.00
1,002.00	86.96	86.96	0.00
1,002.10	89.11	89.11	0.00
1,002.20	91.19	91.19	0.00
1,002.30	93.22	93.22	0.00
1,002.40	95.18	95.18	0.00
1,002.50	97.11	97.11	0.00
1,002.60	98.98	98.98	0.00
1,002.70	100.82	100.82	0.00
1,002.80	102.61	102.61	0.00
1,002.90	104.38	104.38	0.00
1,003.00	**106.10**	**106.10**	0.00

Stage-Area-Storage for Pond 1P: Proposed Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
996.00	0	0
996.10	510	25
996.20	1,019	102
996.30	1,528	229
996.40	2,038	408
996.50	2,548	637
996.60	3,057	917
996.70	3,567	1,248
996.80	4,076	1,630
996.90	4,585	2,063
997.00	5,095	2,548
997.10	5,237	3,064
997.20	5,379	3,595
997.30	5,522	4,140
997.40	5,664	4,699
997.50	5,806	5,273
997.60	5,948	5,860
997.70	6,090	6,462
997.80	6,233	7,079
997.90	6,375	7,709
998.00	6,517	8,354
998.10	6,679	9,013
998.20	6,841	9,689
998.30	7,002	10,381
998.40	7,164	11,090
998.50	7,326	11,814
998.60	7,488	12,555
998.70	7,650	13,312
998.80	7,811	14,085
998.90	7,973	14,874
999.00	8,135	15,680
999.10	8,303	16,501
999.20	8,470	17,340
999.30	8,637	18,195
999.40	8,805	19,067
999.50	8,973	19,956
999.60	9,140	20,862
999.70	9,308	21,784
999.80	9,475	22,723
999.90	9,642	23,679
1,000.00	9,810	24,652
1,000.10	9,982	25,642
1,000.20	10,154	26,648
1,000.30	10,325	27,672
1,000.40	10,497	28,713
1,000.50	10,669	29,772
1,000.60	10,841	30,847
1,000.70	11,013	31,940
1,000.80	11,184	33,050
1,000.90	11,356	34,177
1,001.00	11,528	35,321
1,001.10	11,710	36,483
1,001.20	11,892	37,663
1,001.30	12,073	38,861
1,001.40	12,255	40,078
1,001.50	12,437	41,312
1,001.60	12,619	42,565
1,001.70	12,801	43,836
1,001.80	12,982	45,125
1,001.90	13,164	46,432
1,002.00	13,346	47,758
1,002.10	13,494	49,100
1,002.20	13,643	50,457
1,002.30	13,791	51,829
1,002.40	13,939	53,215
1,002.50	14,088	54,616
1,002.60	14,236	56,033
1,002.70	14,384	57,464
1,002.80	14,532	58,909
1,002.90	14,681	60,370
1,003.00	**14,829**	**61,846**

Summary for Pond 6P: Firestone Detention

Inflow Area = 1.020 ac, 0.00% Impervious, Inflow Depth = 3.95" for Jackson - 10 YR event
Inflow = 7.03 cfs @ 11.96 hrs, Volume= 0.336 af
Outflow = 0.21 cfs @ 13.92 hrs, Volume= 0.214 af, Atten= 97%, Lag= 117.6 min
Primary = 0.21 cfs @ 13.92 hrs, Volume= 0.214 af
Routed to Pond 1P : Proposed Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,013.70' @ 13.92 hrs Surf.Area= 4,137 sf Storage= 9,947 cf

Plug-Flow detention time= 813.7 min calculated for 0.214 af (64% of inflow)
Center-of-Mass det. time= 711.4 min (1,503.2 - 791.7)

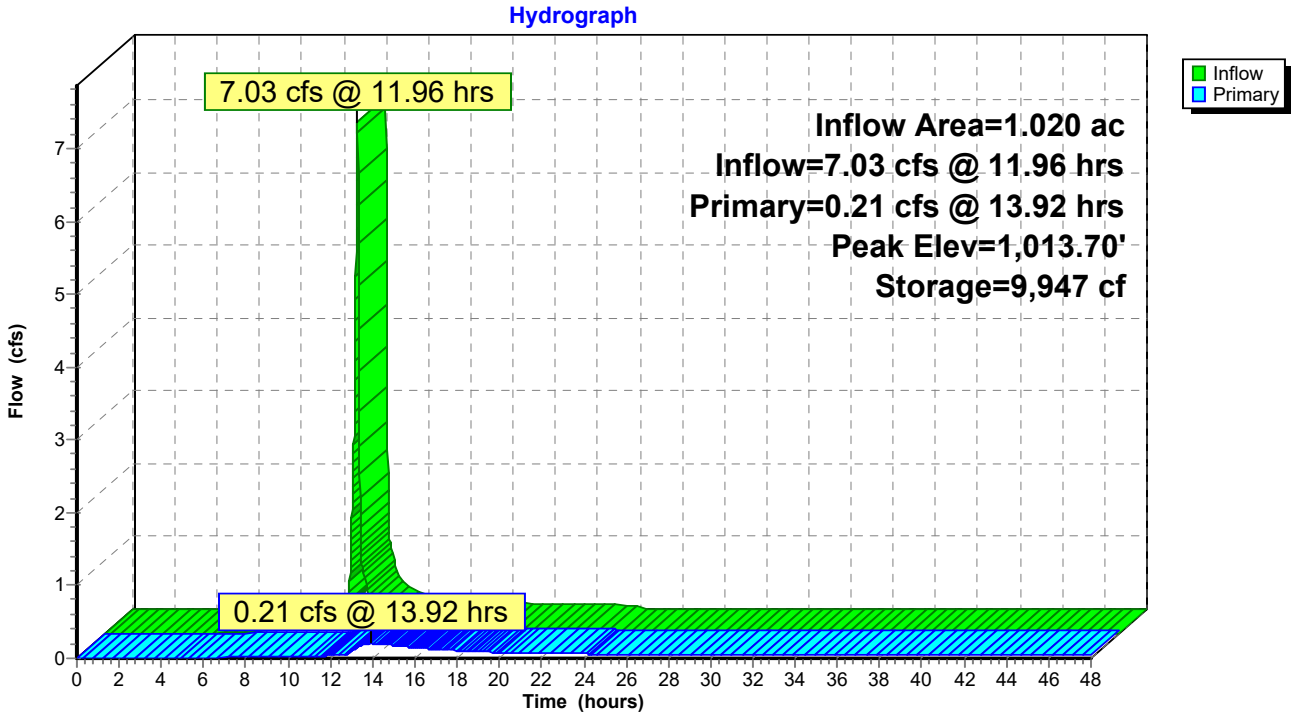
Volume	Invert	Avail.Storage	Storage Description
#1	1,009.54'	22,002 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,009.54	0	0	0
1,010.00	909	209	209
1,011.00	2,085	1,497	1,706
1,012.00	2,776	2,431	4,137
1,013.00	3,504	3,140	7,277
1,014.00	4,409	3,957	11,233
1,015.00	5,525	4,967	16,200
1,016.00	6,079	5,802	22,002

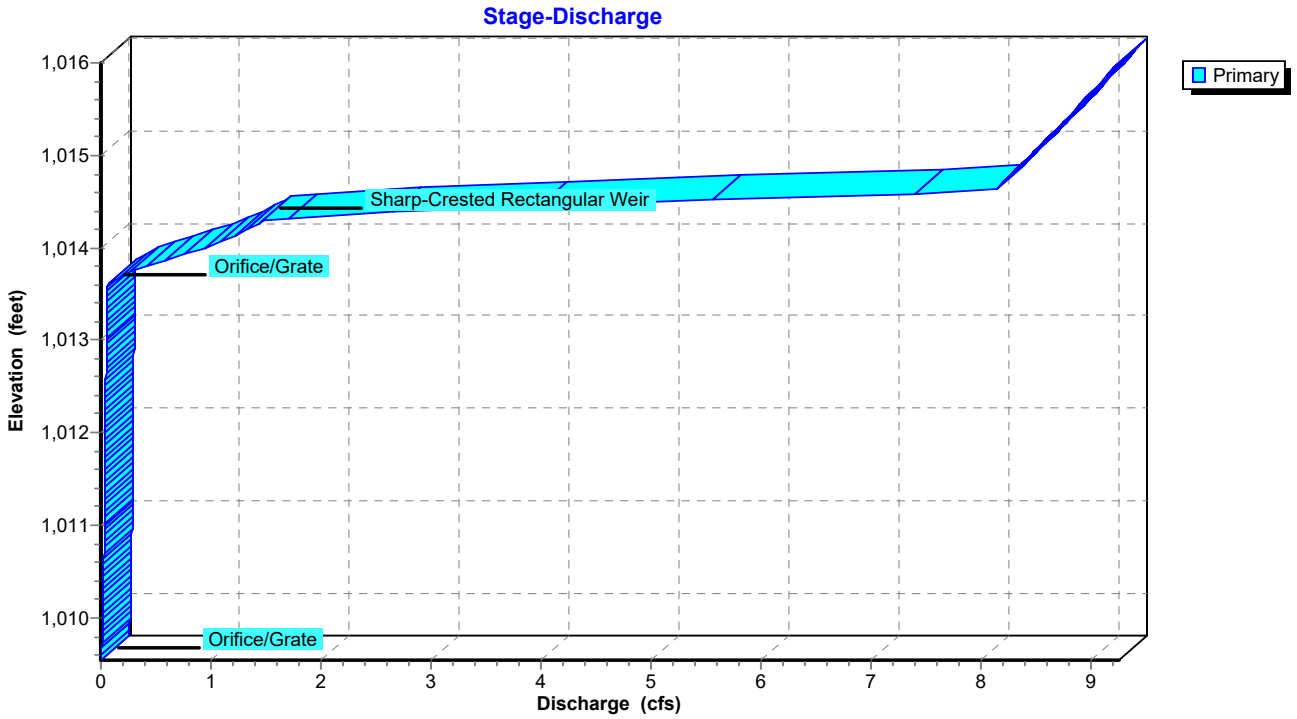
Device	Routing	Invert	Outlet Devices
#1	Primary	1,009.50'	**12.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,009.50' / 1,009.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,009.54'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,013.57'	**12.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,014.29'	**11.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.20 cfs @ 13.92 hrs HW=1,013.70' (Free Discharge)
└**1=Culvert** (Passes 0.20 cfs of 7.27 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.77 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.15 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

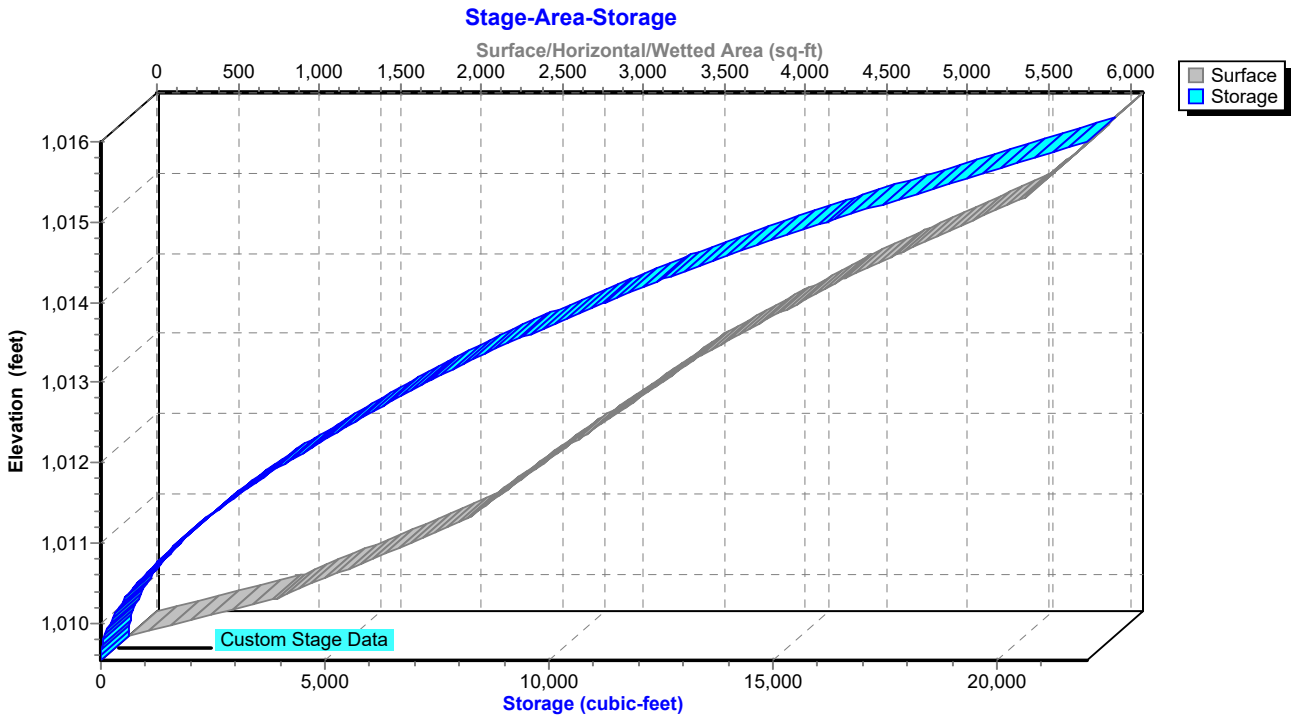
Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Hydrograph for Pond 6P: Firestone Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,009.54	0.00
1.00	0.00	0	1,009.54	0.00
2.00	0.00	0	1,009.54	0.00
3.00	0.00	0	1,009.54	0.00
4.00	0.00	0	1,009.54	0.00
5.00	0.01	4	1,009.60	0.00
6.00	0.02	24	1,009.69	0.01
7.00	0.03	72	1,009.81	0.01
8.00	0.04	155	1,009.94	0.02
9.00	0.08	308	1,010.10	0.02
10.00	0.12	566	1,010.32	0.02
11.00	**0.24**	1,088	1,010.67	0.03
12.00	**5.89**	6,822	1,012.87	0.05
13.00	0.33	**9,664**	**1,013.63**	**0.10**
14.00	0.20	**9,946**	**1,013.70**	**0.20**
15.00	0.16	9,882	1,013.68	0.18
16.00	0.12	9,800	1,013.66	0.15
17.00	0.11	9,724	1,013.64	0.12
18.00	0.09	9,673	1,013.63	0.11
19.00	0.08	9,629	1,013.62	0.09
20.00	0.07	9,587	1,013.61	0.08
21.00	0.07	9,552	1,013.60	0.07
22.00	0.06	9,525	1,013.60	0.07
23.00	0.06	9,503	1,013.59	0.07
24.00	0.06	9,484	1,013.59	0.06
25.00	0.00	9,303	1,013.54	0.05
26.00	0.00	9,116	1,013.49	0.05
27.00	0.00	8,929	1,013.45	0.05
28.00	0.00	8,744	1,013.40	0.05
29.00	0.00	8,560	1,013.35	0.05
30.00	0.00	8,377	1,013.30	0.05
31.00	0.00	8,195	1,013.25	0.05
32.00	0.00	8,015	1,013.21	0.05
33.00	0.00	7,835	1,013.16	0.05
34.00	0.00	7,657	1,013.11	0.05
35.00	0.00	7,480	1,013.06	0.05
36.00	0.00	7,305	1,013.01	0.05
37.00	0.00	7,130	1,012.96	0.05
38.00	0.00	6,957	1,012.91	0.05
39.00	0.00	6,785	1,012.86	0.05
40.00	0.00	6,615	1,012.81	0.05
41.00	0.00	6,446	1,012.76	0.05
42.00	0.00	6,278	1,012.71	0.05
43.00	0.00	6,112	1,012.66	0.05
44.00	0.00	5,947	1,012.60	0.05
45.00	0.00	5,783	1,012.55	0.05
46.00	0.00	5,621	1,012.50	0.04
47.00	0.00	5,460	1,012.45	0.04
48.00	0.00	5,300	1,012.40	0.04

Stage-Discharge for Pond 6P: Firestone Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,009.54	0.00	1,012.19	0.04	1,014.84	8.32
1,009.59	0.00	1,012.24	0.04	1,014.89	8.36
1,009.64	0.01	1,012.29	0.04	1,014.94	8.41
1,009.69	0.01	1,012.34	0.04	1,014.99	8.45
1,009.74	0.01	1,012.39	0.04	1,015.04	8.49
1,009.79	0.01	1,012.44	0.04	1,015.09	8.53
1,009.84	0.01	1,012.49	0.04	1,015.14	8.57
1,009.89	0.01	1,012.54	0.05	1,015.19	8.62
1,009.94	0.02	1,012.59	0.05	1,015.24	8.66
1,009.99	0.02	1,012.64	0.05	1,015.29	8.70
1,010.04	0.02	1,012.69	0.05	1,015.34	8.74
1,010.09	0.02	1,012.74	0.05	1,015.39	8.78
1,010.14	0.02	1,012.79	0.05	1,015.44	8.82
1,010.19	0.02	1,012.84	0.05	1,015.49	8.86
1,010.24	0.02	1,012.89	0.05	1,015.54	8.90
1,010.29	0.02	1,012.94	0.05	1,015.59	8.94
1,010.34	0.02	1,012.99	0.05	1,015.64	8.98
1,010.39	0.02	1,013.04	0.05	1,015.69	9.02
1,010.44	0.02	1,013.09	0.05	1,015.74	9.06
1,010.49	0.03	1,013.14	0.05	1,015.79	9.10
1,010.54	0.03	1,013.19	0.05	1,015.84	9.14
1,010.59	0.03	1,013.24	0.05	1,015.89	9.18
1,010.64	0.03	1,013.29	0.05	1,015.94	9.22
1,010.69	0.03	1,013.34	0.05	1,015.99	**9.26**
1,010.74	0.03	1,013.39	0.05		
1,010.79	0.03	1,013.44	0.05		
1,010.84	0.03	1,013.49	0.05		
1,010.89	0.03	1,013.54	0.05		
1,010.94	0.03	1,013.59	0.06		
1,010.99	0.03	1,013.64	0.11		
1,011.04	0.03	1,013.69	0.19		
1,011.09	0.03	1,013.74	0.28		
1,011.14	0.03	1,013.79	0.39		
1,011.19	0.03	1,013.84	0.50		
1,011.24	0.03	1,013.89	0.64		
1,011.29	0.03	1,013.94	0.78		
1,011.34	0.03	1,013.99	0.93		
1,011.39	0.04	1,014.04	1.05		
1,011.44	0.04	1,014.09	1.15		
1,011.49	0.04	1,014.14	1.24		
1,011.54	0.04	1,014.19	1.33		
1,011.59	0.04	1,014.24	1.41		
1,011.64	0.04	1,014.29	1.48		
1,011.69	0.04	1,014.34	1.95		
1,011.74	0.04	1,014.39	2.75		
1,011.79	0.04	1,014.44	3.77		
1,011.84	0.04	1,014.49	4.95		
1,011.89	0.04	1,014.54	6.28		
1,011.94	0.04	1,014.59	7.74		
1,011.99	0.04	1,014.64	8.15		
1,012.04	0.04	1,014.69	8.19		
1,012.09	0.04	1,014.74	8.23		
1,012.14	0.04	1,014.79	8.28		

Stage-Area-Storage for Pond 6P: Firestone Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,009.54	0	0
1,009.64	198	10
1,009.74	395	40
1,009.84	593	89
1,009.94	790	158
1,010.04	956	246
1,010.14	1,074	348
1,010.24	1,191	461
1,010.34	1,309	586
1,010.44	1,426	723
1,010.54	1,544	871
1,010.64	1,662	1,032
1,010.74	1,779	1,204
1,010.84	1,897	1,388
1,010.94	2,014	1,583
1,011.04	2,113	1,790
1,011.14	2,182	2,005
1,011.24	2,251	2,226
1,011.34	2,320	2,455
1,011.44	2,389	2,690
1,011.54	2,458	2,933
1,011.64	2,527	3,182
1,011.74	2,596	3,438
1,011.84	2,665	3,701
1,011.94	2,735	3,971
1,012.04	2,805	4,248
1,012.14	2,878	4,532
1,012.24	2,951	4,824
1,012.34	3,024	5,122
1,012.44	3,096	5,428
1,012.54	3,169	5,742
1,012.64	3,242	6,062
1,012.74	3,315	6,390
1,012.84	3,388	6,725
1,012.94	3,460	7,068
1,013.04	3,540	7,417
1,013.14	3,631	7,776
1,013.24	3,721	8,144
1,013.34	3,812	8,520
1,013.44	3,902	8,906
1,013.54	3,993	9,301
1,013.64	4,083	9,704
1,013.74	4,174	10,117
1,013.84	4,264	10,539
1,013.94	4,355	10,970
1,014.04	4,454	11,410
1,014.14	4,565	11,861
1,014.24	4,677	12,323
1,014.34	4,788	12,797
1,014.44	4,900	13,281
1,014.54	5,012	13,777
1,014.64	5,123	14,283
1,014.74	5,235	14,801
1,014.84	5,346	15,330
1,014.94	5,458	15,871
1,015.04	5,547	16,422
1,015.14	5,603	16,979
1,015.24	5,658	17,542
1,015.34	5,713	18,111
1,015.44	5,769	18,685
1,015.54	5,824	19,264
1,015.64	5,880	19,850
1,015.74	5,935	20,440
1,015.84	5,990	21,037
1,015.94	**6,046**	**21,638**

Summary for Pond 8P: Walmart Detention

Inflow Area = 12.230 ac, 0.00% Impervious, Inflow Depth = 3.35" for Jackson - 10 YR event
Inflow = 39.89 cfs @ 12.18 hrs, Volume= 3.413 af
Outflow = 6.83 cfs @ 12.83 hrs, Volume= 2.698 af, Atten= 83%, Lag= 39.3 min
Primary = 6.83 cfs @ 12.83 hrs, Volume= 2.698 af
Routed to Pond 1P : Proposed Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,012.92' @ 12.83 hrs Surf.Area= 20,624 sf Storage= 77,205 cf

Plug-Flow detention time= 232.5 min calculated for 2.697 af (79% of inflow)
Center-of-Mass det. time= 148.6 min (977.0 - 828.4)

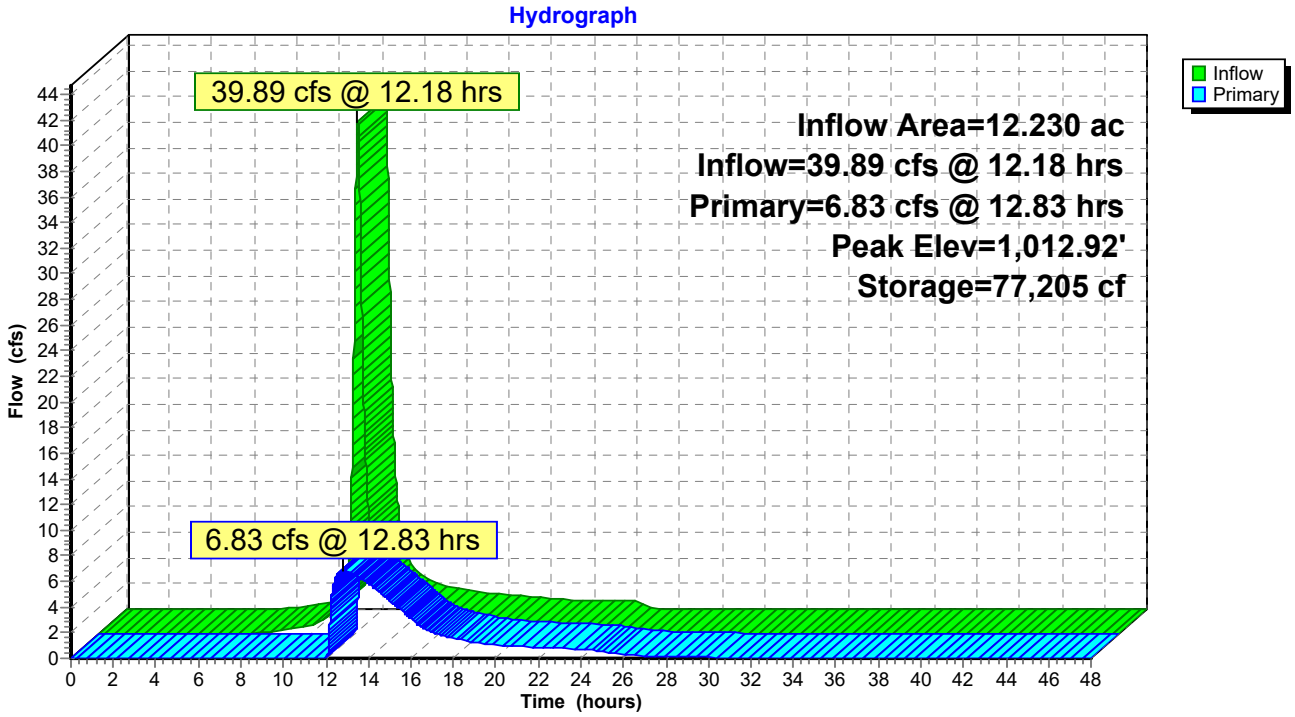
Volume	Invert	Avail.Storage	Storage Description
#1	1,005.00'	150,049 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,005.00	0	0	0
1,006.00	627	314	314
1,007.00	1,983	1,305	1,619
1,008.00	5,044	3,514	5,132
1,009.00	10,030	7,537	12,669
1,010.00	14,662	12,346	25,015
1,010.40	15,976	6,128	31,143
1,011.00	17,049	9,908	41,050
1,011.46	17,886	8,035	49,085
1,012.00	18,879	9,927	59,012
1,013.00	20,773	19,826	78,838
1,014.00	22,710	21,742	100,579
1,015.00	24,723	23,717	124,296
1,016.00	26,783	25,753	150,049

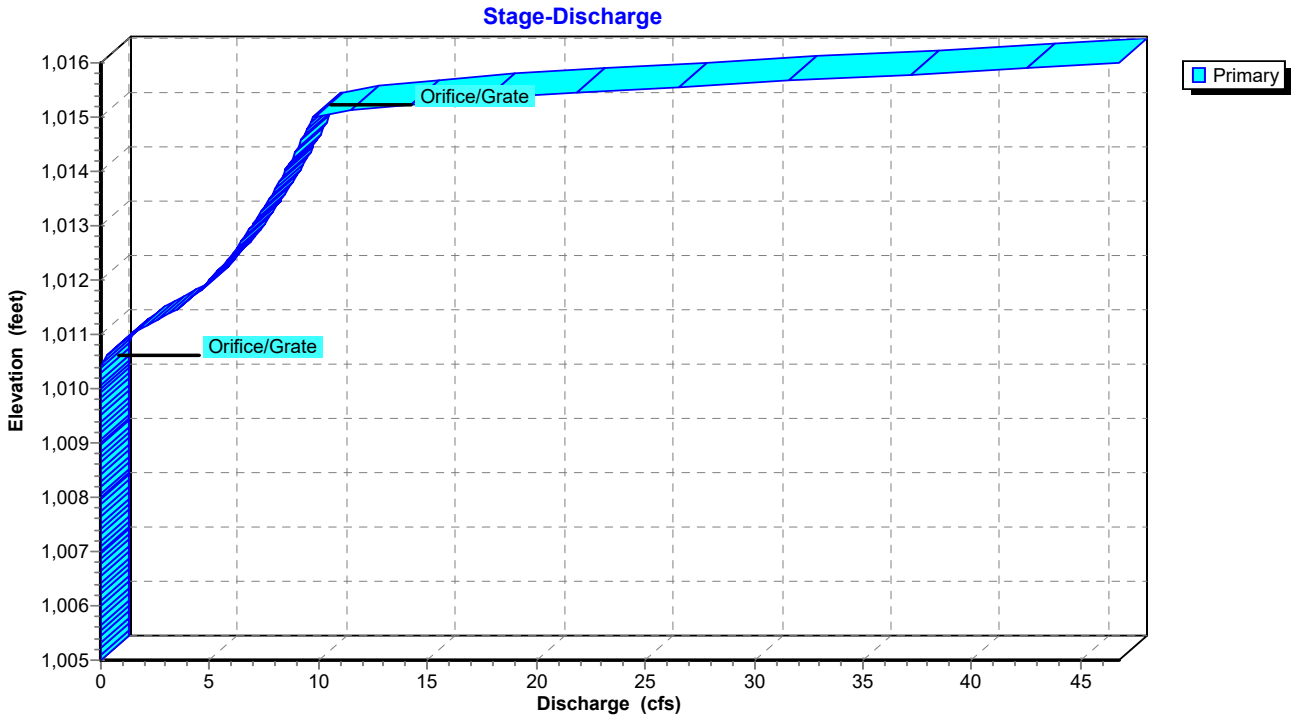
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.83'	**30.0" Round Culvert** L= 87.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,004.83' / 1,004.48' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	1,010.40'	**12.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,015.00'	**144.0" W x 10.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.83 cfs @ 12.83 hrs HW=1,012.92' (Free Discharge)
└**1=Culvert** (Passes 6.83 cfs of 61.82 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 6.83 cfs @ 6.83 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

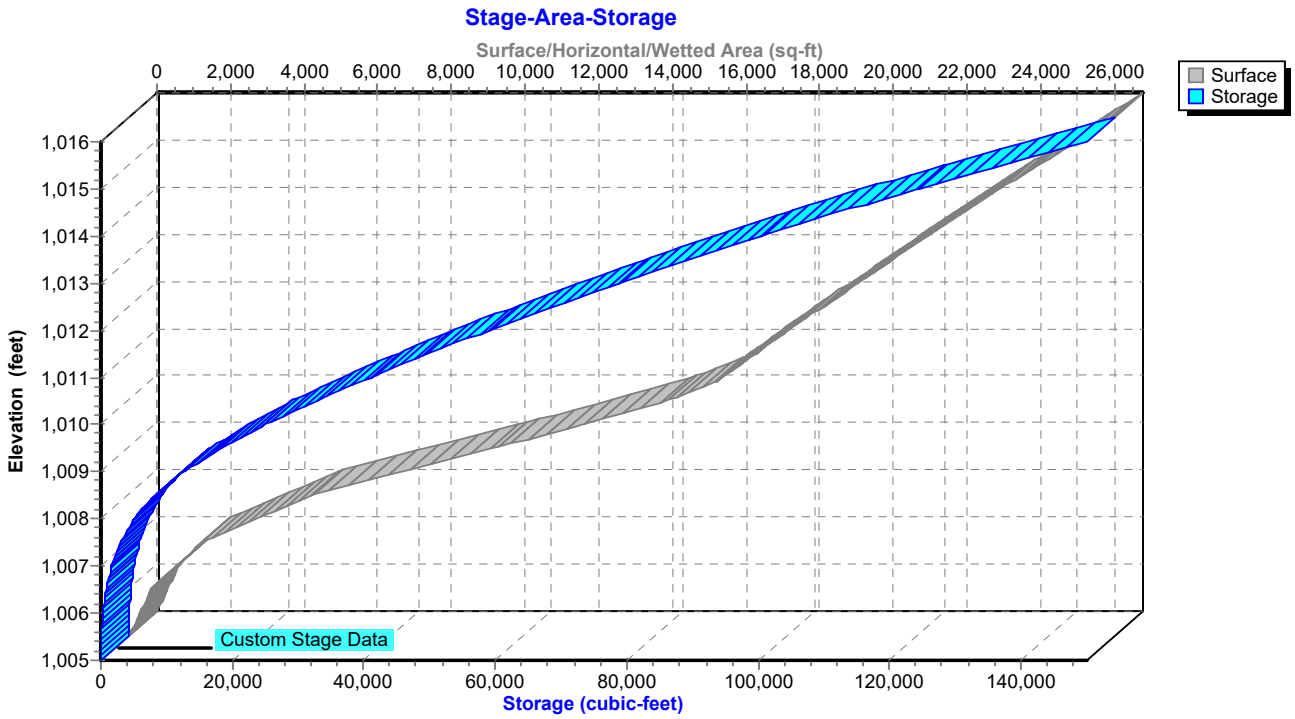
Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Hydrograph for Pond 8P: Walmart Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,005.00	0.00
1.00	0.00	0	1,005.00	0.00
2.00	0.00	0	1,005.00	0.00
3.00	0.00	0	1,005.00	0.00
4.00	0.00	0	1,005.00	0.00
5.00	0.00	0	1,005.00	0.00
6.00	0.00	0	1,005.00	0.00
7.00	0.05	48	1,005.39	0.00
8.00	0.18	450	1,006.18	0.00
9.00	0.39	1,413	1,006.89	0.00
10.00	0.70	3,356	1,007.60	0.00
11.00	1.56	7,137	1,008.34	0.00
12.00	**22.82**	**24,319**	**1,009.95**	**0.00**
13.00	**5.20**	**76,675**	**1,012.90**	**6.78**
14.00	2.55	66,291	1,012.38	5.83
15.00	1.87	55,316	1,011.80	4.51
16.00	1.48	47,606	1,011.38	3.10
17.00	1.24	43,424	1,011.14	2.04
18.00	1.10	41,291	1,011.01	1.55
19.00	0.96	39,982	1,010.94	1.26
20.00	0.82	38,995	1,010.88	1.07
21.00	0.74	38,216	1,010.83	0.91
22.00	0.72	37,729	1,010.80	0.83
23.00	0.69	37,397	1,010.78	0.77
24.00	0.66	37,146	1,010.77	0.72
25.00	0.01	35,774	1,010.69	0.50
26.00	0.00	34,399	1,010.60	0.29
27.00	0.00	33,537	1,010.55	0.19
28.00	0.00	32,969	1,010.51	0.13
29.00	0.00	32,589	1,010.49	0.09
30.00	0.00	32,294	1,010.47	0.07
31.00	0.00	32,060	1,010.46	0.06
32.00	0.00	31,873	1,010.45	0.05
33.00	0.00	31,725	1,010.44	0.04
34.00	0.00	31,606	1,010.43	0.03
35.00	0.00	31,512	1,010.42	0.02
36.00	0.00	31,437	1,010.42	0.02
37.00	0.00	31,377	1,010.41	0.01
38.00	0.00	31,329	1,010.41	0.01
39.00	0.00	31,291	1,010.41	0.01
40.00	0.00	31,261	1,010.41	0.01
41.00	0.00	31,237	1,010.41	0.01
42.00	0.00	31,218	1,010.40	0.00
43.00	0.00	31,202	1,010.40	0.00
44.00	0.00	31,190	1,010.40	0.00
45.00	0.00	31,181	1,010.40	0.00
46.00	0.00	31,173	1,010.40	0.00
47.00	0.00	31,167	1,010.40	0.00
48.00	0.00	31,162	1,010.40	0.00

Stage-Discharge for Pond 8P: Walmart Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,005.00	0.00	1,010.30	0.00	1,015.60	28.34
1,005.10	0.00	1,010.40	0.00	1,015.70	33.10
1,005.20	0.00	1,010.50	0.10	1,015.80	38.22
1,005.30	0.00	1,010.60	0.29	1,015.90	42.99
1,005.40	0.00	1,010.70	0.53	1,016.00	**46.77**
1,005.50	0.00	1,010.80	0.81		
1,005.60	0.00	1,010.90	1.13		
1,005.70	0.00	1,011.00	1.49		
1,005.80	0.00	1,011.10	1.88		
1,005.90	0.00	1,011.20	2.30		
1,006.00	0.00	1,011.30	2.74		
1,006.10	0.00	1,011.40	3.21		
1,006.20	0.00	1,011.50	3.60		
1,006.30	0.00	1,011.60	3.93		
1,006.40	0.00	1,011.70	4.23		
1,006.50	0.00	1,011.80	4.51		
1,006.60	0.00	1,011.90	4.76		
1,006.70	0.00	1,012.00	5.00		
1,006.80	0.00	1,012.10	5.24		
1,006.90	0.00	1,012.20	5.46		
1,007.00	0.00	1,012.30	5.67		
1,007.10	0.00	1,012.40	5.87		
1,007.20	0.00	1,012.50	6.07		
1,007.30	0.00	1,012.60	6.25		
1,007.40	0.00	1,012.70	6.44		
1,007.50	0.00	1,012.80	6.62		
1,007.60	0.00	1,012.90	6.79		
1,007.70	0.00	1,013.00	6.96		
1,007.80	0.00	1,013.10	7.13		
1,007.90	0.00	1,013.20	7.29		
1,008.00	0.00	1,013.30	7.45		
1,008.10	0.00	1,013.40	7.60		
1,008.20	0.00	1,013.50	7.75		
1,008.30	0.00	1,013.60	7.90		
1,008.40	0.00	1,013.70	8.05		
1,008.50	0.00	1,013.80	8.19		
1,008.60	0.00	1,013.90	8.33		
1,008.70	0.00	1,014.00	8.47		
1,008.80	0.00	1,014.10	8.60		
1,008.90	0.00	1,014.20	8.74		
1,009.00	0.00	1,014.30	8.87		
1,009.10	0.00	1,014.40	9.00		
1,009.20	0.00	1,014.50	9.13		
1,009.30	0.00	1,014.60	9.25		
1,009.40	0.00	1,014.70	9.38		
1,009.50	0.00	1,014.80	9.50		
1,009.60	0.00	1,014.90	9.62		
1,009.70	0.00	1,015.00	9.74		
1,009.80	0.00	1,015.10	11.08		
1,009.90	0.00	1,015.20	13.42		
1,010.00	0.00	1,015.30	16.42		
1,010.10	0.00	1,015.40	19.95		
1,010.20	0.00	1,015.50	23.94		

Stage-Area-Storage for Pond 8P: Walmart Detention

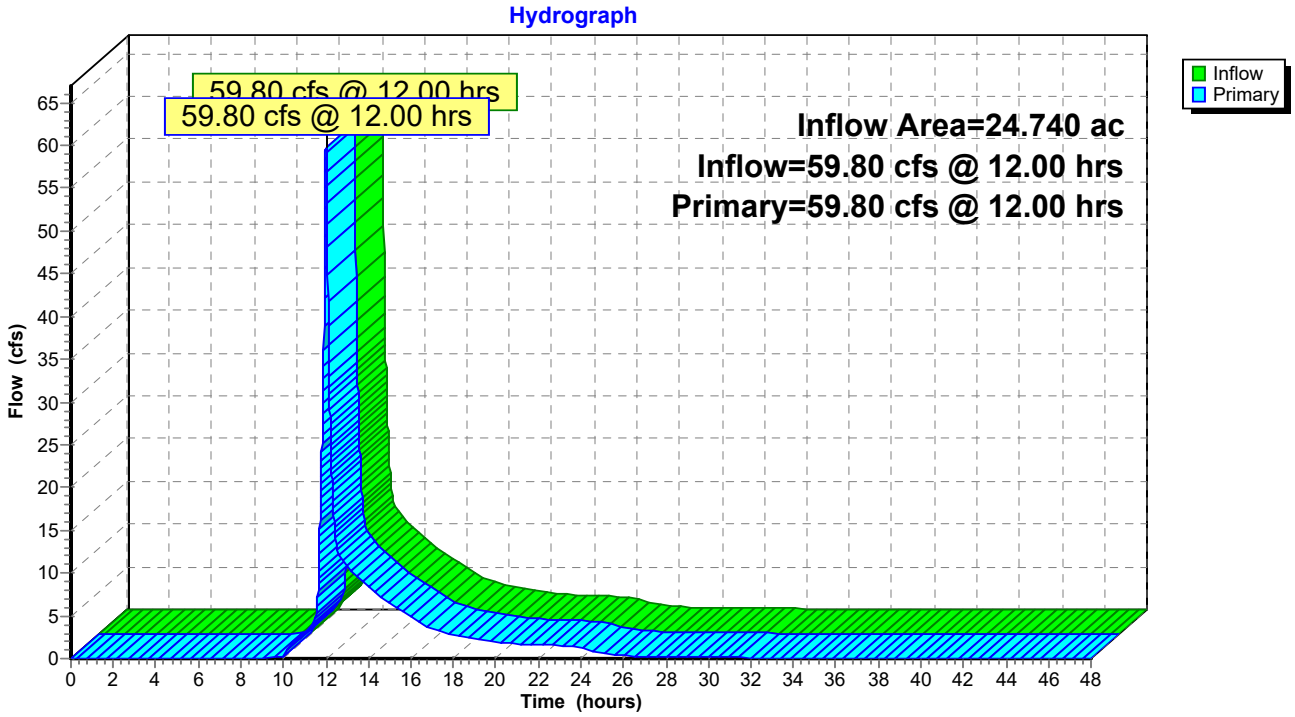
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,005.00	0	0
1,005.20	125	13
1,005.40	251	50
1,005.60	376	113
1,005.80	502	201
1,006.00	627	314
1,006.20	898	466
1,006.40	1,169	673
1,006.60	1,441	934
1,006.80	1,712	1,249
1,007.00	1,983	1,619
1,007.20	2,595	2,076
1,007.40	3,207	2,657
1,007.60	3,820	3,359
1,007.80	4,432	4,184
1,008.00	5,044	5,132
1,008.20	6,041	6,241
1,008.40	7,038	7,548
1,008.60	8,036	9,056
1,008.80	9,033	10,763
1,009.00	10,030	12,669
1,009.20	10,956	14,768
1,009.40	11,883	17,052
1,009.60	12,809	19,521
1,009.80	13,736	22,175
1,010.00	14,662	25,015
1,010.20	15,319	28,013
1,010.40	15,976	31,143
1,010.60	16,334	34,374
1,010.80	16,691	37,676
1,011.00	17,049	41,050
1,011.20	17,413	44,496
1,011.40	17,777	48,015
1,011.60	18,143	51,607
1,011.80	18,511	55,273
1,012.00	18,879	59,012
1,012.20	19,258	62,825
1,012.40	19,637	66,715
1,012.60	20,015	70,680
1,012.80	20,394	74,721
1,013.00	20,773	78,838
1,013.20	21,160	83,031
1,013.40	21,548	87,302
1,013.60	21,935	91,650
1,013.80	22,323	96,076
1,014.00	22,710	100,579
1,014.20	23,113	105,161
1,014.40	23,515	109,824
1,014.60	23,918	114,568
1,014.80	24,320	119,391
1,015.00	24,723	124,296
1,015.20	25,135	129,282
1,015.40	25,547	134,350
1,015.60	25,959	139,500
1,015.80	26,371	144,733
1,016.00	**26,783**	**150,049**

Summary for Link 1L: Proposed Total

Inflow Area = 24.740 ac, 9.42% Impervious, Inflow Depth > 3.23" for Jackson - 10 YR event
Inflow = 59.80 cfs @ 12.00 hrs, Volume= 6.660 af
Primary = 59.80 cfs @ 12.00 hrs, Volume= 6.660 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Proposed Total



Hydrograph for Link 1L: Proposed Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
0.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00
2.00	0.00	0.00	0.00
2.50	0.01	0.00	0.01
3.00	0.04	0.00	0.04
3.50	0.05	0.00	0.05
4.00	0.05	0.00	0.05
4.50	0.05	0.00	0.05
5.00	0.06	0.00	0.06
5.50	0.06	0.00	0.06
6.00	0.06	0.00	0.06
6.50	0.07	0.00	0.07
7.00	0.07	0.00	0.07
7.50	0.08	0.00	0.08
8.00	0.08	0.00	0.08
8.50	0.08	0.00	0.08
9.00	0.10	0.00	0.10
9.50	0.11	0.00	0.11
10.00	0.13	0.00	0.13
10.50	1.94	0.00	1.94
11.00	2.87	0.00	2.87
11.50	4.93	0.00	4.93
12.00	**59.76**	0.00	**59.76**
12.50	13.49	0.00	13.49
13.00	10.80	0.00	10.80
13.50	9.55	0.00	9.55
14.00	8.41	0.00	8.41
14.50	7.47	0.00	7.47
15.00	6.58	0.00	6.58
15.50	5.69	0.00	5.69
16.00	4.76	0.00	4.76
16.50	3.98	0.00	3.98
17.00	3.44	0.00	3.44
17.50	3.06	0.00	3.06
18.00	2.76	0.00	2.76
18.50	2.52	0.00	2.52
19.00	2.32	0.00	2.32
19.50	2.13	0.00	2.13
20.00	1.96	0.00	1.96
20.50	1.83	0.00	1.83
21.00	1.74	0.00	1.74
21.50	1.67	0.00	1.67
22.00	1.61	0.00	1.61
22.50	1.56	0.00	1.56
23.00	1.52	0.00	1.52
23.50	1.48	0.00	1.48
24.00	1.44	0.00	1.44
24.50	0.77	0.00	0.77
25.00	0.59	0.00	0.59
25.50	0.47	0.00	0.47
26.00	0.37	0.00	0.37
26.50	0.31	0.00	0.31
27.00	0.26	0.00	0.26
27.50	0.22	0.00	0.22
28.00	0.20	0.00	0.20
28.50	0.17	0.00	0.17
29.00	0.15	0.00	0.15
29.50	0.14	0.00	0.14
30.00	0.13	0.00	0.13
30.50	0.12	0.00	0.12
31.00	0.11	0.00	0.11
31.50	0.11	0.00	0.11
32.00	0.10	0.00	0.10
32.50	0.10	0.00	0.10
33.00	0.10	0.00	0.10
33.50	0.10	0.00	0.10
34.00	0.10	0.00	0.10
34.50	0.10	0.00	0.10
35.00	0.10	0.00	0.10
35.50	0.10	0.00	0.10
36.00	0.10	0.00	0.10
36.50	0.10	0.00	0.10
37.00	0.10	0.00	0.10
37.50	0.10	0.00	0.10
38.00	0.10	0.00	0.10
38.50	0.10	0.00	0.10
39.00	0.10	0.00	0.10
39.50	0.10	0.00	0.10
40.00	0.10	0.00	0.10
40.50	0.10	0.00	0.10
41.00	0.10	0.00	0.10
41.50	0.10	0.00	0.10
42.00	0.10	0.00	0.10
42.50	0.10	0.00	0.10
43.00	0.10	0.00	0.10
43.50	0.10	0.00	0.10
44.00	0.10	0.00	0.10
44.50	0.10	0.00	0.10
45.00	0.10	0.00	0.10
45.50	0.10	0.00	0.10
46.00	0.10	0.00	0.10
46.50	0.10	0.00	0.10
47.00	0.10	0.00	0.10
47.50	0.10	0.00	0.10
48.00	0.10	0.00	0.10

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Proposed Onsite Runoff Area=4.050 ac 57.53% Impervious Runoff Depth=6.28"
Tc=5.0 min CN=88 Runoff=42.91 cfs 2.118 af

Subcatchment 2S: Walmart Bypass Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=5.81"
Tc=5.0 min CN=84 Runoff=5.44 cfs 0.261 af

Subcatchment 3S: Proposed Onsite Bypass Runoff Area=0.980 ac 0.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=74 Runoff=8.31 cfs 0.380 af

Subcatchment 4S: Firestone Bypass Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=6.28"
Tc=5.0 min CN=88 Runoff=2.33 cfs 0.115 af

Subcatchment 5S: Firestone Detention Runoff Area=1.020 ac 0.00% Impervious Runoff Depth=6.28"
Tc=5.0 min CN=88 Runoff=10.81 cfs 0.533 af

Subcatchment 6S: Market Street RW Runoff Area=1.500 ac 0.00% Impervious Runoff Depth=6.98"
Tc=5.0 min CN=94 Runoff=16.73 cfs 0.873 af

Subcatchment 7S: Walmart Detention Runoff Area=12.230 ac 0.00% Impervious Runoff Depth=5.58"
Tc=24.9 min CN=82 Runoff=65.61 cfs 5.682 af

Subcatchment 9S: Commercial Plus RW Runoff Area=4.200 ac 0.00% Impervious Runoff Depth=6.98"
Tc=5.0 min CN=94 Runoff=46.85 cfs 2.444 af

Pond 1P: Proposed Detention Peak Elev=1,001.95' Storage=47,065 cf Inflow=116.64 cfs 11.188 af
Primary=85.81 cfs 10.967 af Secondary=0.00 cfs 0.000 af Outflow=85.81 cfs 10.967 af

Pond 6P: Firestone Detention Peak Elev=1,014.33' Storage=12,727 cf Inflow=10.81 cfs 0.533 af
Outflow=1.79 cfs 0.410 af

Pond 8P: Walmart Detention Peak Elev=1,015.23' Storage=129,948 cf Inflow=65.61 cfs 5.682 af
Outflow=14.17 cfs 4.967 af

Link 1L: Proposed Total Inflow=92.26 cfs 11.347 af
Primary=92.26 cfs 11.347 af

Total Runoff Area = 24.740 ac Runoff Volume = 12.408 af Average Runoff Depth = 6.02"
90.58% Pervious = 22.410 ac 9.42% Impervious = 2.330 ac

Summary for Subcatchment 1S: Proposed Onsite Detention

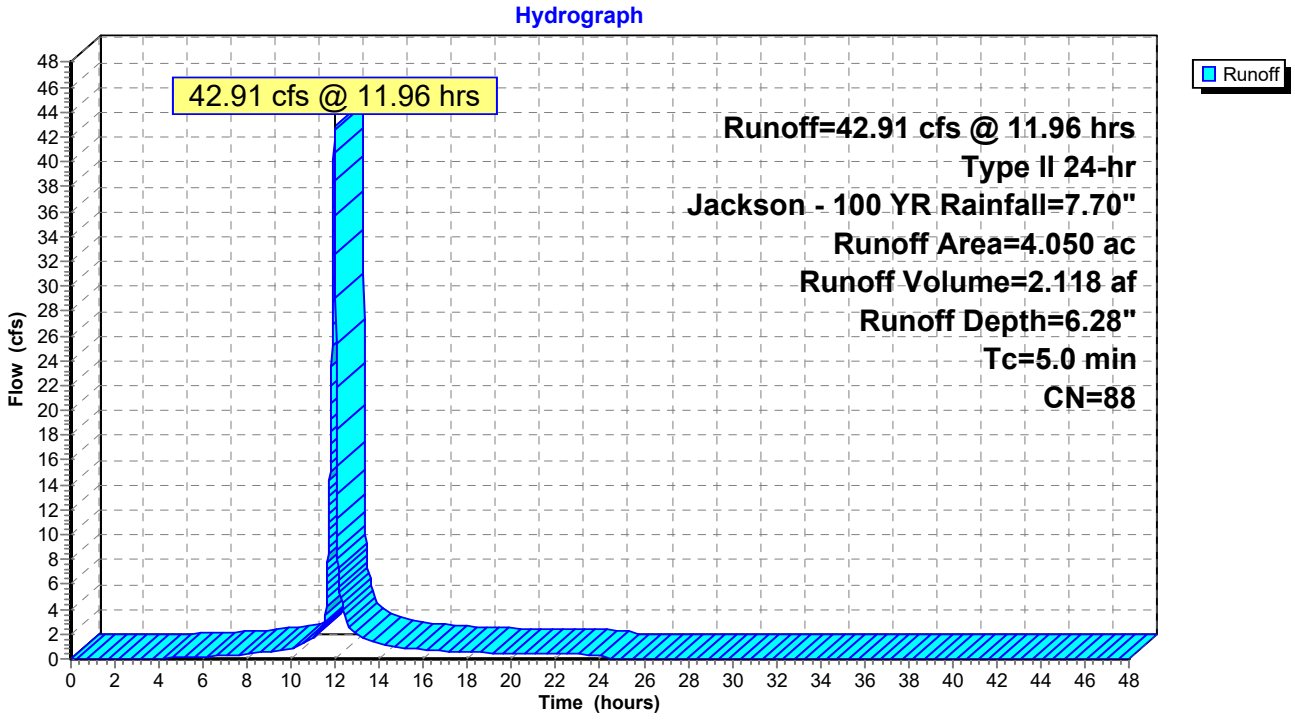
Runoff = 42.91 cfs @ 11.96 hrs, Volume= 2.118 af, Depth= 6.28"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

Area (ac)	CN	Description
1.720	74	>75% Grass cover, Good, HSG C
2.330	98	Paved parking, HSG D
4.050	88	Weighted Average
1.720		42.47% Pervious Area
2.330		57.53% Impervious Area

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

Subcatchment 1S: Proposed Onsite Detention



Hydrograph for Subcatchment 1S: Proposed Onsite Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.02
4.00	0.37	0.01	0.05
4.50	0.43	0.02	0.08
5.00	0.49	0.03	0.12
5.50	0.55	0.05	0.16
6.00	0.62	0.07	0.20
6.50	0.69	0.10	0.24
7.00	0.76	0.13	0.28
7.50	0.84	0.17	0.32
8.00	0.92	0.21	0.37
8.50	1.02	0.26	0.47
9.00	1.13	0.33	0.61
9.50	1.26	0.41	0.66
10.00	1.39	0.51	0.84
10.50	1.57	0.63	1.15
11.00	1.81	0.81	1.67
11.50	2.18	1.11	**2.90**
12.00	5.11	3.77	**35.71**
12.50	5.66	4.30	3.15
13.00	5.94	4.57	1.97
13.50	6.15	4.77	1.49
14.00	6.31	4.93	1.17
14.50	6.45	5.06	1.04
15.00	6.57	5.18	0.93
15.50	6.68	5.28	0.82
16.00	6.78	5.38	0.72
16.50	6.86	5.46	0.67
17.00	6.94	5.54	0.63
17.50	7.02	5.61	0.59
18.00	7.09	5.68	0.56
18.50	7.16	5.75	0.52
19.00	7.22	5.81	0.48
19.50	7.28	5.86	0.44
20.00	7.33	5.91	0.40
20.50	7.38	5.96	0.39
21.00	7.43	6.01	0.38
21.50	7.48	6.06	0.38
22.00	7.52	6.10	0.37
22.50	7.57	6.15	0.36
23.00	7.61	6.19	0.35
23.50	7.66	6.23	0.35
24.00	**7.70**	**6.28**	0.34
24.50	7.70	6.28	0.00
25.00	7.70	6.28	0.00
25.50	7.70	6.28	0.00
26.00	7.70	6.28	0.00
26.50	7.70	6.28	0.00
27.00	7.70	6.28	0.00
27.50	7.70	6.28	0.00
28.00	7.70	6.28	0.00
28.50	7.70	6.28	0.00
29.00	7.70	6.28	0.00
29.50	7.70	6.28	0.00
30.00	7.70	6.28	0.00
30.50	7.70	6.28	0.00
31.00	7.70	6.28	0.00
31.50	7.70	6.28	0.00
32.00	7.70	6.28	0.00
32.50	7.70	6.28	0.00
33.00	7.70	6.28	0.00
33.50	7.70	6.28	0.00
34.00	7.70	6.28	0.00
34.50	7.70	6.28	0.00
35.00	7.70	6.28	0.00
35.50	7.70	6.28	0.00
36.00	7.70	6.28	0.00
36.50	7.70	6.28	0.00
37.00	7.70	6.28	0.00
37.50	7.70	6.28	0.00
38.00	7.70	6.28	0.00
38.50	7.70	6.28	0.00
39.00	7.70	6.28	0.00
39.50	7.70	6.28	0.00
40.00	7.70	6.28	0.00
40.50	7.70	6.28	0.00
41.00	7.70	6.28	0.00
41.50	7.70	6.28	0.00
42.00	7.70	6.28	0.00
42.50	7.70	6.28	0.00
43.00	7.70	6.28	0.00
43.50	7.70	6.28	0.00
44.00	7.70	6.28	0.00
44.50	7.70	6.28	0.00
45.00	7.70	6.28	0.00
45.50	7.70	6.28	0.00
46.00	7.70	6.28	0.00
46.50	7.70	6.28	0.00
47.00	7.70	6.28	0.00
47.50	7.70	6.28	0.00
48.00	7.70	6.28	0.00

Summary for Subcatchment 2S: Walmart Bypass

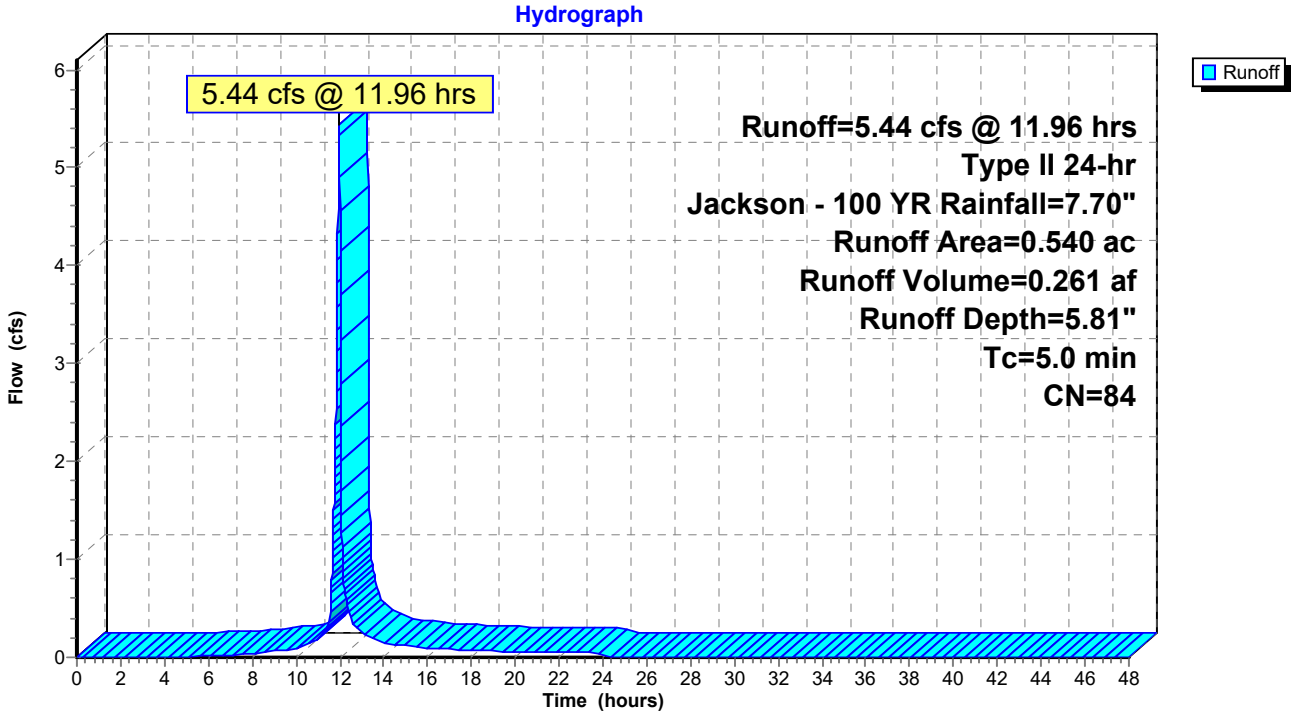
Runoff = 5.44 cfs @ 11.96 hrs, Volume= 0.261 af, Depth= 5.81"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	0.540	84	
	0.540		100.00% Pervious Area

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

Subcatchment 2S: Walmart Bypass



Hydrograph for Subcatchment 2S: Walmart Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	7.70	5.81	0.00
0.50	0.04	0.00	0.00	27.00	7.70	5.81	0.00
1.00	0.08	0.00	0.00	27.50	7.70	5.81	0.00
1.50	0.12	0.00	0.00	28.00	7.70	5.81	0.00
2.00	0.17	0.00	0.00	28.50	7.70	5.81	0.00
2.50	0.22	0.00	0.00	29.00	7.70	5.81	0.00
3.00	0.27	0.00	0.00	29.50	7.70	5.81	0.00
3.50	0.32	0.00	0.00	30.00	7.70	5.81	0.00
4.00	0.37	0.00	0.00	30.50	7.70	5.81	0.00
4.50	0.43	0.00	0.00	31.00	7.70	5.81	0.00
5.00	0.49	0.01	0.01	31.50	7.70	5.81	0.00
5.50	0.55	0.01	0.01	32.00	7.70	5.81	0.00
6.00	0.62	0.03	0.01	32.50	7.70	5.81	0.00
6.50	0.69	0.04	0.02	33.00	7.70	5.81	0.00
7.00	0.76	0.06	0.02	33.50	7.70	5.81	0.00
7.50	0.84	0.09	0.03	34.00	7.70	5.81	0.00
8.00	0.92	0.12	0.04	34.50	7.70	5.81	0.00
8.50	1.02	0.16	0.05	35.00	7.70	5.81	0.00
9.00	1.13	0.21	0.06	35.50	7.70	5.81	0.00
9.50	1.26	0.27	0.07	36.00	7.70	5.81	0.00
10.00	1.39	0.35	0.09	36.50	7.70	5.81	0.00
10.50	1.57	0.46	0.13	37.00	7.70	5.81	0.00
11.00	1.81	0.61	0.19	37.50	7.70	5.81	0.00
11.50	2.18	0.87	**0.34**	38.00	7.70	5.81	0.00
12.00	5.11	3.37	**4.56**	38.50	7.70	5.81	0.00
12.50	5.66	3.88	0.41	39.00	7.70	5.81	0.00
13.00	5.94	4.14	0.25	39.50	7.70	5.81	0.00
13.50	6.15	4.34	0.19	40.00	7.70	5.81	0.00
14.00	6.31	4.49	0.15	40.50	7.70	5.81	0.00
14.50	6.45	4.62	0.13	41.00	7.70	5.81	0.00
15.00	6.57	4.73	0.12	41.50	7.70	5.81	0.00
15.50	6.68	4.84	0.11	42.00	7.70	5.81	0.00
16.00	6.78	4.93	0.09	42.50	7.70	5.81	0.00
16.50	6.86	5.01	0.09	43.00	7.70	5.81	0.00
17.00	6.94	5.09	0.08	43.50	7.70	5.81	0.00
17.50	7.02	5.16	0.08	44.00	7.70	5.81	0.00
18.00	7.09	5.23	0.07	44.50	7.70	5.81	0.00
18.50	7.16	5.29	0.07	45.00	7.70	5.81	0.00
19.00	7.22	5.35	0.06	45.50	7.70	5.81	0.00
19.50	7.28	5.40	0.06	46.00	7.70	5.81	0.00
20.00	7.33	5.45	0.05	46.50	7.70	5.81	0.00
20.50	7.38	5.50	0.05	47.00	7.70	5.81	0.00
21.00	7.43	5.55	0.05	47.50	7.70	5.81	0.00
21.50	7.48	5.59	0.05	48.00	7.70	5.81	0.00
22.00	7.52	5.64	0.05				
22.50	7.57	5.68	0.05				
23.00	7.61	5.72	0.05				
23.50	7.66	5.77	0.05				
24.00	**7.70**	**5.81**	0.04				
24.50	7.70	5.81	0.00				
25.00	7.70	5.81	0.00				
25.50	7.70	5.81	0.00				
26.00	7.70	5.81	0.00				

Summary for Subcatchment 3S: Proposed Onsite Bypass

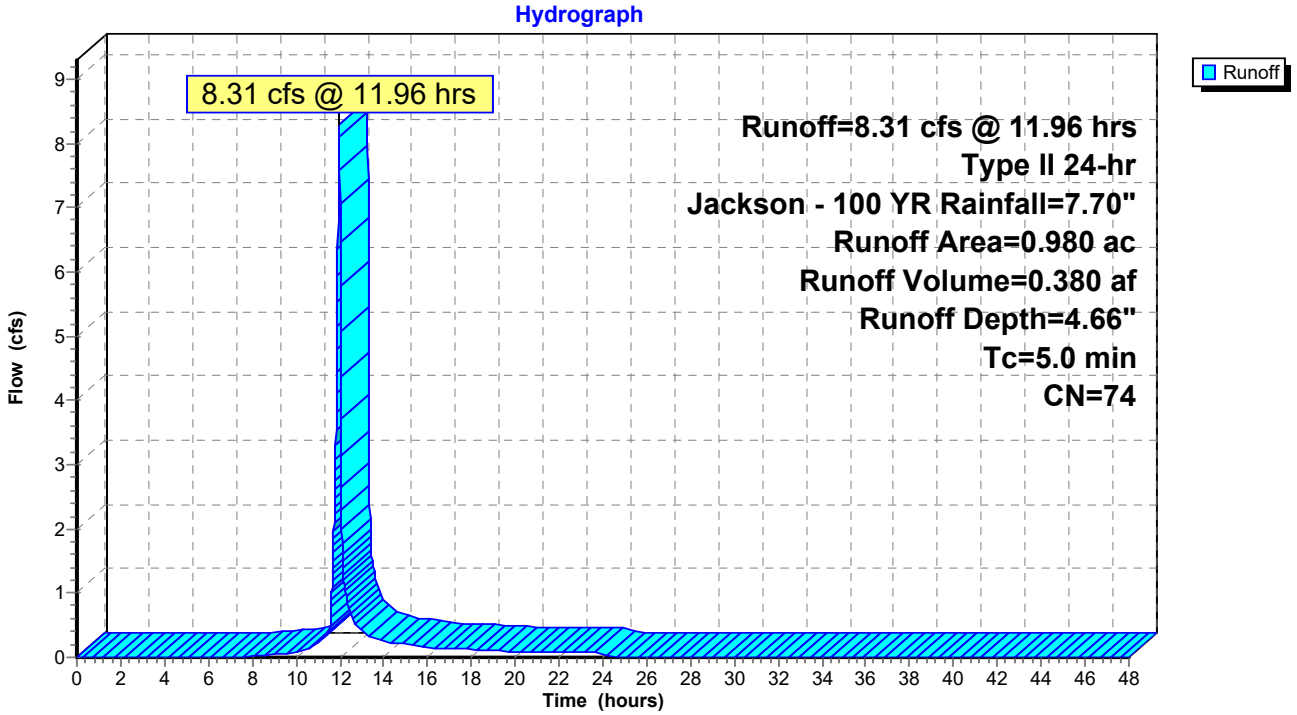
Runoff = 8.31 cfs @ 11.96 hrs, Volume= 0.380 af, Depth= 4.66"
Routed to Link 1L : Proposed Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

Area (ac)	CN	Description
0.980	74	>75% Grass cover, Good, HSG C
0.980		100.00% Pervious Area

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

Subcatchment 3S: Proposed Onsite Bypass



Hydrograph for Subcatchment 3S: Proposed Onsite Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.00	0.00
4.50	0.43	0.00	0.00
5.00	0.49	0.00	0.00
5.50	0.55	0.00	0.00
6.00	0.62	0.00	0.00
6.50	0.69	0.00	0.00
7.00	0.76	0.00	0.00
7.50	0.84	0.01	0.01
8.00	0.92	0.01	0.02
8.50	1.02	0.03	0.03
9.00	1.13	0.05	0.05
9.50	1.26	0.08	0.06
10.00	1.39	0.11	0.09
10.50	1.57	0.17	0.13
11.00	1.81	0.27	0.22
11.50	2.18	0.44	**0.42**
12.00	5.11	2.45	**7.07**
12.50	5.66	2.90	0.66
13.00	5.94	3.14	0.41
13.50	6.15	3.31	0.32
14.00	6.31	3.45	0.25
14.50	6.45	3.57	0.22
15.00	6.57	3.67	0.20
15.50	6.68	3.77	0.18
16.00	6.78	3.85	0.15
16.50	6.86	3.92	0.14
17.00	6.94	3.99	0.14
17.50	7.02	4.06	0.13
18.00	7.09	4.12	0.12
18.50	7.16	4.18	0.11
19.00	7.22	4.24	0.10
19.50	7.28	4.29	0.10
20.00	7.33	4.33	0.09
20.50	7.38	4.38	0.09
21.00	7.43	4.42	0.08
21.50	7.48	4.46	0.08
22.00	7.52	4.50	0.08
22.50	7.57	4.54	0.08
23.00	7.61	4.58	0.08
23.50	7.66	4.62	0.08
24.00	**7.70**	**4.66**	0.07
24.50	7.70	4.66	0.00
25.00	7.70	4.66	0.00
25.50	7.70	4.66	0.00
26.00	7.70	4.66	0.00
26.50	7.70	4.66	0.00
27.00	7.70	4.66	0.00
27.50	7.70	4.66	0.00
28.00	7.70	4.66	0.00
28.50	7.70	4.66	0.00
29.00	7.70	4.66	0.00
29.50	7.70	4.66	0.00
30.00	7.70	4.66	0.00
30.50	7.70	4.66	0.00
31.00	7.70	4.66	0.00
31.50	7.70	4.66	0.00
32.00	7.70	4.66	0.00
32.50	7.70	4.66	0.00
33.00	7.70	4.66	0.00
33.50	7.70	4.66	0.00
34.00	7.70	4.66	0.00
34.50	7.70	4.66	0.00
35.00	7.70	4.66	0.00
35.50	7.70	4.66	0.00
36.00	7.70	4.66	0.00
36.50	7.70	4.66	0.00
37.00	7.70	4.66	0.00
37.50	7.70	4.66	0.00
38.00	7.70	4.66	0.00
38.50	7.70	4.66	0.00
39.00	7.70	4.66	0.00
39.50	7.70	4.66	0.00
40.00	7.70	4.66	0.00
40.50	7.70	4.66	0.00
41.00	7.70	4.66	0.00
41.50	7.70	4.66	0.00
42.00	7.70	4.66	0.00
42.50	7.70	4.66	0.00
43.00	7.70	4.66	0.00
43.50	7.70	4.66	0.00
44.00	7.70	4.66	0.00
44.50	7.70	4.66	0.00
45.00	7.70	4.66	0.00
45.50	7.70	4.66	0.00
46.00	7.70	4.66	0.00
46.50	7.70	4.66	0.00
47.00	7.70	4.66	0.00
47.50	7.70	4.66	0.00
48.00	7.70	4.66	0.00

Summary for Subcatchment 4S: Firestone Bypass

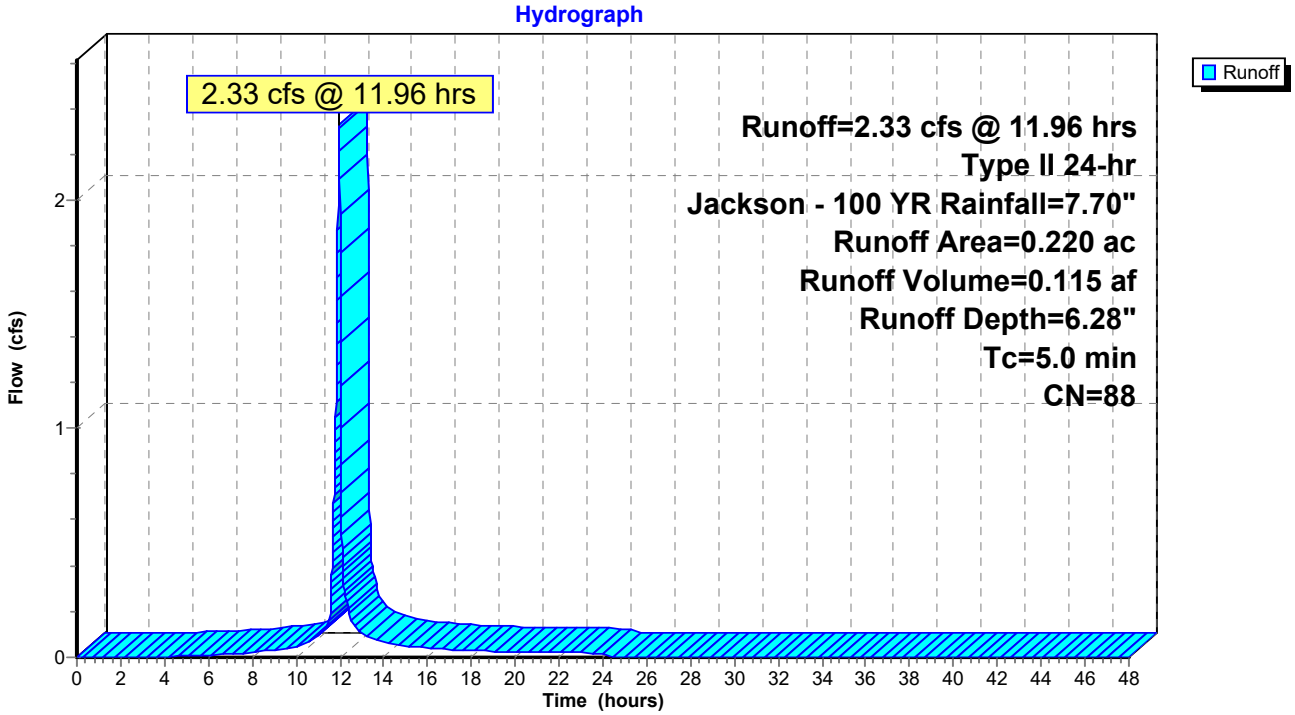
Runoff = 2.33 cfs @ 11.96 hrs, Volume= 0.115 af, Depth= 6.28"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	0.220	88	
	0.220		100.00% Pervious Area

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

Subcatchment 4S: Firestone Bypass



Hydrograph for Subcatchment 4S: Firestone Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.01	0.00
4.50	0.43	0.02	0.00
5.00	0.49	0.03	0.01
5.50	0.55	0.05	0.01
6.00	0.62	0.07	0.01
6.50	0.69	0.10	0.01
7.00	0.76	0.13	0.02
7.50	0.84	0.17	0.02
8.00	0.92	0.21	0.02
8.50	1.02	0.26	0.03
9.00	1.13	0.33	0.03
9.50	1.26	0.41	0.04
10.00	1.39	0.51	0.05
10.50	1.57	0.63	0.06
11.00	1.81	0.81	0.09
11.50	2.18	1.11	**0.16**
12.00	5.11	3.77	**1.94**
12.50	5.66	4.30	0.17
13.00	5.94	4.57	0.11
13.50	6.15	4.77	0.08
14.00	6.31	4.93	0.06
14.50	6.45	5.06	0.06
15.00	6.57	5.18	0.05
15.50	6.68	5.28	0.04
16.00	6.78	5.38	0.04
16.50	6.86	5.46	0.04
17.00	6.94	5.54	0.03
17.50	7.02	5.61	0.03
18.00	7.09	5.68	0.03
18.50	7.16	5.75	0.03
19.00	7.22	5.81	0.03
19.50	7.28	5.86	0.02
20.00	7.33	5.91	0.02
20.50	7.38	5.96	0.02
21.00	7.43	6.01	0.02
21.50	7.48	6.06	0.02
22.00	7.52	6.10	0.02
22.50	7.57	6.15	0.02
23.00	7.61	6.19	0.02
23.50	7.66	6.23	0.02
24.00	**7.70**	**6.28**	0.02
24.50	7.70	6.28	0.00
25.00	7.70	6.28	0.00
25.50	7.70	6.28	0.00
26.00	7.70	6.28	0.00
26.50	7.70	6.28	0.00
27.00	7.70	6.28	0.00
27.50	7.70	6.28	0.00
28.00	7.70	6.28	0.00
28.50	7.70	6.28	0.00
29.00	7.70	6.28	0.00
29.50	7.70	6.28	0.00
30.00	7.70	6.28	0.00
30.50	7.70	6.28	0.00
31.00	7.70	6.28	0.00
31.50	7.70	6.28	0.00
32.00	7.70	6.28	0.00
32.50	7.70	6.28	0.00
33.00	7.70	6.28	0.00
33.50	7.70	6.28	0.00
34.00	7.70	6.28	0.00
34.50	7.70	6.28	0.00
35.00	7.70	6.28	0.00
35.50	7.70	6.28	0.00
36.00	7.70	6.28	0.00
36.50	7.70	6.28	0.00
37.00	7.70	6.28	0.00
37.50	7.70	6.28	0.00
38.00	7.70	6.28	0.00
38.50	7.70	6.28	0.00
39.00	7.70	6.28	0.00
39.50	7.70	6.28	0.00
40.00	7.70	6.28	0.00
40.50	7.70	6.28	0.00
41.00	7.70	6.28	0.00
41.50	7.70	6.28	0.00
42.00	7.70	6.28	0.00
42.50	7.70	6.28	0.00
43.00	7.70	6.28	0.00
43.50	7.70	6.28	0.00
44.00	7.70	6.28	0.00
44.50	7.70	6.28	0.00
45.00	7.70	6.28	0.00
45.50	7.70	6.28	0.00
46.00	7.70	6.28	0.00
46.50	7.70	6.28	0.00
47.00	7.70	6.28	0.00
47.50	7.70	6.28	0.00
48.00	7.70	6.28	0.00

Summary for Subcatchment 5S: Firestone Detention

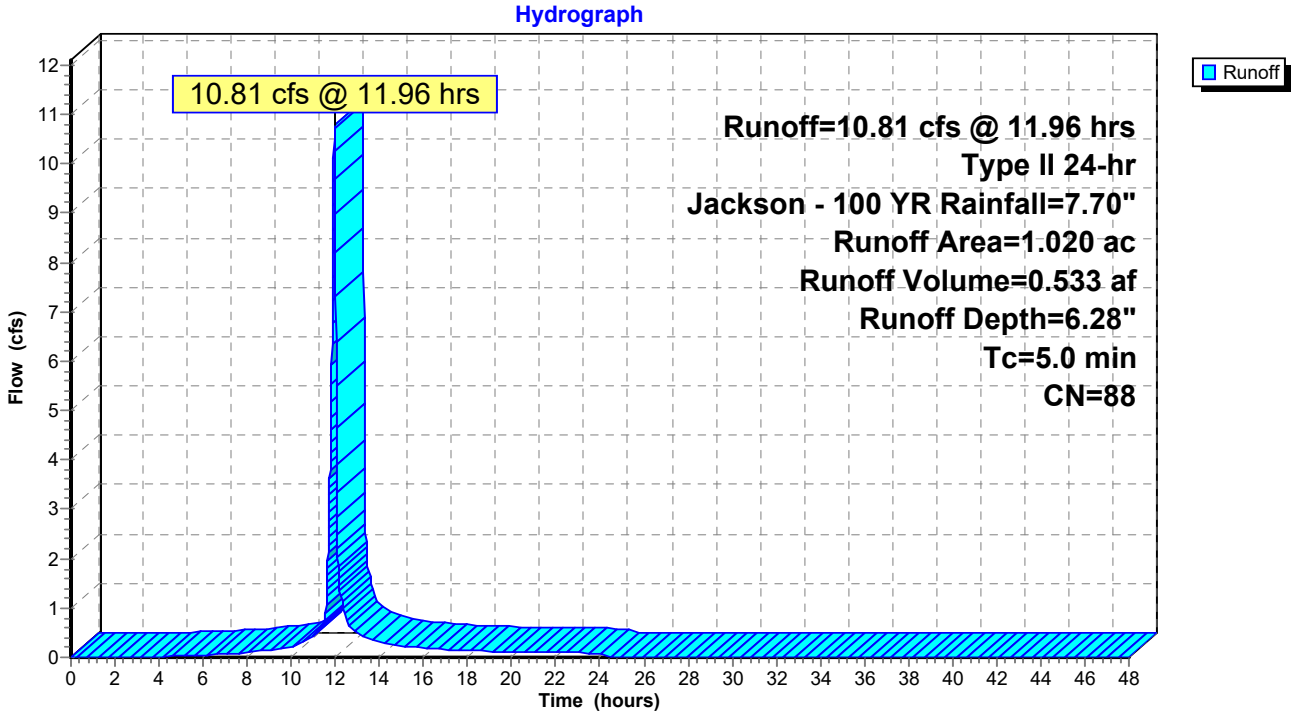
Runoff = 10.81 cfs @ 11.96 hrs, Volume= 0.533 af, Depth= 6.28"
Routed to Pond 6P : Firestone Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	1.020	88	
	1.020		100.00% Pervious Area

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

Subcatchment 5S: Firestone Detention



Hydrograph for Subcatchment 5S: Firestone Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.01
4.00	0.37	0.01	0.01
4.50	0.43	0.02	0.02
5.00	0.49	0.03	0.03
5.50	0.55	0.05	0.04
6.00	0.62	0.07	0.05
6.50	0.69	0.10	0.06
7.00	0.76	0.13	0.07
7.50	0.84	0.17	0.08
8.00	0.92	0.21	0.09
8.50	1.02	0.26	0.12
9.00	1.13	0.33	0.15
9.50	1.26	0.41	0.17
10.00	1.39	0.51	0.21
10.50	1.57	0.63	0.29
11.00	1.81	0.81	0.42
11.50	2.18	1.11	**0.73**
12.00	5.11	3.77	**8.99**
12.50	5.66	4.30	0.79
13.00	5.94	4.57	0.50
13.50	6.15	4.77	0.38
14.00	6.31	4.93	0.29
14.50	6.45	5.06	0.26
15.00	6.57	5.18	0.23
15.50	6.68	5.28	0.21
16.00	6.78	5.38	0.18
16.50	6.86	5.46	0.17
17.00	6.94	5.54	0.16
17.50	7.02	5.61	0.15
18.00	7.09	5.68	0.14
18.50	7.16	5.75	0.13
19.00	7.22	5.81	0.12
19.50	7.28	5.86	0.11
20.00	7.33	5.91	0.10
20.50	7.38	5.96	0.10
21.00	7.43	6.01	0.10
21.50	7.48	6.06	0.09
22.00	7.52	6.10	0.09
22.50	7.57	6.15	0.09
23.00	7.61	6.19	0.09
23.50	7.66	6.23	0.09
24.00	**7.70**	**6.28**	0.09
24.50	7.70	6.28	0.00
25.00	7.70	6.28	0.00
25.50	7.70	6.28	0.00
26.00	7.70	6.28	0.00
26.50	7.70	6.28	0.00
27.00	7.70	6.28	0.00
27.50	7.70	6.28	0.00
28.00	7.70	6.28	0.00
28.50	7.70	6.28	0.00
29.00	7.70	6.28	0.00
29.50	7.70	6.28	0.00
30.00	7.70	6.28	0.00
30.50	7.70	6.28	0.00
31.00	7.70	6.28	0.00
31.50	7.70	6.28	0.00
32.00	7.70	6.28	0.00
32.50	7.70	6.28	0.00
33.00	7.70	6.28	0.00
33.50	7.70	6.28	0.00
34.00	7.70	6.28	0.00
34.50	7.70	6.28	0.00
35.00	7.70	6.28	0.00
35.50	7.70	6.28	0.00
36.00	7.70	6.28	0.00
36.50	7.70	6.28	0.00
37.00	7.70	6.28	0.00
37.50	7.70	6.28	0.00
38.00	7.70	6.28	0.00
38.50	7.70	6.28	0.00
39.00	7.70	6.28	0.00
39.50	7.70	6.28	0.00
40.00	7.70	6.28	0.00
40.50	7.70	6.28	0.00
41.00	7.70	6.28	0.00
41.50	7.70	6.28	0.00
42.00	7.70	6.28	0.00
42.50	7.70	6.28	0.00
43.00	7.70	6.28	0.00
43.50	7.70	6.28	0.00
44.00	7.70	6.28	0.00
44.50	7.70	6.28	0.00
45.00	7.70	6.28	0.00
45.50	7.70	6.28	0.00
46.00	7.70	6.28	0.00
46.50	7.70	6.28	0.00
47.00	7.70	6.28	0.00
47.50	7.70	6.28	0.00
48.00	7.70	6.28	0.00

Summary for Subcatchment 6S: Market Street RW

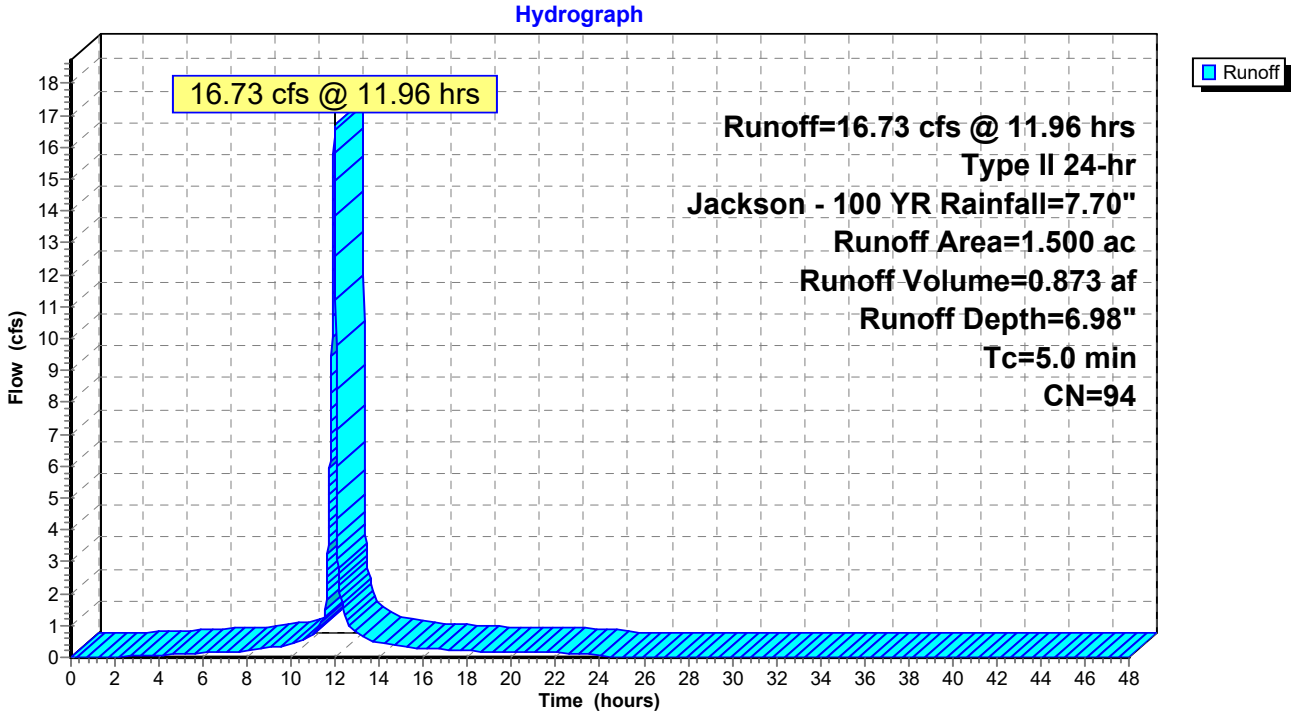
Runoff = 16.73 cfs @ 11.96 hrs, Volume= 0.873 af, Depth= 6.98"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	1.500	94	
	1.500		100.00% Pervious Area

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

Subcatchment 6S: Market Street RW



Hydrograph for Subcatchment 6S: Market Street RW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.01
2.50	0.22	0.01	0.03
3.00	0.27	0.02	0.05
3.50	0.32	0.04	0.06
4.00	0.37	0.07	0.08
4.50	0.43	0.09	0.09
5.00	0.49	0.13	0.11
5.50	0.55	0.17	0.12
6.00	0.62	0.21	0.14
6.50	0.69	0.26	0.16
7.00	0.76	0.32	0.17
7.50	0.84	0.38	0.19
8.00	0.92	0.44	0.20
8.50	1.02	0.52	0.25
9.00	1.13	0.61	0.31
9.50	1.26	0.72	0.32
10.00	1.39	0.84	0.40
10.50	1.57	1.00	0.53
11.00	1.81	1.22	0.74
11.50	2.18	1.56	**1.23**
12.00	5.11	4.41	**13.84**
12.50	5.66	4.96	1.21
13.00	5.94	5.24	0.75
13.50	6.15	5.45	0.57
14.00	6.31	5.61	0.44
14.50	6.45	5.74	0.39
15.00	6.57	5.86	0.35
15.50	6.68	5.97	0.31
16.00	6.78	6.07	0.27
16.50	6.86	6.15	0.25
17.00	6.94	6.23	0.24
17.50	7.02	6.31	0.22
18.00	7.09	6.38	0.21
18.50	7.16	6.45	0.20
19.00	7.22	6.51	0.18
19.50	7.28	6.56	0.17
20.00	7.33	6.62	0.15
20.50	7.38	6.67	0.15
21.00	7.43	6.71	0.15
21.50	7.48	6.76	0.14
22.00	7.52	6.81	0.14
22.50	7.57	6.85	0.14
23.00	7.61	6.90	0.13
23.50	7.66	6.94	0.13
24.00	**7.70**	**6.98**	0.13
24.50	7.70	6.98	0.00
25.00	7.70	6.98	0.00
25.50	7.70	6.98	0.00
26.00	7.70	6.98	0.00
26.50	7.70	6.98	0.00
27.00	7.70	6.98	0.00
27.50	7.70	6.98	0.00
28.00	7.70	6.98	0.00
28.50	7.70	6.98	0.00
29.00	7.70	6.98	0.00
29.50	7.70	6.98	0.00
30.00	7.70	6.98	0.00
30.50	7.70	6.98	0.00
31.00	7.70	6.98	0.00
31.50	7.70	6.98	0.00
32.00	7.70	6.98	0.00
32.50	7.70	6.98	0.00
33.00	7.70	6.98	0.00
33.50	7.70	6.98	0.00
34.00	7.70	6.98	0.00
34.50	7.70	6.98	0.00
35.00	7.70	6.98	0.00
35.50	7.70	6.98	0.00
36.00	7.70	6.98	0.00
36.50	7.70	6.98	0.00
37.00	7.70	6.98	0.00
37.50	7.70	6.98	0.00
38.00	7.70	6.98	0.00
38.50	7.70	6.98	0.00
39.00	7.70	6.98	0.00
39.50	7.70	6.98	0.00
40.00	7.70	6.98	0.00
40.50	7.70	6.98	0.00
41.00	7.70	6.98	0.00
41.50	7.70	6.98	0.00
42.00	7.70	6.98	0.00
42.50	7.70	6.98	0.00
43.00	7.70	6.98	0.00
43.50	7.70	6.98	0.00
44.00	7.70	6.98	0.00
44.50	7.70	6.98	0.00
45.00	7.70	6.98	0.00
45.50	7.70	6.98	0.00
46.00	7.70	6.98	0.00
46.50	7.70	6.98	0.00
47.00	7.70	6.98	0.00
47.50	7.70	6.98	0.00
48.00	7.70	6.98	0.00

Summary for Subcatchment 7S: Walmart Detention

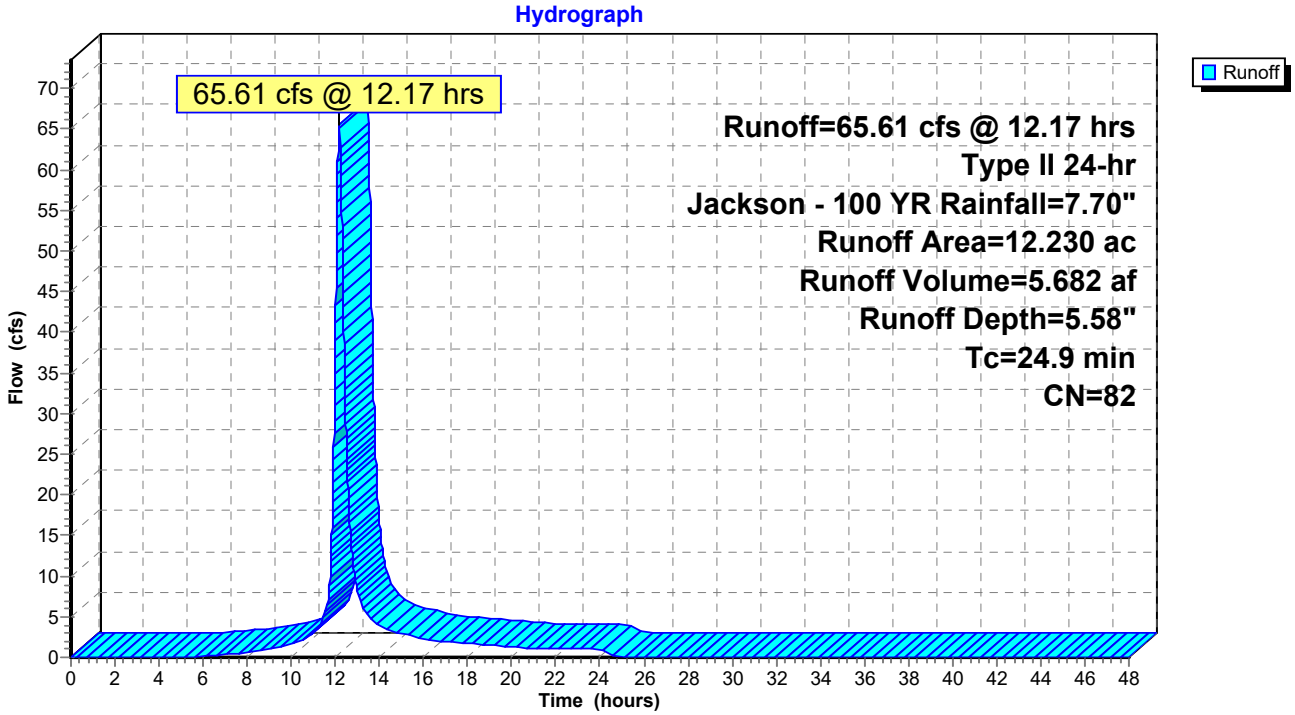
Runoff = 65.61 cfs @ 12.17 hrs, Volume= 5.682 af, Depth= 5.58"
Routed to Pond 8P : Walmart Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	12.230	82	
	12.230		100.00% Pervious Area

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

Subcatchment 7S: Walmart Detention



Hydrograph for Subcatchment 7S: Walmart Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.00
2.50	0.22	0.00	0.00
3.00	0.27	0.00	0.00
3.50	0.32	0.00	0.00
4.00	0.37	0.00	0.00
4.50	0.43	0.00	0.00
5.00	0.49	0.00	0.01
5.50	0.55	0.01	0.08
6.00	0.62	0.01	0.17
6.50	0.69	0.03	0.27
7.00	0.76	0.04	0.37
7.50	0.84	0.06	0.48
8.00	0.92	0.09	0.60
8.50	1.02	0.12	0.76
9.00	1.13	0.17	1.03
9.50	1.26	0.22	1.30
10.00	1.39	0.29	1.57
10.50	1.57	0.39	2.16
11.00	1.81	0.53	3.15
11.50	2.18	0.77	5.16
12.00	5.11	3.17	**39.00**
12.50	5.66	3.68	**26.00**
13.00	5.94	3.94	8.15
13.50	6.15	4.13	5.13
14.00	6.31	4.28	3.94
14.50	6.45	4.40	3.22
15.00	6.57	4.52	2.88
15.50	6.68	4.62	2.58
16.00	6.78	4.71	2.27
16.50	6.86	4.79	2.03
17.00	6.94	4.86	1.91
17.50	7.02	4.93	1.80
18.00	7.09	5.00	1.69
18.50	7.16	5.06	1.58
19.00	7.22	5.12	1.47
19.50	7.28	5.18	1.36
20.00	7.33	5.23	1.25
20.50	7.38	5.27	1.16
21.00	7.43	5.32	1.14
21.50	7.48	5.36	1.11
22.00	7.52	5.41	1.09
22.50	7.57	5.45	1.07
23.00	7.61	5.49	1.05
23.50	7.66	5.53	1.03
24.00	**7.70**	**5.58**	1.01
24.50	7.70	5.58	0.21
25.00	7.70	5.58	0.01
25.50	7.70	5.58	0.00
26.00	7.70	5.58	0.00
26.50	7.70	5.58	0.00
27.00	7.70	5.58	0.00
27.50	7.70	5.58	0.00
28.00	7.70	5.58	0.00
28.50	7.70	5.58	0.00
29.00	7.70	5.58	0.00
29.50	7.70	5.58	0.00
30.00	7.70	5.58	0.00
30.50	7.70	5.58	0.00
31.00	7.70	5.58	0.00
31.50	7.70	5.58	0.00
32.00	7.70	5.58	0.00
32.50	7.70	5.58	0.00
33.00	7.70	5.58	0.00
33.50	7.70	5.58	0.00
34.00	7.70	5.58	0.00
34.50	7.70	5.58	0.00
35.00	7.70	5.58	0.00
35.50	7.70	5.58	0.00
36.00	7.70	5.58	0.00
36.50	7.70	5.58	0.00
37.00	7.70	5.58	0.00
37.50	7.70	5.58	0.00
38.00	7.70	5.58	0.00
38.50	7.70	5.58	0.00
39.00	7.70	5.58	0.00
39.50	7.70	5.58	0.00
40.00	7.70	5.58	0.00
40.50	7.70	5.58	0.00
41.00	7.70	5.58	0.00
41.50	7.70	5.58	0.00
42.00	7.70	5.58	0.00
42.50	7.70	5.58	0.00
43.00	7.70	5.58	0.00
43.50	7.70	5.58	0.00
44.00	7.70	5.58	0.00
44.50	7.70	5.58	0.00
45.00	7.70	5.58	0.00
45.50	7.70	5.58	0.00
46.00	7.70	5.58	0.00
46.50	7.70	5.58	0.00
47.00	7.70	5.58	0.00
47.50	7.70	5.58	0.00
48.00	7.70	5.58	0.00

Summary for Subcatchment 9S: Commercial Plus RW Bypass

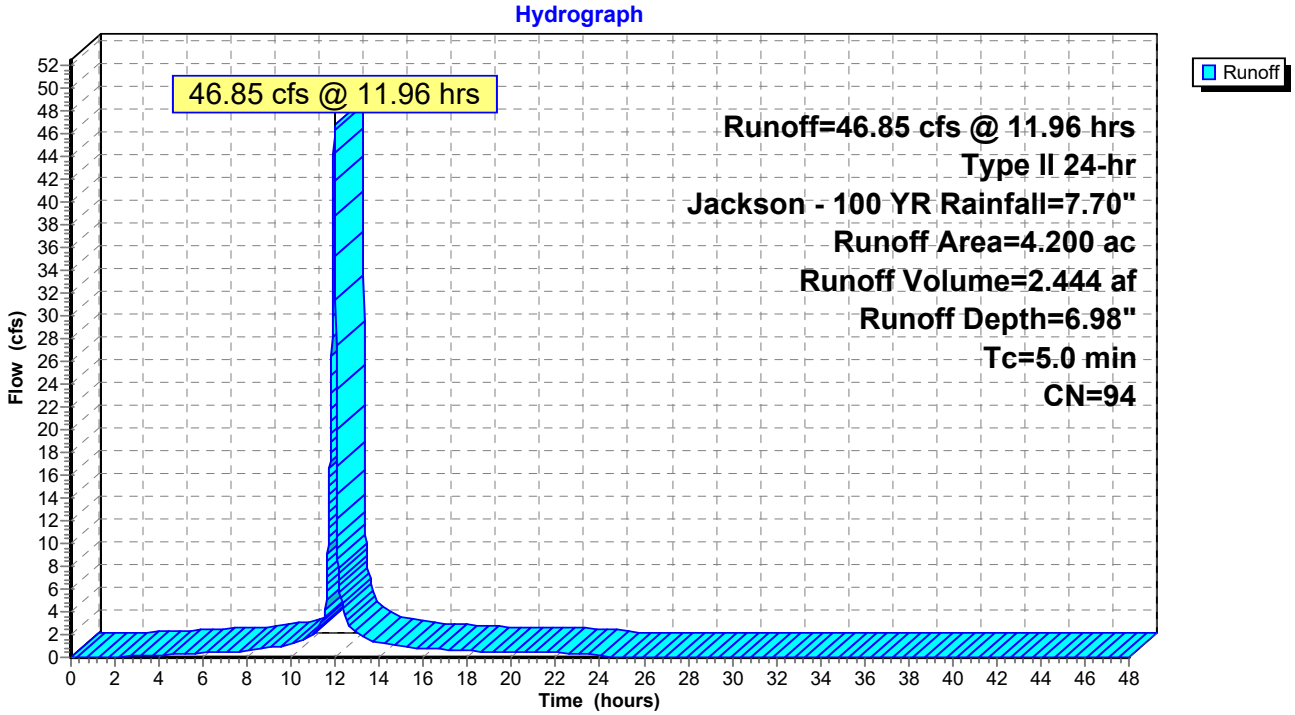
Runoff = 46.85 cfs @ 11.96 hrs, Volume= 2.444 af, Depth= 6.98"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 100 YR Rainfall=7.70"

	Area (ac)	CN	Description
*	4.200	94	
	4.200		100.00% Pervious Area

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

Subcatchment 9S: Commercial Plus RW Bypass



Hydrograph for Subcatchment 9S: Commercial Plus RW Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.08	0.00	0.00
1.50	0.12	0.00	0.00
2.00	0.17	0.00	0.04
2.50	0.22	0.01	0.09
3.00	0.27	0.02	0.13
3.50	0.32	0.04	0.17
4.00	0.37	0.07	0.21
4.50	0.43	0.09	0.25
5.00	0.49	0.13	0.30
5.50	0.55	0.17	0.35
6.00	0.62	0.21	0.39
6.50	0.69	0.26	0.44
7.00	0.76	0.32	0.48
7.50	0.84	0.38	0.53
8.00	0.92	0.44	0.57
8.50	1.02	0.52	0.70
9.00	1.13	0.61	0.86
9.50	1.26	0.72	0.90
10.00	1.39	0.84	1.12
10.50	1.57	1.00	1.48
11.00	1.81	1.22	2.07
11.50	2.18	1.56	**3.45**
12.00	5.11	4.41	**38.74**
12.50	5.66	4.96	3.37
13.00	5.94	5.24	2.10
13.50	6.15	5.45	1.59
14.00	6.31	5.61	1.25
14.50	6.45	5.74	1.10
15.00	6.57	5.86	0.99
15.50	6.68	5.97	0.87
16.00	6.78	6.07	0.76
16.50	6.86	6.15	0.71
17.00	6.94	6.23	0.67
17.50	7.02	6.31	0.63
18.00	7.09	6.38	0.59
18.50	7.16	6.45	0.55
19.00	7.22	6.51	0.51
19.50	7.28	6.56	0.47
20.00	7.33	6.62	0.43
20.50	7.38	6.67	0.41
21.00	7.43	6.71	0.41
21.50	7.48	6.76	0.40
22.00	7.52	6.81	0.39
22.50	7.57	6.85	0.38
23.00	7.61	6.90	0.37
23.50	7.66	6.94	0.37
24.00	**7.70**	**6.98**	0.36
24.50	7.70	6.98	0.00
25.00	7.70	6.98	0.00
25.50	7.70	6.98	0.00
26.00	7.70	6.98	0.00
26.50	7.70	6.98	0.00
27.00	7.70	6.98	0.00
27.50	7.70	6.98	0.00
28.00	7.70	6.98	0.00
28.50	7.70	6.98	0.00
29.00	7.70	6.98	0.00
29.50	7.70	6.98	0.00
30.00	7.70	6.98	0.00
30.50	7.70	6.98	0.00
31.00	7.70	6.98	0.00
31.50	7.70	6.98	0.00
32.00	7.70	6.98	0.00
32.50	7.70	6.98	0.00
33.00	7.70	6.98	0.00
33.50	7.70	6.98	0.00
34.00	7.70	6.98	0.00
34.50	7.70	6.98	0.00
35.00	7.70	6.98	0.00
35.50	7.70	6.98	0.00
36.00	7.70	6.98	0.00
36.50	7.70	6.98	0.00
37.00	7.70	6.98	0.00
37.50	7.70	6.98	0.00
38.00	7.70	6.98	0.00
38.50	7.70	6.98	0.00
39.00	7.70	6.98	0.00
39.50	7.70	6.98	0.00
40.00	7.70	6.98	0.00
40.50	7.70	6.98	0.00
41.00	7.70	6.98	0.00
41.50	7.70	6.98	0.00
42.00	7.70	6.98	0.00
42.50	7.70	6.98	0.00
43.00	7.70	6.98	0.00
43.50	7.70	6.98	0.00
44.00	7.70	6.98	0.00
44.50	7.70	6.98	0.00
45.00	7.70	6.98	0.00
45.50	7.70	6.98	0.00
46.00	7.70	6.98	0.00
46.50	7.70	6.98	0.00
47.00	7.70	6.98	0.00
47.50	7.70	6.98	0.00
48.00	7.70	6.98	0.00

Summary for Pond 1P: Proposed Detention

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 23.760 ac, 9.81% Impervious, Inflow Depth > 5.65" for Jackson - 100 YR event
Inflow = 116.64 cfs @ 11.96 hrs, Volume= 11.188 af
Outflow = 85.81 cfs @ 12.02 hrs, Volume= 10.967 af, Atten= 26%, Lag= 3.4 min
Primary = 85.81 cfs @ 12.02 hrs, Volume= 10.967 af
Routed to Link 1L : Proposed Total
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : Proposed Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,001.95' @ 12.02 hrs Surf.Area= 13,251 sf Storage= 47,065 cf

Plug-Flow detention time= 46.4 min calculated for 10.967 af (98% of inflow)
Center-of-Mass det. time= 25.6 min (896.8 - 871.1)

Volume	Invert	Avail.Storage	Storage Description
#1	996.00'	61,846 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

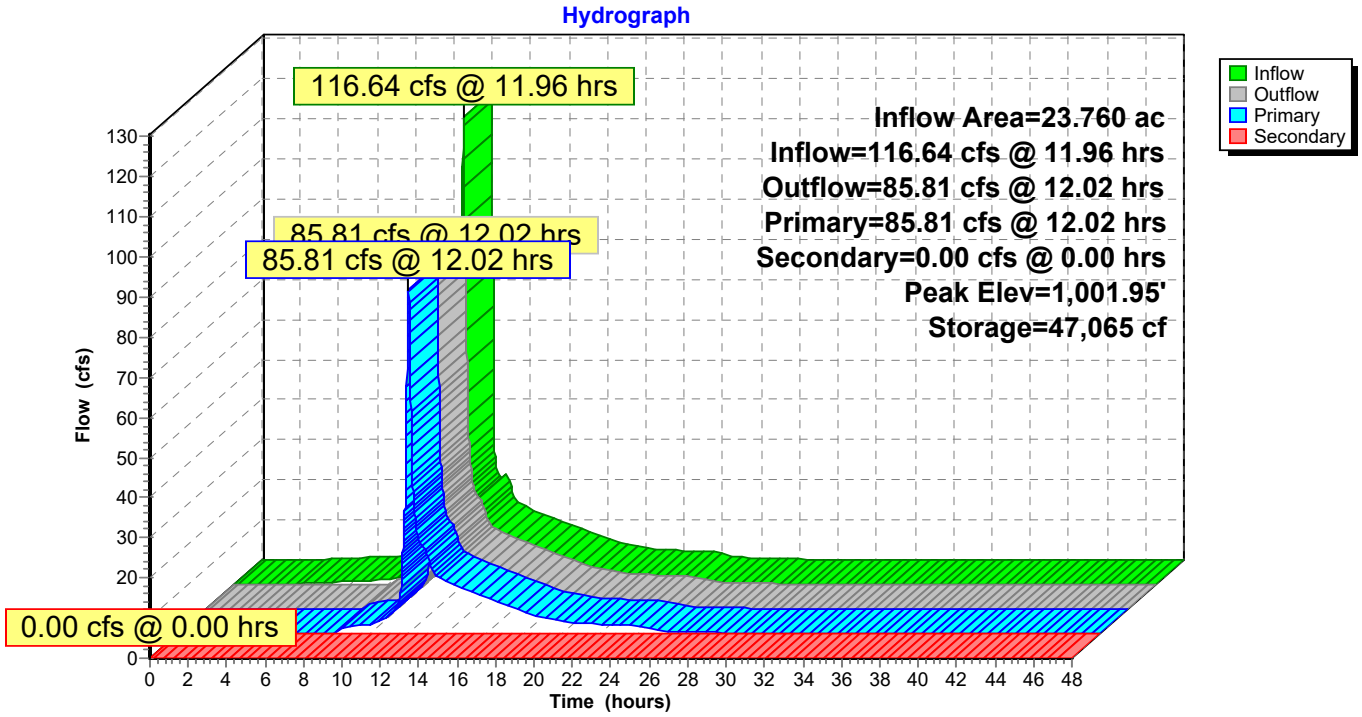
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
996.00	0	0	0
997.00	5,095	2,548	2,548
998.00	6,517	5,806	8,354
999.00	8,135	7,326	15,680
1,000.00	9,810	8,973	24,652
1,001.00	11,528	10,669	35,321
1,002.00	13,346	12,437	47,758
1,003.00	14,829	14,088	61,846

Device	Routing	Invert	Outlet Devices
#0	Secondary	1,003.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	995.30'	**48.0" Round Culvert** L= 34.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 995.30' / 995.10' S= 0.0058 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Device 1	995.50'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	998.50'	**140.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,000.00'	**92.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	1,000.90'	**64.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

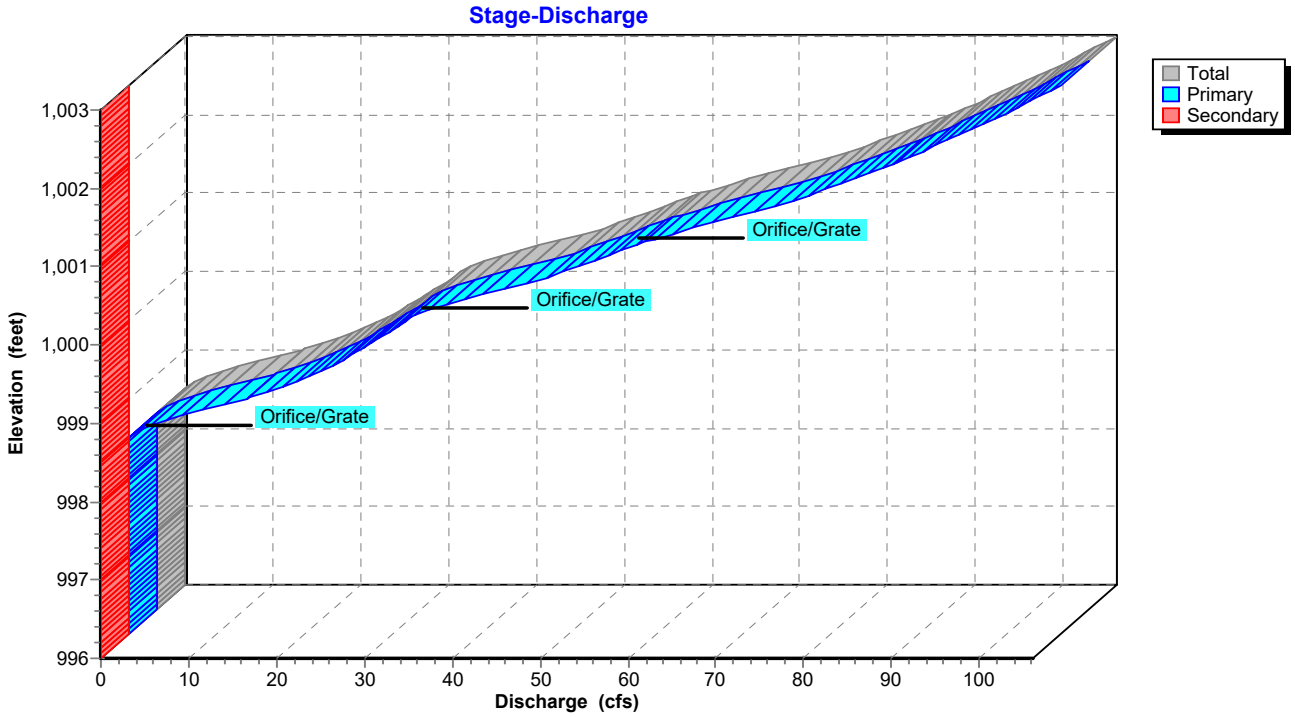
Primary OutFlow Max=85.75 cfs @ 12.02 hrs HW=1,001.94' (Free Discharge)
└─**1=Culvert** (Passes 85.75 cfs of 130.41 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 12.16 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 50.19 cfs @ 8.60 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 24.01 cfs @ 6.26 fps)
  └─**5=Orifice/Grate** (Orifice Controls 11.40 cfs @ 4.27 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=996.00' (Free Discharge)

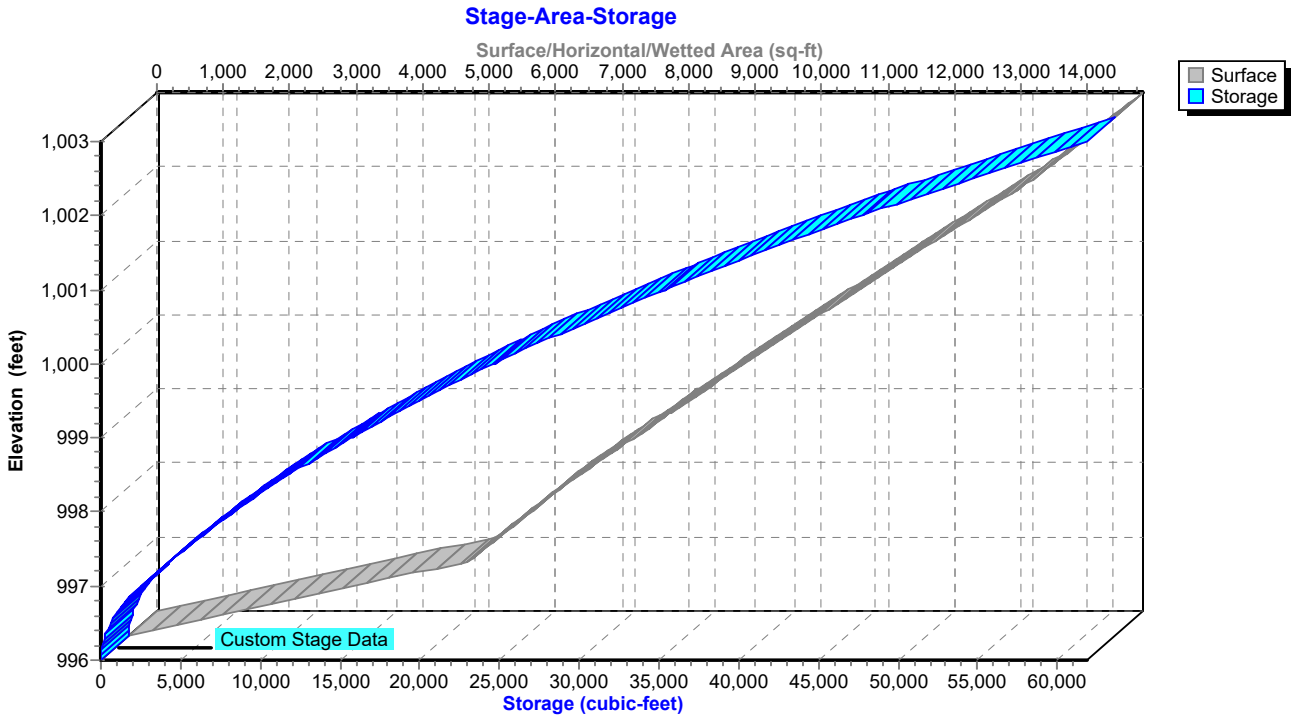
Pond 1P: Proposed Detention



Pond 1P: Proposed Detention



Pond 1P: Proposed Detention



Hydrograph for Pond 1P: Proposed Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	996.00	0.00	0.00	**0.00**
1.00	0.00	0	996.00	0.00	0.00	0.00
2.00	0.05	12	996.07	0.04	0.04	0.00
3.00	0.18	265	996.32	0.05	0.05	0.00
4.00	0.35	994	996.62	0.06	0.06	0.00
5.00	0.55	2,369	996.96	0.07	0.07	0.00
6.00	0.77	4,481	997.36	0.08	0.08	0.00
7.00	0.99	7,354	997.84	0.09	0.09	0.00
8.00	1.22	10,996	998.39	0.10	0.10	0.00
9.00	1.90	12,746	998.63	1.81	1.81	0.00
10.00	2.53	12,971	998.66	2.41	2.41	0.00
11.00	**4.80**	13,630	998.74	4.56	4.56	0.00
12.00	**99.23**	**46,659**	**1,001.92**	**85.12**	**85.12**	0.00
13.00	17.65	**17,625**	**999.23**	**19.40**	**19.40**	0.00
14.00	12.60	15,556	998.98	12.76	12.76	0.00
15.00	10.70	15,144	998.93	10.81	10.81	0.00
16.00	8.80	14,721	998.88	8.92	8.92	0.00
17.00	7.13	14,322	998.83	7.24	7.24	0.00
18.00	5.50	13,914	998.78	5.62	5.62	0.00
19.00	3.96	13,490	998.72	4.07	4.07	0.00
20.00	3.03	13,190	998.68	3.10	3.10	0.00
21.00	2.58	13,041	998.66	2.61	2.61	0.00
22.00	2.34	12,955	998.65	2.36	2.36	0.00
23.00	2.19	12,895	998.65	2.20	2.20	0.00
24.00	2.07	12,848	998.64	2.08	2.08	0.00
25.00	0.77	12,327	998.57	0.85	0.85	0.00
26.00	0.46	12,125	998.54	0.49	0.49	0.00
27.00	0.30	12,026	998.53	0.32	0.32	0.00
28.00	0.22	11,973	998.52	0.23	0.23	0.00
29.00	0.16	11,920	998.51	0.18	0.18	0.00
30.00	0.13	11,873	998.51	0.14	0.14	0.00
31.00	0.12	11,845	998.50	0.12	0.12	0.00
32.00	0.10	11,824	998.50	0.11	0.11	0.00
33.00	0.09	11,804	998.50	0.10	0.10	0.00
34.00	0.08	11,755	998.49	0.10	0.10	0.00
35.00	0.08	11,677	998.48	0.10	0.10	0.00
36.00	0.07	11,577	998.47	0.10	0.10	0.00
37.00	0.07	11,459	998.45	0.10	0.10	0.00
38.00	0.06	11,327	998.43	0.10	0.10	0.00
39.00	0.06	11,183	998.41	0.10	0.10	0.00
40.00	0.06	11,031	998.39	0.10	0.10	0.00
41.00	0.05	10,871	998.37	0.10	0.10	0.00
42.00	0.05	10,706	998.35	0.10	0.10	0.00
43.00	0.05	10,537	998.32	0.10	0.10	0.00
44.00	0.05	10,364	998.30	0.10	0.10	0.00
45.00	0.05	10,188	998.27	0.10	0.10	0.00
46.00	0.05	10,011	998.25	0.10	0.10	0.00
47.00	0.05	9,832	998.22	0.10	0.10	0.00
48.00	0.05	9,652	998.19	0.10	0.10	0.00

Stage-Discharge for Pond 1P: Proposed Detention

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
996.00	0.00	0.00	**0.00**
996.10	0.04	0.04	0.00
996.20	0.05	0.05	0.00
996.30	0.05	0.05	0.00
996.40	0.05	0.05	0.00
996.50	0.06	0.06	0.00
996.60	0.06	0.06	0.00
996.70	0.06	0.06	0.00
996.80	0.07	0.07	0.00
996.90	0.07	0.07	0.00
997.00	0.07	0.07	0.00
997.10	0.07	0.07	0.00
997.20	0.08	0.08	0.00
997.30	0.08	0.08	0.00
997.40	0.08	0.08	0.00
997.50	0.08	0.08	0.00
997.60	0.08	0.08	0.00
997.70	0.09	0.09	0.00
997.80	0.09	0.09	0.00
997.90	0.09	0.09	0.00
998.00	0.09	0.09	0.00
998.10	0.09	0.09	0.00
998.20	0.10	0.10	0.00
998.30	0.10	0.10	0.00
998.40	0.10	0.10	0.00
998.50	0.10	0.10	0.00
998.60	1.29	1.29	0.00
998.70	3.45	3.45	0.00
998.80	6.26	6.26	0.00
998.90	9.58	9.58	0.00
999.00	13.35	13.35	0.00
999.10	16.33	16.33	0.00
999.20	18.70	18.70	0.00
999.30	20.76	20.76	0.00
999.40	22.62	22.62	0.00
999.50	24.33	24.33	0.00
999.60	25.92	25.92	0.00
999.70	27.42	27.42	0.00
999.80	28.83	28.83	0.00
999.90	30.18	30.18	0.00
1,000.00	31.47	31.47	0.00
1,000.10	33.49	33.49	0.00
1,000.20	36.11	36.11	0.00
1,000.30	39.10	39.10	0.00
1,000.40	42.40	42.40	0.00
1,000.50	45.96	45.96	0.00
1,000.60	48.97	48.97	0.00
1,000.70	51.54	51.54	0.00
1,000.80	53.89	53.89	0.00
1,000.90	56.08	56.08	0.00
1,001.00	58.70	58.70	0.00
1,001.10	61.66	61.66	0.00
1,001.20	64.84	64.84	0.00
1,001.30	68.17	68.17	0.00
1,001.40	71.66	71.66	0.00
1,001.50	74.72	74.72	0.00
1,001.60	77.46	77.46	0.00
1,001.70	80.01	80.01	0.00
1,001.80	82.43	82.43	0.00
1,001.90	84.74	84.74	0.00
1,002.00	86.96	86.96	0.00
1,002.10	89.11	89.11	0.00
1,002.20	91.19	91.19	0.00
1,002.30	93.22	93.22	0.00
1,002.40	95.18	95.18	0.00
1,002.50	97.11	97.11	0.00
1,002.60	98.98	98.98	0.00
1,002.70	100.82	100.82	0.00
1,002.80	102.61	102.61	0.00
1,002.90	104.38	104.38	0.00
1,003.00	**106.10**	**106.10**	0.00

Stage-Area-Storage for Pond 1P: Proposed Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
996.00	0	0
996.10	510	25
996.20	1,019	102
996.30	1,528	229
996.40	2,038	408
996.50	2,548	637
996.60	3,057	917
996.70	3,567	1,248
996.80	4,076	1,630
996.90	4,585	2,063
997.00	5,095	2,548
997.10	5,237	3,064
997.20	5,379	3,595
997.30	5,522	4,140
997.40	5,664	4,699
997.50	5,806	5,273
997.60	5,948	5,860
997.70	6,090	6,462
997.80	6,233	7,079
997.90	6,375	7,709
998.00	6,517	8,354
998.10	6,679	9,013
998.20	6,841	9,689
998.30	7,002	10,381
998.40	7,164	11,090
998.50	7,326	11,814
998.60	7,488	12,555
998.70	7,650	13,312
998.80	7,811	14,085
998.90	7,973	14,874
999.00	8,135	15,680
999.10	8,303	16,501
999.20	8,470	17,340
999.30	8,637	18,195
999.40	8,805	19,067
999.50	8,973	19,956
999.60	9,140	20,862
999.70	9,308	21,784
999.80	9,475	22,723
999.90	9,642	23,679
1,000.00	9,810	24,652
1,000.10	9,982	25,642
1,000.20	10,154	26,648
1,000.30	10,325	27,672
1,000.40	10,497	28,713
1,000.50	10,669	29,772
1,000.60	10,841	30,847
1,000.70	11,013	31,940
1,000.80	11,184	33,050
1,000.90	11,356	34,177
1,001.00	11,528	35,321
1,001.10	11,710	36,483
1,001.20	11,892	37,663
1,001.30	12,073	38,861
1,001.40	12,255	40,078
1,001.50	12,437	41,312
1,001.60	12,619	42,565
1,001.70	12,801	43,836
1,001.80	12,982	45,125
1,001.90	13,164	46,432
1,002.00	13,346	47,758
1,002.10	13,494	49,100
1,002.20	13,643	50,457
1,002.30	13,791	51,829
1,002.40	13,939	53,215
1,002.50	14,088	54,616
1,002.60	14,236	56,033
1,002.70	14,384	57,464
1,002.80	14,532	58,909
1,002.90	14,681	60,370
1,003.00	**14,829**	**61,846**

Summary for Pond 6P: Firestone Detention

Inflow Area = 1.020 ac, 0.00% Impervious, Inflow Depth = 6.28" for Jackson - 100 YR event
Inflow = 10.81 cfs @ 11.96 hrs, Volume= 0.533 af
Outflow = 1.79 cfs @ 12.13 hrs, Volume= 0.410 af, Atten= 83%, Lag= 10.1 min
Primary = 1.79 cfs @ 12.13 hrs, Volume= 0.410 af
Routed to Pond 1P : Proposed Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,014.33' @ 12.13 hrs Surf.Area= 4,772 sf Storage= 12,727 cf

Plug-Flow detention time= 486.8 min calculated for 0.410 af (77% of inflow)
Center-of-Mass det. time= 401.3 min (1,180.3 - 779.0)

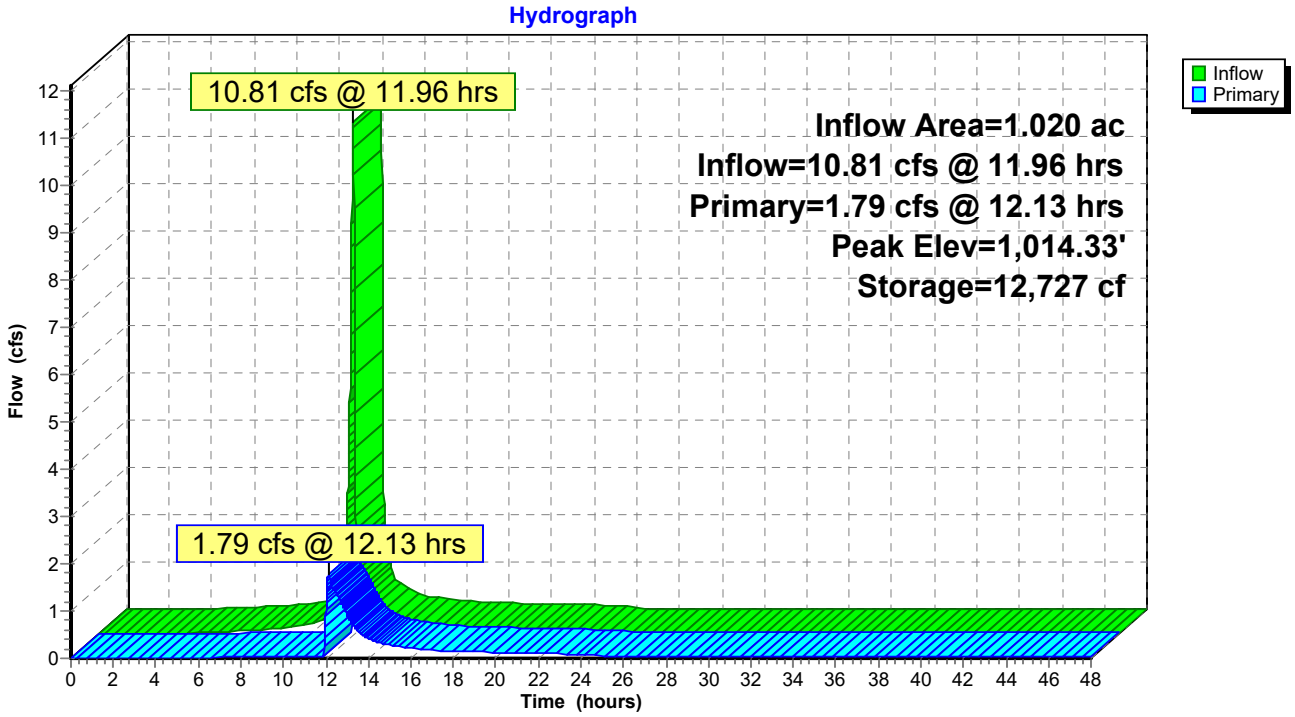
Volume	Invert	Avail.Storage	Storage Description
#1	1,009.54'	22,002 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,009.54	0	0	0
1,010.00	909	209	209
1,011.00	2,085	1,497	1,706
1,012.00	2,776	2,431	4,137
1,013.00	3,504	3,140	7,277
1,014.00	4,409	3,957	11,233
1,015.00	5,525	4,967	16,200
1,016.00	6,079	5,802	22,002

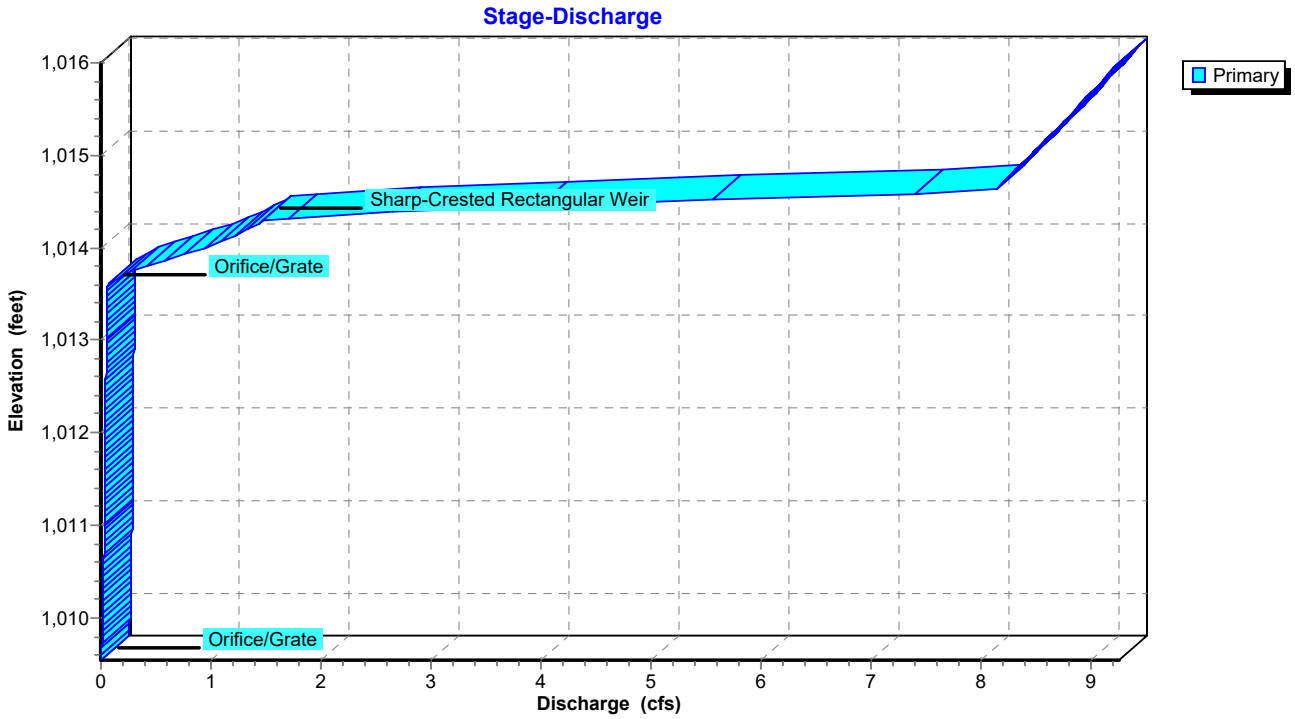
Device	Routing	Invert	Outlet Devices
#1	Primary	1,009.50'	**12.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,009.50' / 1,009.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,009.54'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,013.57'	**12.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,014.29'	**11.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.77 cfs @ 12.13 hrs HW=1,014.33' (Free Discharge)
↑**1=Culvert** (Passes 1.77 cfs of 7.86 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.49 fps)
3=Orifice/Grate (Orifice Controls 1.47 cfs @ 3.54 fps)
4=Sharp-Crested Rectangular Weir (Weir Controls 0.24 cfs @ 0.61 fps)

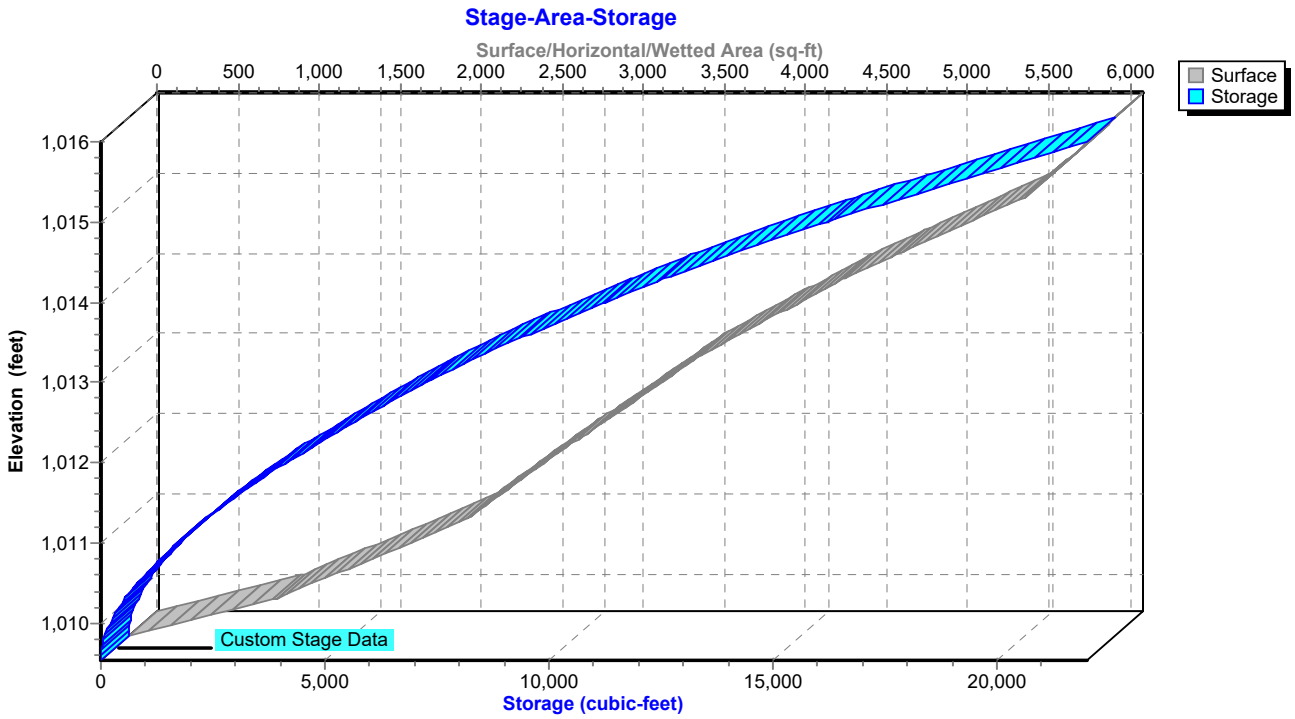
Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Hydrograph for Pond 6P: Firestone Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,009.54	0.00
1.00	0.00	0	1,009.54	0.00
2.00	0.00	0	1,009.54	0.00
3.00	0.00	0	1,009.54	0.00
4.00	0.01	11	1,009.64	0.01
5.00	0.03	56	1,009.78	0.01
6.00	0.05	151	1,009.93	0.02
7.00	0.07	306	1,010.10	0.02
8.00	0.09	527	1,010.29	0.02
9.00	0.15	874	1,010.54	0.03
10.00	0.21	1,401	1,010.85	0.03
11.00	**0.42**	2,369	1,011.30	0.03
12.00	**8.99**	**11,416**	**1,014.04**	**1.05**
13.00	0.50	**11,208**	**1,013.99**	**0.94**
14.00	0.29	10,382	1,013.80	0.41
15.00	0.23	10,117	1,013.74	0.28
16.00	0.18	9,975	1,013.71	0.22
17.00	0.16	9,882	1,013.68	0.18
18.00	0.14	9,826	1,013.67	0.16
19.00	0.12	9,769	1,013.66	0.14
20.00	0.10	9,709	1,013.64	0.12
21.00	0.10	9,666	1,013.63	0.10
22.00	0.09	9,644	1,013.63	0.10
23.00	0.09	9,628	1,013.62	0.09
24.00	0.09	9,615	1,013.62	0.09
25.00	0.00	9,398	1,013.56	0.05
26.00	0.00	9,210	1,013.52	0.05
27.00	0.00	9,023	1,013.47	0.05
28.00	0.00	8,837	1,013.42	0.05
29.00	0.00	8,653	1,013.37	0.05
30.00	0.00	8,469	1,013.33	0.05
31.00	0.00	8,287	1,013.28	0.05
32.00	0.00	8,105	1,013.23	0.05
33.00	0.00	7,926	1,013.18	0.05
34.00	0.00	7,747	1,013.13	0.05
35.00	0.00	7,569	1,013.08	0.05
36.00	0.00	7,393	1,013.03	0.05
37.00	0.00	7,218	1,012.98	0.05
38.00	0.00	7,044	1,012.93	0.05
39.00	0.00	6,872	1,012.88	0.05
40.00	0.00	6,701	1,012.83	0.05
41.00	0.00	6,531	1,012.78	0.05
42.00	0.00	6,362	1,012.73	0.05
43.00	0.00	6,195	1,012.68	0.05
44.00	0.00	6,030	1,012.63	0.05
45.00	0.00	5,865	1,012.58	0.05
46.00	0.00	5,702	1,012.53	0.05
47.00	0.00	5,541	1,012.48	0.04
48.00	0.00	5,381	1,012.42	0.04

Stage-Discharge for Pond 6P: Firestone Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,009.54	0.00	1,012.19	0.04	1,014.84	8.32
1,009.59	0.00	1,012.24	0.04	1,014.89	8.36
1,009.64	0.01	1,012.29	0.04	1,014.94	8.41
1,009.69	0.01	1,012.34	0.04	1,014.99	8.45
1,009.74	0.01	1,012.39	0.04	1,015.04	8.49
1,009.79	0.01	1,012.44	0.04	1,015.09	8.53
1,009.84	0.01	1,012.49	0.04	1,015.14	8.57
1,009.89	0.01	1,012.54	0.05	1,015.19	8.62
1,009.94	0.02	1,012.59	0.05	1,015.24	8.66
1,009.99	0.02	1,012.64	0.05	1,015.29	8.70
1,010.04	0.02	1,012.69	0.05	1,015.34	8.74
1,010.09	0.02	1,012.74	0.05	1,015.39	8.78
1,010.14	0.02	1,012.79	0.05	1,015.44	8.82
1,010.19	0.02	1,012.84	0.05	1,015.49	8.86
1,010.24	0.02	1,012.89	0.05	1,015.54	8.90
1,010.29	0.02	1,012.94	0.05	1,015.59	8.94
1,010.34	0.02	1,012.99	0.05	1,015.64	8.98
1,010.39	0.02	1,013.04	0.05	1,015.69	9.02
1,010.44	0.02	1,013.09	0.05	1,015.74	9.06
1,010.49	0.03	1,013.14	0.05	1,015.79	9.10
1,010.54	0.03	1,013.19	0.05	1,015.84	9.14
1,010.59	0.03	1,013.24	0.05	1,015.89	9.18
1,010.64	0.03	1,013.29	0.05	1,015.94	9.22
1,010.69	0.03	1,013.34	0.05	1,015.99	**9.26**
1,010.74	0.03	1,013.39	0.05		
1,010.79	0.03	1,013.44	0.05		
1,010.84	0.03	1,013.49	0.05		
1,010.89	0.03	1,013.54	0.05		
1,010.94	0.03	1,013.59	0.06		
1,010.99	0.03	1,013.64	0.11		
1,011.04	0.03	1,013.69	0.19		
1,011.09	0.03	1,013.74	0.28		
1,011.14	0.03	1,013.79	0.39		
1,011.19	0.03	1,013.84	0.50		
1,011.24	0.03	1,013.89	0.64		
1,011.29	0.03	1,013.94	0.78		
1,011.34	0.03	1,013.99	0.93		
1,011.39	0.04	1,014.04	1.05		
1,011.44	0.04	1,014.09	1.15		
1,011.49	0.04	1,014.14	1.24		
1,011.54	0.04	1,014.19	1.33		
1,011.59	0.04	1,014.24	1.41		
1,011.64	0.04	1,014.29	1.48		
1,011.69	0.04	1,014.34	1.95		
1,011.74	0.04	1,014.39	2.75		
1,011.79	0.04	1,014.44	3.77		
1,011.84	0.04	1,014.49	4.95		
1,011.89	0.04	1,014.54	6.28		
1,011.94	0.04	1,014.59	7.74		
1,011.99	0.04	1,014.64	8.15		
1,012.04	0.04	1,014.69	8.19		
1,012.09	0.04	1,014.74	8.23		
1,012.14	0.04	1,014.79	8.28		

Stage-Area-Storage for Pond 6P: Firestone Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,009.54	0	0
1,009.64	198	10
1,009.74	395	40
1,009.84	593	89
1,009.94	790	158
1,010.04	956	246
1,010.14	1,074	348
1,010.24	1,191	461
1,010.34	1,309	586
1,010.44	1,426	723
1,010.54	1,544	871
1,010.64	1,662	1,032
1,010.74	1,779	1,204
1,010.84	1,897	1,388
1,010.94	2,014	1,583
1,011.04	2,113	1,790
1,011.14	2,182	2,005
1,011.24	2,251	2,226
1,011.34	2,320	2,455
1,011.44	2,389	2,690
1,011.54	2,458	2,933
1,011.64	2,527	3,182
1,011.74	2,596	3,438
1,011.84	2,665	3,701
1,011.94	2,735	3,971
1,012.04	2,805	4,248
1,012.14	2,878	4,532
1,012.24	2,951	4,824
1,012.34	3,024	5,122
1,012.44	3,096	5,428
1,012.54	3,169	5,742
1,012.64	3,242	6,062
1,012.74	3,315	6,390
1,012.84	3,388	6,725
1,012.94	3,460	7,068
1,013.04	3,540	7,417
1,013.14	3,631	7,776
1,013.24	3,721	8,144
1,013.34	3,812	8,520
1,013.44	3,902	8,906
1,013.54	3,993	9,301
1,013.64	4,083	9,704
1,013.74	4,174	10,117
1,013.84	4,264	10,539
1,013.94	4,355	10,970
1,014.04	4,454	11,410
1,014.14	4,565	11,861
1,014.24	4,677	12,323
1,014.34	4,788	12,797
1,014.44	4,900	13,281
1,014.54	5,012	13,777
1,014.64	5,123	14,283
1,014.74	5,235	14,801
1,014.84	5,346	15,330
1,014.94	5,458	15,871
1,015.04	5,547	16,422
1,015.14	5,603	16,979
1,015.24	5,658	17,542
1,015.34	5,713	18,111
1,015.44	5,769	18,685
1,015.54	5,824	19,264
1,015.64	5,880	19,850
1,015.74	5,935	20,440
1,015.84	5,990	21,037
1,015.94	**6,046**	**21,638**

Summary for Pond 8P: Walmart Detention

Inflow Area = 12.230 ac, 0.00% Impervious, Inflow Depth = 5.58" for Jackson - 100 YR event
Inflow = 65.61 cfs @ 12.17 hrs, Volume= 5.682 af
Outflow = 14.17 cfs @ 12.71 hrs, Volume= 4.967 af, Atten= 78%, Lag= 32.3 min
Primary = 14.17 cfs @ 12.71 hrs, Volume= 4.967 af
Routed to Pond 1P : Proposed Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,015.23' @ 12.71 hrs Surf.Area= 25,190 sf Storage= 129,948 cf

Plug-Flow detention time= 213.4 min calculated for 4.966 af (87% of inflow)
Center-of-Mass det. time= 153.2 min (967.1 - 813.9)

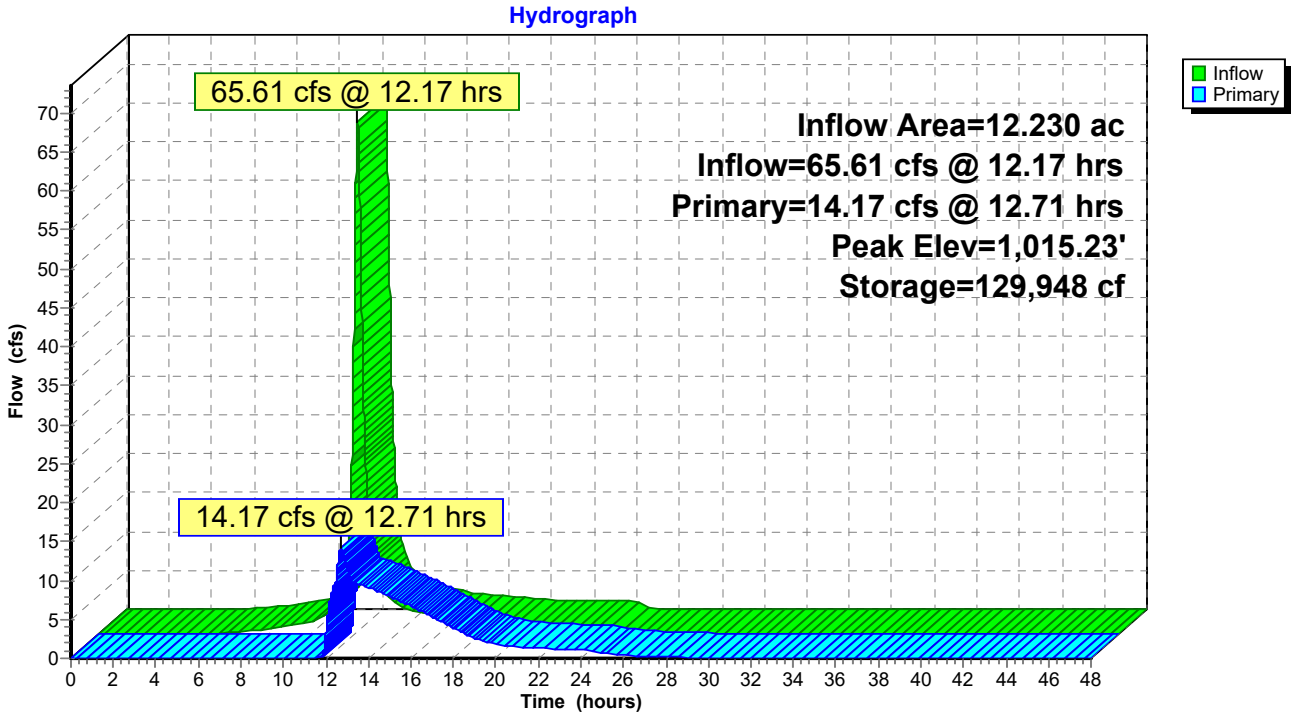
Volume	Invert	Avail.Storage	Storage Description
#1	1,005.00'	150,049 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,005.00	0	0	0
1,006.00	627	314	314
1,007.00	1,983	1,305	1,619
1,008.00	5,044	3,514	5,132
1,009.00	10,030	7,537	12,669
1,010.00	14,662	12,346	25,015
1,010.40	15,976	6,128	31,143
1,011.00	17,049	9,908	41,050
1,011.46	17,886	8,035	49,085
1,012.00	18,879	9,927	59,012
1,013.00	20,773	19,826	78,838
1,014.00	22,710	21,742	100,579
1,015.00	24,723	23,717	124,296
1,016.00	26,783	25,753	150,049

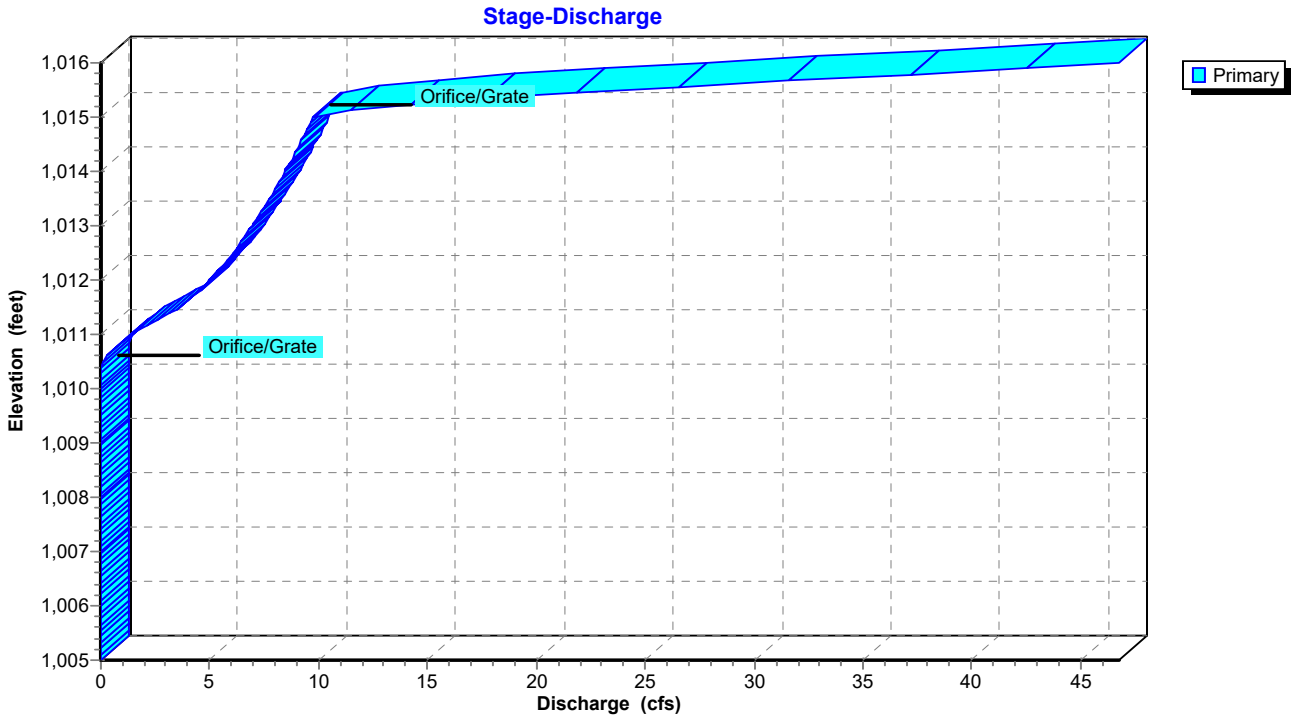
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.83'	**30.0" Round Culvert** L= 87.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,004.83' / 1,004.48' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	1,010.40'	**12.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,015.00'	**144.0" W x 10.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=14.16 cfs @ 12.71 hrs HW=1,015.23' (Free Discharge)
↑**1=Culvert** (Passes 14.16 cfs of 71.48 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 10.01 cfs @ 10.01 fps)
3=Orifice/Grate (Orifice Controls 4.15 cfs @ 1.53 fps)

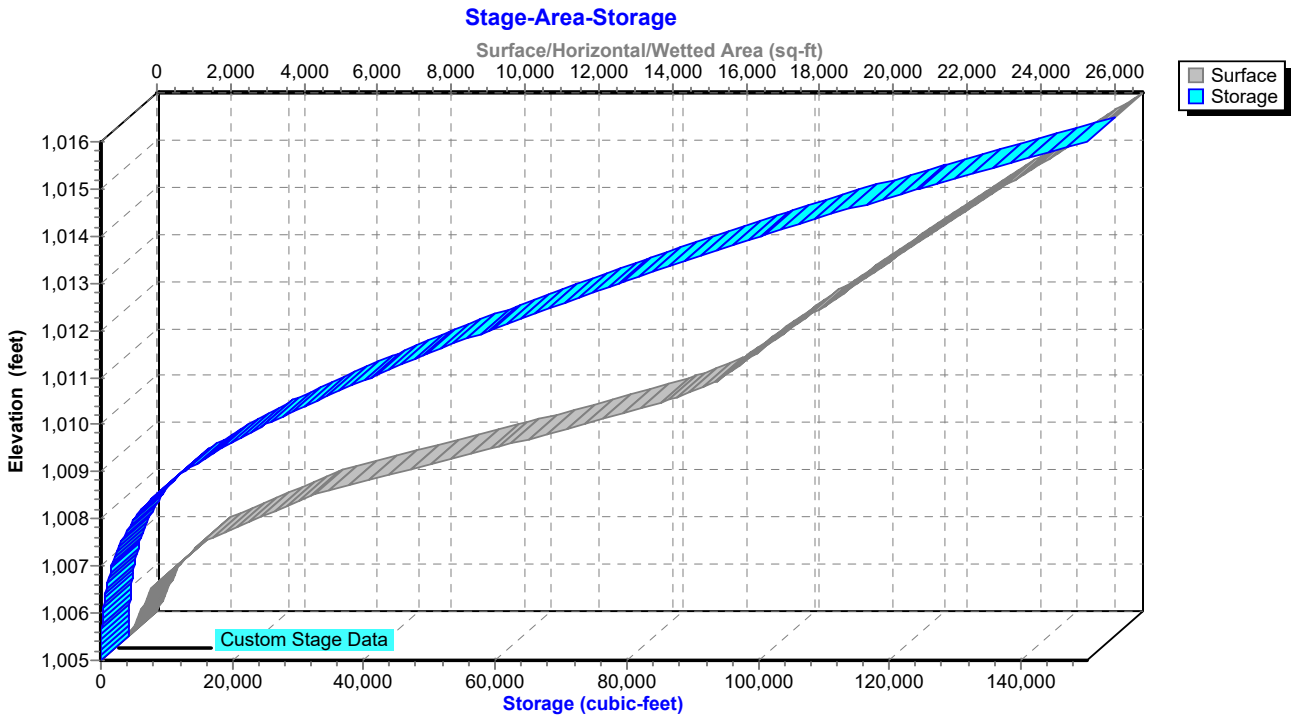
Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Hydrograph for Pond 8P: Walmart Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,005.00	0.00
1.00	0.00	0	1,005.00	0.00
2.00	0.00	0	1,005.00	0.00
3.00	0.00	0	1,005.00	0.00
4.00	0.00	0	1,005.00	0.00
5.00	0.01	3	1,005.09	0.00
6.00	0.17	309	1,005.99	0.00
7.00	0.37	1,282	1,006.82	0.00
8.00	0.60	3,021	1,007.51	0.00
9.00	1.03	5,819	1,008.13	0.00
10.00	1.57	10,481	1,008.77	0.00
11.00	3.15	18,463	1,009.52	0.00
12.00	**39.00**	**48,829**	**1,011.45**	**3.39**
13.00	**8.15**	**127,322**	**1,015.12**	**11.53**
14.00	3.94	111,776	1,014.48	9.11
15.00	2.88	92,814	1,013.65	7.98
16.00	2.27	75,648	1,012.85	6.70
17.00	1.91	61,428	1,012.13	5.29
18.00	1.69	51,377	1,011.59	3.89
19.00	1.47	45,550	1,011.26	2.56
20.00	1.25	42,636	1,011.09	1.85
21.00	1.14	40,954	1,010.99	1.47
22.00	1.09	40,051	1,010.94	1.28
23.00	1.05	39,512	1,010.91	1.17
24.00	1.01	39,136	1,010.89	1.10
25.00	0.01	37,107	1,010.77	0.72
26.00	0.00	35,169	1,010.65	0.40
27.00	0.00	34,031	1,010.58	0.25
28.00	0.00	33,295	1,010.53	0.16
29.00	0.00	32,810	1,010.50	0.11
30.00	0.00	32,470	1,010.48	0.08
31.00	0.00	32,200	1,010.47	0.07
32.00	0.00	31,985	1,010.45	0.05
33.00	0.00	31,813	1,010.44	0.04
34.00	0.00	31,677	1,010.43	0.03
35.00	0.00	31,568	1,010.43	0.03
36.00	0.00	31,482	1,010.42	0.02
37.00	0.00	31,413	1,010.42	0.02
38.00	0.00	31,358	1,010.41	0.01
39.00	0.00	31,314	1,010.41	0.01
40.00	0.00	31,279	1,010.41	0.01
41.00	0.00	31,251	1,010.41	0.01
42.00	0.00	31,229	1,010.41	0.01
43.00	0.00	31,212	1,010.40	0.00
44.00	0.00	31,198	1,010.40	0.00
45.00	0.00	31,186	1,010.40	0.00
46.00	0.00	31,177	1,010.40	0.00
47.00	0.00	31,170	1,010.40	0.00
48.00	0.00	31,165	1,010.40	0.00

Stage-Discharge for Pond 8P: Walmart Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,005.00	0.00	1,010.30	0.00	1,015.60	28.34
1,005.10	0.00	1,010.40	0.00	1,015.70	33.10
1,005.20	0.00	1,010.50	0.10	1,015.80	38.22
1,005.30	0.00	1,010.60	0.29	1,015.90	42.99
1,005.40	0.00	1,010.70	0.53	1,016.00	**46.77**
1,005.50	0.00	1,010.80	0.81		
1,005.60	0.00	1,010.90	1.13		
1,005.70	0.00	1,011.00	1.49		
1,005.80	0.00	1,011.10	1.88		
1,005.90	0.00	1,011.20	2.30		
1,006.00	0.00	1,011.30	2.74		
1,006.10	0.00	1,011.40	3.21		
1,006.20	0.00	1,011.50	3.60		
1,006.30	0.00	1,011.60	3.93		
1,006.40	0.00	1,011.70	4.23		
1,006.50	0.00	1,011.80	4.51		
1,006.60	0.00	1,011.90	4.76		
1,006.70	0.00	1,012.00	5.00		
1,006.80	0.00	1,012.10	5.24		
1,006.90	0.00	1,012.20	5.46		
1,007.00	0.00	1,012.30	5.67		
1,007.10	0.00	1,012.40	5.87		
1,007.20	0.00	1,012.50	6.07		
1,007.30	0.00	1,012.60	6.25		
1,007.40	0.00	1,012.70	6.44		
1,007.50	0.00	1,012.80	6.62		
1,007.60	0.00	1,012.90	6.79		
1,007.70	0.00	1,013.00	6.96		
1,007.80	0.00	1,013.10	7.13		
1,007.90	0.00	1,013.20	7.29		
1,008.00	0.00	1,013.30	7.45		
1,008.10	0.00	1,013.40	7.60		
1,008.20	0.00	1,013.50	7.75		
1,008.30	0.00	1,013.60	7.90		
1,008.40	0.00	1,013.70	8.05		
1,008.50	0.00	1,013.80	8.19		
1,008.60	0.00	1,013.90	8.33		
1,008.70	0.00	1,014.00	8.47		
1,008.80	0.00	1,014.10	8.60		
1,008.90	0.00	1,014.20	8.74		
1,009.00	0.00	1,014.30	8.87		
1,009.10	0.00	1,014.40	9.00		
1,009.20	0.00	1,014.50	9.13		
1,009.30	0.00	1,014.60	9.25		
1,009.40	0.00	1,014.70	9.38		
1,009.50	0.00	1,014.80	9.50		
1,009.60	0.00	1,014.90	9.62		
1,009.70	0.00	1,015.00	9.74		
1,009.80	0.00	1,015.10	11.08		
1,009.90	0.00	1,015.20	13.42		
1,010.00	0.00	1,015.30	16.42		
1,010.10	0.00	1,015.40	19.95		
1,010.20	0.00	1,015.50	23.94		

Stage-Area-Storage for Pond 8P: Walmart Detention

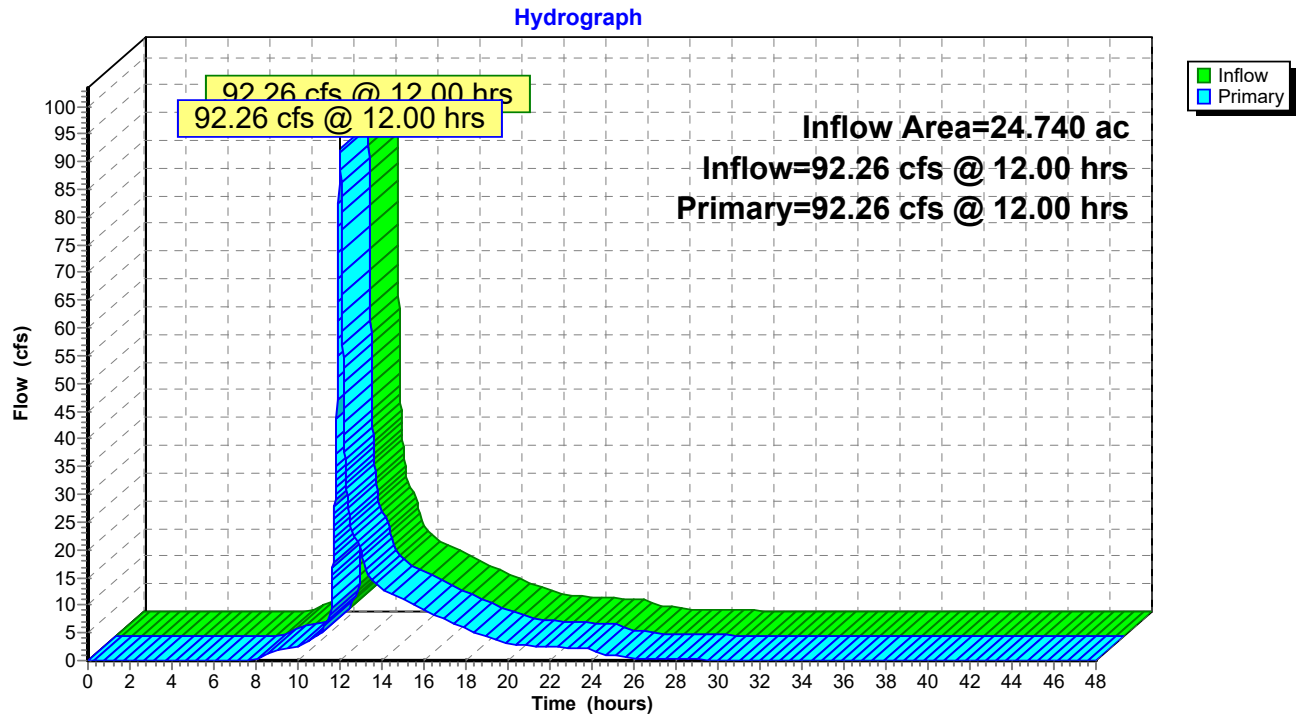
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,005.00	0	0
1,005.20	125	13
1,005.40	251	50
1,005.60	376	113
1,005.80	502	201
1,006.00	627	314
1,006.20	898	466
1,006.40	1,169	673
1,006.60	1,441	934
1,006.80	1,712	1,249
1,007.00	1,983	1,619
1,007.20	2,595	2,076
1,007.40	3,207	2,657
1,007.60	3,820	3,359
1,007.80	4,432	4,184
1,008.00	5,044	5,132
1,008.20	6,041	6,241
1,008.40	7,038	7,548
1,008.60	8,036	9,056
1,008.80	9,033	10,763
1,009.00	10,030	12,669
1,009.20	10,956	14,768
1,009.40	11,883	17,052
1,009.60	12,809	19,521
1,009.80	13,736	22,175
1,010.00	14,662	25,015
1,010.20	15,319	28,013
1,010.40	15,976	31,143
1,010.60	16,334	34,374
1,010.80	16,691	37,676
1,011.00	17,049	41,050
1,011.20	17,413	44,496
1,011.40	17,777	48,015
1,011.60	18,143	51,607
1,011.80	18,511	55,273
1,012.00	18,879	59,012
1,012.20	19,258	62,825
1,012.40	19,637	66,715
1,012.60	20,015	70,680
1,012.80	20,394	74,721
1,013.00	20,773	78,838
1,013.20	21,160	83,031
1,013.40	21,548	87,302
1,013.60	21,935	91,650
1,013.80	22,323	96,076
1,014.00	22,710	100,579
1,014.20	23,113	105,161
1,014.40	23,515	109,824
1,014.60	23,918	114,568
1,014.80	24,320	119,391
1,015.00	24,723	124,296
1,015.20	25,135	129,282
1,015.40	25,547	134,350
1,015.60	25,959	139,500
1,015.80	26,371	144,733
1,016.00	**26,783**	**150,049**

Summary for Link 1L: Proposed Total

Inflow Area = 24.740 ac, 9.42% Impervious, Inflow Depth > 5.50" for Jackson - 100 YR event
Inflow = 92.26 cfs @ 12.00 hrs, Volume= 11.347 af
Primary = 92.26 cfs @ 12.00 hrs, Volume= 11.347 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Proposed Total



Hydrograph for Link 1L: Proposed Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
0.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00
2.00	0.04	0.00	0.04
2.50	0.05	0.00	0.05
3.00	0.05	0.00	0.05
3.50	0.06	0.00	0.06
4.00	0.06	0.00	0.06
4.50	0.07	0.00	0.07
5.00	0.07	0.00	0.07
5.50	0.07	0.00	0.07
6.00	0.08	0.00	0.08
6.50	0.08	0.00	0.08
7.00	0.09	0.00	0.09
7.50	0.11	0.00	0.11
8.00	0.12	0.00	0.12
8.50	1.30	0.00	1.30
9.00	1.86	0.00	1.86
9.50	2.06	0.00	2.06
10.00	2.49	0.00	2.49
10.50	3.36	0.00	3.36
11.00	4.78	0.00	4.78
11.50	8.04	0.00	8.04
12.00	**92.19**	0.00	**92.19**
12.50	24.44	0.00	24.44
13.00	19.82	0.00	19.82
13.50	14.67	0.00	14.67
14.00	13.01	0.00	13.01
14.50	11.94	0.00	11.94
15.00	11.01	0.00	11.01
15.50	10.06	0.00	10.06
16.00	9.07	0.00	9.07
16.50	8.21	0.00	8.21
17.00	7.38	0.00	7.38
17.50	6.55	0.00	6.55
18.00	5.74	0.00	5.74
18.50	4.92	0.00	4.92
19.00	4.17	0.00	4.17
19.50	3.61	0.00	3.61
20.00	3.18	0.00	3.18
20.50	2.89	0.00	2.89
21.00	2.69	0.00	2.69
21.50	2.56	0.00	2.56
22.00	2.44	0.00	2.44
22.50	2.36	0.00	2.36
23.00	2.28	0.00	2.28
23.50	2.22	0.00	2.22
24.00	2.16	0.00	2.16
24.50	1.11	0.00	1.11
25.00	0.85	0.00	0.85
25.50	0.64	0.00	0.64
26.00	0.49	0.00	0.49
26.50	0.39	0.00	0.39
27.00	0.32	0.00	0.32
27.50	0.27	0.00	0.27
28.00	0.23	0.00	0.23
28.50	0.20	0.00	0.20
29.00	0.18	0.00	0.18
29.50	0.16	0.00	0.16
30.00	0.14	0.00	0.14
30.50	0.13	0.00	0.13
31.00	0.12	0.00	0.12
31.50	0.12	0.00	0.12
32.00	0.11	0.00	0.11
32.50	0.10	0.00	0.10
33.00	0.10	0.00	0.10
33.50	0.10	0.00	0.10
34.00	0.10	0.00	0.10
34.50	0.10	0.00	0.10
35.00	0.10	0.00	0.10
35.50	0.10	0.00	0.10
36.00	0.10	0.00	0.10
36.50	0.10	0.00	0.10
37.00	0.10	0.00	0.10
37.50	0.10	0.00	0.10
38.00	0.10	0.00	0.10
38.50	0.10	0.00	0.10
39.00	0.10	0.00	0.10
39.50	0.10	0.00	0.10
40.00	0.10	0.00	0.10
40.50	0.10	0.00	0.10
41.00	0.10	0.00	0.10
41.50	0.10	0.00	0.10
42.00	0.10	0.00	0.10
42.50	0.10	0.00	0.10
43.00	0.10	0.00	0.10
43.50	0.10	0.00	0.10
44.00	0.10	0.00	0.10
44.50	0.10	0.00	0.10
45.00	0.10	0.00	0.10
45.50	0.10	0.00	0.10
46.00	0.10	0.00	0.10
46.50	0.10	0.00	0.10
47.00	0.10	0.00	0.10
47.50	0.10	0.00	0.10
48.00	0.10	0.00	0.10

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Proposed Onsite Runoff Area=4.050 ac 57.53% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=88 Runoff=16.54 cfs 0.766 af

Subcatchment 2S: Walmart Bypass Runoff Area=0.540 ac 0.00% Impervious Runoff Depth=1.94"
Tc=5.0 min CN=84 Runoff=1.92 cfs 0.087 af

Subcatchment 3S: Proposed Onsite Bypass Runoff Area=0.980 ac 0.00% Impervious Runoff Depth=1.24"
Tc=5.0 min CN=74 Runoff=2.26 cfs 0.101 af

Subcatchment 4S: Firestone Bypass Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=88 Runoff=0.90 cfs 0.042 af

Subcatchment 5S: Firestone Detention Runoff Area=1.020 ac 0.00% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=88 Runoff=4.17 cfs 0.193 af

Subcatchment 6S: Market Street RW Runoff Area=1.500 ac 0.00% Impervious Runoff Depth=2.84"
Tc=5.0 min CN=94 Runoff=7.20 cfs 0.354 af

Subcatchment 7S: Walmart Detention Runoff Area=12.230 ac 0.00% Impervious Runoff Depth=1.78"
Tc=24.9 min CN=82 Runoff=21.20 cfs 1.817 af

Subcatchment 9S: Commercial Plus RW Runoff Area=4.200 ac 0.00% Impervious Runoff Depth=2.84"
Tc=5.0 min CN=94 Runoff=20.16 cfs 0.992 af

Pond 1P: Proposed Detention Peak Elev=1,000.04' Storage=25,005 cf Inflow=46.75 cfs 3.476 af
Primary=32.14 cfs 3.270 af Secondary=0.00 cfs 0.000 af Outflow=32.14 cfs 3.270 af

Pond 6P: Firestone Detention Peak Elev=1,012.70' Storage=6,249 cf Inflow=4.17 cfs 0.193 af
Outflow=0.05 cfs 0.133 af

Pond 8P: Walmart Detention Peak Elev=1,011.20' Storage=44,415 cf Inflow=21.20 cfs 1.817 af
Outflow=2.28 cfs 1.101 af

Link 1L: Proposed Total Inflow=33.87 cfs 3.371 af
Primary=33.87 cfs 3.371 af

Total Runoff Area = 24.740 ac Runoff Volume = 4.352 af Average Runoff Depth = 2.11"
90.58% Pervious = 22.410 ac 9.42% Impervious = 2.330 ac

Summary for Subcatchment 1S: Proposed Onsite Detention

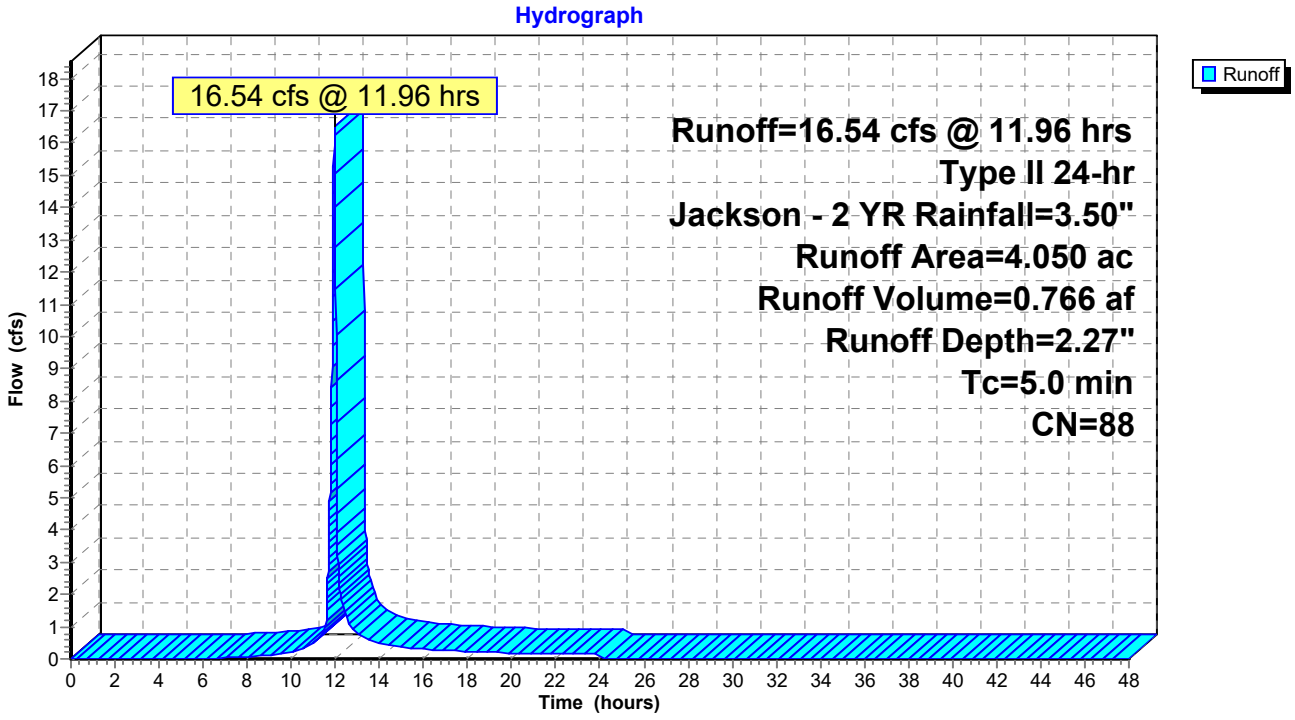
Runoff = 16.54 cfs @ 11.96 hrs, Volume= 0.766 af, Depth= 2.27"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

Area (ac)	CN	Description
1.720	74	>75% Grass cover, Good, HSG C
2.330	98	Paved parking, HSG D
4.050	88	Weighted Average
1.720		42.47% Pervious Area
2.330		57.53% Impervious Area

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

Subcatchment 1S: Proposed Onsite Detention



Hydrograph for Subcatchment 1S: Proposed Onsite Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.01
7.00	0.35	0.00	0.03
7.50	0.38	0.01	0.04
8.00	0.42	0.01	0.06
8.50	0.46	0.02	0.08
9.00	0.51	0.04	0.12
9.50	0.57	0.05	0.15
10.00	0.63	0.08	0.20
10.50	0.71	0.11	0.30
11.00	0.82	0.16	0.47
11.50	0.99	0.25	**0.90**
12.00	2.32	1.23	**14.00**
12.50	2.57	1.44	1.28
13.00	2.70	1.56	0.81
13.50	2.80	1.64	0.62
14.00	2.87	1.70	0.49
14.50	2.93	1.76	0.43
15.00	2.99	1.81	0.39
15.50	3.04	1.85	0.34
16.00	3.08	1.89	0.30
16.50	3.12	1.92	0.28
17.00	3.16	1.96	0.27
17.50	3.19	1.99	0.25
18.00	3.22	2.02	0.23
18.50	3.25	2.05	0.22
19.00	3.28	2.07	0.20
19.50	3.31	2.09	0.19
20.00	3.33	2.12	0.17
20.50	3.35	2.14	0.17
21.00	3.38	2.16	0.16
21.50	3.40	2.18	0.16
22.00	3.42	2.20	0.16
22.50	3.44	2.21	0.15
23.00	3.46	2.23	0.15
23.50	3.48	2.25	0.15
24.00	**3.50**	**2.27**	0.14
24.50	3.50	2.27	0.00
25.00	3.50	2.27	0.00
25.50	3.50	2.27	0.00
26.00	3.50	2.27	0.00
26.50	3.50	2.27	0.00
27.00	3.50	2.27	0.00
27.50	3.50	2.27	0.00
28.00	3.50	2.27	0.00
28.50	3.50	2.27	0.00
29.00	3.50	2.27	0.00
29.50	3.50	2.27	0.00
30.00	3.50	2.27	0.00
30.50	3.50	2.27	0.00
31.00	3.50	2.27	0.00
31.50	3.50	2.27	0.00
32.00	3.50	2.27	0.00
32.50	3.50	2.27	0.00
33.00	3.50	2.27	0.00
33.50	3.50	2.27	0.00
34.00	3.50	2.27	0.00
34.50	3.50	2.27	0.00
35.00	3.50	2.27	0.00
35.50	3.50	2.27	0.00
36.00	3.50	2.27	0.00
36.50	3.50	2.27	0.00
37.00	3.50	2.27	0.00
37.50	3.50	2.27	0.00
38.00	3.50	2.27	0.00
38.50	3.50	2.27	0.00
39.00	3.50	2.27	0.00
39.50	3.50	2.27	0.00
40.00	3.50	2.27	0.00
40.50	3.50	2.27	0.00
41.00	3.50	2.27	0.00
41.50	3.50	2.27	0.00
42.00	3.50	2.27	0.00
42.50	3.50	2.27	0.00
43.00	3.50	2.27	0.00
43.50	3.50	2.27	0.00
44.00	3.50	2.27	0.00
44.50	3.50	2.27	0.00
45.00	3.50	2.27	0.00
45.50	3.50	2.27	0.00
46.00	3.50	2.27	0.00
46.50	3.50	2.27	0.00
47.00	3.50	2.27	0.00
47.50	3.50	2.27	0.00
48.00	3.50	2.27	0.00

Summary for Subcatchment 2S: Walmart Bypass

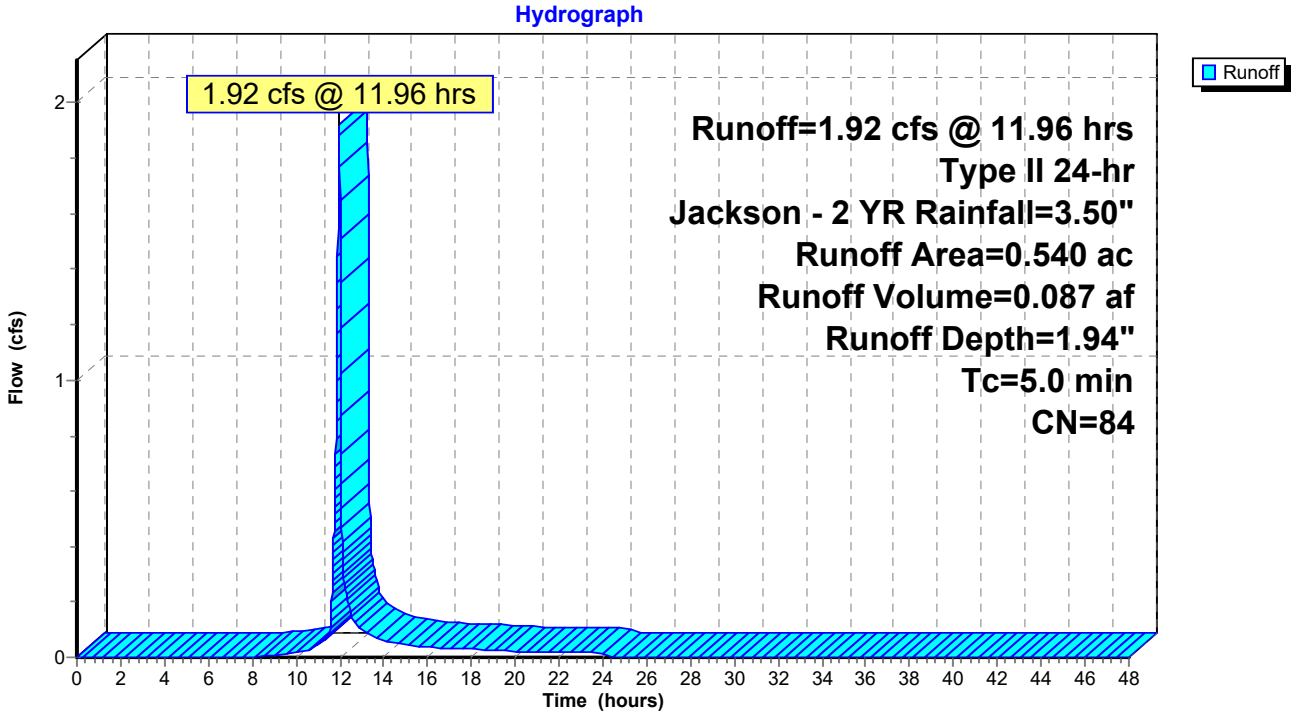
Runoff = 1.92 cfs @ 11.96 hrs, Volume= 0.087 af, Depth= 1.94"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	0.540	84	
	0.540		100.00% Pervious Area

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

Subcatchment 2S: Walmart Bypass



Hydrograph for Subcatchment 2S: Walmart Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.00
7.50	0.38	0.00	0.00
8.00	0.42	0.00	0.00
8.50	0.46	0.00	0.00
9.00	0.51	0.01	0.01
9.50	0.57	0.02	0.01
10.00	0.63	0.03	0.02
10.50	0.71	0.05	0.03
11.00	0.82	0.08	0.04
11.50	0.99	0.15	**0.09**
12.00	2.32	0.98	**1.65**
12.50	2.57	1.17	0.16
13.00	2.70	1.27	0.10
13.50	2.80	1.35	0.08
14.00	2.87	1.41	0.06
14.50	2.93	1.46	0.05
15.00	2.99	1.51	0.05
15.50	3.04	1.55	0.04
16.00	3.08	1.58	0.04
16.50	3.12	1.61	0.03
17.00	3.16	1.65	0.03
17.50	3.19	1.67	0.03
18.00	3.22	1.70	0.03
18.50	3.25	1.73	0.03
19.00	3.28	1.75	0.03
19.50	3.31	1.77	0.02
20.00	3.33	1.79	0.02
20.50	3.35	1.81	0.02
21.00	3.38	1.83	0.02
21.50	3.40	1.85	0.02
22.00	3.42	1.87	0.02
22.50	3.44	1.89	0.02
23.00	3.46	1.90	0.02
23.50	3.48	1.92	0.02
24.00	**3.50**	**1.94**	0.02
24.50	3.50	1.94	0.00
25.00	3.50	1.94	0.00
25.50	3.50	1.94	0.00
26.00	3.50	1.94	0.00
26.50	3.50	1.94	0.00
27.00	3.50	1.94	0.00
27.50	3.50	1.94	0.00
28.00	3.50	1.94	0.00
28.50	3.50	1.94	0.00
29.00	3.50	1.94	0.00
29.50	3.50	1.94	0.00
30.00	3.50	1.94	0.00
30.50	3.50	1.94	0.00
31.00	3.50	1.94	0.00
31.50	3.50	1.94	0.00
32.00	3.50	1.94	0.00
32.50	3.50	1.94	0.00
33.00	3.50	1.94	0.00
33.50	3.50	1.94	0.00
34.00	3.50	1.94	0.00
34.50	3.50	1.94	0.00
35.00	3.50	1.94	0.00
35.50	3.50	1.94	0.00
36.00	3.50	1.94	0.00
36.50	3.50	1.94	0.00
37.00	3.50	1.94	0.00
37.50	3.50	1.94	0.00
38.00	3.50	1.94	0.00
38.50	3.50	1.94	0.00
39.00	3.50	1.94	0.00
39.50	3.50	1.94	0.00
40.00	3.50	1.94	0.00
40.50	3.50	1.94	0.00
41.00	3.50	1.94	0.00
41.50	3.50	1.94	0.00
42.00	3.50	1.94	0.00
42.50	3.50	1.94	0.00
43.00	3.50	1.94	0.00
43.50	3.50	1.94	0.00
44.00	3.50	1.94	0.00
44.50	3.50	1.94	0.00
45.00	3.50	1.94	0.00
45.50	3.50	1.94	0.00
46.00	3.50	1.94	0.00
46.50	3.50	1.94	0.00
47.00	3.50	1.94	0.00
47.50	3.50	1.94	0.00
48.00	3.50	1.94	0.00

Summary for Subcatchment 3S: Proposed Onsite Bypass

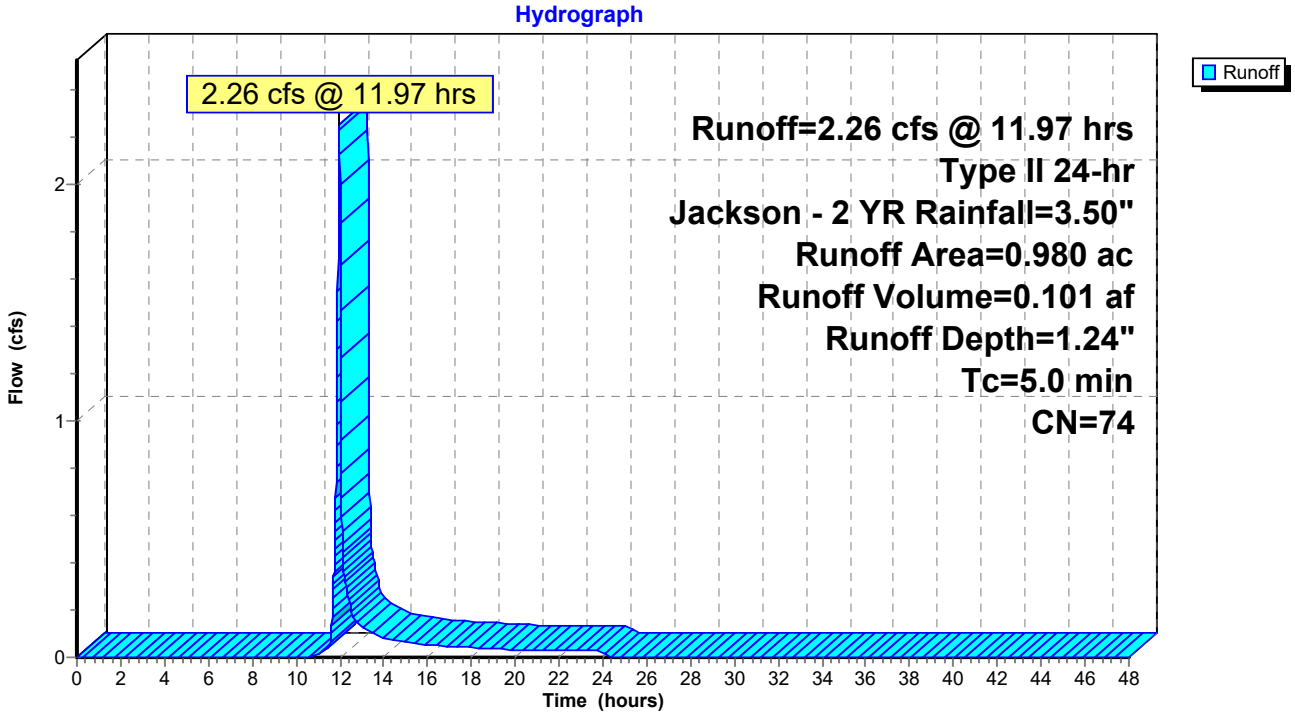
Runoff = 2.26 cfs @ 11.97 hrs, Volume= 0.101 af, Depth= 1.24"
Routed to Link 1L : Proposed Total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

Area (ac)	CN	Description
0.980	74	>75% Grass cover, Good, HSG C
0.980		100.00% Pervious Area

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

Subcatchment 3S: Proposed Onsite Bypass



Hydrograph for Subcatchment 3S: Proposed Onsite Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.00
7.50	0.38	0.00	0.00
8.00	0.42	0.00	0.00
8.50	0.46	0.00	0.00
9.00	0.51	0.00	0.00
9.50	0.57	0.00	0.00
10.00	0.63	0.00	0.00
10.50	0.71	0.00	0.00
11.00	0.82	0.00	0.01
11.50	0.99	0.02	**0.05**
12.00	2.32	0.51	**2.00**
12.50	2.57	0.65	0.21
13.00	2.70	0.73	0.13
13.50	2.80	0.78	0.10
14.00	2.87	0.83	0.08
14.50	2.93	0.87	0.07
15.00	2.99	0.90	0.07
15.50	3.04	0.93	0.06
16.00	3.08	0.96	0.05
16.50	3.12	0.98	0.05
17.00	3.16	1.01	0.05
17.50	3.19	1.03	0.04
18.00	3.22	1.05	0.04
18.50	3.25	1.07	0.04
19.00	3.28	1.09	0.04
19.50	3.31	1.11	0.03
20.00	3.33	1.13	0.03
20.50	3.35	1.14	0.03
21.00	3.38	1.16	0.03
21.50	3.40	1.17	0.03
22.00	3.42	1.18	0.03
22.50	3.44	1.20	0.03
23.00	3.46	1.21	0.03
23.50	3.48	1.23	0.03
24.00	**3.50**	**1.24**	0.03
24.50	3.50	1.24	0.00
25.00	3.50	1.24	0.00
25.50	3.50	1.24	0.00
26.00	3.50	1.24	0.00
26.50	3.50	1.24	0.00
27.00	3.50	1.24	0.00
27.50	3.50	1.24	0.00
28.00	3.50	1.24	0.00
28.50	3.50	1.24	0.00
29.00	3.50	1.24	0.00
29.50	3.50	1.24	0.00
30.00	3.50	1.24	0.00
30.50	3.50	1.24	0.00
31.00	3.50	1.24	0.00
31.50	3.50	1.24	0.00
32.00	3.50	1.24	0.00
32.50	3.50	1.24	0.00
33.00	3.50	1.24	0.00
33.50	3.50	1.24	0.00
34.00	3.50	1.24	0.00
34.50	3.50	1.24	0.00
35.00	3.50	1.24	0.00
35.50	3.50	1.24	0.00
36.00	3.50	1.24	0.00
36.50	3.50	1.24	0.00
37.00	3.50	1.24	0.00
37.50	3.50	1.24	0.00
38.00	3.50	1.24	0.00
38.50	3.50	1.24	0.00
39.00	3.50	1.24	0.00
39.50	3.50	1.24	0.00
40.00	3.50	1.24	0.00
40.50	3.50	1.24	0.00
41.00	3.50	1.24	0.00
41.50	3.50	1.24	0.00
42.00	3.50	1.24	0.00
42.50	3.50	1.24	0.00
43.00	3.50	1.24	0.00
43.50	3.50	1.24	0.00
44.00	3.50	1.24	0.00
44.50	3.50	1.24	0.00
45.00	3.50	1.24	0.00
45.50	3.50	1.24	0.00
46.00	3.50	1.24	0.00
46.50	3.50	1.24	0.00
47.00	3.50	1.24	0.00
47.50	3.50	1.24	0.00
48.00	3.50	1.24	0.00

Summary for Subcatchment 4S: Firestone Bypass

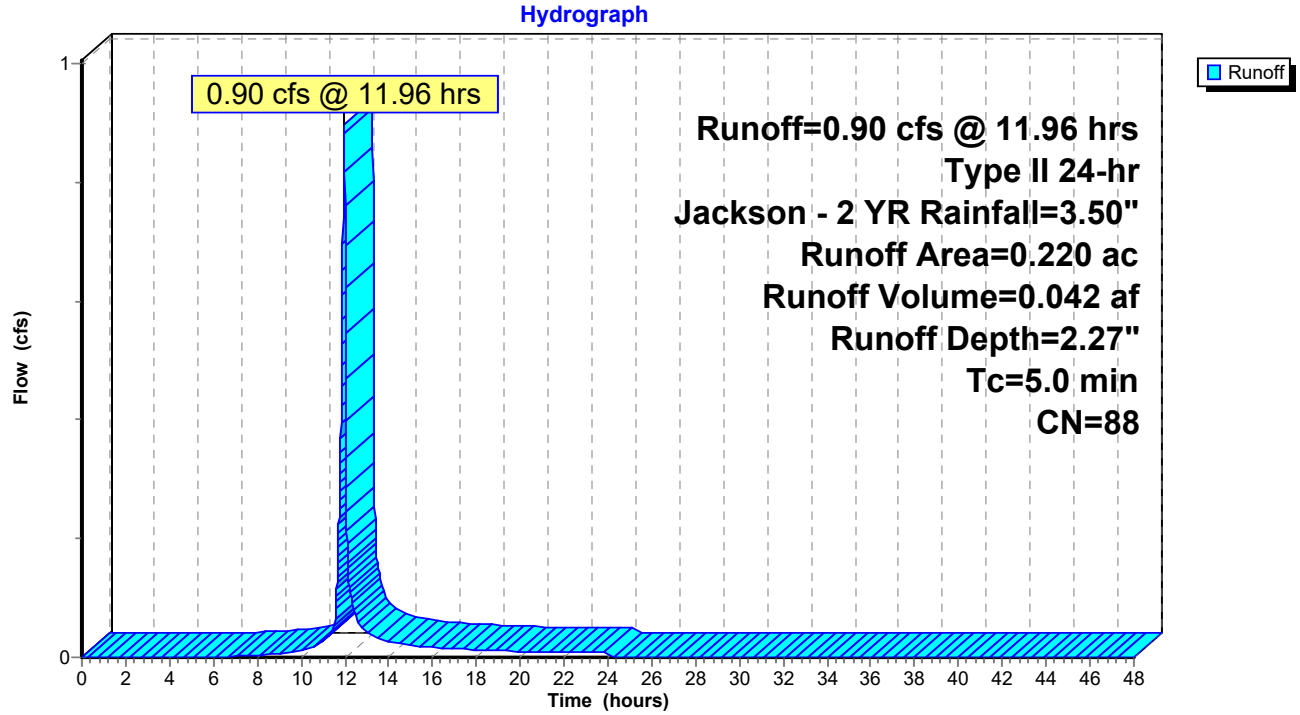
Runoff = 0.90 cfs @ 11.96 hrs, Volume= 0.042 af, Depth= 2.27"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	0.220	88	
	0.220		100.00% Pervious Area

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

Subcatchment 4S: Firestone Bypass



Hydrograph for Subcatchment 4S: Firestone Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.50	2.27	0.00
0.50	0.02	0.00	0.00	27.00	3.50	2.27	0.00
1.00	0.04	0.00	0.00	27.50	3.50	2.27	0.00
1.50	0.06	0.00	0.00	28.00	3.50	2.27	0.00
2.00	0.08	0.00	0.00	28.50	3.50	2.27	0.00
2.50	0.10	0.00	0.00	29.00	3.50	2.27	0.00
3.00	0.12	0.00	0.00	29.50	3.50	2.27	0.00
3.50	0.14	0.00	0.00	30.00	3.50	2.27	0.00
4.00	0.17	0.00	0.00	30.50	3.50	2.27	0.00
4.50	0.19	0.00	0.00	31.00	3.50	2.27	0.00
5.00	0.22	0.00	0.00	31.50	3.50	2.27	0.00
5.50	0.25	0.00	0.00	32.00	3.50	2.27	0.00
6.00	0.28	0.00	0.00	32.50	3.50	2.27	0.00
6.50	0.31	0.00	0.00	33.00	3.50	2.27	0.00
7.00	0.35	0.00	0.00	33.50	3.50	2.27	0.00
7.50	0.38	0.01	0.00	34.00	3.50	2.27	0.00
8.00	0.42	0.01	0.00	34.50	3.50	2.27	0.00
8.50	0.46	0.02	0.00	35.00	3.50	2.27	0.00
9.00	0.51	0.04	0.01	35.50	3.50	2.27	0.00
9.50	0.57	0.05	0.01	36.00	3.50	2.27	0.00
10.00	0.63	0.08	0.01	36.50	3.50	2.27	0.00
10.50	0.71	0.11	0.02	37.00	3.50	2.27	0.00
11.00	0.82	0.16	0.03	37.50	3.50	2.27	0.00
11.50	0.99	0.25	**0.05**	38.00	3.50	2.27	0.00
12.00	2.32	1.23	**0.76**	38.50	3.50	2.27	0.00
12.50	2.57	1.44	0.07	39.00	3.50	2.27	0.00
13.00	2.70	1.56	0.04	39.50	3.50	2.27	0.00
13.50	2.80	1.64	0.03	40.00	3.50	2.27	0.00
14.00	2.87	1.70	0.03	40.50	3.50	2.27	0.00
14.50	2.93	1.76	0.02	41.00	3.50	2.27	0.00
15.00	2.99	1.81	0.02	41.50	3.50	2.27	0.00
15.50	3.04	1.85	0.02	42.00	3.50	2.27	0.00
16.00	3.08	1.89	0.02	42.50	3.50	2.27	0.00
16.50	3.12	1.92	0.02	43.00	3.50	2.27	0.00
17.00	3.16	1.96	0.01	43.50	3.50	2.27	0.00
17.50	3.19	1.99	0.01	44.00	3.50	2.27	0.00
18.00	3.22	2.02	0.01	44.50	3.50	2.27	0.00
18.50	3.25	2.05	0.01	45.00	3.50	2.27	0.00
19.00	3.28	2.07	0.01	45.50	3.50	2.27	0.00
19.50	3.31	2.09	0.01	46.00	3.50	2.27	0.00
20.00	3.33	2.12	0.01	46.50	3.50	2.27	0.00
20.50	3.35	2.14	0.01	47.00	3.50	2.27	0.00
21.00	3.38	2.16	0.01	47.50	3.50	2.27	0.00
21.50	3.40	2.18	0.01	48.00	3.50	2.27	0.00
22.00	3.42	2.20	0.01				
22.50	3.44	2.21	0.01				
23.00	3.46	2.23	0.01				
23.50	3.48	2.25	0.01				
24.00	**3.50**	**2.27**	0.01				
24.50	3.50	2.27	0.00				
25.00	3.50	2.27	0.00				
25.50	3.50	2.27	0.00				
26.00	3.50	2.27	0.00				

Summary for Subcatchment 5S: Firestone Detention

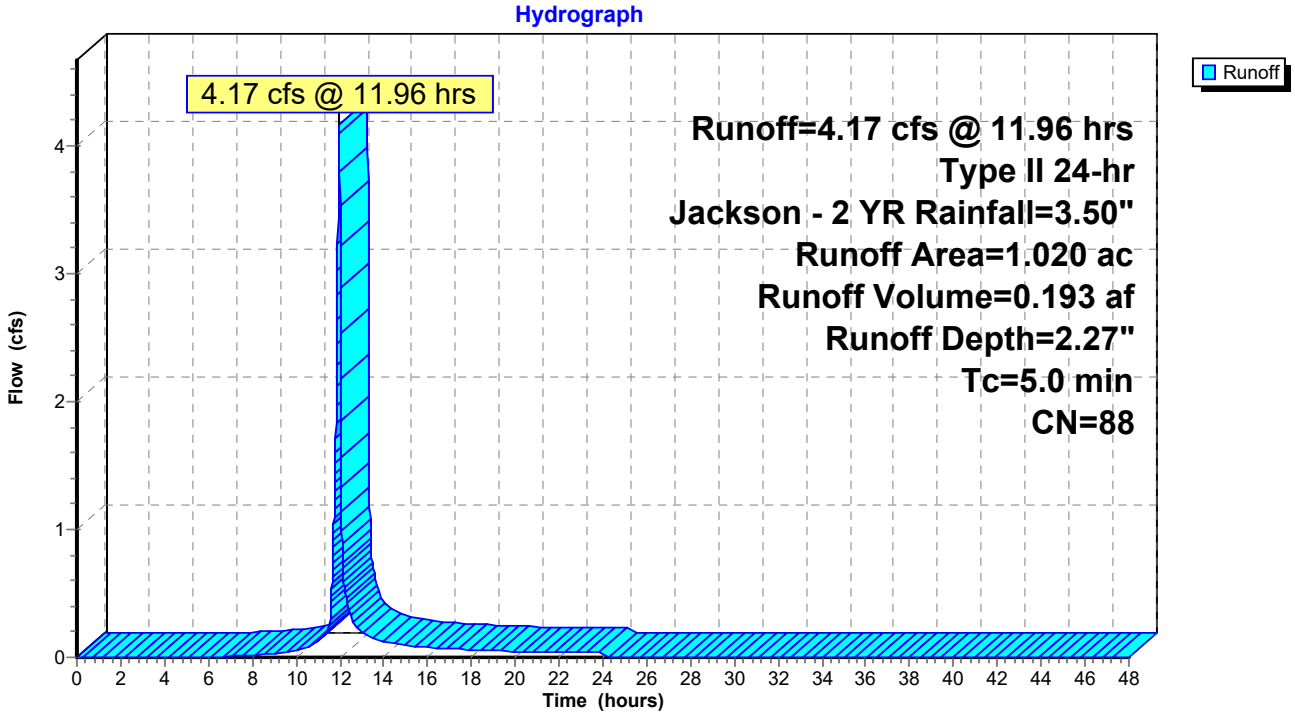
Runoff = 4.17 cfs @ 11.96 hrs, Volume= 0.193 af, Depth= 2.27"
Routed to Pond 6P : Firestone Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	1.020	88	
	1.020		100.00% Pervious Area

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

Subcatchment 5S: Firestone Detention



Hydrograph for Subcatchment 5S: Firestone Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.01
7.50	0.38	0.01	0.01
8.00	0.42	0.01	0.01
8.50	0.46	0.02	0.02
9.00	0.51	0.04	0.03
9.50	0.57	0.05	0.04
10.00	0.63	0.08	0.05
10.50	0.71	0.11	0.08
11.00	0.82	0.16	0.12
11.50	0.99	0.25	**0.23**
12.00	2.32	1.23	**3.53**
12.50	2.57	1.44	0.32
13.00	2.70	1.56	0.20
13.50	2.80	1.64	0.16
14.00	2.87	1.70	0.12
14.50	2.93	1.76	0.11
15.00	2.99	1.81	0.10
15.50	3.04	1.85	0.09
16.00	3.08	1.89	0.08
16.50	3.12	1.92	0.07
17.00	3.16	1.96	0.07
17.50	3.19	1.99	0.06
18.00	3.22	2.02	0.06
18.50	3.25	2.05	0.05
19.00	3.28	2.07	0.05
19.50	3.31	2.09	0.05
20.00	3.33	2.12	0.04
20.50	3.35	2.14	0.04
21.00	3.38	2.16	0.04
21.50	3.40	2.18	0.04
22.00	3.42	2.20	0.04
22.50	3.44	2.21	0.04
23.00	3.46	2.23	0.04
23.50	3.48	2.25	0.04
24.00	**3.50**	**2.27**	0.04
24.50	3.50	2.27	0.00
25.00	3.50	2.27	0.00
25.50	3.50	2.27	0.00
26.00	3.50	2.27	0.00
26.50	3.50	2.27	0.00
27.00	3.50	2.27	0.00
27.50	3.50	2.27	0.00
28.00	3.50	2.27	0.00
28.50	3.50	2.27	0.00
29.00	3.50	2.27	0.00
29.50	3.50	2.27	0.00
30.00	3.50	2.27	0.00
30.50	3.50	2.27	0.00
31.00	3.50	2.27	0.00
31.50	3.50	2.27	0.00
32.00	3.50	2.27	0.00
32.50	3.50	2.27	0.00
33.00	3.50	2.27	0.00
33.50	3.50	2.27	0.00
34.00	3.50	2.27	0.00
34.50	3.50	2.27	0.00
35.00	3.50	2.27	0.00
35.50	3.50	2.27	0.00
36.00	3.50	2.27	0.00
36.50	3.50	2.27	0.00
37.00	3.50	2.27	0.00
37.50	3.50	2.27	0.00
38.00	3.50	2.27	0.00
38.50	3.50	2.27	0.00
39.00	3.50	2.27	0.00
39.50	3.50	2.27	0.00
40.00	3.50	2.27	0.00
40.50	3.50	2.27	0.00
41.00	3.50	2.27	0.00
41.50	3.50	2.27	0.00
42.00	3.50	2.27	0.00
42.50	3.50	2.27	0.00
43.00	3.50	2.27	0.00
43.50	3.50	2.27	0.00
44.00	3.50	2.27	0.00
44.50	3.50	2.27	0.00
45.00	3.50	2.27	0.00
45.50	3.50	2.27	0.00
46.00	3.50	2.27	0.00
46.50	3.50	2.27	0.00
47.00	3.50	2.27	0.00
47.50	3.50	2.27	0.00
48.00	3.50	2.27	0.00

Summary for Subcatchment 6S: Market Street RW

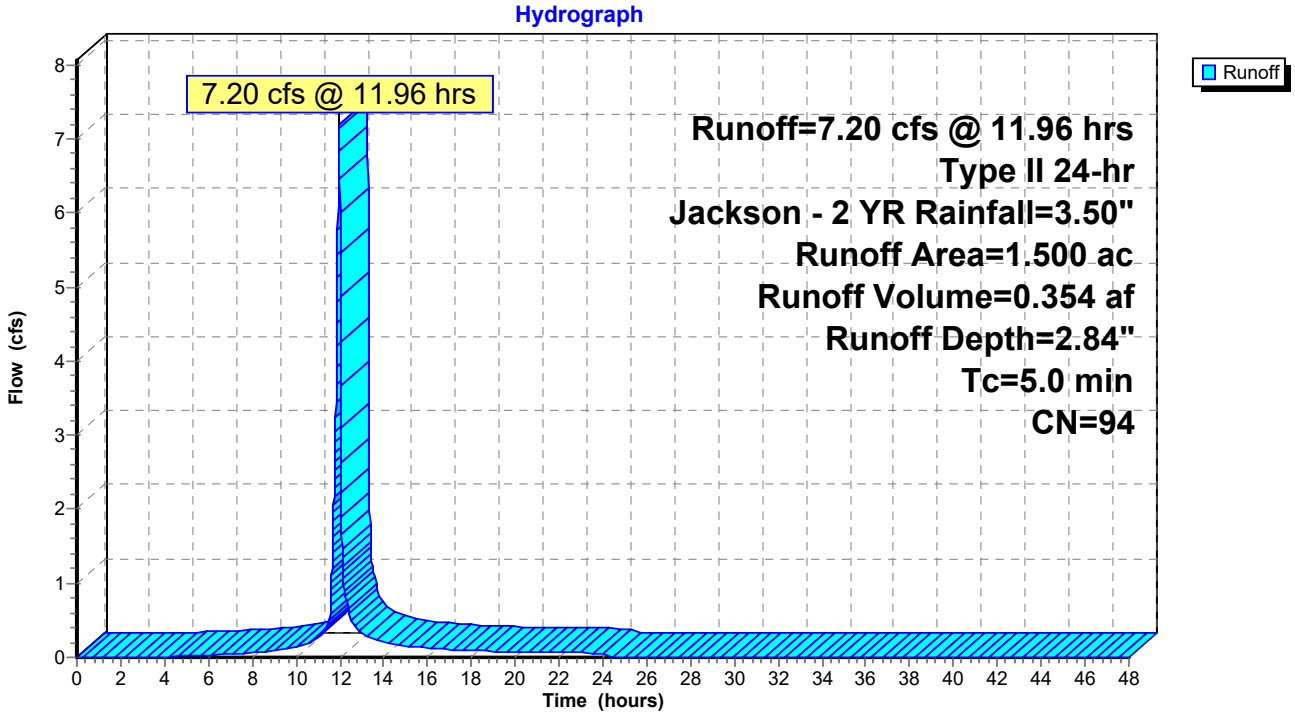
Runoff = 7.20 cfs @ 11.96 hrs, Volume= 0.354 af, Depth= 2.84"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	1.500	94	
	1.500		100.00% Pervious Area

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

Subcatchment 6S: Market Street RW



Hydrograph for Subcatchment 6S: Market Street RW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.01
4.50	0.19	0.01	0.01
5.00	0.22	0.01	0.02
5.50	0.25	0.02	0.03
6.00	0.28	0.03	0.03
6.50	0.31	0.04	0.04
7.00	0.35	0.06	0.05
7.50	0.38	0.07	0.05
8.00	0.42	0.09	0.06
8.50	0.46	0.12	0.08
9.00	0.51	0.15	0.10
9.50	0.57	0.18	0.11
10.00	0.63	0.22	0.14
10.50	0.71	0.28	0.19
11.00	0.82	0.36	0.28
11.50	0.99	0.50	**0.48**
12.00	2.32	1.70	**5.99**
12.50	2.57	1.94	0.53
13.00	2.70	2.06	0.33
13.50	2.80	2.15	0.25
14.00	2.87	2.22	0.20
14.50	2.93	2.28	0.17
15.00	2.99	2.34	0.16
15.50	3.04	2.39	0.14
16.00	3.08	2.43	0.12
16.50	3.12	2.47	0.11
17.00	3.16	2.50	0.11
17.50	3.19	2.54	0.10
18.00	3.22	2.57	0.09
18.50	3.25	2.60	0.09
19.00	3.28	2.62	0.08
19.50	3.31	2.65	0.07
20.00	3.33	2.67	0.07
20.50	3.35	2.69	0.07
21.00	3.38	2.72	0.06
21.50	3.40	2.74	0.06
22.00	3.42	2.76	0.06
22.50	3.44	2.78	0.06
23.00	3.46	2.80	0.06
23.50	3.48	2.82	0.06
24.00	**3.50**	**2.84**	0.06
24.50	3.50	2.84	0.00
25.00	3.50	2.84	0.00
25.50	3.50	2.84	0.00
26.00	3.50	2.84	0.00
26.50	3.50	2.84	0.00
27.00	3.50	2.84	0.00
27.50	3.50	2.84	0.00
28.00	3.50	2.84	0.00
28.50	3.50	2.84	0.00
29.00	3.50	2.84	0.00
29.50	3.50	2.84	0.00
30.00	3.50	2.84	0.00
30.50	3.50	2.84	0.00
31.00	3.50	2.84	0.00
31.50	3.50	2.84	0.00
32.00	3.50	2.84	0.00
32.50	3.50	2.84	0.00
33.00	3.50	2.84	0.00
33.50	3.50	2.84	0.00
34.00	3.50	2.84	0.00
34.50	3.50	2.84	0.00
35.00	3.50	2.84	0.00
35.50	3.50	2.84	0.00
36.00	3.50	2.84	0.00
36.50	3.50	2.84	0.00
37.00	3.50	2.84	0.00
37.50	3.50	2.84	0.00
38.00	3.50	2.84	0.00
38.50	3.50	2.84	0.00
39.00	3.50	2.84	0.00
39.50	3.50	2.84	0.00
40.00	3.50	2.84	0.00
40.50	3.50	2.84	0.00
41.00	3.50	2.84	0.00
41.50	3.50	2.84	0.00
42.00	3.50	2.84	0.00
42.50	3.50	2.84	0.00
43.00	3.50	2.84	0.00
43.50	3.50	2.84	0.00
44.00	3.50	2.84	0.00
44.50	3.50	2.84	0.00
45.00	3.50	2.84	0.00
45.50	3.50	2.84	0.00
46.00	3.50	2.84	0.00
46.50	3.50	2.84	0.00
47.00	3.50	2.84	0.00
47.50	3.50	2.84	0.00
48.00	3.50	2.84	0.00

Summary for Subcatchment 7S: Walmart Detention

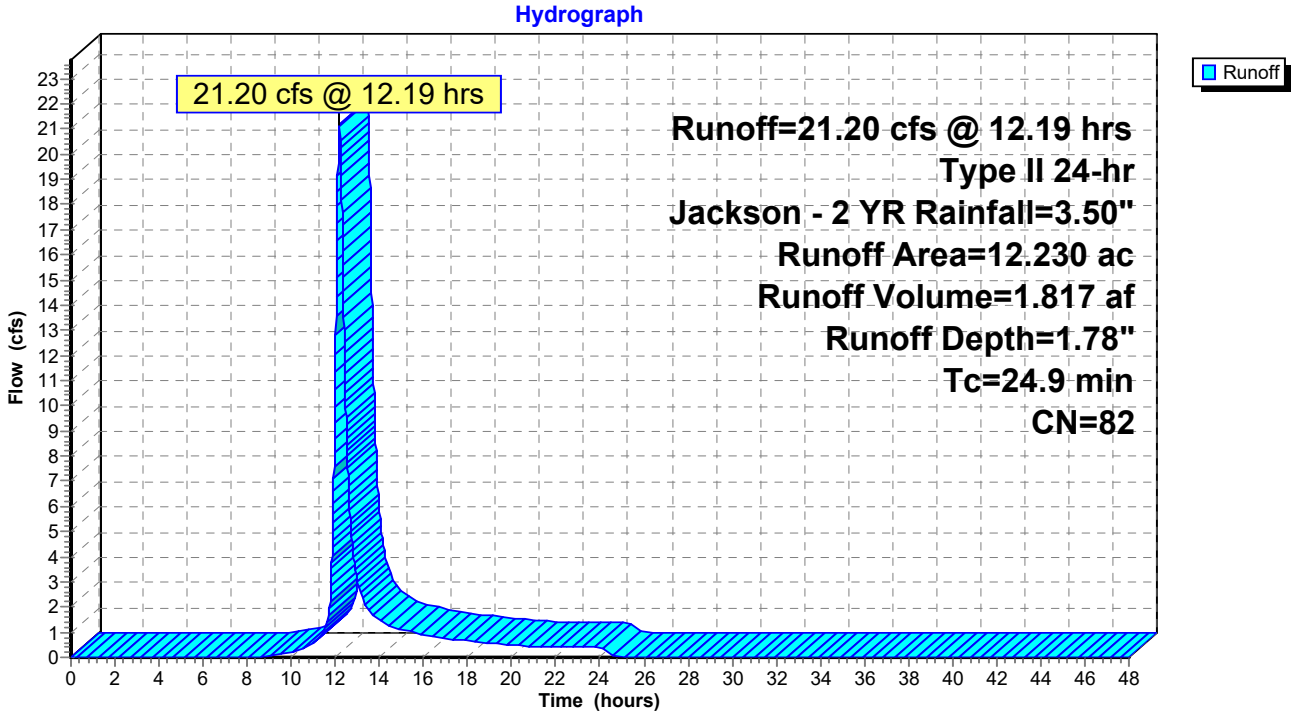
Runoff = 21.20 cfs @ 12.19 hrs, Volume= 1.817 af, Depth= 1.78"
Routed to Pond 8P : Walmart Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	12.230	82	
	12.230		100.00% Pervious Area

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

Subcatchment 7S: Walmart Detention



Hydrograph for Subcatchment 7S: Walmart Detention

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.17	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.22	0.00	0.00
5.50	0.25	0.00	0.00
6.00	0.28	0.00	0.00
6.50	0.31	0.00	0.00
7.00	0.35	0.00	0.00
7.50	0.38	0.00	0.00
8.00	0.42	0.00	0.00
8.50	0.46	0.00	0.00
9.00	0.51	0.00	0.04
9.50	0.57	0.01	0.10
10.00	0.63	0.02	0.18
10.50	0.71	0.03	0.32
11.00	0.82	0.06	0.56
11.50	0.99	0.11	1.10
12.00	2.32	0.87	**11.35**
12.50	2.57	1.05	**8.97**
13.00	2.70	1.15	2.99
13.50	2.80	1.22	1.93
14.00	2.87	1.28	1.49
14.50	2.93	1.33	1.23
15.00	2.99	1.37	1.10
15.50	3.04	1.41	0.99
16.00	3.08	1.44	0.88
16.50	3.12	1.47	0.78
17.00	3.16	1.50	0.74
17.50	3.19	1.53	0.70
18.00	3.22	1.56	0.66
18.50	3.25	1.58	0.62
19.00	3.28	1.60	0.57
19.50	3.31	1.63	0.53
20.00	3.33	1.64	0.49
20.50	3.35	1.66	0.46
21.00	3.38	1.68	0.45
21.50	3.40	1.70	0.44
22.00	3.42	1.72	0.43
22.50	3.44	1.73	0.42
23.00	3.46	1.75	0.41
23.50	3.48	1.77	0.41
24.00	**3.50**	**1.78**	0.40
24.50	3.50	1.78	0.08
25.00	3.50	1.78	0.00
25.50	3.50	1.78	0.00
26.00	3.50	1.78	0.00
26.50	3.50	1.78	0.00
27.00	3.50	1.78	0.00
27.50	3.50	1.78	0.00
28.00	3.50	1.78	0.00
28.50	3.50	1.78	0.00
29.00	3.50	1.78	0.00
29.50	3.50	1.78	0.00
30.00	3.50	1.78	0.00
30.50	3.50	1.78	0.00
31.00	3.50	1.78	0.00
31.50	3.50	1.78	0.00
32.00	3.50	1.78	0.00
32.50	3.50	1.78	0.00
33.00	3.50	1.78	0.00
33.50	3.50	1.78	0.00
34.00	3.50	1.78	0.00
34.50	3.50	1.78	0.00
35.00	3.50	1.78	0.00
35.50	3.50	1.78	0.00
36.00	3.50	1.78	0.00
36.50	3.50	1.78	0.00
37.00	3.50	1.78	0.00
37.50	3.50	1.78	0.00
38.00	3.50	1.78	0.00
38.50	3.50	1.78	0.00
39.00	3.50	1.78	0.00
39.50	3.50	1.78	0.00
40.00	3.50	1.78	0.00
40.50	3.50	1.78	0.00
41.00	3.50	1.78	0.00
41.50	3.50	1.78	0.00
42.00	3.50	1.78	0.00
42.50	3.50	1.78	0.00
43.00	3.50	1.78	0.00
43.50	3.50	1.78	0.00
44.00	3.50	1.78	0.00
44.50	3.50	1.78	0.00
45.00	3.50	1.78	0.00
45.50	3.50	1.78	0.00
46.00	3.50	1.78	0.00
46.50	3.50	1.78	0.00
47.00	3.50	1.78	0.00
47.50	3.50	1.78	0.00
48.00	3.50	1.78	0.00

Summary for Subcatchment 9S: Commercial Plus RW Bypass

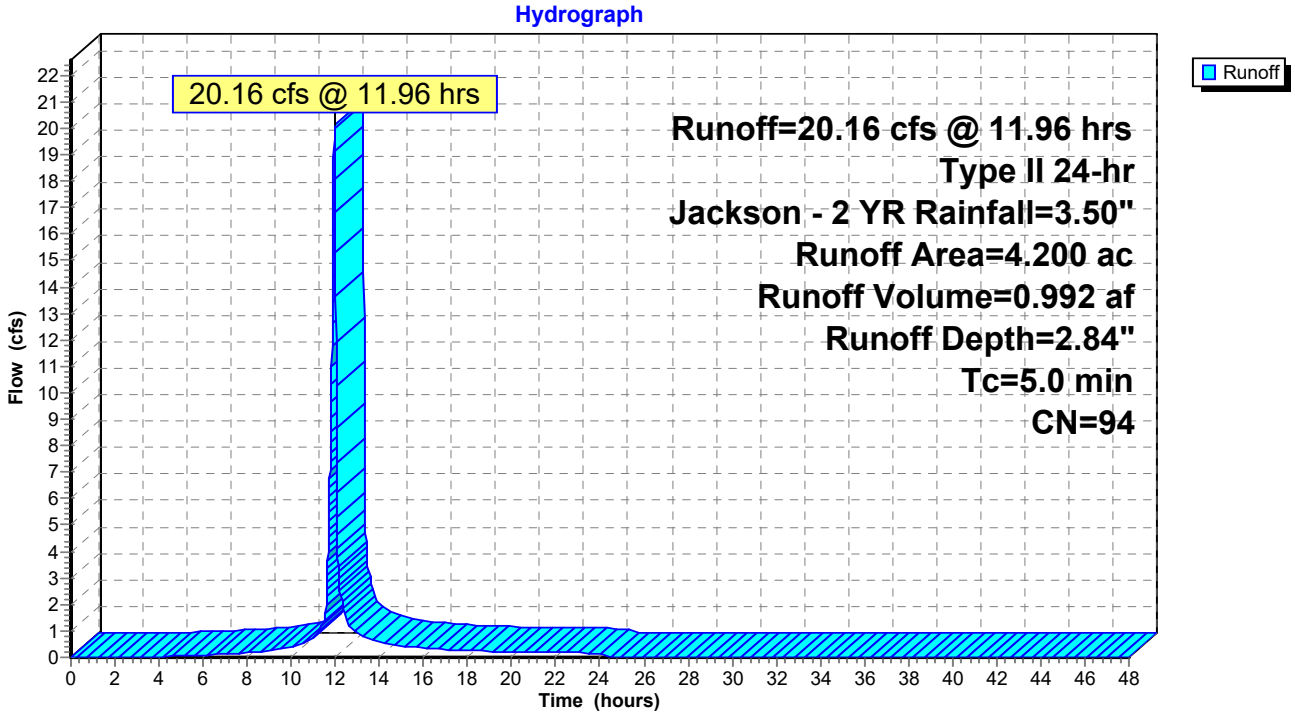
Runoff = 20.16 cfs @ 11.96 hrs, Volume= 0.992 af, Depth= 2.84"
Routed to Pond 1P : Proposed Detention

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr Jackson - 2 YR Rainfall=3.50"

	Area (ac)	CN	Description
*	4.200	94	
	4.200		100.00% Pervious Area

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

Subcatchment 9S: Commercial Plus RW Bypass



Hydrograph for Subcatchment 9S: Commercial Plus RW Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.01
4.00	0.17	0.00	0.02
4.50	0.19	0.01	0.04
5.00	0.22	0.01	0.05
5.50	0.25	0.02	0.07
6.00	0.28	0.03	0.09
6.50	0.31	0.04	0.11
7.00	0.35	0.06	0.13
7.50	0.38	0.07	0.15
8.00	0.42	0.09	0.17
8.50	0.46	0.12	0.22
9.00	0.51	0.15	0.28
9.50	0.57	0.18	0.31
10.00	0.63	0.22	0.39
10.50	0.71	0.28	0.54
11.00	0.82	0.36	0.78
11.50	0.99	0.50	**1.35**
12.00	2.32	1.70	**16.78**
12.50	2.57	1.94	1.48
13.00	2.70	2.06	0.93
13.50	2.80	2.15	0.70
14.00	2.87	2.22	0.55
14.50	2.93	2.28	0.49
15.00	2.99	2.34	0.44
15.50	3.04	2.39	0.39
16.00	3.08	2.43	0.34
16.50	3.12	2.47	0.32
17.00	3.16	2.50	0.30
17.50	3.19	2.54	0.28
18.00	3.22	2.57	0.26
18.50	3.25	2.60	0.24
19.00	3.28	2.62	0.23
19.50	3.31	2.65	0.21
20.00	3.33	2.67	0.19
20.50	3.35	2.69	0.18
21.00	3.38	2.72	0.18
21.50	3.40	2.74	0.18
22.00	3.42	2.76	0.17
22.50	3.44	2.78	0.17
23.00	3.46	2.80	0.17
23.50	3.48	2.82	0.16
24.00	**3.50**	**2.84**	0.16
24.50	3.50	2.84	0.00
25.00	3.50	2.84	0.00
25.50	3.50	2.84	0.00
26.00	3.50	2.84	0.00
26.50	3.50	2.84	0.00
27.00	3.50	2.84	0.00
27.50	3.50	2.84	0.00
28.00	3.50	2.84	0.00
28.50	3.50	2.84	0.00
29.00	3.50	2.84	0.00
29.50	3.50	2.84	0.00
30.00	3.50	2.84	0.00
30.50	3.50	2.84	0.00
31.00	3.50	2.84	0.00
31.50	3.50	2.84	0.00
32.00	3.50	2.84	0.00
32.50	3.50	2.84	0.00
33.00	3.50	2.84	0.00
33.50	3.50	2.84	0.00
34.00	3.50	2.84	0.00
34.50	3.50	2.84	0.00
35.00	3.50	2.84	0.00
35.50	3.50	2.84	0.00
36.00	3.50	2.84	0.00
36.50	3.50	2.84	0.00
37.00	3.50	2.84	0.00
37.50	3.50	2.84	0.00
38.00	3.50	2.84	0.00
38.50	3.50	2.84	0.00
39.00	3.50	2.84	0.00
39.50	3.50	2.84	0.00
40.00	3.50	2.84	0.00
40.50	3.50	2.84	0.00
41.00	3.50	2.84	0.00
41.50	3.50	2.84	0.00
42.00	3.50	2.84	0.00
42.50	3.50	2.84	0.00
43.00	3.50	2.84	0.00
43.50	3.50	2.84	0.00
44.00	3.50	2.84	0.00
44.50	3.50	2.84	0.00
45.00	3.50	2.84	0.00
45.50	3.50	2.84	0.00
46.00	3.50	2.84	0.00
46.50	3.50	2.84	0.00
47.00	3.50	2.84	0.00
47.50	3.50	2.84	0.00
48.00	3.50	2.84	0.00

Summary for Pond 1P: Proposed Detention

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 23.760 ac, 9.81% Impervious, Inflow Depth > 1.76" for Jackson - 2 YR event
Inflow = 46.75 cfs @ 11.96 hrs, Volume= 3.476 af
Outflow = 32.14 cfs @ 12.02 hrs, Volume= 3.270 af, Atten= 31%, Lag= 3.7 min
Primary = 32.14 cfs @ 12.02 hrs, Volume= 3.270 af
Routed to Link 1L : Proposed Total
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : Proposed Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,000.04' @ 12.02 hrs Surf.Area= 9,872 sf Storage= 25,005 cf

Plug-Flow detention time= 121.1 min calculated for 3.270 af (94% of inflow)
Center-of-Mass det. time= 63.5 min (974.5 - 911.0)

Volume	Invert	Avail.Storage	Storage Description
#1	996.00'	61,846 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

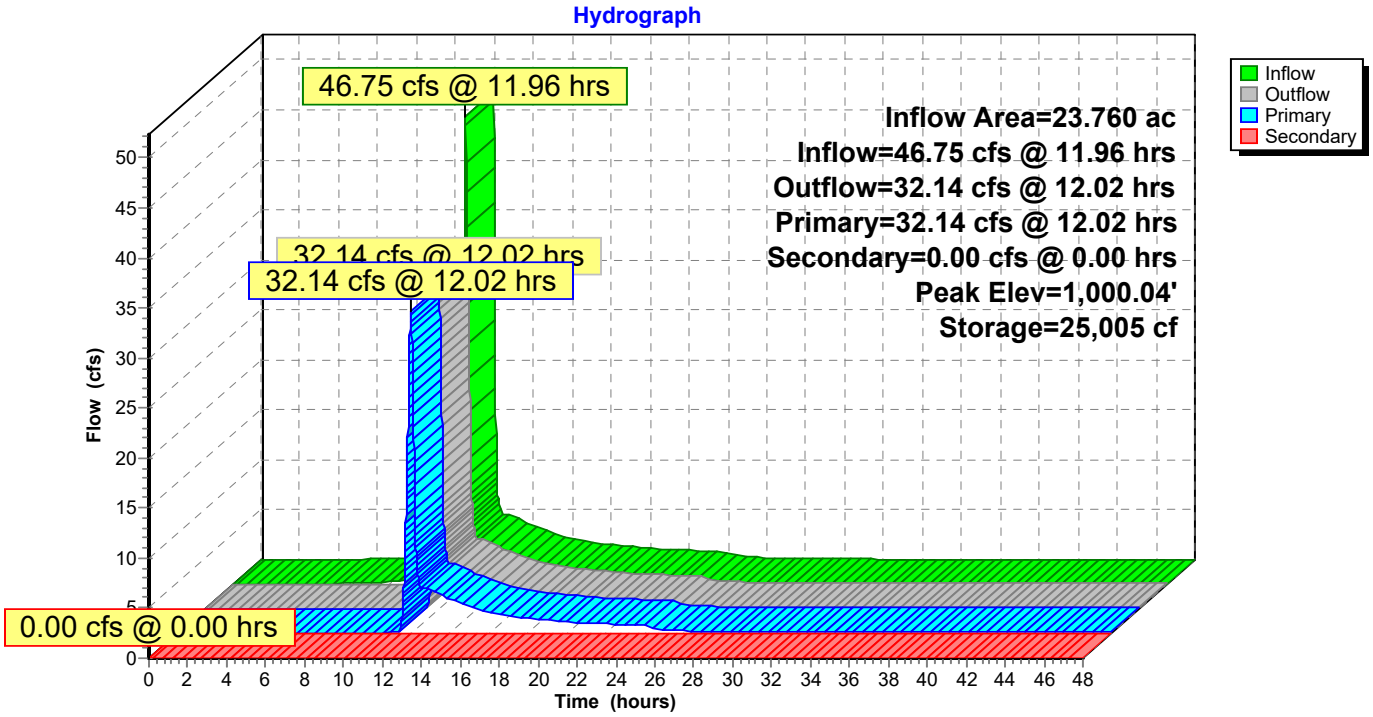
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
996.00	0	0	0
997.00	5,095	2,548	2,548
998.00	6,517	5,806	8,354
999.00	8,135	7,326	15,680
1,000.00	9,810	8,973	24,652
1,001.00	11,528	10,669	35,321
1,002.00	13,346	12,437	47,758
1,003.00	14,829	14,088	61,846

Device	Routing	Invert	Outlet Devices
#0	Secondary	1,003.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	995.30'	**48.0" Round Culvert** L= 34.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 995.30' / 995.10' S= 0.0058 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf
#2	Device 1	995.50'	**1.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	998.50'	**140.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,000.00'	**92.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	1,000.90'	**64.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

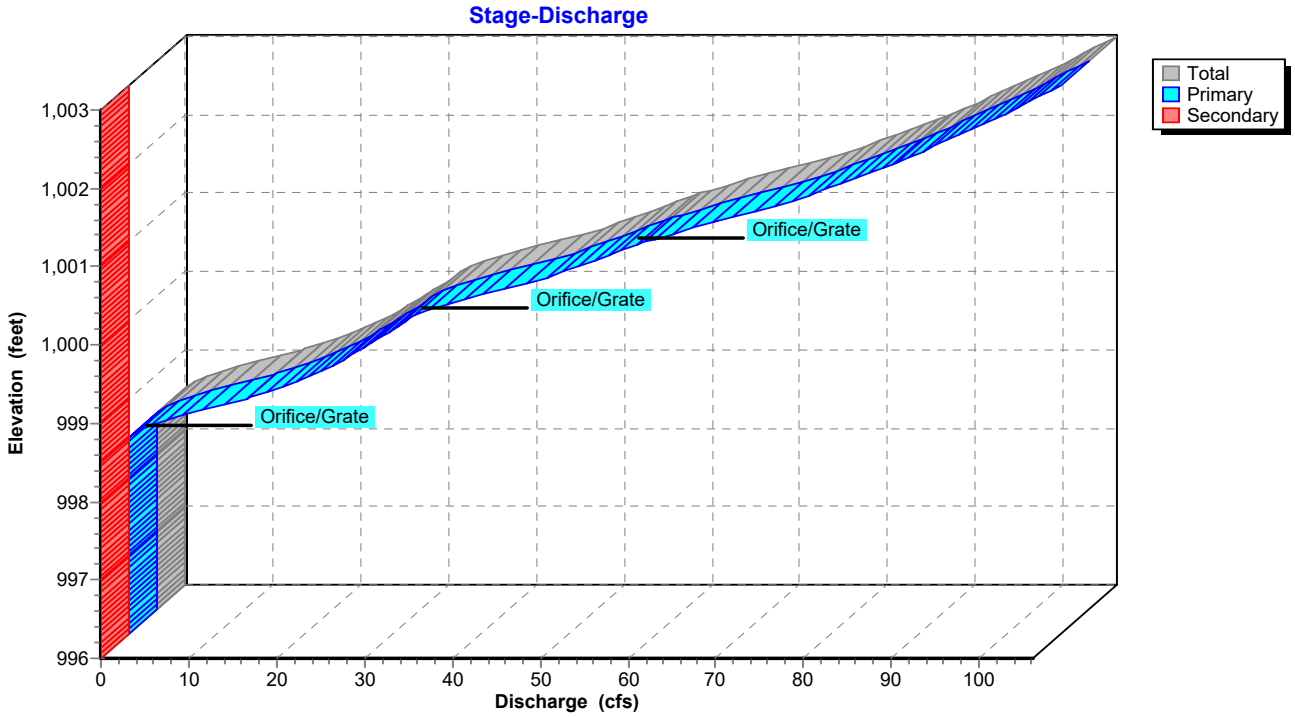
Primary OutFlow Max=32.09 cfs @ 12.02 hrs HW=1,000.04' (Free Discharge)
└**1=Culvert** (Passes 32.09 cfs of 87.10 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 10.18 fps)
  └**3=Orifice/Grate** (Orifice Controls 31.80 cfs @ 5.45 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.17 cfs @ 0.61 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=996.00' (Free Discharge)

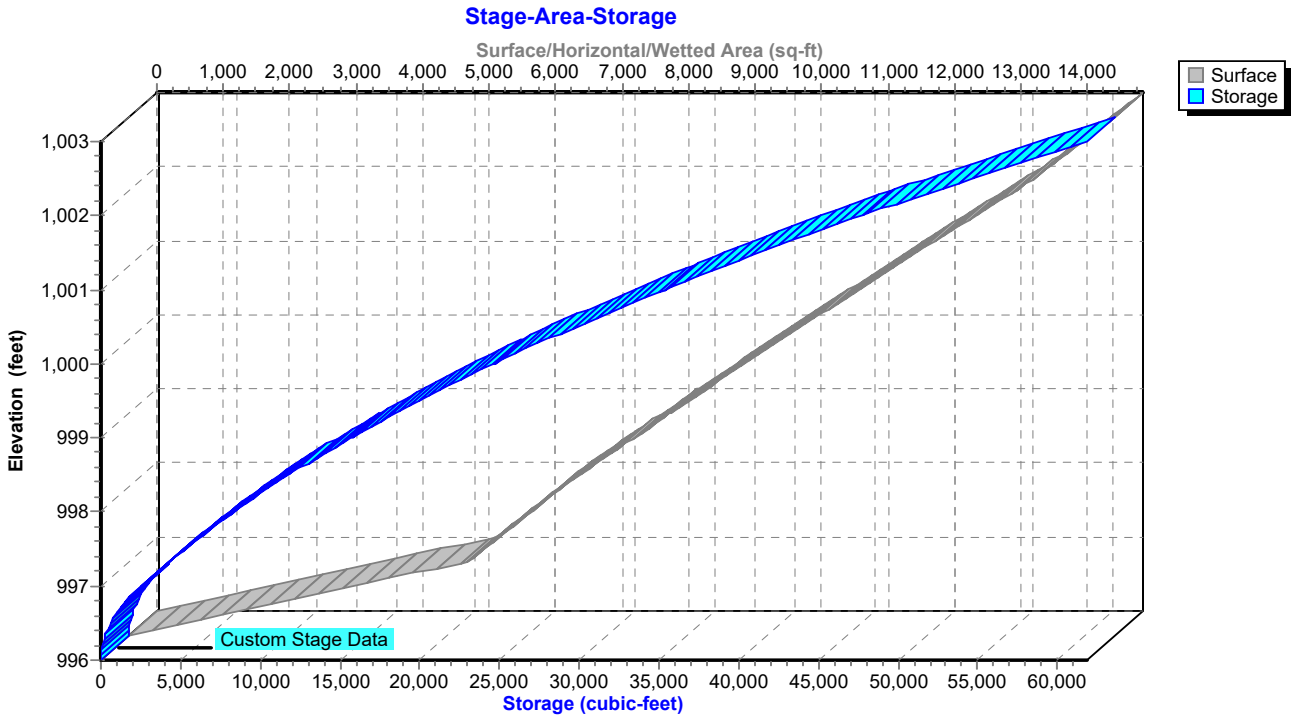
Pond 1P: Proposed Detention



Pond 1P: Proposed Detention



Pond 1P: Proposed Detention



Hydrograph for Pond 1P: Proposed Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	996.00	0.00	0.00	**0.00**
1.00	0.00	0	996.00	0.00	0.00	0.00
2.00	0.00	0	996.00	0.00	0.00	0.00
3.00	0.00	0	996.00	0.00	0.00	0.00
4.00	0.03	8	996.04	0.03	0.03	0.00
5.00	0.07	48	996.14	0.04	0.04	0.00
6.00	0.12	226	996.30	0.05	0.05	0.00
7.00	0.21	624	996.49	0.06	0.06	0.00
8.00	0.30	1,314	996.72	0.06	0.06	0.00
9.00	0.53	2,523	997.00	0.07	0.07	0.00
10.00	0.78	4,486	997.36	0.08	0.08	0.00
11.00	**1.62**	8,252	997.98	0.09	0.09	0.00
12.00	**39.23**	**24,738**	**1,000.01**	**31.64**	**31.64**	0.00
13.00	4.45	**13,613**	**998.74**	**4.50**	**4.50**	0.00
14.00	3.41	13,316	998.70	3.50	3.50	0.00
15.00	2.68	13,078	998.67	2.73	2.73	0.00
16.00	2.11	12,882	998.64	2.17	2.17	0.00
17.00	1.78	12,744	998.63	1.81	1.81	0.00
18.00	1.53	12,648	998.61	1.56	1.56	0.00
19.00	1.33	12,571	998.60	1.35	1.35	0.00
20.00	1.15	12,500	998.59	1.17	1.17	0.00
21.00	1.04	12,446	998.59	1.06	1.06	0.00
22.00	0.97	12,406	998.58	0.98	0.98	0.00
23.00	0.92	12,375	998.58	0.93	0.93	0.00
24.00	0.88	12,348	998.57	0.88	0.88	0.00
25.00	0.36	12,064	998.53	0.39	0.39	0.00
26.00	0.25	11,994	998.52	0.27	0.27	0.00
27.00	0.18	11,947	998.52	0.20	0.20	0.00
28.00	0.14	11,884	998.51	0.15	0.15	0.00
29.00	0.12	11,850	998.50	0.13	0.13	0.00
30.00	0.10	11,826	998.50	0.11	0.11	0.00
31.00	0.09	11,803	998.50	0.10	0.10	0.00
32.00	0.08	11,748	998.49	0.10	0.10	0.00
33.00	0.07	11,661	998.48	0.10	0.10	0.00
34.00	0.07	11,548	998.46	0.10	0.10	0.00
35.00	0.06	11,415	998.45	0.10	0.10	0.00
36.00	0.06	11,266	998.42	0.10	0.10	0.00
37.00	0.05	11,104	998.40	0.10	0.10	0.00
38.00	0.05	10,931	998.38	0.10	0.10	0.00
39.00	0.05	10,751	998.35	0.10	0.10	0.00
40.00	0.05	10,564	998.33	0.10	0.10	0.00
41.00	0.04	10,372	998.30	0.10	0.10	0.00
42.00	0.04	10,177	998.27	0.10	0.10	0.00
43.00	0.04	9,978	998.24	0.10	0.10	0.00
44.00	0.04	9,776	998.21	0.10	0.10	0.00
45.00	0.04	9,573	998.18	0.10	0.10	0.00
46.00	0.04	9,368	998.15	0.10	0.10	0.00
47.00	0.04	9,163	998.12	0.09	0.09	0.00
48.00	0.04	8,956	998.09	0.09	0.09	0.00

Stage-Discharge for Pond 1P: Proposed Detention

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
996.00	0.00	0.00	**0.00**
996.10	0.04	0.04	0.00
996.20	0.05	0.05	0.00
996.30	0.05	0.05	0.00
996.40	0.05	0.05	0.00
996.50	0.06	0.06	0.00
996.60	0.06	0.06	0.00
996.70	0.06	0.06	0.00
996.80	0.07	0.07	0.00
996.90	0.07	0.07	0.00
997.00	0.07	0.07	0.00
997.10	0.07	0.07	0.00
997.20	0.08	0.08	0.00
997.30	0.08	0.08	0.00
997.40	0.08	0.08	0.00
997.50	0.08	0.08	0.00
997.60	0.08	0.08	0.00
997.70	0.09	0.09	0.00
997.80	0.09	0.09	0.00
997.90	0.09	0.09	0.00
998.00	0.09	0.09	0.00
998.10	0.09	0.09	0.00
998.20	0.10	0.10	0.00
998.30	0.10	0.10	0.00
998.40	0.10	0.10	0.00
998.50	0.10	0.10	0.00
998.60	1.29	1.29	0.00
998.70	3.45	3.45	0.00
998.80	6.26	6.26	0.00
998.90	9.58	9.58	0.00
999.00	13.35	13.35	0.00
999.10	16.33	16.33	0.00
999.20	18.70	18.70	0.00
999.30	20.76	20.76	0.00
999.40	22.62	22.62	0.00
999.50	24.33	24.33	0.00
999.60	25.92	25.92	0.00
999.70	27.42	27.42	0.00
999.80	28.83	28.83	0.00
999.90	30.18	30.18	0.00
1,000.00	31.47	31.47	0.00
1,000.10	33.49	33.49	0.00
1,000.20	36.11	36.11	0.00
1,000.30	39.10	39.10	0.00
1,000.40	42.40	42.40	0.00
1,000.50	45.96	45.96	0.00
1,000.60	48.97	48.97	0.00
1,000.70	51.54	51.54	0.00
1,000.80	53.89	53.89	0.00
1,000.90	56.08	56.08	0.00
1,001.00	58.70	58.70	0.00
1,001.10	61.66	61.66	0.00
1,001.20	64.84	64.84	0.00
1,001.30	68.17	68.17	0.00
1,001.40	71.66	71.66	0.00
1,001.50	74.72	74.72	0.00
1,001.60	77.46	77.46	0.00
1,001.70	80.01	80.01	0.00
1,001.80	82.43	82.43	0.00
1,001.90	84.74	84.74	0.00
1,002.00	86.96	86.96	0.00
1,002.10	89.11	89.11	0.00
1,002.20	91.19	91.19	0.00
1,002.30	93.22	93.22	0.00
1,002.40	95.18	95.18	0.00
1,002.50	97.11	97.11	0.00
1,002.60	98.98	98.98	0.00
1,002.70	100.82	100.82	0.00
1,002.80	102.61	102.61	0.00
1,002.90	104.38	104.38	0.00
1,003.00	**106.10**	**106.10**	0.00

Stage-Area-Storage for Pond 1P: Proposed Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
996.00	0	0
996.10	510	25
996.20	1,019	102
996.30	1,528	229
996.40	2,038	408
996.50	2,548	637
996.60	3,057	917
996.70	3,567	1,248
996.80	4,076	1,630
996.90	4,585	2,063
997.00	5,095	2,548
997.10	5,237	3,064
997.20	5,379	3,595
997.30	5,522	4,140
997.40	5,664	4,699
997.50	5,806	5,273
997.60	5,948	5,860
997.70	6,090	6,462
997.80	6,233	7,079
997.90	6,375	7,709
998.00	6,517	8,354
998.10	6,679	9,013
998.20	6,841	9,689
998.30	7,002	10,381
998.40	7,164	11,090
998.50	7,326	11,814
998.60	7,488	12,555
998.70	7,650	13,312
998.80	7,811	14,085
998.90	7,973	14,874
999.00	8,135	15,680
999.10	8,303	16,501
999.20	8,470	17,340
999.30	8,637	18,195
999.40	8,805	19,067
999.50	8,973	19,956
999.60	9,140	20,862
999.70	9,308	21,784
999.80	9,475	22,723
999.90	9,642	23,679
1,000.00	9,810	24,652
1,000.10	9,982	25,642
1,000.20	10,154	26,648
1,000.30	10,325	27,672
1,000.40	10,497	28,713
1,000.50	10,669	29,772
1,000.60	10,841	30,847
1,000.70	11,013	31,940
1,000.80	11,184	33,050
1,000.90	11,356	34,177
1,001.00	11,528	35,321
1,001.10	11,710	36,483
1,001.20	11,892	37,663
1,001.30	12,073	38,861
1,001.40	12,255	40,078
1,001.50	12,437	41,312
1,001.60	12,619	42,565
1,001.70	12,801	43,836
1,001.80	12,982	45,125
1,001.90	13,164	46,432
1,002.00	13,346	47,758
1,002.10	13,494	49,100
1,002.20	13,643	50,457
1,002.30	13,791	51,829
1,002.40	13,939	53,215
1,002.50	14,088	54,616
1,002.60	14,236	56,033
1,002.70	14,384	57,464
1,002.80	14,532	58,909
1,002.90	14,681	60,370
1,003.00	**14,829**	**61,846**

Summary for Pond 6P: Firestone Detention

Inflow Area = 1.020 ac, 0.00% Impervious, Inflow Depth = 2.27" for Jackson - 2 YR event
Inflow = 4.17 cfs @ 11.96 hrs, Volume= 0.193 af
Outflow = 0.05 cfs @ 19.58 hrs, Volume= 0.133 af, Atten= 99%, Lag= 457.2 min
Primary = 0.05 cfs @ 19.58 hrs, Volume= 0.133 af
Routed to Pond 1P : Proposed Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,012.70' @ 19.58 hrs Surf.Area= 3,283 sf Storage= 6,249 cf

Plug-Flow detention time= 994.9 min calculated for 0.133 af (69% of inflow)
Center-of-Mass det. time= 894.6 min (1,702.0 - 807.4)

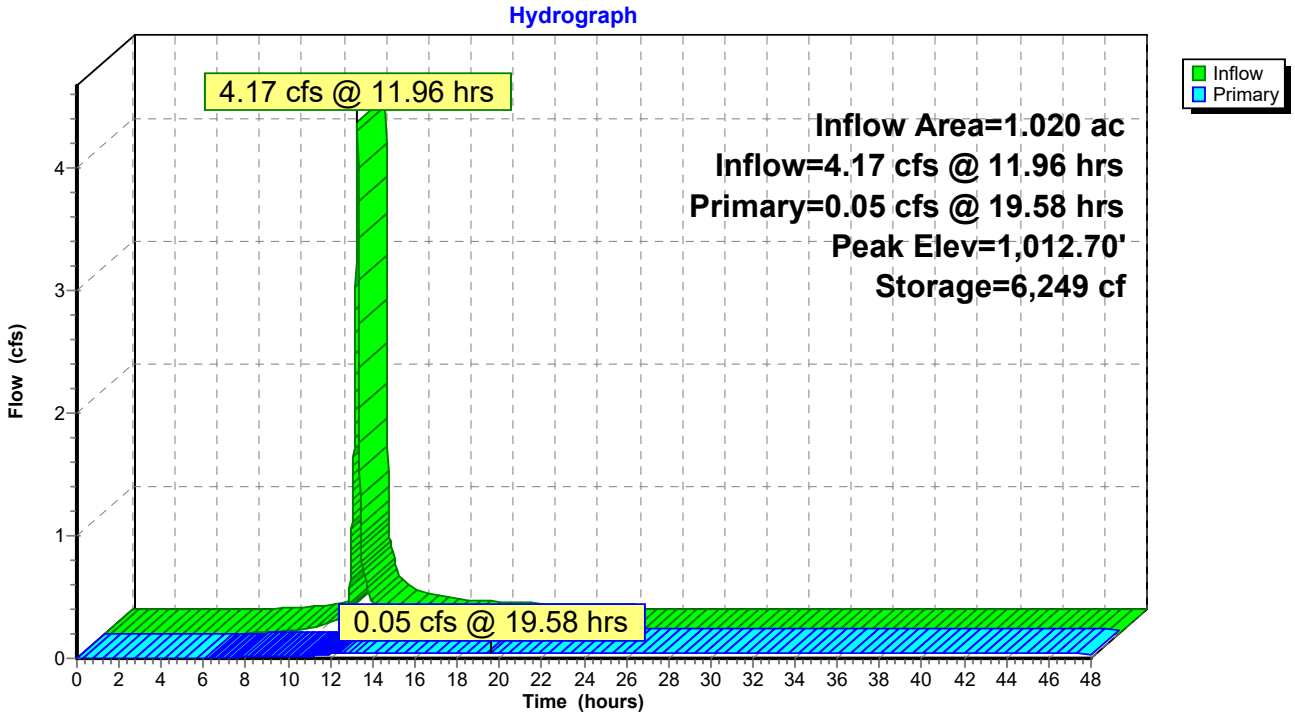
Volume	Invert	Avail.Storage	Storage Description
#1	1,009.54'	22,002 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,009.54	0	0	0
1,010.00	909	209	209
1,011.00	2,085	1,497	1,706
1,012.00	2,776	2,431	4,137
1,013.00	3,504	3,140	7,277
1,014.00	4,409	3,957	11,233
1,015.00	5,525	4,967	16,200
1,016.00	6,079	5,802	22,002

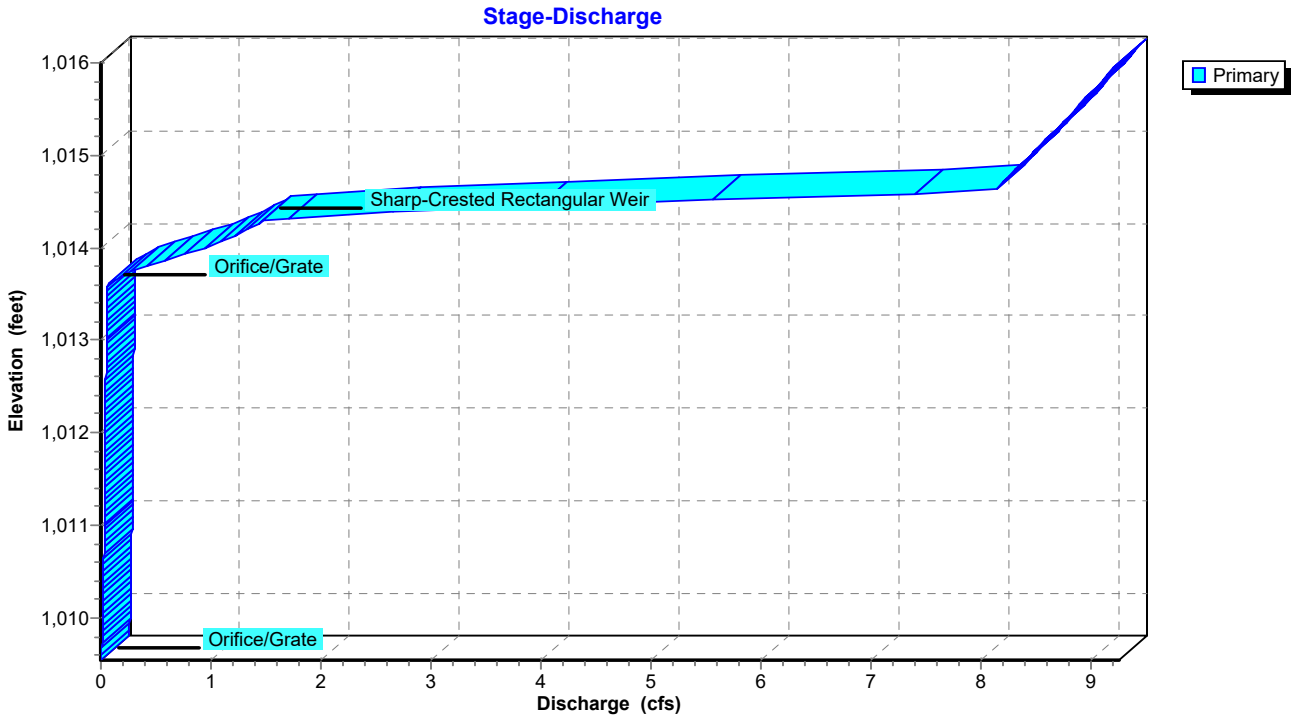
Device	Routing	Invert	Outlet Devices
#1	Primary	1,009.50'	**12.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,009.50' / 1,009.35' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,009.54'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,013.57'	**12.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	1,014.29'	**11.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.05 cfs @ 19.58 hrs HW=1,012.70' (Free Discharge)
└**1=Culvert** (Passes 0.05 cfs of 6.18 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.50 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

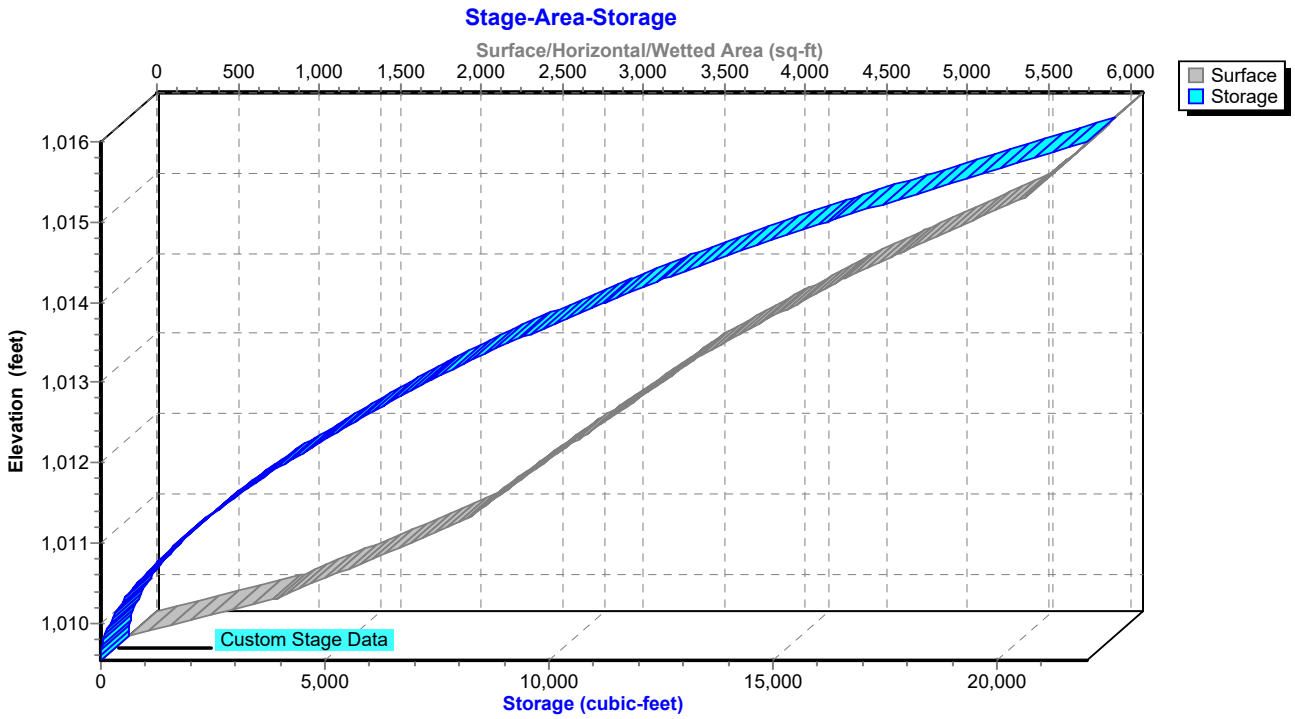
Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Pond 6P: Firestone Detention



Hydrograph for Pond 6P: Firestone Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,009.54	0.00
1.00	0.00	0	1,009.54	0.00
2.00	0.00	0	1,009.54	0.00
3.00	0.00	0	1,009.54	0.00
4.00	0.00	0	1,009.54	0.00
5.00	0.00	0	1,009.54	0.00
6.00	0.00	0	1,009.54	0.00
7.00	0.01	5	1,009.61	0.00
8.00	0.01	20	1,009.68	0.01
9.00	0.03	61	1,009.79	0.01
10.00	0.05	151	1,009.93	0.02
11.00	**0.12**	373	1,010.16	0.02
12.00	**3.53**	3,581	1,011.79	0.04
13.00	0.20	5,283	1,012.39	0.04
14.00	0.12	5,689	1,012.52	0.05
15.00	0.10	5,917	1,012.59	0.05
16.00	0.08	6,064	1,012.64	0.05
17.00	0.07	6,153	1,012.67	0.05
18.00	0.06	6,213	1,012.69	0.05
19.00	0.05	**6,244**	**1,012.70**	**0.05**
20.00	0.04	**6,246**	**1,012.70**	**0.05**
21.00	0.04	6,230	1,012.69	0.05
22.00	0.04	6,207	1,012.68	0.05
23.00	0.04	6,180	1,012.68	0.05
24.00	0.04	6,147	1,012.67	0.05
25.00	0.00	5,992	1,012.62	0.05
26.00	0.00	5,828	1,012.57	0.05
27.00	0.00	5,665	1,012.52	0.04
28.00	0.00	5,504	1,012.46	0.04
29.00	0.00	5,344	1,012.41	0.04
30.00	0.00	5,186	1,012.36	0.04
31.00	0.00	5,029	1,012.31	0.04
32.00	0.00	4,873	1,012.26	0.04
33.00	0.00	4,720	1,012.20	0.04
34.00	0.00	4,567	1,012.15	0.04
35.00	0.00	4,416	1,012.10	0.04
36.00	0.00	4,267	1,012.05	0.04
37.00	0.00	4,120	1,011.99	0.04
38.00	0.00	3,974	1,011.94	0.04
39.00	0.00	3,829	1,011.89	0.04
40.00	0.00	3,686	1,011.83	0.04
41.00	0.00	3,545	1,011.78	0.04
42.00	0.00	3,406	1,011.73	0.04
43.00	0.00	3,268	1,011.67	0.04
44.00	0.00	3,133	1,011.62	0.04
45.00	0.00	2,998	1,011.57	0.04
46.00	0.00	2,866	1,011.51	0.04
47.00	0.00	2,736	1,011.46	0.04
48.00	0.00	2,607	1,011.40	0.04

Stage-Discharge for Pond 6P: Firestone Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,009.54	0.00	1,012.19	0.04	1,014.84	8.32
1,009.59	0.00	1,012.24	0.04	1,014.89	8.36
1,009.64	0.01	1,012.29	0.04	1,014.94	8.41
1,009.69	0.01	1,012.34	0.04	1,014.99	8.45
1,009.74	0.01	1,012.39	0.04	1,015.04	8.49
1,009.79	0.01	1,012.44	0.04	1,015.09	8.53
1,009.84	0.01	1,012.49	0.04	1,015.14	8.57
1,009.89	0.01	1,012.54	0.05	1,015.19	8.62
1,009.94	0.02	1,012.59	0.05	1,015.24	8.66
1,009.99	0.02	1,012.64	0.05	1,015.29	8.70
1,010.04	0.02	1,012.69	0.05	1,015.34	8.74
1,010.09	0.02	1,012.74	0.05	1,015.39	8.78
1,010.14	0.02	1,012.79	0.05	1,015.44	8.82
1,010.19	0.02	1,012.84	0.05	1,015.49	8.86
1,010.24	0.02	1,012.89	0.05	1,015.54	8.90
1,010.29	0.02	1,012.94	0.05	1,015.59	8.94
1,010.34	0.02	1,012.99	0.05	1,015.64	8.98
1,010.39	0.02	1,013.04	0.05	1,015.69	9.02
1,010.44	0.02	1,013.09	0.05	1,015.74	9.06
1,010.49	0.03	1,013.14	0.05	1,015.79	9.10
1,010.54	0.03	1,013.19	0.05	1,015.84	9.14
1,010.59	0.03	1,013.24	0.05	1,015.89	9.18
1,010.64	0.03	1,013.29	0.05	1,015.94	9.22
1,010.69	0.03	1,013.34	0.05	1,015.99	**9.26**
1,010.74	0.03	1,013.39	0.05		
1,010.79	0.03	1,013.44	0.05		
1,010.84	0.03	1,013.49	0.05		
1,010.89	0.03	1,013.54	0.05		
1,010.94	0.03	1,013.59	0.06		
1,010.99	0.03	1,013.64	0.11		
1,011.04	0.03	1,013.69	0.19		
1,011.09	0.03	1,013.74	0.28		
1,011.14	0.03	1,013.79	0.39		
1,011.19	0.03	1,013.84	0.50		
1,011.24	0.03	1,013.89	0.64		
1,011.29	0.03	1,013.94	0.78		
1,011.34	0.03	1,013.99	0.93		
1,011.39	0.04	1,014.04	1.05		
1,011.44	0.04	1,014.09	1.15		
1,011.49	0.04	1,014.14	1.24		
1,011.54	0.04	1,014.19	1.33		
1,011.59	0.04	1,014.24	1.41		
1,011.64	0.04	1,014.29	1.48		
1,011.69	0.04	1,014.34	1.95		
1,011.74	0.04	1,014.39	2.75		
1,011.79	0.04	1,014.44	3.77		
1,011.84	0.04	1,014.49	4.95		
1,011.89	0.04	1,014.54	6.28		
1,011.94	0.04	1,014.59	7.74		
1,011.99	0.04	1,014.64	8.15		
1,012.04	0.04	1,014.69	8.19		
1,012.09	0.04	1,014.74	8.23		
1,012.14	0.04	1,014.79	8.28		

Stage-Area-Storage for Pond 6P: Firestone Detention

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,009.54	0	0
1,009.64	198	10
1,009.74	395	40
1,009.84	593	89
1,009.94	790	158
1,010.04	956	246
1,010.14	1,074	348
1,010.24	1,191	461
1,010.34	1,309	586
1,010.44	1,426	723
1,010.54	1,544	871
1,010.64	1,662	1,032
1,010.74	1,779	1,204
1,010.84	1,897	1,388
1,010.94	2,014	1,583
1,011.04	2,113	1,790
1,011.14	2,182	2,005
1,011.24	2,251	2,226
1,011.34	2,320	2,455
1,011.44	2,389	2,690
1,011.54	2,458	2,933
1,011.64	2,527	3,182
1,011.74	2,596	3,438
1,011.84	2,665	3,701
1,011.94	2,735	3,971
1,012.04	2,805	4,248
1,012.14	2,878	4,532
1,012.24	2,951	4,824
1,012.34	3,024	5,122
1,012.44	3,096	5,428
1,012.54	3,169	5,742
1,012.64	3,242	6,062
1,012.74	3,315	6,390
1,012.84	3,388	6,725
1,012.94	3,460	7,068
1,013.04	3,540	7,417
1,013.14	3,631	7,776
1,013.24	3,721	8,144
1,013.34	3,812	8,520
1,013.44	3,902	8,906
1,013.54	3,993	9,301
1,013.64	4,083	9,704
1,013.74	4,174	10,117
1,013.84	4,264	10,539
1,013.94	4,355	10,970
1,014.04	4,454	11,410
1,014.14	4,565	11,861
1,014.24	4,677	12,323
1,014.34	4,788	12,797
1,014.44	4,900	13,281
1,014.54	5,012	13,777
1,014.64	5,123	14,283
1,014.74	5,235	14,801
1,014.84	5,346	15,330
1,014.94	5,458	15,871
1,015.04	5,547	16,422
1,015.14	5,603	16,979
1,015.24	5,658	17,542
1,015.34	5,713	18,111
1,015.44	5,769	18,685
1,015.54	5,824	19,264
1,015.64	5,880	19,850
1,015.74	5,935	20,440
1,015.84	5,990	21,037
1,015.94	**6,046**	**21,638**

Summary for Pond 8P: Walmart Detention

Inflow Area = 12.230 ac, 0.00% Impervious, Inflow Depth = 1.78" for Jackson - 2 YR event
Inflow = 21.20 cfs @ 12.19 hrs, Volume= 1.817 af
Outflow = 2.28 cfs @ 13.25 hrs, Volume= 1.101 af, Atten= 89%, Lag= 63.8 min
Primary = 2.28 cfs @ 13.25 hrs, Volume= 1.101 af
Routed to Pond 1P : Proposed Detention

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 1,011.20' @ 13.25 hrs Surf.Area= 17,404 sf Storage= 44,415 cf

Plug-Flow detention time= 326.9 min calculated for 1.101 af (61% of inflow)
Center-of-Mass det. time= 212.3 min (1,058.6 - 846.3)

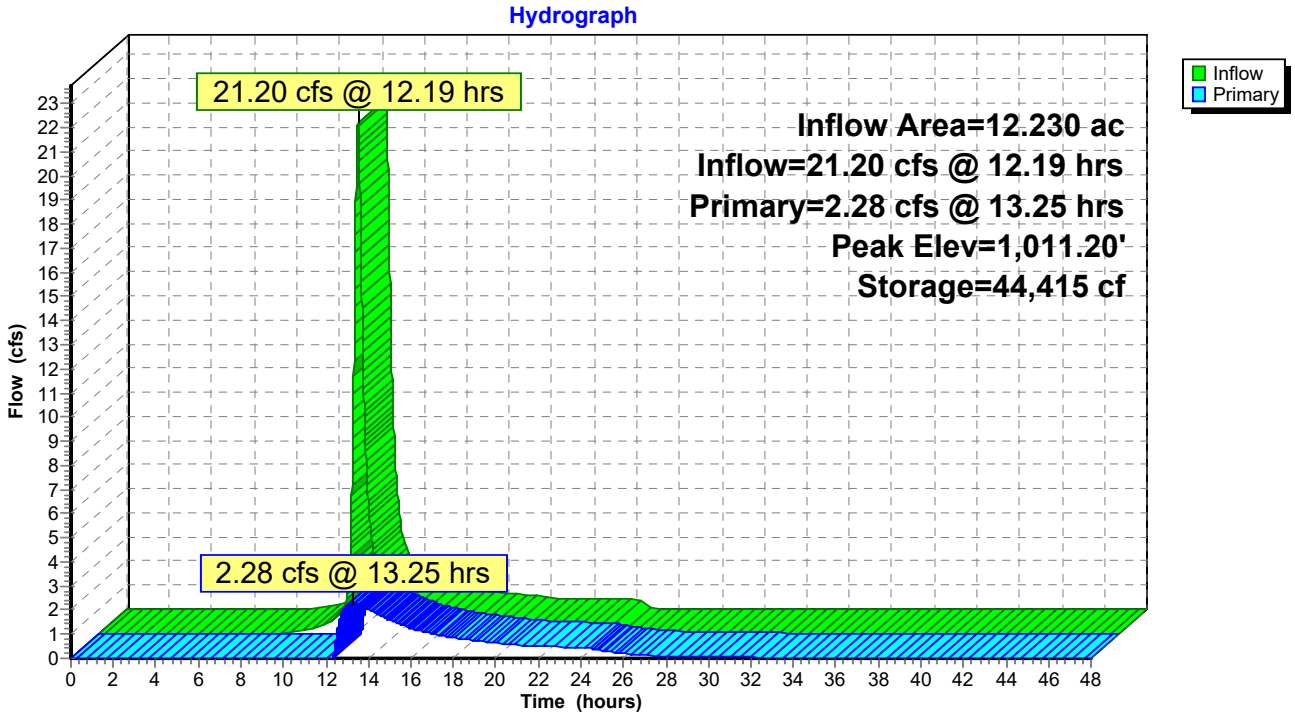
Volume	Invert	Avail.Storage	Storage Description
#1	1,005.00'	150,049 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,005.00	0	0	0
1,006.00	627	314	314
1,007.00	1,983	1,305	1,619
1,008.00	5,044	3,514	5,132
1,009.00	10,030	7,537	12,669
1,010.00	14,662	12,346	25,015
1,010.40	15,976	6,128	31,143
1,011.00	17,049	9,908	41,050
1,011.46	17,886	8,035	49,085
1,012.00	18,879	9,927	59,012
1,013.00	20,773	19,826	78,838
1,014.00	22,710	21,742	100,579
1,015.00	24,723	23,717	124,296
1,016.00	26,783	25,753	150,049

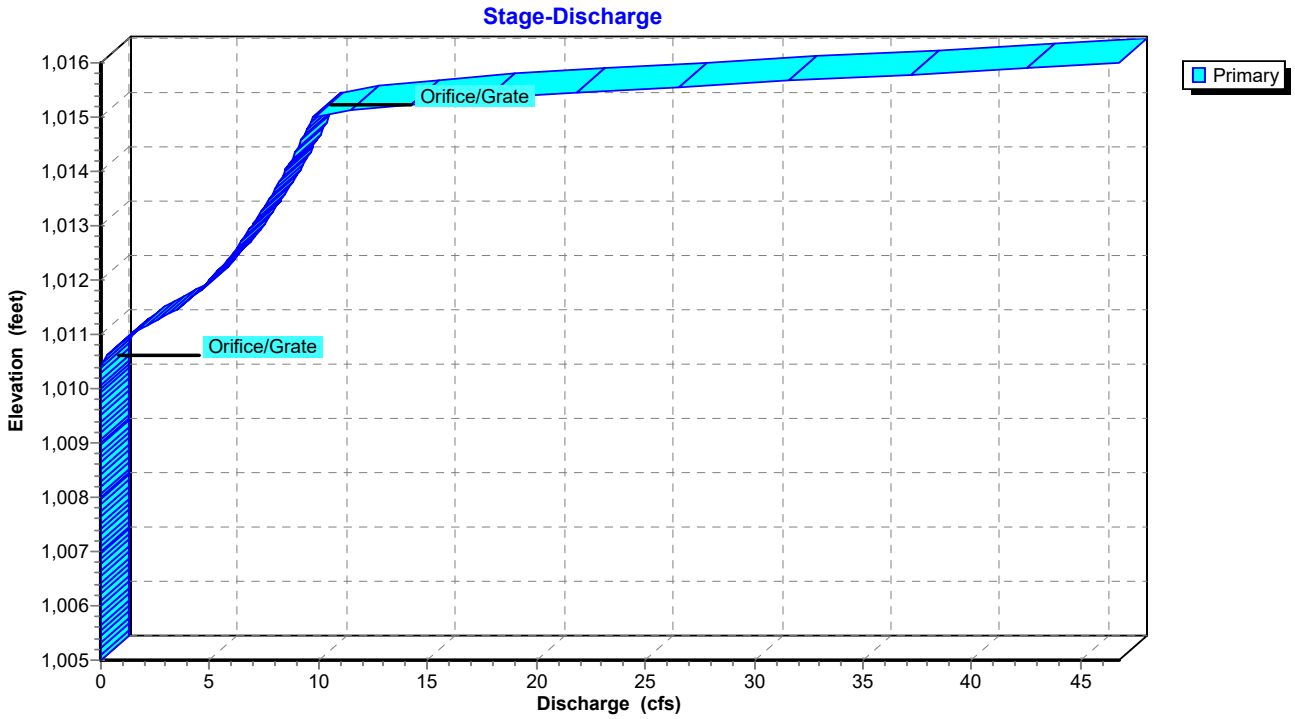
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.83'	**30.0" Round Culvert** L= 87.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,004.83' / 1,004.48' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	1,010.40'	**12.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,015.00'	**144.0" W x 10.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.28 cfs @ 13.25 hrs HW=1,011.20' (Free Discharge)
└**1=Culvert** (Passes 2.28 cfs of 53.27 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.28 cfs @ 2.86 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

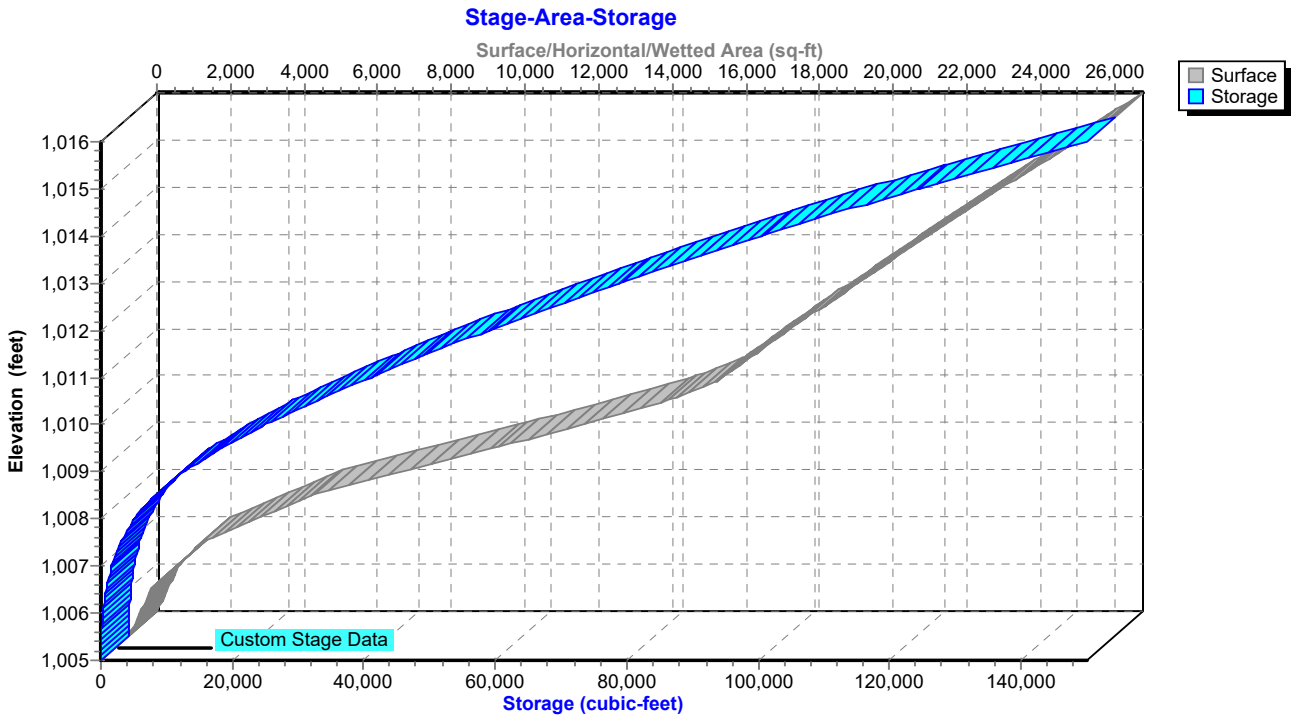
Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Pond 8P: Walmart Detention



Hydrograph for Pond 8P: Walmart Detention

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	1,005.00	0.00
1.00	0.00	0	1,005.00	0.00
2.00	0.00	0	1,005.00	0.00
3.00	0.00	0	1,005.00	0.00
4.00	0.00	0	1,005.00	0.00
5.00	0.00	0	1,005.00	0.00
6.00	0.00	0	1,005.00	0.00
7.00	0.00	0	1,005.00	0.00
8.00	0.00	0	1,005.00	0.00
9.00	0.04	31	1,005.31	0.00
10.00	0.18	409	1,006.13	0.00
11.00	0.56	1,607	1,006.99	0.00
12.00	**11.35**	9,238	1,008.62	0.00
13.00	**2.99**	**44,101**	**1,011.18**	**2.20**
14.00	1.49	**43,439**	**1,011.14**	**2.04**
15.00	1.10	41,457	1,011.02	1.58
16.00	0.88	39,944	1,010.93	1.26
17.00	0.74	38,733	1,010.86	1.02
18.00	0.66	37,902	1,010.81	0.86
19.00	0.57	37,251	1,010.77	0.74
20.00	0.49	36,683	1,010.74	0.64
21.00	0.45	36,197	1,010.71	0.56
22.00	0.43	35,863	1,010.69	0.51
23.00	0.41	35,623	1,010.68	0.47
24.00	0.40	35,439	1,010.66	0.44
25.00	0.00	34,566	1,010.61	0.31
26.00	0.00	33,648	1,010.56	0.21
27.00	0.00	33,042	1,010.52	0.14
28.00	0.00	32,640	1,010.49	0.09
29.00	0.00	32,336	1,010.47	0.08
30.00	0.00	32,093	1,010.46	0.06
31.00	0.00	31,900	1,010.45	0.05
32.00	0.00	31,746	1,010.44	0.04
33.00	0.00	31,623	1,010.43	0.03
34.00	0.00	31,525	1,010.42	0.02
35.00	0.00	31,447	1,010.42	0.02
36.00	0.00	31,385	1,010.42	0.02
37.00	0.00	31,336	1,010.41	0.01
38.00	0.00	31,297	1,010.41	0.01
39.00	0.00	31,265	1,010.41	0.01
40.00	0.00	31,240	1,010.41	0.01
41.00	0.00	31,220	1,010.40	0.00
42.00	0.00	31,205	1,010.40	0.00
43.00	0.00	31,192	1,010.40	0.00
44.00	0.00	31,182	1,010.40	0.00
45.00	0.00	31,174	1,010.40	0.00
46.00	0.00	31,168	1,010.40	0.00
47.00	0.00	31,162	1,010.40	0.00
48.00	0.00	31,158	1,010.40	0.00

Stage-Discharge for Pond 8P: Walmart Detention

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
1,005.00	0.00	1,010.30	0.00	1,015.60	28.34
1,005.10	0.00	1,010.40	0.00	1,015.70	33.10
1,005.20	0.00	1,010.50	0.10	1,015.80	38.22
1,005.30	0.00	1,010.60	0.29	1,015.90	42.99
1,005.40	0.00	1,010.70	0.53	1,016.00	**46.77**
1,005.50	0.00	1,010.80	0.81		
1,005.60	0.00	1,010.90	1.13		
1,005.70	0.00	1,011.00	1.49		
1,005.80	0.00	1,011.10	1.88		
1,005.90	0.00	1,011.20	2.30		
1,006.00	0.00	1,011.30	2.74		
1,006.10	0.00	1,011.40	3.21		
1,006.20	0.00	1,011.50	3.60		
1,006.30	0.00	1,011.60	3.93		
1,006.40	0.00	1,011.70	4.23		
1,006.50	0.00	1,011.80	4.51		
1,006.60	0.00	1,011.90	4.76		
1,006.70	0.00	1,012.00	5.00		
1,006.80	0.00	1,012.10	5.24		
1,006.90	0.00	1,012.20	5.46		
1,007.00	0.00	1,012.30	5.67		
1,007.10	0.00	1,012.40	5.87		
1,007.20	0.00	1,012.50	6.07		
1,007.30	0.00	1,012.60	6.25		
1,007.40	0.00	1,012.70	6.44		
1,007.50	0.00	1,012.80	6.62		
1,007.60	0.00	1,012.90	6.79		
1,007.70	0.00	1,013.00	6.96		
1,007.80	0.00	1,013.10	7.13		
1,007.90	0.00	1,013.20	7.29		
1,008.00	0.00	1,013.30	7.45		
1,008.10	0.00	1,013.40	7.60		
1,008.20	0.00	1,013.50	7.75		
1,008.30	0.00	1,013.60	7.90		
1,008.40	0.00	1,013.70	8.05		
1,008.50	0.00	1,013.80	8.19		
1,008.60	0.00	1,013.90	8.33		
1,008.70	0.00	1,014.00	8.47		
1,008.80	0.00	1,014.10	8.60		
1,008.90	0.00	1,014.20	8.74		
1,009.00	0.00	1,014.30	8.87		
1,009.10	0.00	1,014.40	9.00		
1,009.20	0.00	1,014.50	9.13		
1,009.30	0.00	1,014.60	9.25		
1,009.40	0.00	1,014.70	9.38		
1,009.50	0.00	1,014.80	9.50		
1,009.60	0.00	1,014.90	9.62		
1,009.70	0.00	1,015.00	9.74		
1,009.80	0.00	1,015.10	11.08		
1,009.90	0.00	1,015.20	13.42		
1,010.00	0.00	1,015.30	16.42		
1,010.10	0.00	1,015.40	19.95		
1,010.20	0.00	1,015.50	23.94		

Stage-Area-Storage for Pond 8P: Walmart Detention

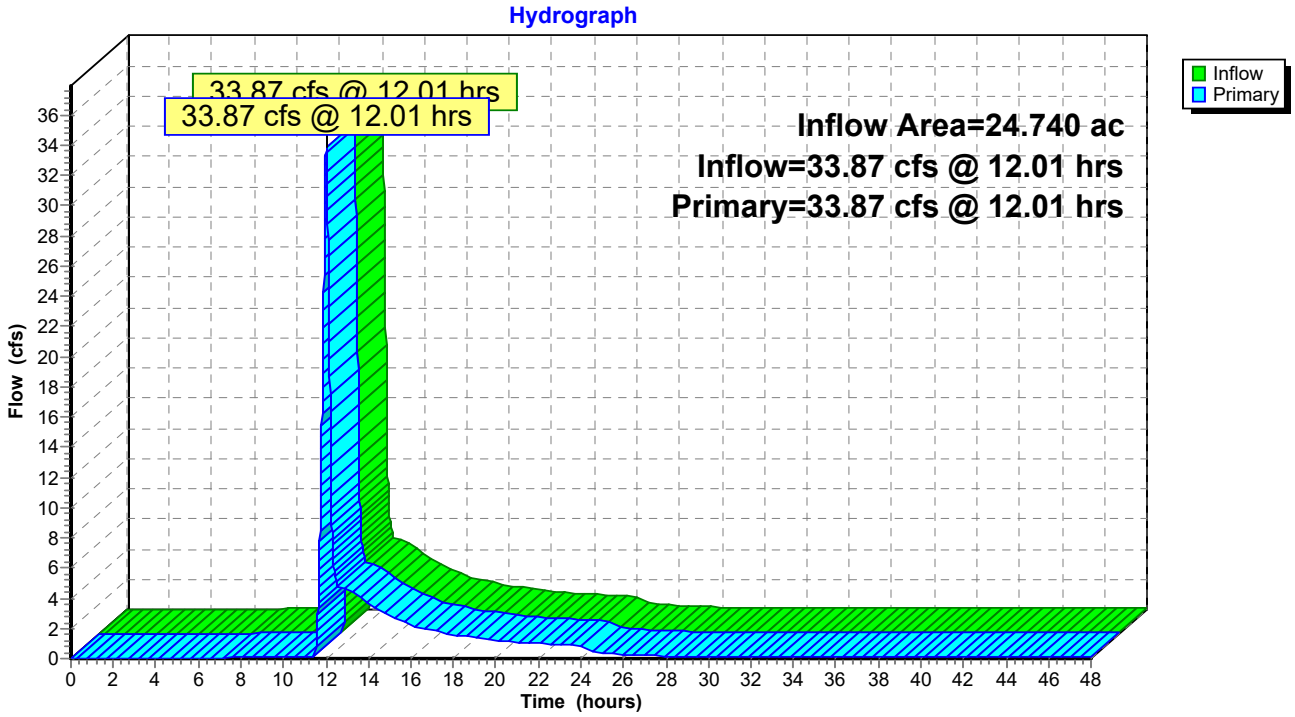
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,005.00	0	0
1,005.20	125	13
1,005.40	251	50
1,005.60	376	113
1,005.80	502	201
1,006.00	627	314
1,006.20	898	466
1,006.40	1,169	673
1,006.60	1,441	934
1,006.80	1,712	1,249
1,007.00	1,983	1,619
1,007.20	2,595	2,076
1,007.40	3,207	2,657
1,007.60	3,820	3,359
1,007.80	4,432	4,184
1,008.00	5,044	5,132
1,008.20	6,041	6,241
1,008.40	7,038	7,548
1,008.60	8,036	9,056
1,008.80	9,033	10,763
1,009.00	10,030	12,669
1,009.20	10,956	14,768
1,009.40	11,883	17,052
1,009.60	12,809	19,521
1,009.80	13,736	22,175
1,010.00	14,662	25,015
1,010.20	15,319	28,013
1,010.40	15,976	31,143
1,010.60	16,334	34,374
1,010.80	16,691	37,676
1,011.00	17,049	41,050
1,011.20	17,413	44,496
1,011.40	17,777	48,015
1,011.60	18,143	51,607
1,011.80	18,511	55,273
1,012.00	18,879	59,012
1,012.20	19,258	62,825
1,012.40	19,637	66,715
1,012.60	20,015	70,680
1,012.80	20,394	74,721
1,013.00	20,773	78,838
1,013.20	21,160	83,031
1,013.40	21,548	87,302
1,013.60	21,935	91,650
1,013.80	22,323	96,076
1,014.00	22,710	100,579
1,014.20	23,113	105,161
1,014.40	23,515	109,824
1,014.60	23,918	114,568
1,014.80	24,320	119,391
1,015.00	24,723	124,296
1,015.20	25,135	129,282
1,015.40	25,547	134,350
1,015.60	25,959	139,500
1,015.80	26,371	144,733
1,016.00	**26,783**	**150,049**

Summary for Link 1L: Proposed Total

Inflow Area = 24.740 ac, 9.42% Impervious, Inflow Depth > 1.64" for Jackson - 2 YR event
Inflow = 33.87 cfs @ 12.01 hrs, Volume= 3.371 af
Primary = 33.87 cfs @ 12.01 hrs, Volume= 3.371 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link 1L: Proposed Total



Hydrograph for Link 1L: Proposed Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.50	0.22	0.00	0.22
0.50	0.00	0.00	0.00	27.00	0.20	0.00	0.20
1.00	0.00	0.00	0.00	27.50	0.17	0.00	0.17
1.50	0.00	0.00	0.00	28.00	0.15	0.00	0.15
2.00	0.00	0.00	0.00	28.50	0.14	0.00	0.14
2.50	0.00	0.00	0.00	29.00	0.13	0.00	0.13
3.00	0.00	0.00	0.00	29.50	0.12	0.00	0.12
3.50	0.01	0.00	0.01	30.00	0.11	0.00	0.11
4.00	0.03	0.00	0.03	30.50	0.10	0.00	0.10
4.50	0.04	0.00	0.04	31.00	0.10	0.00	0.10
5.00	0.04	0.00	0.04	31.50	0.10	0.00	0.10
5.50	0.05	0.00	0.05	32.00	0.10	0.00	0.10
6.00	0.05	0.00	0.05	32.50	0.10	0.00	0.10
6.50	0.05	0.00	0.05	33.00	0.10	0.00	0.10
7.00	0.06	0.00	0.06	33.50	0.10	0.00	0.10
7.50	0.06	0.00	0.06	34.00	0.10	0.00	0.10
8.00	0.06	0.00	0.06	34.50	0.10	0.00	0.10
8.50	0.07	0.00	0.07	35.00	0.10	0.00	0.10
9.00	0.07	0.00	0.07	35.50	0.10	0.00	0.10
9.50	0.07	0.00	0.07	36.00	0.10	0.00	0.10
10.00	0.08	0.00	0.08	36.50	0.10	0.00	0.10
10.50	0.08	0.00	0.08	37.00	0.10	0.00	0.10
11.00	0.11	0.00	0.11	37.50	0.10	0.00	0.10
11.50	0.37	0.00	0.37	38.00	0.10	0.00	0.10
12.00	**33.63**	0.00	**33.63**	38.50	0.10	0.00	0.10
12.50	**4.98**	0.00	**4.98**	39.00	0.10	0.00	0.10
13.00	4.63	0.00	4.63	39.50	0.10	0.00	0.10
13.50	4.16	0.00	4.16	40.00	0.10	0.00	0.10
14.00	3.58	0.00	3.58	40.50	0.10	0.00	0.10
14.50	3.15	0.00	3.15	41.00	0.10	0.00	0.10
15.00	2.80	0.00	2.80	41.50	0.10	0.00	0.10
15.50	2.50	0.00	2.50	42.00	0.10	0.00	0.10
16.00	2.22	0.00	2.22	42.50	0.10	0.00	0.10
16.50	2.02	0.00	2.02	43.00	0.10	0.00	0.10
17.00	1.86	0.00	1.86	43.50	0.10	0.00	0.10
17.50	1.72	0.00	1.72	44.00	0.10	0.00	0.10
18.00	1.60	0.00	1.60	44.50	0.10	0.00	0.10
18.50	1.49	0.00	1.49	45.00	0.10	0.00	0.10
19.00	1.39	0.00	1.39	45.50	0.10	0.00	0.10
19.50	1.29	0.00	1.29	46.00	0.10	0.00	0.10
20.00	1.20	0.00	1.20	46.50	0.09	0.00	0.09
20.50	1.13	0.00	1.13	47.00	0.09	0.00	0.09
21.00	1.08	0.00	1.08	47.50	0.09	0.00	0.09
21.50	1.05	0.00	1.05	48.00	0.09	0.00	0.09
22.00	1.01	0.00	1.01				
22.50	0.98	0.00	0.98				
23.00	0.96	0.00	0.96				
23.50	0.93	0.00	0.93				
24.00	0.91	0.00	0.91				
24.50	0.50	0.00	0.50				
25.00	0.39	0.00	0.39				
25.50	0.32	0.00	0.32				
26.00	0.27	0.00	0.27				

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APPENDIX D

D. Previously Approved Reports

- Walmart Supercenter No. 4590-01 Final Stormwater Report
- Firestone Complete Auto Care Final Stormwater Report

Detention Calculations

Walmart Supercenter No. 4590-01
3410 SW Market Street
Lee's Summit, MO. 64082

Project No. 12-5082

November 25, 2015

Comprehensive Control Strategy used ✓ OK 12/10/15

RECEIVED
DEC 02 2015
Planning & Codes Admin

Elliott R. Reed

11/30/15
Date

Elliott R. Reed, P.E. #2006002845
State of Missouri
Registered Professional Engineer for Cochran

STATE OF MISSOURI
ELLIOTT R. REED
NUMBER PE2006002845
PROFESSIONAL ENGINEER

COCHRAN

Architecture • Civil Engineering • Land Surveying • Site Development • Geotechnical Engineering • Inspection & Materials Testing

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737 Rudder Road
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Telephone: 314-842-4033
Fax: 314-842-5957

www.cochraneng.com

Executive Summary

Walmart is planning a new Supercenter development on Market St. just north of Highway 150. The development will consist of a new 160,499 s.f. Walmart Supercenter and two outlots. There are no users defined at this time for the two outlots so the outlots are assumed to be 100% impervious for the purposes of storm water detention at the site.

The site is currently undeveloped. The existing use of the property is agriculture. The site gently slopes from the west to the east. The drainage on the site is split into three areas. Drainage Area #1 flows to the southeast corner of the site to a 30" diameter storm sewer culvert under Market St. Drainage Area #1 is tributary to Lake Winnebago. Drainage Area #2 flows to the northeast corner of the site to the west ditchline along Market St. Drainage Area #2 is tributary to Big Creek. Drainage Area #3 flows to the north of the site to the west ditchline along Market St. Drainage Area #3 is tributary to Big Creek. The locations of the storm water discharge from the site are shown on the attached pre-developed drainage area map. The pre-developed peak storm water runoffs for each drainage area are summarized below:

Pre-developed Flow Rates

Drainage Area #1 (Lake Winnebago)	Drainage Area #2 (Big Creek)	Drainage Area #3 (Big Creek)
2-year storm = 9.74 cfs	2-year storm = 13.57 cfs	2-year storm = 3.61 cfs
10-year storm = 22.32 cfs	10-year storm = 31.10 cfs	10-year storm = 8.24 cfs
100-year storm = 37.79 cfs	100-year storm = 52.65 cfs	100-year storm = 13.91 cfs

The post-developed tributary areas for the site will roughly follow the existing drainage patterns. The two outlots and a portion of the front parking field will be tributary to Drainage Area #1. The storm water runoff from Drainage Area #1 will be detained in Storm Water Detention Basin #1. The Walmart building, rear truck drive, and remainder of the front parking field will be tributary to Drainage Area #2. The storm water runoff from Drainage Area #2 will be detained in Storm Water Detention Basin #2. Detention was not provided for drainage area #3, as the post developed flow rates decreased of that from the pre-developed flow rates. Storm water quality was not provided, as the drainage area is all pervious. The post-developed peak storm water runoffs for each drainage area are summarized below:

Post-Developed Flow Rates

Drainage Area #1 (Lake Winnebago)	Drainage Area #2 (Big Creek)	Drainage Area #3 (Big Creek)
2-year storm = 4.74 cfs	2-year storm = 6.38 cfs	2-year storm = 1.69 cfs
10-year storm = 11.41 cfs	10-year storm = 23.61 cfs	10-year storm = 3.84 cfs
100-year storm = 16.67 cfs	100-year storm = 37.33 cfs	100-year storm = 6.49 cfs

The peak storm water runoff was reduced for all three design storms. A summary of the percentage reduction of peak storm water runoff is summarized below:

Drainage Area #1 (Lake Winnebago)	Drainage Area #2 (Big Creek)	Drainage Area #3 (Big Creek)
2-year storm = 51% reduction	2-year storm = 53% reduction	2-year storm = 53% reduction
10-year storm = 49% reduction	10-year storm = 24% reduction	10-year storm = 53% reduction
100-year storm = 56% reduction	100-year storm = 29% reduction	100-year storm = 53% reduction

The storm water quality requirements for the project will be satisfied in the bottom portions of each of the storm water detention basins. A PVC standpipe riser pipe protected by a cone of 2" clean limestone will provide the outlet for the storm water quality. The standpipe and gravel will also be utilized in the bottom of the storm water detention basins throughout construction activities on the site. When construction is complete on the site, the sediment captured in the bottom of the basins will be removed and new gravel installed around the standpipe.

The required water quality volume for Drainage Area #1 is 24,470 ft^3. The water quality volume provided in Storm Water Detention Basin #1 is 31,143 ft^3.

The required water quality volume for Drainage Area #2 is 56,439 ft^3. The water quality volume provided in Storm Water Detention Basin #2 is 58,598 ft^3.

Groundwater infiltration was a water quality option that was discussed with City staff. The high plastic soils on the site do not allow the groundwater infiltration as an option for meeting the water quality requirements. An alternative to the high plastic clay would be soil remediation in the upper two feet of the bottom of the storm water detention basin. This option would allow the water to filtrate into the remediated soil, but the water would then not infiltrate into the clay beneath the remediated soil. We have found that the gravel standpipe is an effective, low maintenance option for water quality on large commercial developments.

DETENTION CALCULATIONS

Walmart Supercenter No. 4590-01
3410 SW Market St., Lee's Summit, MO. 64082
Project No. 12-5082
November 25, 2015

The following detention calculations have been performed for final design for the Walmart Supercenter Store No. 4590-01 located in Lee's Summit, Missouri. Said calculations were performed in accordance with the City of Lee's Summit and Kansas City AWPA Regulations. All detention design was performed with the aid of Hydraflow Hydrographs Software. Developed, tributary, and routed hydrographs for the 2, 10, and 100 year storms are attached.

DETENTION BASIN CALCULATIONS SUMMARY:

A summary of the Detention Basin Calculations is shown below. All detention calculations, including release rates and volumes, are included in this report. The release rates were calculated utilizing the comprehensive control, per the APWA regulations. The 2-year storm maximum release rate from the site is 0.5 cfs/site acre, the 10-year storm maximum release rate from the site is 2.0 cfs/site acre, and the 100-year storm maximum release rate allows for 3.0 cfs/site acre. A drainage area map is also included at the end of this report.

DETENTION BASIN #1

Year of Storm Frequency	Pre-Developed Flow Rate (cfs)	Post-Developed Flow Rate (cfs)	Total Runoff Tributary to Detention Basin (cfs) [A]	Detention Basin Release Rate (cfs) [B]	On-Site runoff directly to Outflow #1 [C]	**Total Release Rate To Outflow #1 (cfs) [B+C] = [D]**	**Maximum Allowable Release Rate to Outflow #1 (cfs) (See Table 1)**	Total Detention Provided (cfs) [A-D]
2	9.74	36.24	22.15	2.91	1.83	**4.74**	**4.82**	17.86
10	22.32	64.56	43.44	8.00	3.41	**11.41**	**19.26**	29.12
100	37.79	95.99	67.84	11.48	5.19	**16.67**	**28.89**	47.08

Watershed: Lake Winnebago

DETENTION BASIN #2

Year of Storm Frequency	Pre-Developed Flow Rate (cfs)	Post-Developed Flow Rate (cfs)	Total Runoff Tributary to Detention Basin (cfs) [A]	**Detention Basin Release Rate (cfs) [B]**	**On-Site runoff directly to Outflow #2 [C]**	Total Release Rate to Outflow #2 [B+C] = **[D]**	**Maximum Allowable Release Rate to Outflow #2 (cfs) (See Table 1)**	Total Detention Provided (cfs) [A-D]
2	13.57	37.29	30.49	**4.28**	**2.10**	6.38	**7.48**	25.93
10	31.10	63.54	50.64	**19.71**	**4.51**	23.61	**29.90**	30.73
100	52.65	92.50	72.87	**29.96**	**7.37**	37.33	**44.85**	42.83

Watershed: Big Creek

DETENTION CALCULATIONS

Walmart Supercenter No. 4590-01
3410 SW Market St., Lee's Summit, MO. 64082
Project No. 12-5082
November 30, 2015

Table 1					
Year of Storm Frequency	Release Rate Per Site Acre* (cfs/ac)	Total Site Acreage to Drainage Area		**Maximum Release Rate to Outflow (cfs)**	
		1	2	**Outflow #1**	**Outflow #2**
2	0.5	9.63	14.95	**4.82**	**7.48**
10	2.0	9.63	14.95	**19.26**	**29.90**
100	3.0	9.63	14.95	**28.89**	**44.85**

*Based on Kansas City Metropolitan Chapter American Public Works Association Standard Specifications & Design Criteria – Section 5608.3 C

	Water Elevation			**Top of Berm**
	2 Year Elevation	10 Year Elevation	100 Year Elevation	
Basin #1	1010.89	1012.83	1014.97	**1016.00**
Basin #2	1015.02	1016.48	1017.98	**1019.00**

Water Quality Calculation Summary

24-Hour Storm	**WQCV (cf)**
1.37" Rainfall - Basin #1	24,470
1.37" Rainfall - Basin #2	56,439
1.37" Rainfall - Entire Site	80,909

WATER QUALITY CALCULATION NOTES

Walmart Supercenter No. 4590-01
3410 SW Market St., Lee's Summit, MO. 64082
Project No. 12-5082
November 30, 2015

1.37" RAINFALL OVER ENTIRE SITE

Total Onsite Area

Area = 24.58 Ac.

Volumetric Runoff Coefficient

$R_v = 0.05 + 0.009(I)$ I = % Impervious

Basin #1 - $R_v = 0.05 + 0.009(51\%) = 0.51$

Basin #2 - $R_v = 0.05 + 0.009(79\%) = 0.76$

Water Quality Volume (inches)

$WQ_v = P \times R_v$

Basin #1 - $WQ_v = 1.37" \times 0.51 = 0.70"$

Basin #2 - $WQ_v = 1.37" \times 0.76 = 1.04"$

Watershed Breakdown – 1.37" Rainfall – 24-hour Storm

$$WQCV = \frac{q(in)}{12(in/ft)} \times \text{Total Onsite Area}(ft^2)$$

Basin #1 - $WQCV = \frac{0.70"(in)}{12(in/ft)} \times 419{,}483\ (ft^2) =$ **24,470 CF**

Basin #2 - $WQCV = \frac{1.04"(in)}{12(in/ft)} \times 651{,}222\ (ft^2) =$ **56,439 CF**

Total Water Quality Control Volume = 80,909 CF

OUTFLOW #1

2 YEAR STORM

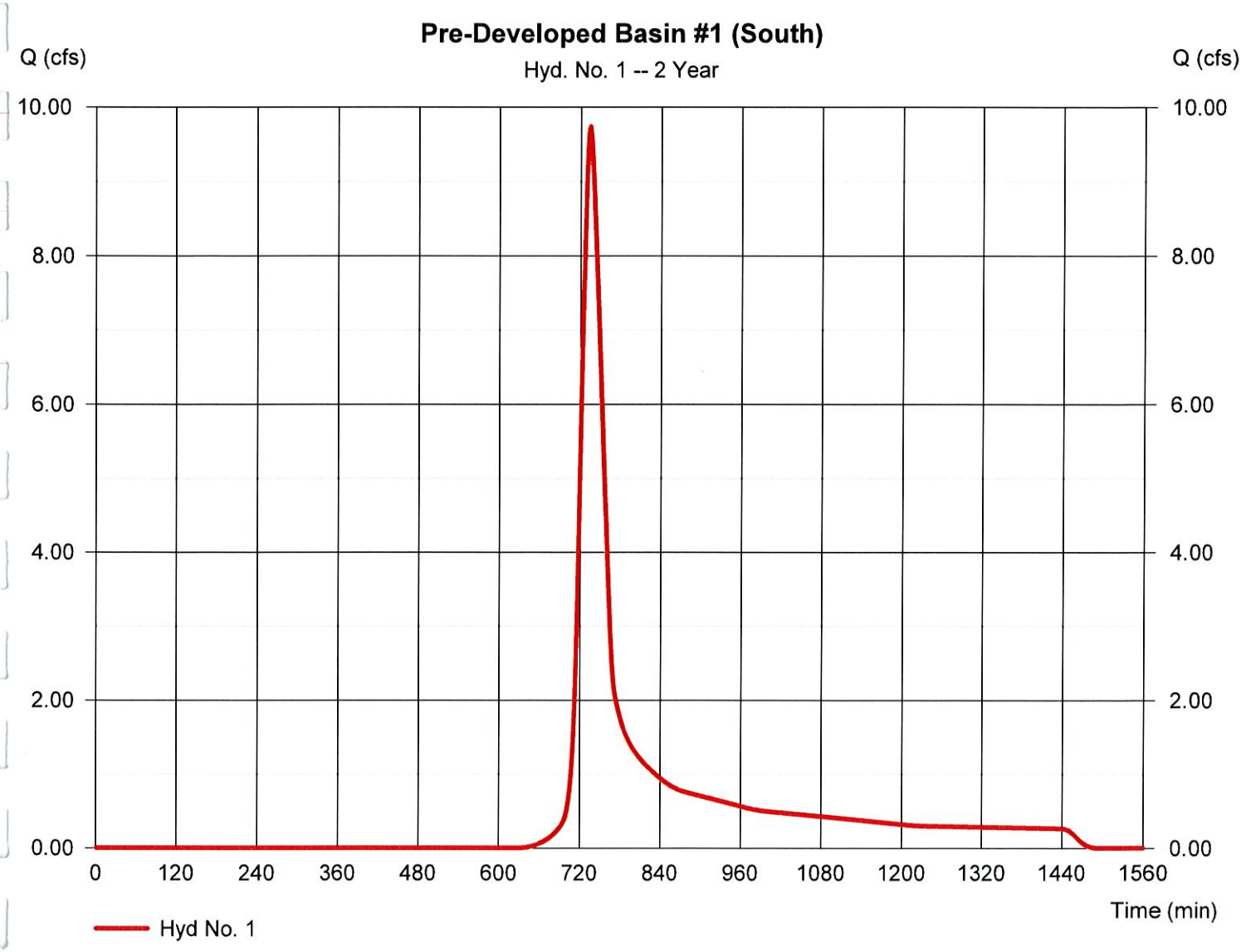
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 11 / 30 / 2015

Hyd. No. 1

Pre-Developed Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 9.739 cfs
Storm frequency	= 2 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 44,035 cuft
Drainage area	= 9.150 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 31.80 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



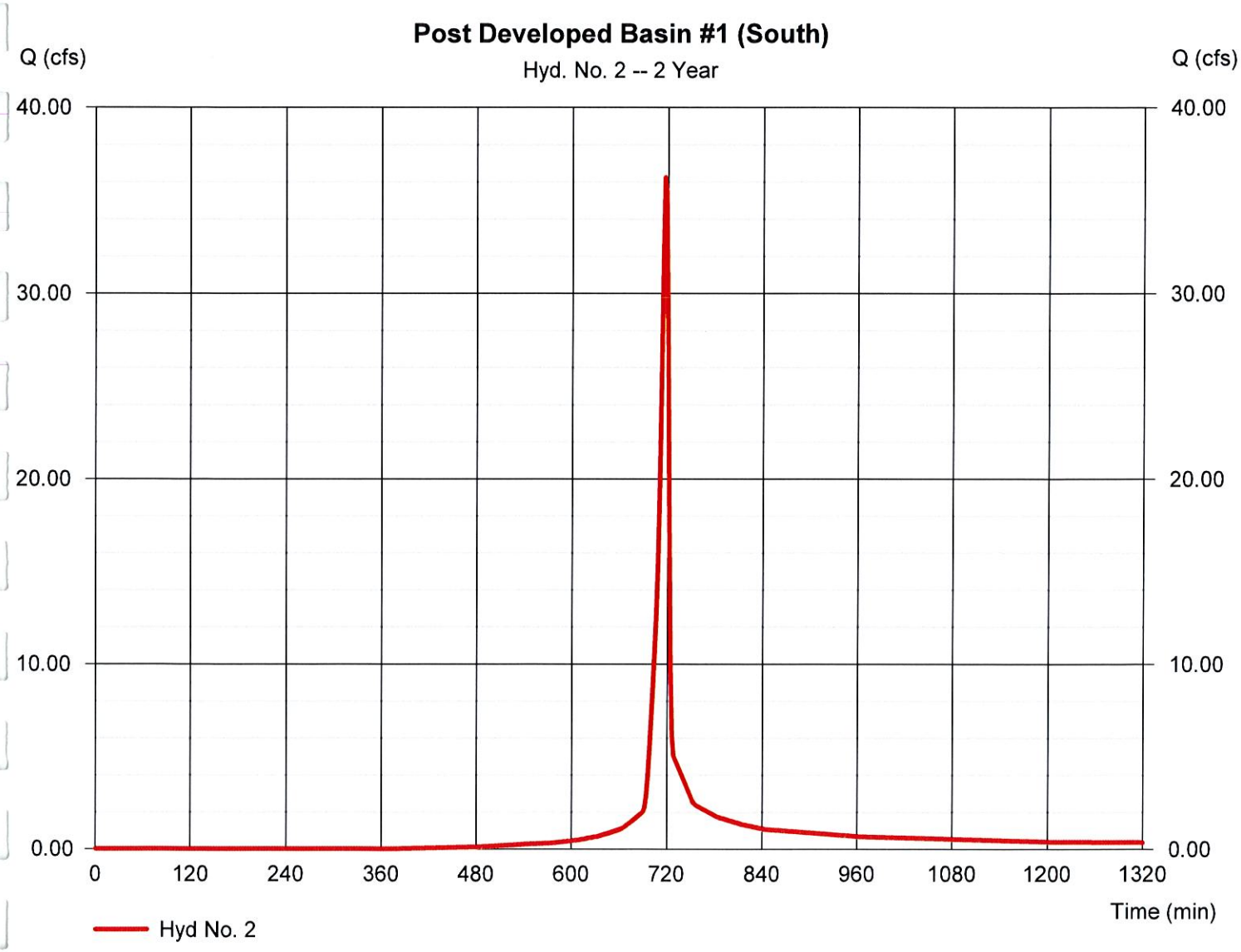
Hydrograph Report

Hyd. No. 2

Post Developed Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 36.24 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 74,397 cuft
Drainage area	= 9.620 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.910 x 98) + (5.710 x 74)] / 9.620



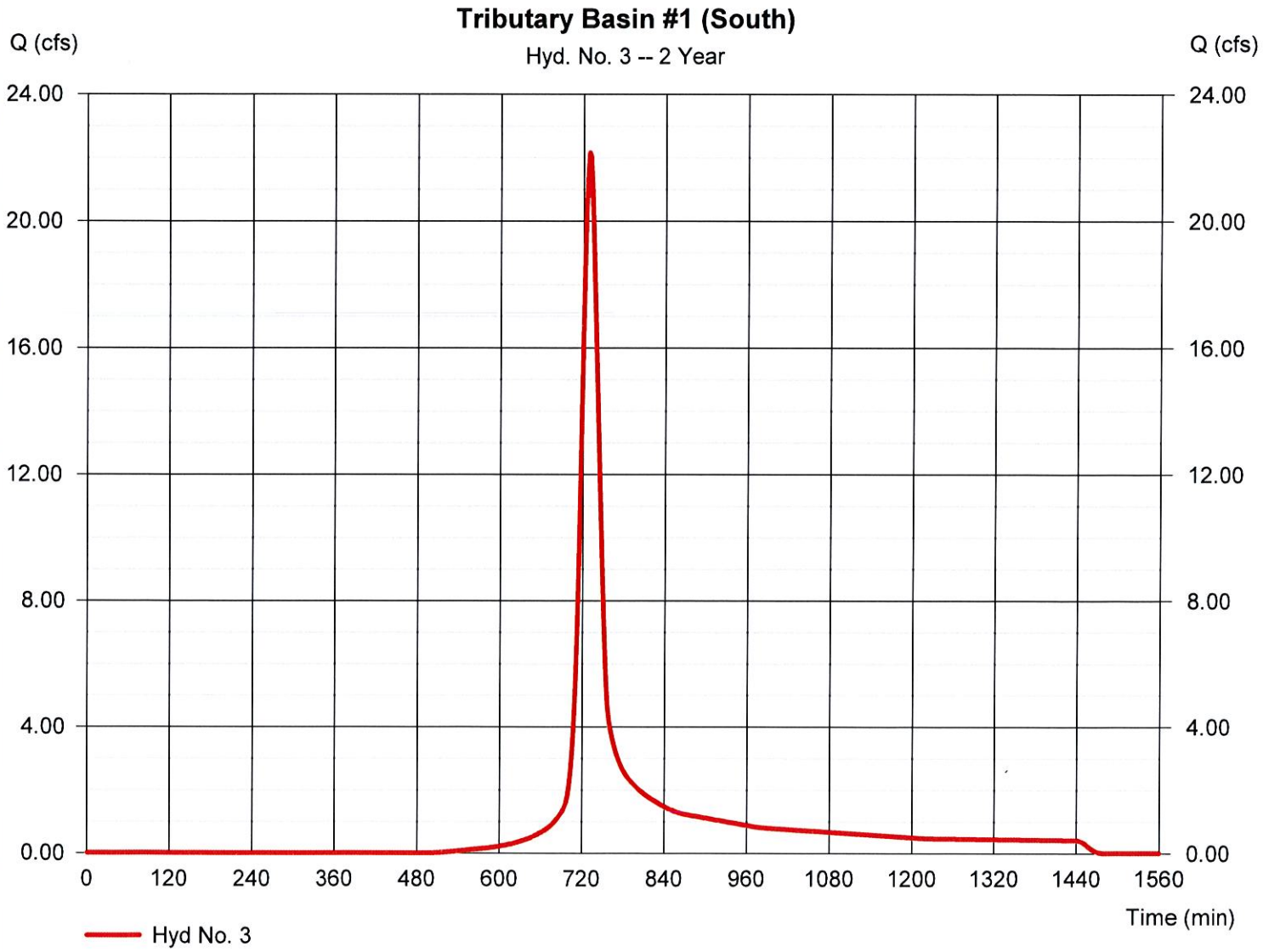
Hydrograph Report

Hyd. No. 3

Tributary Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 22.15 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 81,524 cuft
Drainage area	= 12.230 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 24.90 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(4.120 x 98) + (8.110 x 74)] / 12.230



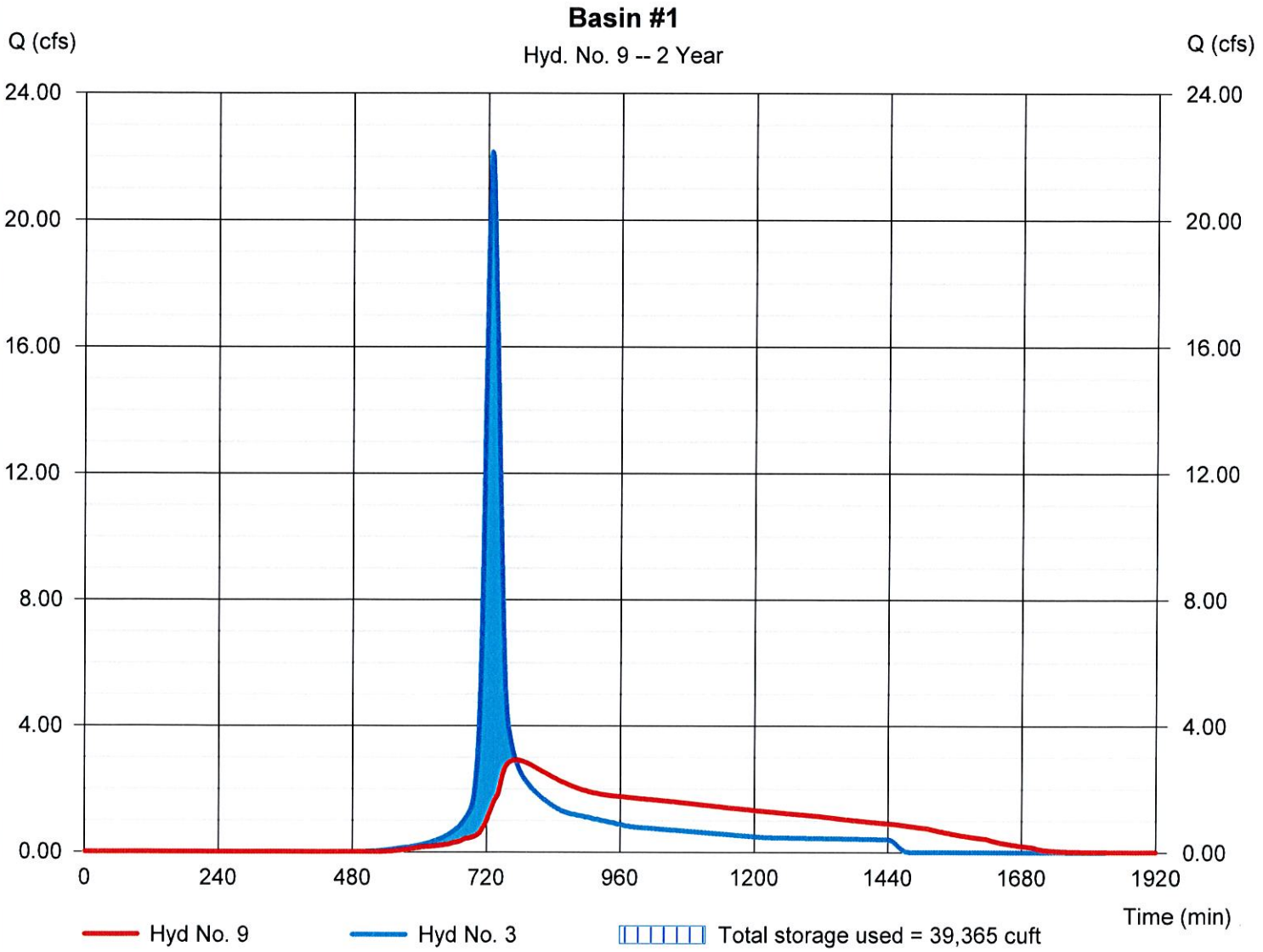
Hydrograph Report

Hyd. No. 9

Basin #1

Hydrograph type	= Reservoir	Peak discharge	= 2.910 cfs
Storm frequency	= 2 yrs	Time to peak	= 772 min
Time interval	= 2 min	Hyd. volume	= 81,518 cuft
Inflow hyd. No.	= 3 - Tributary Basin #1 (South)	Max. Elevation	= 1010.90 ft
Reservoir name	= South Basin #1	Max. Storage	= 39,365 cuft

Storage Indication method used.



Hydrograph Report

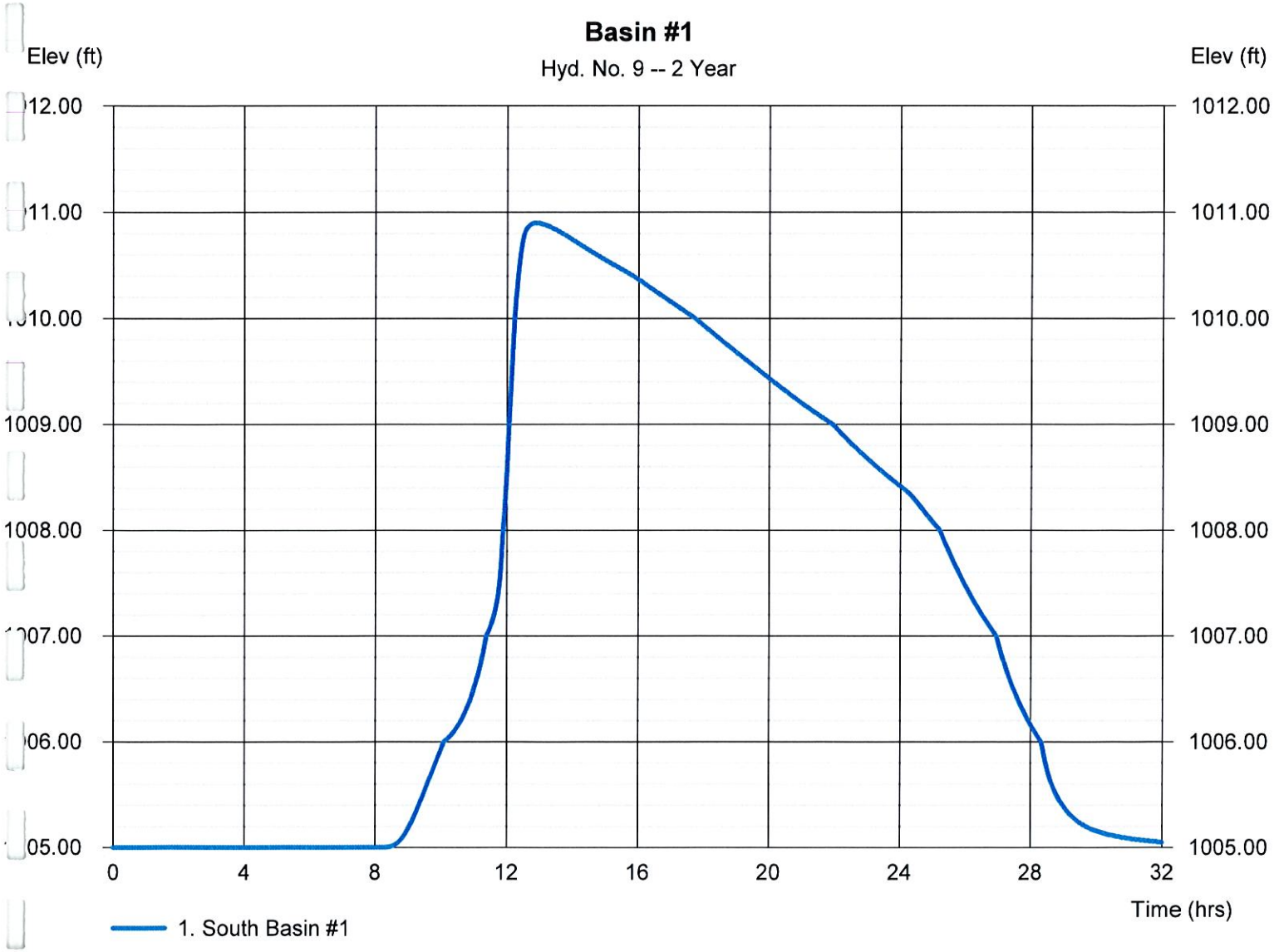
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 11 / 30 / 2015

Hyd. No. 9

Basin #1

Hydrograph type	= Reservoir	Peak discharge	= 2.910 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.87 hrs
Time interval	= 2 min	Hyd. volume	= 81,518 cuft
Inflow hyd. No.	= 3 - Tributary Basin #1 (South)	Max. Elevation	= 1010.90 ft
Reservoir name	= South Basin #1	Max. Storage	= 39,365 cuft

Storage Indication method used.



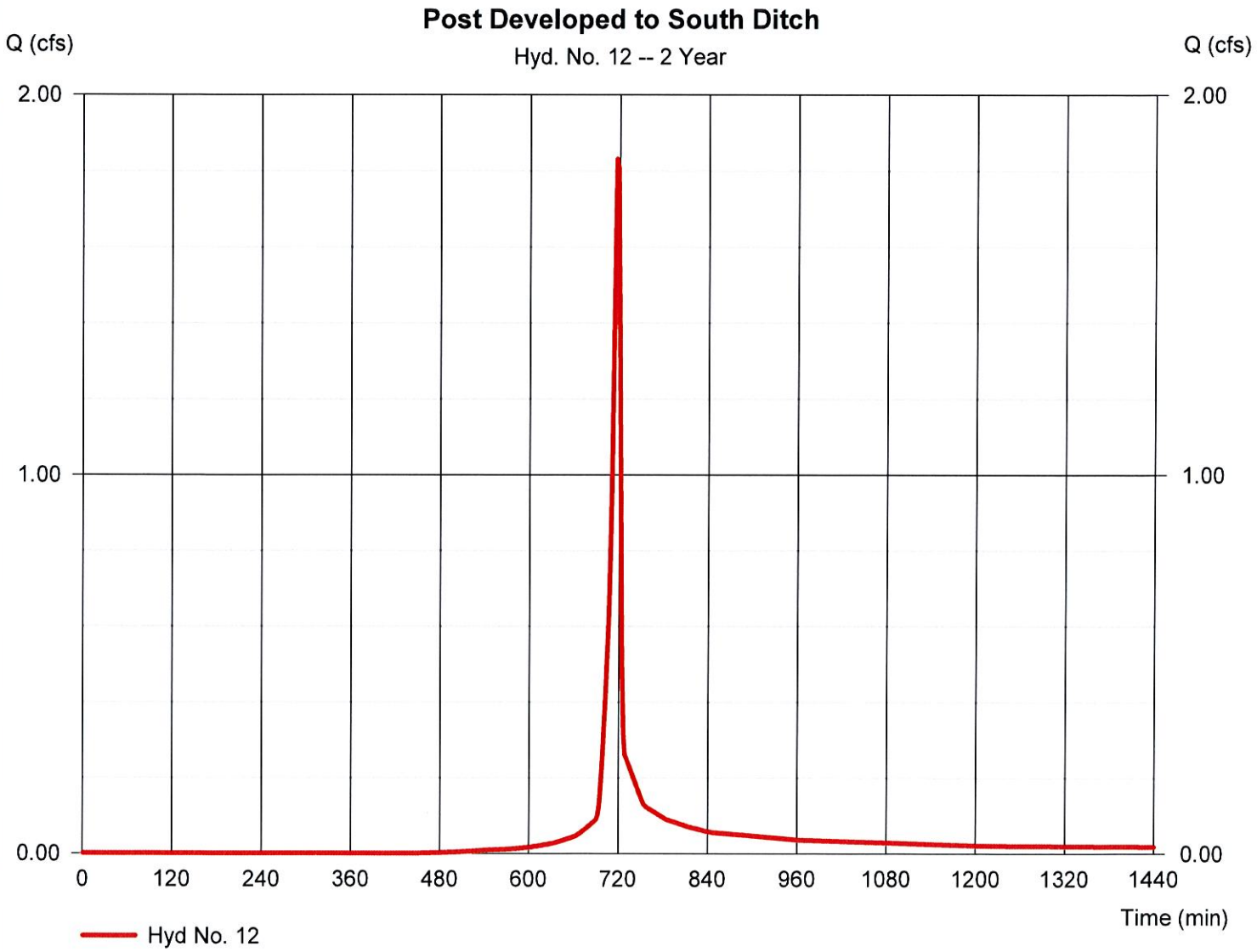
Hydrograph Report

Hyd. No. 12

Post Developed to South Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 1.831 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 3,716 cuft
Drainage area	= 0.540 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.250 x 98) + (0.350 x 74)] / 0.540



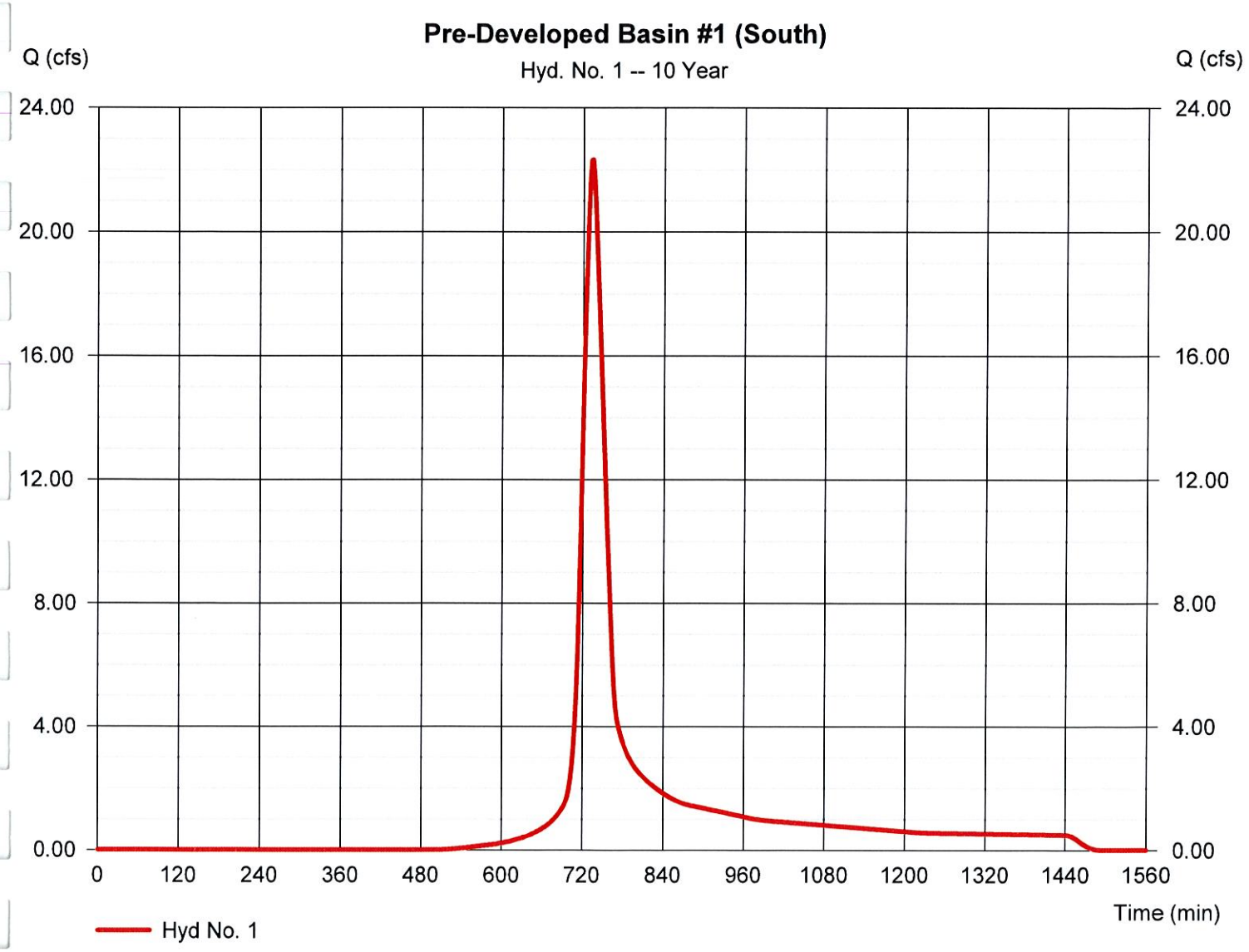
10 YEAR STORM

Hydrograph Report

Hyd. No. 1

Pre-Developed Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 22.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 97,007 cuft
Drainage area	= 9.150 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 31.80 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



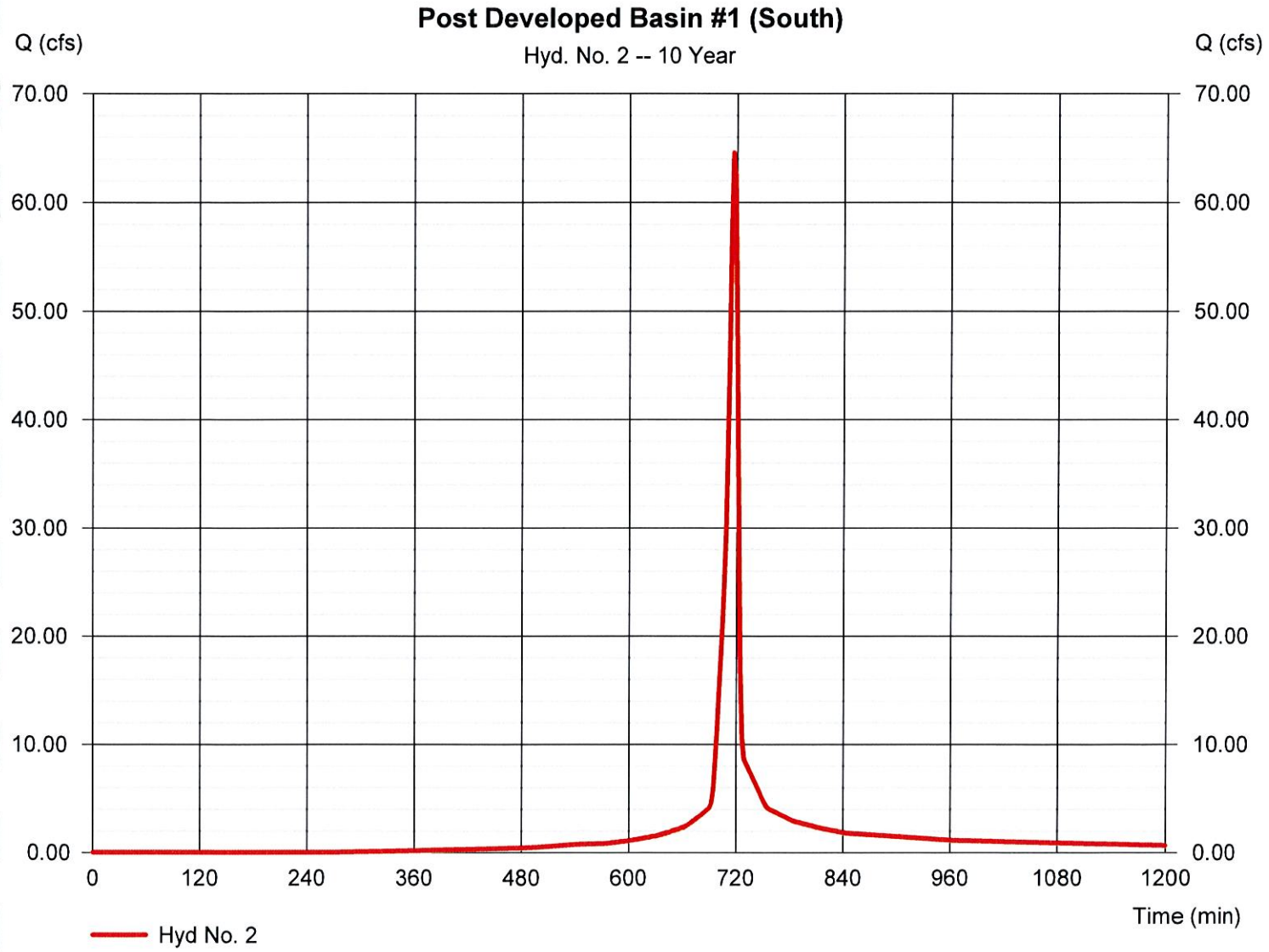
Hydrograph Report

Hyd. No. 2

Post Developed Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 64.56 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 136,634 cuft
Drainage area	= 9.620 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.910 x 98) + (5.710 x 74)] / 9.620



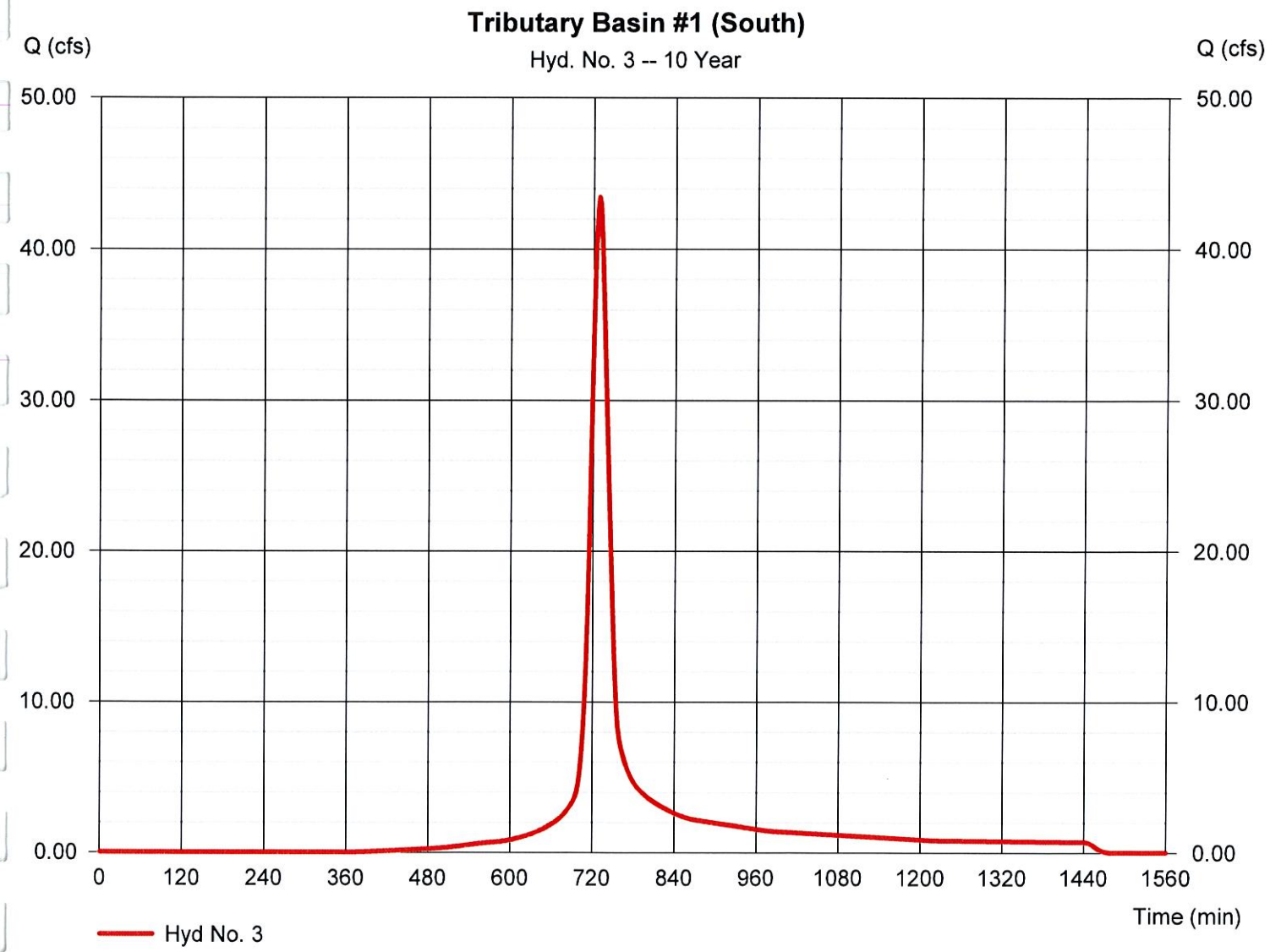
Hydrograph Report

Hyd. No. 3

Tributary Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 43.44 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 159,831 cuft
Drainage area	= 12.230 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 24.90 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(4.120 x 98) + (8.110 x 74)] / 12.230



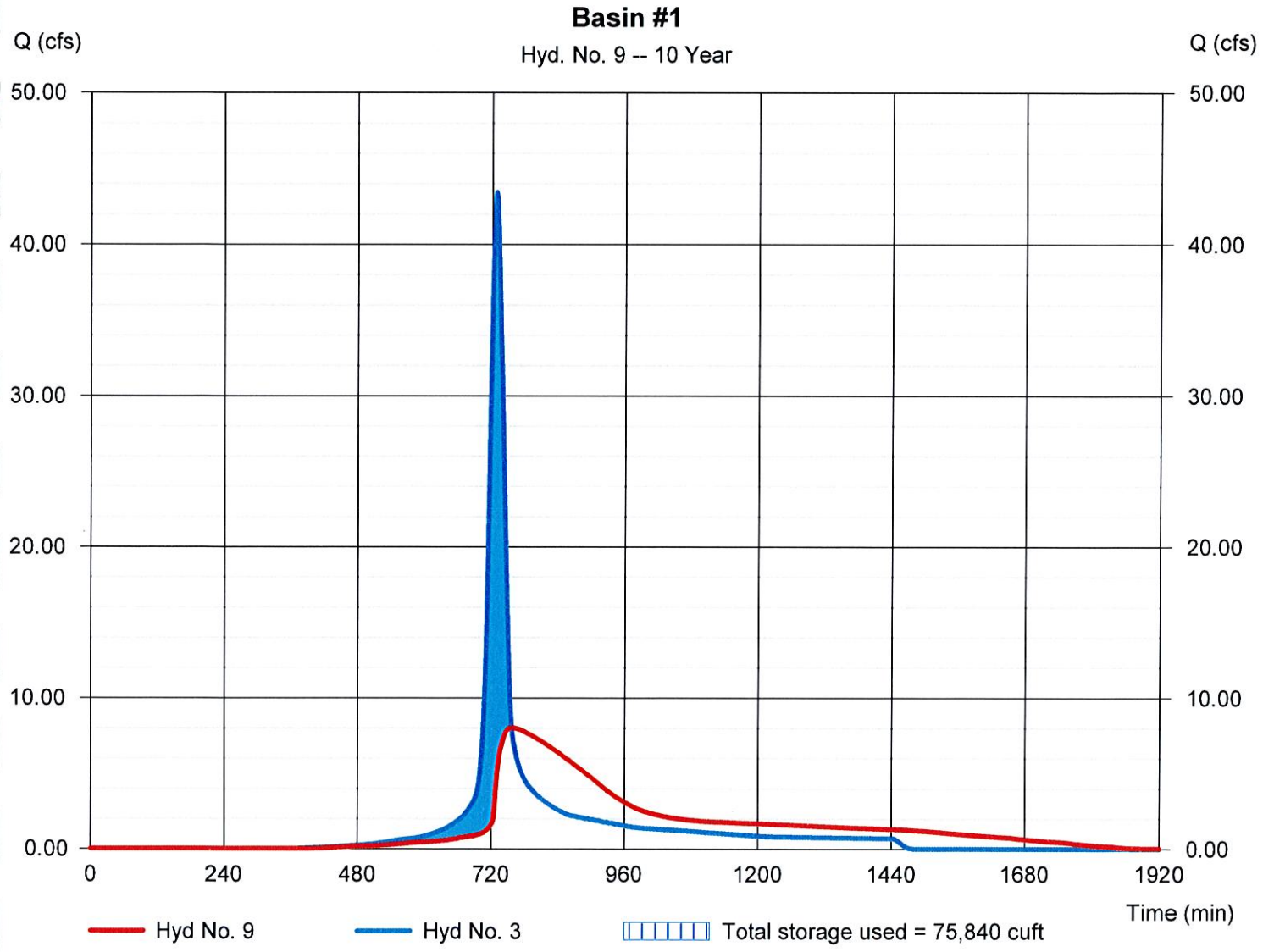
Hydrograph Report

Hyd. No. 9

Basin #1

Hydrograph type	= Reservoir	Peak discharge	= 8.001 cfs
Storm frequency	= 10 yrs	Time to peak	= 756 min
Time interval	= 2 min	Hyd. volume	= 159,824 cuft
Inflow hyd. No.	= 3 - Tributary Basin #1 (South)	Max. Elevation	= 1012.85 ft
Reservoir name	= South Basin #1	Max. Storage	= 75,840 cuft

Storage Indication method used.



Hydrograph Report

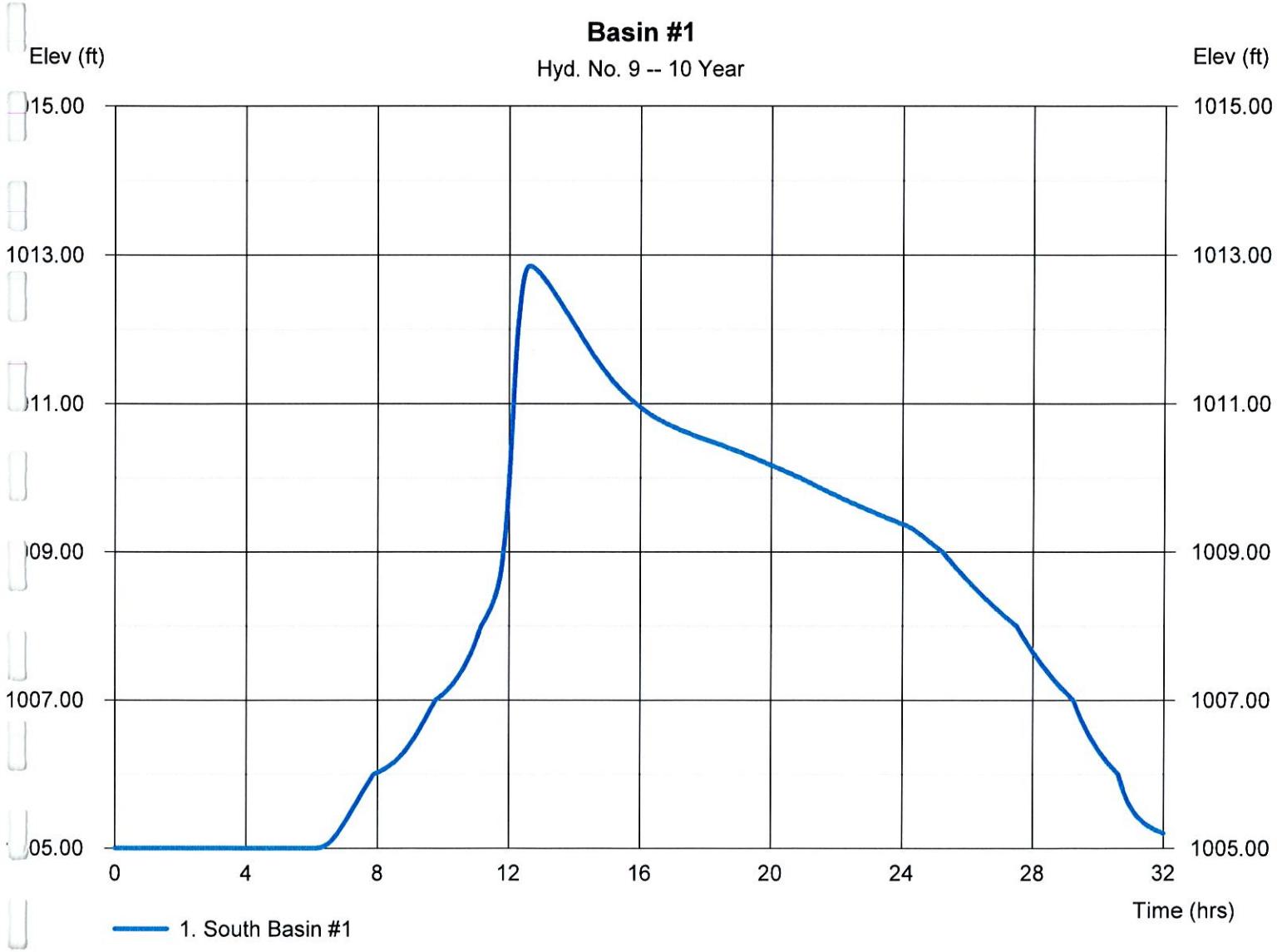
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 11 / 30 / 2015

Hyd. No. 9

Basin #1

Hydrograph type	= Reservoir	Peak discharge	= 8.001 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.60 hrs
Time interval	= 2 min	Hyd. volume	= 159,824 cuft
Inflow hyd. No.	= 3 - Tributary Basin #1 (South)	Max. Elevation	= 1012.85 ft
Reservoir name	= South Basin #1	Max. Storage	= 75,840 cuft

Storage Indication method used.



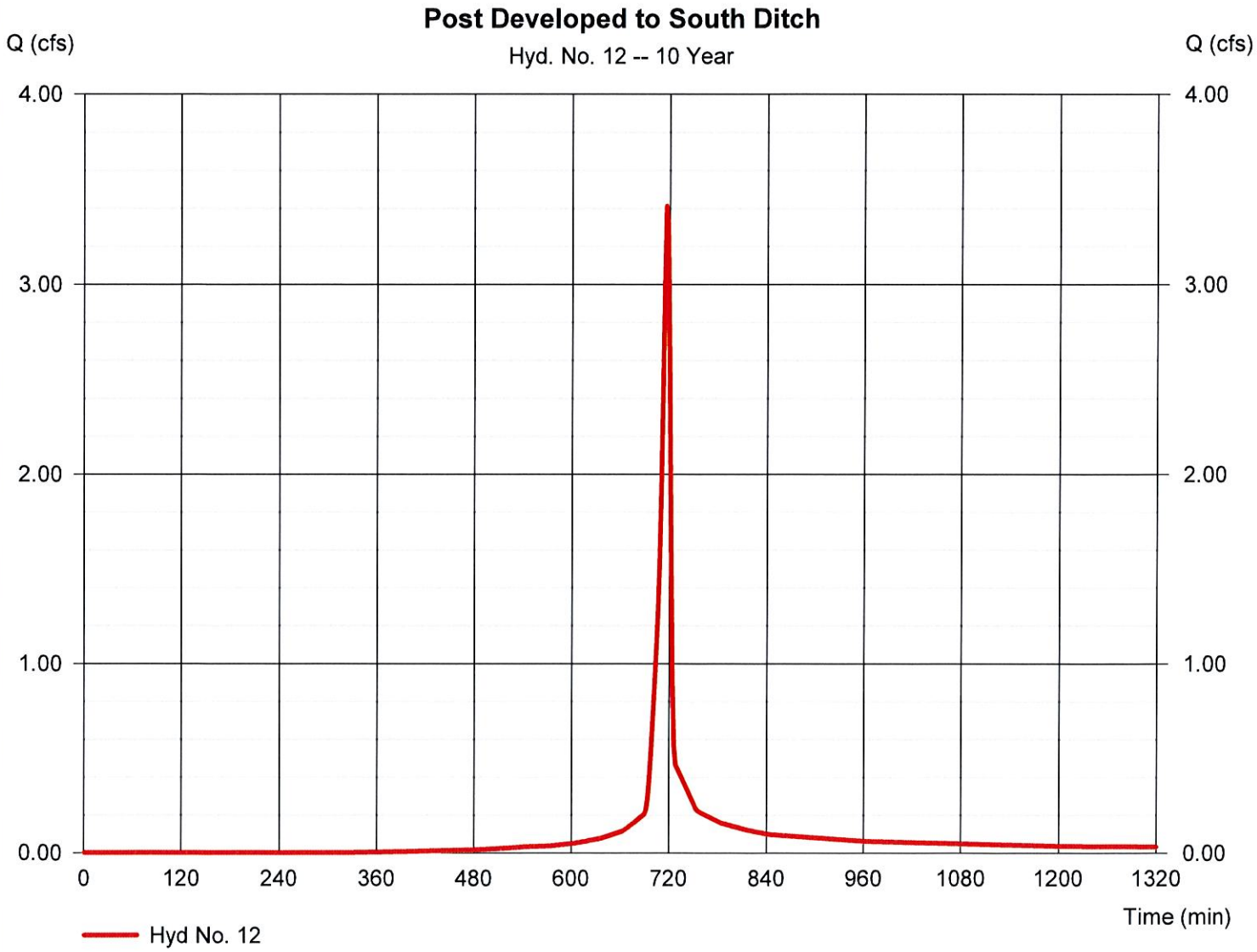
Hydrograph Report

Hyd. No. 12

Post Developed to South Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 3.412 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 7,095 cuft
Drainage area	= 0.540 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.250 x 98) + (0.350 x 74)] / 0.540



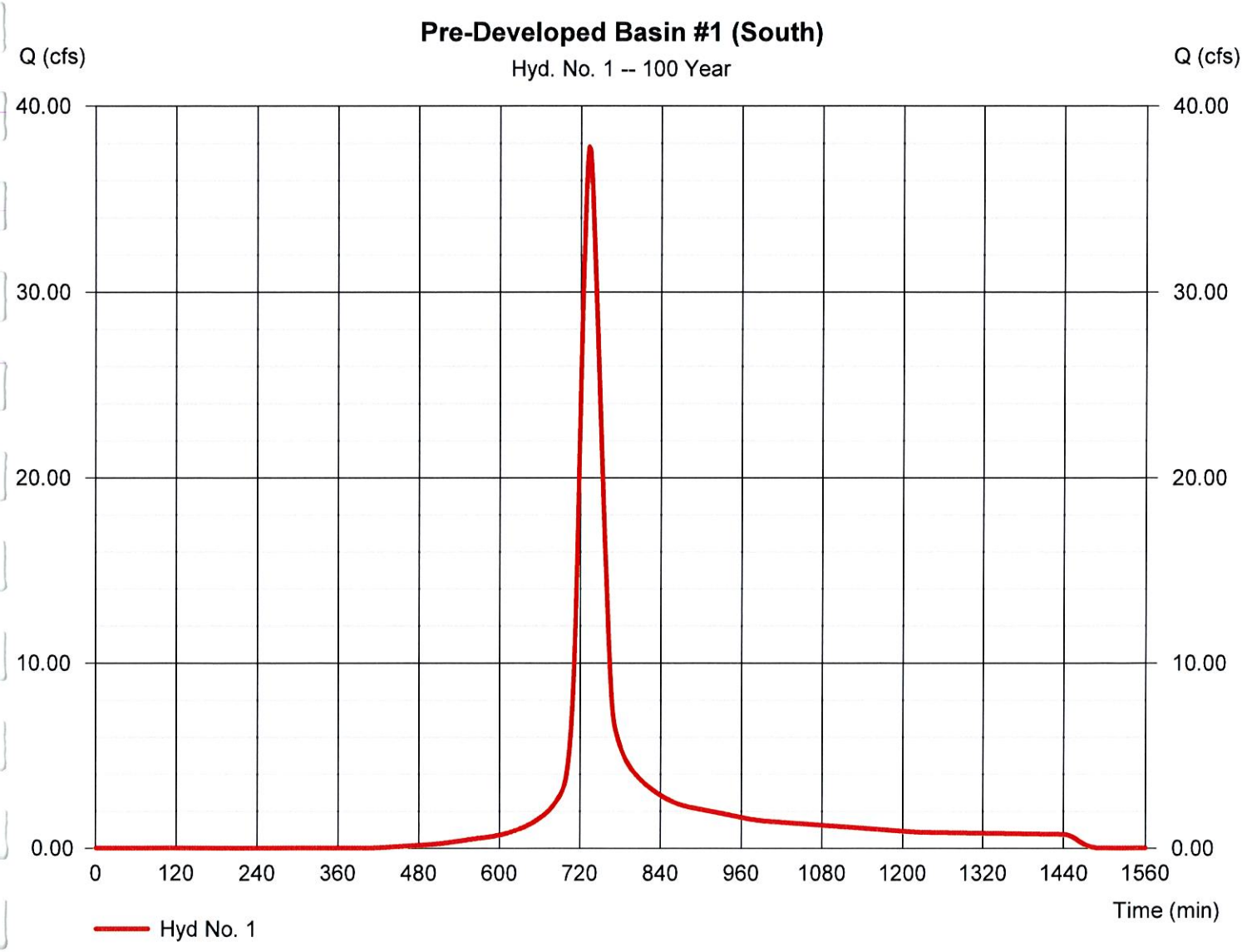
100 YEAR STORM

Hydrograph Report

Hyd. No. 1

Pre-Developed Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 37.79 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 163,245 cuft
Drainage area	= 9.150 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 31.80 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



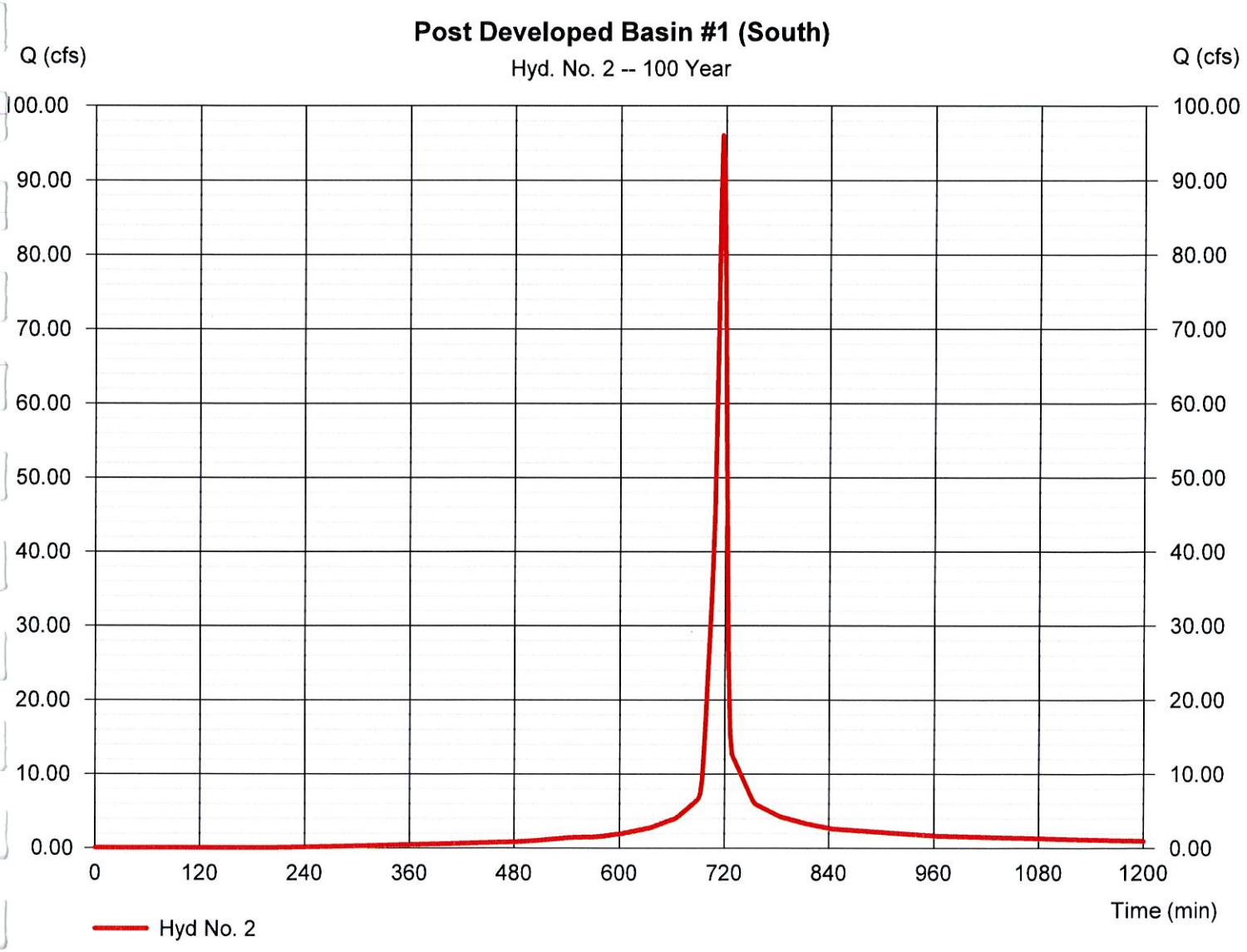
Hydrograph Report

Hyd. No. 2

Post Developed Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 95.99 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 208,602 cuft
Drainage area	= 9.620 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.910 x 98) + (5.710 x 74)] / 9.620



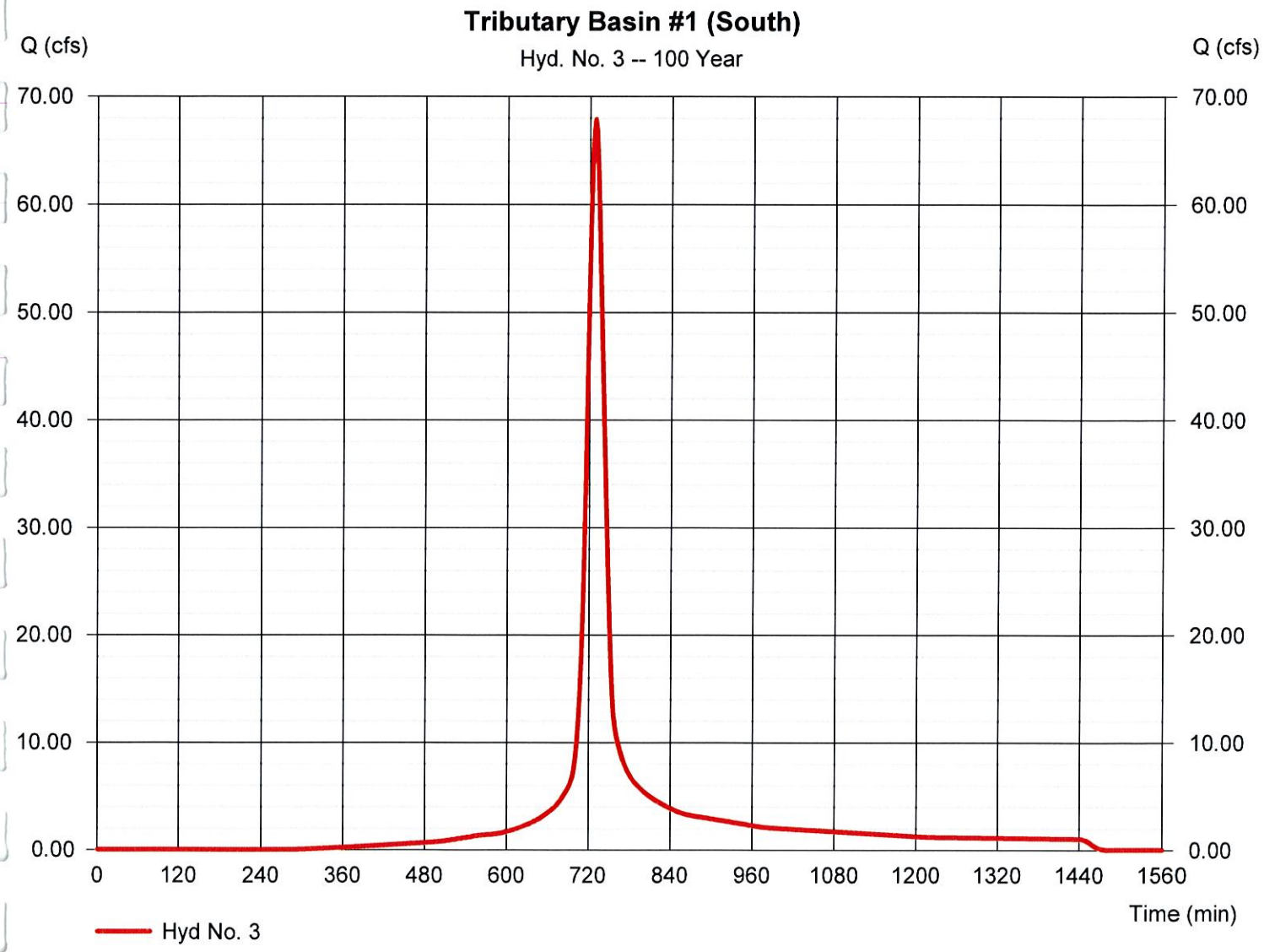
Hydrograph Report

Hyd. No. 3

Tributary Basin #1 (South)

Hydrograph type	= SCS Runoff	Peak discharge	= 67.84 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 252,761 cuft
Drainage area	= 12.230 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 24.90 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(4.120 x 98) + (8.110 x 74)] / 12.230



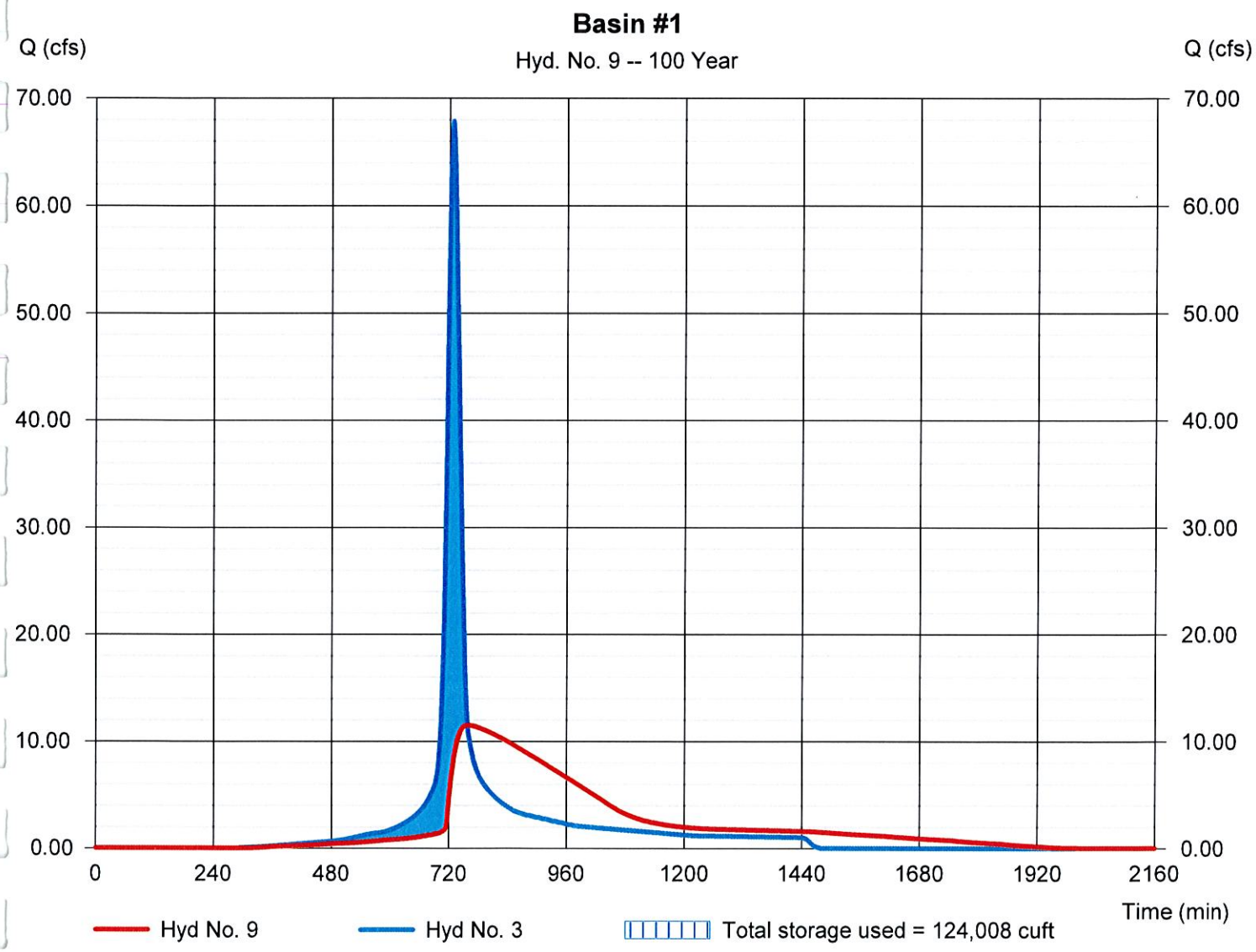
Hydrograph Report

Hyd. No. 9

Basin #1

Hydrograph type	= Reservoir	Peak discharge	= 11.48 cfs
Storm frequency	= 100 yrs	Time to peak	= 758 min
Time interval	= 2 min	Hyd. volume	= 252,755 cuft
Inflow hyd. No.	= 3 - Tributary Basin #1 (South)	Max. Elevation	= 1014.99 ft
Reservoir name	= South Basin #1	Max. Storage	= 124,008 cuft

Storage Indication method used.



Hydrograph Report

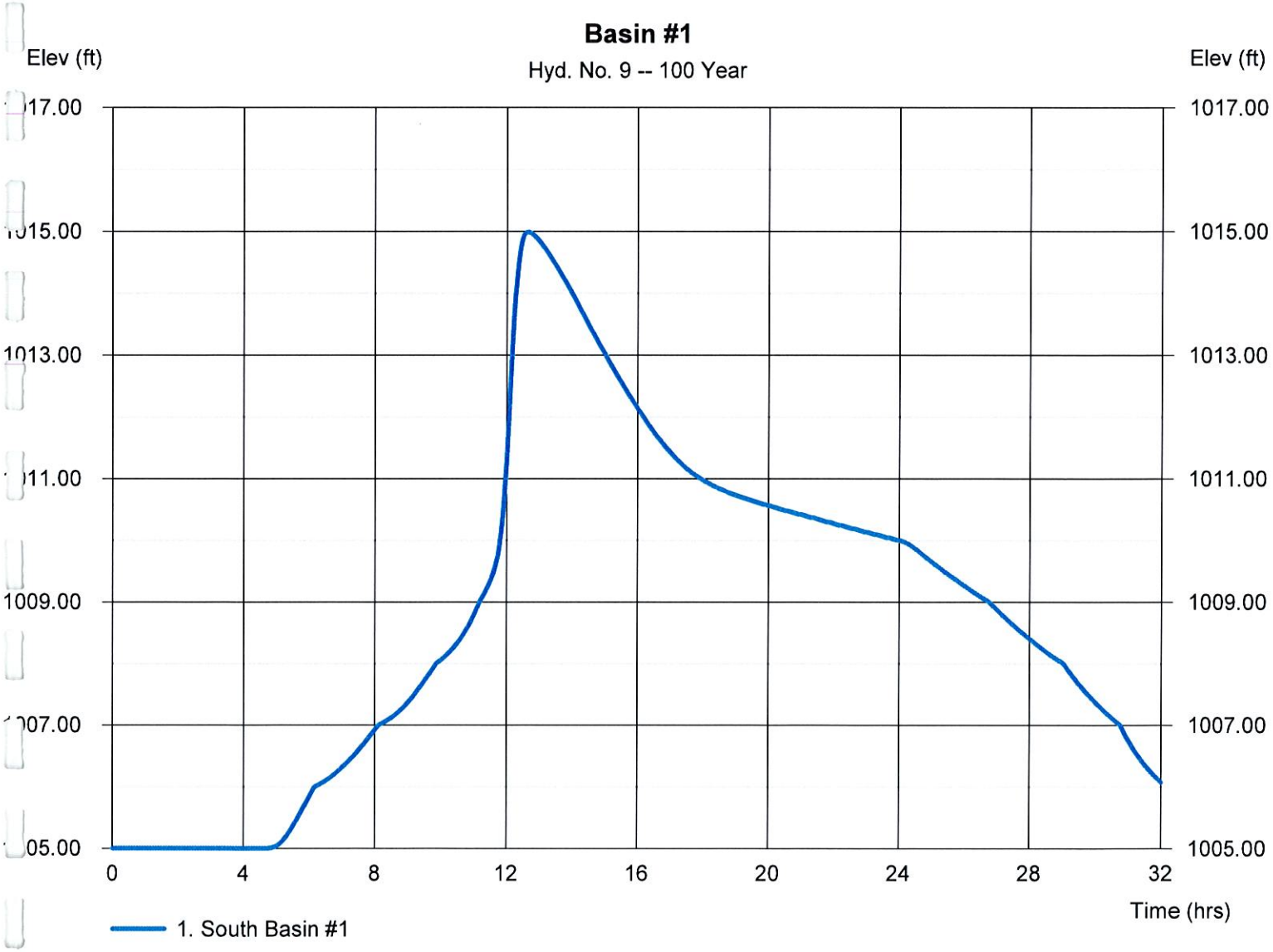
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 11 / 30 / 2015

Hyd. No. 9

Basin #1

Hydrograph type	= Reservoir	Peak discharge	= 11.48 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.63 hrs
Time interval	= 2 min	Hyd. volume	= 252,755 cuft
Inflow hyd. No.	= 3 - Tributary Basin #1 (South)	Max. Elevation	= 1014.99 ft
Reservoir name	= South Basin #1	Max. Storage	= 124,008 cuft

Storage Indication method used.



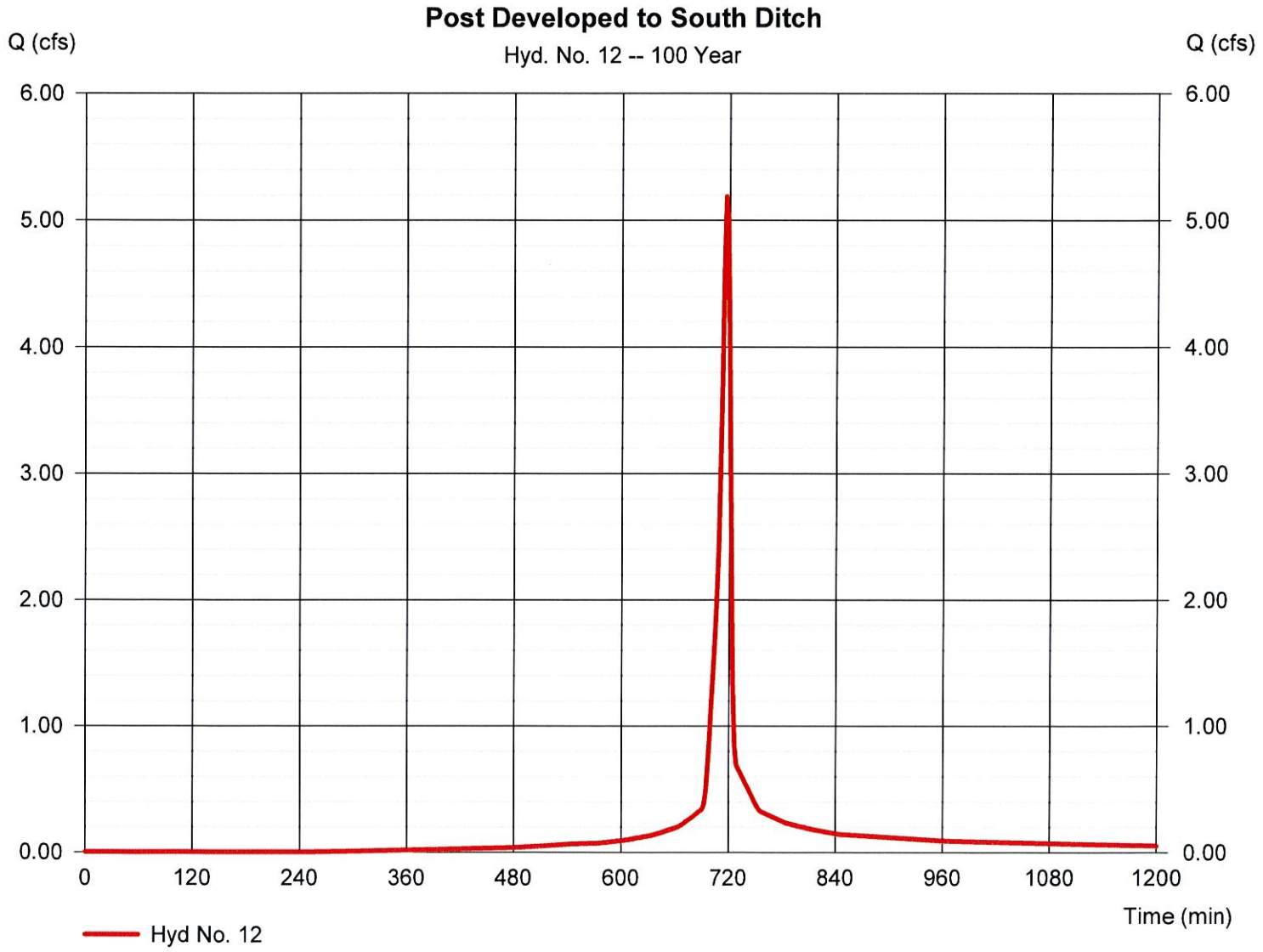
Hydrograph Report

Hyd. No. 12

Post Developed to South Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 5.187 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 11,060 cuft
Drainage area	= 0.540 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.250 x 98) + (0.350 x 74)] / 0.540



OUTFLOW #2

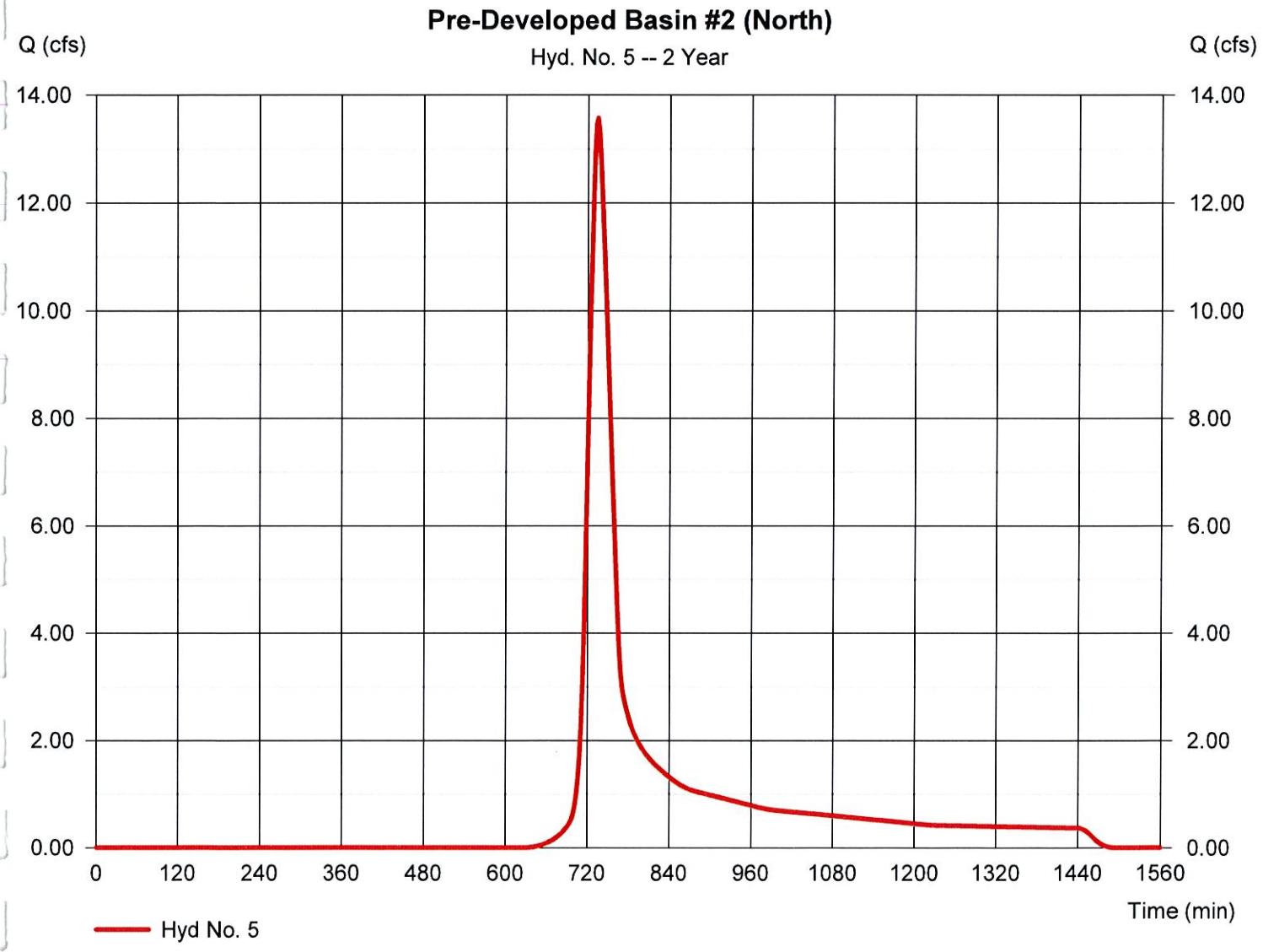
2 YEAR STORM

Hydrograph Report

Hyd. No. 5

Pre-Developed Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 13.57 cfs
Storm frequency	= 2 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 61,360 cuft
Drainage area	= 12.750 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 31.80 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



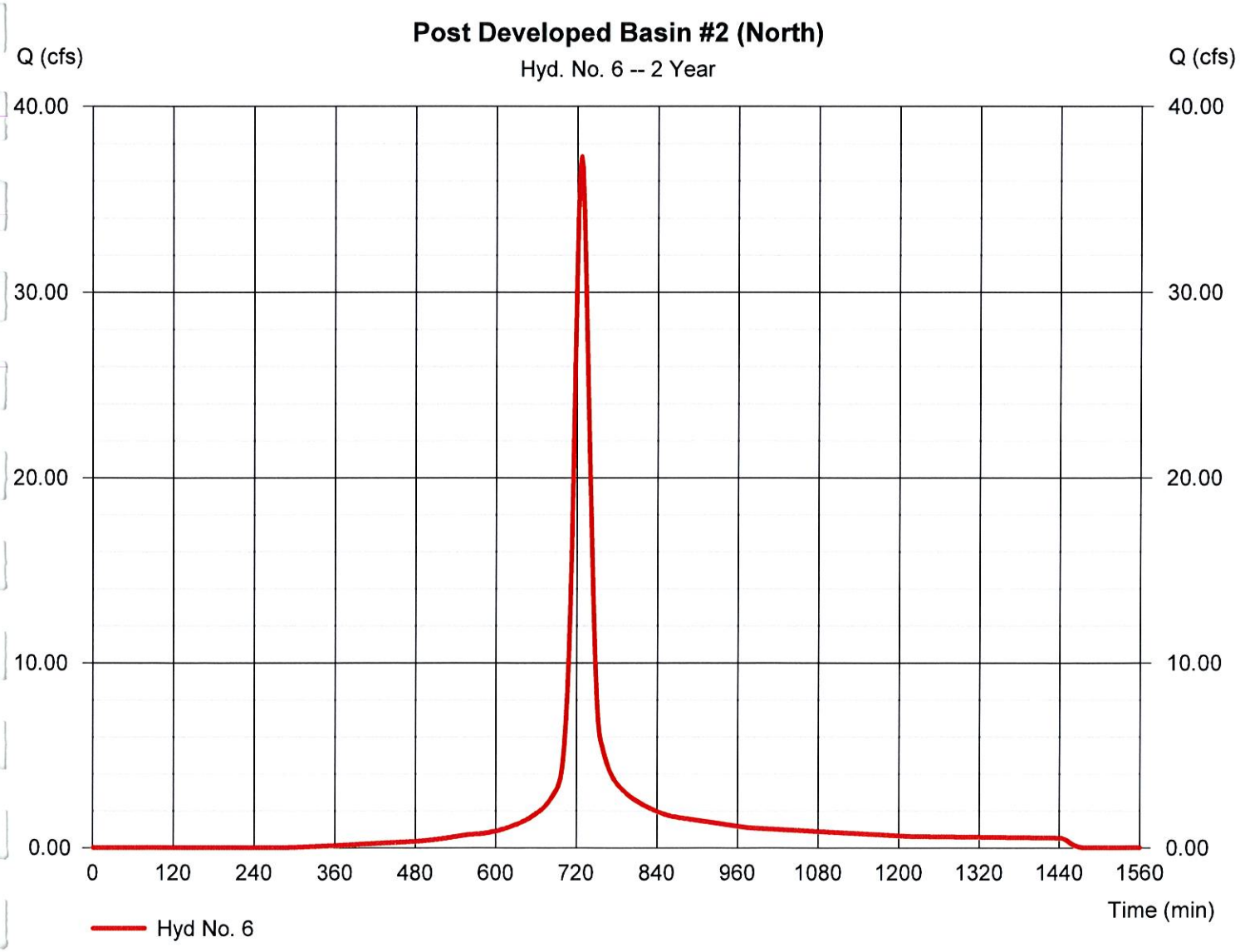
Hydrograph Report

Hyd. No. 6

Post Developed Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 37.29 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 130,896 cuft
Drainage area	= 13.440 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.10 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.790 x 74) + (9.650 x 98)] / 13.440



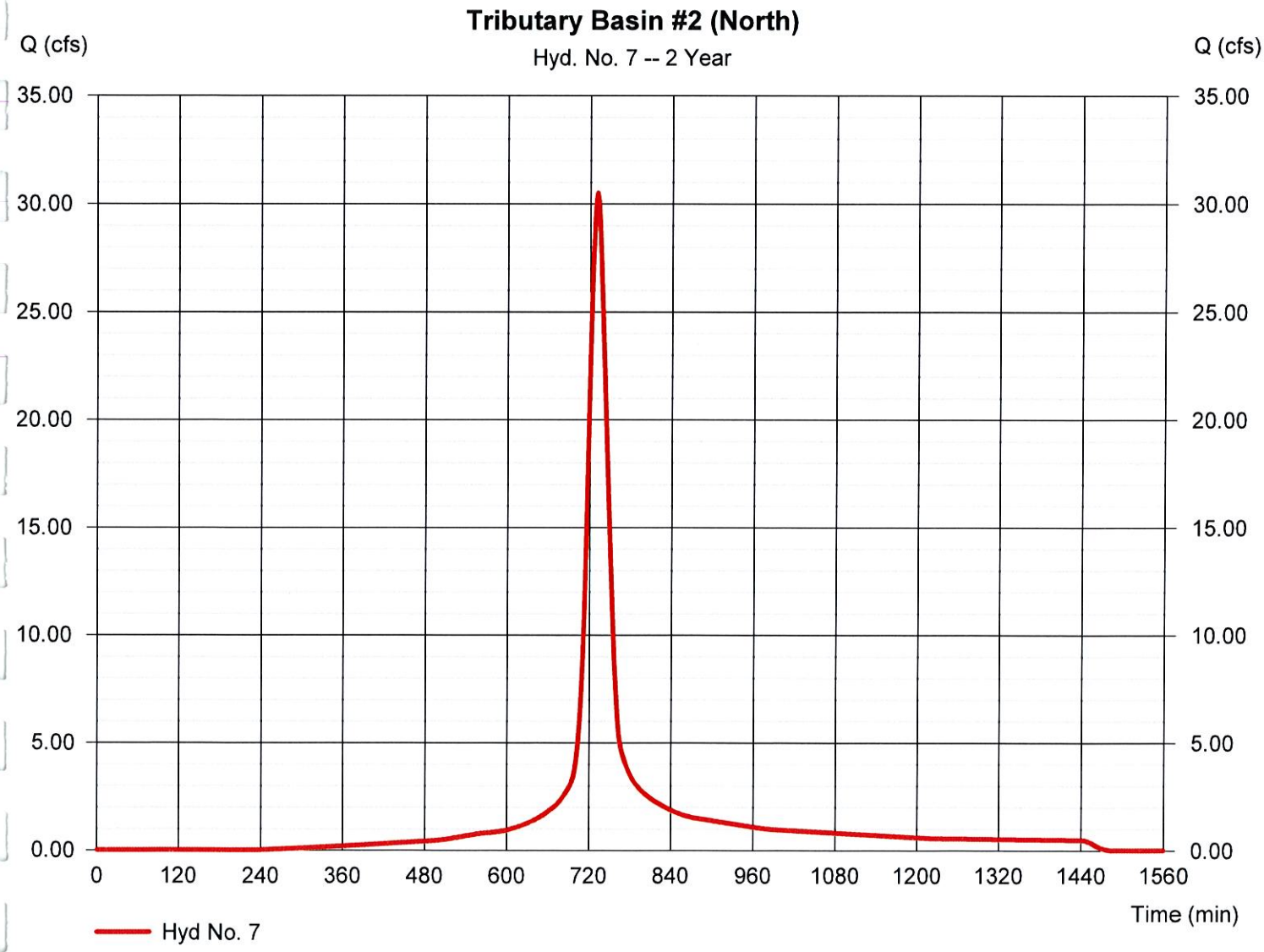
Hydrograph Report

Hyd. No. 7

Tributary Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 30.49 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 125,194 cuft
Drainage area	= 12.180 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.30 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(9.650 x 98) + (2.530 x 74)] / 12.180



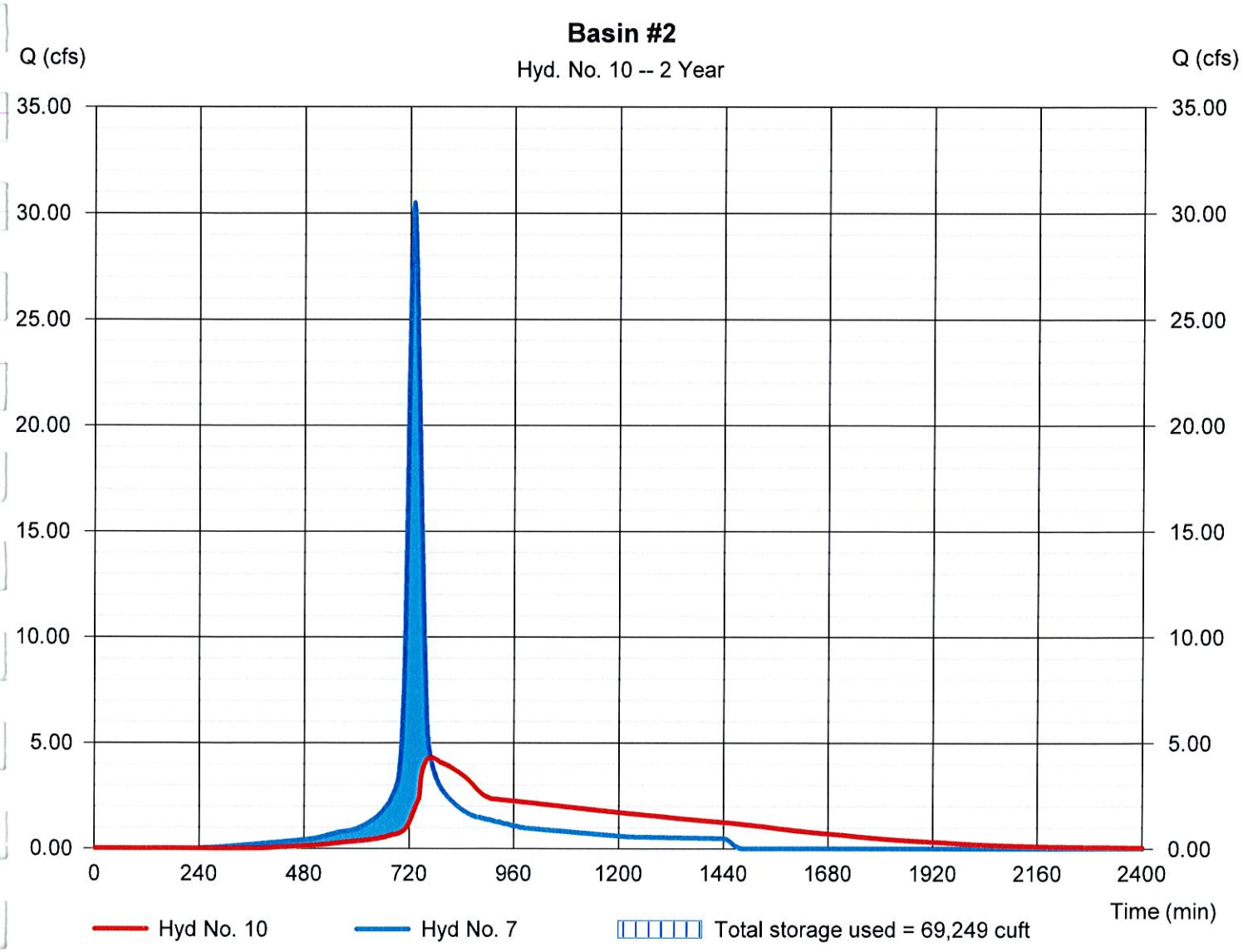
Hydrograph Report

Hyd. No. 10

Basin #2

Hydrograph type	= Reservoir	Peak discharge	= 4.284 cfs
Storm frequency	= 2 yrs	Time to peak	= 770 min
Time interval	= 2 min	Hyd. volume	= 124,363 cuft
Inflow hyd. No.	= 7 - Tributary Basin #2 (North)	Max. Elevation	= 1015.04 ft
Reservoir name	= North Basin #2	Max. Storage	= 69,249 cuft

Storage Indication method used.



Hydrograph Report

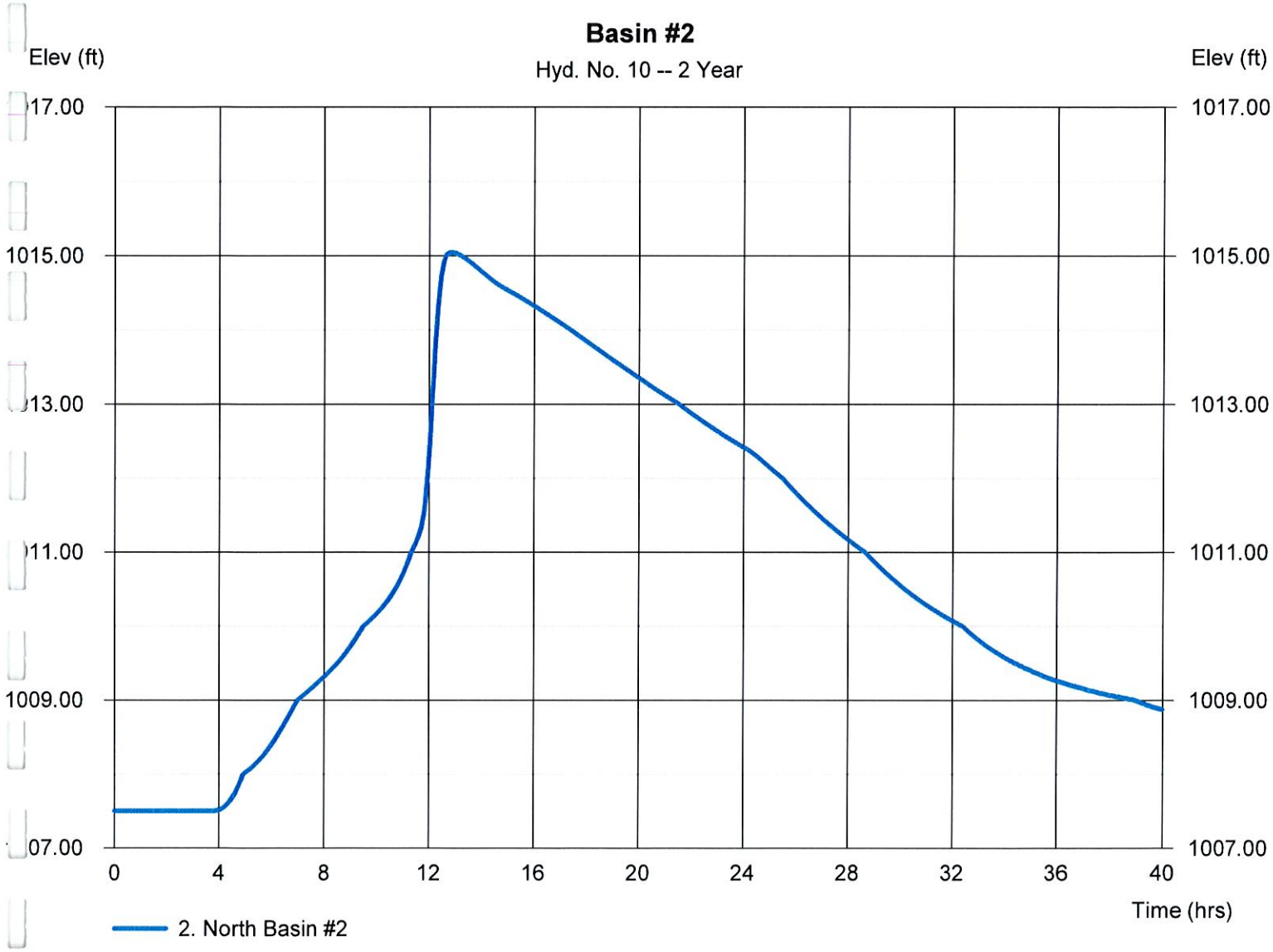
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 11 / 30 / 2015

Hyd. No. 10

Basin #2

Hydrograph type	= Reservoir	Peak discharge	= 4.284 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.83 hrs
Time interval	= 2 min	Hyd. volume	= 124,363 cuft
Inflow hyd. No.	= 7 - Tributary Basin #2 (North)	Max. Elevation	= 1015.04 ft
Reservoir name	= North Basin #2	Max. Storage	= 69,249 cuft

Storage Indication method used.



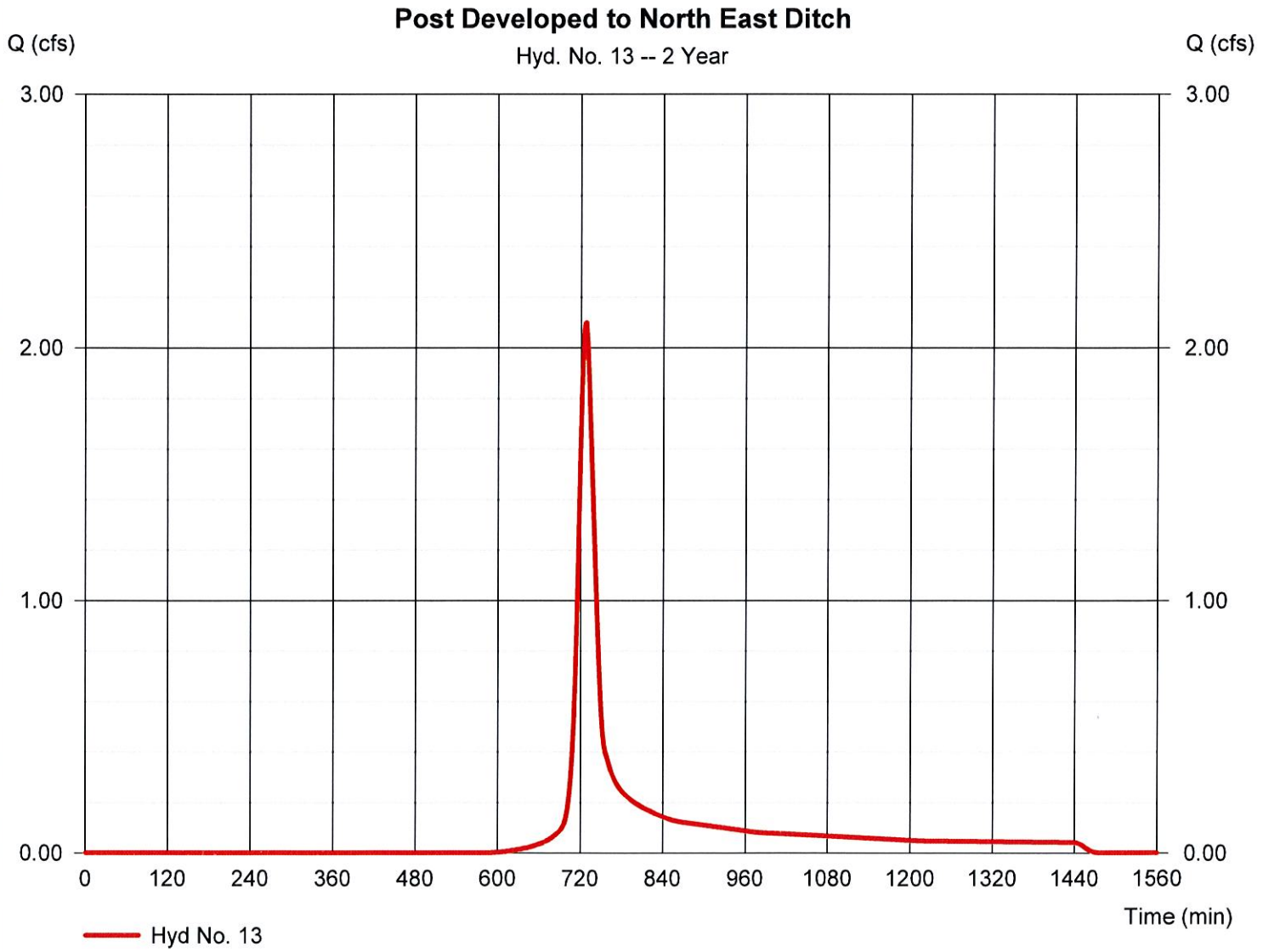
Hydrograph Report

Hyd. No. 13

Post Developed to North East Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 2.098 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 7,397 cuft
Drainage area	= 1.330 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.170 x 98) + (1.160 x 74)] / 1.330



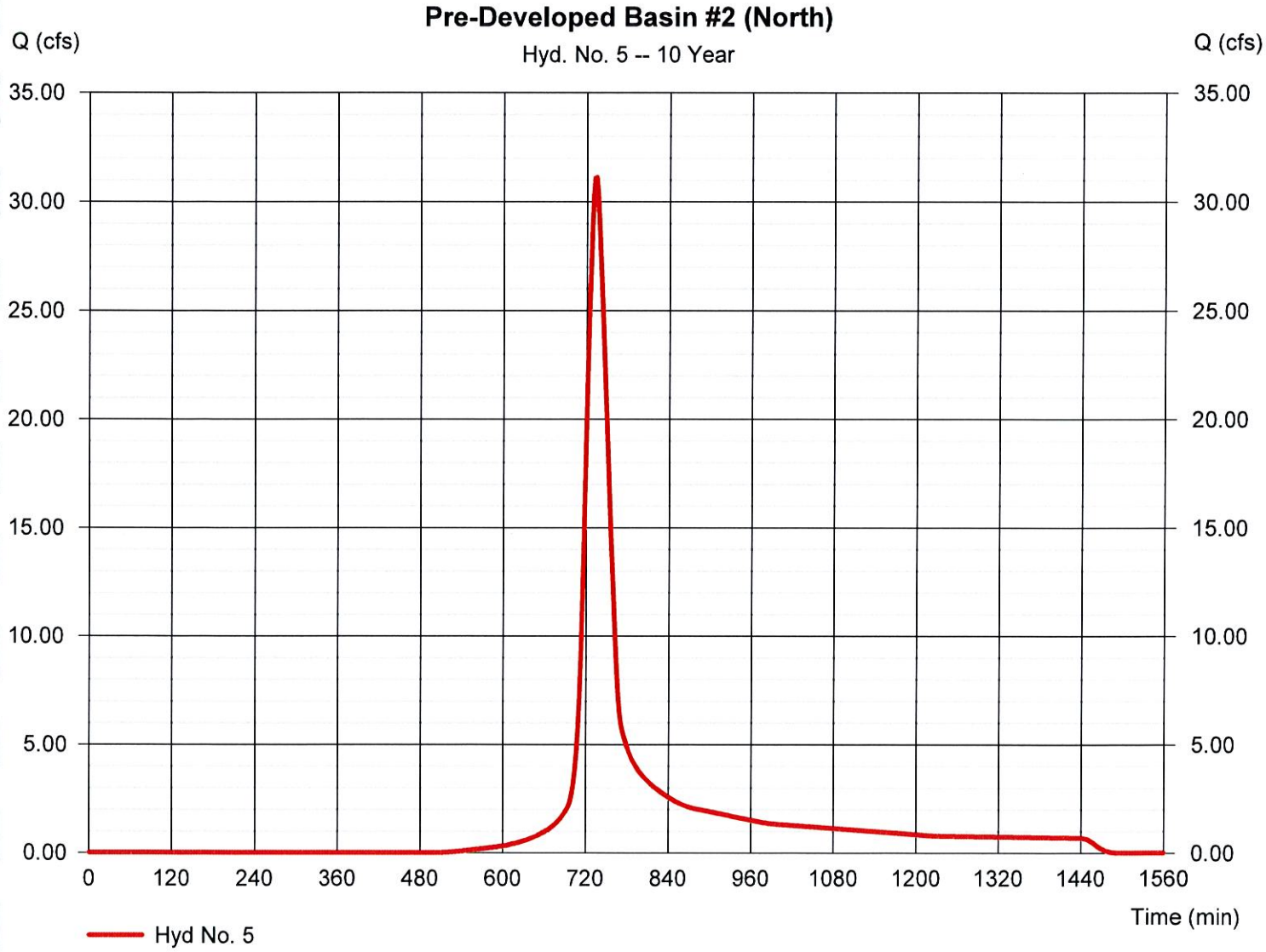
10 YEAR STORM

Hydrograph Report

Hyd. No. 5

Pre-Developed Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 31.10 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 135,174 cuft
Drainage area	= 12.750 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 31.80 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



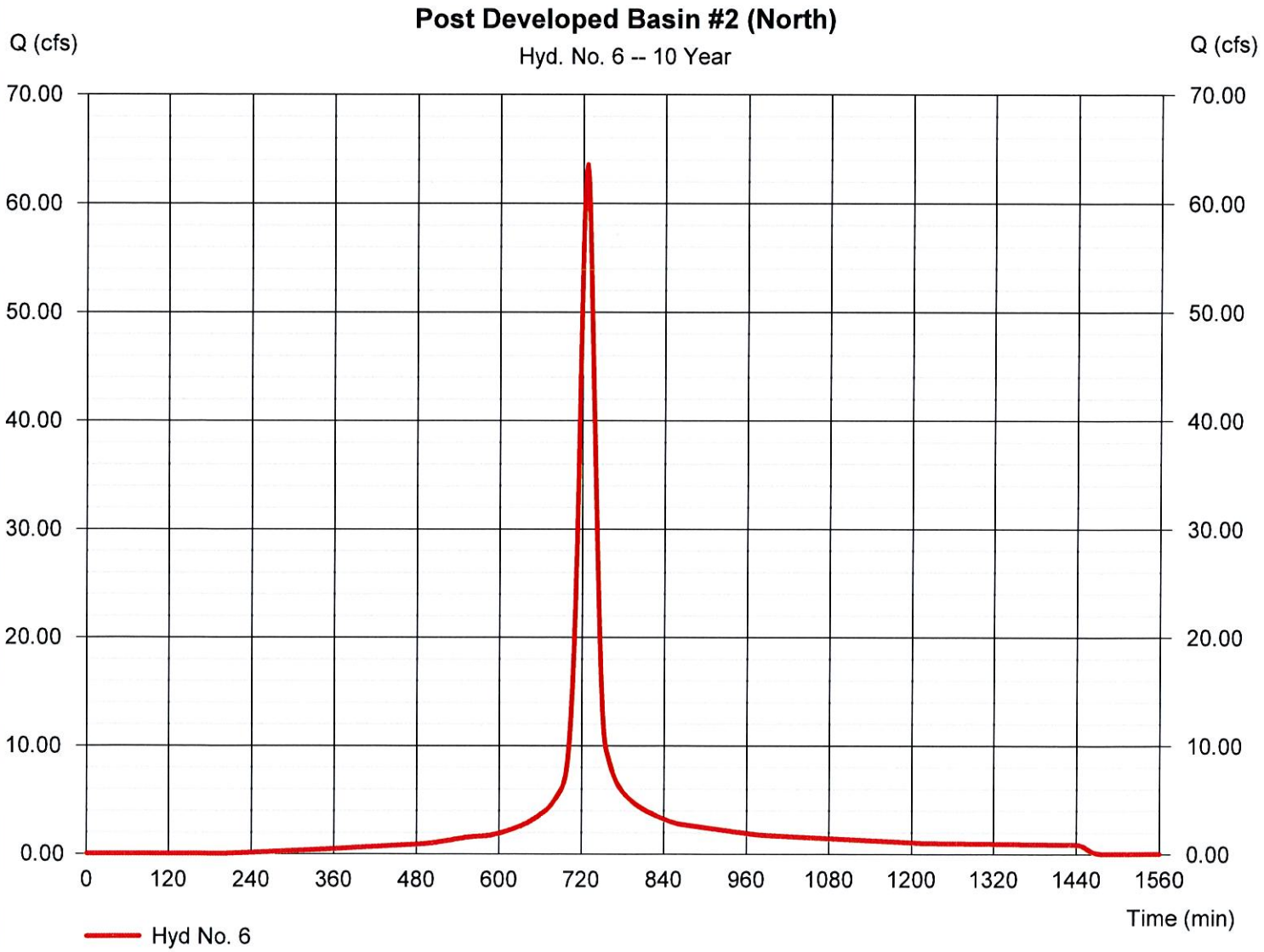
Hydrograph Report

Hyd. No. 6

Post Developed Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 63.54 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 228,691 cuft
Drainage area	= 13.440 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.10 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.790 x 74) + (9.650 x 98)] / 13.440



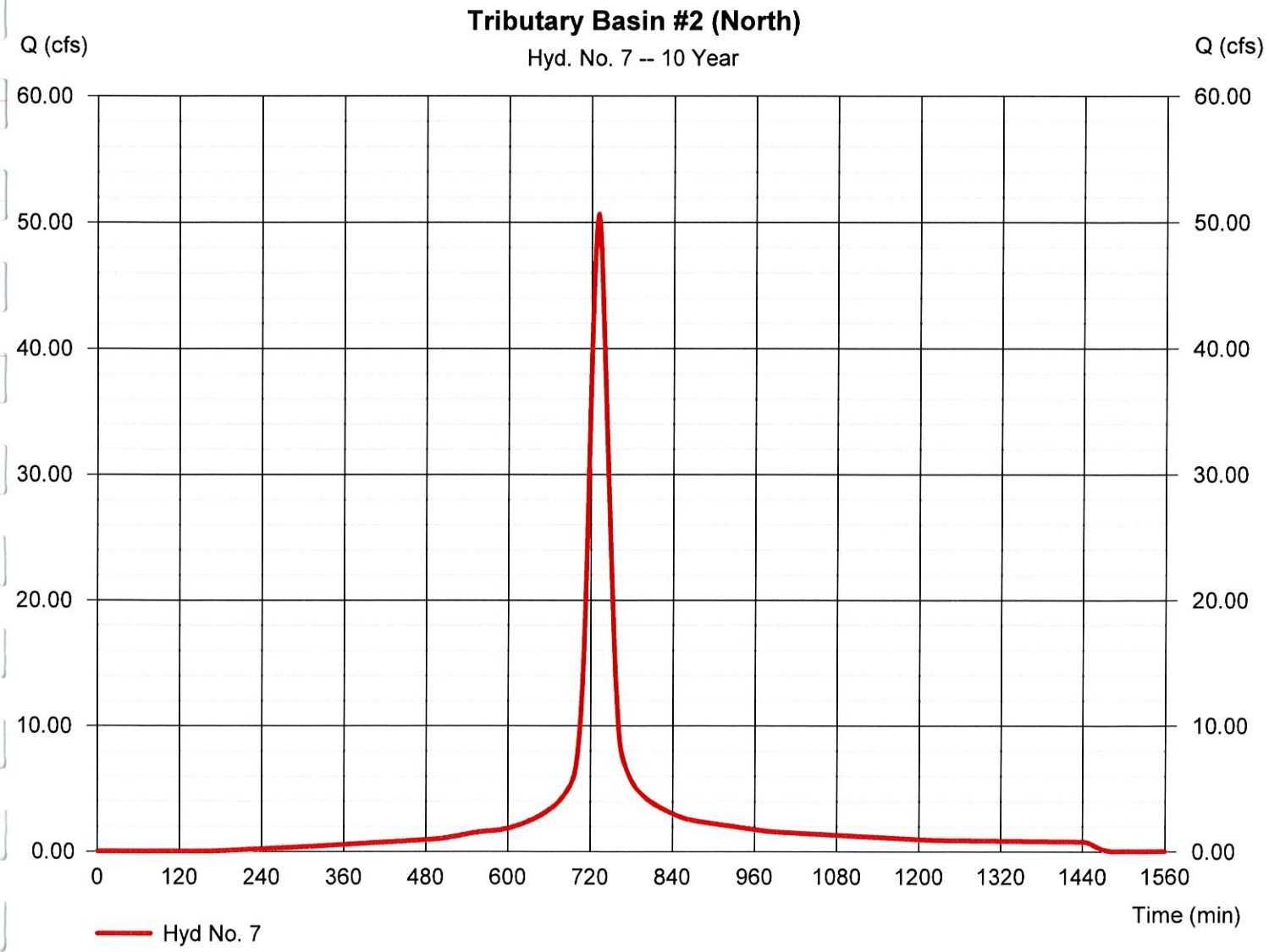
Hydrograph Report

Hyd. No. 7

Tributary Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 50.64 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 213,442 cuft
Drainage area	= 12.180 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.30 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(9.650 x 98) + (2.530 x 74)] / 12.180



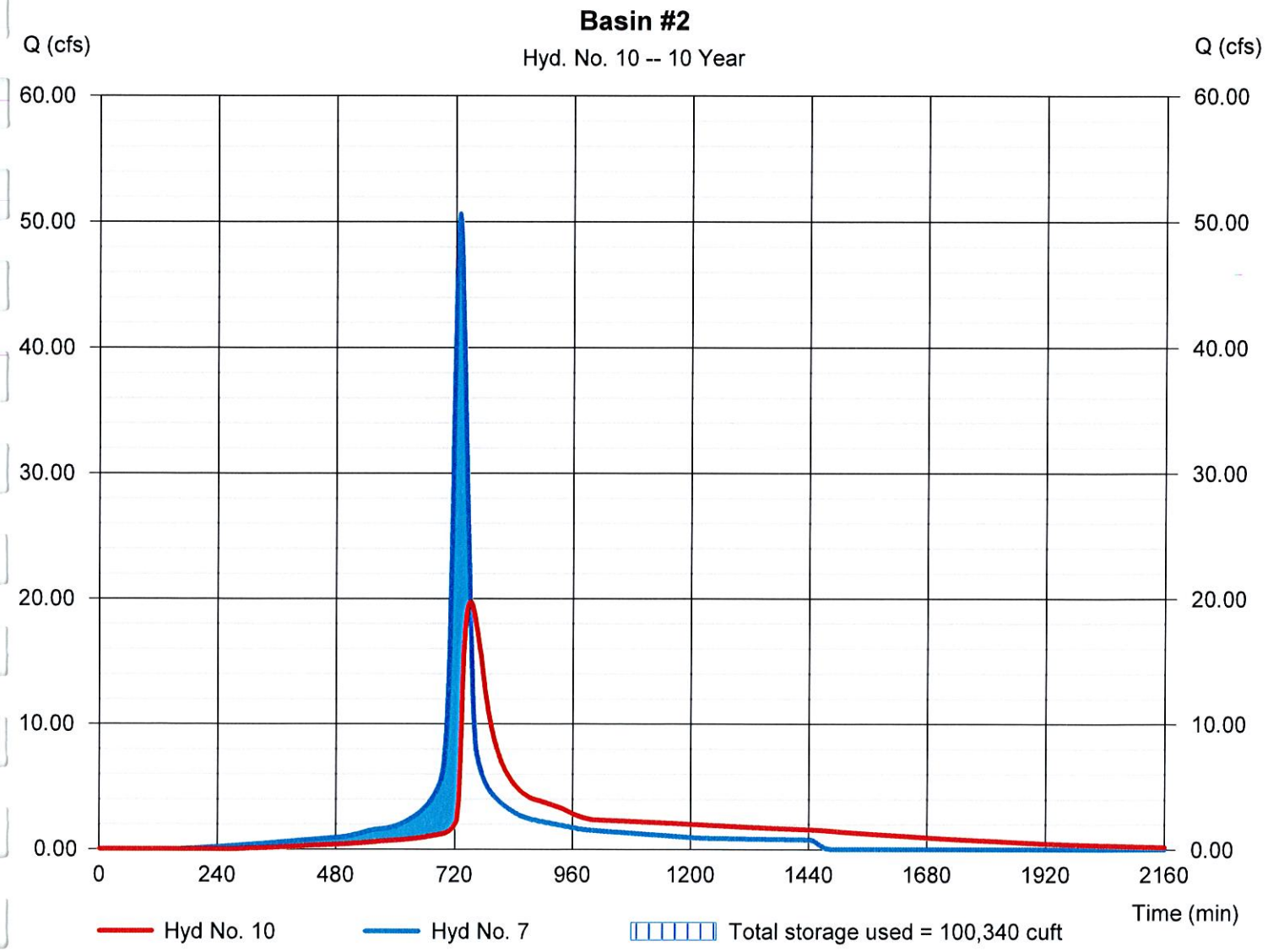
Hydrograph Report

Hyd. No. 10

Basin #2

Hydrograph type	= Reservoir	Peak discharge	= 19.71 cfs
Storm frequency	= 10 yrs	Time to peak	= 752 min
Time interval	= 2 min	Hyd. volume	= 212,610 cuft
Inflow hyd. No.	= 7 - Tributary Basin #2 (North)	Max. Elevation	= 1016.48 ft
Reservoir name	= North Basin #2	Max. Storage	= 100,340 cuft

Storage Indication method used.



Hydrograph Report

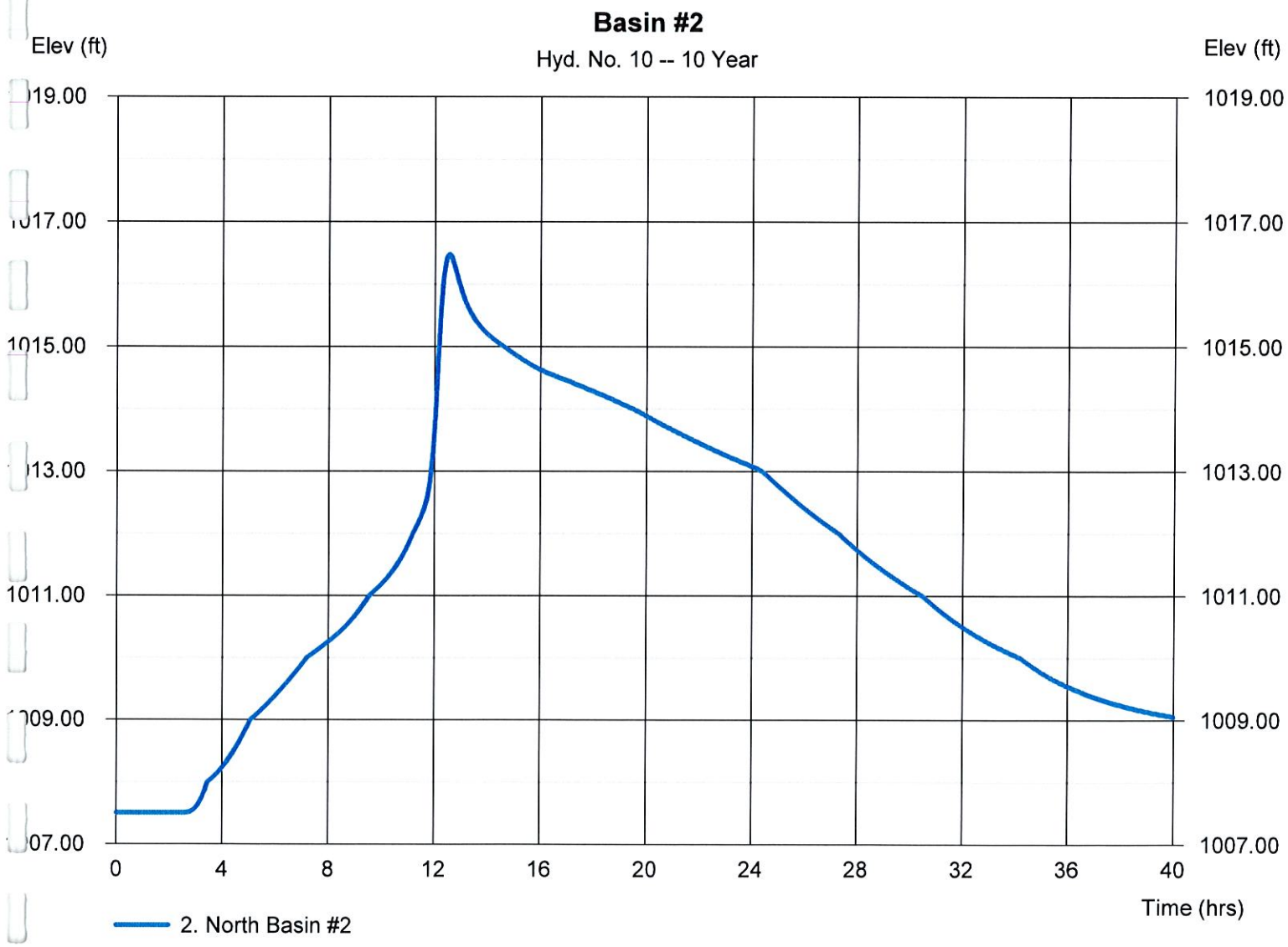
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 11 / 30 / 2015

Hyd. No. 10

Basin #2

Hydrograph type	= Reservoir	Peak discharge	= 19.71 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.53 hrs
Time interval	= 2 min	Hyd. volume	= 212,610 cuft
Inflow hyd. No.	= 7 - Tributary Basin #2 (North)	Max. Elevation	= 1016.48 ft
Reservoir name	= North Basin #2	Max. Storage	= 100,340 cuft

Storage Indication method used.



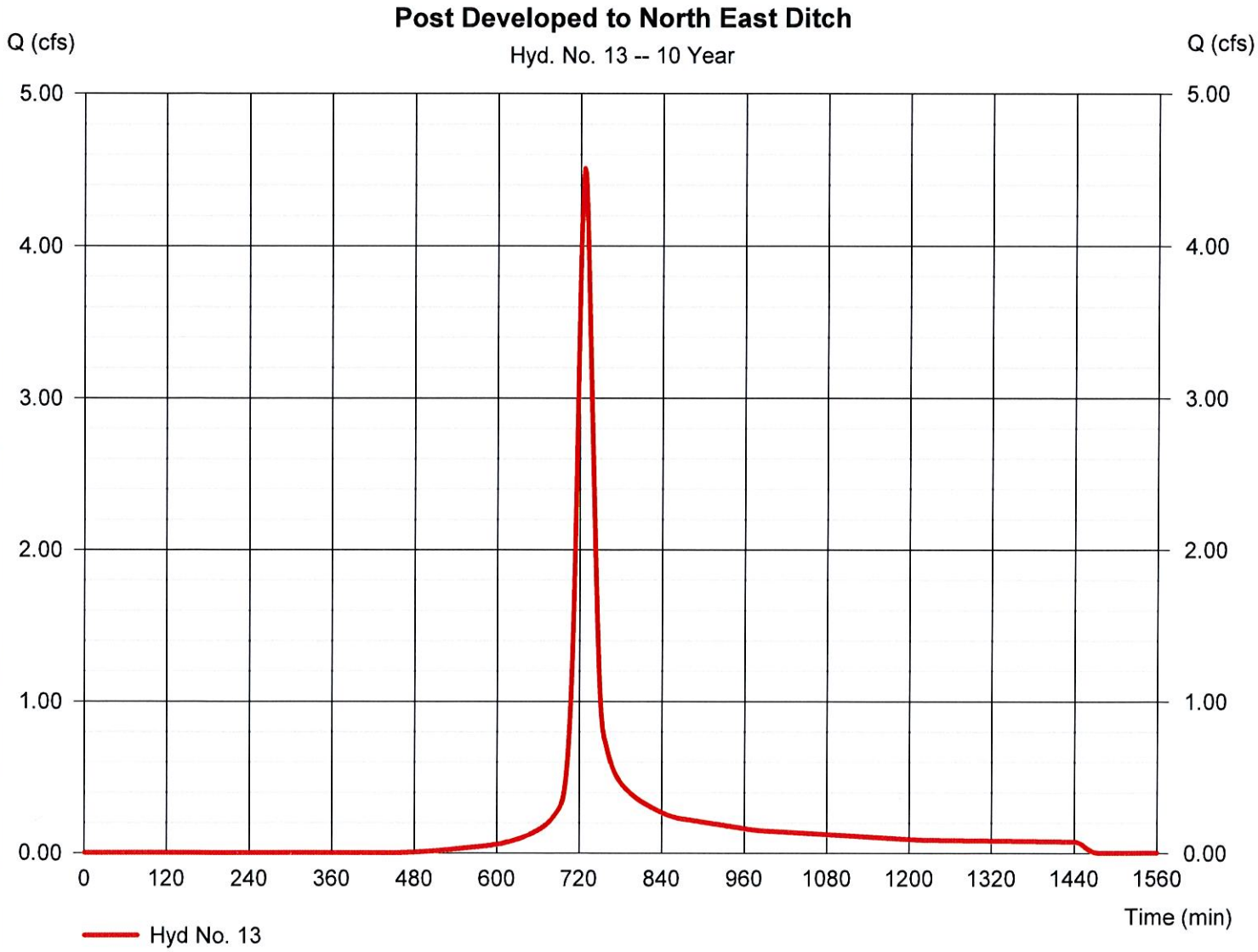
Hydrograph Report

Hyd. No. 13

Post Developed to North East Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 4.506 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 15,562 cuft
Drainage area	= 1.330 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.170 x 98) + (1.160 x 74)] / 1.330



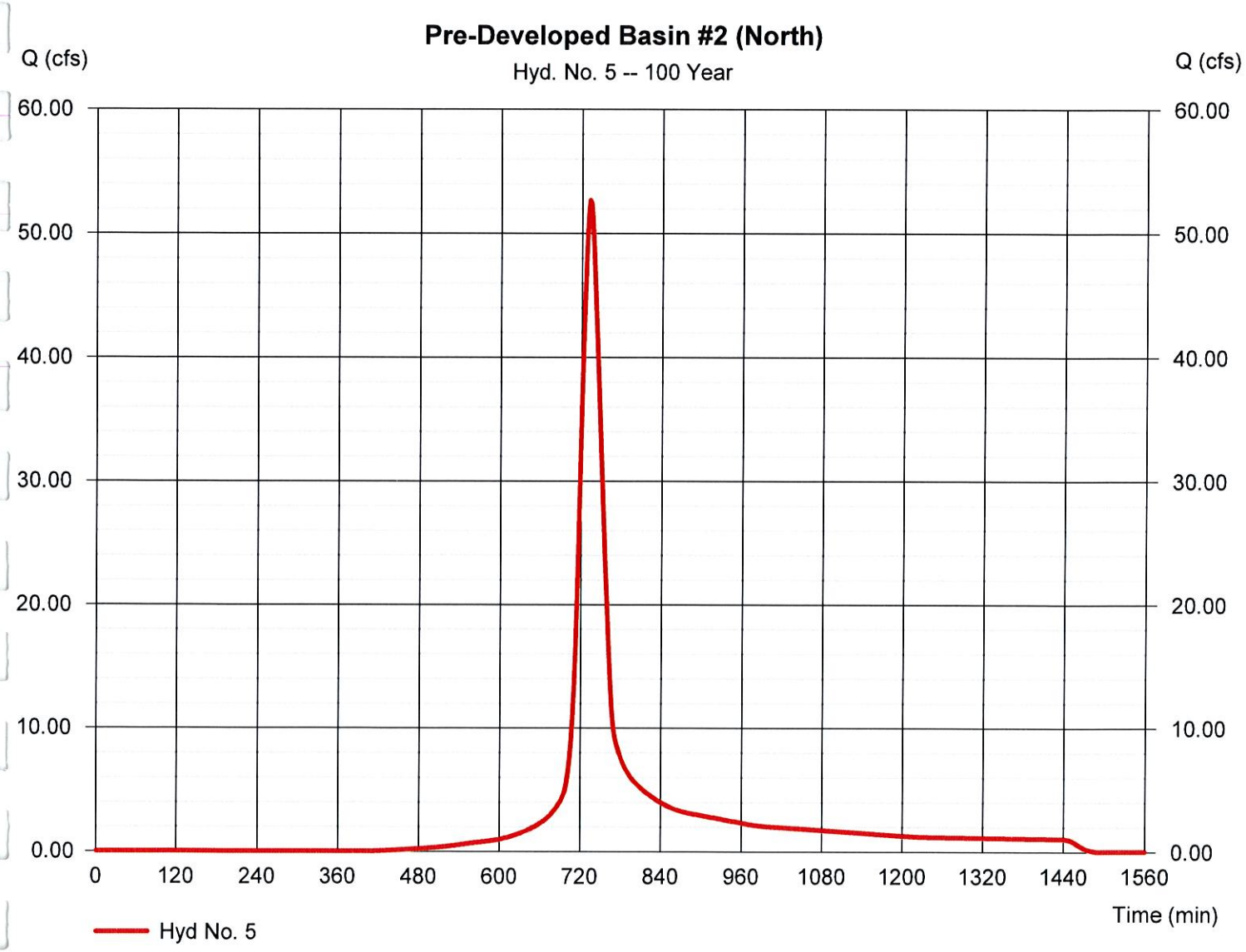
100 YEAR STORM

Hydrograph Report

Hyd. No. 5

Pre-Developed Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 52.65 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 227,472 cuft
Drainage area	= 12.750 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 31.80 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



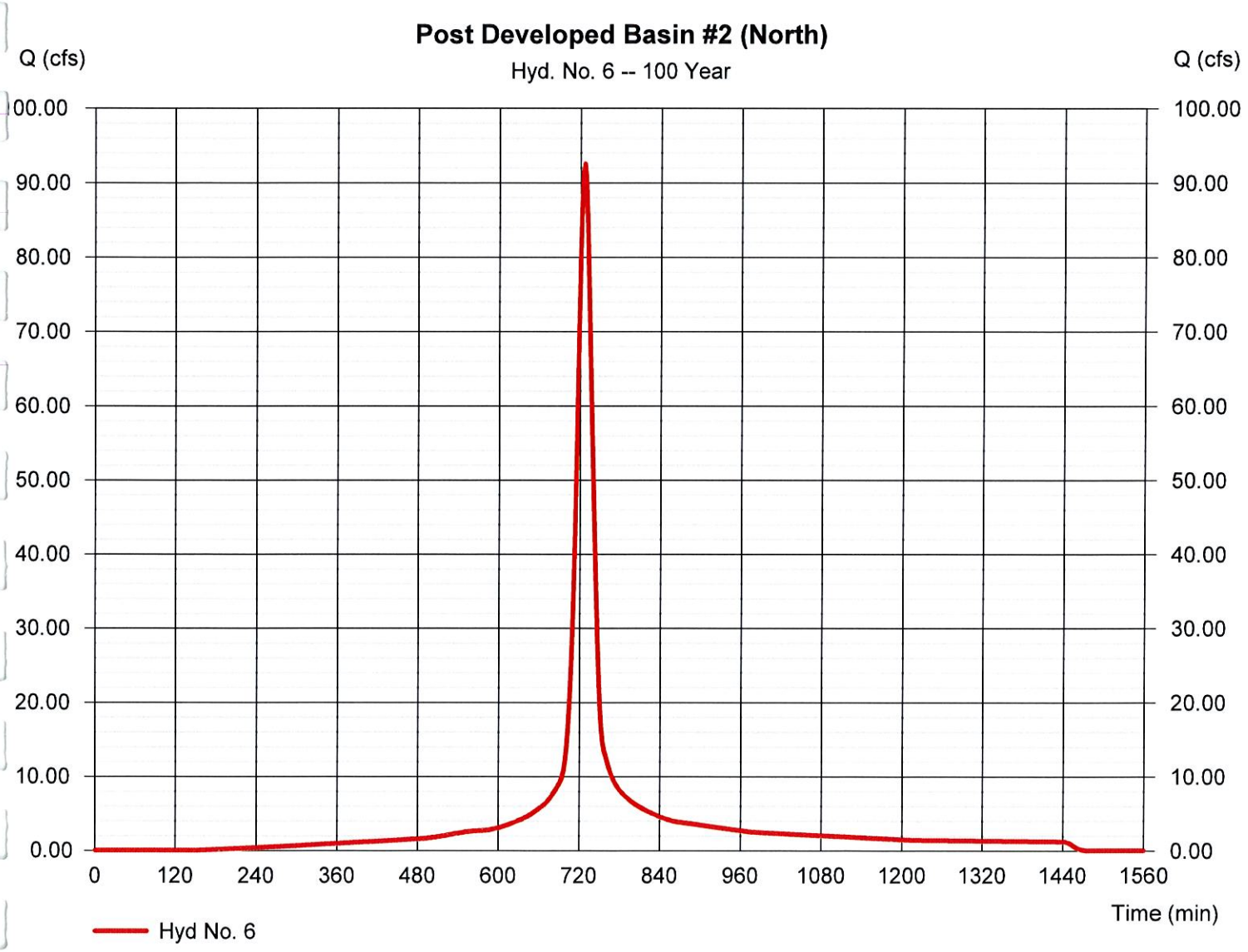
Hydrograph Report

Hyd. No. 6

Post Developed Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 92.50 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 339,935 cuft
Drainage area	= 13.440 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.10 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.790 x 74) + (9.650 x 98)] / 13.440



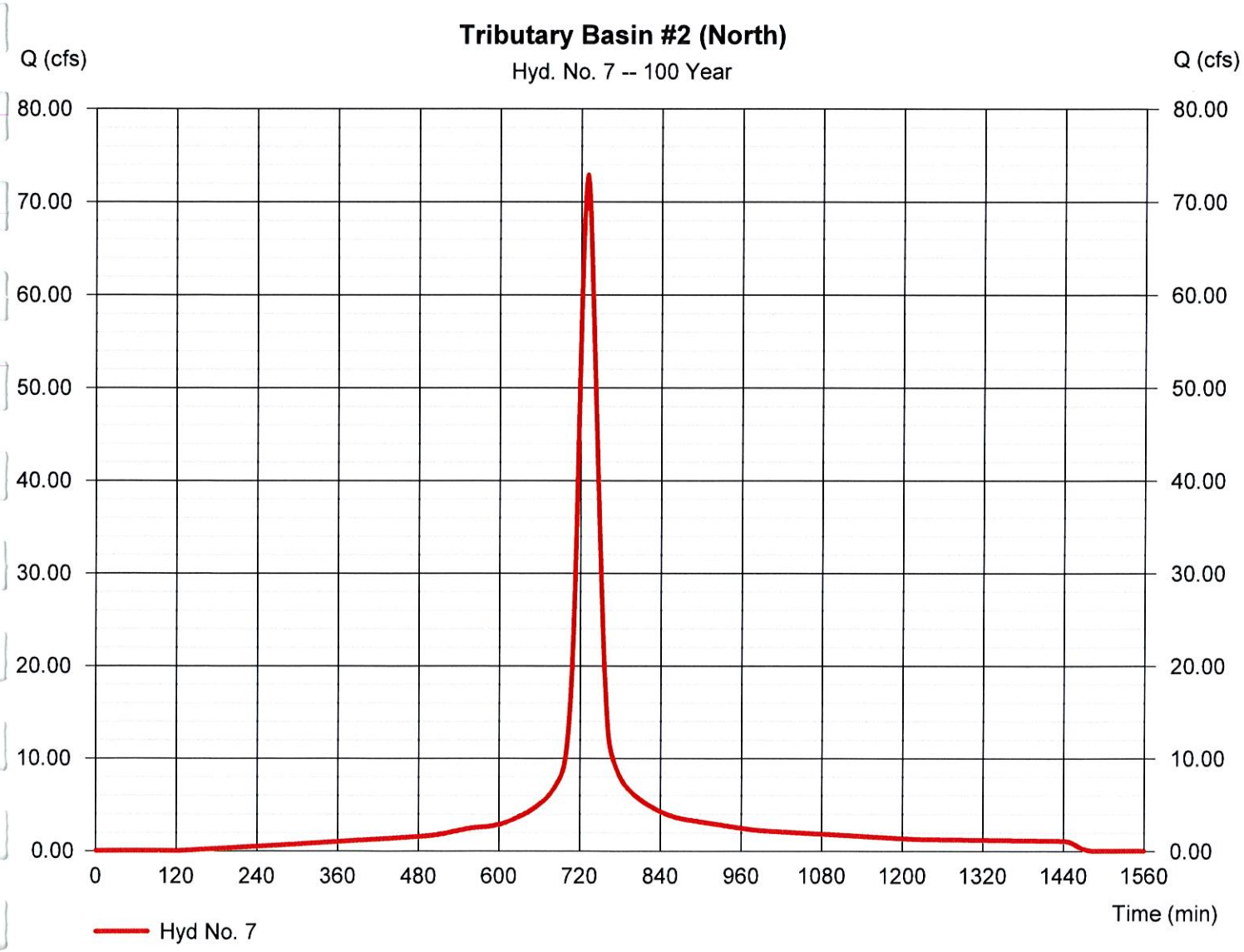
Hydrograph Report

Hyd. No. 7

Tributary Basin #2 (North)

Hydrograph type	= SCS Runoff	Peak discharge	= 72.87 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 313,174 cuft
Drainage area	= 12.180 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 28.30 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(9.650 x 98) + (2.530 x 74)] / 12.180



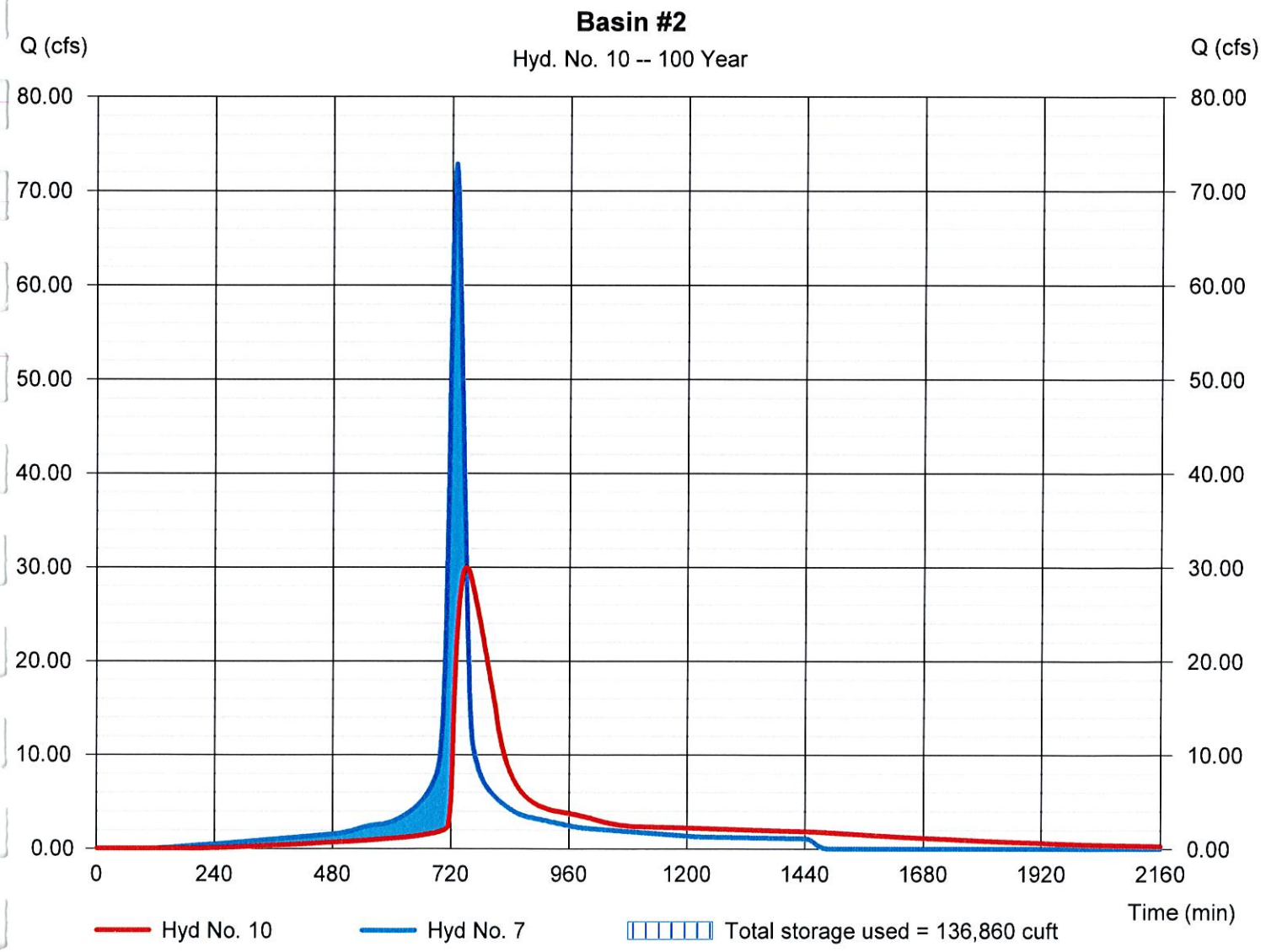
Hydrograph Report

Hyd. No. 10

Basin #2

Hydrograph type	= Reservoir	Peak discharge	= 29.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 750 min
Time interval	= 2 min	Hyd. volume	= 312,343 cuft
Inflow hyd. No.	= 7 - Tributary Basin #2 (North)	Max. Elevation	= 1017.97 ft
Reservoir name	= North Basin #2	Max. Storage	= 136,860 cuft

Storage Indication method used.



Hydrograph Report

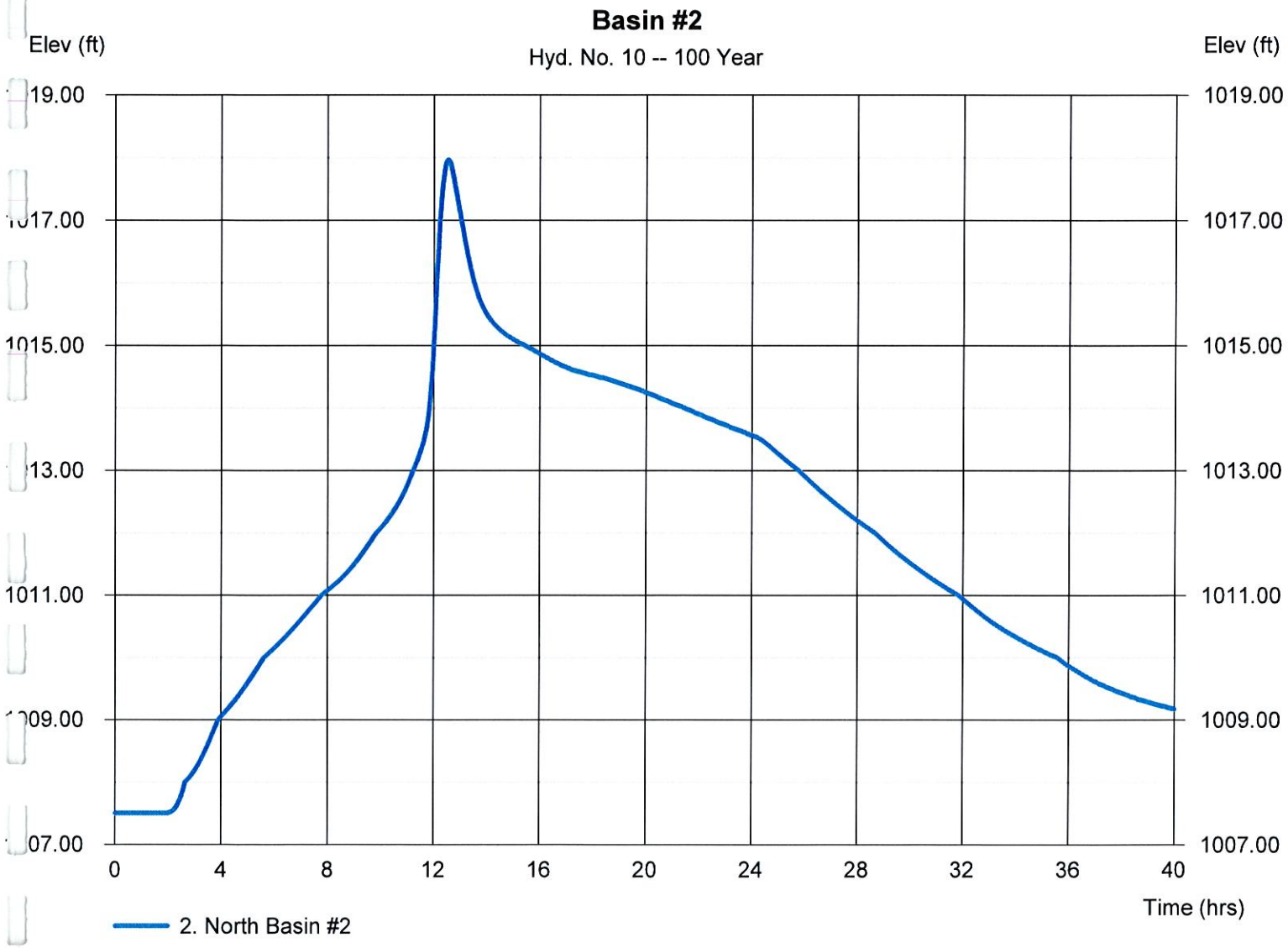
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 11 / 30 / 2015

Hyd. No. 10

Basin #2

Hydrograph type	= Reservoir	Peak discharge	= 29.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.50 hrs
Time interval	= 2 min	Hyd. volume	= 312,343 cuft
Inflow hyd. No.	= 7 - Tributary Basin #2 (North)	Max. Elevation	= 1017.97 ft
Reservoir name	= North Basin #2	Max. Storage	= 136,860 cuft

Storage Indication method used.



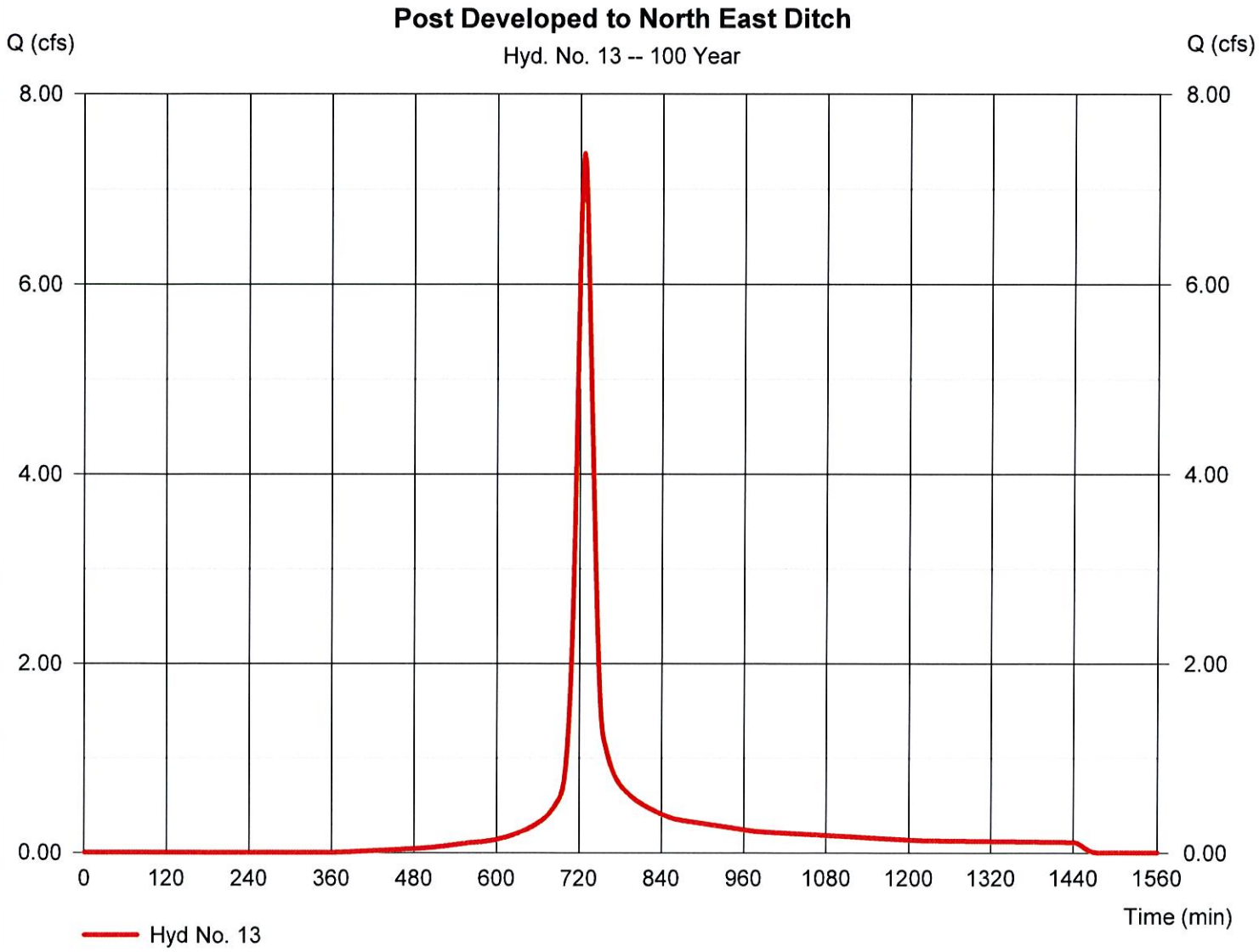
Hydrograph Report

Hyd. No. 13

Post Developed to North East Ditch

Hydrograph type	= SCS Runoff	Peak discharge	= 7.373 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 25,558 cuft
Drainage area	= 1.330 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.170 x 98) + (1.160 x 74)] / 1.330



OUTFLOW #3

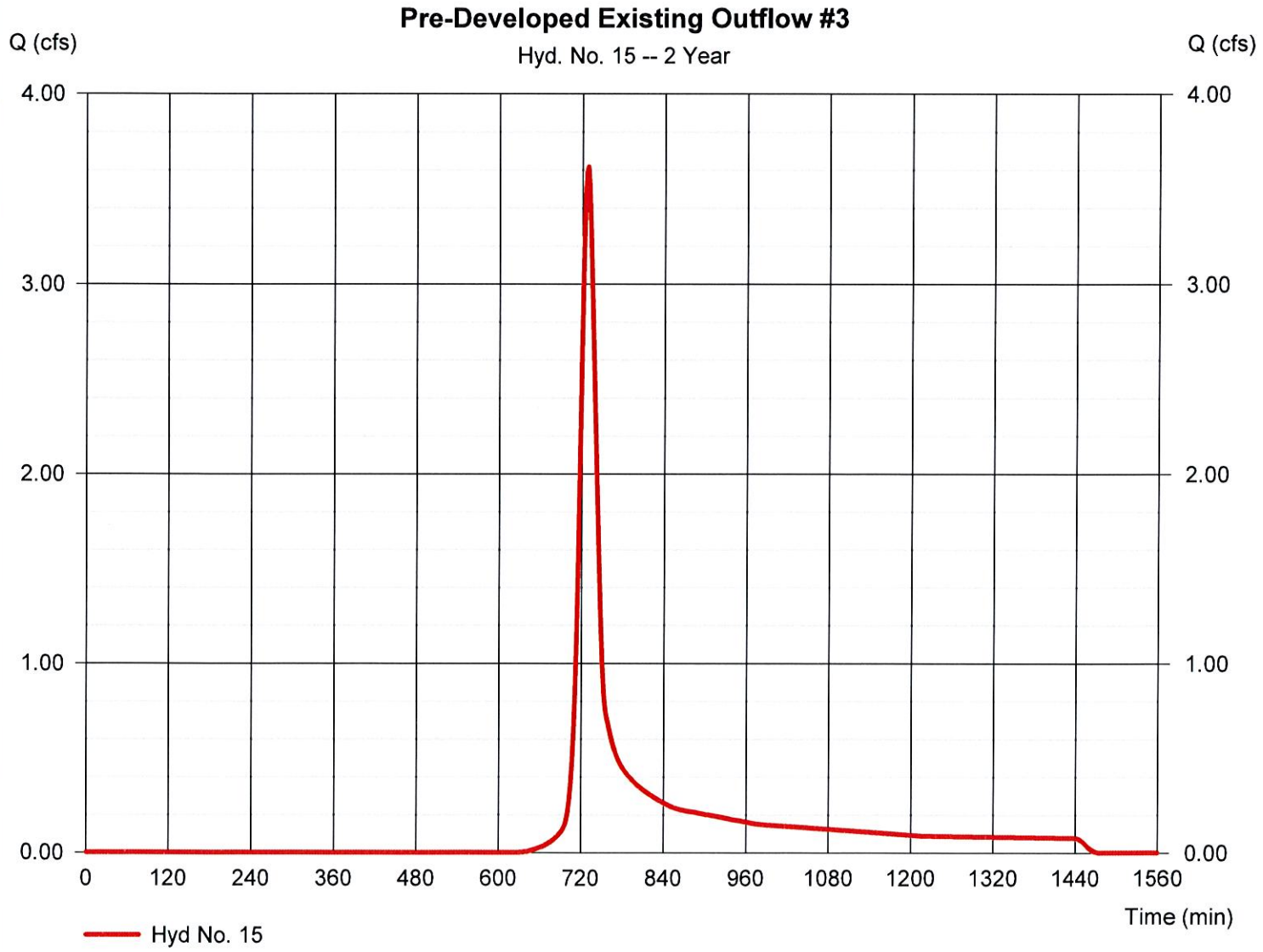
2 YEAR STORM

Hydrograph Report

Hyd. No. 15

Pre-Developed Existing Outflow #3

Hydrograph type	= SCS Runoff	Peak discharge	= 3.616 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 12,966 cuft
Drainage area	= 2.680 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.80 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

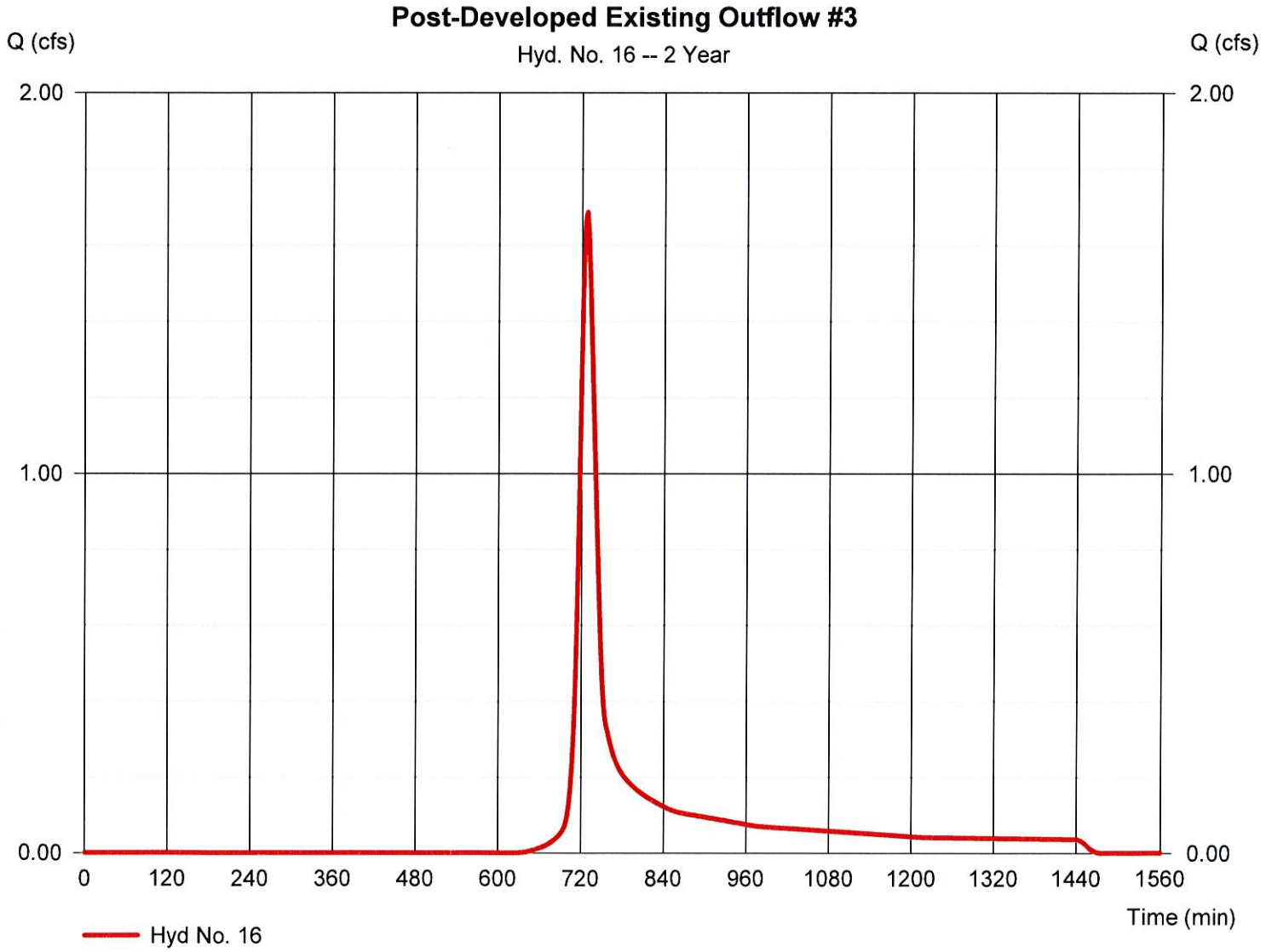


Hydrograph Report

Hyd. No. 16

Post-Developed Existing Outflow #3

Hydrograph type	= SCS Runoff	Peak discharge	= 1.686 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 6,048 cuft
Drainage area	= 1.250 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



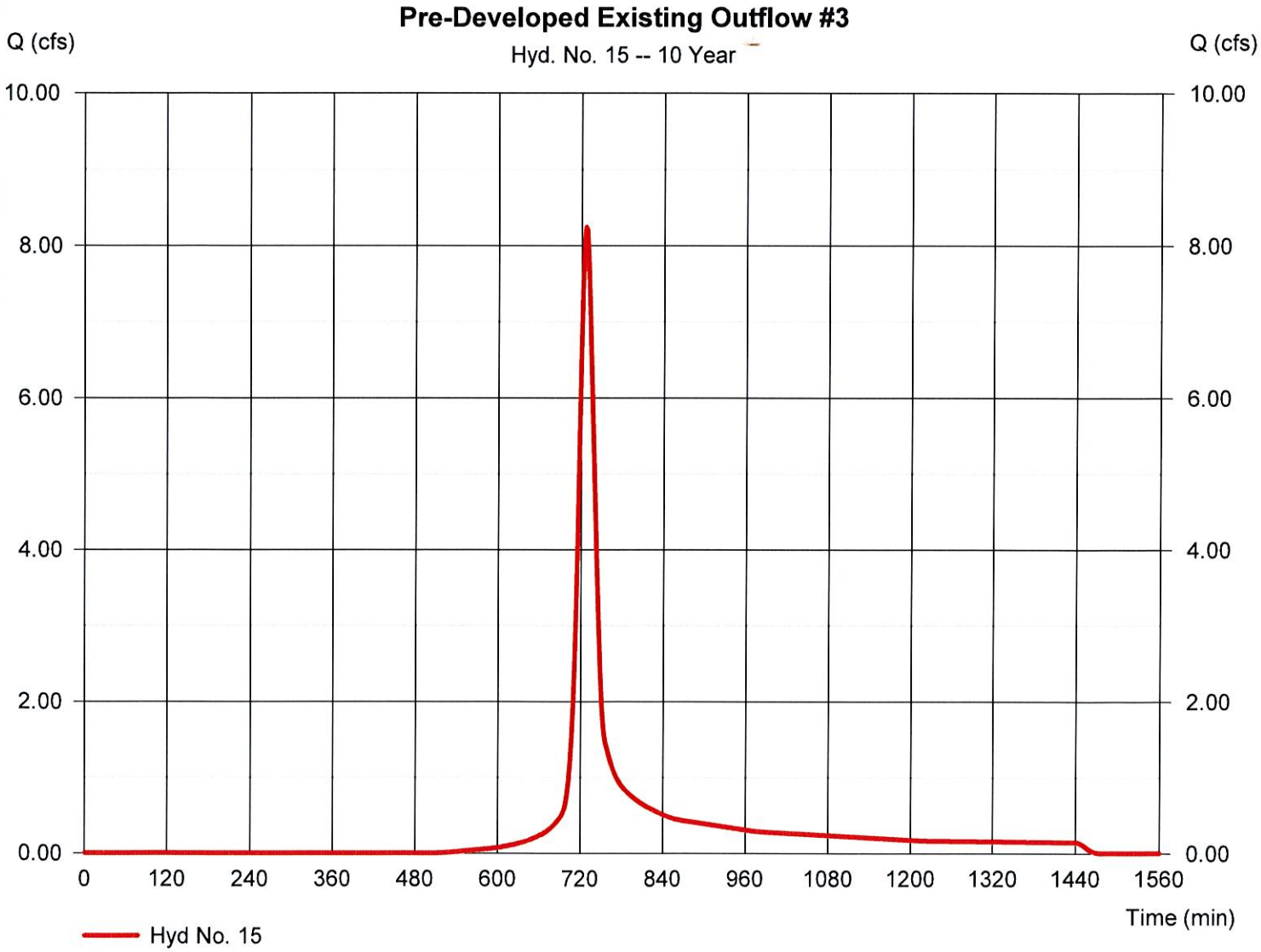
10 YEAR STORM

Hydrograph Report

Hyd. No. 15

Pre-Developed Existing Outflow #3

Hydrograph type	= SCS Runoff	Peak discharge	= 8.242 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 28,563 cuft
Drainage area	= 2.680 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.80 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

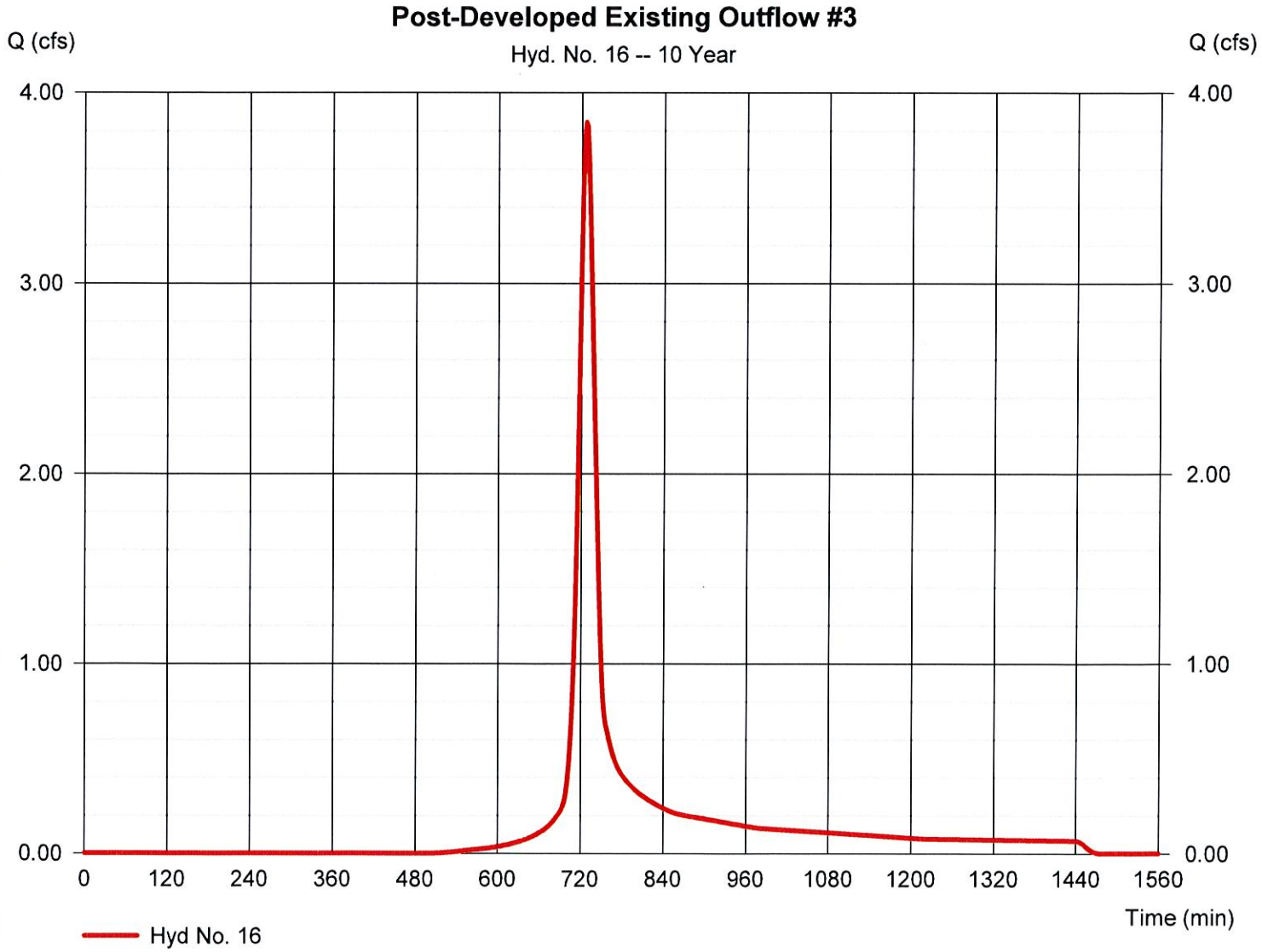


Hydrograph Report

Hyd. No. 16

Post-Developed Existing Outflow #3

Hydrograph type	= SCS Runoff	Peak discharge	= 3.844 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 13,322 cuft
Drainage area	= 1.250 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 5.64 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



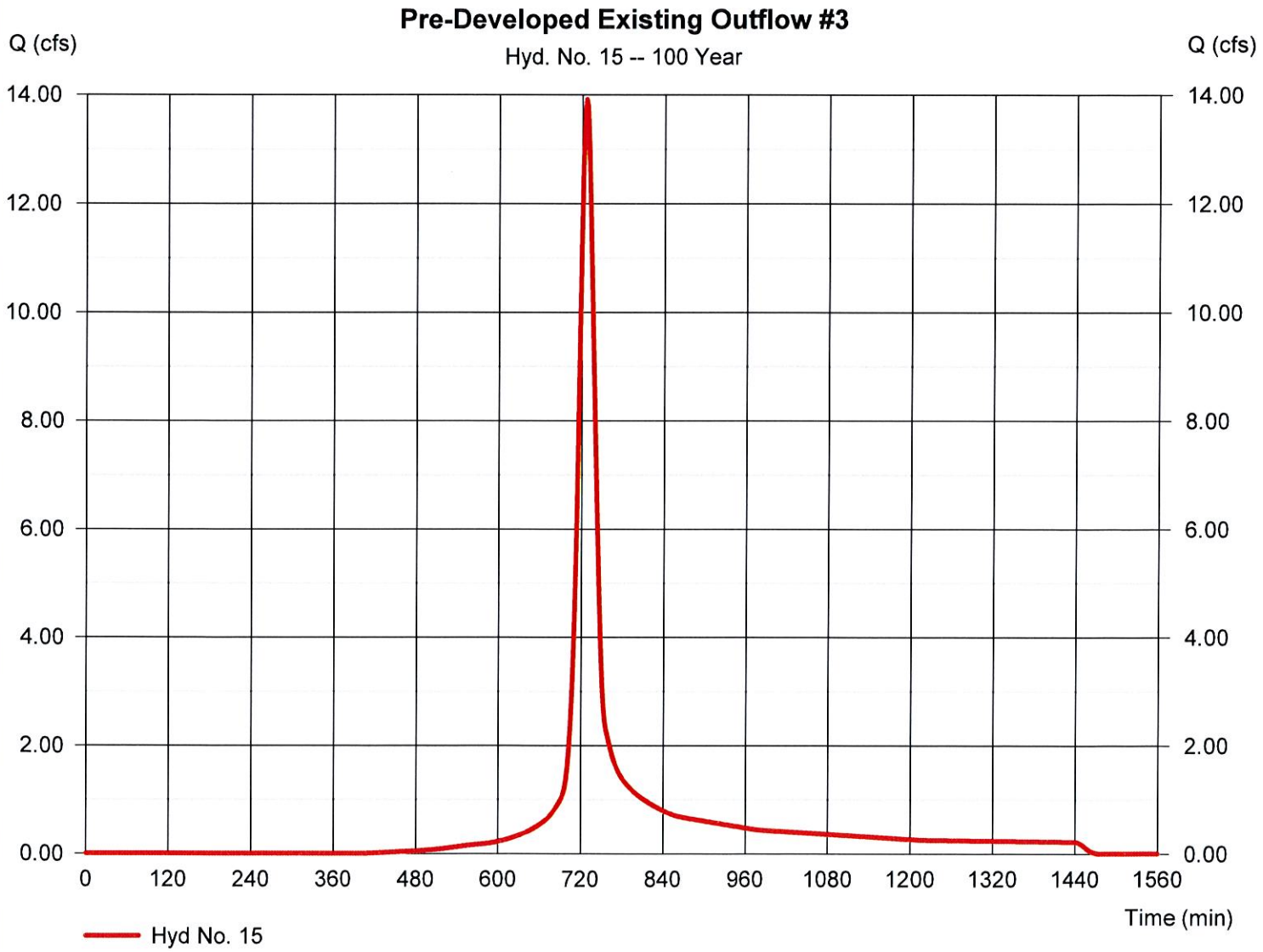
100 YEAR STORM

Hydrograph Report

Hyd. No. 15

Pre-Developed Existing Outflow #3

Hydrograph type	= SCS Runoff	Peak discharge	= 13.91 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 48,067 cuft
Drainage area	= 2.680 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.80 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

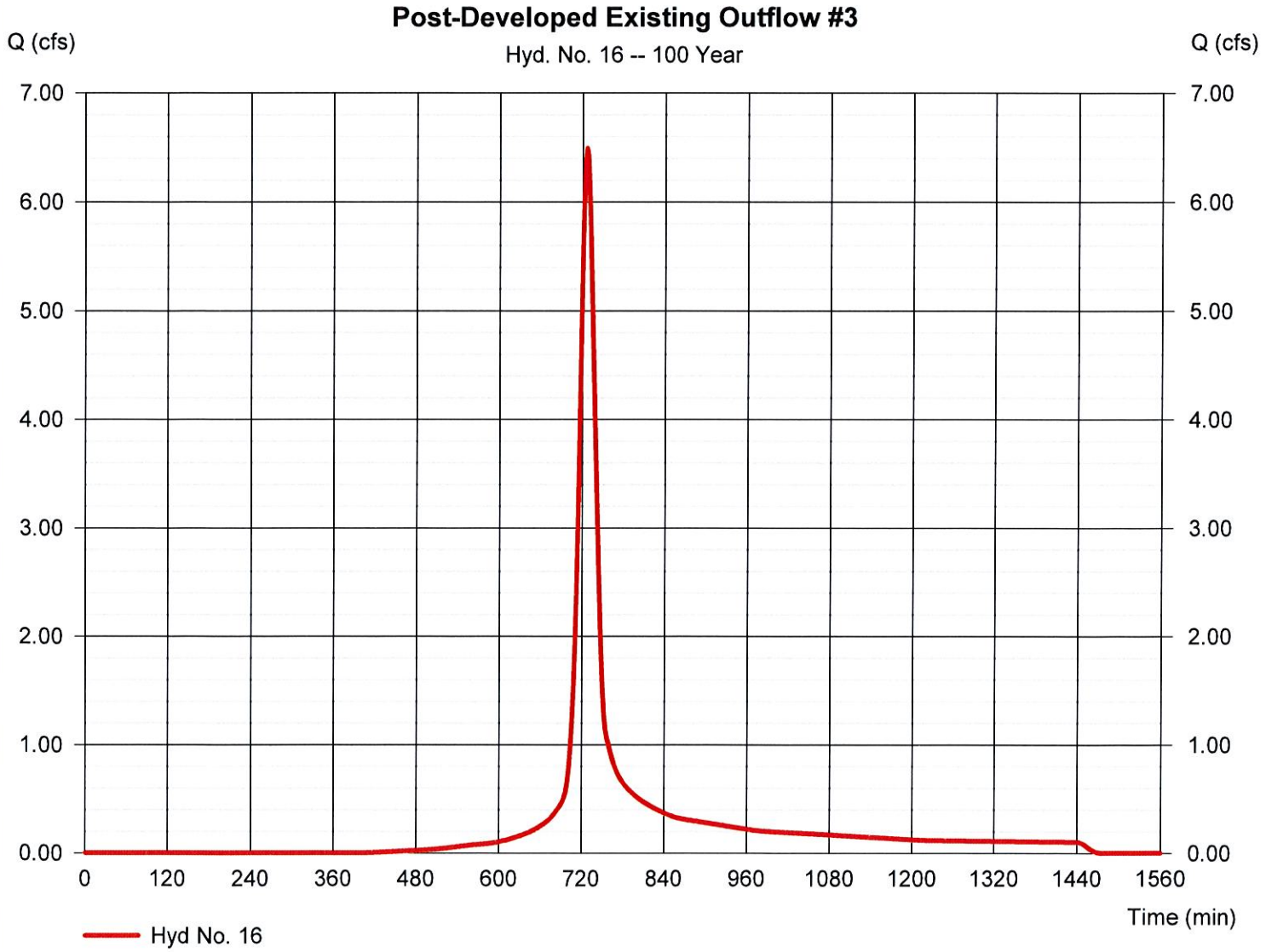


Hydrograph Report

Hyd. No. 16

Post-Developed Existing Outflow #3

Hydrograph type	= SCS Runoff	Peak discharge	= 6.489 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 22,419 cuft
Drainage area	= 1.250 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 7.92 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



POND REPORT

Pond Report

Pond No. 1 - South Basin #1

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1005.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1005.00	00	0	0
1.00	1006.00	627	314	314
2.00	1007.00	1,983	1,305	1,619
3.00	1008.00	5,044	3,513	5,132
4.00	1009.00	10,030	7,537	12,669
5.00	1010.00	14,662	12,346	25,015
5.40	1010.40	15,976	6,128	31,143
6.00	1011.00	17,049	9,907	41,050
6.46	1011.46	17,886	8,035	49,085
7.00	1012.00	18,879	9,926	59,012
8.00	1013.00	20,773	19,826	78,837
9.00	1014.00	22,710	21,741	100,579
10.00	1015.00	24,723	23,716	124,295
11.00	1016.00	26,783	25,753	150,048

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	12.00	10.00	1.00
Span (in)	= 30.00	12.00	36.00	1.00
No. Barrels	= 1	1	4	40
Invert El. (ft)	= 1004.83	1010.40	1015.00	1005.00
Length (ft)	= 87.00	0.00	0.00	4.50
Slope (%)	= 0.40	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	Yes

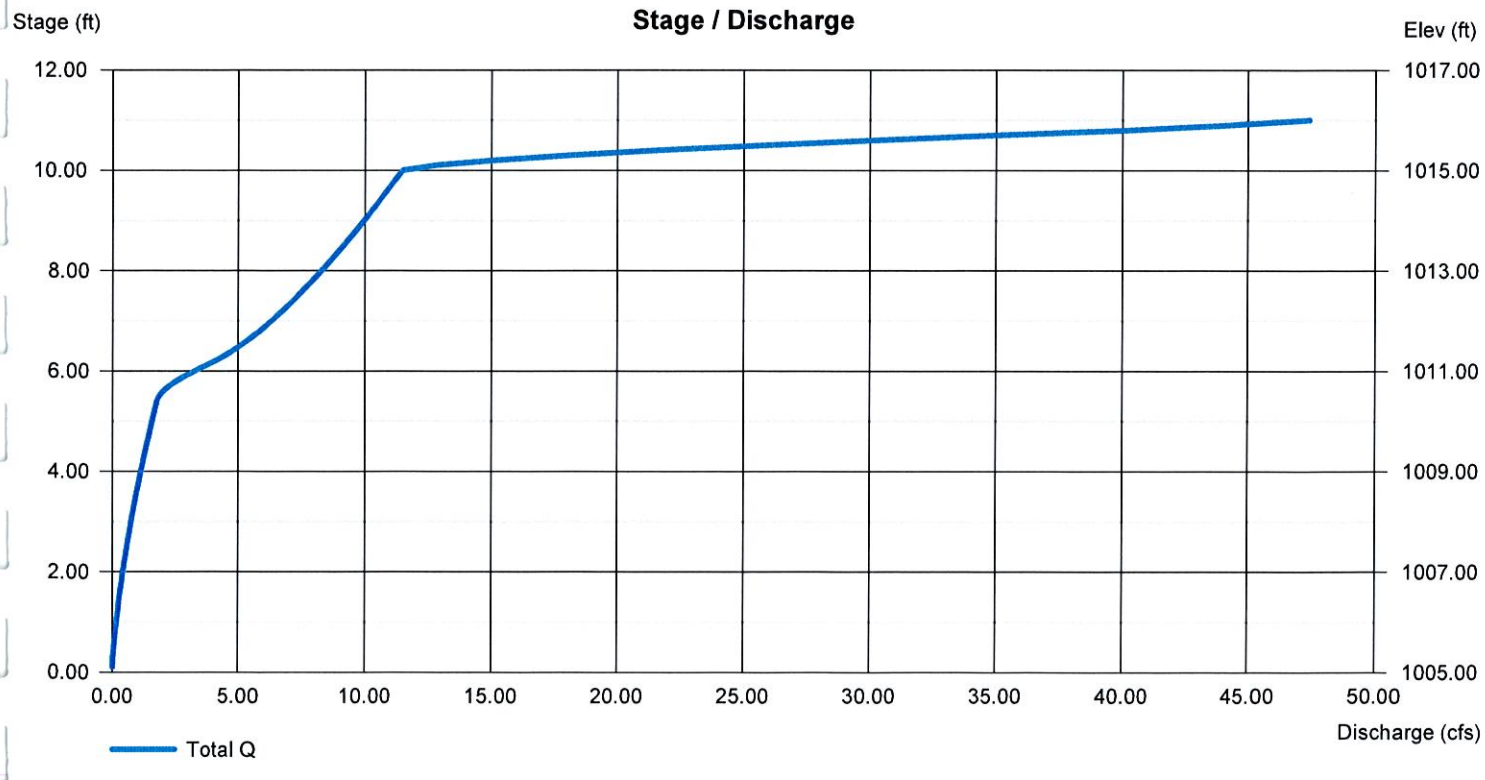
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Pond Report

Pond No. 2 - North Basin #2

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1007.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1007.50	00	0	0
0.50	1008.00	585	146	146
1.50	1009.00	2,051	1,318	1,464
2.50	1010.00	4,258	3,154	4,619
3.50	1011.00	7,359	5,808	10,427
4.50	1012.00	11,187	9,273	19,700
5.50	1013.00	15,123	13,155	32,856
6.50	1014.00	17,927	16,525	49,381
7.00	1014.50	18,942	9,217	58,598
7.50	1015.00	19,972	9,729	68,327
8.50	1016.00	22,073	21,023	89,349
9.50	1017.00	24,231	23,152	112,502
10.50	1018.00	26,446	25,339	137,840
11.50	1019.00	28,716	27,581	165,421

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	2.00	12.00	1.00
Span (in)	= 36.00	36.00	36.00	1.00
No. Barrels	= 1	1	1	50
Invert El. (ft)	= 1007.70	1014.50	1015.00	1008.50
Length (ft)	= 24.00	0.00	0.00	5.50
Slope (%)	= 0.40	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	Yes

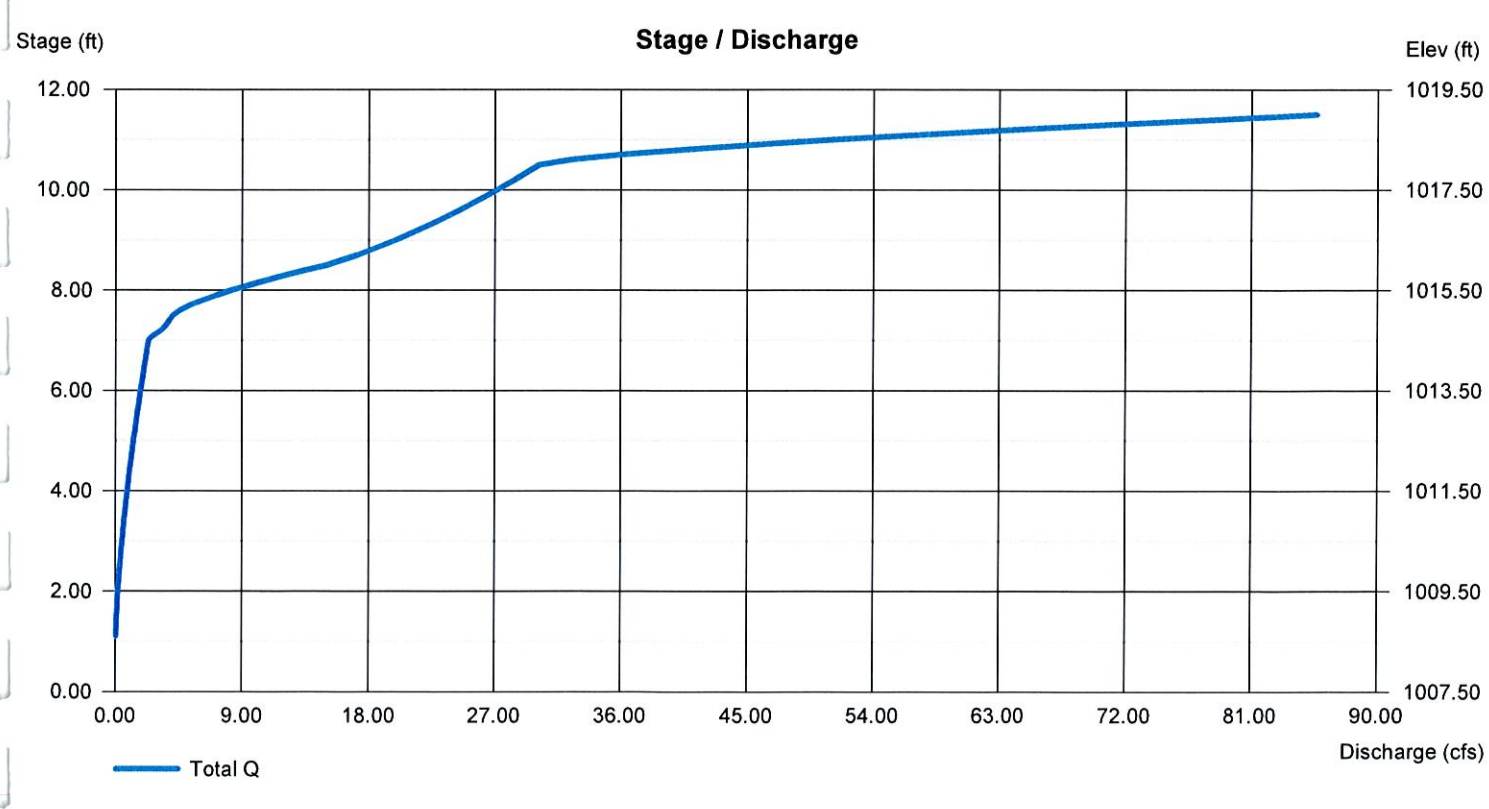
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 1018.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

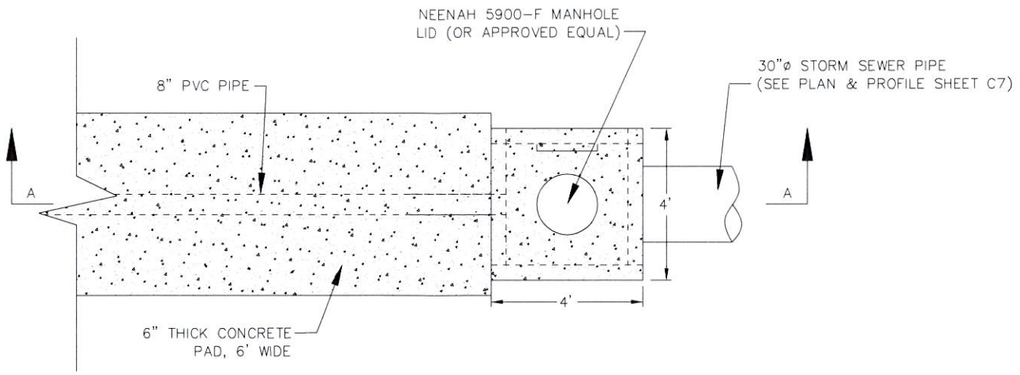


DETENTION BASIN

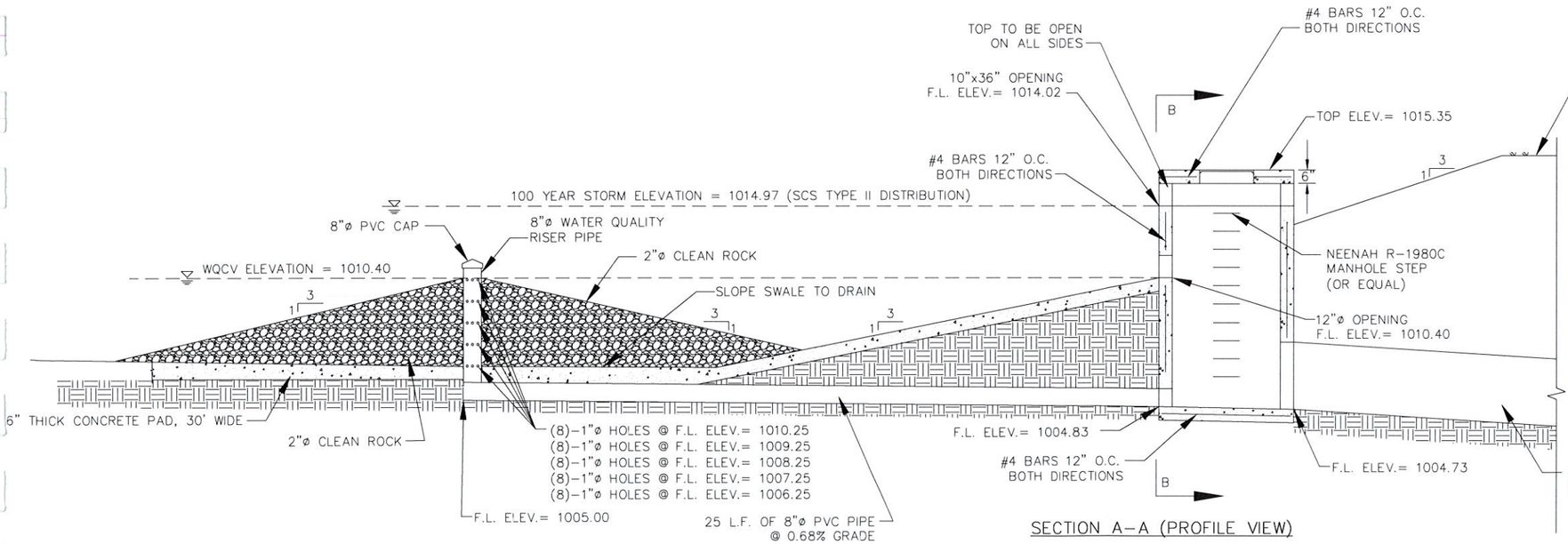
OUTLET STRUCTURE DETAILS

DRAINAGE AREA MAPS

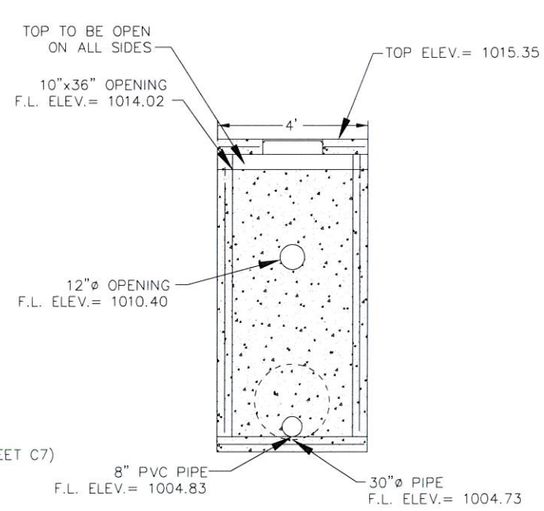
PROVIDE 3/4" EPOXY COATED REBAR ACROSS ANY INLET OPENING WITH A VERTICAL OPENING GREATER THAN 6", SO THAT THE MAXIMUM VERTICAL OPENING DIMENSION IS 6"



PLAN VIEW



SECTION A-A (PROFILE VIEW)

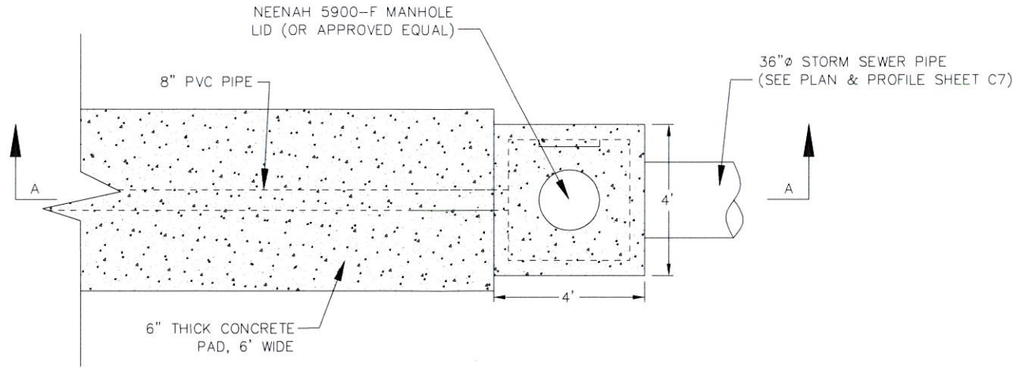


SECTION B-B

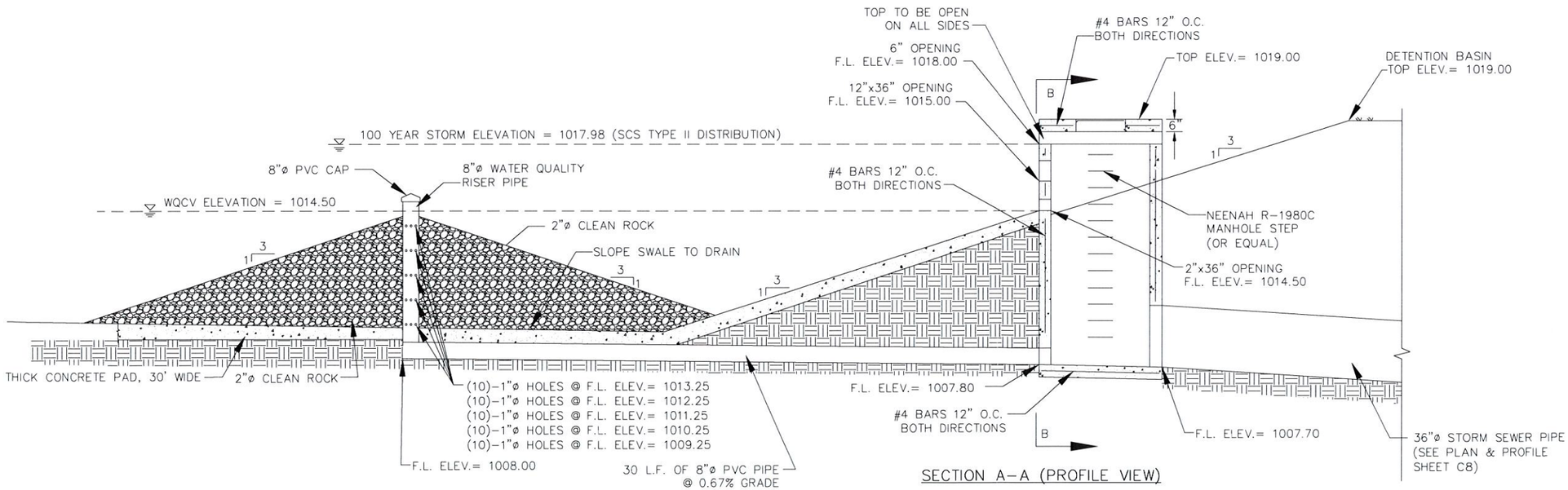
DETENTION BASIN #1 OVERFLOW STRUCTURE

COCHRAN STANDARD DETAIL - NO SCALE

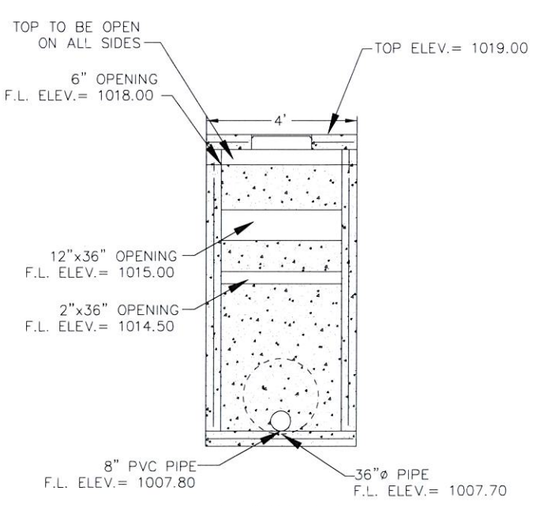
PROVIDE 3/4" EPOXY COATED REBAR ACROSS ANY INLET OPENING WITH A VERTICAL OPENING GREATER THAN 6", SO THAT THE MAXIMUM VERTICAL OPENING DIMENSION IS 6"



PLAN VIEW



SECTION A-A (PROFILE VIEW)



SECTION B-B

DETENTION BASIN #2 OVERFLOW STRUCTURE

COCHRAN STANDARD DETAIL - NO SCALE

PRE-DEVELOPED DRAINAGE AREA MAP

EXISTING OUTFLOW #3
(DITCHLINE ALONG MARKET STREET)
(TRIBUTARY TO BIG CREEK)

EXISTING OUTFLOW #2
(DITCHLINE ALONG MARKET STREET)
(TRIBUTARY TO BIG CREEK)

EXISTING ON-SITE
DRAINAGE AREA #3
2.68 AC.
Q_{100} = 13.91 cfs

EXISTING ON-SITE
DRAINAGE AREA #2
15.44 AC.
Q_{100} = 52.65 cfs

EXISTING ON-SITE
DRAINAGE AREA #1
9.14 AC.
Q_{100} = 37.79 cfs

OUTLOT #1

OUTLOT #2

HIGHWAY 291
(SOUTH BOUND) (VARIABLE WIDTH ROW)

HIGHWAY 291
(NORTH BOUND) (VARIABLE WIDTH ROW)

R/W

EXISTING OUTFLOW #1
(EXISTING 30" PIPE)
(TRIBUTARY TO LAKE
WINNEBAGO)

0 75 150

NOVEMBER, 2015

LEGEND

EXISTING		PROPOSED
500	INDEX CONTOUR	500
	INTERMEDIATE CONTOUR	498
	PROPERTY LINE	P
	RIGHT-OF-WAY	R/W
SS	STORM SEWER	SS
	DRAINAGE AREA LIMITS	

530A E. Independence Dr.
Union, Missouri 63084
636-584-0540 (tel.)
636-584-0512 (fax)
mail@cochraneng.com

COCHRAN
• Civil Engineering
• Land Surveying
• Architecture
• Site Development
• General Consulting
• Master Planning

Two working days prior to the start of any excavation on this site, contractor shall call 1-800-DIG-RITE for utility location information.

All OSHA rules & regulations established for the type of construction required by these plans shall be strictly followed (ie. Trenching, Blasting, etc.)

WALMART SUPERCENTER #4590-01
CITY OF LEE'S SUMMIT, JACKSON CO., MO
WAL-MART STORES, INC., BENTONVILLE, AR

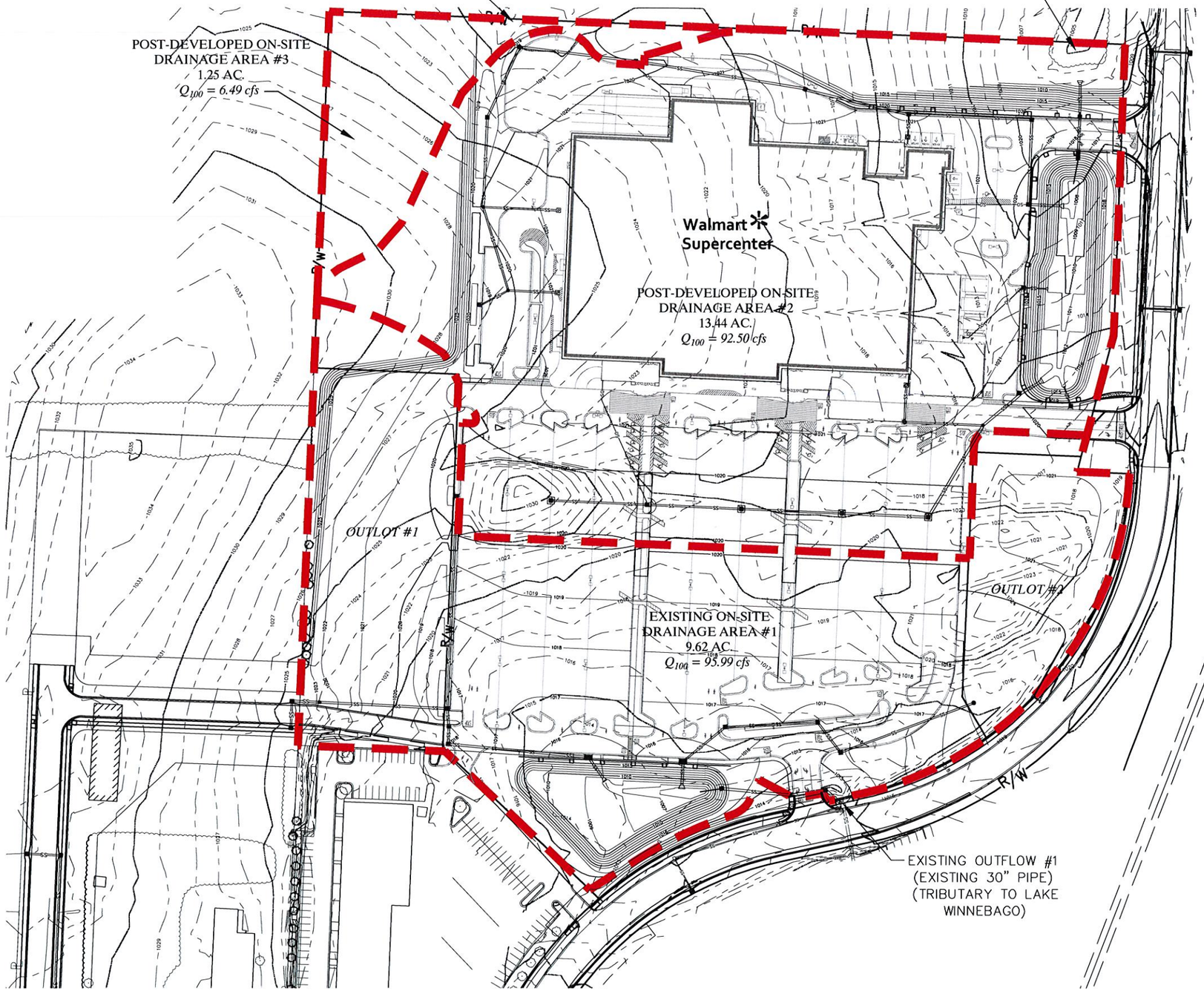
PRE-DEVELOPED DRAINAGE AREA MAP

DRN. BY:	APP'D. BY:
JMM	ERR

DATE: NOV. 25, 2015
SCALE: 1" = 150'
PROJ. NO: 12-5082
DWG. NO:

1 OF 3

POST-DEVELOPED DRAINAGE AREA MAP



0 75 150

NOVEMBER, 2015

LEGEND

EXISTING		PROPOSED
500	INDEX CONTOUR	500
	INTERMEDIATE CONTOUR	498
	PROPERTY LINE	P
	RIGHT-OF-WAY	R/W
SS	STORM SEWER	SS
	DRAINAGE AREA LIMITS	

530A E. Independence Dr.
Union, Missouri 63084
636-584-0540 (tel.)
636-584-0512 (fax)
mail@cochraneng.com

COCHRAN
• Civil Engineering
• Land Surveying
• Architecture
• Site Development
• General Consulting
• Master Planning

Two working days prior to the start of construction on this site, contractor shall call 1-800-DIG-RITE for utility location information.

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WALMART SUPERCENTER #4590-01

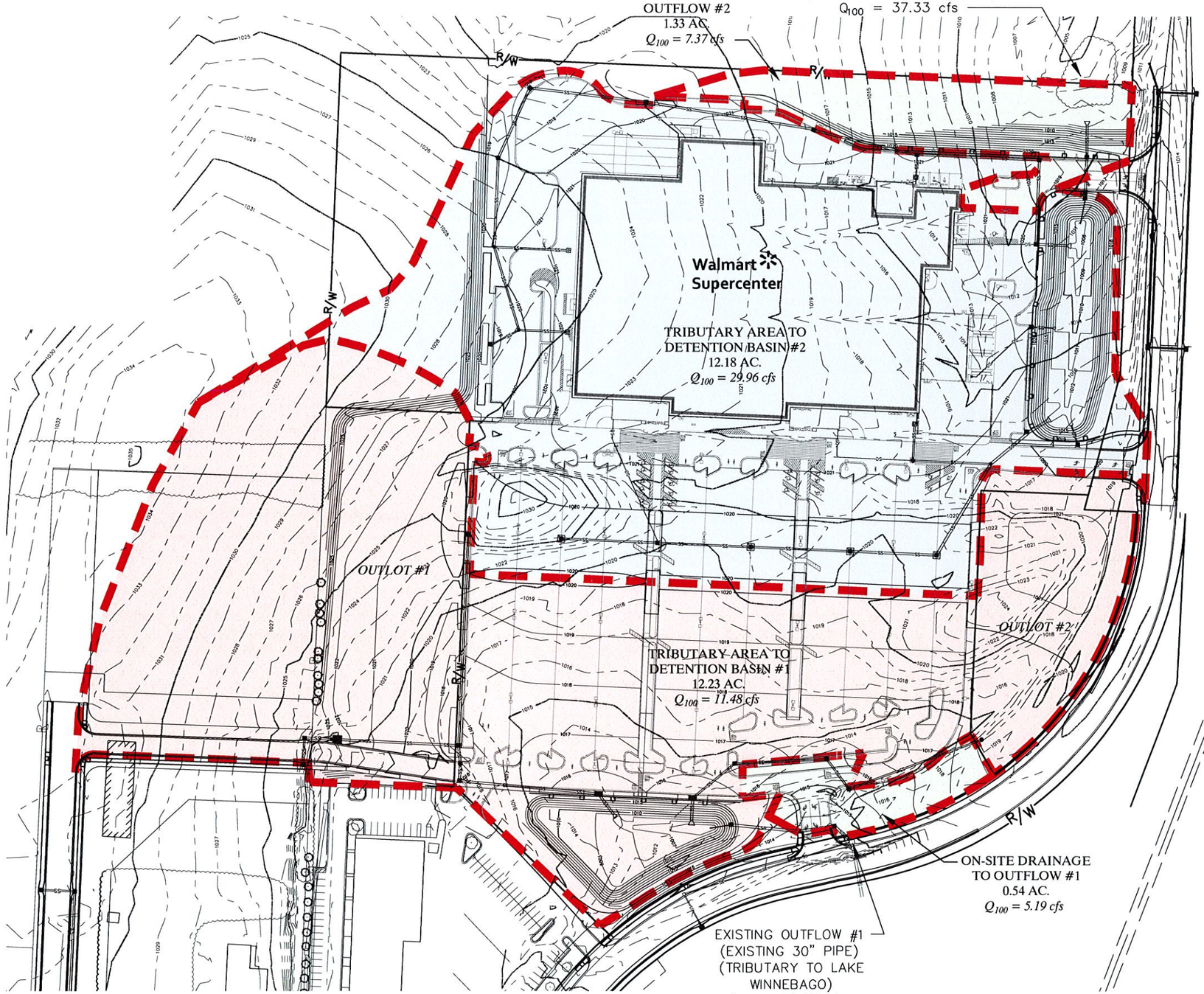
CITY OF LEE'S SUMMIT, JACKSON, CO., MO.

WAL-MART STORES, INC., BENTONVILLE, AR.

POST-DEVELOPED DRAINAGE AREA MAP

DRN. BY:	APP'D. BY:
DATE:	
REVISION	
DRN. BY: JMM	APP'D. BY: ERR
DATE: NOV. 25, 2015	
SCALE: 1" = 150'	
PROJ. NO: 12-5082	
DWG. NO: 2 OF 3	

TRIBUTARY DRAINAGE AREA MAP



0 75 150

NOVEMBER, 2015

LEGEND

EXISTING		PROPOSED
500	INDEX CONTOUR	500
	INTERMEDIATE CONTOUR	498
	PROPERTY LINE	℄
	RIGHT-OF-WAY	R/W
SS	STORM SEWER	SS
	DRAINAGE AREA LIMITS	

OCHRAN
5304 E. Independence Dr.
Union, Missouri 63084
636-584-0540 (tel.)
636-584-0512 (fax)
mail@ochraneng.com
: Civil Engineering
: Land Surveying
: Architecture
: Site Development
: General Consulting
: Master Planning

Two working days prior to the start of any excavation on this site, contractor shall call 1-800-DIG-RITE for utility location information.

All OSHA rules & regulations established for the type of construction required by these plans shall be strictly followed (ie. Trenching, Blasting, etc.)

WALMART SUPERCENTER #4590-01

CITY OF LEE'S SUMMIT, JACKSON, CO., MO.

WAL-MART STORES, INC., BENTONVILLE, AR.

TRIBUTARY DEVELOPED DRAINAGE AREA MAP

DWN. BY:	APP'D. BY:
JMM	ERR

DATE: NOV. 25, 2015

SCALE: 1" = 150'

PROJ. NO.: 12-5082

DWG. NO.: 3 OF 3

STORM SEWER DRAINAGE AREA MAP

0 75 150

NOVEMBER, 2015

LEGEND

EXISTING		PROPOSED
500	INDEX CONTOUR	500
	INTERMEDIATE CONTOUR	498
	PROPERTY LINE	PL
	RIGHT-OF-WAY	R/W
SS	STORM SEWER	SS
	DRAINAGE AREA LIMITS	

NOTE:
SEE SHEET 2 OF 2 FOR STORM SEWER INLET FLOW RATES.

530A E. Independence Dr.
Union, Missouri 63084
636-584-0540 (tel.)
636-584-0512 (fax)
mail@cochranengineering.com

COCHRAN

• Civil Engineering
• Land Surveying
• Architecture
• Site Development
• General Consulting
• Master Planning

Three working days prior to the start of any excavation on this site, contractor shall call 1-800-DIG-RITE for utility location information.

All OSHA rules & regulations established for the type of construction required by these plans shall be strictly followed (ie. Trenching, Blasting, etc.)

WALMART SUPER CENTER #4590-01
CITY OF LEE'S SUMMIT, MISSOURI
WAL-MART STORES, INC.

STORM SEWER DRAINAGE AREA MAP

DRN. BY:	APPD. BY:
JMM	ERR

DATE: NOV. 25, 2015
SCALE: 1" = 150'
PROJ. NO. 12-5082
DWG. NO. 1 OF 2

STORM SEWER INLET FLOW RATES

					Intensity		K-Factor			Flow Rate (cfs)	
Drainage Area	Pervious Area	Impervious Area	Total Area	C-Factor	I10	I100	K-10	K-100	C*K - 100	Q10	Q100
1	0.02	0.04	0.06	0.70	5.70	8.08	1.0	1.25	0.88	**0.24**	**0.42**
2	0.03	0.07	0.1	0.72	5.70	8.08	1.0	1.25	0.90	**0.41**	**0.73**
5	0.08	0.77	0.85	0.84	5.70	8.08	1.0	1.25	1.00	**4.09**	**6.87**
6	0.04	0.33	0.37	0.84	5.70	8.08	1.0	1.25	1.00	**1.76**	**2.99**
7	0.05	0.6	0.65	0.85	5.70	8.08	1.0	1.25	1.00	**3.16**	**5.25**
8	0.11	0.52	0.63	0.80	5.70	8.08	1.0	1.25	0.99	**2.86**	**5.06**
9	1.34	0	1.34	0.30	5.70	8.08	1.0	1.25	0.38	**2.29**	**4.06**
11	0.05	1.31	1.36	0.88	5.70	8.08	1.0	1.25	1.00	**6.81**	**10.99**
12	0	0.07	0.07	0.90	5.70	8.08	1.0	1.25	1.00	**0.36**	**0.57**
13	0	0.07	0.07	0.90	5.70	8.08	1.0	1.25	1.00	**0.36**	**0.57**
14	2.96	0.45	3.41	0.38	5.70	8.08	1.0	1.25	0.47	**7.37**	**13.06**
15	2.2	0.33	2.53	0.38	5.70	8.08	1.0	1.25	0.47	**5.45**	**9.67**
16	Flow rate based from storm water report for Hollywood Drive.									**6.00**	**7.93**
18	0	0.03	0.03	0.90	5.70	8.08	1.0	1.25	1.00	**0.15**	**0.24**
19	0.01	0.12	0.13	0.85	5.70	8.08	1.0	1.25	1.00	**0.63**	**1.05**
22	0.01	0.4	0.41	0.89	5.70	8.08	1.0	1.25	1.00	**2.07**	**3.31**
23	0	0.08	0.08	0.90	5.70	8.08	1.0	1.25	1.00	**0.41**	**0.65**
24	0	0.16	0.16	0.90	5.70	8.08	1.0	1.25	1.00	**0.82**	**1.29**
25	0	0.28	0.28	0.90	5.70	8.08	1.0	1.25	1.00	**1.44**	**2.26**
26	0	0.14	0.14	0.90	5.70	8.08	1.0	1.25	1.00	**0.72**	**1.13**
27	0	0.54	0.54	0.90	5.70	8.08	1.0	1.25	1.00	**2.77**	**4.36**
28	0.67	0	0.67	0.30	5.70	8.08	1.0	1.25	0.38	**1.15**	**2.03**
31	0	0.53	0.53	0.90	5.70	8.08	1.0	1.25	1.00	**2.72**	**4.28**
32	0	0.99	0.99	0.90	5.70	8.08	1.0	1.25	1.00	**5.08**	**8.00**
33	0	0.87	0.87	0.90	5.70	8.08	1.0	1.25	1.00	**4.46**	**7.03**
34	0.72	0.58	1.3	0.57	5.70	8.08	1.0	1.25	0.71	**4.21**	**7.45**
36	0	0.24	0.24	0.90	5.70	8.08	1.0	1.25	1.00	**1.23**	**1.94**
38	0	0.19	0.19	0.90	5.70	8.08	1.0	1.25	1.00	**0.97**	**1.54**
40	0.05	0.5	0.55	0.85	5.70	8.08	1.0	1.25	1.00	**2.65**	**4.44**
41	0.04	0.62	0.66	0.86	5.70	8.08	1.0	1.25	1.00	**3.25**	**5.33**
42	0.04	0.63	0.67	0.86	5.70	8.08	1.0	1.25	1.00	**3.30**	**5.41**
43	0.03	0.63	0.66	0.87	5.70	8.08	1.0	1.25	1.00	**3.28**	**5.33**
44	0.02	0.48	0.5	0.88	5.70	8.08	1.0	1.25	1.00	**2.50**	**4.04**
46	0	1.2	1.2	0.90	5.70	8.08	1.0	1.25	1.00	**6.16**	**9.70**
48	0.1	0.28	0.38	0.74	5.70	8.08	1.0	1.25	0.93	**1.61**	**2.85**

OCHRAN
530A E. Independence Dr.
Union, Missouri 63084
636-584-0540 (tel.)
636-584-0512 (fax)
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• Civil Engineering
• Land Surveying
• Architecture
• Site Development
• General Consulting
• Master Planning

Three working days prior to the start of any excavation on this site, contractor shall call 1-800-DIG-RITE for utility location information.

All OSHA rules & regulations established for the type of construction required by these plans shall be strictly followed (ie. Trenching, Blasting, etc.)

WALMART SUPER CENTER #4590-01
CITY OF LEE'S SUMMIT, MISSOURI
WAL-MART STORES, INC.

STORM SEWER INLET FLOW RATES

DRN. BY:	JMM
APP'D. BY:	ERR
DATE:	NOV. 25, 2015
SCALE:	1" = 150'
PROJ. NO:	12-5082
DWG. NO:	2 OF 2

STORMWATER REPORT

Firestone Complete Auto Care

3501 SW Market Street
Lee's Summit, MO 64082

Jackson County

Gresham Smith Project # 40831.45

January 8, 2020
Revised April 28, 2020

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GENERAL INFORMATION

The proposed Firestone Auto Care store is located on approximately 1.237 acres at 3501 SW Market Street in Lee's Summit, Jackson County, Missouri. The site is currently undeveloped. Existing slopes range from 1 to 5 percent, draining to the northeast (see Appendix A). The proposed development is a one story, 6,262 square foot commercial auto maintenance store with associated parking and utilities. Existing drainage patterns will be preserved in the proposed design, with the addition of a detention pond for stormwater discharge management and quality.

Approximately 49.6% of the proposed site will consist of the building footprint and pavement, and the remaining 50.4% will be grass and landscaped areas. See Figure 1 for a further pre and post development breakdown. The soils onsite consist of 16.6% Arisburg-Urban land complex loam, classified as Hydrologic soil group C and 83.4% Udarents-Urban land-Sampsel complex, classified as Hydrologic soil group C according to the NRCS Web Soil Survey. Runoff coefficients for soil group C were used in the following analysis, see table 1 below. None of the project site is located within a Flood Zone according to FEMA map number 29095C0532G, revised January 20, 2017. The proposed area of disturbance is 1.60 acres.

Table 1: Soil Classification Table (based on NRCS Web Soil Survey)

Soil Classification Name	Slope	Hydrologic Soil Group
Arisburg-Urban land complex (16.6% of site)	1 to 5 percent	C
Udarents-urban land-sampsel complex (83.4% of site)	2 to 5 percent	C

METHODOLOGY:

The general design approach for calculating the storm water runoff at the project location came from the APWA (American Public Works Association) hydrology section 5602 and stormwater detention and retention section 5608. The SCS method was used to calculate the peak flow rates of runoff at two points of interest. The SCS method was also used to develop the baseline unit hydrograph. SCS curve numbers are based on APWA Section 5602.3, as the entirety of the site falls under hydrologic soils C (74 for pervious locations and 98 for impervious areas). Design storm rainfall depths are taken from NOAA's Precipitation Data Server for the 24 hour duration on the 2 year, 10 year and 100 year storm events. There is a water quality element for the detention pond that is designed to store the water and drain it out slowly over a 40 hour period.

EXISTING CONDITIONS ANALYSIS:

The 1.237 acre property and the surrounding locations is currently 100% pervious. From the existing drainage patterns, 2 points of interest can be identified. The first is the storm grate to the North of the site along SW Market Street while the second is where the sheet flow from the site and surrounding location becomes concentrated flow to the east. The following land use areas and curve numbers shown below in figure 1 were developed using the TR-55 data:

Figure 1: Existing Conditions Curve Number Summary Table

Curve Numbers - Soil Group C (POI 1)		
Land Use	Curve Number	Predeveloped Acres
Impervious	98	0.286
Semi-Pervious (Gravel)	88	0.000
Pervious (Open Space)	74	0.421
	Total Area	0.708
Composite Curve Number		84

Curve Numbers - Soil Group C (POI 2)		
Land Use	Curve Number	Predeveloped Acres
Impervious	98	0.000
Semi-Pervious (Gravel)	88	0.000
Pervious (Open Space)	74	2.421
	Total Area	2.421
Composite Curve Number		74

The point of interest's locations, flow paths and drainage areas can be found in Appendix A. The flow path for POI 1, using the TR-55 Tc worksheet available in Autocad Civil 3d's Hydraflow software resulted in a time of concentration of 9.6 minutes for existing conditions. The flow path for POI 2, using the TR-55 Tc worksheet available in Autocad Civil 3d's Hydraflow software resulted in a time of concentration of 9.8 minutes for existing conditions. Using the SCS method of calculating storm runoff to each point of interest, the following flow rates were obtained:

FS SITE	24-HOUR RAINFALL	PRE-DEVELOPED RUNOFF FOR POI 1	PRE-DEVELOPED RUNOFF FOR POI 2
RECURRENCE INTERVAL	(IN.)	(C.F.S.)	(C.F.S.)
2-YEAR STORM	3.68	2.343	5.230
10-YEAR STORM	5.61	4.214	10.990
100-YEAR STORM	9.17	7.681	22.65

Detailed calculations for the existing conditions for points of interest 1 and 2 can be found in Appendix B.

PROPOSED CONDITIONS ANALYSIS:

The proposed site grading reduces the storm peak discharge and volume of runoff from the site through the use of a detention pond and outlet control structure. The pond is located to the east of the proposed building. The pond's exact location and outfall may be seen on Drawing C3.1. The detention pond is 5.60 feet from the lowest pond bottom elevation to the top of berm.

The point of interests storm flows were determined using the method presented in Section 5602.6 of the APWA 5600 Manual. Post-developed conditions from the detention pond are not to exceed 3 cfs per acre for the 100 year storm event, 2 cfs per acre for the 10 year storm event or 0.5 cfs per acre for the 2 year storm event. The remainder of the peripheral drainage elements near the right of way will require a waiver, but have calculated such that the pre-developed versus post-developed conditions have improved. The comprehensive control strategy also includes a water quality element for the detention pond which specifies that a 40 hour extended detention be provided for the 1.37 inch 90% mean annual storm event. For this project, a detention basin is incorporated to achieve the water quality and storm water management requirements. Refer to the Hydraflow calculations provided in Appendix B for detailed stage-storage volumes for the pond.

The water surface elevation needed to achieve the required Water Quality Volume was calculated as 1012.69 from the Hydraflow pond stage-storage graph provided in Appendix D. An elevation of 1014.65 was taken as the bottom of the rectangular weir in the Hydraflow model used for detention calculations to ensure that the water quality volume and release rates are met.

The outlet of the detention pond will be a precast concrete control structure with a rectangular weir set above the water quality volume storage elevation calculated. See sheet C903 for details of the outlet structure and underdrain connection.

The detention pond's emergency spillway was designed such that the 1% storm WSE maintains and 0.5 foot freeboard from the bottom of the spillway elevation to the top of the 100 year water storage elevation under normal conditions. This is achieved by setting the top of the pond berm to an elevation of 1016.45 and the bottom of the emergency spillway to an elevation of 1015.90. The 1% WSE of 1015.38 (0.52 feet below the bottom elevation of the emergency spillway). The detailed calculations can be found in Appendix B, while a detail of the detention overflow spillway can be found on sheet C903. A 100' wide emergency overflow spillway was designed to achieve the requirements stated above. The emergency spillway was designed to pass the 1% storm event with greater than a 0.5 foot of freeboard from the design stage to the top of the dam. A waiver will be needed in lieu of reaching the required 1 foot of freeboard for the zero available storage in the basin and zero flow through the primary outlet of the structure during a 100 year storm event.

Figure 2 shows the detailed breakdown of land use types used in calculating the curve numbers, using a Hydrologic Soil Group C.

Figure 1: Proposed Condition Curve Number Summary Table

Curve Numbers - Soil Group C (POI 1)		
Land Use	Curve Number	Post Developed Acres
Impervious	98	0.353
Semi-Pervious (Gravel)	88	0.000
Pervious (Open Space)	74	0.176
	Total Area	0.529
Composite Curve Number		90

Curve Numbers - Soil Group C (POI 2)		
Land Use	Curve Number	To Pond Acres
Impervious	98	0.581
Semi-Pervious (Gravel)	88	0.000
Pervious (Open Space)	74	0.439
	Total Area	1.020
Composite Curve Number		88

Curve Numbers - Soil Group C (POI 2)		
Land Use	Curve Number	Remainder of Post Developed Acres
Impervious	98	0.439
Semi-Pervious (Gravel)	88	0.000
Pervious (Open Space)	74	2.221
	Total Area	2.660
Composite Curve Number		78

Figure 3: Stormwater Discharge Summary Table

FS SITE	24-HOUR RAINFALL	POST-DEVELOPED RUNOFF FOR POI 1	POST-DEVELOPED RUNOFF FOR POI 2	SITE DRAINAGE THRU DETENTION POND	POND WATER SURFACE ELEVATION	POND STORAGE VOLUME	FREE BOARD
RECURRENCE INTERVAL	(IN.)	(C.F.S.)	(C.F.S.)	(C.F.S.)	(FT.)	(CU. FT.)	(FT.)
2-YEAR STORM	3.68	2.248	3.581	0.043	1013.41	5,573	3.04
10-YEAR STORM	5.61	3.714	7.487	0.060	1014.62	10,492	1.83
100-YEAR STORM	9.17	6.376	16.55	3.021	1015.38	14,287	1.07
	Top of berm	1016.45					

Stormwater quality is achieved through the use of an extended dry detention pond. The detention pond will provide temporary storage of stormwater runoff allowing settlement of suspended solids over a period of 40 hours. The reduction in flow from the pre-developed to post-developed conditions will correlate to a water quality improvement for the site and allow for TSS removal. Water Quality Volume required by the city of Lee's Summit is found by the equation below, given in Section 5600 of the Comprehensive Control Strategy Design and Construction Manual.

$$WQv = 1.37 * 0.05 + 0.009(Percent\ site\ imperviousness)$$

The percent site imperviousness will be 56.4%, yielding a required Water Quality Volume of 2,828 cubic feet. Adding in an additional 20%, a water quality volume of 3,394.15 cubic feet was used for design of this site.

An Extended Dry Detention Basin will be used to achieve the water quality requirement. A 4" perforated PVC riser will connect to the structure. The end of the PVC riser will be capped and a 1" water quality orifice drilled in the end cap and will dewater the pond in approximately 40 hours. The depth of water quality volume was found to be 1.94' (required water quality volume = 1012.69 – water quality orifice elevation = 1010.75) using the stage-storage table from Hydraflow as shown in Appendix D. A water quality elevation of 1014.65 was used in design of this site.

CONCLUSIONS AND RECOMMENDATIONS:

The flate release rates for the 2, 10 and 100 year storm events are achieved through the use of an extended dry detention basin, while the post development drainage patterns will match the existing conditions drainage pattern in the peripheral drainage areas flowing to tow (2) separate points of interest. The development of a Firestone Complete Auto Care store is proposed on an existing tract on 100% pervious land. This proposed site will consist of 56.4% impervious area. The majority of the 1.237 acre site (approximately 1.02 acres) will be routed through an extended dry detention pond utilizing a water quality and flow release element, as specified in Lee's Summit Design and Construction Manual (DCM). Two (2) points of interests were used in analysis of comparing existing conditions versus post-construction conditions for the peripheral drainage areas. Detailed drainage areas and calculations can

be found in Appendix A and B, respectively. The following table summarizes the runoff conditions for this development:

		Peripheral Drainage		Peripheral Drainage		Flat release rate			
FS SITE	24-HOUR RAINFALL	PRE-DEVELOPED RUNOFF FOR POI 1	POST-DEVELOPED RUNOFF FOR POI 1	PRE-DEVELOPED RUNOFF FOR POI 2	POST-DEVELOPED RUNOFF FOR POI 2	SITE DRAINAGE THRU DETENTION POND	POND WATER SURFACE ELEVATION	POND STORAGE VOLUME	FREE BOARD
RECURRENCE INTERVAL	(IN.)	(C.F.S.)	(C.F.S.)	(C.F.S.)	(C.F.S.)	(C.F.S.)	(FT.)	(CU. FT.)	(FT.)
2-YEAR STORM	3.68	2.34	2.248	5.23	3.581	0.043	1013.41	5,573	3.04
10-YEAR STORM	5.61	4.21	3.714	10.99	7.487	0.060	1014.62	10,492	1.83
100-YEAR STORM	9.17	7.68	6.376	22.65	16.55	3.021	1015.38	14,287	1.07
	Top of berm		1016.45						

In accordance with the Lee's Summit Design and Construction Manual (DCM) Section 1002.A, the proposed Firestone site will apply for a modification to the following specification:

Perimeter drainage issue which will include specific citations of the Design and Construction Manual related to the peak discharge requirements, as well as supporting documentation, in particular a comparison between pre-development versus post-development peak flow rates for the peripheral areas. The emergency spillway was designed to pass the 1% storm event with greater than a 0.5 foot of freeboard from the design stage to the top of the dam. A waiver will be needed in lieu of reaching the required 1 foot of freeboard for the zero available storage in the basin and zero flow through the primary outlet of the structure during a 100 year storm event.

APPENDIX A

Drainage Area Maps

EXISTING CONDITIONS ANALYSIS (POI 1):

DRAINAGE STUDY AREA = 0.708 ACRES
IMPERVIOUS AREA (CN = 98) = 0.286 ACRES
PERVIOUS AREA, OPEN SPACE (CN = 74) = 0.421 ACRES
COMPOSITE CURVE NUMBER, CN = 84
TIME OF CONCENTRATION = 9.60 MINUTES
PEAK RUNOFF (100 YEAR STORM) = 7.68 CFS

EXISTING CONDITIONS ANALYSIS (POI 2):

DRAINAGE STUDY AREA = 2.421 ACRES
IMPERVIOUS AREA (CN = 98) = 0.000 ACRES
PERVIOUS AREA, OPEN SPACE (CN = 74) = 2.421 ACRES
COMPOSITE CURVE NUMBER, CN = 74
TIME OF CONCENTRATION = 9.8 MINUTES
PEAK RUNOFF (100 YEAR STORM) = 22.65 CFS

POI # 1

POI 1TIME OF CONCENTRATION FLOW PATH
Tc = 9.60 MINUTES

POI 1 PROJECT AREA IN EXISTING CONDITONS

POI 2 TIME OF CONCENTRATION FLOW PATH
Tc = 9.80 MINUTES

POI 2 PROJECT AREA IN EXISTING CONDITONS

POI # 2

NORTH

50' 0 50' 100'
GRAPHIC SCALE

LEGEND

IMPERVIOUS

PERVIOUS (OPEN SPACE)

EXISTING CONDITIONS

PROPOSED CONDITIONS ANALYSIS (POI 1):

DRAINAGE STUDY AREA = 0.529 ACRES
IMPERVIOUS AREA (CN = 98) = 0.353 ACRES
PERVIOUS AREA, OPEN SPACE (CN = 74) = 0.176 ACRES
COMPOSITE CURVE NUMBER, CN = 90
TIME OF CONCENTRATION = 5 MINUTES
PEAK RUNOFF (100 YEAR STORM WITH DETENTION) = 6.376 CFS

PROPOSED CONDITIONS ANALYSIS (POI 2):

DRAINAGE STUDY AREA = 2.660 ACRES
IMPERVIOUS AREA (CN = 98) = 0.439 ACRES
PERVIOUS AREA, OPEN SPACE (CN = 74) = 2.221 ACRES
COMPOSITE CURVE NUMBER, CN = 78
TIME OF CONCENTRATION = 5 MINUTES
PEAK RUNOFF (100 YEAR STORM WITH DETENTION) = 16.55 CFS

PROPOSED DRAINAGE AREA TO DETENTION POND:

DRAINAGE AREA = 1.020 ACRES
IMPERVIOUS AREA (CN = 98) = 0.581 ACRES
PERVIOUS AREA, OPEN SPACE (CN = 74) = 0.439 ACRES
COMPOSITE CURVE NUMBER, CN = 88
TIME OF CONCENTRATION = 5 MINUTES

NORTH

60' 0 60' 120'

GRAPHIC SCALE

LEGEND

IMPERVIOUS

PERVIOUS (OPEN SPACE)

PROPOSED SITE BYPASS

POI 1 PROJECT AREA IN PROPOSED CONDITIONS

POI # 1

POI 2 PROJECT AREA IN FUTURE CONDITIONS

100' WIDE EMERGENCY SPILLWAY ELEV. = 1015.90

SITE

DETENTION POND 100-YEAR W.S.E. = 1015.38

POI # 2

DASHED LINE REPRESENTS DRAINAGE AREA TO THE PROPOSED DETENTION POND

PROPOSED CONDITIONS

STORM SEWER MANHOLE TOP ELEV. 1010.47 16"PIPE FL NW. 1006.87 16"PIPE FL SE. 1007.07

STORM SEWER MANHOLE TOP ELEV. 1010.18 16"PIPE FL NW. 1006.98

STORM SEWER MANHOLE TOP ELEV. 1016.40 16"PIPE FL S. 1013.30

STORM SEWER MANHOLE TOP ELEV. 1015.41 48"PIPE FL E. 1003.11 48"PIPE FL W. 1002.06

STORM SEWER MANHOLE TOP ELEV. 1013.65 48"PIPE FL N. 1001.40 48"PIPE FL S. 1001.45

STORM SEWER MANHOLE TOP ELEV. 1005.06 36"PIPE FL W. 999.76 36"PIPE FL E. 999.66

30"CPP FL N. 999.37

STORM SEWER MANHOLE

48"CMP

12"CPP FL 998.81

S 77°52'45" W

S 61°41'15" W 257.39'

N 02°24'25" E 914.84'

8" W

UGE

LG

APPENDIX B

Onsite Drainage Calculations

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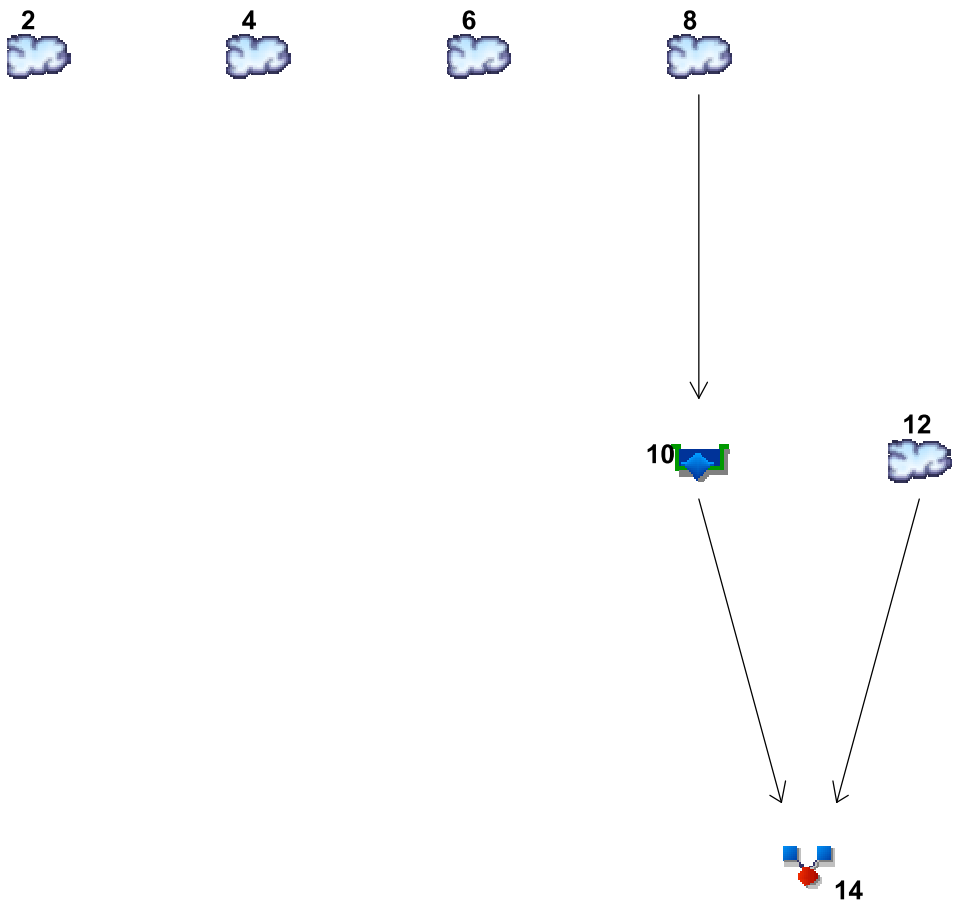
Watershed Model Schematic



Legend

Hyd.	Origin	Description
2	SCS Runoff	Existing to POI 1
4	SCS Runoff	Proposed to POI 1
6	SCS Runoff	Existing to POI 2
8	SCS Runoff	Prop to Detention Pond
10	Reservoir	Detention Pond
12	SCS Runoff	Remainder Prop to POI 2
14	Combine	Total to POI 2

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
2	SCS Runoff	------	-------	2.343	-------	-------	4.214	-------	-------	7.681	Existing to POI 1
4	SCS Runoff	------	-------	2.248	-------	-------	3.714	-------	-------	6.376	Proposed to POI 1
6	SCS Runoff	------	-------	5.230	-------	-------	10.99	-------	-------	22.65	Existing to POI 2
8	SCS Runoff	------	-------	4.086	-------	-------	6.926	-------	-------	12.10	Prop to Detention Pond
10	Reservoir	8	-------	0.043	-------	-------	0.060	-------	-------	3.021	Detention Pond
12	SCS Runoff	------	-------	3.543	-------	-------	7.442	-------	-------	15.34	Remainder Prop to POI 2
14	Combine	10, 12,	-------	3.581	-------	-------	7.487	-------	-------	16.55	Total to POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

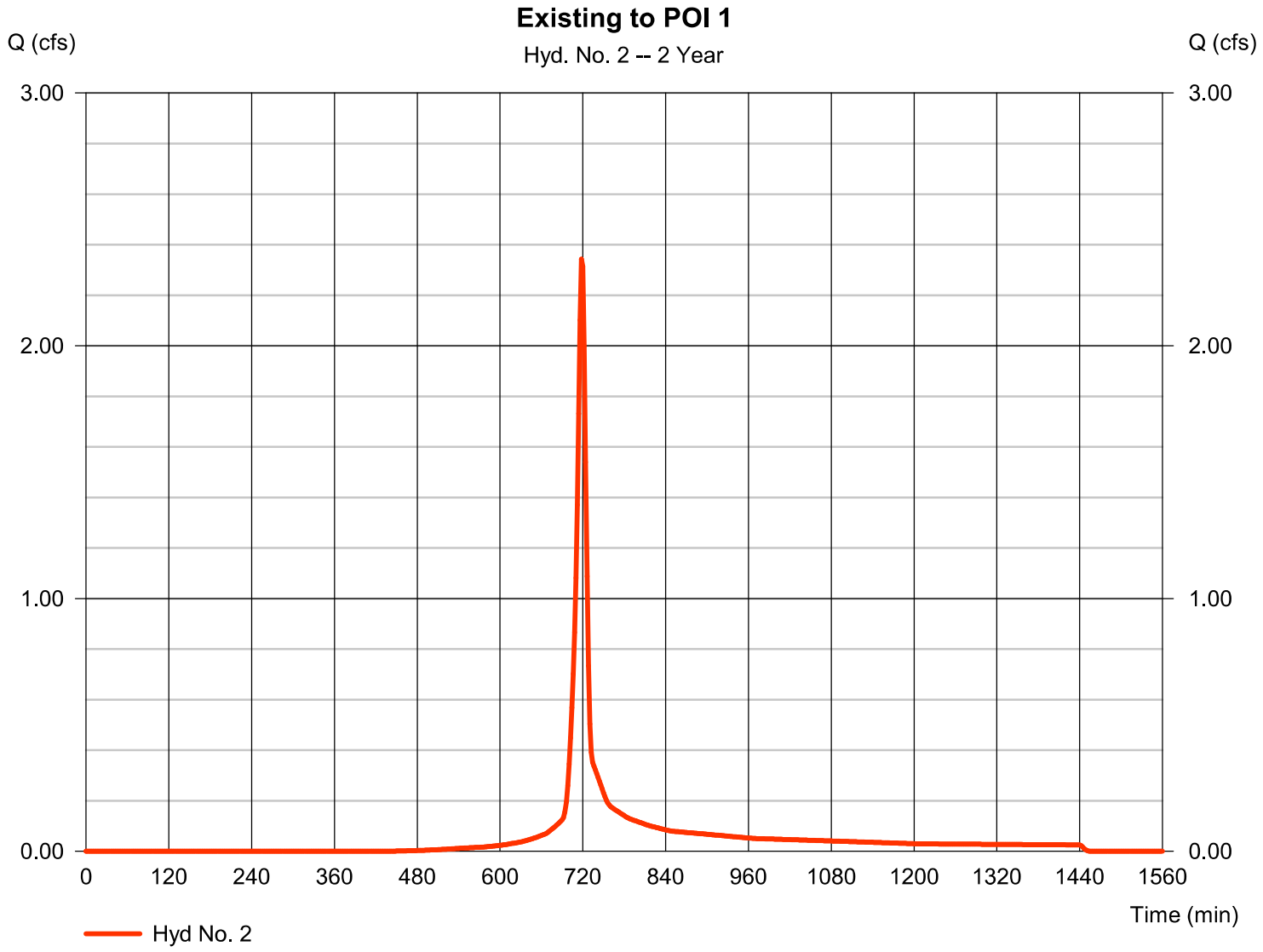
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
2	SCS Runoff	2.343	2	718	5,375	------	------	------	Existing to POI 1
4	SCS Runoff	2.248	2	716	4,711	------	------	------	Proposed to POI 1
6	SCS Runoff	5.230	2	720	12,002	------	------	------	Existing to POI 2
8	SCS Runoff	4.086	2	716	8,447	------	------	------	Prop to Detention Pond
10	Reservoir	0.043	2	954	4,837	8	1013.41	5,573	Detention Pond
12	SCS Runoff	3.543	2	720	8,130	------	------	------	Remainder Prop to POI 2
14	Combine	3.581	2	720	12,967	10, 12,	------	------	Total to POI 2

Hydrograph Report

Hyd. No. 2

Existing to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.343 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 5,375 cuft
Drainage area	= 0.708 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.60 min
Total precip.	= 3.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 2

Existing to POI 1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.68		0.00		0.00		
Land slope (%)	= 2.24		0.00		0.00		
Travel Time (min)	**= 8.73**	**+**	**0.00**	**+**	**0.00**	**=**	**8.73**
Shallow Concentrated Flow							
Flow length (ft)	= 100.00		0.00		0.00		
Watercourse slope (%)	= 1.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.98		0.00		0.00		
Travel Time (min)	**= 0.84**	**+**	**0.00**	**+**	**0.00**	**=**	**0.84**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

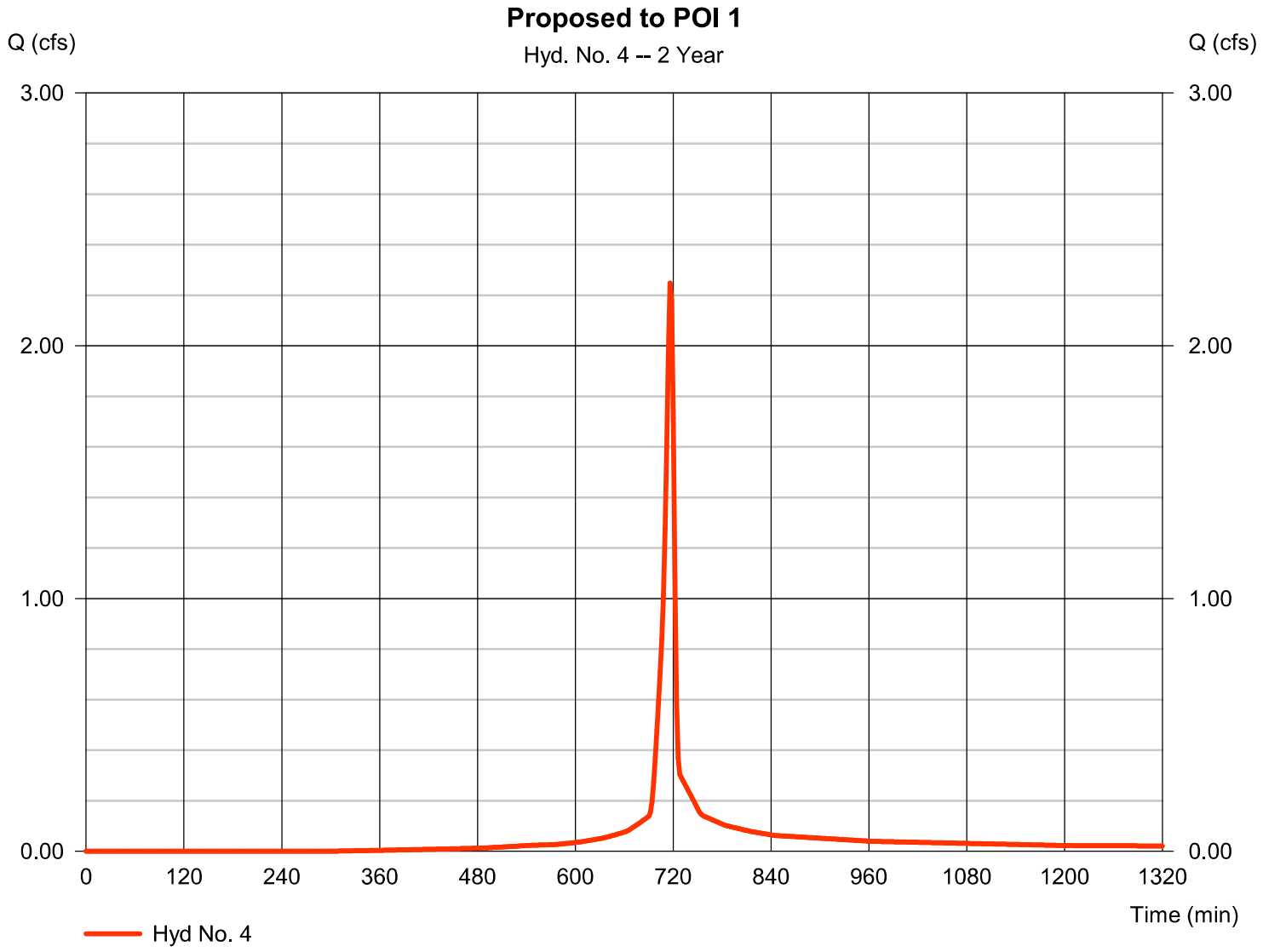
Total Travel Time, Tc ..... 9.60 min

Hydrograph Report

Hyd. No. 4

Proposed to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.248 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 4,711 cuft
Drainage area	= 0.529 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

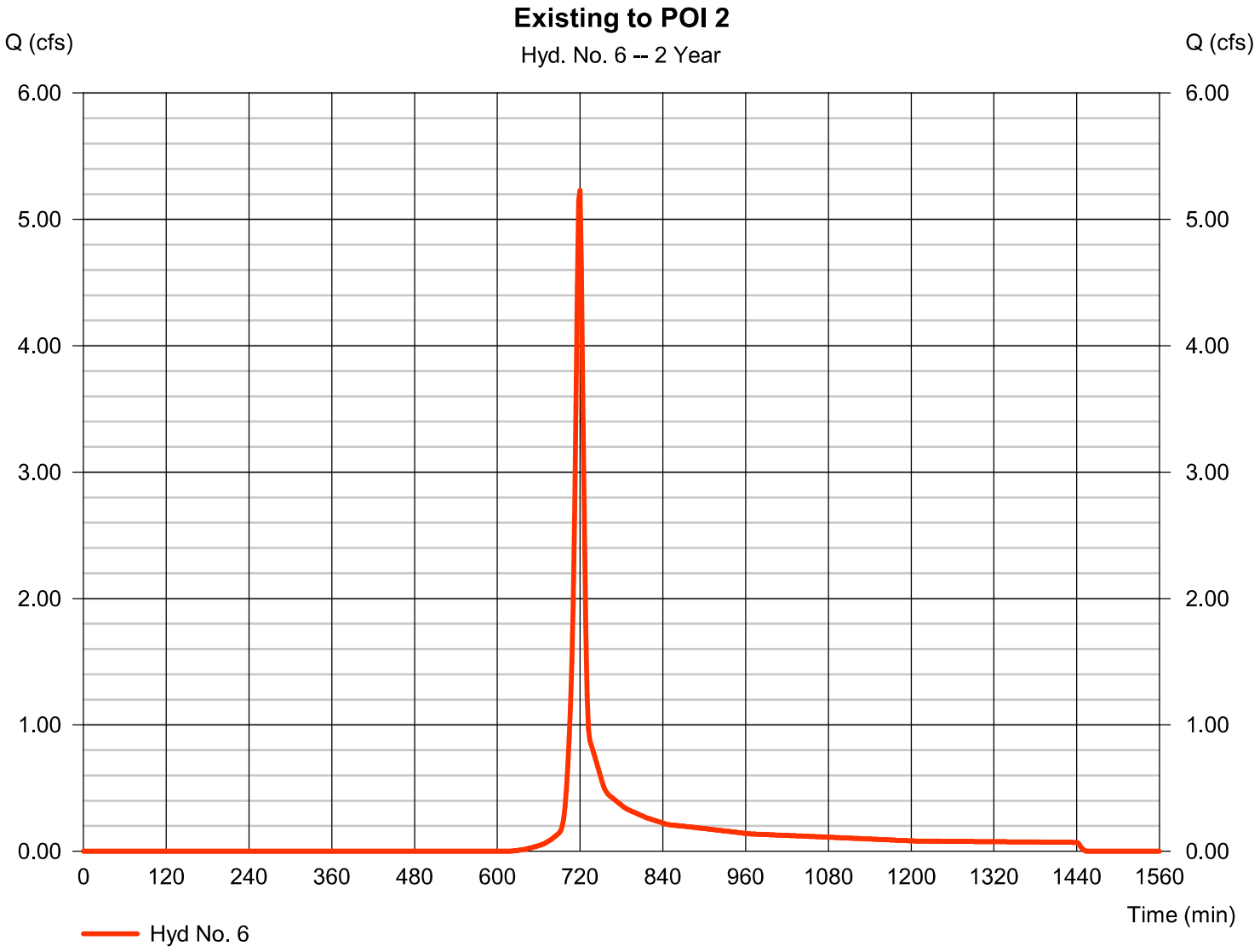


Hydrograph Report

Hyd. No. 6

Existing to POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 5.230 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 12,002 cuft
Drainage area	= 2.421 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 3.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

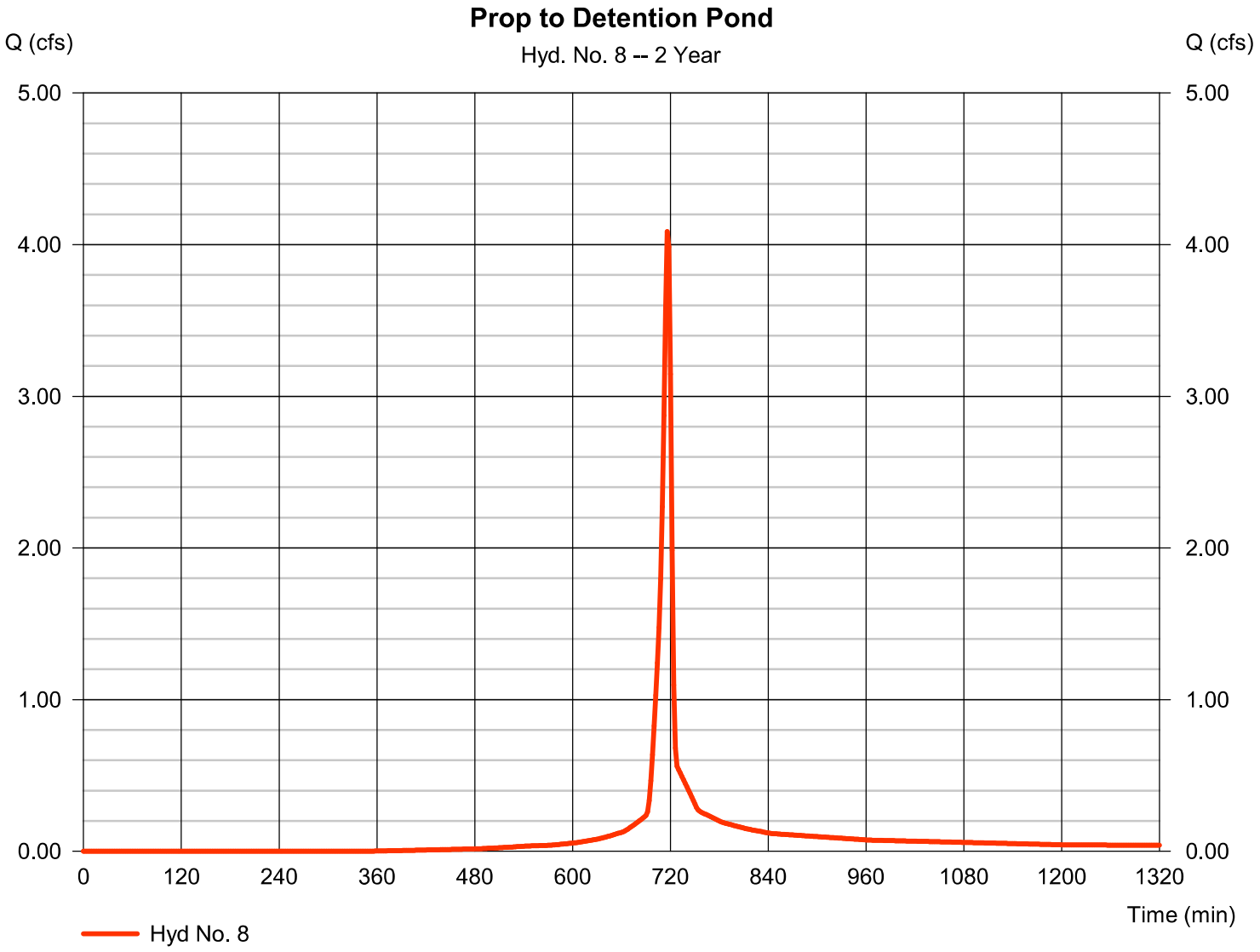


Hydrograph Report

Hyd. No. 8

Prop to Detention Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.086 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	8,447 cuft
Drainage area	=	1.020 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.68 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



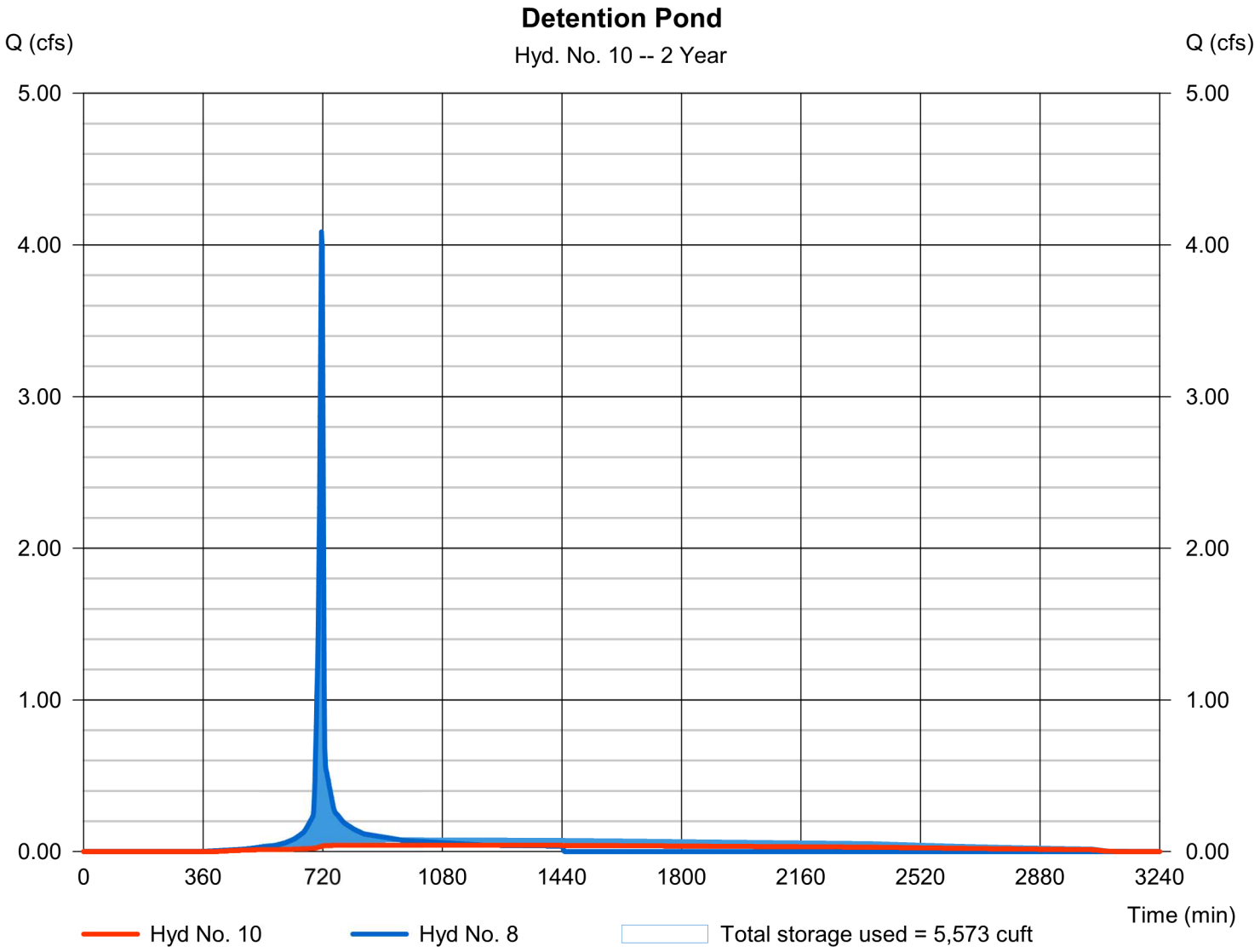
Hydrograph Report

Hyd. No. 10

Detention Pond

Hydrograph type	= Reservoir	Peak discharge	= 0.043 cfs
Storm frequency	= 2 yrs	Time to peak	= 954 min
Time interval	= 2 min	Hyd. volume	= 4,837 cuft
Inflow hyd. No.	= 8 - Prop to Detention Pond	Max. Elevation	= 1013.41 ft
Reservoir name	= Detention Pond	Max. Storage	= 5,573 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Detention Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1010.75 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1010.75	05	0	0
0.25	1011.00	429	40	40
1.25	1012.00	2,392	1,278	1,318
2.25	1013.00	3,167	2,770	4,088
3.25	1014.00	4,039	3,594	7,682
4.25	1015.00	5,010	4,515	12,197
5.25	1016.00	6,079	5,535	17,733
5.70	1016.45	6,483	2,826	20,558

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	1.00	0.00	0.00
Span (in)	= 12.00	1.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1010.65	1010.75	0.00	0.00
Length (ft)	= 30.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 11.00	100.00	1.00	0.00
Crest El. (ft)	= 1015.30	1015.90	1014.65	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Ciplti	Rect	---
Multi-Stage	= Yes	No	Yes	No

Exfil.(in/hr) = 0.420 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

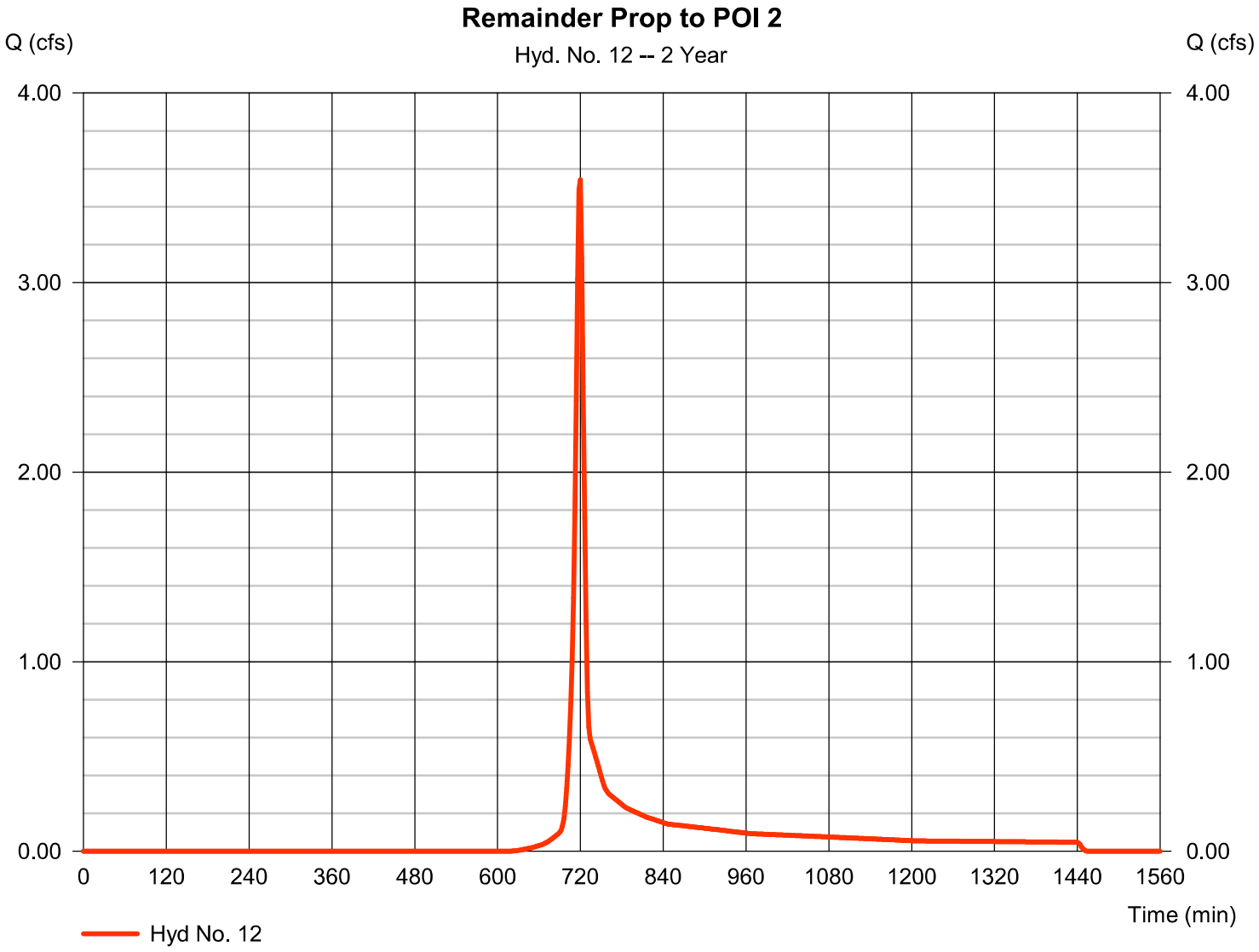
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	1010.75	0.00	0.00	---	---	0.00	0.00	0.00	---	0.000	---	0.000
0.25	40	1011.00	0.04 ic	0.01 ic	---	---	0.00	0.00	0.00	---	0.004	---	0.016
1.25	1,318	1012.00	0.04 ic	0.03 ic	---	---	0.00	0.00	0.00	---	0.023	---	0.052
2.25	4,088	1013.00	0.04 ic	0.04 ic	---	---	0.00	0.00	0.00	---	0.031	---	0.070
3.25	7,682	1014.00	0.04 ic	0.05 ic	---	---	0.00	0.00	0.00	---	0.039	---	0.086
4.25	12,197	1015.00	0.70 oc	0.05 ic	---	---	0.00	0.00	0.69	---	0.049	---	0.792
5.25	17,733	1016.00	8.31 ic	0.06 ic	---	---	6.98 s	10.53	1.32 s	---	0.059	---	18.95
5.70	20,558	1016.45	8.70 ic	0.06 ic	---	---	7.56 s	135.82	1.13 s	---	0.063	---	144.65

Hydrograph Report

Hyd. No. 12

Remainder Prop to POI 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.543 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	8,130 cuft
Drainage area	=	1.640 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.80 min
Total precip.	=	3.68 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

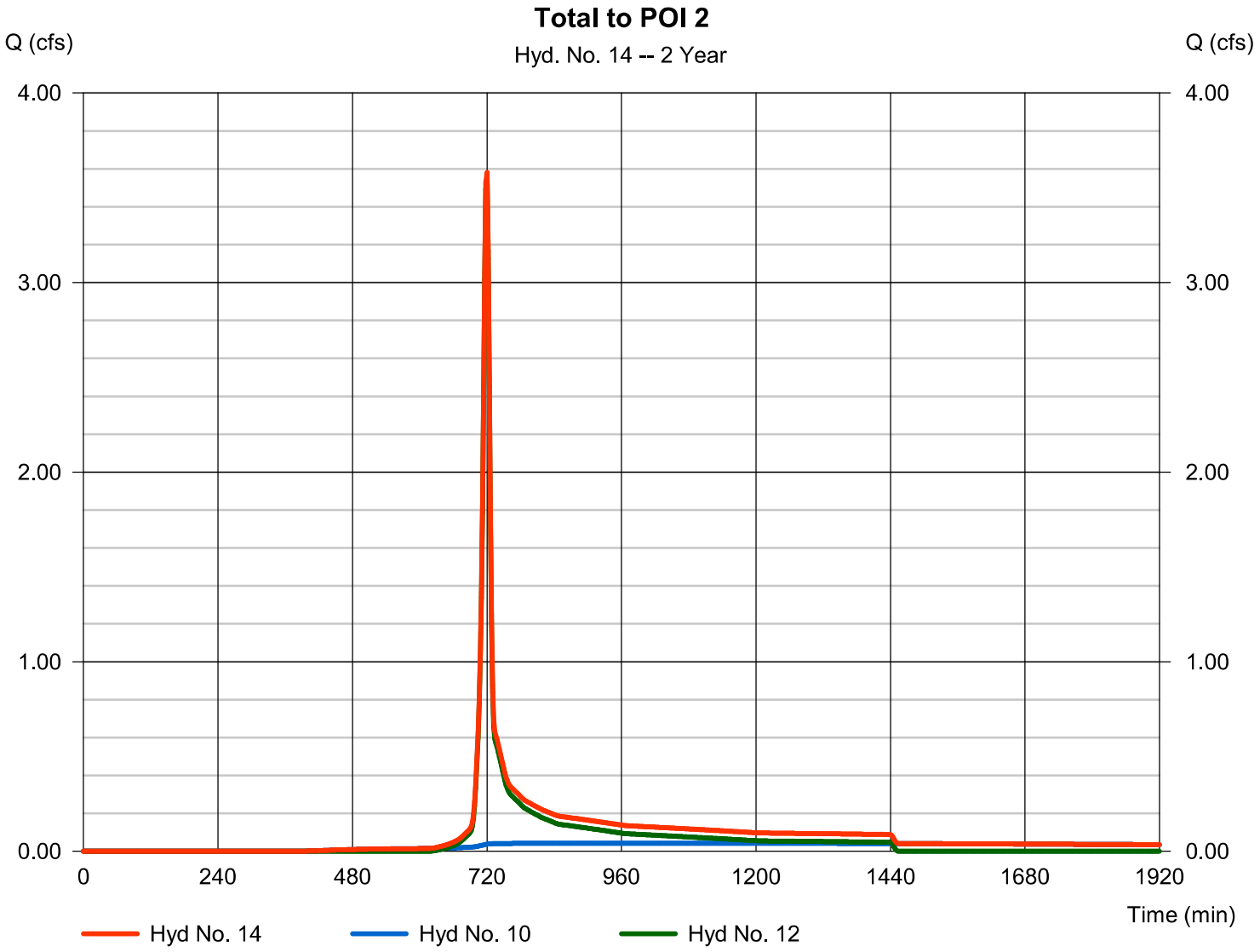


Hydrograph Report

Hyd. No. 14

Total to POI 2

Hydrograph type	=	Combine	Peak discharge	=	3.581 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	12,967 cuft
Inflow hyds.	=	10, 12	Contrib. drain. area	=	1.640 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

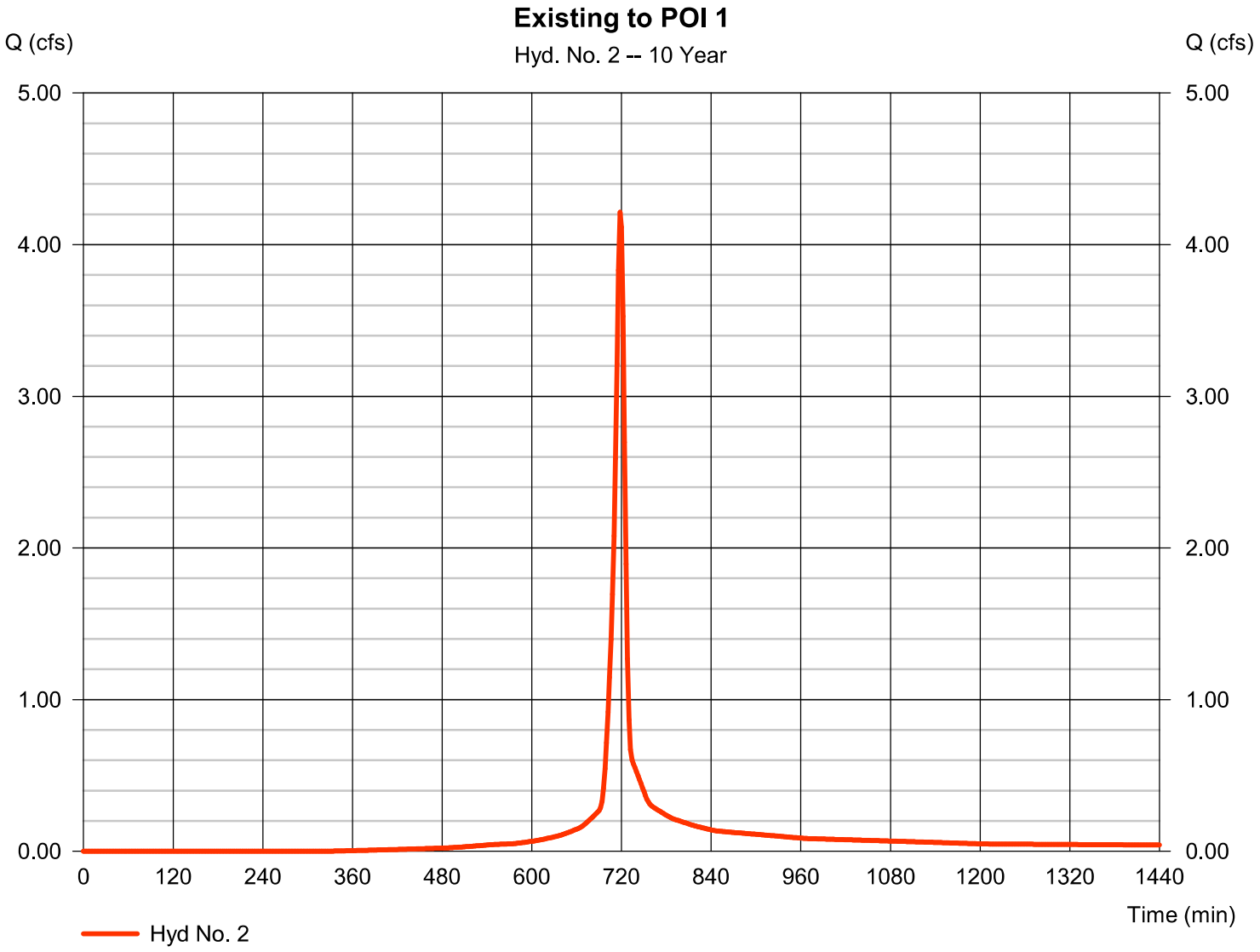
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
2	SCS Runoff	4.214	2	718	9,851	------	------	------	Existing to POI 1
4	SCS Runoff	3.714	2	716	8,041	------	------	------	Proposed to POI 1
6	SCS Runoff	10.99	2	718	25,132	------	------	------	Existing to POI 2
8	SCS Runoff	6.926	2	716	14,757	------	------	------	Prop to Detention Pond
10	Reservoir	0.060	2	1026	8,257	8	1014.62	10,492	Detention Pond
12	SCS Runoff	7.442	2	718	17,025	------	------	------	Remainder Prop to POI 2
14	Combine	7.487	2	718	25,281	10, 12,	------	------	Total to POI 2

Hydrograph Report

Hyd. No. 2

Existing to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 4.214 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 9,851 cuft
Drainage area	= 0.708 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.60 min
Total precip.	= 5.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

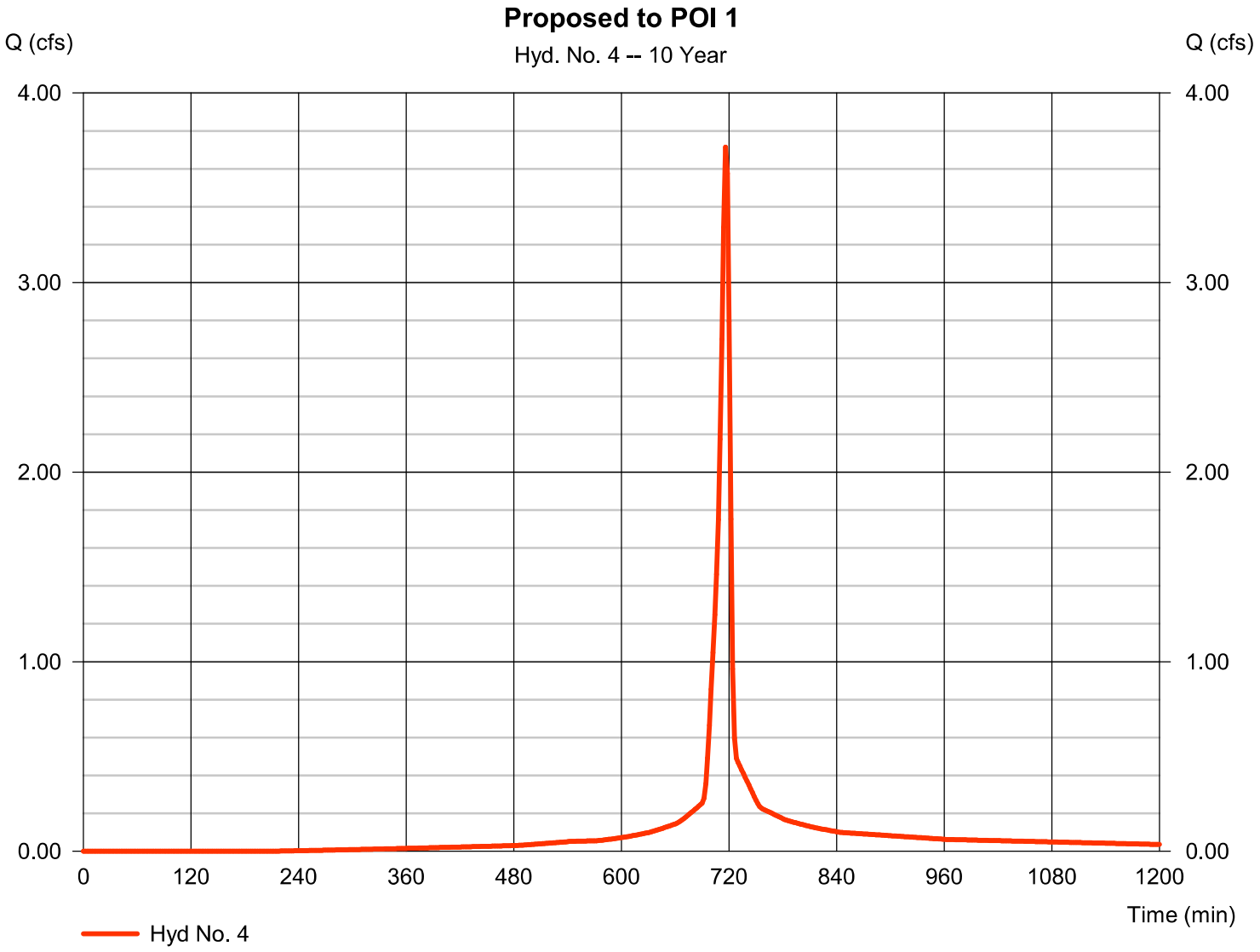


Hydrograph Report

Hyd. No. 4

Proposed to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 3.714 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 8,041 cuft
Drainage area	= 0.529 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

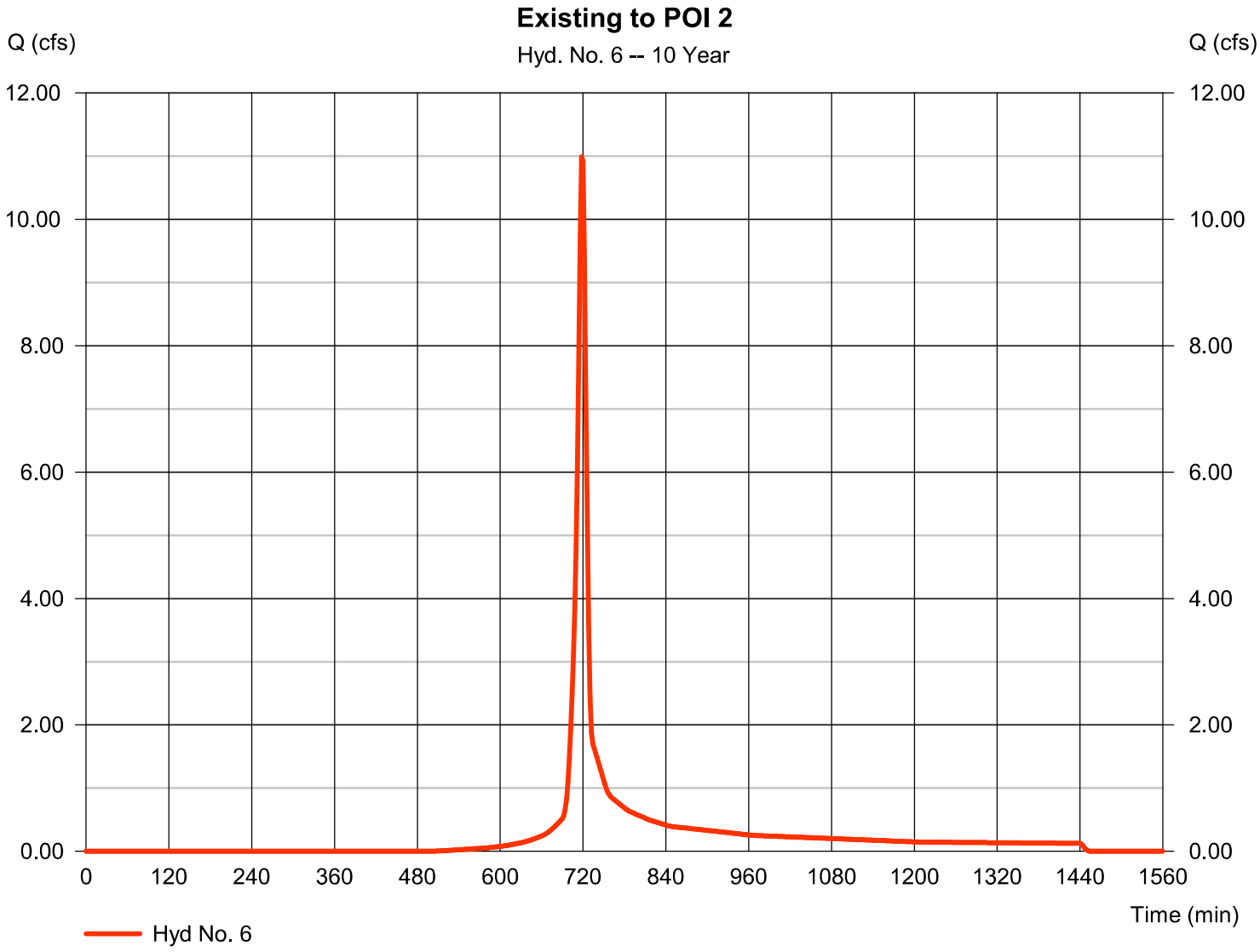


Hydrograph Report

Hyd. No. 6

Existing to POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 10.99 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 25,132 cuft
Drainage area	= 2.421 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 5.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

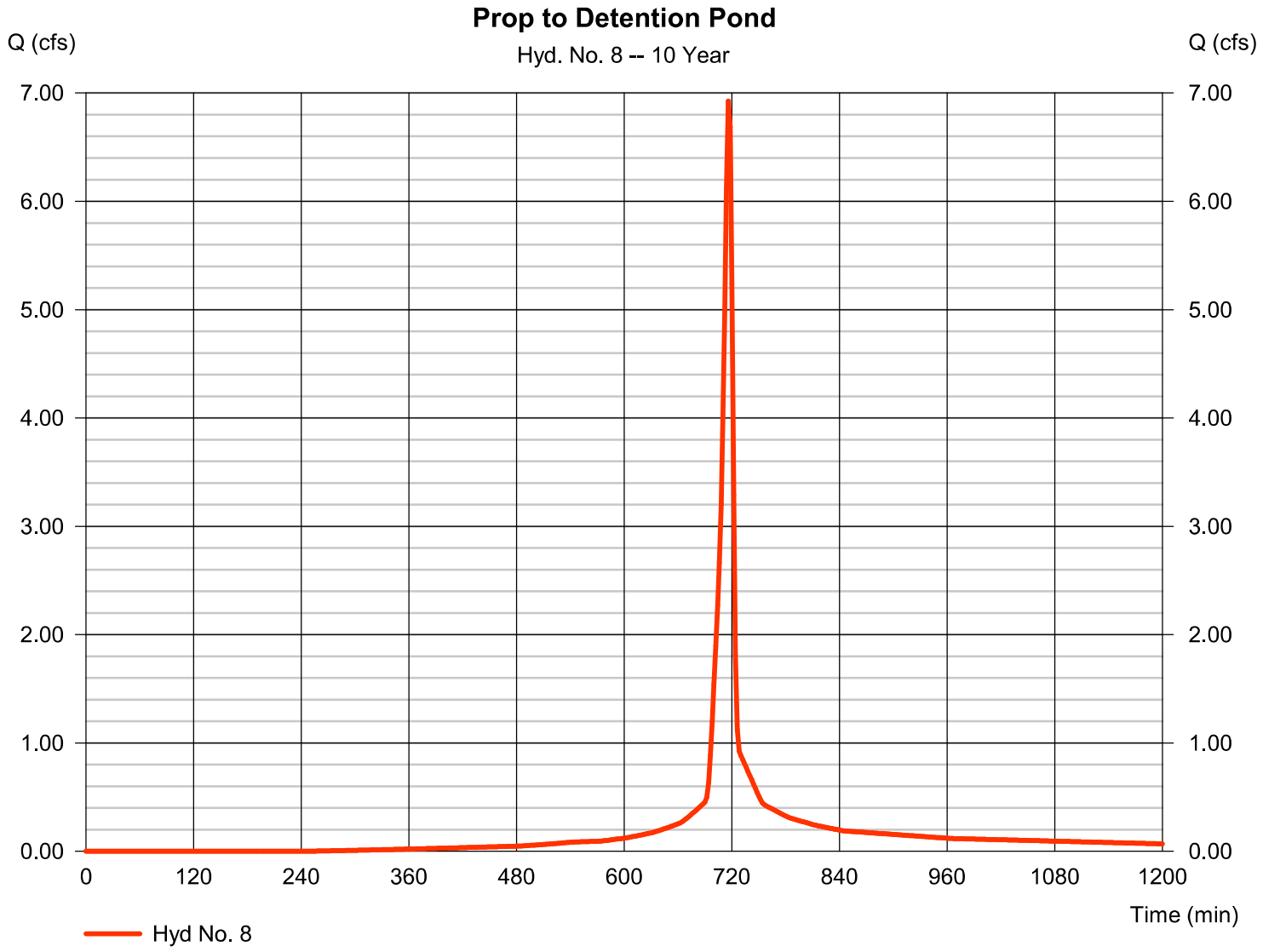


Hydrograph Report

Hyd. No. 8

Prop to Detention Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.926 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	14,757 cuft
Drainage area	=	1.020 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



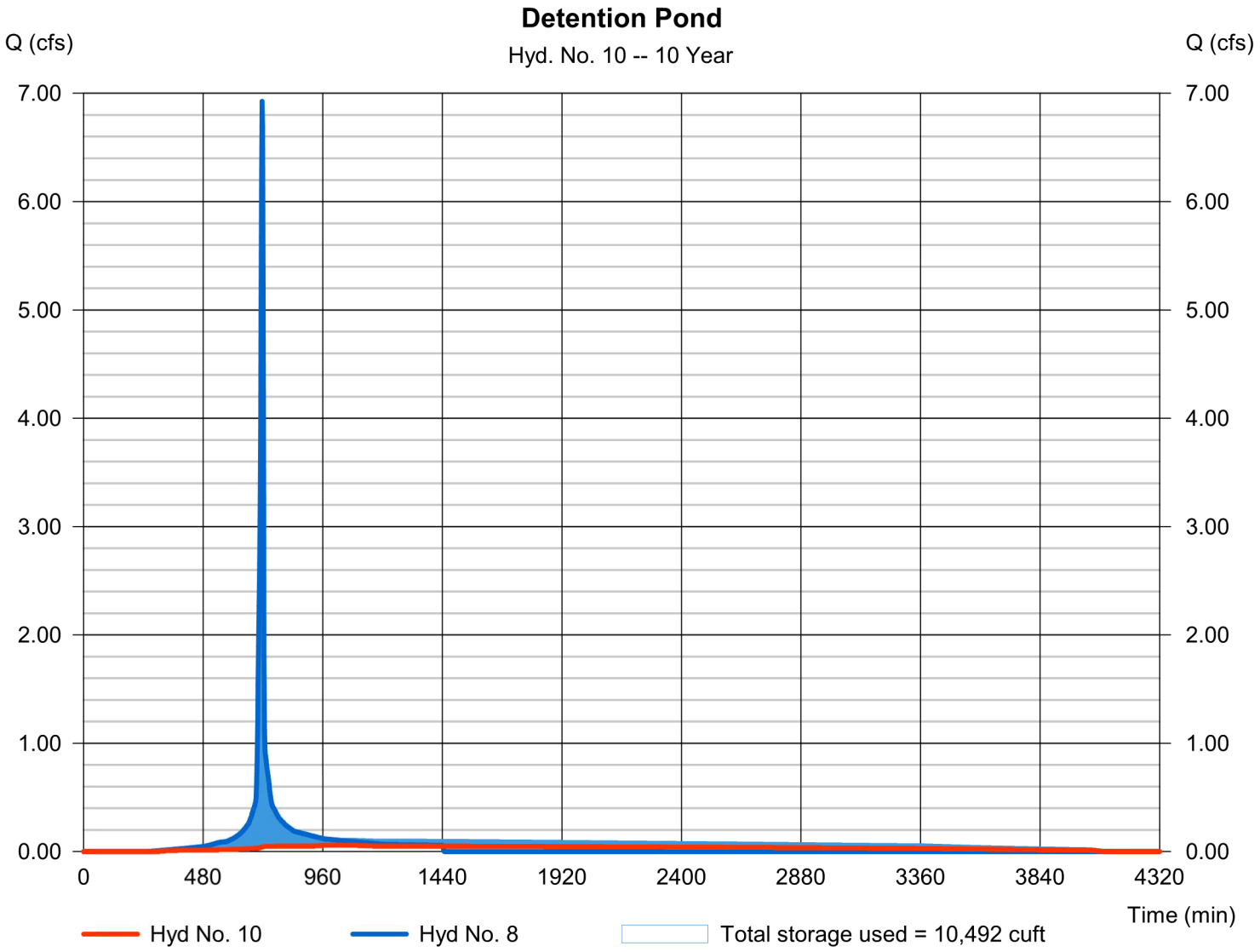
Hydrograph Report

Hyd. No. 10

Detention Pond

Hydrograph type	=	Reservoir	Peak discharge	=	0.060 cfs
Storm frequency	=	10 yrs	Time to peak	=	1026 min
Time interval	=	2 min	Hyd. volume	=	8,257 cuft
Inflow hyd. No.	=	8 - Prop to Detention Pond	Max. Elevation	=	1014.62 ft
Reservoir name	=	Detention Pond	Max. Storage	=	10,492 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

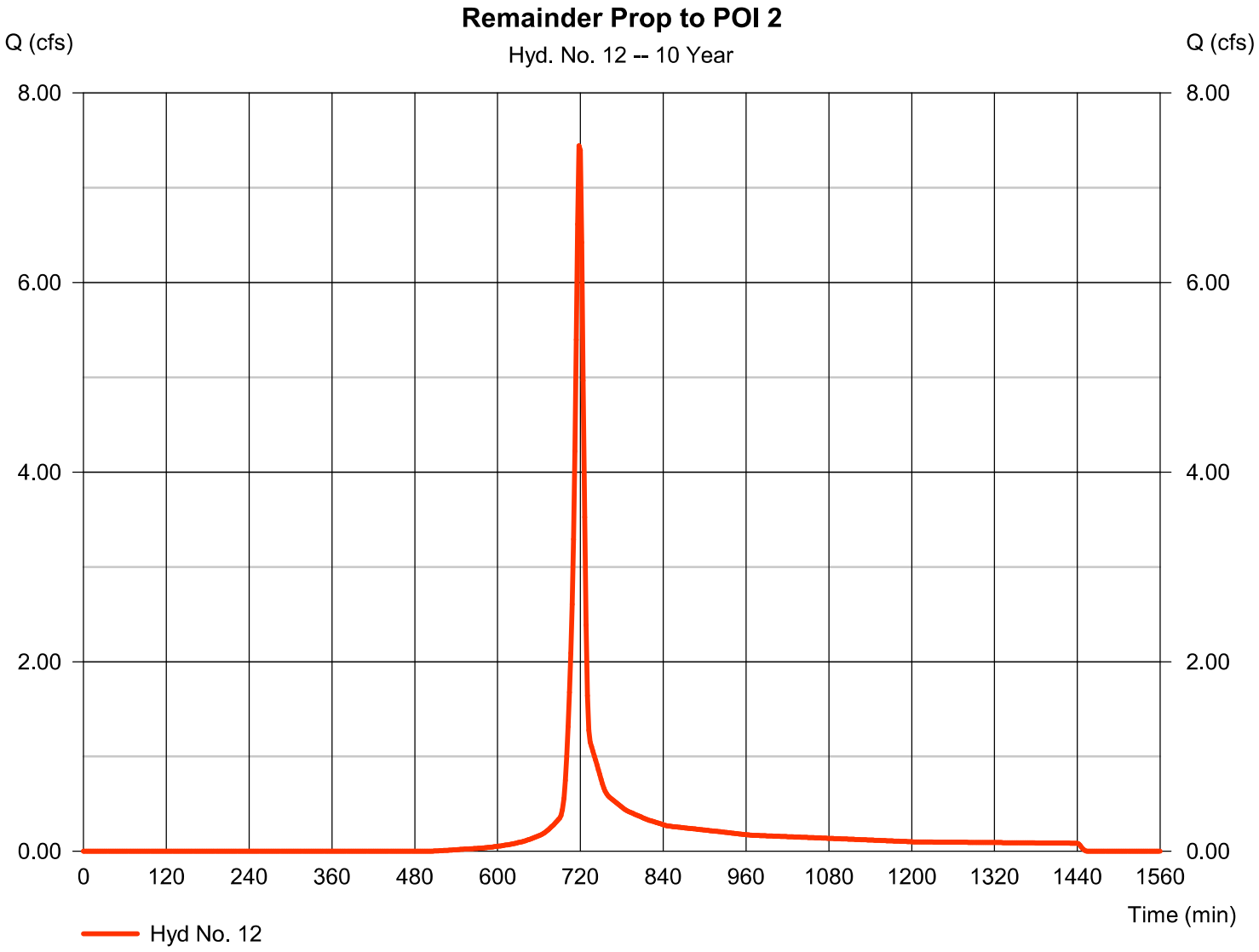


Hydrograph Report

Hyd. No. 12

Remainder Prop to POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 7.442 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 17,025 cuft
Drainage area	= 1.640 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 5.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

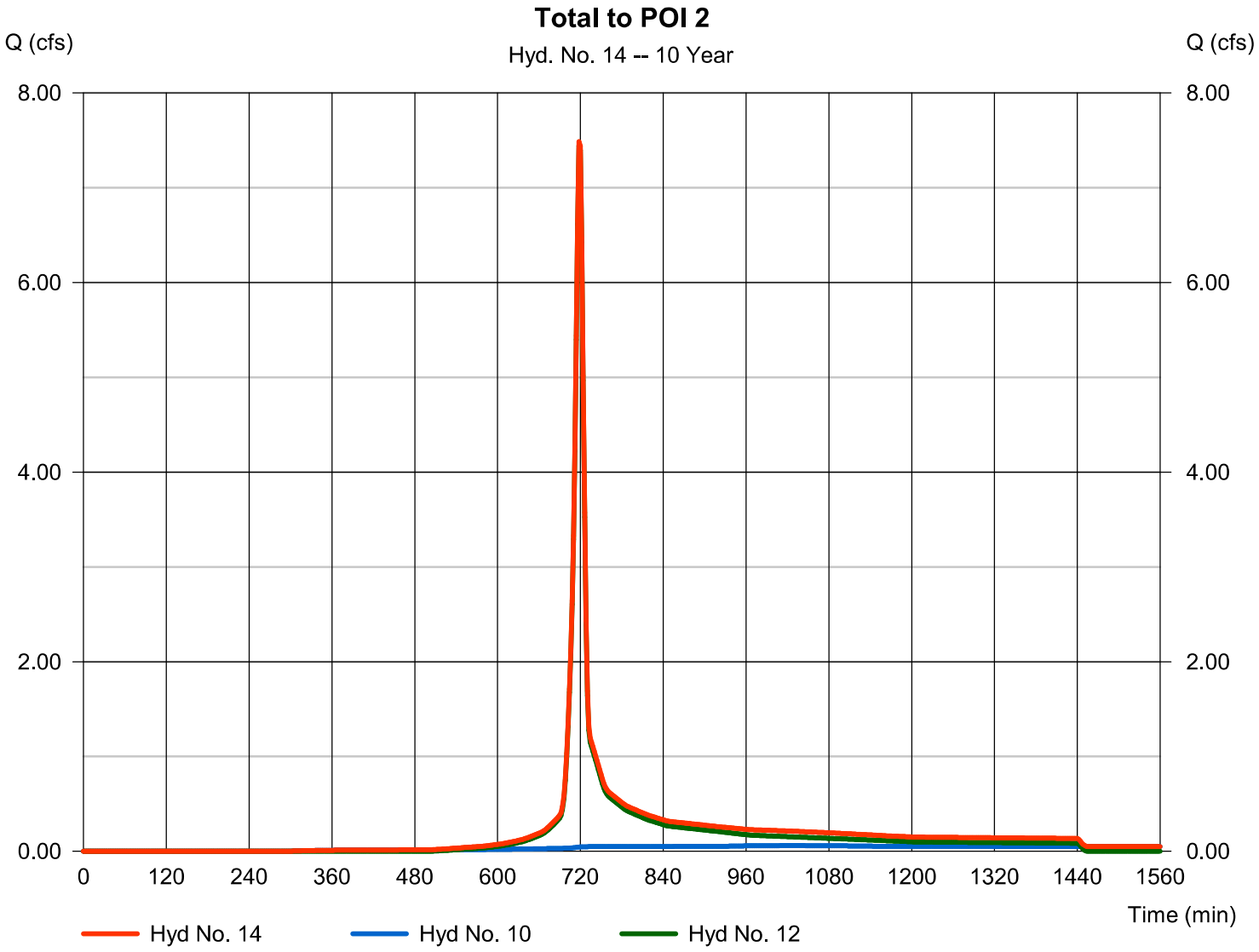


Hydrograph Report

Hyd. No. 14

Total to POI 2

Hydrograph type	= Combine	Peak discharge	= 7.487 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 25,281 cuft
Inflow hyds.	= 10, 12	Contrib. drain. area	= 1.640 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

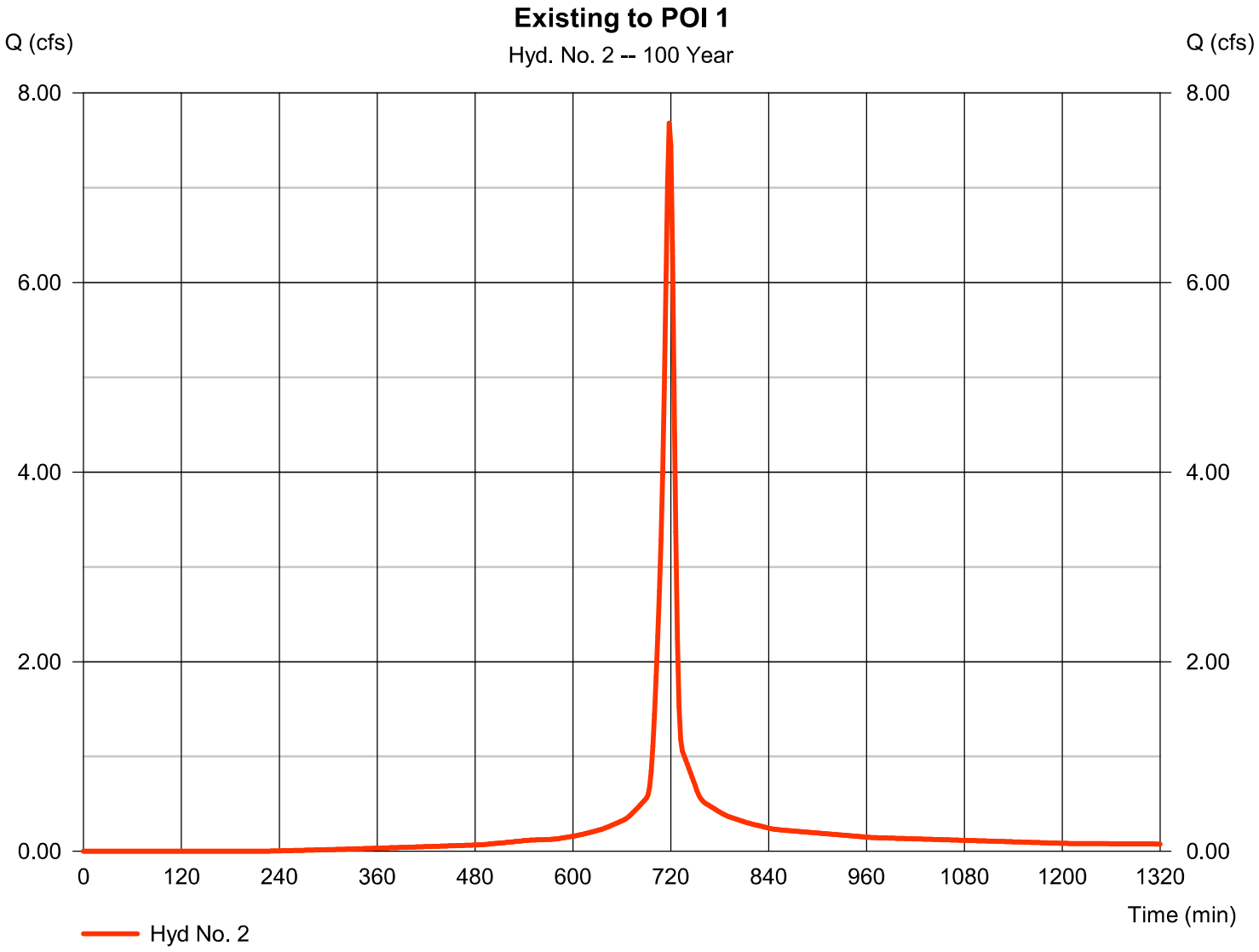
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
2	SCS Runoff	7.681	2	718	18,565	------	------	------	Existing to POI 1
4	SCS Runoff	6.376	2	716	14,329	------	------	------	Proposed to POI 1
6	SCS Runoff	22.65	2	718	52,590	------	------	------	Existing to POI 2
8	SCS Runoff	12.10	2	716	26,780	------	------	------	Prop to Detention Pond
10	Reservoir	3.021	2	724	19,633	8	1015.38	14,287	Detention Pond
12	SCS Runoff	15.34	2	718	35,625	------	------	------	Remainder Prop to POI 2
14	Combine	16.55	2	720	55,258	10, 12,	------	------	Total to POI 2

Hydrograph Report

Hyd. No. 2

Existing to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.681 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 18,565 cuft
Drainage area	= 0.708 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.60 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

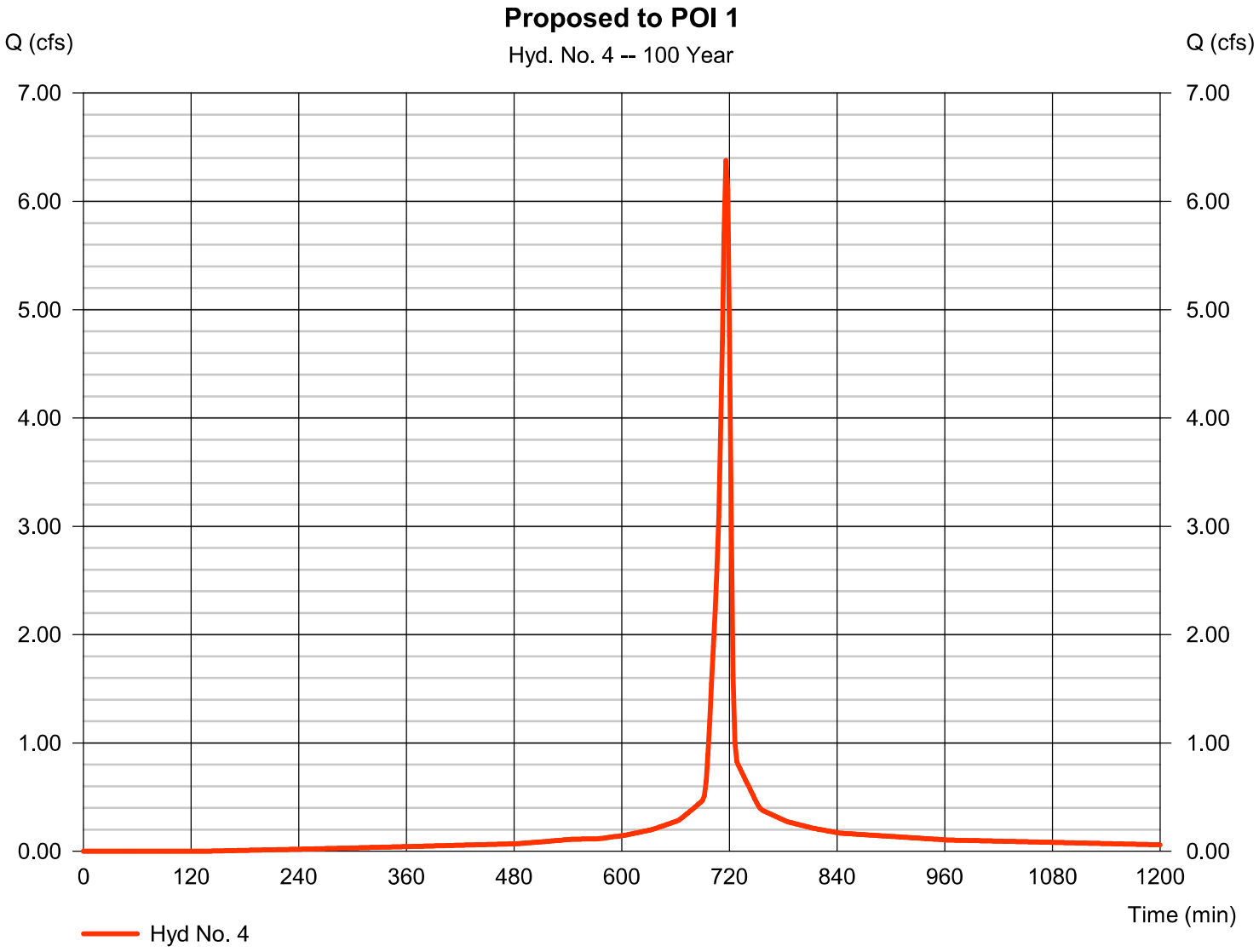


Hydrograph Report

Hyd. No. 4

Proposed to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 6.376 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 14,329 cuft
Drainage area	= 0.529 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

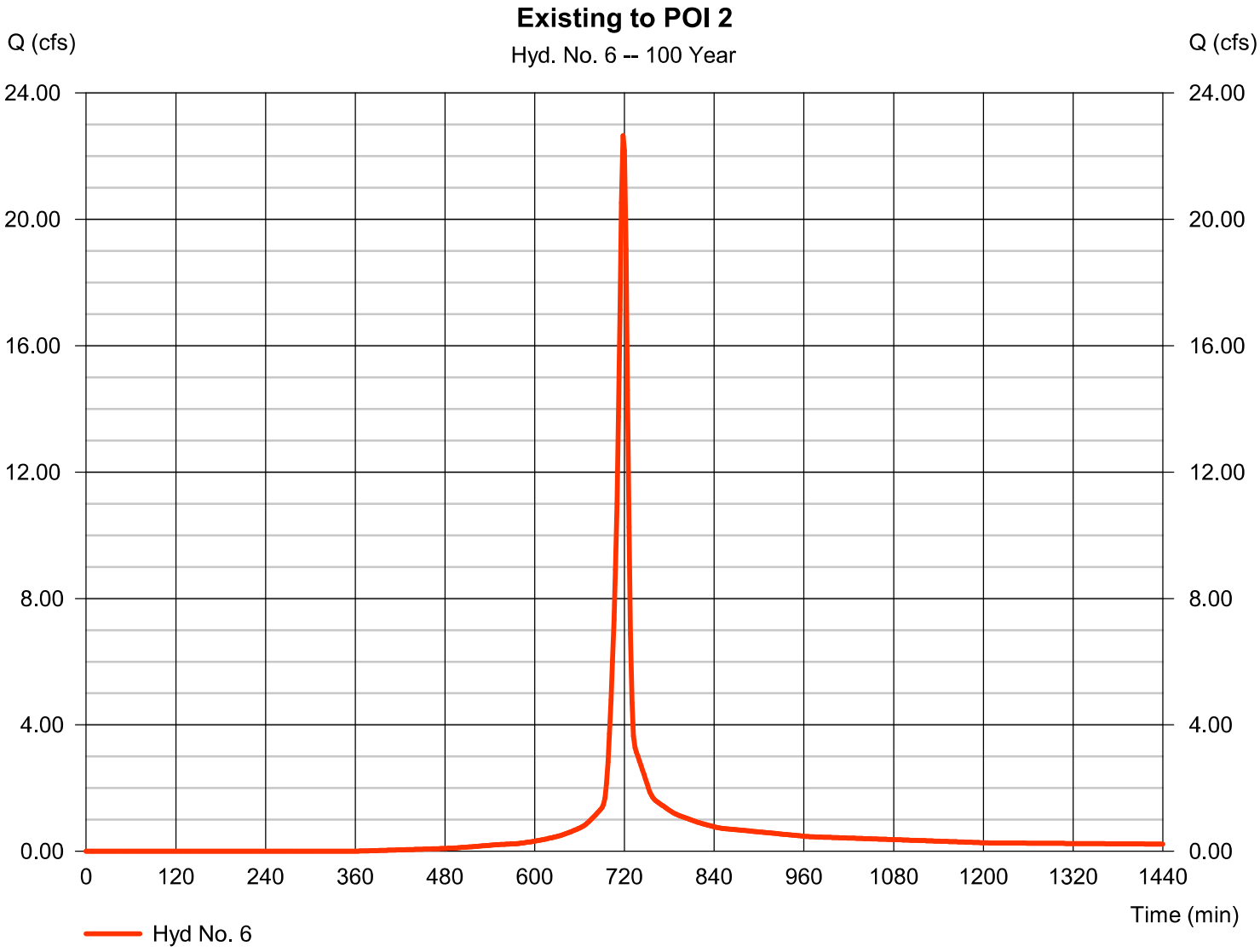


Hydrograph Report

Hyd. No. 6

Existing to POI 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	22.65 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	52,590 cuft
Drainage area	=	2.421 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.80 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

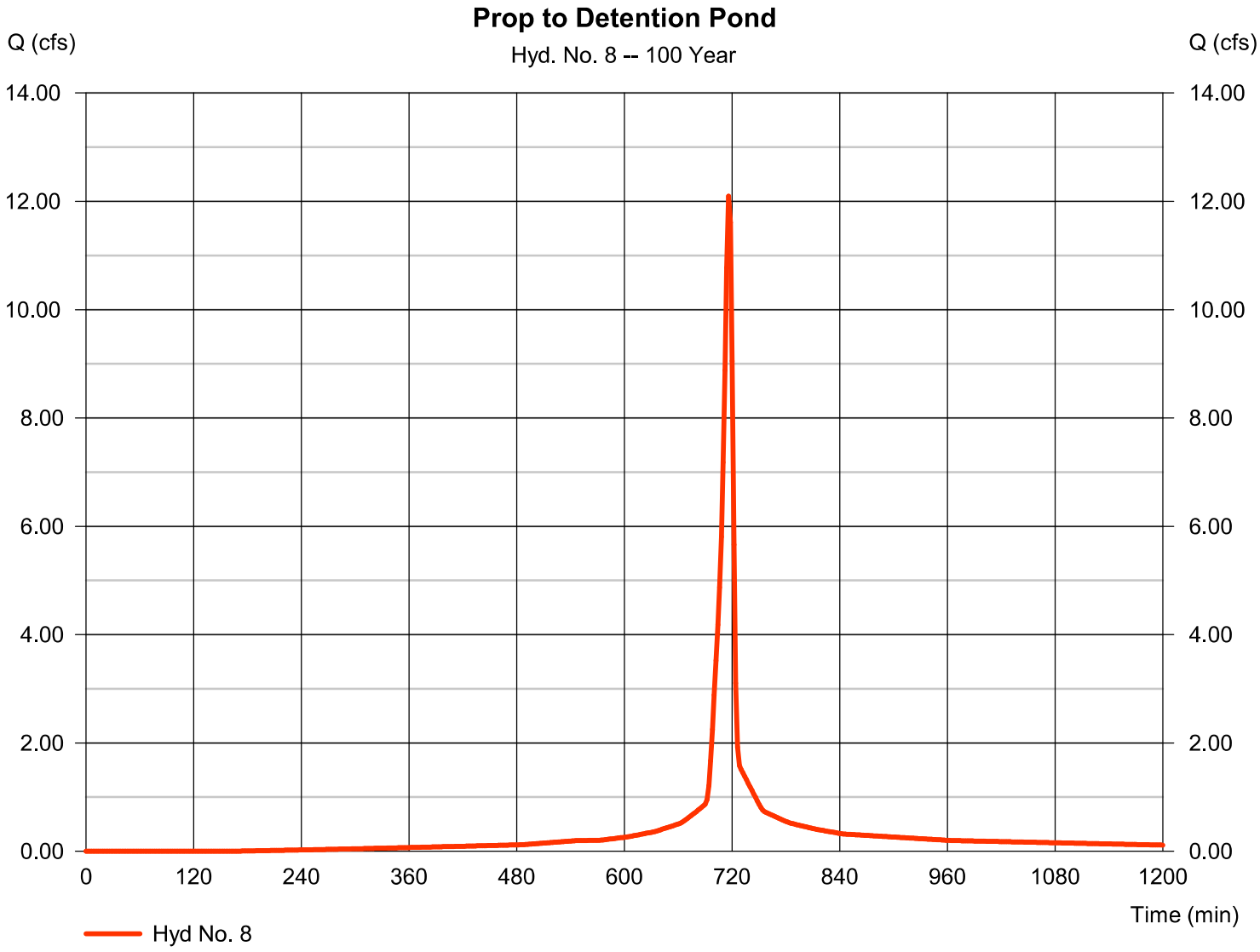


Hydrograph Report

Hyd. No. 8

Prop to Detention Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.10 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	26,780 cuft
Drainage area	=	1.020 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



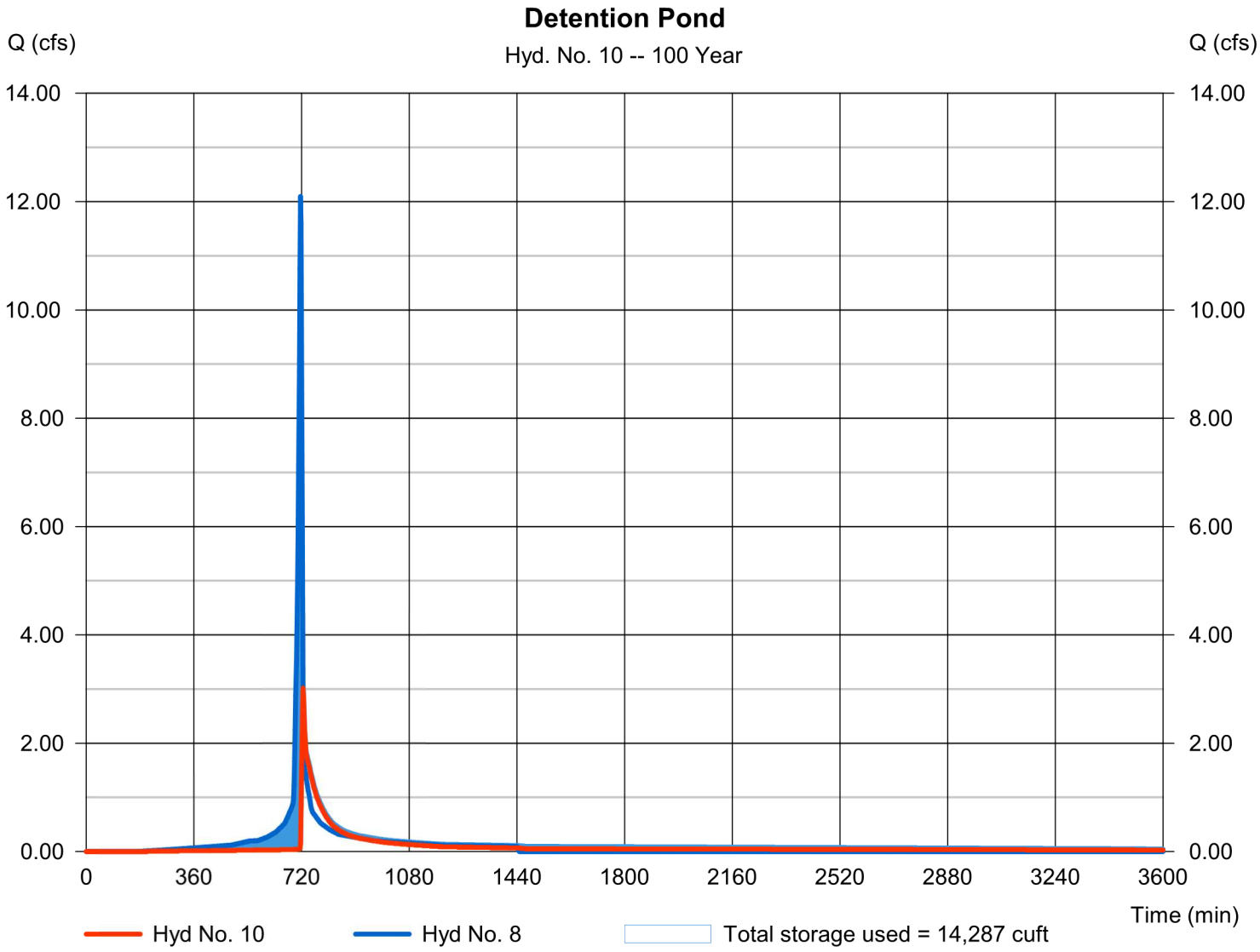
Hydrograph Report

Hyd. No. 10

Detention Pond

Hydrograph type	=	Reservoir	Peak discharge	=	3.021 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	19,633 cuft
Inflow hyd. No.	=	8 - Prop to Detention Pond	Max. Elevation	=	1015.38 ft
Reservoir name	=	Detention Pond	Max. Storage	=	14,287 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

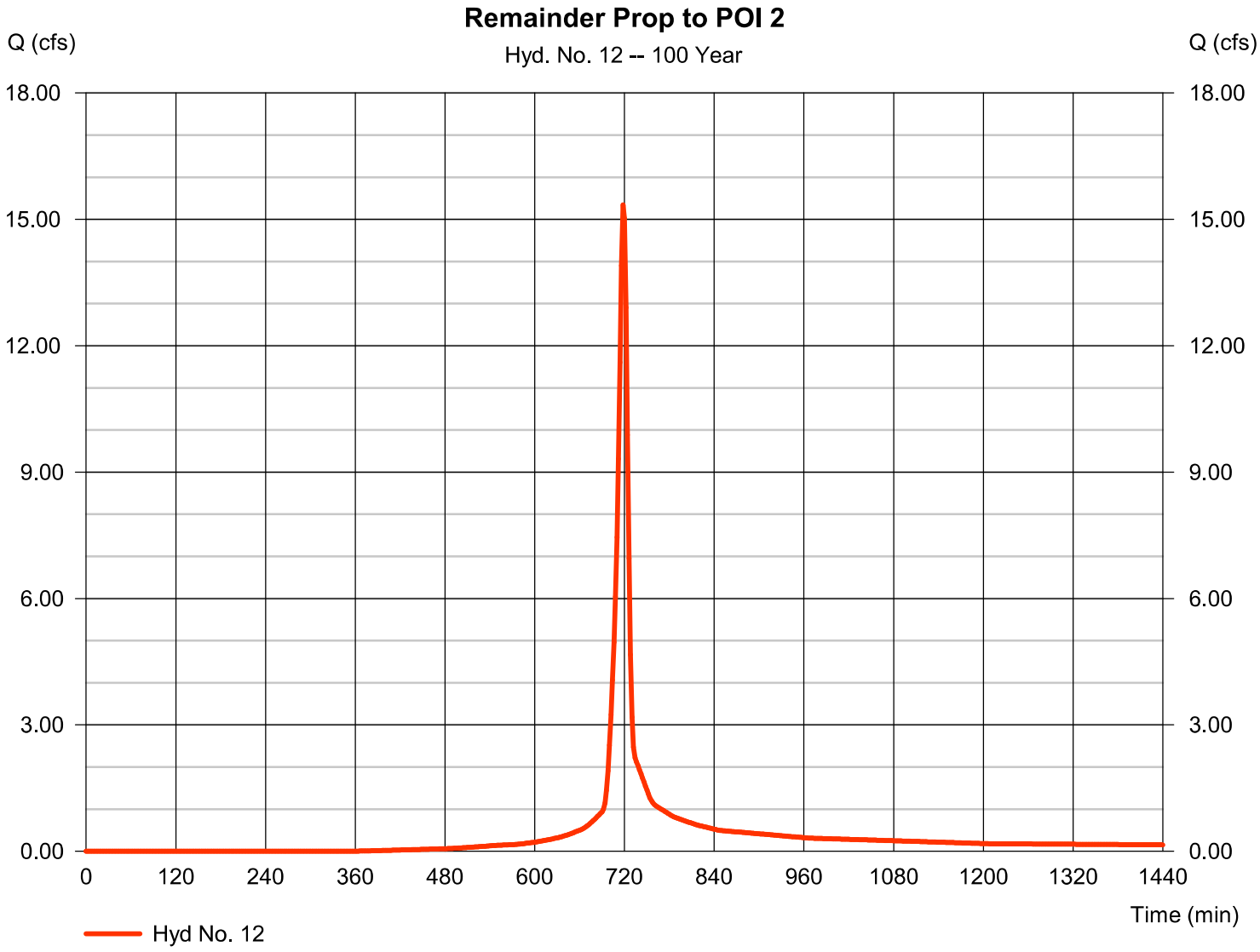


Hydrograph Report

Hyd. No. 12

Remainder Prop to POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 15.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 35,625 cuft
Drainage area	= 1.640 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

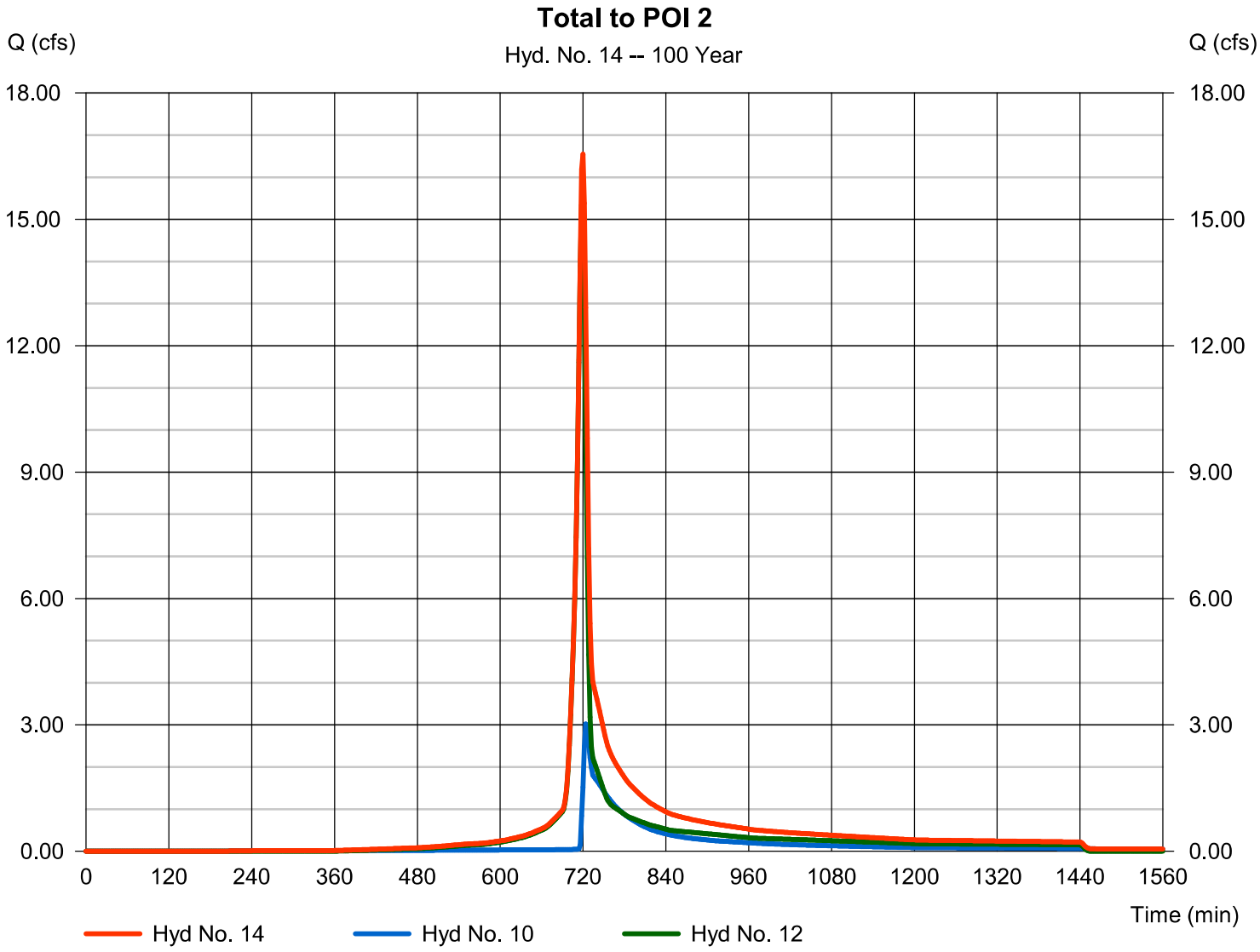


Hydrograph Report

Hyd. No. 14

Total to POI 2

Hydrograph type	= Combine	Peak discharge	= 16.55 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 55,258 cuft
Inflow hyds.	= 10, 12	Contrib. drain. area	= 1.640 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	21.2433	4.0000	0.6645	--------
2	26.1250	4.3000	0.6753	--------
3	0.0000	0.0000	0.0000	--------
5	33.6055	4.6000	0.6818	--------
10	38.8836	4.6000	0.6794	--------
25	45.4115	4.5000	0.6730	--------
50	48.7964	4.2000	0.6607	--------
100	52.0785	3.9000	0.6501	--------

File name: Lees Summit.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.93	3.68	3.00	2.57	2.27	2.04	1.86	1.72	1.60	1.50	1.41	1.34
2	5.79	4.33	3.54	3.03	2.67	2.40	2.19	2.02	1.88	1.76	1.66	1.57
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	7.19	5.40	4.42	3.79	3.34	3.00	2.74	2.52	2.35	2.20	2.07	1.96
10	8.36	6.29	5.15	4.41	3.89	3.50	3.19	2.95	2.74	2.57	2.42	2.29
25	9.98	7.51	6.15	5.28	4.66	4.19	3.83	3.53	3.29	3.08	2.90	2.75
50	11.26	8.45	6.93	5.94	5.25	4.73	4.32	3.99	3.72	3.49	3.29	3.12
100	12.57	9.41	7.71	6.61	5.85	5.27	4.82	4.45	4.15	3.90	3.68	3.49

Tc = time in minutes. Values may exceed 60.

Precip. file name: \\global.gsp\data\nf\na_nf05\4083145\01Work\03Tech\LP\01Storm\02Detention\SCS.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	3.09	3.68	0.00	4.71	5.61	6.94	8.02	9.17
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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100 - Year

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Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
2	SCS Runoff	------	-------	2.343	-------	-------	4.214	-------	-------	7.681	Existing to POI 1
4	SCS Runoff	------	-------	2.248	-------	-------	3.714	-------	-------	6.376	Proposed to POI 1
6	SCS Runoff	------	-------	5.230	-------	-------	10.99	-------	-------	22.65	Existing to POI 2
8	SCS Runoff	------	-------	4.086	-------	-------	6.926	-------	-------	12.10	Prop to Detention Pond
10	Reservoir	8	-------	0.000	-------	-------	0.000	-------	-------	1.041	Detention Pond
12	SCS Runoff	------	-------	3.543	-------	-------	7.442	-------	-------	15.34	Remainder Prop to POI 2
14	Combine	10, 12,	-------	3.543	-------	-------	7.442	-------	-------	15.34	Total to POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

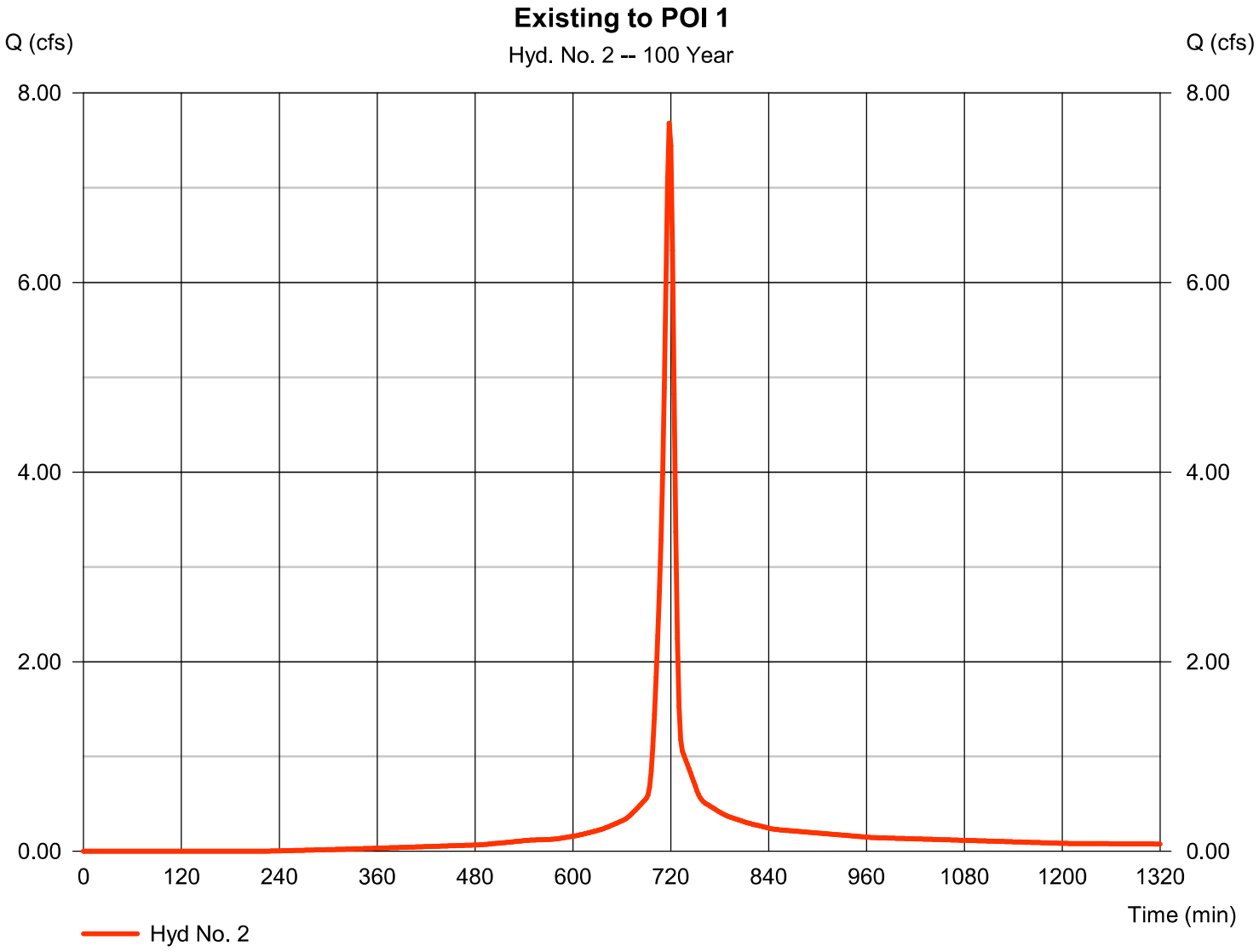
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
2	SCS Runoff	7.681	2	718	18,565	------	------	------	Existing to POI 1
4	SCS Runoff	6.376	2	716	14,329	------	------	------	Proposed to POI 1
6	SCS Runoff	22.65	2	718	52,590	------	------	------	Existing to POI 2
8	SCS Runoff	12.10	2	716	26,780	------	------	------	Prop to Detention Pond
10	Reservoir	1.041	2	744	6,554	8	1015.91	17,234	Detention Pond
12	SCS Runoff	15.34	2	718	35,625	------	------	------	Remainder Prop to POI 2
14	Combine	15.34	2	718	42,178	10, 12,	------	------	Total to POI 2

Hydrograph Report

Hyd. No. 2

Existing to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.681 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 18,565 cuft
Drainage area	= 0.708 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.60 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 2

Existing to POI 1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.68		0.00		0.00		
Land slope (%)	= 2.24		0.00		0.00		
Travel Time (min)	**= 8.73**	**+**	**0.00**	**+**	**0.00**	**=**	**8.73**
Shallow Concentrated Flow							
Flow length (ft)	= 100.00		0.00		0.00		
Watercourse slope (%)	= 1.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.98		0.00		0.00		
Travel Time (min)	**= 0.84**	**+**	**0.00**	**+**	**0.00**	**=**	**0.84**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

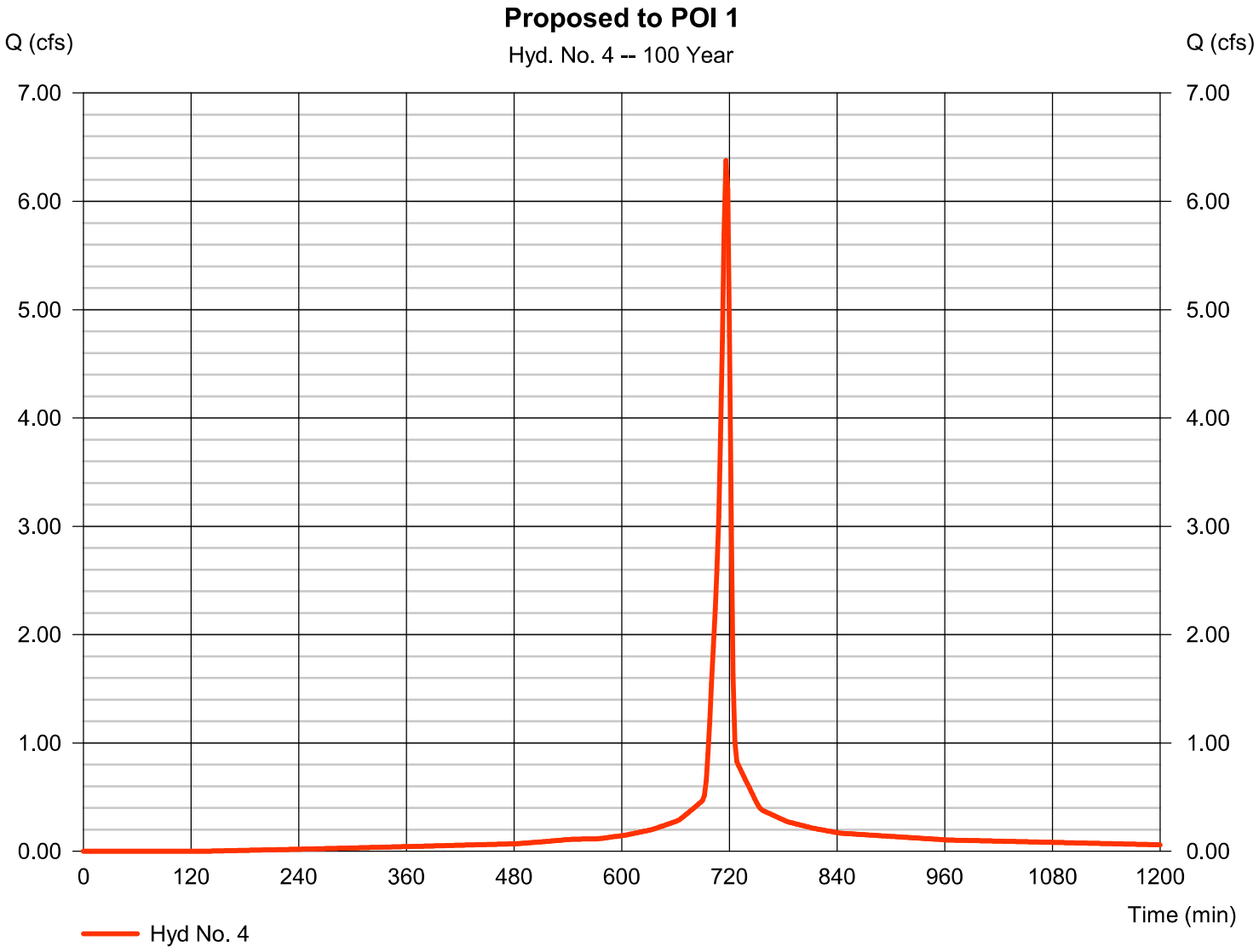
Total Travel Time, Tc ..... 9.60 min

Hydrograph Report

Hyd. No. 4

Proposed to POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 6.376 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 14,329 cuft
Drainage area	= 0.529 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

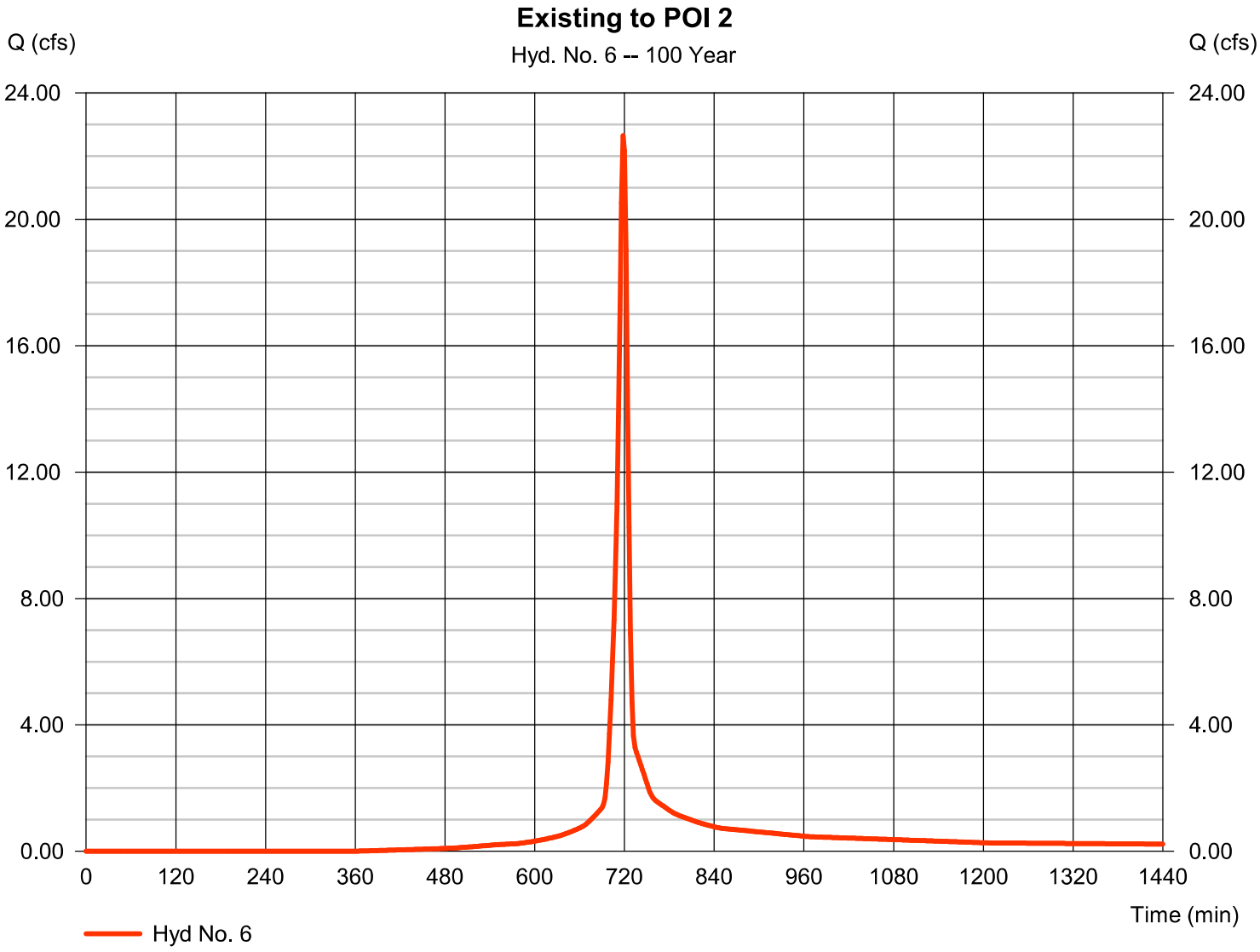


Hydrograph Report

Hyd. No. 6

Existing to POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 22.65 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 52,590 cuft
Drainage area	= 2.421 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

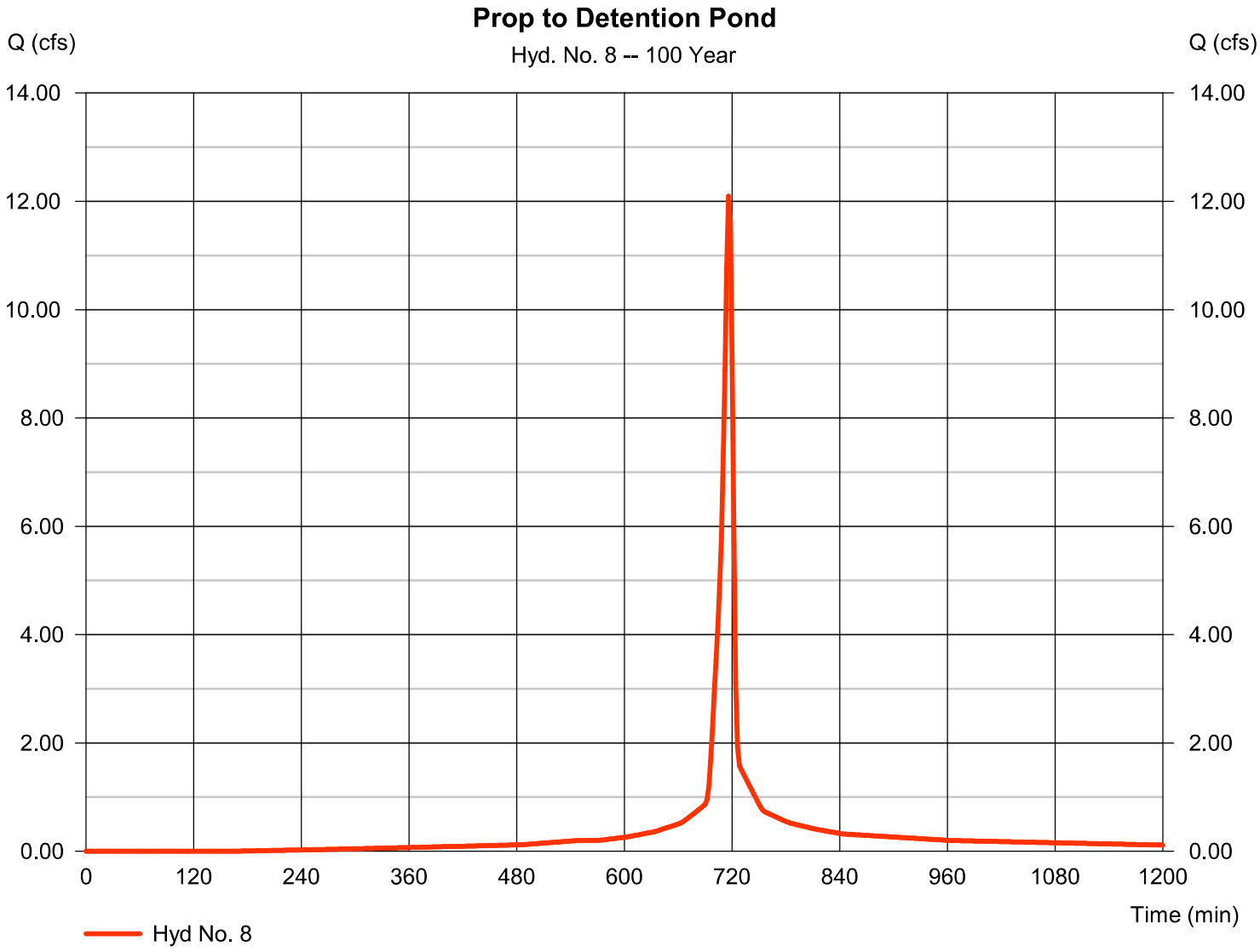


Hydrograph Report

Hyd. No. 8

Prop to Detention Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.10 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	26,780 cuft
Drainage area	=	1.020 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	9.17 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



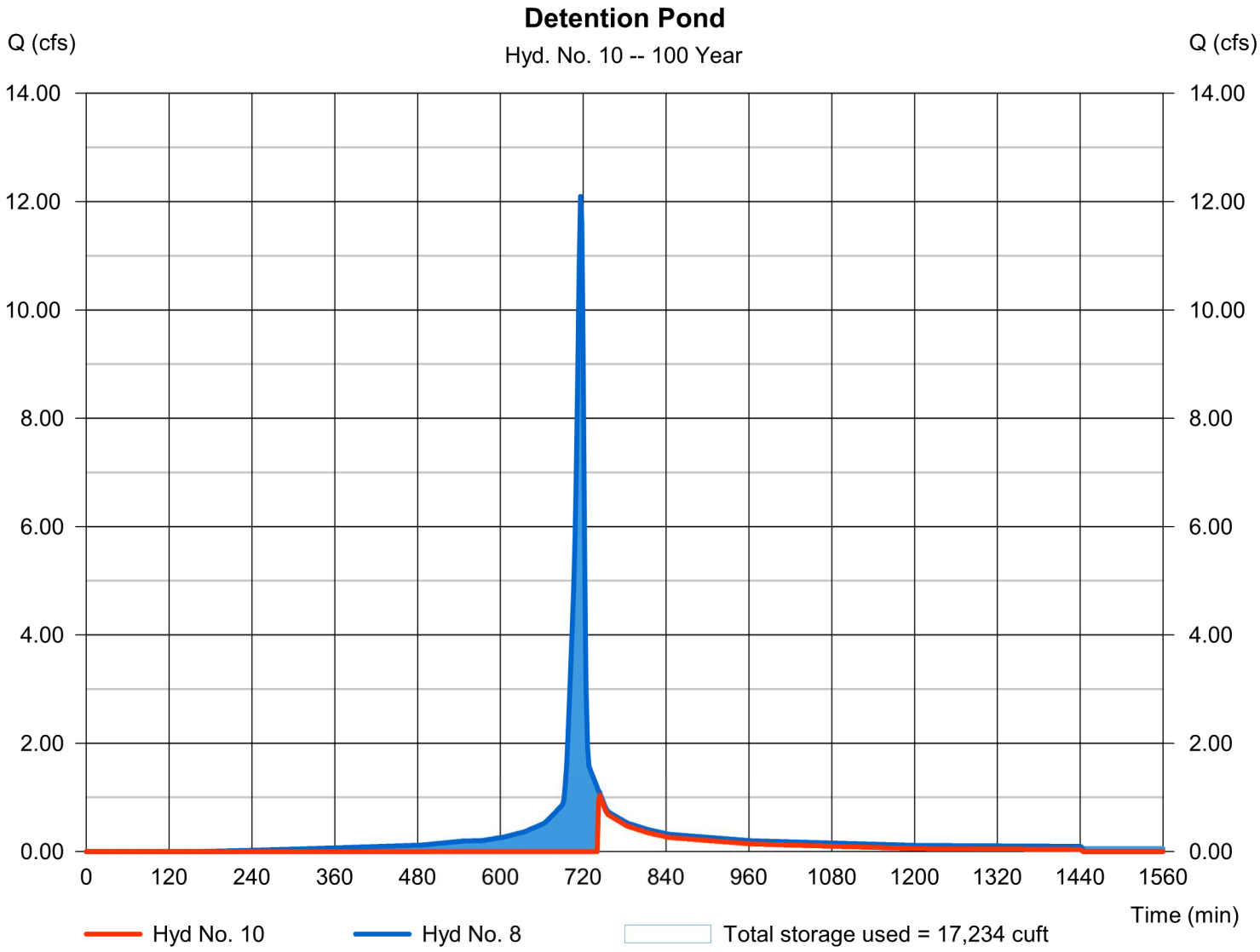
Hydrograph Report

Hyd. No. 10

Detention Pond

Hydrograph type	=	Reservoir	Peak discharge	=	1.041 cfs
Storm frequency	=	100 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	6,554 cuft
Inflow hyd. No.	=	8 - Prop to Detention Pond	Max. Elevation	=	1015.91 ft
Reservoir name	=	Detention Pond	Max. Storage	=	17,234 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Detention Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1010.75 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1010.75	05	0	0
0.25	1011.00	429	40	40
1.25	1012.00	2,392	1,278	1,318
2.25	1013.00	3,167	2,770	4,088
3.25	1014.00	4,039	3,594	7,682
4.25	1015.00	5,010	4,515	12,197
5.25	1016.00	6,079	5,535	17,733
5.70	1016.45	6,483	2,826	20,558

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	0.00	0.00
Span (in)	= 12.00	1.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1010.65	1010.75	0.00	0.00
Length (ft)	= 30.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	100.00	Inactive	0.00
Crest El. (ft)	= 1015.30	1015.90	1014.65	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Ciplti	Rect	---
Multi-Stage	= Yes	No	Yes	No

Exfil.(in/hr)	= 0.420 (by Contour)
TW Elev. (ft)	= 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

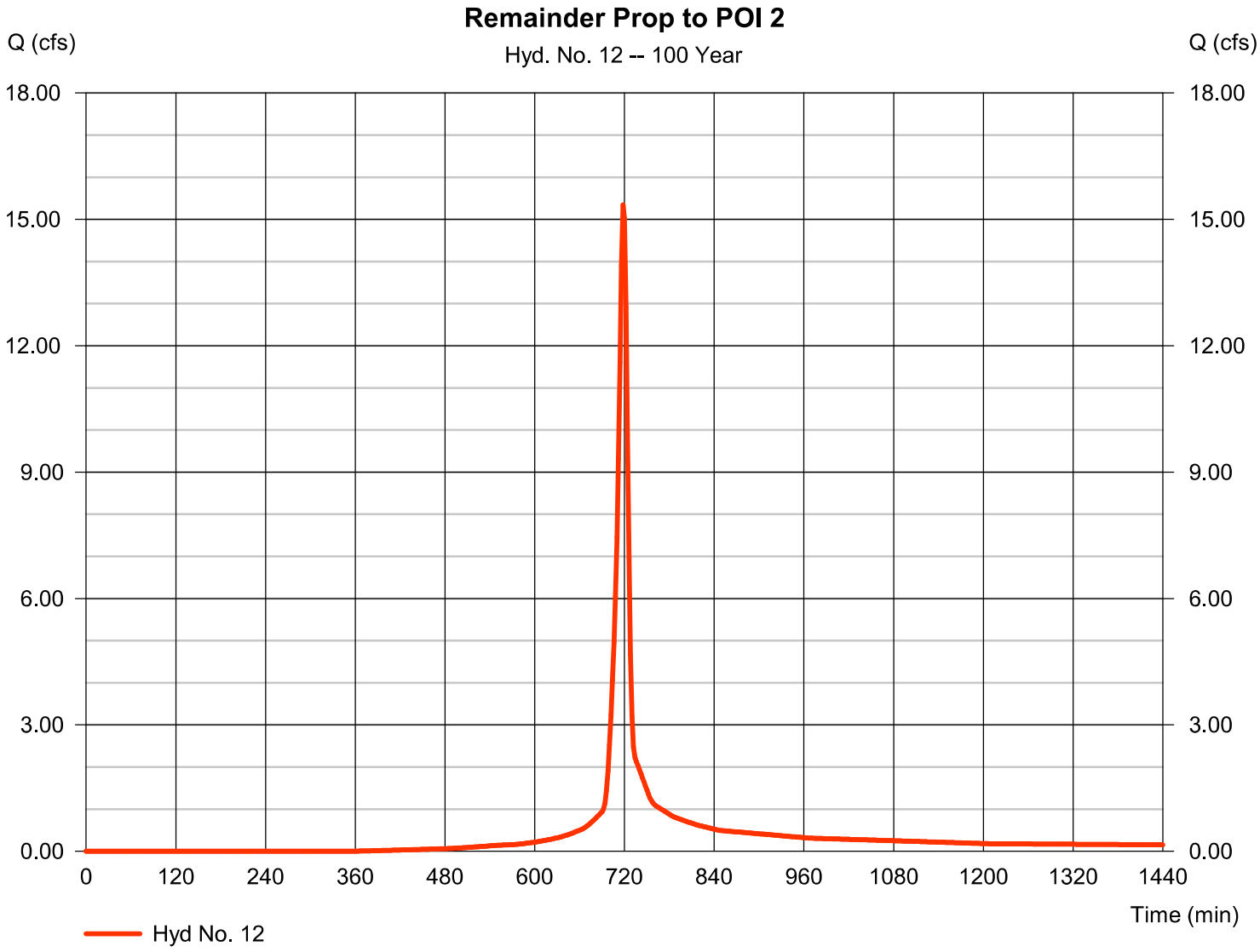
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	1010.75	0.00	0.00	---	---	0.00	0.00	0.00	---	0.000	---	0.000
0.25	40	1011.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.004	---	0.004
1.25	1,318	1012.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.023	---	0.023
2.25	4,088	1013.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.031	---	0.031
3.25	7,682	1014.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.039	---	0.039
4.25	12,197	1015.00	0.00	0.00	---	---	0.00	0.00	0.00	---	0.049	---	0.049
5.25	17,733	1016.00	0.00	0.00	---	---	0.00	10.53	0.00	---	0.059	---	10.59
5.70	20,558	1016.45	0.00	0.00	---	---	0.00	135.82	0.00	---	0.063	---	135.89

Hydrograph Report

Hyd. No. 12

Remainder Prop to POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 15.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 35,625 cuft
Drainage area	= 1.640 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 9.17 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

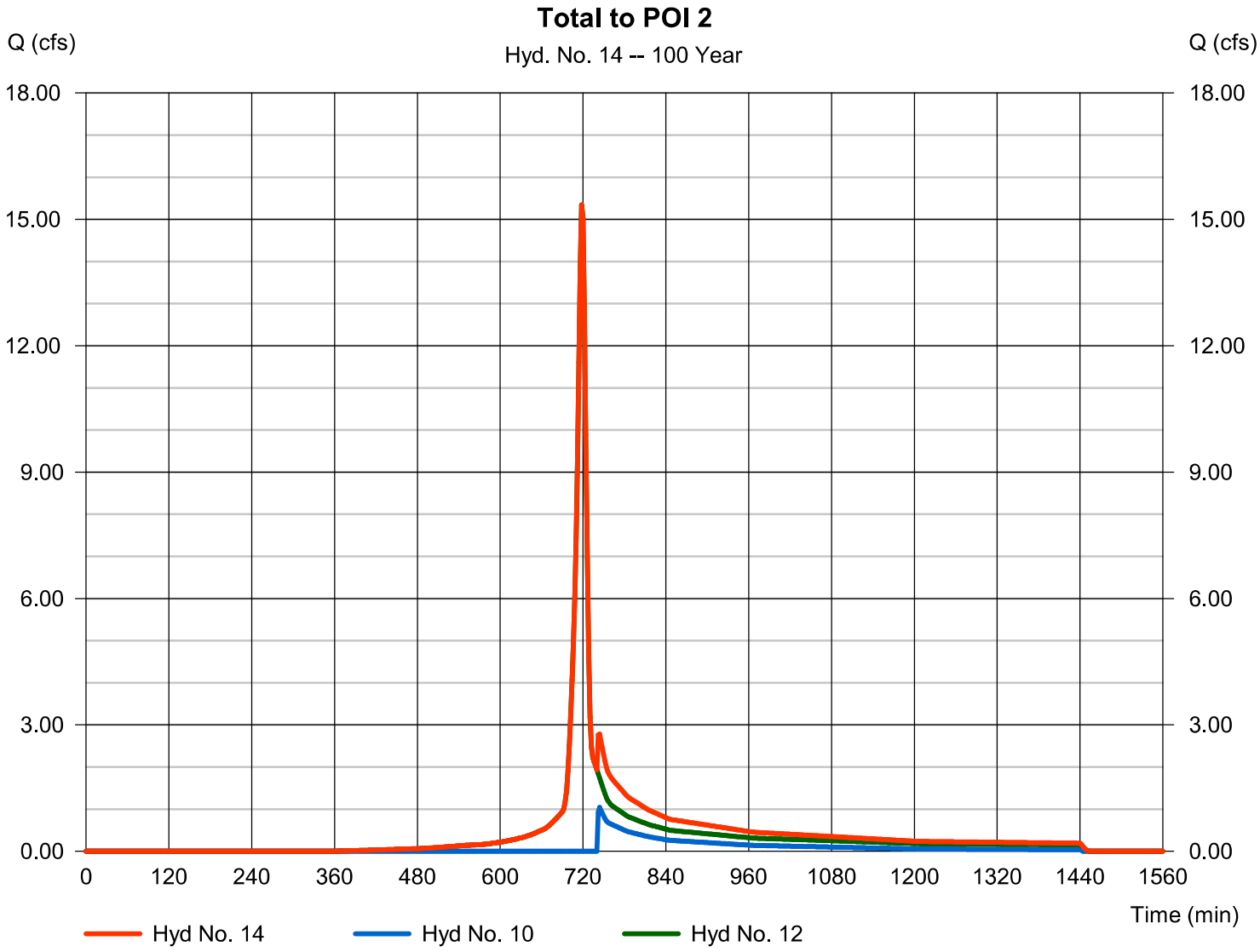


Hydrograph Report

Hyd. No. 14

Total to POI 2

Hydrograph type	= Combine	Peak discharge	= 15.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 42,178 cuft
Inflow hyds.	= 10, 12	Contrib. drain. area	= 1.640 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	21.2433	4.0000	0.6645	--------
2	26.1250	4.3000	0.6753	--------
3	0.0000	0.0000	0.0000	--------
5	33.6055	4.6000	0.6818	--------
10	38.8836	4.6000	0.6794	--------
25	45.4115	4.5000	0.6730	--------
50	48.7964	4.2000	0.6607	--------
100	52.0785	3.9000	0.6501	--------

File name: Lees Summit.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.93	3.68	3.00	2.57	2.27	2.04	1.86	1.72	1.60	1.50	1.41	1.34
2	5.79	4.33	3.54	3.03	2.67	2.40	2.19	2.02	1.88	1.76	1.66	1.57
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	7.19	5.40	4.42	3.79	3.34	3.00	2.74	2.52	2.35	2.20	2.07	1.96
10	8.36	6.29	5.15	4.41	3.89	3.50	3.19	2.95	2.74	2.57	2.42	2.29
25	9.98	7.51	6.15	5.28	4.66	4.19	3.83	3.53	3.29	3.08	2.90	2.75
50	11.26	8.45	6.93	5.94	5.25	4.73	4.32	3.99	3.72	3.49	3.29	3.12
100	12.57	9.41	7.71	6.61	5.85	5.27	4.82	4.45	4.15	3.90	3.68	3.49

Tc = time in minutes. Values may exceed 60.

Precip. file name: \\global.gsp\data\nf\na_nf05\4083145\01Work\03Tech\LP\01Storm\02Detention\SCS.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	3.09	3.68	0.00	4.71	5.61	6.94	8.02	9.17
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX C

Water Quality Calculations

WATER QUALITY POND CALCULATIONS-PERFORATED PIPE

Project: Firestone Complete Auto Care, Lee's Summit, MO ***Date: 11/18/19***
GSP# 40831.45 ***Revised Date: 2/20/20***

Calculate Water Quality Volume

P (in.), rainfall for 90% storm event	1.37
I, impervious cover by %	56.4
R_v, runoff coeffcient = 0.05 + 0.009 x I	0.56
A (ac), drainage area	1.02
WQ_v (ac-ft), water quality volume = P x R_v x A/12	0.06
WQ_v (ft^3), water quality volume converted units	2828
Add 20% WQv (ft3), water quality volume converted units	**3394.15**

Pond Areas

Elevation (ft)	Area (ft^2)	Elev. Difference (ft)	Increment Volume (ft^3)	Total Volume (ft^3)
1010.75	5			0
1011	429	0.25	54	54
1012	2392	1	1411	1465
1013	3167	1	2780	4244
1014	4039	1	3603	7847
1015	5010	1	4525	12372
1016	6079	1	5545	17916
1016.35	6483	0.35	2198	20115
		Required WQ_v elevation (ft)		1012.69
			Weir elevation (ft)	1014.65

Size Low Flow Orifice

C, orifice coefficient	0.66
T (hrs), drawdown time (should be between 24 and 48 hrs)	40
g (ft/s^2), gravity	32.20
$Q_{wq, avg}$ (cfs), average release rate of WQ_v	0.024
$H_{wq, avg}$ (ft), average head on the water quality outlet	0.97
A_{wq} (ft^2), the orifice area	0.005
D_{wq} (ft), the orifice area	0.08
D_{wq} (in), the orifice area	0.91
Use D=	**1.00**

APPENDIX D

NRCS Soil Map

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Jackson County, Missouri

October 22, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 20, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 11, 2017—Sep 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	0.6	16.6%
10180	Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes	3.0	83.4%
Totals for Area of Interest		**3.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Jackson County, Missouri

10082—Arisburg-Urban land complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w7ld
Elevation: 750 to 1,130 feet
Mean annual precipitation: 39 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 177 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arisburg and similar soils: 61 percent
Urban land: 30 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arisburg

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silt loam
A - 6 to 13 inches: silt loam
Bt - 13 to 19 inches: silty clay loam
Btg - 19 to 56 inches: silty clay loam
BCg - 56 to 79 inches: silty clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: Loess Upland Prairie (R107BY007MO)
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Sampsel

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Concave
Ecological site: Interbedded Sedimentary Upland Savanna (R109XY010MO)
Hydric soil rating: Yes

Greenton

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Loess Upland Prairie (R109XY002MO)
Hydric soil rating: No

Sharpsburg

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loess Upland Prairie (R109XY002MO)
Hydric soil rating: No

10180—Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1n85h
Elevation: 600 to 900 feet
Mean annual precipitation: 33 to 43 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 175 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Udarents and similar soils: 41 percent
Urban land: 39 percent
Sampsel and similar soils: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udarents

Setting

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mine spoil or earthy fill

Typical profile

C1 - 0 to 5 inches: silt loam
C2 - 5 to 80 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Deep Loess Upland Prairie (R107BY002MO)
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Across-slope shape: Convex

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Sampsel

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from shale

Typical profile

Ap - 0 to 13 inches: silty clay loam
Bt - 13 to 80 inches: silty clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: Wet Footslope Prairie (R112XY041MO)
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

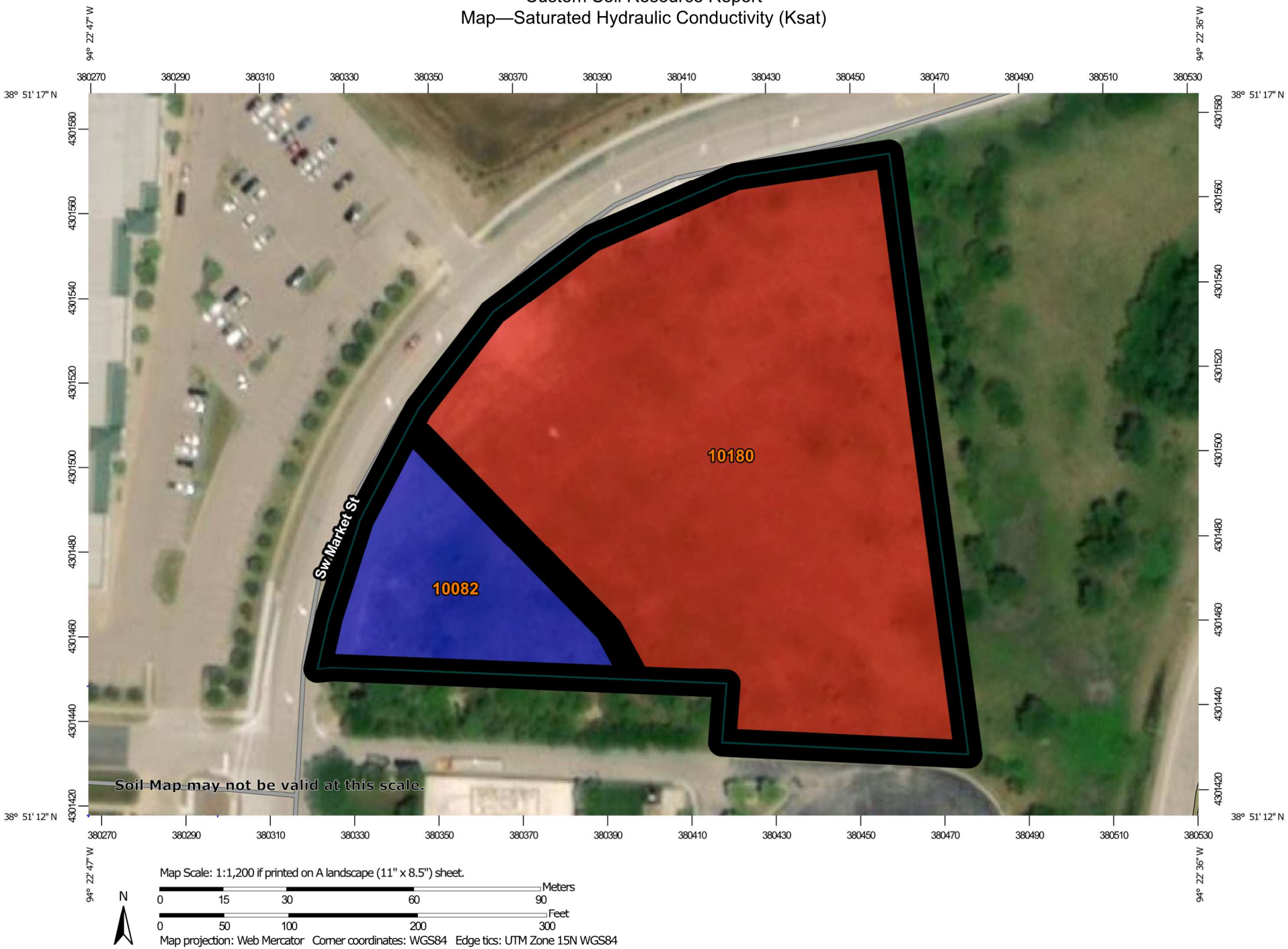
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

<= 2.9163

> 2.9163 and <= 3.8300

Not rated or not available

Soil Rating Lines

<= 2.9163

> 2.9163 and <= 3.8300

Not rated or not available

Soil Rating Points

<= 2.9163

> 2.9163 and <= 3.8300

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 20, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 11, 2017—Sep 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	3.8300	0.6	16.6%
10180	Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes	2.9163	3.0	83.4%
Totals for Area of Interest			**3.6**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

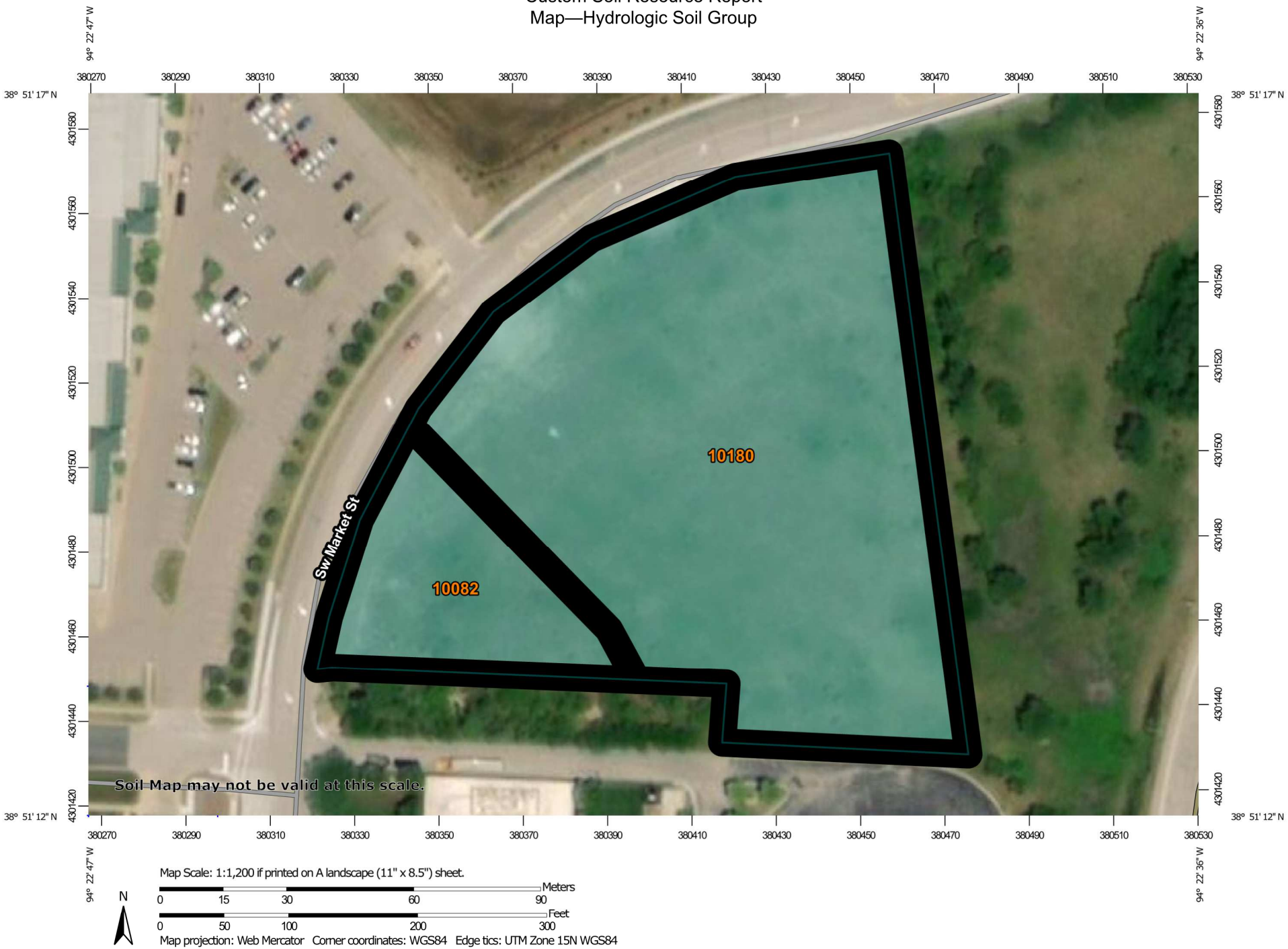
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 20, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 11, 2017—Sep 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	C	0.6	16.6%
10180	Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes	C	3.0	83.4%
Totals for Area of Interest			**3.6**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

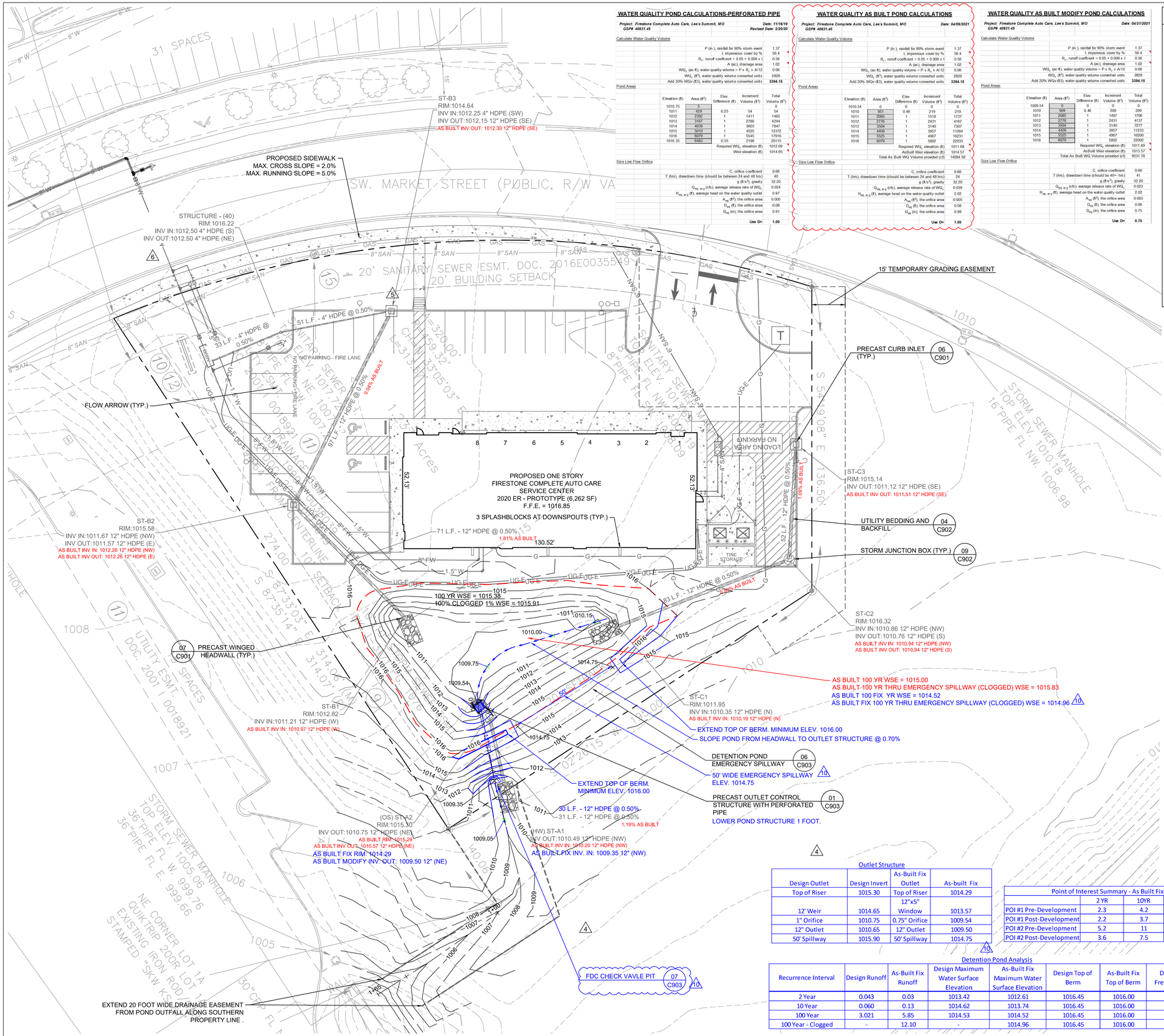
United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



WATER QUALITY POND CALCULATIONS-PERFORATED PIPE

Project: Firestone Complete Auto Care, Lee's Summit, MO — *Date: 11/18/19*
GSP# 40831.45 — *Revised Date: 2/20/20*

Calculate Water Quality Volume

P (in.), rainfall for 90% storm event	1.37
I, impervious cover by %	56.4
R_v, runoff coefficient = 0.05 + 0.009 x I	0.56
A (ac), drainage area	1.02
WQ_v (ac-ft), water quality volume = P x R_v x A/12	0.06
WQ_v (ft^3), water quality volume converted units	2828
Add 20% WQv (ft^3), water quality volume converted units	**3394.15**

Pond Areas

Elevation (ft)	Area (ft^2)	Elev. Difference (ft)	Increment Volume (ft^3)	Total Volume (ft^3)
1010.75	5		0	0
1011	429	0.25	54	54
1012	2392	1	1411	1465
1013	3167	1	2780	4244
1014	4039	1	3603	7847
1015	5010	1	4525	12372
1016	6079	1	5545	17916
1016.35	6483	0.35	2198	20115
			Required WQ_v elevation (ft)	1012.69
			Weir elevation (ft)	1014.65

Size Low Flow Orifice

C_o orifice coefficient	0.66
T (hrs), drawdown time (should be between 24 and 48 hrs)	40
g (ft/s^2), gravity	32.20
$Q_{wq\ in\ g}$ (cfs), average release rate of WQ_v	0.024
$H_{wq\ in\ g}$ (ft), average head on the water quality outlet	0.97
A_{wq} (ft^2), the orifice area	0.005
D_{wq} (ft), the orifice area	0.08
D_{wq} (in), the orifice area	0.91
	Use D= **1.00**

WATER QUALITY AS BUILT POND CALCULATIONS

Project: Firestone Complete Auto Care, Lee's Summit, MO — *Date: 04/09/2021*
GSP# 40831.45

Calculate Water Quality Volume

P (in.), rainfall for 90% storm event	1.37
I, impervious cover by %	56.4
R_v, runoff coefficient = 0.05 + 0.009 x I	0.56
A (ac), drainage area	1.02
WQ_v (ac-ft), water quality volume = P x R_v x A/12	0.06
WQ_v (ft^3), water quality volume converted units	2828
Add 20% WQv (ft^3), water quality volume converted units	**3394.15**

Pond Areas

Elevation (ft)	Area (ft^2)	Elev. Difference (ft)	Increment Volume (ft^3)	Total Volume (ft^3)
1010.54	0		0	0
1010	951	0.46	219	219
1011	2065	1	1518	1737
1012	2776	1	2431	4167
1013	3504	1	3140	7307
1014	4409	1	3957	11264
1015	5525	1	4967	16231
1016	6079	1	5802	22033
			Required WQ_v elevation (ft)	1011.68
			AsBuilt Weir elevation (ft)	1014.57
			Total As Built WQ Volume provded (cf)	14094.92

Size Low Flow Orifice

C_o orifice coefficient	0.66
T (hrs), drawdown time (should be between 24 and 48 hrs)	40
g (ft/s^2), gravity	32.20
$Q_{wq\ in\ g}$ (cfs), average release rate of WQ_v	0.039
$H_{wq\ in\ g}$ (ft), average head on the water quality outlet	0.97
A_{wq} (ft^2), the orifice area	0.005
D_{wq} (ft), the orifice area	0.08
D_{wq} (in), the orifice area	0.98
	Use D= **1.00**

WATER QUALITY AS BUILT MODIFY POND CALCULATIONS

Project: Firestone Complete Auto Care, Lee's Summit, MO — *Date: 04/21/2021*
GSP# 40831.45

Calculate Water Quality Volume

P (in.), rainfall for 90% storm event	1.37
I, impervious cover by %	56.4
R_v, runoff coefficient = 0.05 + 0.009 x I	0.56
A (ac), drainage area	1.02
WQ_v (ac-ft), water quality volume = P x R_v x A/12	0.06
WQ_v (ft^3), water quality volume converted units	2828
Add 20% WQv (ft^3), water quality volume converted units	**3394.15**

Pond Areas

Elevation (ft)	Area (ft^2)	Elev. Difference (ft)	Increment Volume (ft^3)	Total Volume (ft^3)
1009.54	0		0	0
1010	909	0.46	209	209
1011	2085	1	1497	1706
1012	2776	1	2431	4137
1013	3504	1	3140	7277
1014	4409	1	3957	11233
1015	5525	1	4967	16200
1016	6079	1	5802	22002
			Required WQ_v elevation (ft)	1011.69
			AsBuilt Weir elevation (ft)	1013.57
			Total As Built WQ Volume provded (cf)	9531.78

Size Low Flow Orifice

C_o orifice coefficient	0.66
T (hrs), drawdown time (should be 40+ hrs)	41
g (ft/s^2), gravity	32.20
$Q_{wq\ in\ g}$ (cfs), average release rate of WQ_v	0.023
$H_{wq\ in\ g}$ (ft), average head on the water quality outlet	2.02
A_{wq} (ft^2), the orifice area	0.003
D_{wq} (ft), the orifice area	0.06
D_{wq} (in), the orifice area	0.75
	Use D= **0.75**

LEGEND

- PROPERTY LINE
- BUILDING LINE
- 1015 EXISTING MAJOR CONTOUR
- 1014 EXISTING MINOR CONTOUR
- 1015 MAJOR CONTOUR
- 1014 MINOR CONTOUR
- STORM PIPE
- HEADWALL
- ST STORM MANHOLE
- AREA INLET
- CURB INLET
- STORM CLEANOUT
- 940.50 SPOT ELEVATION
- 937.85(F) FLUSH ELEVATION
- M.E.F.G. 937.85 MATCH EXISTING FINISH GRADE ELEVATION
- 938.75 / 938.25 CURB TOP/BOTTOM ELEVATIONS
- FLOW ARROW

STORM STRUCTURE ABBREVIATIONS

(SCI)	SINGLE CURB INLET	DETAIL 06, SHEET C901
(JB)	JUNCTION BOX	DETAIL 09, SHEET C902
(HW)	HEADWALL	DETAIL 07, SHEET C901
(OS)	OUTLET STRUCTURE	DETAIL 08, SHEET C901

NOTES:
1. FOR SITE PREPARATION AND GEOTECHNICAL RECOMMENDATIONS, REFER TO INTERTEK PSI GEOTECHNICAL REPORT 03381947, DATED 7/24/2019.
2. ITEMS IN RED AND CLOUDED IN RED INDICATE AS BUILT CONDITIONS.
3. ITEMS IN BLUE AND CLOUDED IN BLUE INDICATE AS BUILT FIX. ONCE FIX IS COMPLETED, PROVIDE TOPO SURVEY OF THE ENTIRE SITE INCLUDING PARKING, BUILDING FFE, AREA INLET TOP OF CASTING, POND, POND STRUCTURE INVERTS AND DIMENSIONS.

POND CONTOUR AREAS - DESIGN

DESIGN ELEVATION	IGN CAD AREA (	DESIGN CAD VOLUME (CF.) AVG. END METHOD
1010.75	5	0
1011.00	429	54
1012.00	2392	1,465
1013.00	3167	4,244
1014.00	4039	7,847
1015.00	5010	12,372
1016.00	6079	17,916
1016.35	6483	20,115

POND CONTOUR AREAS - AS BUILT FIX

ASBUILT ELEVATION	ASBUILT modify CAD AREA (SF.)	ASBUILT CAD VOLUME (CF.) AVG. END METHOD
1009.54	0	0
1010.00	909	209
1011.00	2085	1,706
1012.00	2776	4,137
1013.00	3504	7,277
1014.00	4409	11,234
1015.00	5525	16,201
1016.00	6079	22,003

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
07/08/2021

4 Outlet Structure

Design Outlet	Design Invert	As-Built Fix Outlet	As-built Fix
Top of Riser	1015.30	Top of Riser	1014.29
12' Weir	1014.65	12"x5" Window	1013.57
1" Orifice	1010.75	0.75" Orifice	1009.54
12" Outlet	1010.65	12" Outlet	1009.50
50' Spillway	1015.90	50' Spillway	1014.75

10

Point of Interest Summary - As Built Fix (cfs)

	2 YR	10YR	100YR
POI #1 Pre-Development	2.3	4.2	7.7
POI #1 Post-Development	2.2	3.7	6.4
POI #2 Pre-Development	5.2	11	22.7
POI #2 Post-Development	3.6	7.5	19.4

10

Detention Pond Analysis

Recurrence Interval	Design Runoff	As-Built Fix Runoff	Design Maximum Water Surface Elevation	As-Built Fix Maximum Water Surface Elevation	Design Top of Berm	As-Built Fix Top of Berm	Design Freeboard	As-Built Fix Freeboard
2 Year	0.043	0.03	1013.42	1012.61	1016.45	1016.00	3.03	3.39
10 Year	0.060	0.13	1014.62	1013.74	1016.45	1016.00	1.83	2.26
100 Year	3.021	5.85	1014.53	1014.52	1016.45	1016.00	1.92	1.48
100 Year - Clogged	-	12.10	-	1014.96	1016.45	1016.00	-	1.04

10

NORTH

20' 0 20' 40'
GRAPHIC SCALE

Gresham Smith
GreshamSmith.com
222 Second Avenue South
Suite 1400
Nashville, TN 37201
615.770.8100

Firestone COMPLETE AUTO CARE

3561 SW MARKET STREET
LEE'S SUMMIT, MISSOURI 64082

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STATE OF MISSOURI
MICHAEL DUANE HUNKLER
NUMBER E-28843
REGISTERED PROFESSIONAL ENGINEER
2021.07.07 16:04:36 -05'00'

Revision

No.	Date	Description
1	02.07.2020	CITY COMMENTS
2	02.21.2020	CITY COMMENTS
3	03.27.2020	CITY COMMENTS
4	04.28.2020	CITY COMMENTS
5	05.15.2020	CITY COMMENTS
6	06.01.2020	CITY COMMENTS
7	04.12.2021	AS BUILT
8	04.15.2021	AS BUILT
9	04.22.2021	AS BUILT FIX
10	06.29.2021	AS BUILT FIX
11	07.07.2021	AS BUILT FIX

GRADING AND DRAINAGE PLAN

C300

40831.45
JANUARY 8, 2020

This Line Is 3 Inches When Printed Full Size

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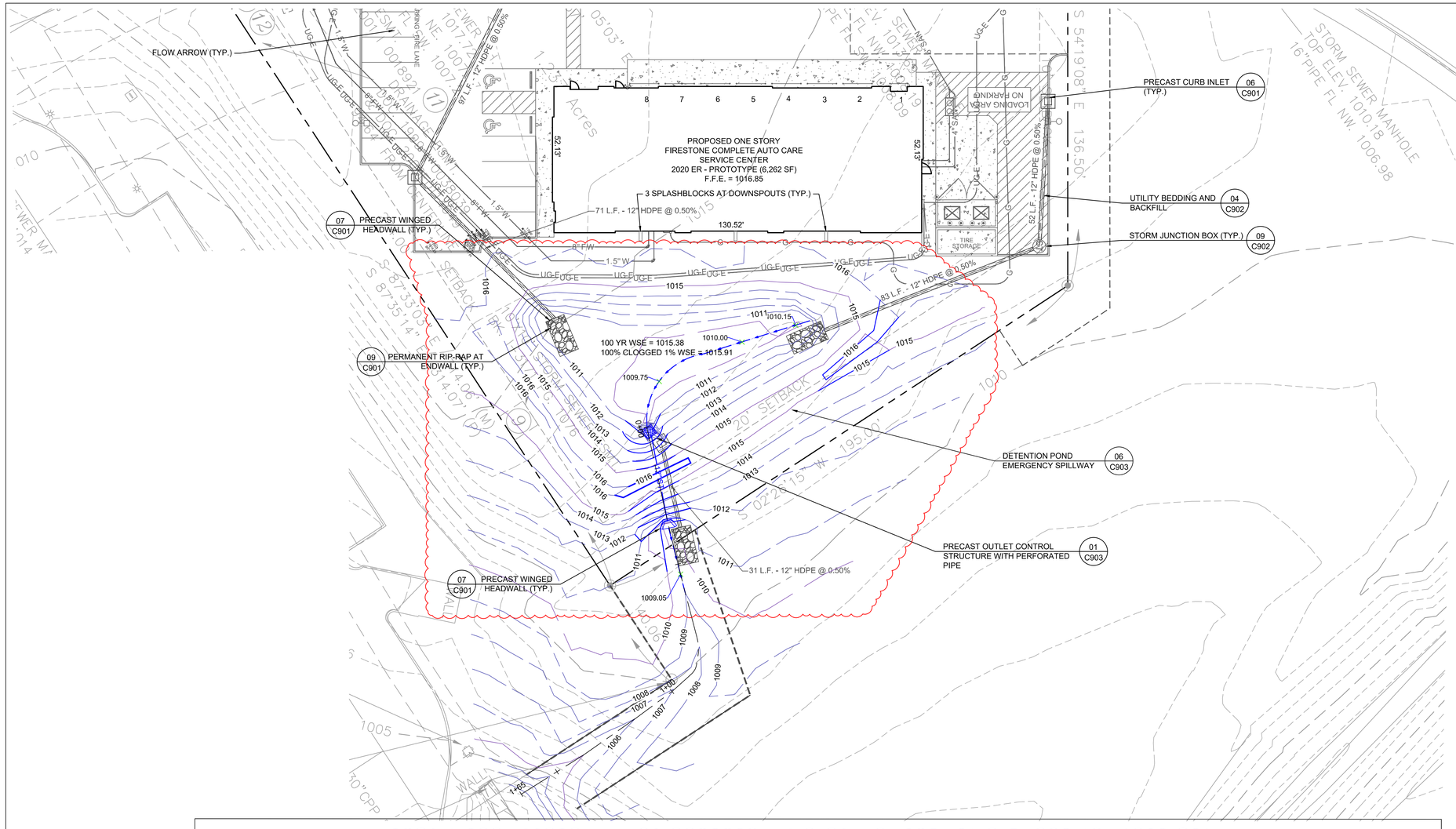

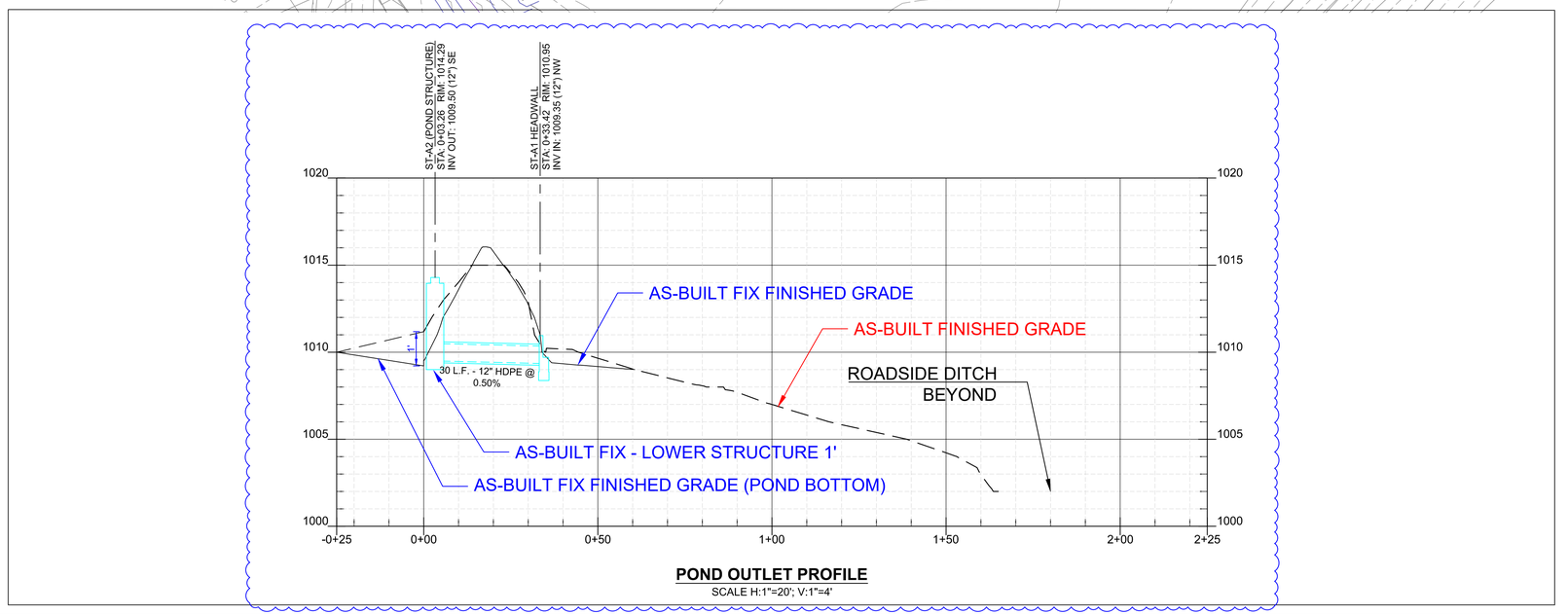

POND OUTLET PROFILE
SCALE H:1"=20'; V:1"=4'

LEGEND

- PROPERTY LINE
- BUILDING LINE
- 1015 EXISTING MAJOR CONTOUR
- 1014 EXISTING MINOR CONTOUR
- 1015 MAJOR CONTOUR
- 1014 MINOR CONTOUR
- STORM PIPE
- HEADWALL
- ST STORM MANHOLE
- AREA INLET
- CURB INLET
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- FLOW ARROW

STORM STRUCTURE ABBREVIATIONS

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(JB)	JUNCTION BOX	DETAIL 09, SHEET C902
(HW)	HEADWALL	DETAIL 07, SHEET C901
(OS)	OUTLET STRUCTURE	DETAIL 08, SHEET C901

NORTH

20' 0 20' 40'
GRAPHIC SCALE

NOTES:
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RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
07/08/2021

Gresham Smith
GreshamSmith.com
222 Second Avenue South
Suite 1400
Nashville, TN 37201
615.770.8100

Firestone COMPLETE AUTO CARE
3561 SW MARKET STREET
LEE'S SUMMIT, MISSOURI 64082

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STATE OF MISSOURI
MICHAEL DUANE HUNKLER
NUMBER E-28843
REGISTERED PROFESSIONAL ENGINEER
2021.06.29 11:28:46 -05'00'

Revision

No.	Date	Description
1	04.28.2020	CITY COMMENTS
2	06.01.2020	CITY COMMENTS
3	04.12.2021	AS BUILT
4	06.29.2021	AS BUILT FIX

STORM PLAN AND PROFILE

C301

40831.45
JANUARY 8, 2020

This Line Is 3 Inches When Printed Full Size

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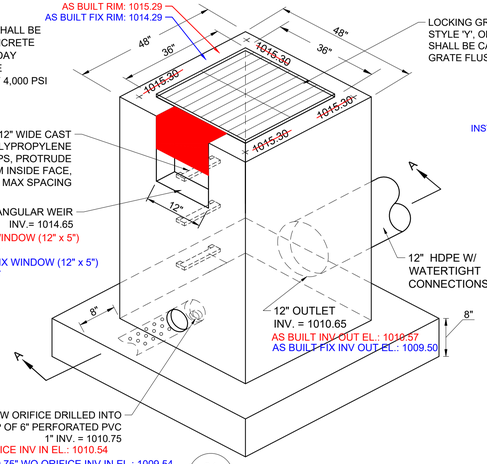
NOTE:
STRUCTURE SHALL BE PRECAST CONCRETE WITH MIN. 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI



NOTE:
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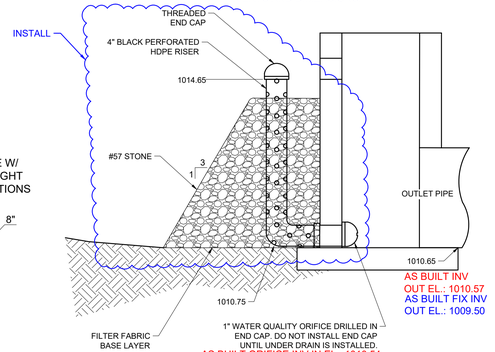
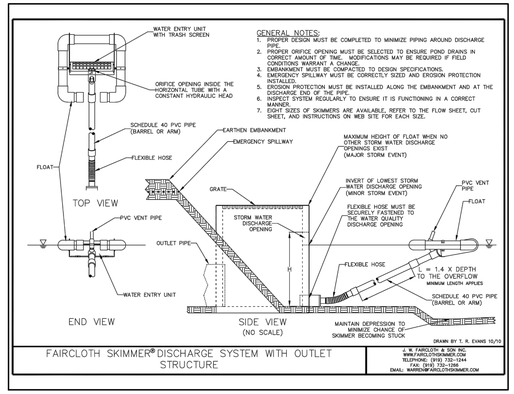


SECTION A-A

01 C903 — PRECAST OUTLET CONTROL STRUCTURE WITH PERFORATED PIPE
NOT TO SCALE

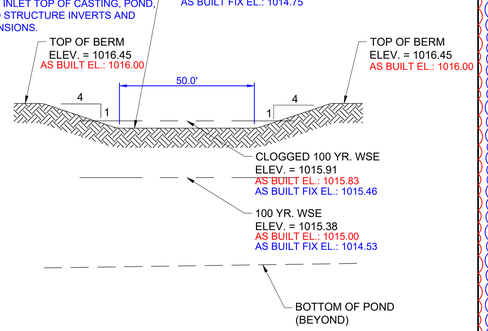


03 C903 — FAIRCLOTH SKIMMER
NOT TO SCALE

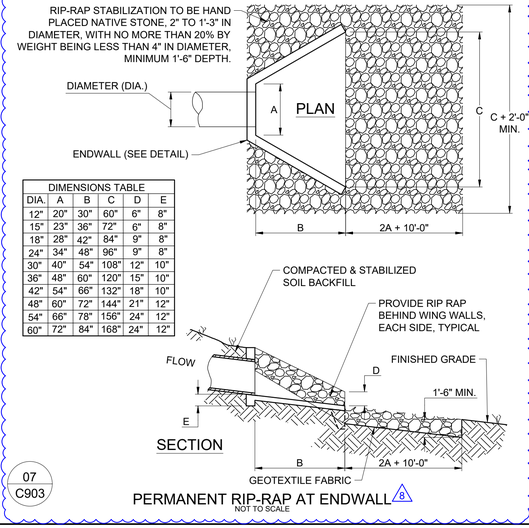
04 C903 — NOT USED
NOT TO SCALE

05 C903 — NOT USED
NOT TO SCALE

NOTE:
1. ITEMS IN RED AND CLOUDED IN RED INDICATE AS BUILT CONDITIONS.
2. ITEMS IN BLUE AND CLOUDED IN BLUE INDICATE AS BUILT FIX. ONCE FIX IS COMPLETED, PROVIDE TOPO SURVEY OF THE ENTIRE SITE INCLUDING PARKING, BUILDING FFE, AREA INLET TOP OF CASTING, POND, POND STRUCTURE INVERTS AND DIMENSIONS.



06 C903 — DETENTION POND EMERGENCY SPILLWAY
NOT TO SCALE



DIMENSIONS TABLE					
DIA.	A	B	C	D	E
12"	20"	30"	60"	6"	8"
15"	23"	36"	72"	6"	8"
18"	28"	42"	84"	9"	8"
24"	34"	48"	96"	9"	8"
30"	40"	54"	108"	12"	10"
36"	48"	60"	120"	15"	10"
42"	54"	66"	132"	18"	10"
48"	60"	72"	144"	21"	12"
54"	66"	78"	156"	24"	12"
60"	72"	84"	168"	24"	12"

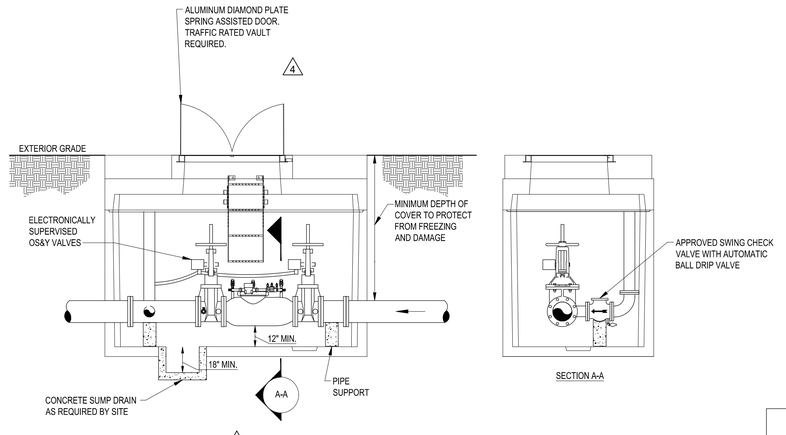
07 C903 — PERMANENT RIP-RAP AT ENDWALL 8
NOT TO SCALE

08 C903 — NOT USED
NOT TO SCALE

09 C903 — NOT USED
NOT TO SCALE

10 C903 — NOT USED
NOT TO SCALE

4



11 C903 — BACKFLOW PREVENTER VAULT
NOT TO SCALE

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW DEVELOPMENT SERVICES LEE'S SUMMIT, MISSOURI
07/08/2021

Gresham Smith
GreshamSmith.com
222 Second Avenue South
Suite 1400
Nashville, TN 37201
615.770.8100

Firestone COMPLETE AUTO CARE
3561 SW MARKET STREET
LEE'S SUMMIT, MISSOURI 64082

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STATE OF MISSOURI
MICHAEL DUANE HUNKLER
NUMBER E-28843
REGISTERED PROFESSIONAL ENGINEER
2021.07.07 16:03:54 -05'00'

Revision

No.	Date	Description
1	02.07.2020	CITY COMMENTS
2	02.20.2020	CITY COMMENTS
3	03.27.2020	CITY COMMENTS
4	05.15.2020	CITY COMMENTS
5	04.12.2021	AS BUILT
6	04.15.2021	AS BUILT
7	06.29.2021	AS BUILT FIX
8	07.07.2021	AS BUILT FIX

SITE DETAILS

C903

40831.45
JANUARY 8, 2020

This Line Is 3 Inches When Printed Full Size