

HEATHER RIDGE

SUBDIVISION APPLICATION

DATE: September 2014

SUBMITTED TO: City of Tualatin
18880 SW Martinazzi Ave
Tualatin, OR 97062

OWNER/APPLICANT: Heather Ridge Subdivision, LLC
9185 SW Burnham Street
Tigard, OR 97223

PREPARED BY: AKS Engineering & Forestry
12965 SW Herman Road, Suite 100
Tualatin, OR 97062



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CITY OF TUALATIN
 18880 SW Martinazzi Ave
 Tualatin, OR 97062-7092
 Phone: (503) 692-2000
 Fax: (503) 692-0147

**DEVELOPMENT APPLICATION:
 SUBDIVISION/PARTITION/
 PROPERTY LINE ADJUSTMENT**

Application for: Subdivision Partition Property Line Adjustment

Project Address: 22930 SW 112th Avenue Planning District: (RL) Low Density Res.

Project Tax Map Number: 2S134AC Tax Lot Number(s): 00200

Property Owner(s): Heather Ridge Subdivision, LLC

Property Owner's Address: 9185 SW Burnham Street, Tigard, Oregon 97223

Owner's Phone Number: Contact Consultant Fax Number: Contact Consultant

Owner's Email Address: Contact Consultant

Owner's Signature: [Signature] Date: 9-3-14

Owner's Signature: _____ Date: _____

Owner's Signature: _____

Applicant's Name: See Owner Information

Applicant's Address: _____

Applicant's Phone Number: Contact Consultant Fax Number: Contact Consultant

Applicant's Email Address: Contact Consultant

Applicant's Signature: _____ Date: _____

Consultant's Name: Alex Hurley

Consultant's Company: AKS Engineering & Forestry, LLC

Consultant's Address: 12965 SW Herman Road, Suite 100 Tualatin, Oregon 97062

Consultant's Phone Number: 503-563-6151 Fax Number: 503-563-6152

Consultant's Email Address: alex@aks-eng.com

Direct Communication to: Owner Applicant Consultant

Existing Use: Single Family Residential Proposed Use: Single Family Residential

Total Acreage: 4.4 Acres No. of Lots/Parcels: 16

Average Lot/Parcel Width: varies by lot shape see preliminary plans Average Lot/Parcel Area: +/- 9,870 sq. ft.

Subdivision Name (if applicable): Heather Ridge

Receipt Number: _____ Fee: \$ _____ Job Number: _____
 By: _____ Date: _____

Sensitive Area Pre-Screening Site Assessment

1. Jurisdiction: City of Tualatin

2. Property Information (example 1S234AB01400)

Tax lot ID(s): 2S134AC00200

Site Address: 22930 SW 112TH AVE

City, State, Zip: Tualatin, OR, 97062

Nearest Cross Street: SW Helenius Street

3. Owner Information

Name: Page Stevens

Company: _____

Address: 9180 SW Burnham St.

City, State, Zip: Tigard, OR, 97223

Phone/Fax: Contact Consultant

E-Mail: _____

4. Development Activity (check all that apply)

- Addition to Single Family Residence (rooms, deck, garage)
- Lot Line Adjustment Minor Land Partition
- Residential Condominium Commercial Condominium
- Residential Subdivision Commercial Subdivision
- Single Lot Commercial Multi Lot Commercial
- Other _____

5. Consultant Information

Name: Matt Scheidegger

Company: AKS Engineering & Forestry, LLC

Address: 12965 SW Herman Road Suite 100

City, State, Zip: Tualatin, OR 97062

Phone/Fax: 503-563-6151

E-Mail: scheidegger@aks-eng.com

6. Will the project involve any off-site work? Yes No Unknown

Location and description of off-site work Construction of SW Helenius St. extension

7. Additional comments or information that may be needed to understand your project _____

16 lot subdivision

This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/Type Name Matt Scheidegger Print/Type Title Planner

ONLINE SUBMITTAL

Date 3/19/2014

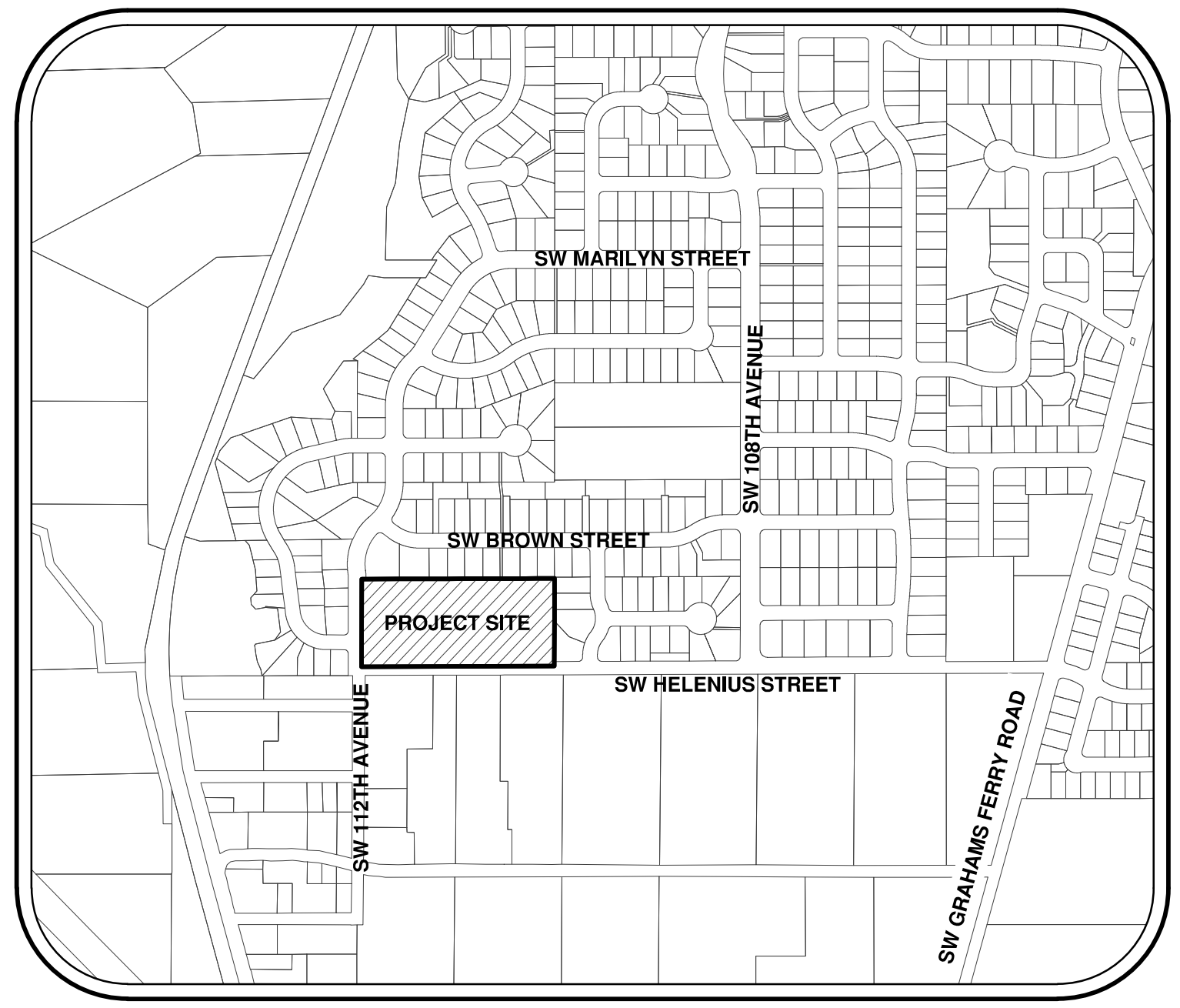
FOR DISTRICT USE ONLY

- Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.
- Based on review of the submitted materials and best available information Sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, State, and federal law.
- Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, state and federal law.
- This Service Provider Letter is not valid unless _____ CWS approved site plan(s) are attached.
- The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.

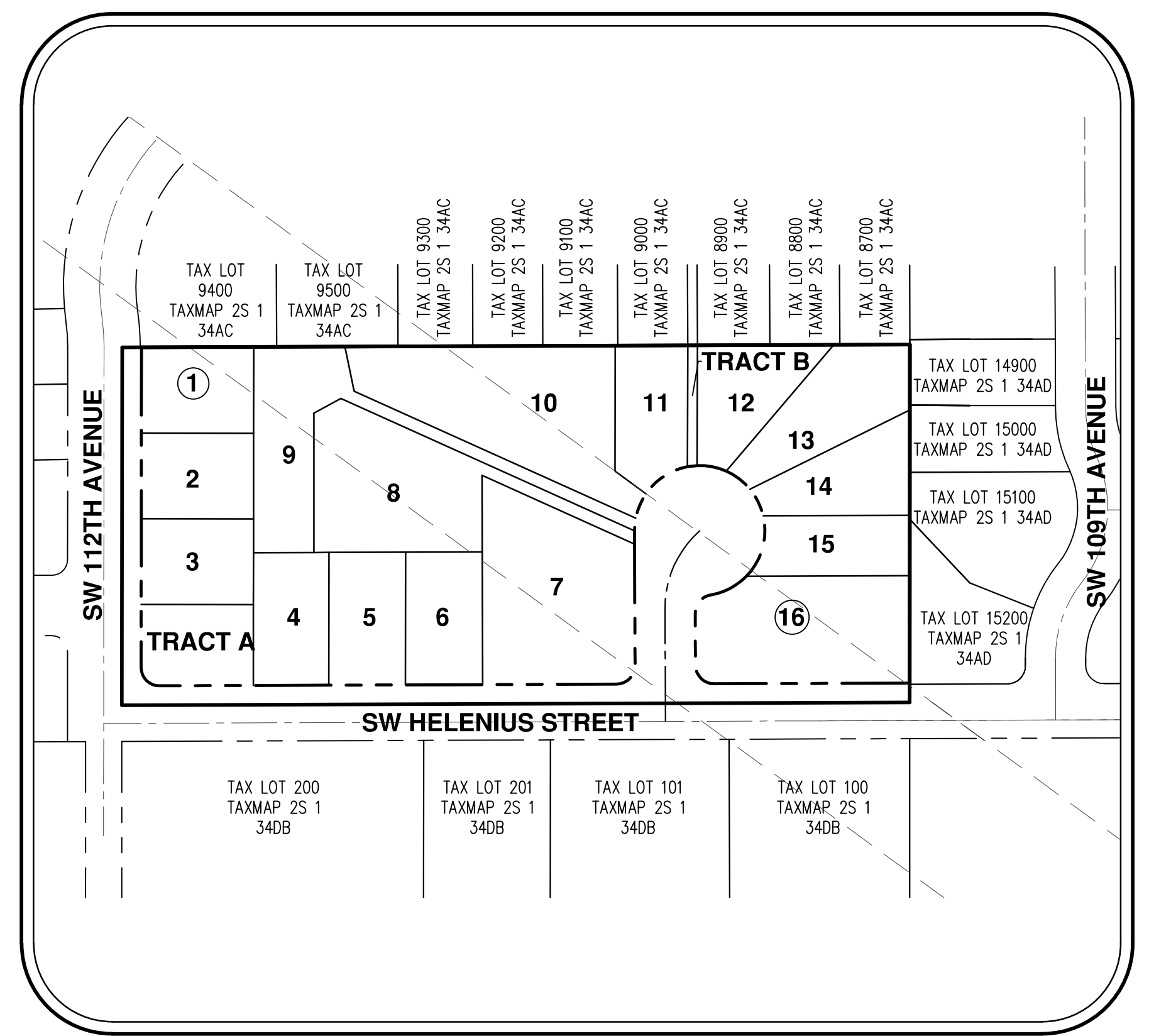
Reviewed by Laurie Harris Date 03/25/14

HEATHER RIDGE

PRELIMINARY SUBDIVISION APPLICATION



VICINITY MAP
 1" = 500'



SITE MAP
 1" = 100'

OWNER/APPLICANT

HEATHER RIDGE SUBDIVISION, LLC
 9185 SW BURNHAM STREET
 TIGARD, OR 97223

ENGINEERING/SURVEYING FIRM

AKS ENGINEERING & FORESTRY, LLC.
 CONTACT: ALEX HURLEY
 12965 SW HERMAN ROAD, SUITE 100
 TUALATIN, OR 97062
 PH: 503-563-6151
 FAX: 503-563-6152

LEGEND			
EXISTING		PROPOSED	
DECIDUOUS TREE			
CONIFEROUS TREE			
FIRE HYDRANT			
WATER BLOWOFF			
WATER METER			
WATER VALVE			
DOUBLE CHECK VALVE			
AIR RELEASE VALVE			
SANITARY SEWER CLEAN OUT			
SANITARY SEWER MANHOLE			
STREET LIGHT			
MAILBOX			

EXISTING		PROPOSED	
RIGHT-OF-WAY LINE			
BOUNDARY LINE			
PROPERTY LINE			
CENTERLINE			
DITCH			
CURB			
EDGE OF PAVEMENT			
EASEMENT			
FENCE LINE			
GRAVEL EDGE			
POWER LINE			
OVERHEAD WIRE			
COMMUNICATIONS LINE			
FIBER OPTIC LINE			
GAS LINE			
STORM SEWER LINE			
SANITARY SEWER LINE			
WATER LINE			

SHEET INDEX

- 01 - COVER SHEET WITH VICINITY AND SITE MAPS
- 02 - EXISTING CONDITIONS
- 03 - PRELIMINARY PLAT
- 04 - PRELIMINARY DEMOLITION PLAN
- 05 - PRELIMINARY GRADING, EROSION CONTROL, AND TREE REMOVAL PLAN
- 06 - TREE PRESERVATION AND REMOVAL TABLE AND NOTES
- 07 - PRELIMINARY STREET PLAN
- 08 - PRELIMINARY STREET PROFILES
- 09 - PRELIMINARY STREET PROFILES
- 10 - PRELIMINARY UTILITY PLAN
- 11 - PRELIMINARY CIRCULATION PLAN

PROPERTY DESCRIPTION:

TAX LOT 200 (TAX MAP 2S 1 34AC)
 CITY OF TUALATIN, WASHINGTON COUNTY, OREGON
 NE 1/4 OF SECTION 34, TOWNSHIP 2 SOUTH, RANGE 1 WEST, W.M.

EXISTING LAND USE:

RESIDENTIAL

PROJECT PURPOSE:

16 LOT RESIDENTIAL SUBDIVISION

TOTAL AREA:

±4.44 ACRES

ZONING:

RESIDENTIAL LOW DENSITY (RL)

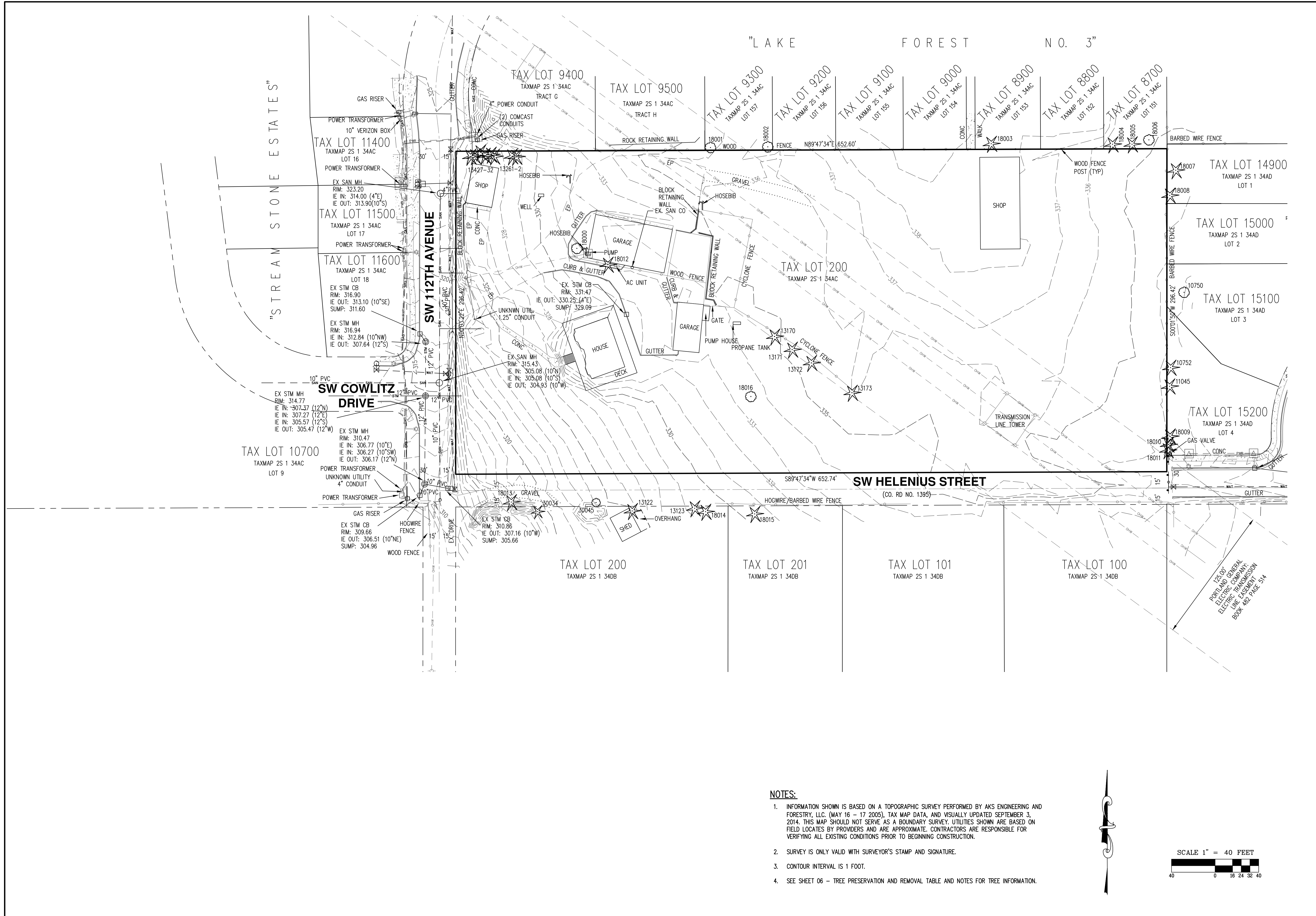
PROJECT LOCATION:

NORTHEAST OF SW 112TH AVENUE AND SW HELENIUS STREET INTERSECTION

BENCHMARK:

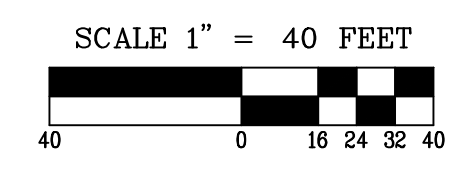
WASHINGTON COUNTY BENCHMARK NO. 91. FOUND BRASS DISK SET IN CONCRETE FILLED METAL CASE NEAR THE INTERSECTION OF GRAHAMS FERRY ROAD AND HELENIUS STREET, LOCATED ON THE EXTENDED CENTERLINE OF HELENIUS STREET, 25 FEET EAST OF THE CENTERLINE OF GRAHAMS FERRY ROAD, AND 69 FEET WEST OF PGE POLE 6122. ELEVATION = 291.709

AKS DRAWING FILE: 3895_P02_EX_COND.DWG | LAYOUT: LAYOUT1



NOTES:

1. INFORMATION SHOWN IS BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY AKS ENGINEERING AND FORESTRY, LLC. (MAY 16 - 17 2005), TAX MAP DATA, AND VISUALLY UPDATED SEPTEMBER 3, 2014. THIS MAP SHOULD NOT SERVE AS A BOUNDARY SURVEY. UTILITIES SHOWN ARE BASED ON FIELD LOCATES BY PROVIDERS AND ARE APPROXIMATE. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
3. CONTOUR INTERVAL IS 1 FOOT.
4. SEE SHEET 06 - TREE PRESERVATION AND REMOVAL TABLE AND NOTES FOR TREE INFORMATION.



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**HEATHER RIDGE
 SUBDIVISION**
 TUALATIN OREGON
 WASHINGTON COUNTY ASSESSOR'S MAP 2S 1 34AC
 TAX LOT 200

EXISTING CONDITIONS

DESIGNED BY: MTS
 DRAWN BY: MTS/SDL
 CHECKED BY: AHH
 SCALE: AS NOTED
 DATE: 09/17/2014

REGISTERED PROFESSIONAL LAND SURVEYOR
ALEXANDER H. HURLEY
 LICENSE NO. 125307
 EXPIRES: JUL 16, 2003
 RENEWS: 6/30/15

REVISIONS:
 JOB NUMBER
3895
 SHEET
02

CURVE TABLE				
CURVE	RADIUS	DELTA	LENGTH	CHORD
C1	15.00'	90°15'48"	23.63'	S45°04'32"E 21.26'
C2	15.50'	90°00'00"	24.35'	N44°47'34"E 21.92'
C3	54.00'	111°3'08"	10.57'	N5°33'50"E 10.56'
C4	54.00'	23°24'04"	22.05'	N22°52'26"E 21.90'
C5	54.00'	44°31'50"	41.97'	N56°50'23"E 40.92'
C6	54.00'	8°33'20"	8.06'	N83°22'58"E 8.06'
C7	54.00'	26°14'48"	24.74'	S79°12'58"E 24.52'
C8	54.00'	26°25'27"	24.90'	S52°52'50"E 24.68'
C9	54.00'	26°28'56"	24.96'	S26°25'39"E 24.74'
C10	54.00'	57°30'47"	54.20'	S15°34'13"W 51.96'
C11	54.00'	36°17'33"	34.20'	S62°28'22"W 33.64'
C12	15.00'	80°49'35"	21.16'	S40°12'21"W 19.45'
C13	15.50'	90°00'00"	24.35'	S45°12'26"E 21.92'
C14	85.00'	48°47'23"	72.38'	N24°11'13"E 70.21'

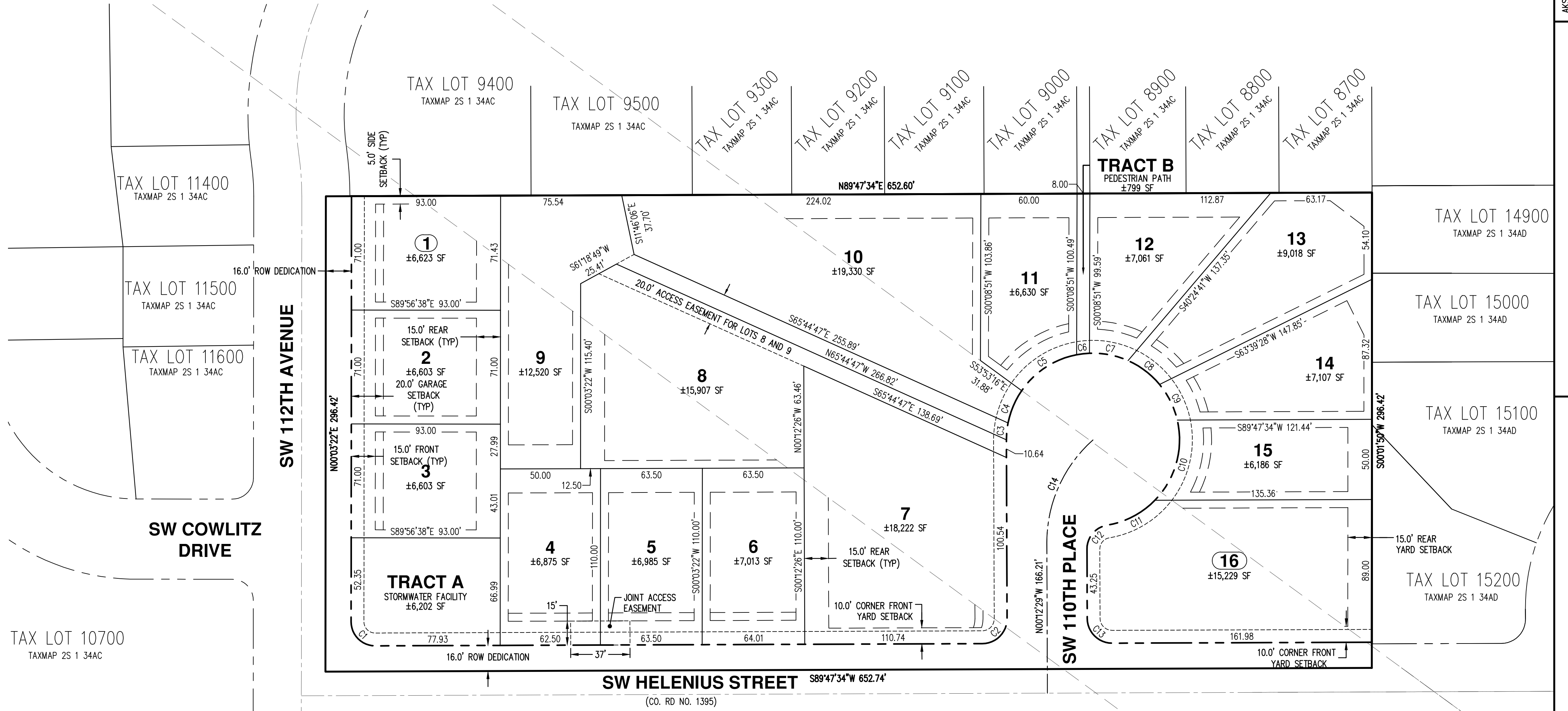
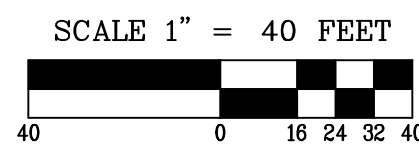
SITE ZONING: RL (LOW DENSITY RESIDENTIAL)
 GROSS SITE AREA: 193,464 SF = 4.44 AC

UNDEVELOPABLE AREAS:
 R.O.W.: 28,552 SF = 0.66 AC
 USABLE OPEN SPACE: 799 SF = 0.02 AC
 STORMWATER TRACT: 6,202 SF = 0.14 AC

NET SITE AREA: 157,911 SF = 3.63 AC
 MAX DENSITY (6.4 LOTS/AC): 23 LOTS

PROPOSED RESIDENTIAL UNITS: 16 LOTS
 NET RESIDENTIAL DENSITY: 4.4 LOTS/AC
 AVERAGE LOT SIZE: 9,699 SF

- NOTES:**
- THE PURPOSE OF THIS PRELIMINARY PLAT IS TO SHOW THE PROPOSED LOT DIMENSIONS FOR PLANNING PURPOSES. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY PURPOSES.
 - TRACT "A" AND TRACT "B" TO BE DEDICATED TO THE CITY OF TUALATIN.



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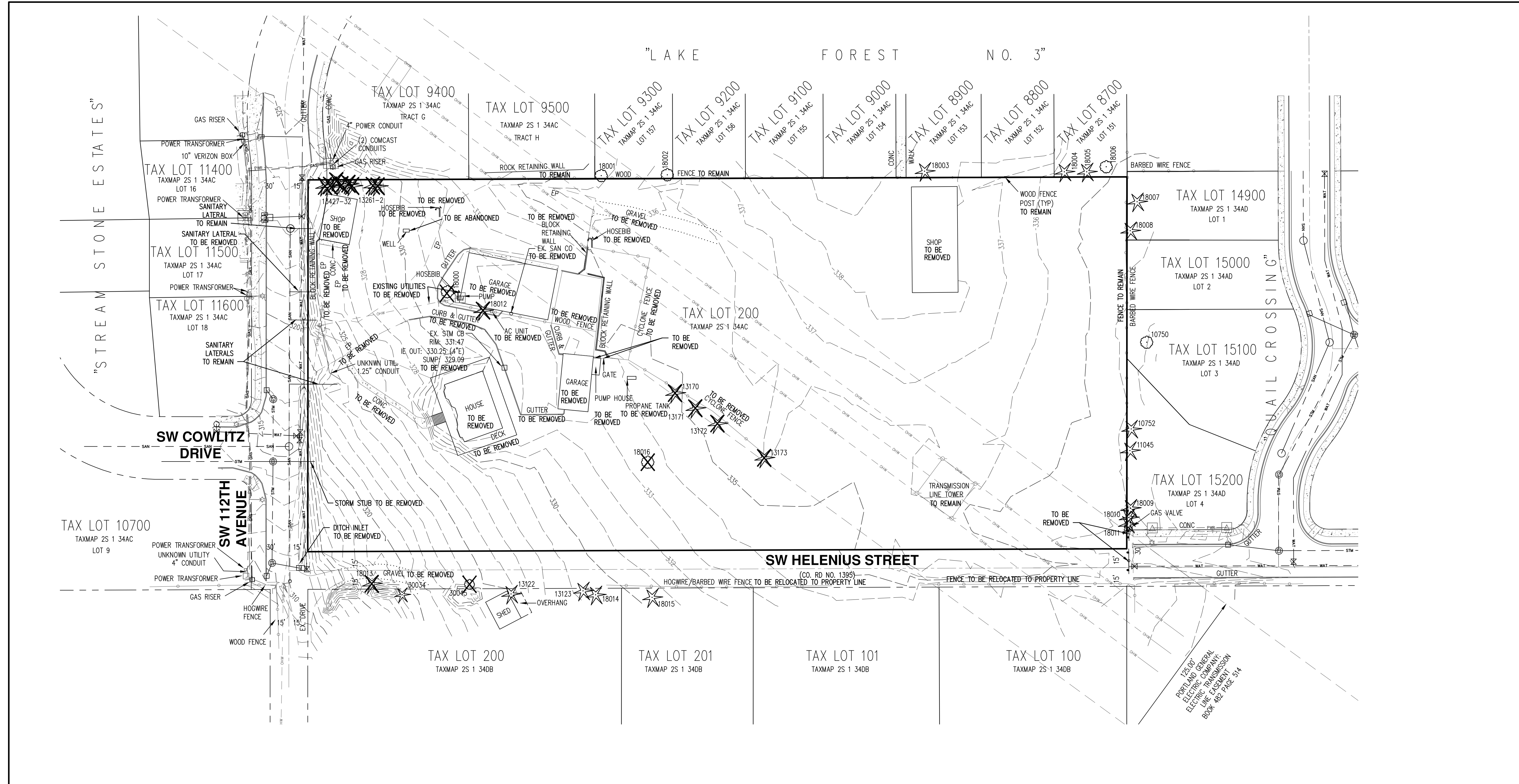
PRELIMINARY PLAT

DESIGNED BY: MTS
 DRAWN BY: MTS/SDL
 CHECKED BY: AHH
 SCALE: AS NOTED
 DATE: 09/17/2014

REGISTERED PROFESSIONAL LAND SURVEYOR
 ALEXANDER H. HURLEY
 LICENSE NO. 12345
 RENEWS: 6/30/15

JOB NUMBER
3895
 SHEET
03

AKS DRAWING FILE: 3895_P03_PLAT.DWG | LAYOUT: LAYOUT1



LEGEND

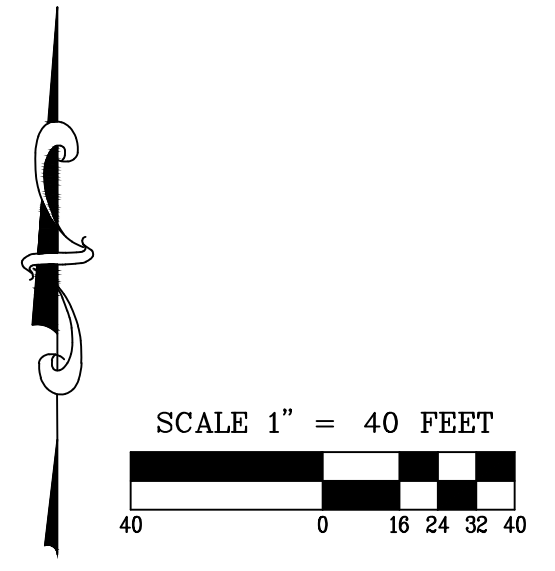
EXISTING GROUND CONTOUR (1 FT)

EXISTING GROUND CONTOUR (5 FT)

EXISTING TREE TO BE REMOVED

EXISTING TREE TO REMAIN

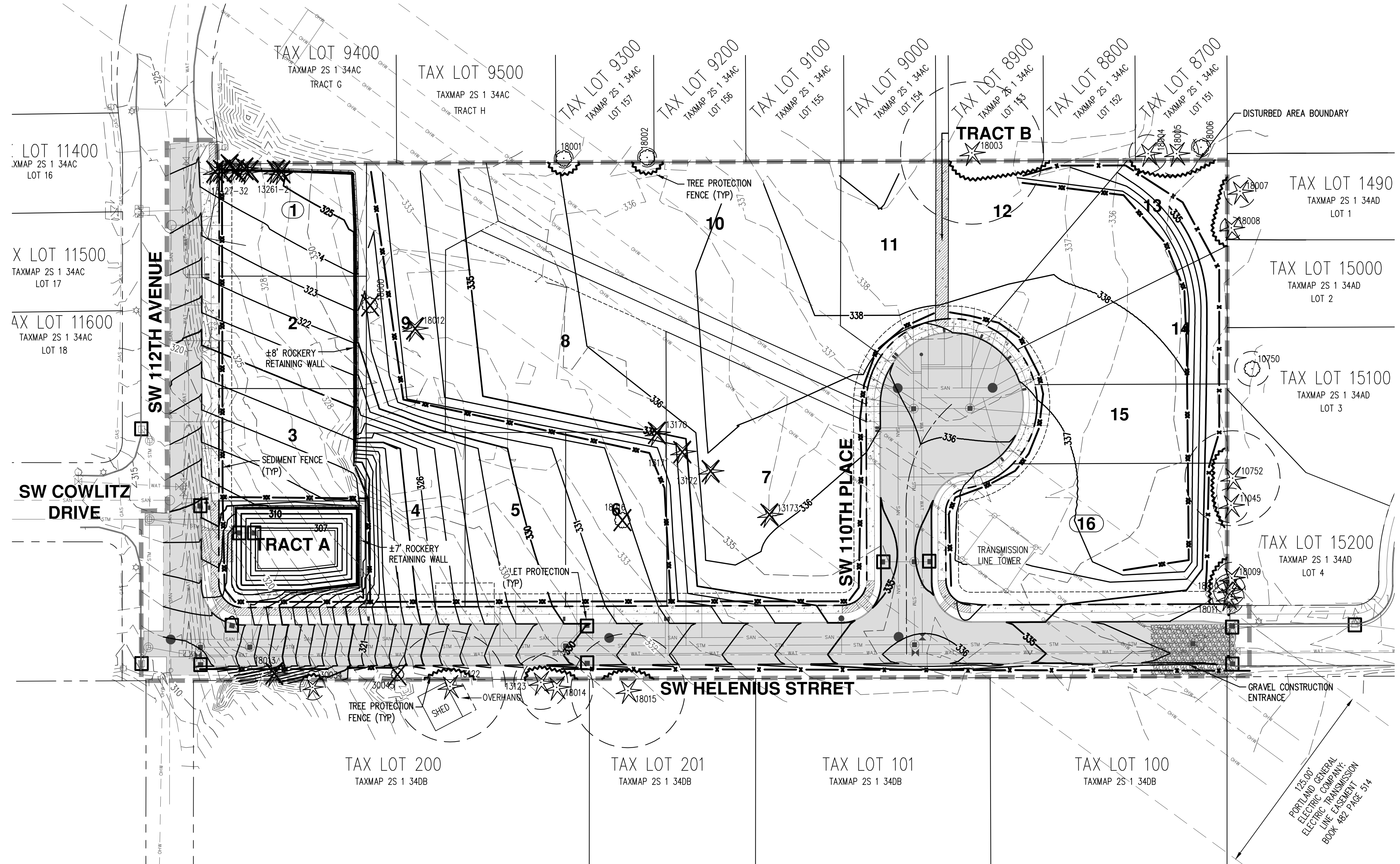
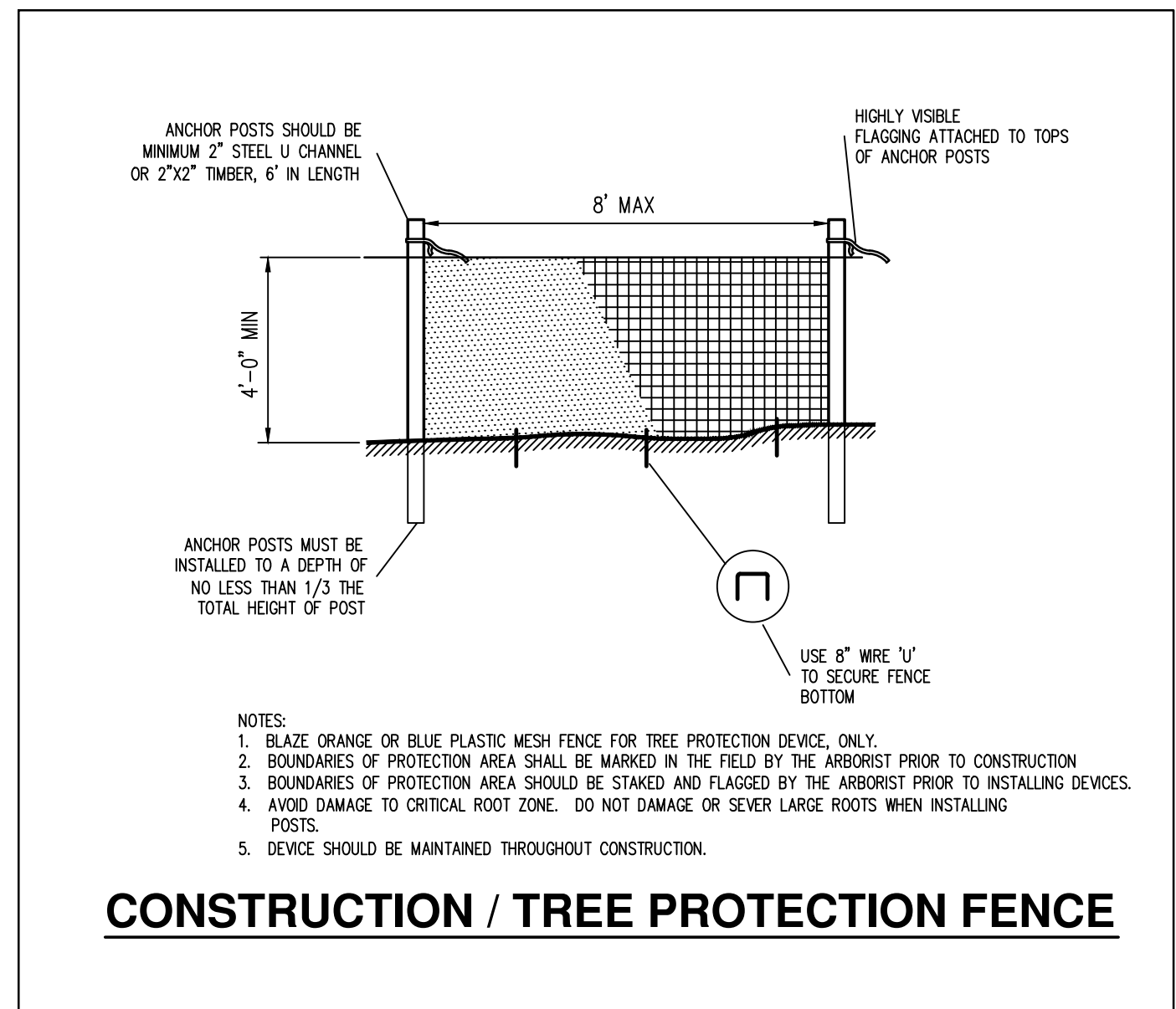
- NOTE:**
- EXISTING WELLS AND SEPTIC TANKS TO BE ABANDONED PER DEQ, OREGON WATER RESOURCES DEPARTMENT, AND CITY OF TUALATIN REQUIREMENTS.
 - SEE SHEET 05 - PRELIMINARY GRADING, EROSION CONTROL, AND TREE REMOVAL PLAN AND 06 - TREE PRESERVATION AND REMOVAL TABLE AND NOTES FOR TREE REMOVAL INFORMATION.



AKS DRAWING FILE: 3895-P04-PRE-DEMO-PLANNING | LAYOUT: LAYOUT1

LEGEND

EXISTING GROUND CONTOUR (1 FT)	---102---
EXISTING GROUND CONTOUR (5 FT)	---100---
FINISHED GRADE CONTOUR (1 FT)	---102---
FINISHED GRADE CONTOUR (5 FT)	---100---
DISTURBED AREA	-----
TREE PROTECTION FENCE	-----
SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING)	-----
SEDIMENT FENCE (TO BE INSTALLED AFTER GRADING)	-----
INLET PROTECTION	□
GRAVEL CONSTRUCTION ENTRANCE	▨
NEW IMPERVIOUS AREA	■
DECIDUOUS / CONIFEROUS	○ / *
EXISTING TREE TO REMAIN	○ / *
EXISTING TREE TO BE REMOVED	⊗ / ⊗
TREE ROOT PROTECTION ZONE. (1 FOOT RADIUS PER INCH DBH)	○
TREE PROTECTION FENCE	-----



120' 00"
 PORTLAND GENERAL
 ELECTRIC COMPANY
 LINE ENCASUREMENT
 BOOK 182 PAGE 914

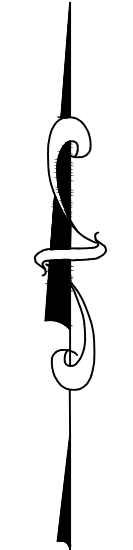
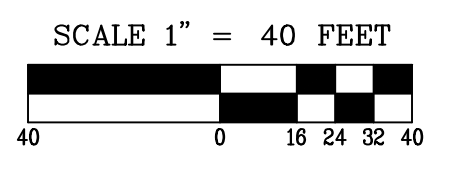


Table with columns: Tree #, DBH (in.), Common Name (Scientific name), Condition/Comments, Hazard Rating 4*, Windthrow Rating**, Reason for Removal. Lists 44 individual trees with their respective attributes and notes.

Total Number of On Site Trees: 15
Total Number of Trees within adjacent ROW: 2
Number of Trees to be Removed for Construction: 12 (includes removal of trees within SW Helenius Road ROW)
Number of Hazard Trees to be Removed: 5
Total Number of Trees to be Removed: 17

Hazard Rating: 1=LOW RISK, 2=MODERATE RISK, 3=HIGH RISK, 4=EXTREME RISK.
Windthrow Rating: A=Most Windthrow Resistant, B=Moderate Windthrow Resistance, C=Least Windthrow Resistant

Trees associated with this development have been evaluated and assessed. Trees shown to be preserved should reasonably be able to be preserved in light of the development proposed, appear healthy, and do not appear to pose an imminent hazard to persons or property.

Arborist Disclosure Statement:

Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the health of trees, and attempt to reduce the risk of living near trees.

At the completion of construction, all trees should once again be reviewed to evaluate their hazard rating. Land clearing and removal of adjacent trees can expose previously unseen defects and otherwise healthy trees can be damaged during construction.

TREE PROTECTION NOTES:

- A. TIMELINE FOR CLEARING, GRADING, AND INSTALLATION OF TREE PROTECTION MEASURES...
B. PLACING MATERIALS NEAR TREES. NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE PROTECTED AREA...
C. ATTACHMENTS TO TREES DURING CONSTRUCTION - NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE...
D. PROTECTIVE BARRIER. BEFORE DEVELOPMENT, LAND CLEARING, FILLING OR ANY LAND ALTERATION...
E. THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE CRITICAL ROOT ZONE OF TREES...
F. IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED...
G. THE APPLICANT SHALL NOT INSTALL AN IMPERVIOUS SURFACE...
H. TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE...
I. TREES AND OTHER VEGETATION TO BE RETAINED SHALL BE PROTECTED FROM EROSION...
J. DIRECTIONAL FELLING OF TREES SHALL BE USED...
K. THE PROJECT ARBORIST MAY REQUIRE ADDITIONAL TREE PROTECTION MEASURES...
L. NO STORAGE OF MATERIALS SHALL BE LOCATED WITHIN THE DRIP LINE...
M. SOME TREES SHOWN TO BE SAVED MAY NEED TO BE REMOVED DURING / AFTER CONSTRUCTION...
N. TREES SHOWN TO BE SAVED SHOULD BE EVALUATED BY THE PROJECT ARBORIST AFTER CONSTRUCTION.

ADDITIONAL NOTES:

NO EXCAVATION, TRENCHING, GRADING, ROOT PRUNING OR OTHER ACTIVITY SHALL OCCUR WITHIN THE TREE PROTECTION ZONE UNLESS DIRECTED BY AN ARBORIST PRESENT ON SITE AND APPROVED BY THE PROJECT ARBORIST.

ARBORIST DISCLOSURE STATEMENT

ARBORISTS ARE TREE SPECIALISTS WHO USE THEIR EDUCATION, KNOWLEDGE, TRAINING, AND EXPERIENCE TO EXAMINE TREES, RECOMMEND MEASURES TO ENHANCE THE HEALTH OF TREES, AND ATTEMPT TO REDUCE THE RISK OF LIVING NEAR TREES.

ARBORISTS CANNOT DETECT EVERY CONDITION THAT COULD POSSIBLY LEAD TO THE STRUCTURAL FAILURE OF A TREE. TREES ARE LIVING ORGANISMS THAT FAIL IN WAYS WE DO NOT FULLY UNDERSTAND.

TREES CAN BE MANAGED, BUT THEY CANNOT BE CONTROLLED. TO LIVE NEAR TREES IS TO ACCEPT SOME DEGREE OF RISK.

TREE REMOVAL NOTES:

- 1. SPOIL SITE PERMIT: WHEN THE MATERIAL AND DEBRIS RESULTING FROM THE CLEARING AND GRUBBING OPERATIONS ARE DISPOSED...
2. CONTRACTOR SHALL ONLY REMOVE THOSE TREES DESIGNATED FOR REMOVAL AS PART OF THE UPPER TUALATIN PROJECT...
3. ALL TREES, STUMPS, VEGETATION AND DEBRIS NOT DESIGNATED TO REMAIN SHALL BE CLEARED, REMOVED AND/OR GRUBBED.
4. ALL TIMBER SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
5. DEBRIS RESULTING FROM THE CLEARING AND GRUBBING OPERATIONS SHALL BE DISPOSED OF AT SPOIL SITES...
6. ALL STUMPS LOCATED WITHIN TREE ROOT PROTECTION ZONES OF TREES TO BE PRESERVED ARE TO BE GROUND TO 18 INCHES...
7. THE WORK TO BE COMPLETED UNDER THIS PROJECT SHALL CONSIST OF TREE REMOVAL AND TREE TRIMMING AS LISTED.
A. THE CONTRACTOR SHALL PROVIDE ADEQUATE CREW OF MEN, EQUIPMENT AND MATERIALS TO SAFELY AND EFFICIENTLY COMPLETE THE ASSIGNED WORK...
B. WHENEVER A TREE, WHICH IS NOT SCHEDULED TO BE REMOVED, MUST BE TRIMMED OR PRUNED...
C. THE CONTRACTOR SHALL BE REQUIRED TO CUT TREES TO A HEIGHT OF APPROXIMATELY 12'...
D. THE CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST GOVERNMENTAL SAFETY REGULATIONS...
E. THE CONTRACTOR SHALL MAKE ALL THE NECESSARY ARRANGEMENTS WITH ANY UTILITY THAT MUST BE PROTECTED...
F. ANY MATERIAL RESULTING FROM THE TRIMMING OR REMOVAL OF ANY TREES SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR.
G. HAZARDOUS TREES-REPORTING - ANY PERSON ENGAGED IN TRIMMING OR PRUNING WHO BECOMES AWARE OF A TREE OF DOUBTFUL STRENGTH...
H. DAMAGES-ANY DAMAGE CAUSED BY THE CONTRACTOR, INCLUDING, BUT NOT LIMITED TO, BROKEN SIDEWALK, CURB, RUTTED LAWN...
I. ANY BRUSH CLEARING REQUIRED WITHIN THE TREE PROTECTION ZONE SHALL BE ACCOMPLISHED WITH HAND OPERATED EQUIPMENT.
J. TREES TO BE REMOVED SHALL BE FELLE D SO AS TO FALL AWAY FROM TREE ROOT PROTECTION ZONES...
K. ALL DOWNED BRUSH AND TREES SHALL BE REMOVED FROM THE TREE PROTECTION ZONE EITHER BY HAND OR WITH EQUIPMENT SITTING OUTSIDE THE TREE ROOT PROTECTION ZONE...
L. IF TEMPORARY HAUL OR ACCESS ROADS MUST PASS OVER THE ROOT AREA OF TREES TO BE RETAINED...
M. PRUNING TREES SHALL BE PRUNED PRIOR TO THE START OF CONSTRUCTION.



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PHONE: 503.563.6151
FAX: 503.563.6152
WWW.AKS-ENG.COM

HEATHER RIDGE
SUBDIVISION
TUALATIN
NOTES

TREE PRESERVATION AND
REMOVAL TABLE AND
NOTES

DESIGNED BY: MTS

DRAWN BY: MTS/SDL

CHECKED BY: AHH

SCALE: AS NOTED

DATE: 09/17/2014



RENEWAL DATE: 6/30/15

REVISIONS:

JOB NUMBER

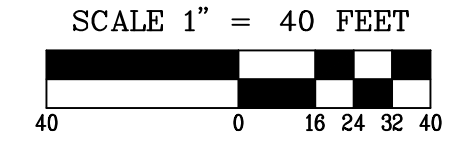
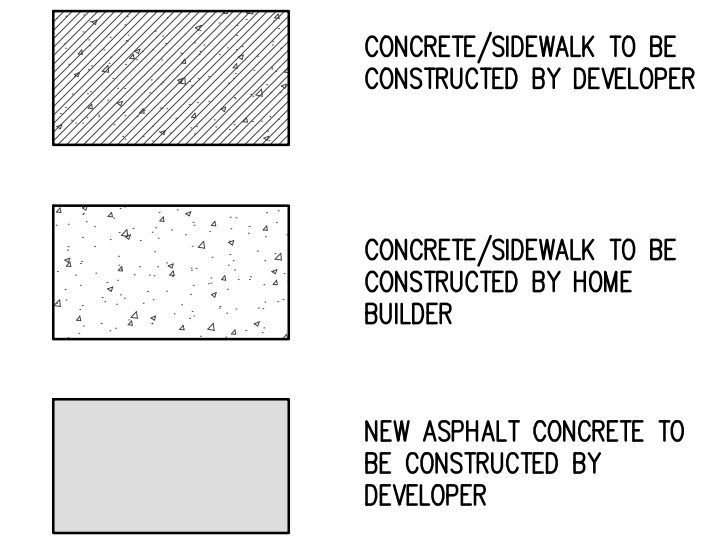
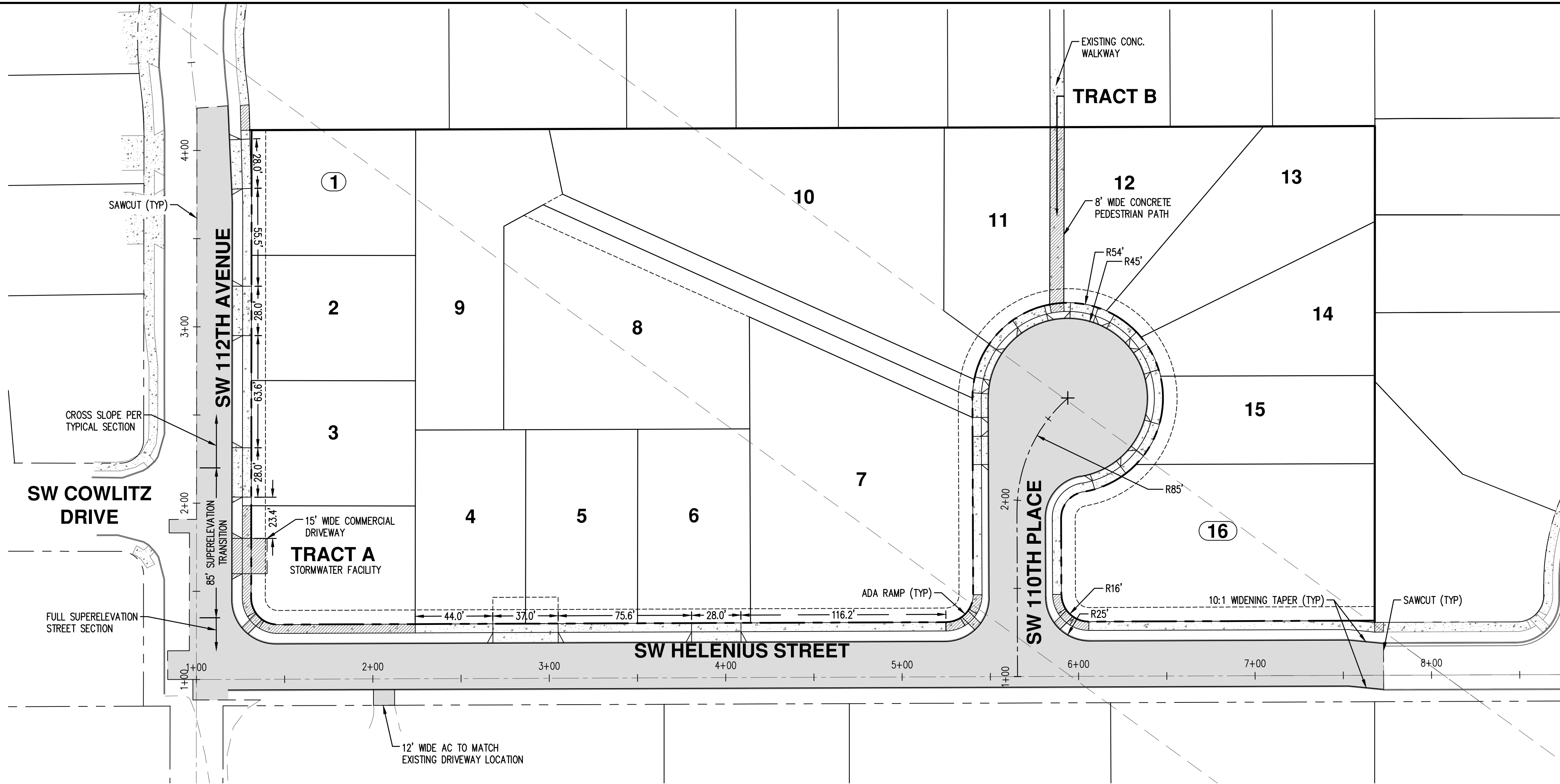
3895

SHEET

06

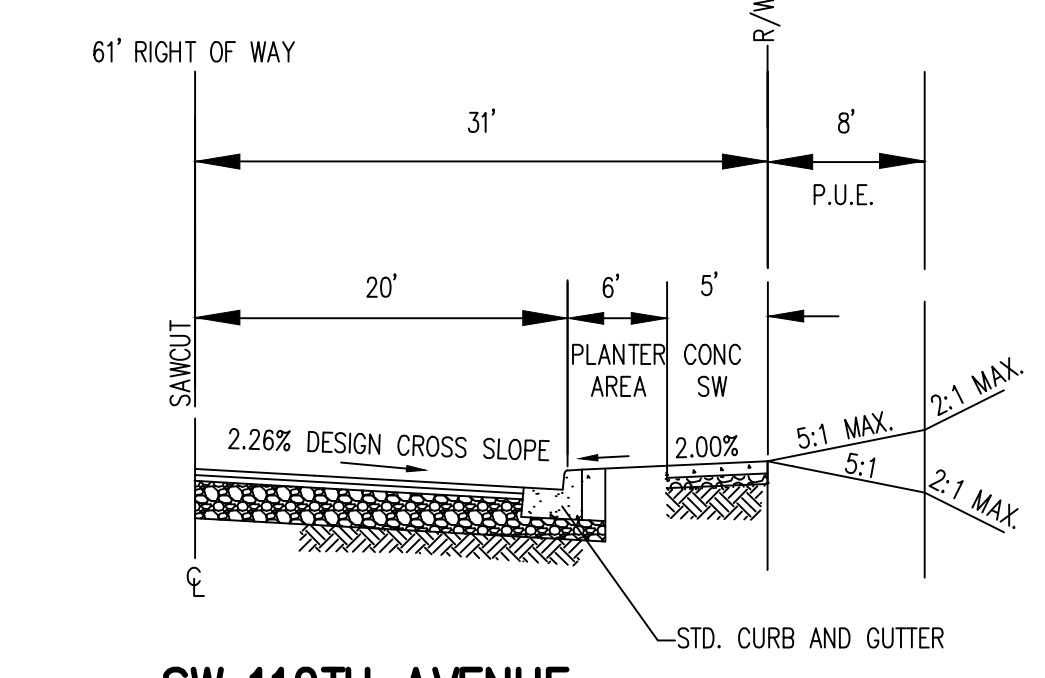
BRUCE R. BALDWIN
CERTIFICATE NUMBER: 19-0684
EXPIRATION DATE: 12/31/14

AKS DRAWING FILE: 3895_P05 GRADING AND EROSION.DWG | LAYOUT: 06



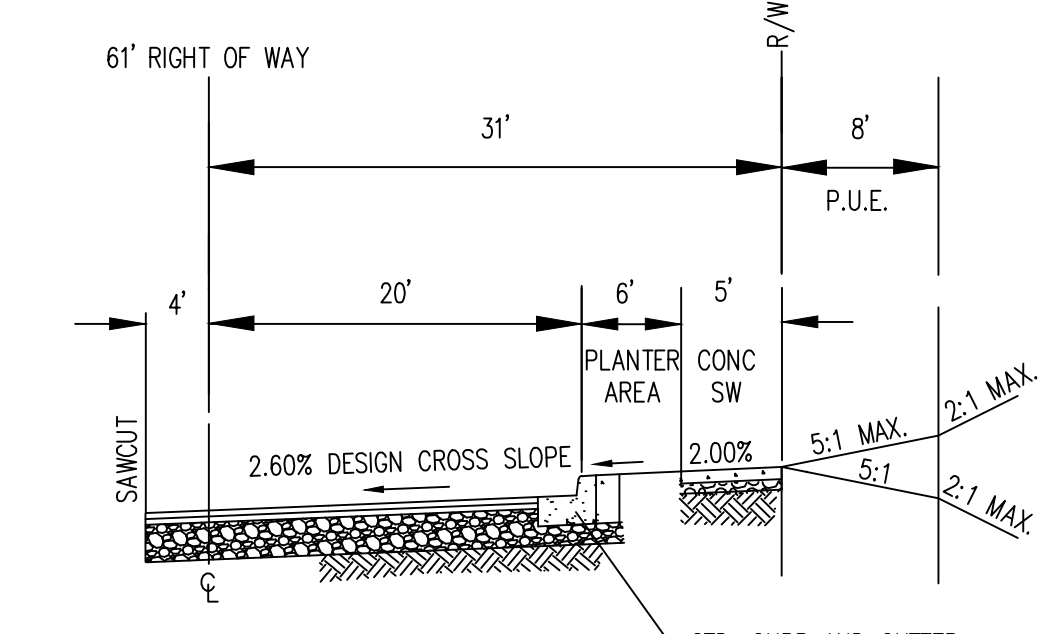
NOTE:

1. DRIVEWAY SPACING AND WIDTHS AS SHOWN HAVE BEEN PRE-APPROVED BY CITY OF TUALATIN STAFF.
2. FRONTAGE FENCES PER SECTION 34.330.1 OF THE CITY OF TUALATIN DEVELOPMENT CODE ARE NOT PROVIDED PER CORRESPONDENCE WITH CITY OF TUALATIN STAFF.



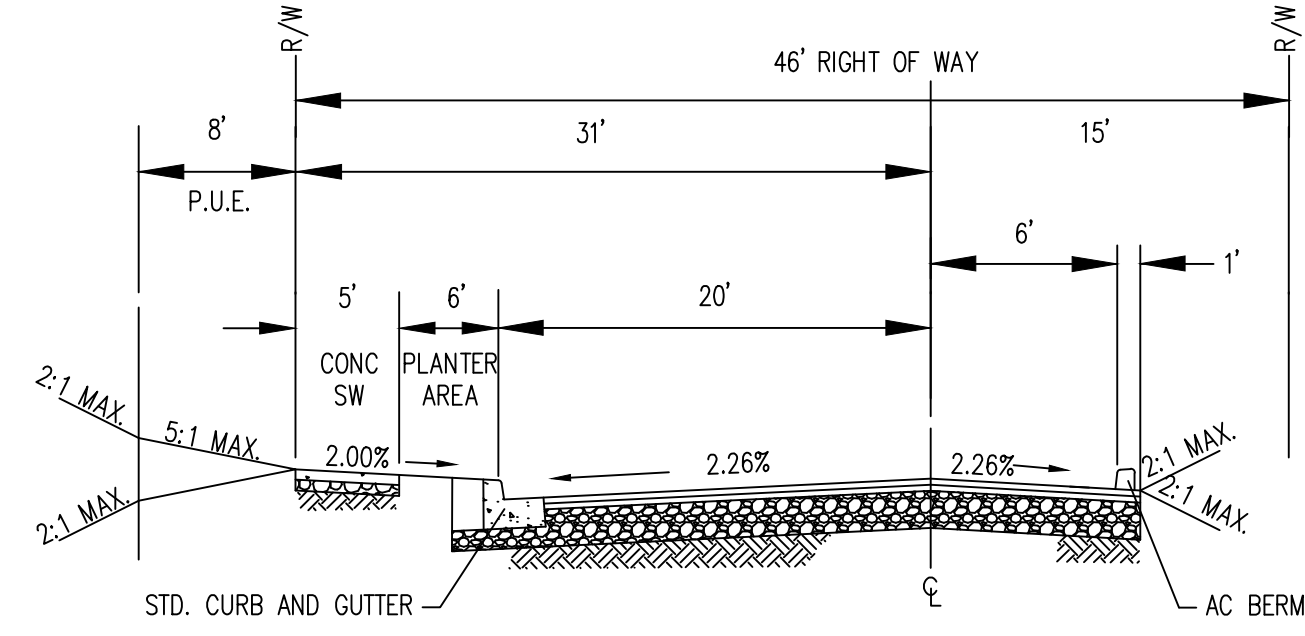
**SW 112TH AVENUE
TYPICAL HALF STREET SECTION**
NOT TO SCALE

3" ASPHALT CONCRETE IN TWO LIFTS
(1-1/2" CLASS "C" OVER 1-1/2" CLASS "B")
2" OF 3/4"-0 LEVELING COURSE OVER
8" OF 1-1/2"-0 BASE COURSE OVER COMPACTED SUBGRADE



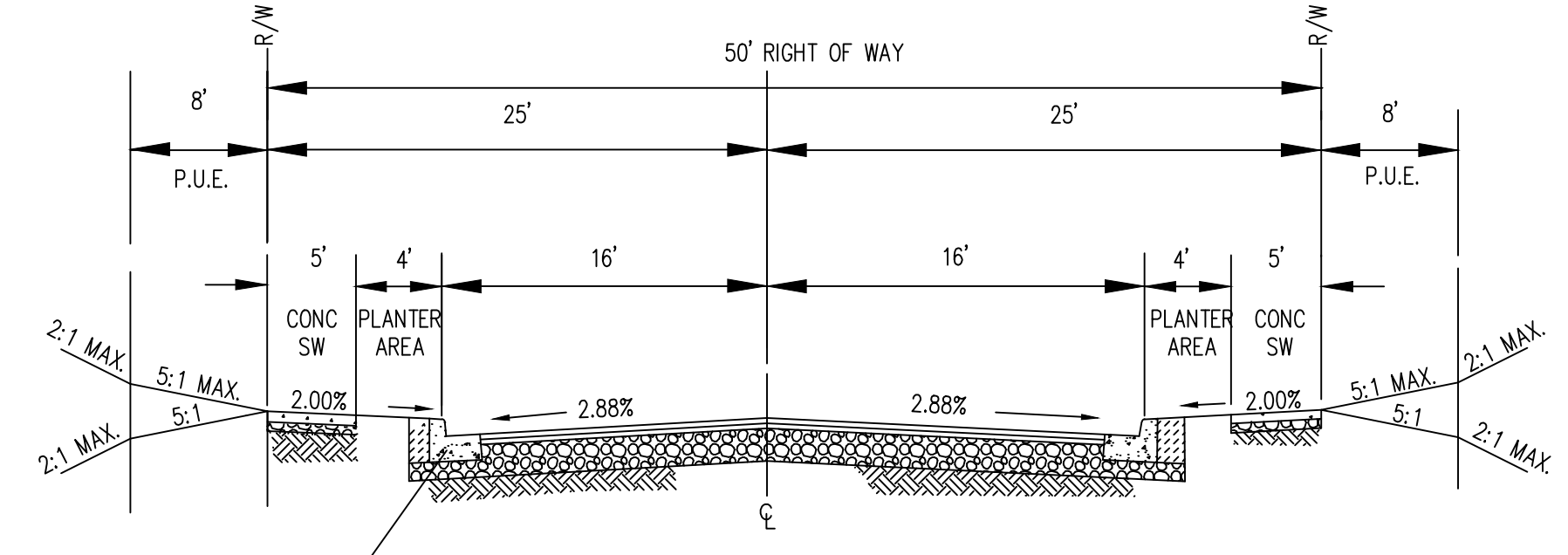
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SUPERELEVATION STREET SECTION**
NOT TO SCALE

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(1-1/2" CLASS "C" OVER 1-1/2" CLASS "B")
2" OF 3/4"-0 LEVELING COURSE OVER
8" OF 1-1/2"-0 BASE COURSE OVER COMPACTED SUBGRADE



**SW HELENIUS STREET
TYPICAL HALF STREET SECTION**
NOT TO SCALE

3" ASPHALT CONCRETE IN TWO LIFTS
(1-1/2" CLASS "C" OVER 1-1/2" CLASS "B")
2" OF 3/4"-0 LEVELING COURSE OVER
8" OF 2"-0 BASE COURSE OVER COMPACTED SUBGRADE



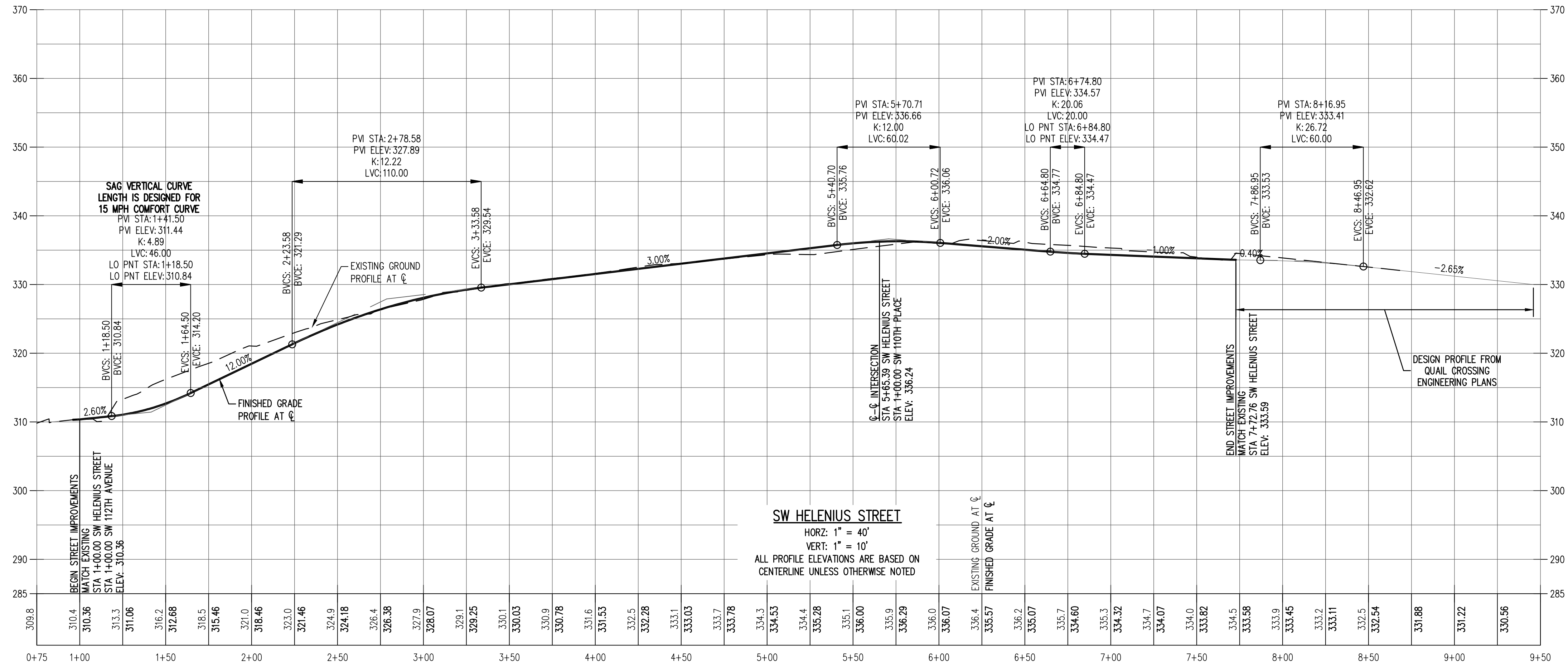
**SW 110TH PLACE
TYPICAL STREET SECTION**
NOT TO SCALE

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(1-1/2" CLASS "C" OVER 1-1/2" CLASS "B")
2" OF 3/4"-0 LEVELING COURSE OVER
6" OF 2"-0 BASE COURSE OVER COMPACTED SUBGRADE

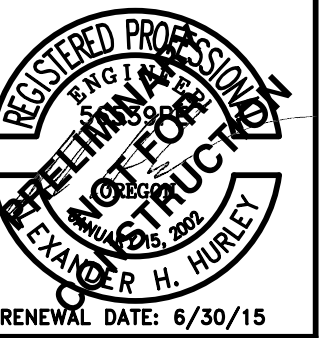
DESIGNED BY:	MTS
DRAWN BY:	MTS/SDL
CHECKED BY:	AHH
SCALE:	AS NOTED
DATE:	09/17/2014



JOB NUMBER	3895
SHEET	07

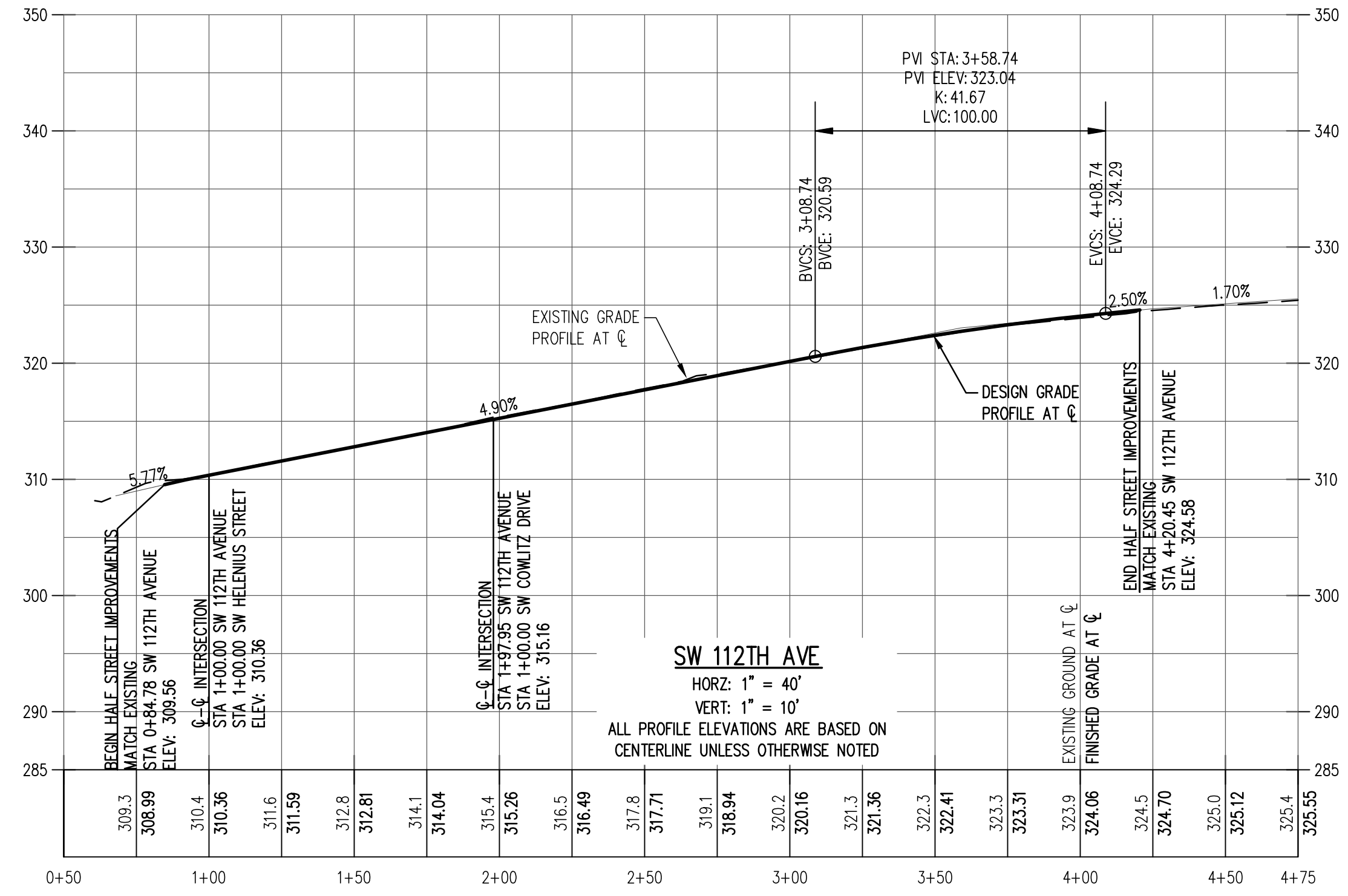
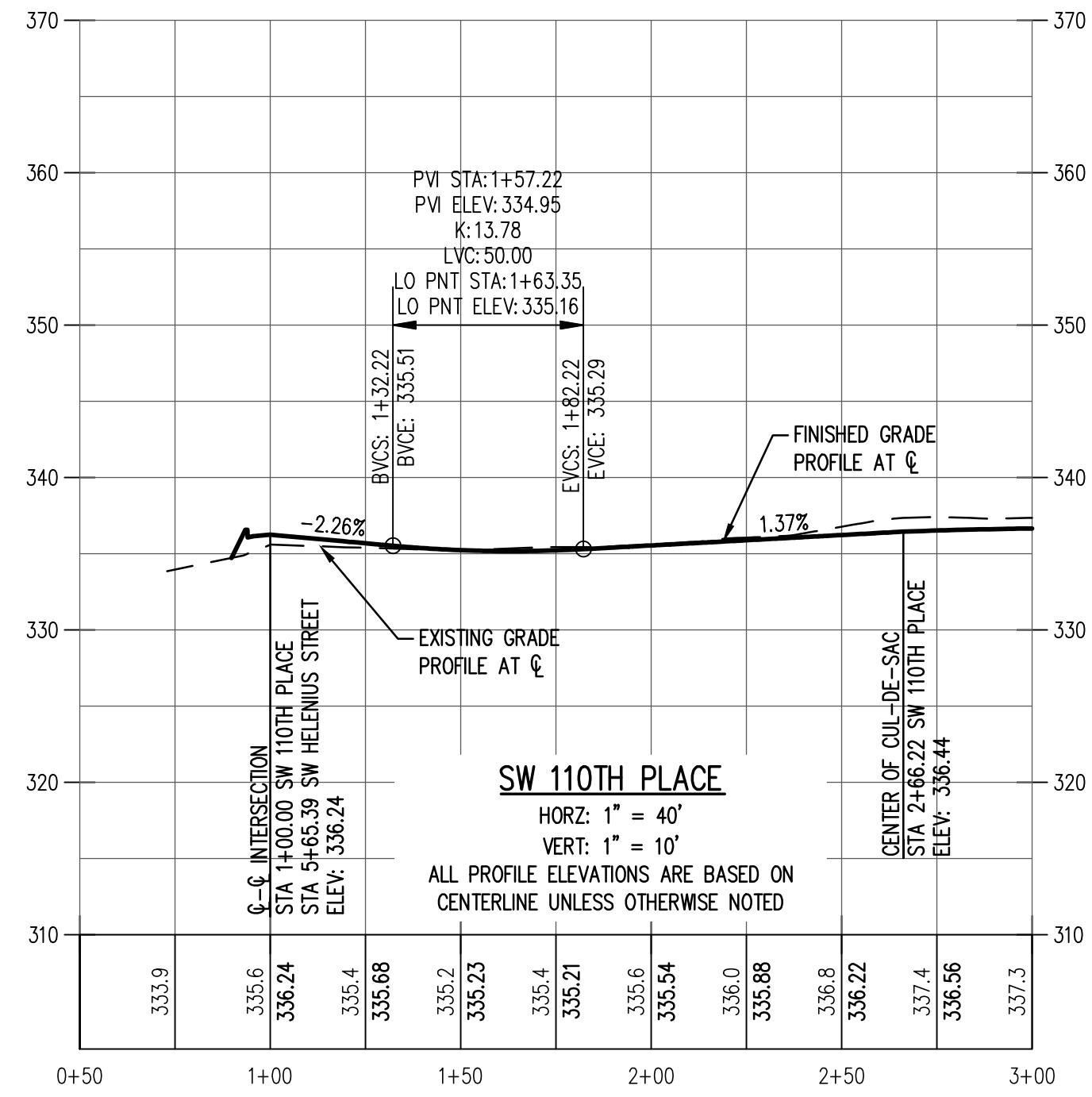


DESIGNED BY: MTS
 DRAWN BY: MTS/SDL
 CHECKED BY: AHH
 SCALE: AS NOTED
 DATE: 09/17/2014



REVISIONS

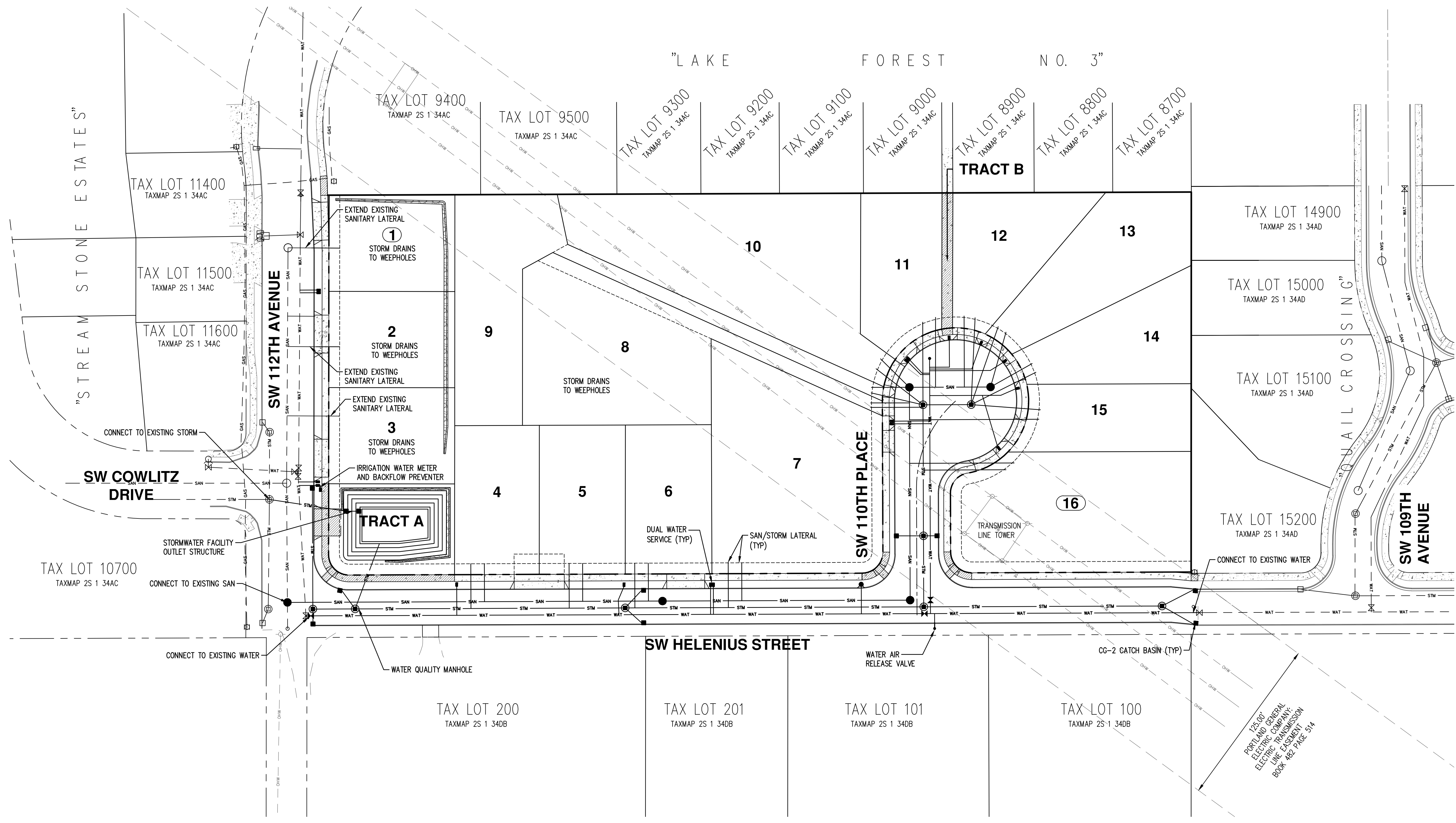
JOB NUMBER
3895
 SHEET
08



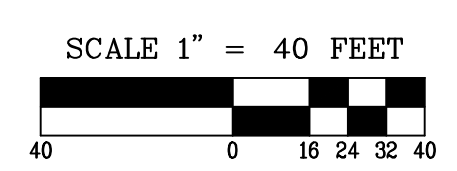
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 DRAWN BY: MTS/SDL
 CHECKED BY: AHH
 SCALE: AS NOTED
 DATE: 09/17/2014

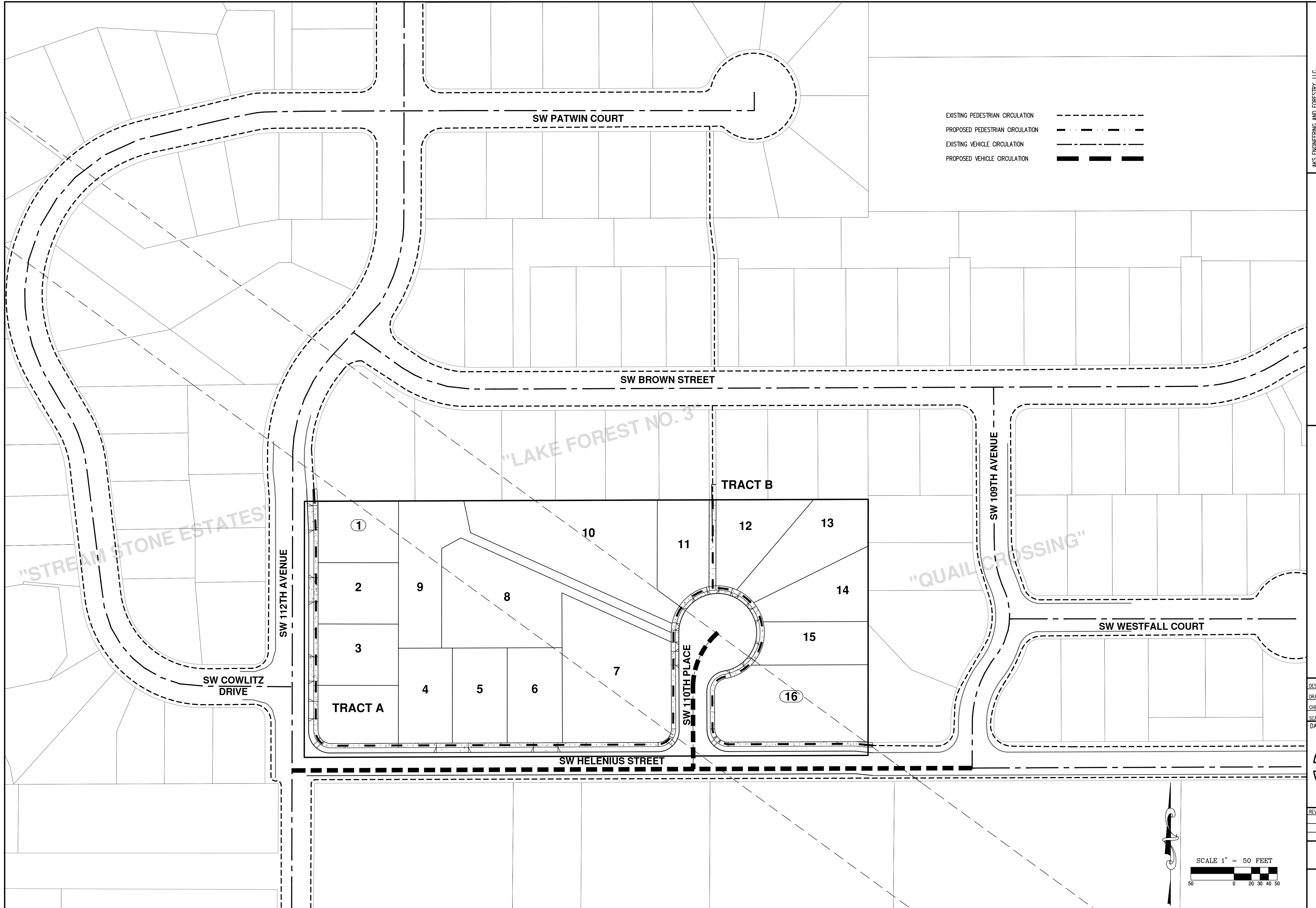
REVISIONS

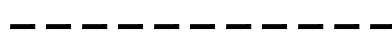
JOB NUMBER
3895
 SHEET
09




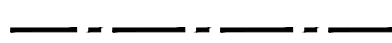
NOTES:
 1. LOTS 1, 2, AND 3 SHALL DRAIN TO CURB WEEP HOLES






EXISTING PEDESTRIAN CIRCULATION 

PROPOSED PEDESTRIAN CIRCULATION 

EXISTING VEHICLE CIRCULATION 


PROPOSED VEHICLE CIRCULATION 

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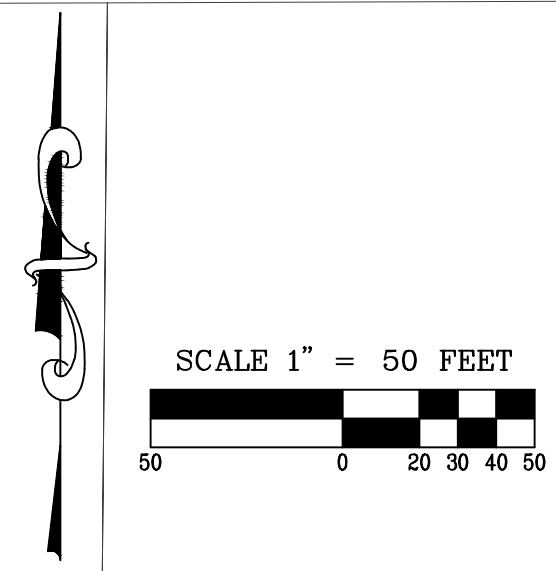
**HEATHER RIDGE
 SUBDIVISION**
 TUALATIN OREGON
 WASHINGTON COUNTY ASSESSOR'S MAP 2S 1.34AC
 TAX LOT 200

**PRELIMINARY
 CIRCULATION PLAN**

DESIGNED BY: MTS
 DRAWN BY: MTS/SDL
 CHECKED BY: AHH
 SCALE: AS NOTED
 DATE: 09/17/2014


 RENEWAL DATE: 6/30/15
 REVISIONS:

JOB NUMBER
3895
 SHEET
11



HEATHER RIDGE

PRELIMINARY STORMWATER REPORT

DATE: September, 2014

CLIENT: Heather Ridge Subdivision, LLC.
9180 SW Burnham St.
Tigard, OR 97223

ENGINEERING CONTACT: Alex Hurley, PE, PLS

ENGINEERING FIRM: AKS Engineering & Forestry, LLC.



12965 SW Herman Road, Suite 100
Tualatin, OR 97062
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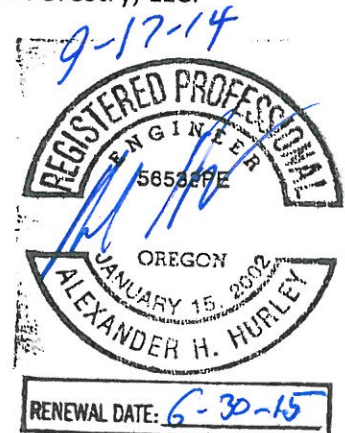


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- 3.0 REGULATORY DESIGN CRITERIA
 - 3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA
 - 3.2 STORMWATER QUALITY MANAGEMENT CRITERIA
- 4.0 DESIGN METHODOLOGY
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 - 5.2 PRE-DEVELOPED SITE CONDITIONS
 - 5.2.1 SITE TOPOGRAPHY
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PRELIMINARY STORMWATER REPORT

PROJECT: HEATHER RIDGE

1.0 PURPOSE OF REPORT

The purpose of this report is to analyze the effects that the proposed developments will have on the existing stormwater conveyance system, document the criteria, methodology, and informational sources by which the proposed stormwater system was designed, and discuss the results of the analysis.

2.0 PROJECT LOCATION/DESCRIPTION

The project site is on a parcel of land (approximately 4.44 acres) in Section 34, Township 2 South, Range 1 West, Willamette meridian, Washington County, Oregon (Tax Lot 200). The project site is located east of the intersection of SW 112th Avenue and SW Cowlitz Drive.

3.0 REGULATORY DESIGN CRITERIA

3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA

Per Clean Water Services (CWS) Design and Construction Standards Manual for Sanitary Sewer and Surface Water Management (R&O 07-20), Section 4.03 Water Quantity Control Requirements, on-site detention is required when any of the following conditions exist:

- 1. There is an identified downstream deficiency and the District or City determines that detention rather than conveyance system enlargement is the more effective solution.*
- 2. There is an identified regional detention site within the boundary of the development.*
- 3. Water quantity facilities are required by District-adopted watershed management plans or adopted subbasin master plans.*

A downstream analysis has been performed in accordance with *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management (R&O 04-9)* and the City of Tualatin's storm water management criteria and a downstream deficiency has been determined. Therefore, the stormwater for the site will be conveyed to a detention pond adjacent to the western property line of the site. This facility will provide on-site detention of post developed flows from the site to pre-developed levels for the 2, 10, and 25 year storm events. Please refer to Section 6.2 and 6.4 of this report for more information.

3.2 STORMWATER QUALITY MANAGEMENT CRITERIA

Per *Clean Water Services (CWS) Design and Construction Standards Manual for Sanitary Sewer and Surface Water Management (R&O 07-20)*, Section 4.05.1 and 4.05.3 Water Quality Requirements are:

1. *Owners of new development and other activities which create new impervious surfaces or increase the amount of stormwater runoff or pollution leaving the site are required to construct or fund permanent water quality facilities to reduce contaminants entering the storm and surface water system.*
2. *Stormwater Quality facilities shall be designed to remove 65 percent of the total phosphorous from the runoff from the impervious area that is tributary to the facility.*

The proposed stormwater facility is designed to treat the newly created impervious area from the 16 residential lots and associated public improvements created with this development.

4.0 DESIGN METHODOLOGY

The Santa Barbara Urban Hydrograph (SBUH) Method was used to analyze stormwater runoff from the site. This method utilizes the SCS Type 1A 24-hour design storm. HydroCAD computer software aided in the analysis. Representative CN numbers are obtained from *Technical Release 55, Urban Hydrology for Small Watersheds* and are included in the Appendix. Water quality flow volumes that require treatment were calculated per *CWS R&O 07-20 Section 4.05.6*.

5.0 DESIGN PARAMETERS

5.1 DESIGN STORM – ON-SITE CONVEYANCE SIZING

Stormwater mains, inlets, and laterals for the site are placed at locations that adequately control the stormwater for the site. The stormwater pipes are sized using Manning's equation based on peak flows for the 25-year storm event.

5.2 PRE-DEVELOPED SITE CONDITIONS

5.2.1 SITE TOPOGRAPHY

The project site has slopes between 1-10% sloping to the southwest. The site is vegetated with grass and scattered trees. There is one existing house and three smaller buildings currently on the site.

5.2.2 LAND USE

The current land use for this site is residential with pastureland.

5.3 SOIL TYPE

The soil for the site is classified as Saum silt loams (hydrologic group “C”) according to the USDA Soil Survey for Washington County. Information on this soil type is included with this report.

5.4 POST DEVELOPED SITE CONDITIONS

5.4.1 SITE TOPOGRAPHY

The post-developed site topography consists of 16 residential lots and two public streets.

5.4.2 LAND USE

The site land use will be single family residential.

5.4.3 POST-DEVELOPED INPUT PARAMETERS

See HydroCAD Analysis and Water Quality Calculations

5.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS

Tax Lot 9400 to the north drains onto the site. To the west and the south are public roads, and to the north and east are subdivisions that do not drain to this site.

6.0 CALCULATION METHODOLOGY

6.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING

The stormwater pipes and inlets are adequately sized for flows from the 25-year event.

6.2 PROPOSED STORMWATER QUANTITY CONTROL FACILITY DESIGN

During the downstream analysis, discussed in greater detail in Section 6.4, it was discovered that development would cause a downstream deficiency at structure 600R. This is due to the increased flows off of the site, shown in the table below. In order to prevent the downstream deficiency, post-developed flows need to be reduced to the pre-developed levels. In order to reduce flows, an on-site detention pond is proposed.

The stormwater runoff from the 16 lots and associated public and private improvements to be created with this development will be routed to the detention pond. The pond is sized to detain the post-developed flows for the 2, 10, and 25 year storm events to the pre-developed flows per the Clean Water Services detention requirements (*R&O 07-20 Sections 4.05.6 and 4.06.3*).

The pre-developed and post-developed flows from the site are as follows:

SITE PRE-DEVELOPED AND POST-DEVELOPED FLOWS			
STORM EVENT	TOTAL PRE-DEVELOPED*	TOTAL POST-DEVELOPED (WITHOUT DETENTION)	TOTAL POST-DEVELOPED (WITH DETENTION)
	FLOWS OFFSITE	FLOWS OFFSITE	FLOWS OFFSITE
	(cfs)	(cfs)	(cfs)
2-YR	0.89	1.63	0.86
10-YR	1.53	2.62	1.48
25-YR	1.84	3.11	1.76

*Includes only the pre-developed flows draining to the west. Pre-developed flows draining to the east are not included.

6.3 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN

Stormwater quality management criteria will be addressed via an on-site detention pond designed to meet the requirements of an extended dry basin for water quality flows per the *CWS Design and Construction Standards Manual for Sanitary Sewer and Surface Water management (R&O 07-20) Section 4.06.3*. The proposed detention pond has been sized to treat stormwater runoff from newly created impervious area and detain post-developed flows to pre-developed levels. Detailed calculations are included in the appendix.

Due to topographical constraints, there is a small section at the southwest corner of the site that will not be treated. In order to offset this area, the northern section of SW 112th Avenue that is not currently being treated will be treated by the water quality pond. The proposed impervious area to be treated totals more than the newly created impervious area that is unable to be treated. There is a detailed impervious area map located in the Appendix.

6.4 DOWNSTREAM ANALYSIS

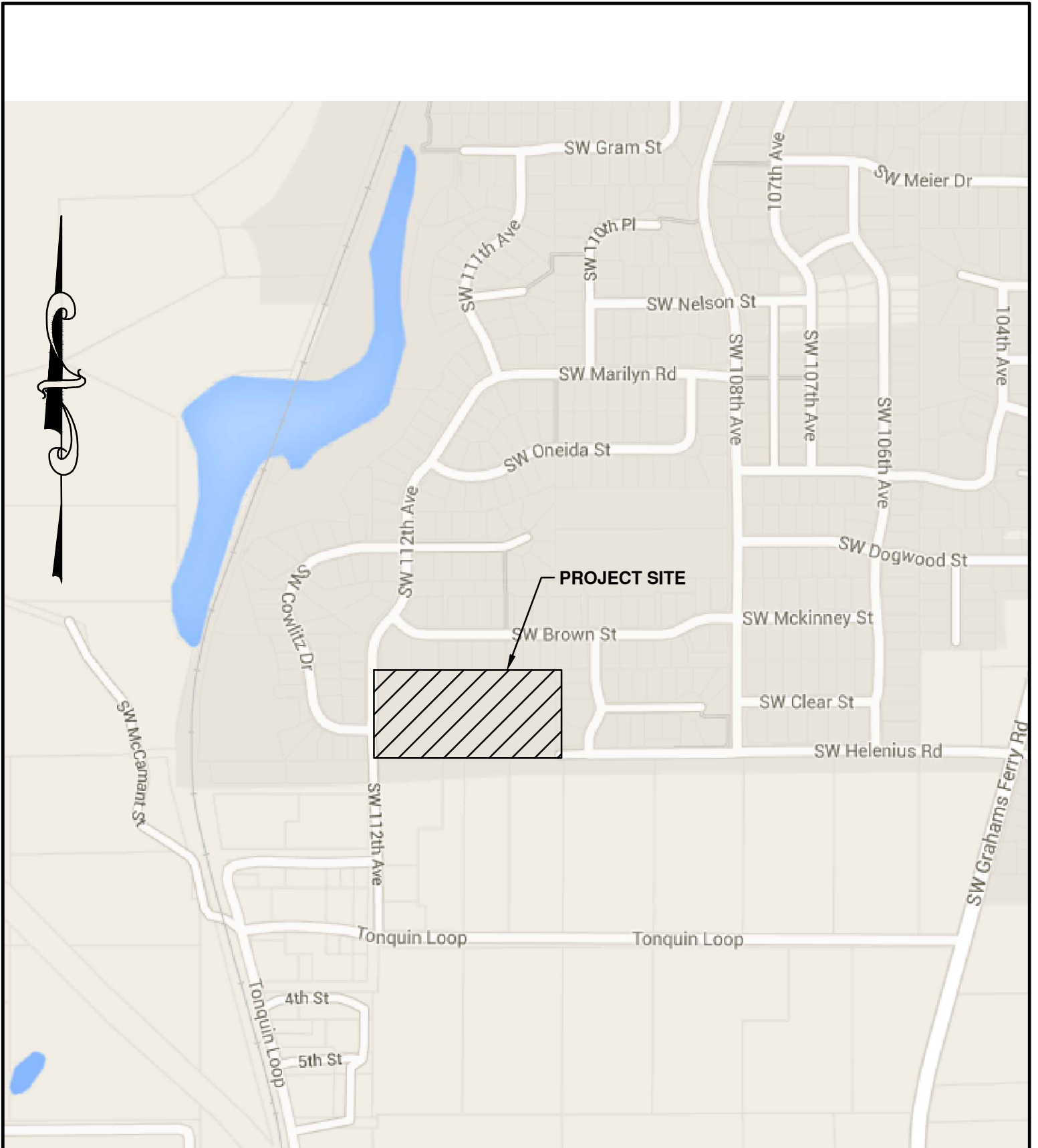
A downstream analysis (Appendix 4) has been performed in accordance with *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management (R&O 04-9) Section 2.04.2* and the City of Tualatin's storm water management criteria. As the table in Section 6.2 shows, post-developed flows without detention are considerably higher than pre-developed, the largest difference being 1.27 cfs for the 25 year storm event.

The downstream analysis was performed to a point where the additional flows were less than 10% of the total drainage flows. This point is located west of adjoining development where storm flows outfall into an existing pond. This point is shown on the downstream catchment map. At this point, the additional flows from the development are 3.3% of the total drainage flows. Since the flows are also below 5% of the total drainage flows, the analysis does not need to continue. In this analysis, a downstream deficiency was determined at structure 600R (as noted on the downstream basin map). The structure does not maintain the minimum 1 foot of required freeboard. In lieu of modifying the downstream conveyance system to alleviate the downstream deficiency, an on-site detention pond is proposed. As Appendix 2.1 shows, the post-developed flows entering the existing conveyance system will be equal to or less than the pre-developed flows for the 2, 10, and 25 year storm events.

With the proposed detention, the downstream deficiency has been alleviated at structure 600R and there are no observable downstream impacts to structures that will result from the stormwater flows from this development.

APPENDIX 1.1

VICINITY MAP



VICINITY MAP

SCALE: 1"=500'

DATE: 8/13/2014

SCALE 1" = 500 FEET



HEATHER RIDGE

DRAWN BY: SDL | CHECKED BY: | DWG: 3895-VICINITY MAP | JOB: 3895

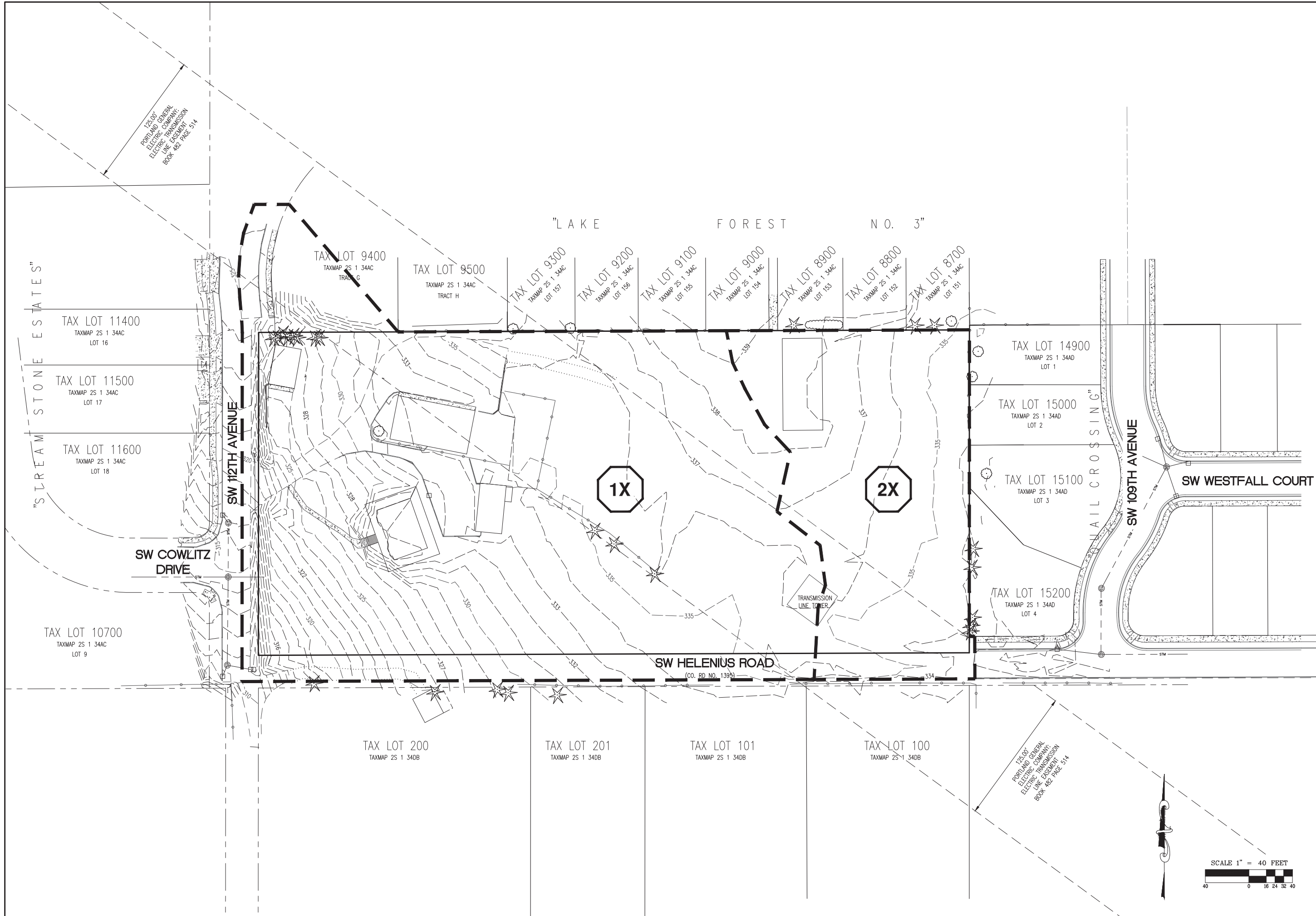
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 12965 SW HERMAN RD SUITE 100
 TUALATIN, OR 97062 www.aks-eng.com
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APPENDIX 1.2

CATCHMENT MAPS

AKS DRAWING FILE: PREDEVELOPED_CATCHMENT.DWG | LAYOUT: LAYOUT1



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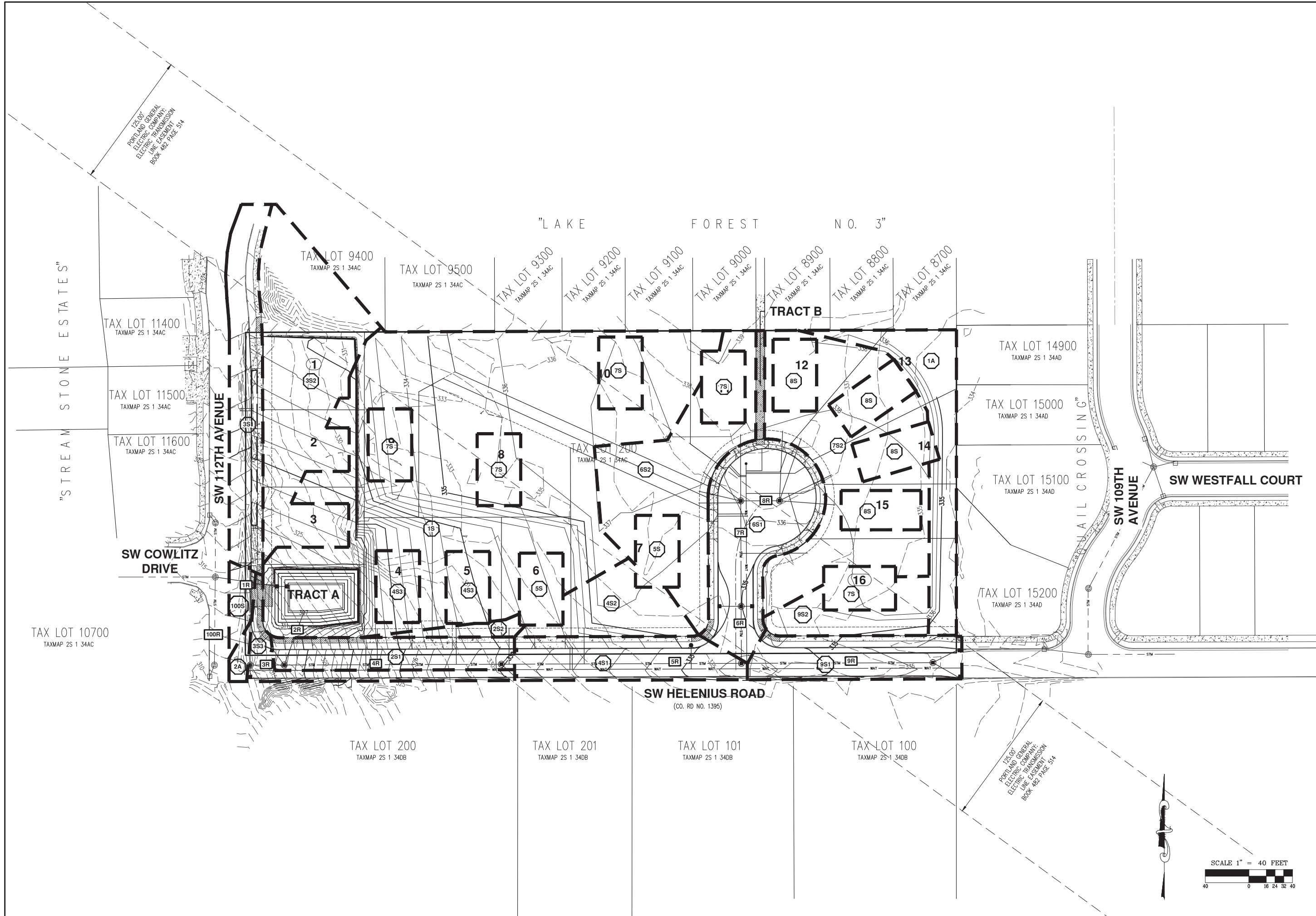
**HEATHER RIDGE
 COMPLETION**

OREGON
 TAX MAP 2S 1 34AC

**PREDEVELOPED
 CATCHMENT**

DESIGNED BY:	
DRAWN BY:	SDL
CHECKED BY:	
SCALE:	AS NOTED
DATE:	8/14/2014
REVISIONS	
JOB NUMBER	3895
SHEET	1

AKS DRAWING FILE: POSTDEVELOPED CATCHMENT.DWG | LAYOUT: LAYOUT1



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**HEATHER RIDGE
 COMPLETION**
 OREGON
 TAX MAP 2S 1 34AC

**POSTDEVELOPED
 CATCHMENT**
 TAX LOTS 200

DESIGNED BY:
 DRAWN BY: SDL
 CHECKED BY:
 SCALE: AS NOTED
 DATE: 9/08/2014

REVISIONS
 JOB NUMBER
3895
 SHEET
2

AKS DRAWING FILE: DOWNSTREAM CATCHMENT REV(DWG) | LAYOUT: LAYOUT1



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OREGON
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DOWNSTREAM CATCHMENT

DESIGNED BY:
 DRAWN BY: SDL
 CHECKED BY:
 SCALE: AS NOTED
 DATE: 9/08/2014

REVISIONS

JOB NUMBER
3895

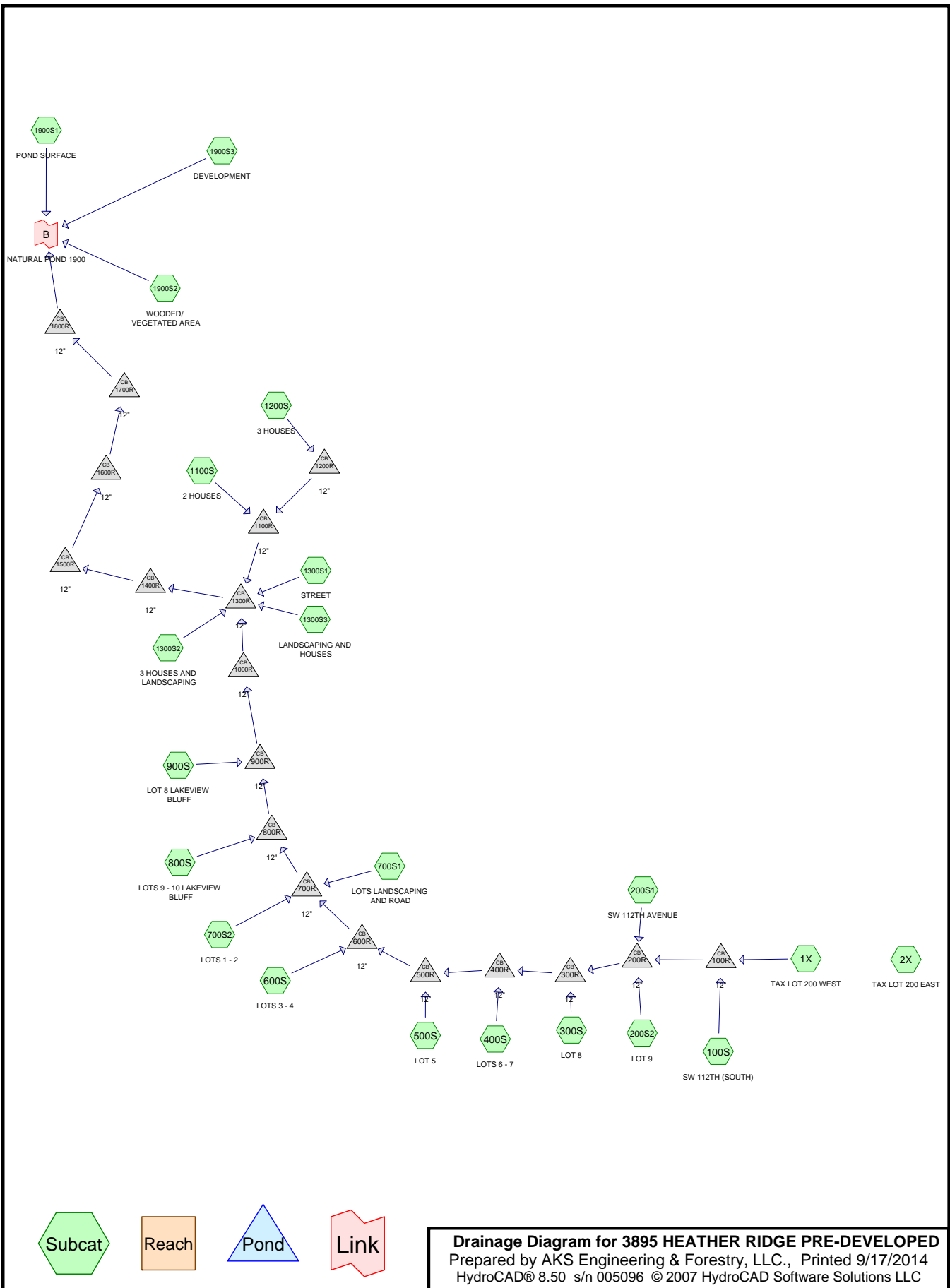
SHEET
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APPENDIX 2

HYDROCAD AND FLOW INFORMATION

APPENDIX 2.1

PRE-DEVELOPED CONDITION



3895 HEATHER RIDGE PRE-DEVELOPED

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Type IA 24-hr 25-Year Rainfall=3.90"

Printed 9/17/2014

Page 2

Summary for Subcatchment 1X: TAX LOT 200 WEST

Runoff = 1.82 cfs @ 8.01 hrs, Volume= 0.851 af, Depth> 2.60"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

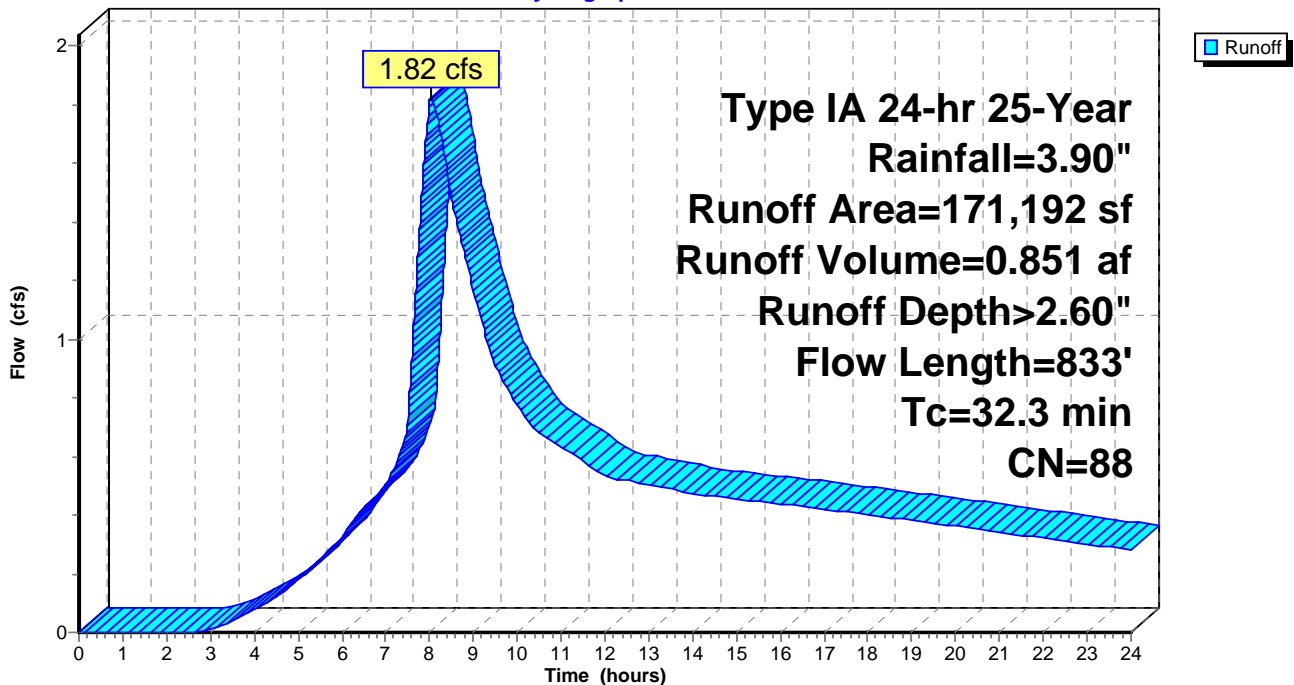
Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
136,192	86	<50% Grass cover, Poor, HSG C
* 33,982	98	AC PAVEMENT, ROOFS
1,018	89	Gravel roads, HSG C
171,192	88	Weighted Average
137,210		Pervious Area
33,982		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	300	0.0220	0.19		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"
6.6	533	0.0375	1.36		Shallow Concentrated Flow, PASTURE/MEADOW Short Grass Pasture Kv= 7.0 fps
32.3	833	Total			

Subcatchment 1X: TAX LOT 200 WEST

Hydrograph



3895 HEATHER RIDGE PRE-DEVELOPED

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Type IA 24-hr 25-Year Rainfall=3.90"

Printed 9/17/2014

Page 3

Summary for Subcatchment 2X: TAX LOT 200 EAST

Runoff = 0.63 cfs @ 8.01 hrs, Volume= 0.260 af, Depth> 2.52"

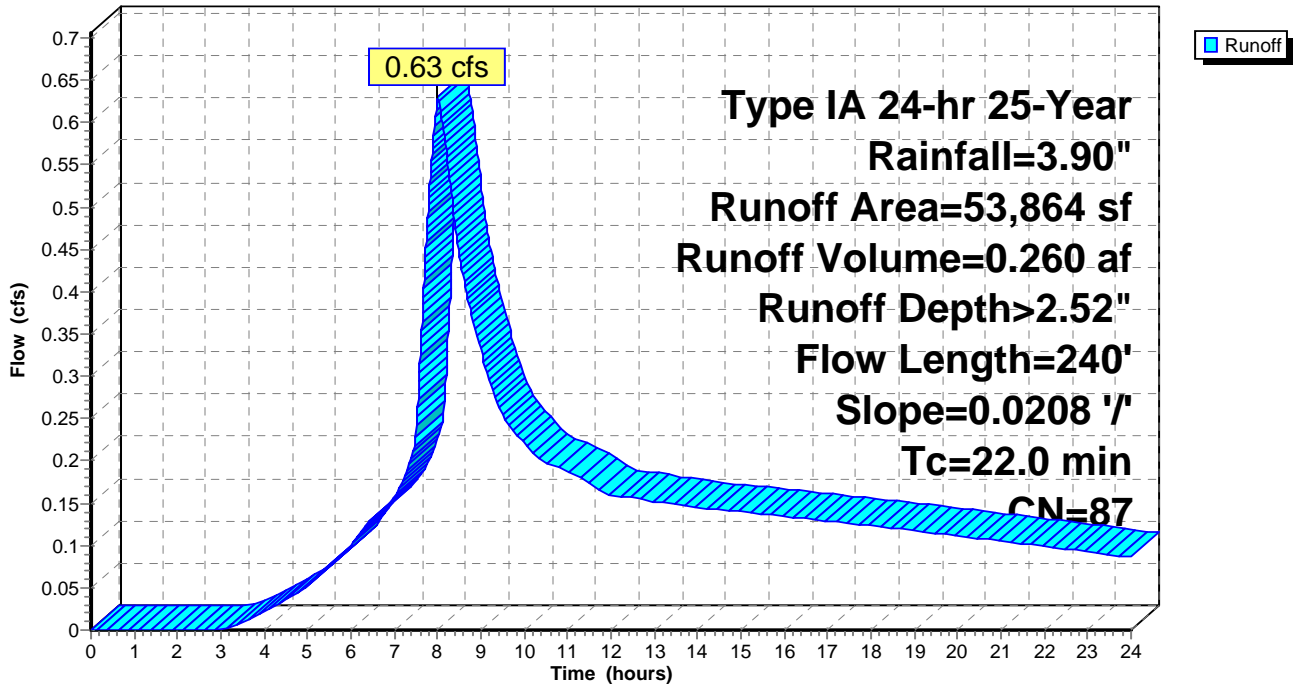
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
50,783	86	<50% Grass cover, Poor, HSG C
* 3,081	98	Roof
53,864	87	Weighted Average
50,783		Pervious Area
3,081		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	240	0.0208	0.18		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 2X: TAX LOT 200 EAST

Hydrograph



Summary for Subcatchment 100S: SW 112TH (SOUTH)

Runoff = 0.02 cfs @ 7.88 hrs, Volume= 0.008 af, Depth> 3.66"

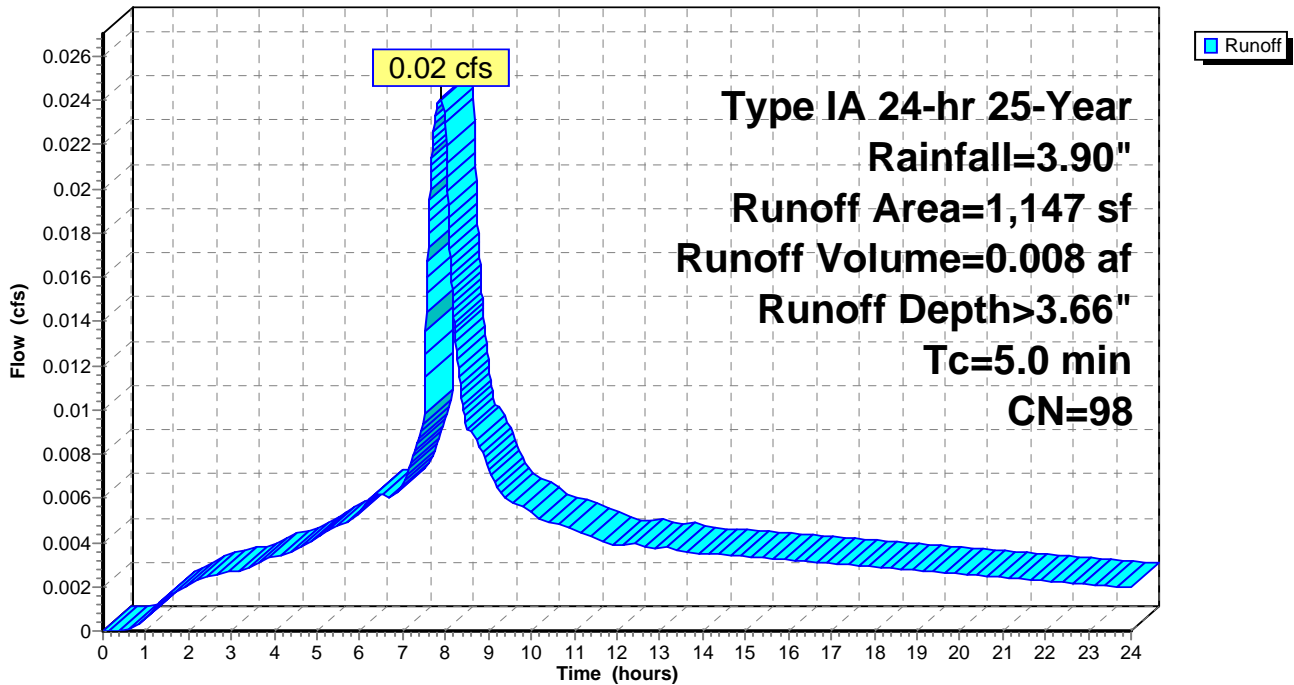
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 1,147	98	Street and sidewalk
1,147		Impervious Area

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

Subcatchment 100S: SW 112TH (SOUTH)

Hydrograph



Summary for Subcatchment 200S1: SW 112TH AVENUE

Runoff = 0.39 cfs @ 7.88 hrs, Volume= 0.128 af, Depth> 3.66"

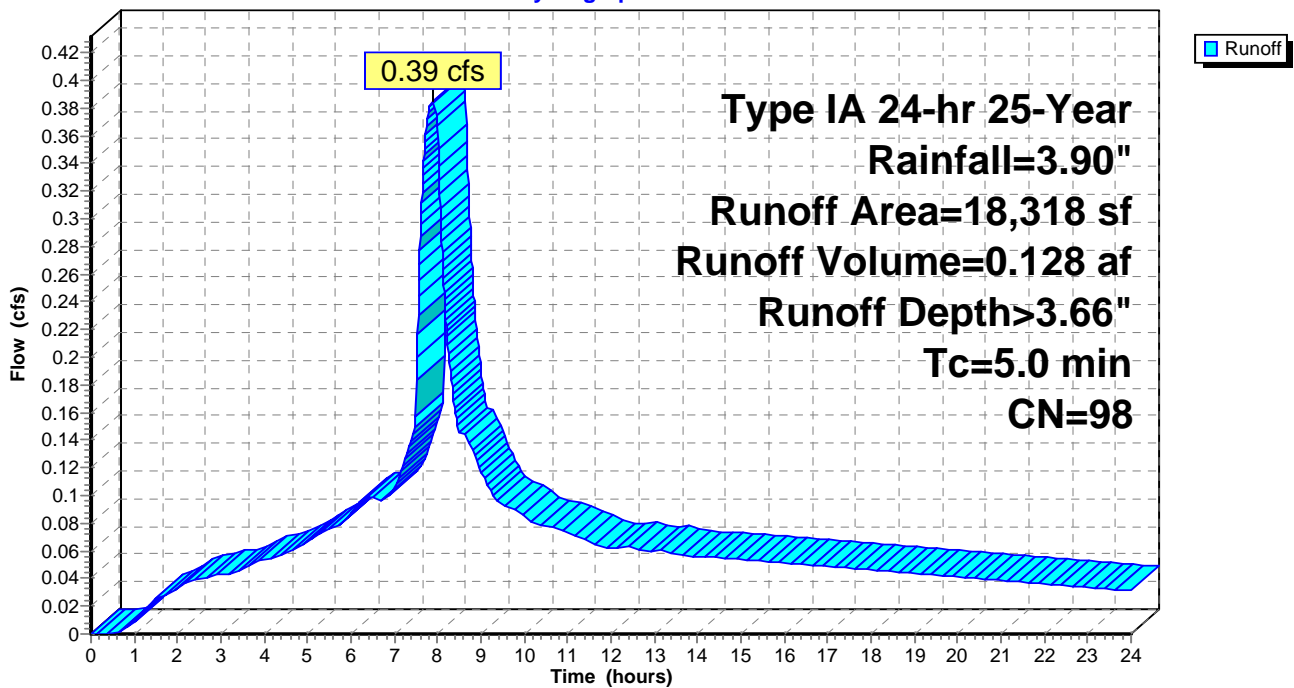
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 18,318	98	Street and sidewalk
18,318		Impervious Area

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

Subcatchment 200S1: SW 112TH AVENUE

Hydrograph



3895 HEATHER RIDGE PRE-DEVELOPED

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Type IA 24-hr 25-Year Rainfall=3.90"

Printed 9/17/2014

Page 6

Summary for Subcatchment 200S2: LOT 9

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.021 af, Depth> 3.43"

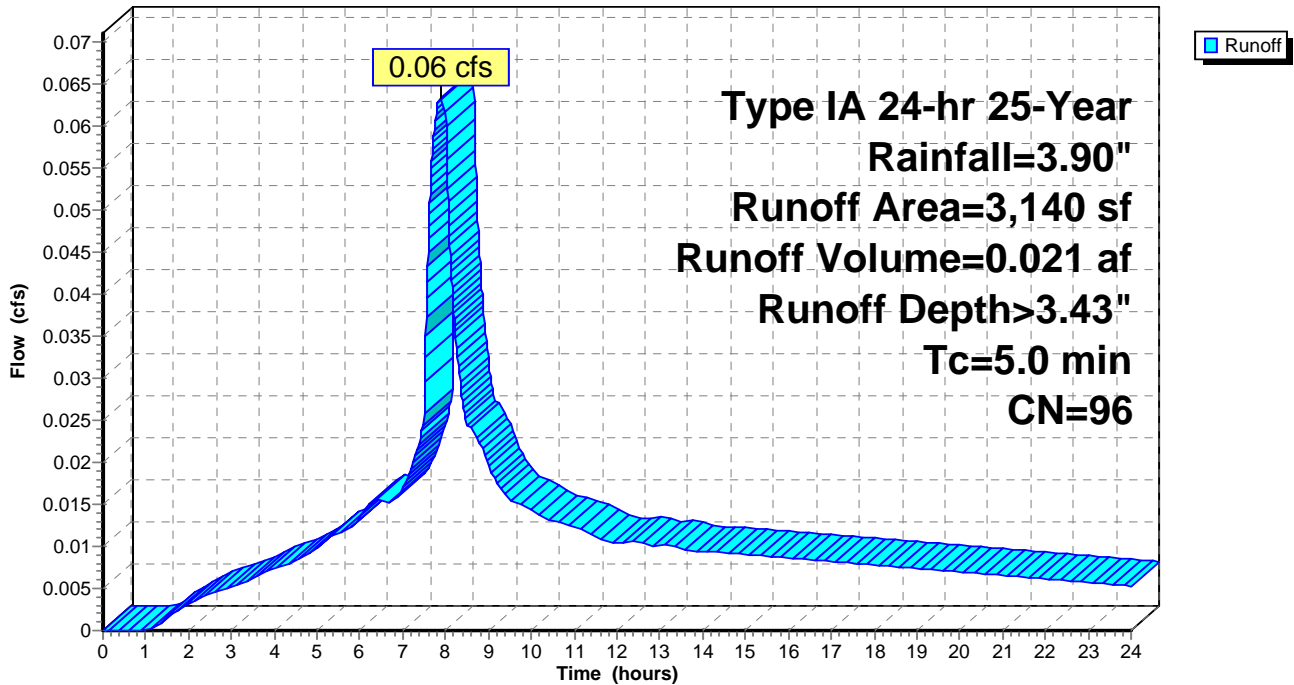
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	3,140	96	Weighted Average
	500		Pervious Area
	2,640		Impervious Area

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

Subcatchment 200S2: LOT 9

Hydrograph



3895 HEATHER RIDGE PRE-DEVELOPED

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Type IA 24-hr 25-Year Rainfall=3.90"

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Summary for Subcatchment 300S: LOT 8

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

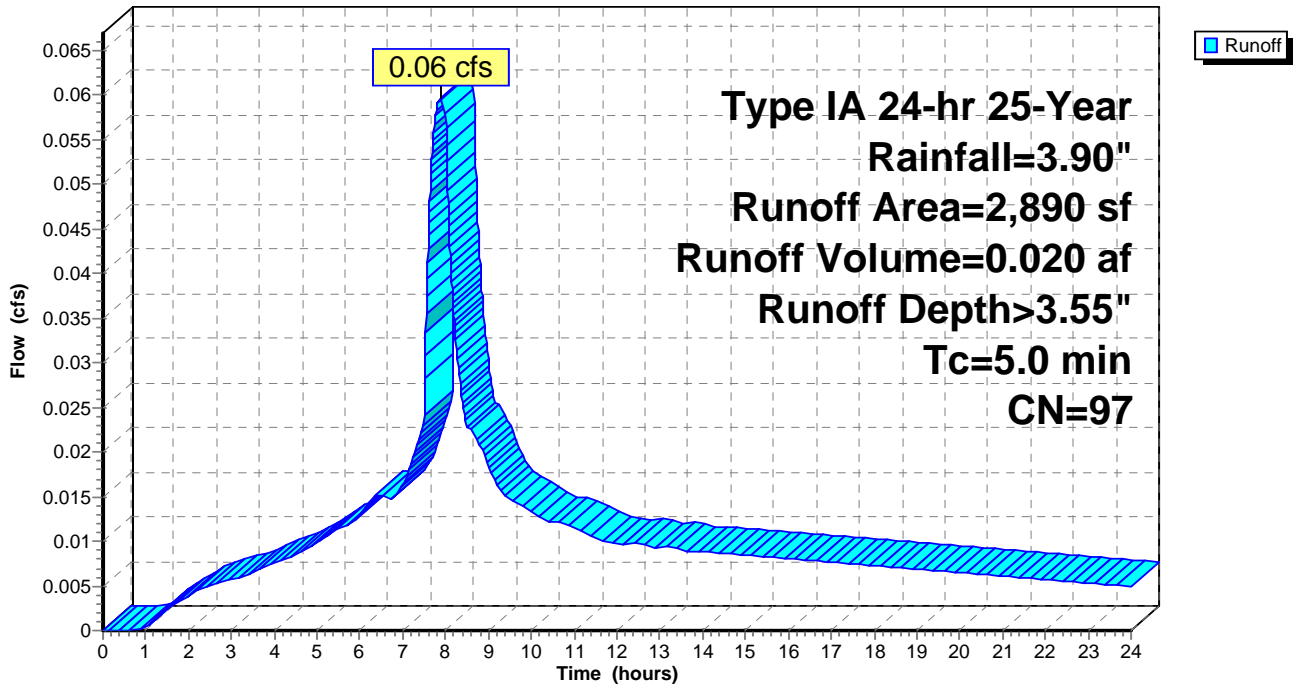
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 300S: LOT 8

Hydrograph



Summary for Subcatchment 400S: LOTS 6 - 7

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

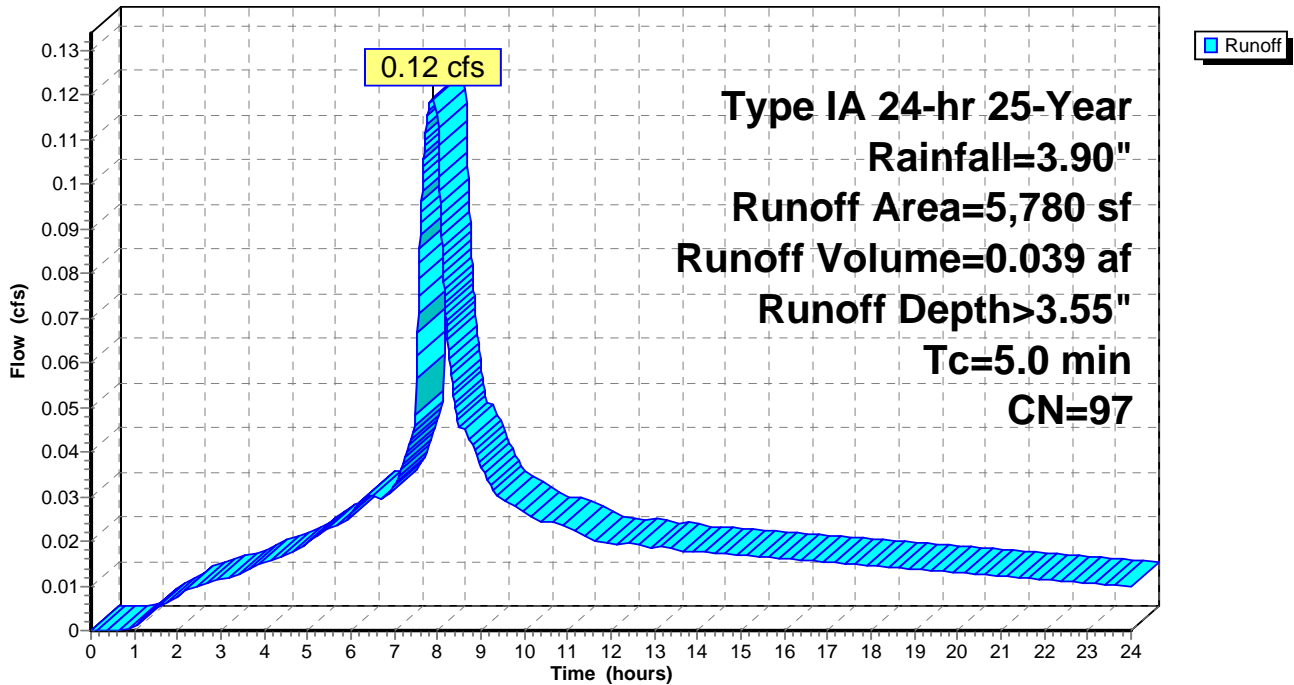
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 400S: LOTS 6 - 7

Hydrograph



3895 HEATHER RIDGE PRE-DEVELOPED

Type IA 24-hr 25-Year Rainfall=3.90"

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Summary for Subcatchment 500S: LOT 5

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

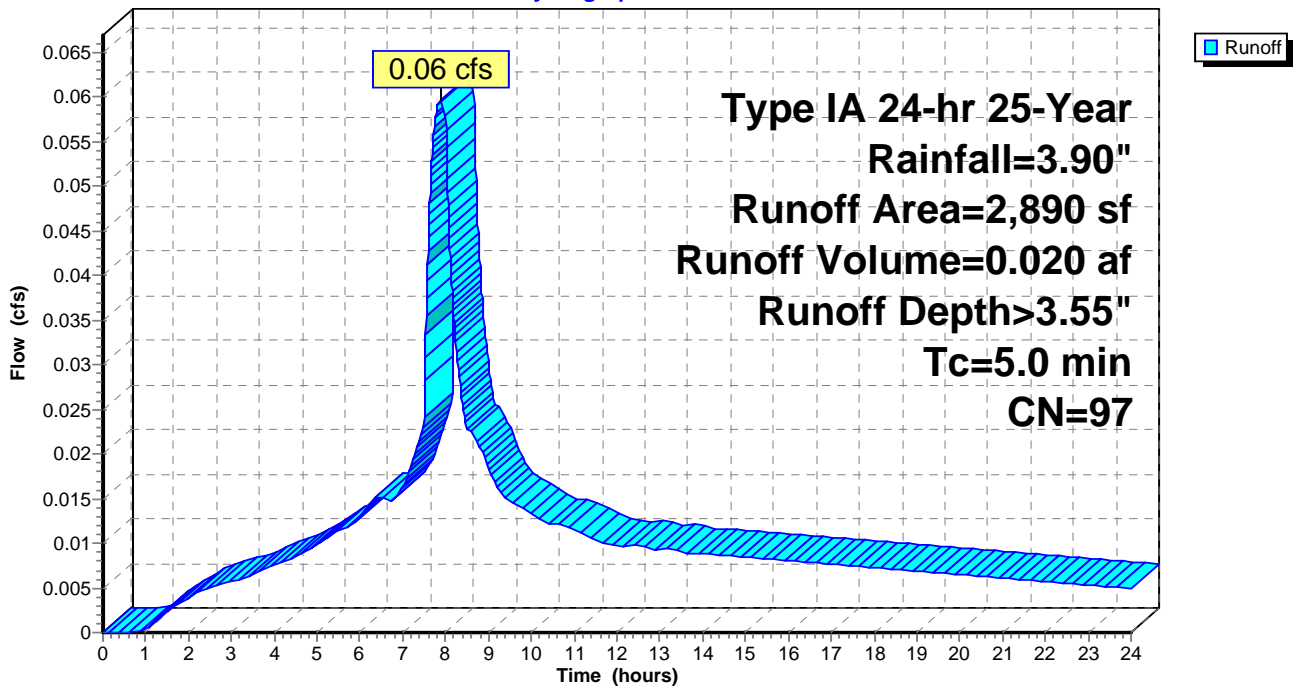
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 500S: LOT 5

Hydrograph



Summary for Subcatchment 600S: LOTS 3 - 4

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

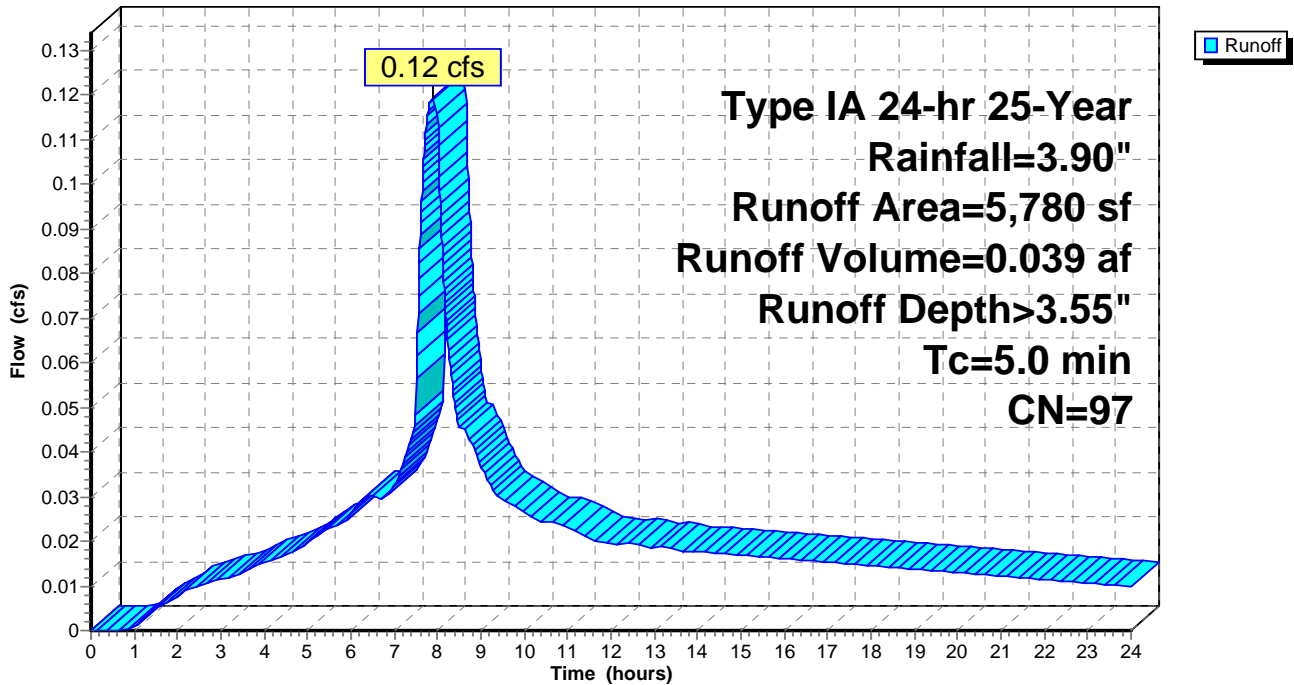
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 600S: LOTS 3 - 4

Hydrograph



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Type IA 24-hr 25-Year Rainfall=3.90"

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Summary for Subcatchment 700S1: LOTS LANDSCAPING AND ROAD

Runoff = 1.52 cfs @ 7.94 hrs, Volume= 0.499 af, Depth> 3.11"

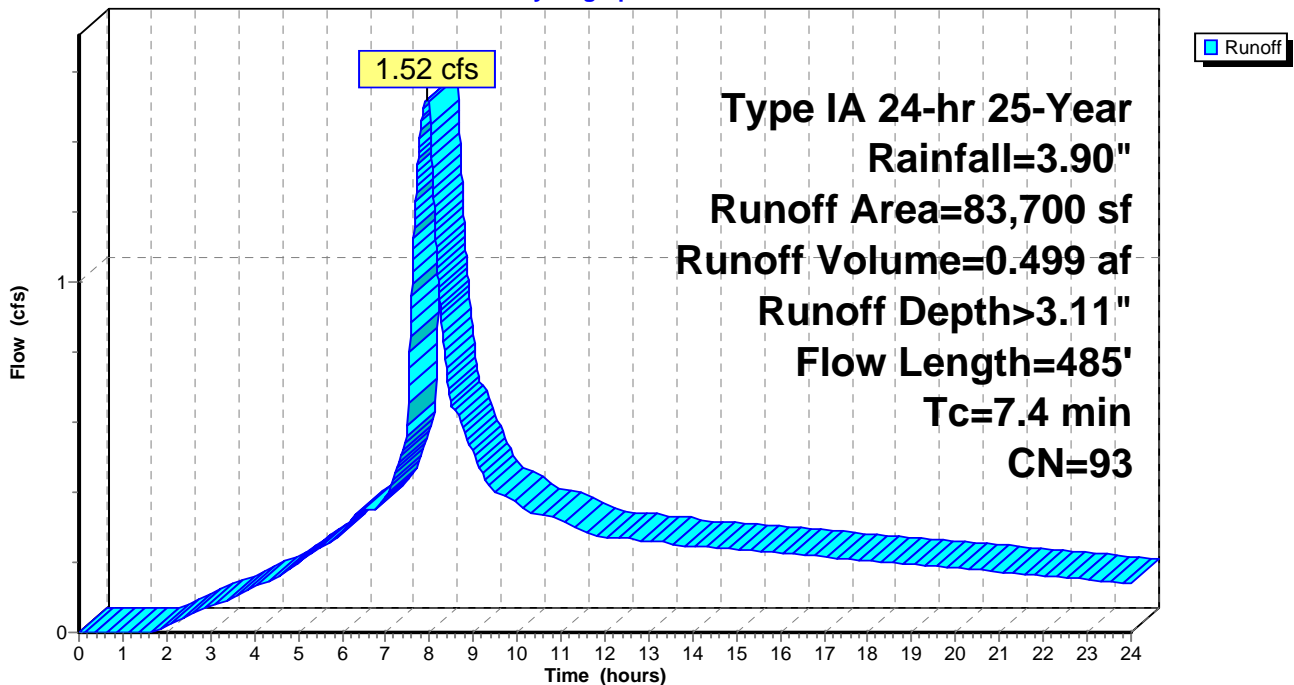
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	26,696	98	Street and sidewalk
*	23,760	98	9 Lots at 2640 SF Impervious/Lot per CWS
	33,244	86	<50% Grass cover, Poor, HSG C
	83,700	93	Weighted Average
	33,244		Pervious Area
	50,456		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	85	0.1000	0.28		Sheet Flow, LANDSCAPE Grass: Short n= 0.150 P2= 2.50"
2.3	400	0.0200	2.87		Shallow Concentrated Flow, GUTTER Paved Kv= 20.3 fps
7.4	485	Total			

Subcatchment 700S1: LOTS LANDSCAPING AND ROAD

Hydrograph



Summary for Subcatchment 700S2: LOTS 1 - 2

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

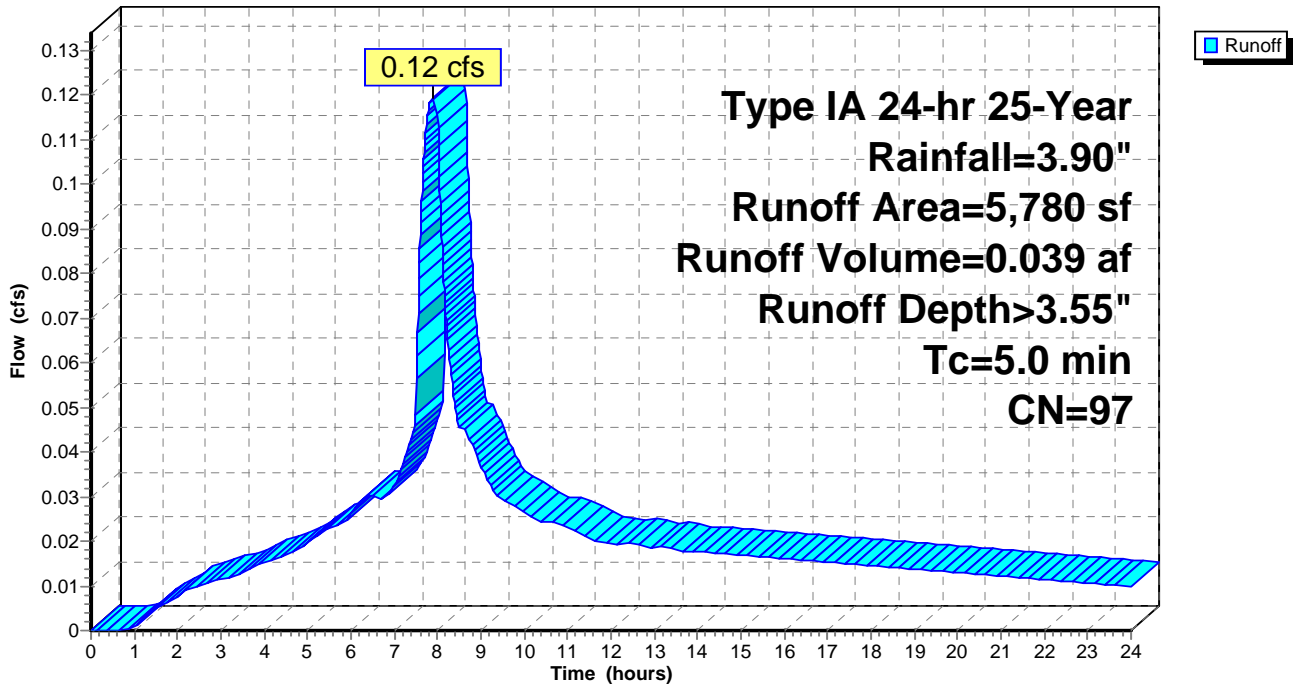
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 700S2: LOTS 1 - 2

Hydrograph



Summary for Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

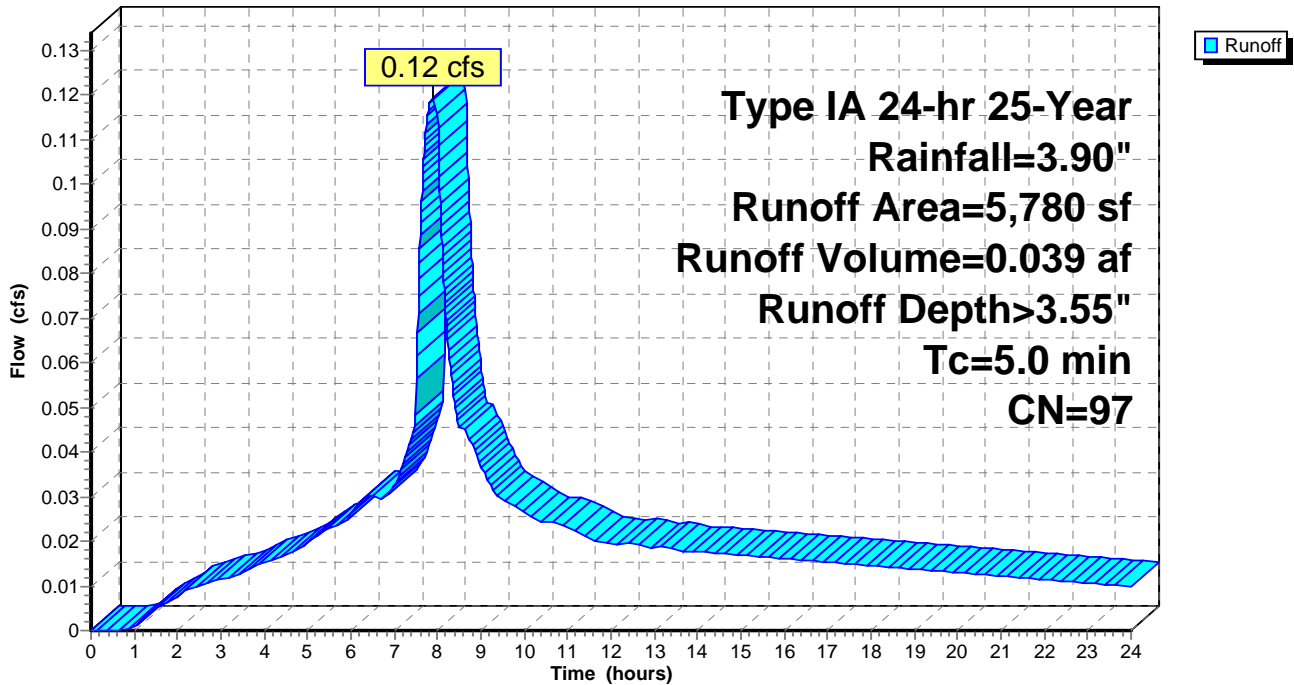
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Hydrograph



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Type IA 24-hr 25-Year Rainfall=3.90"

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Summary for Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

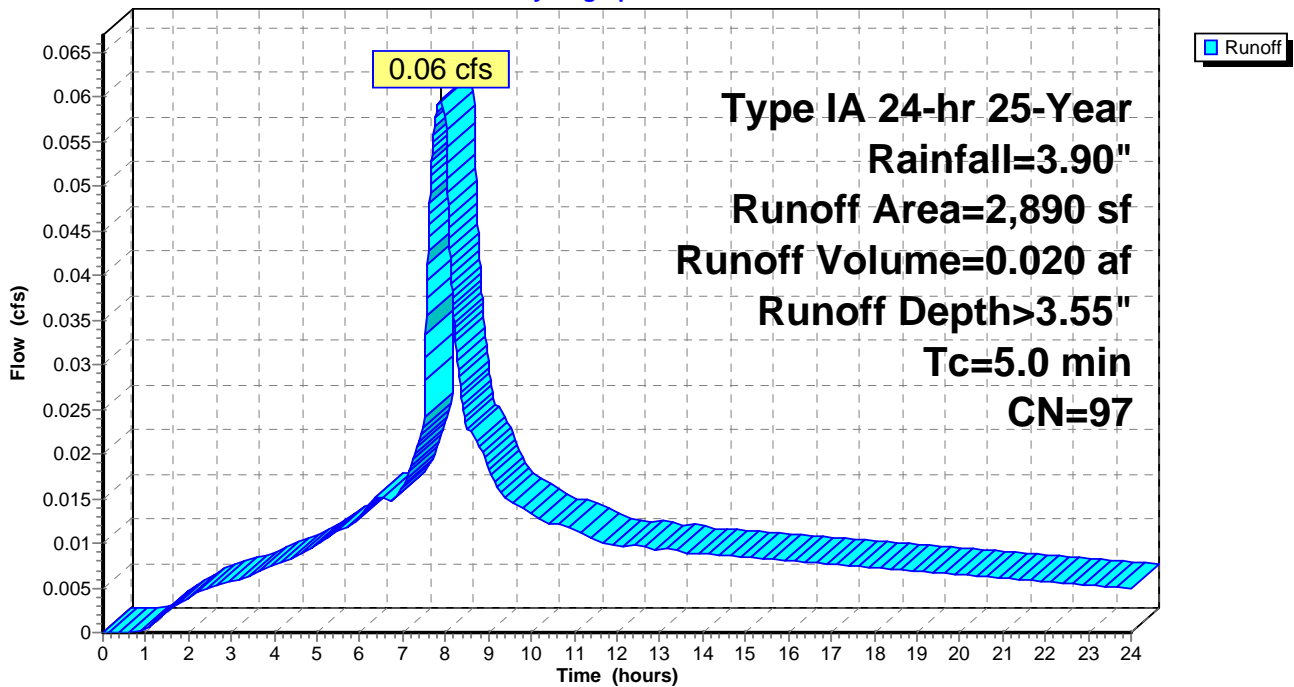
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 1100S: 2 HOUSES

Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.037 af, Depth> 3.66"

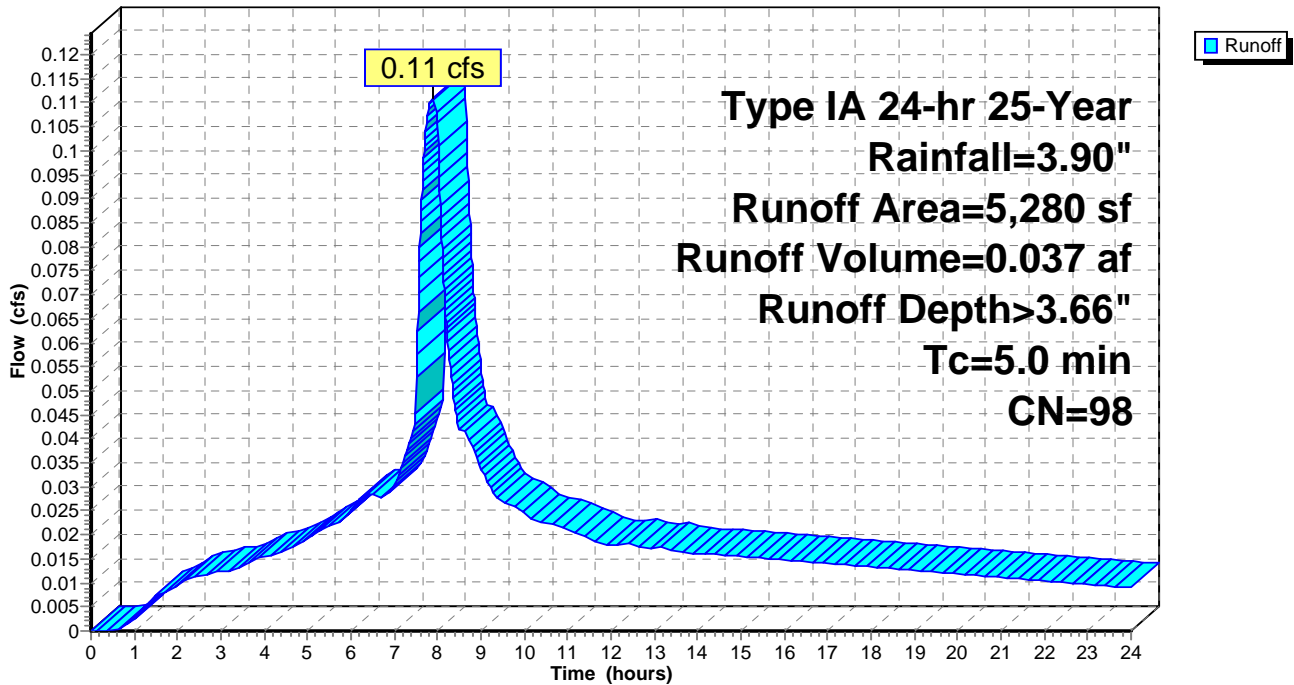
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 1100S: 2 HOUSES

Hydrograph



Summary for Subcatchment 1200S: 3 HOUSES

Runoff = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af, Depth> 3.66"

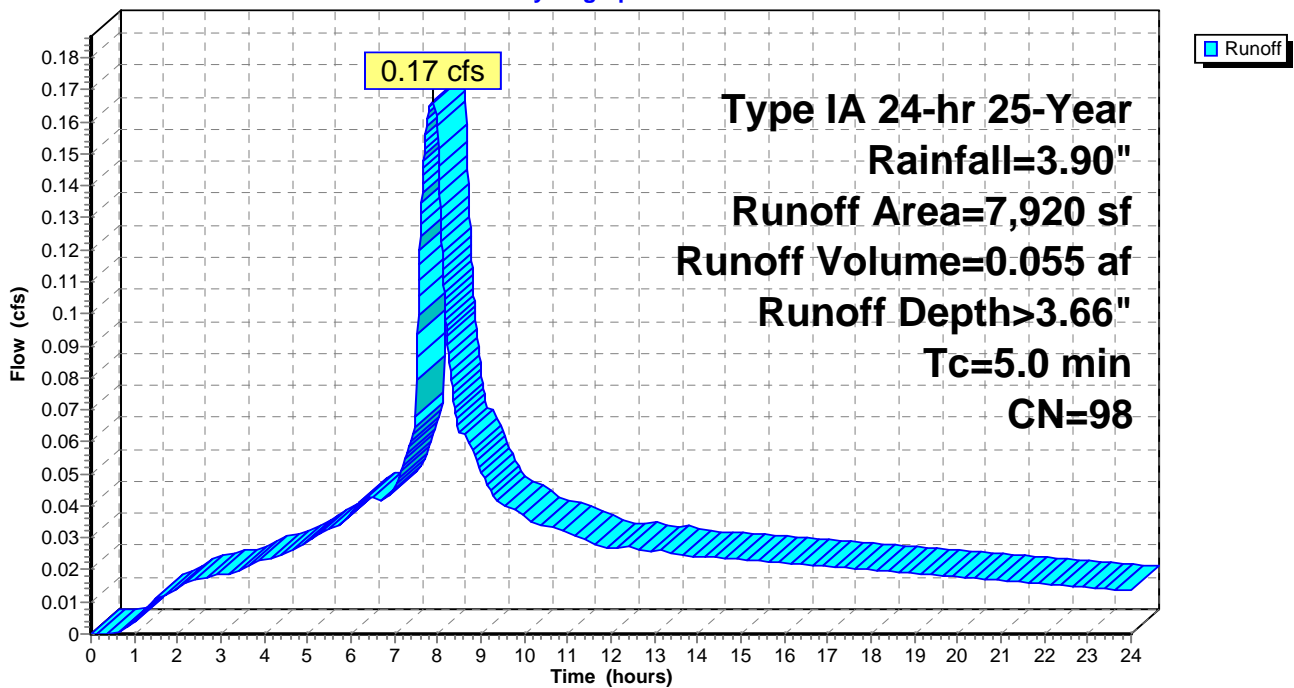
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
7,920		Impervious Area

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

Subcatchment 1200S: 3 HOUSES

Hydrograph



Summary for Subcatchment 1300S1: STREET

Runoff = 0.57 cfs @ 7.88 hrs, Volume= 0.191 af, Depth> 3.66"

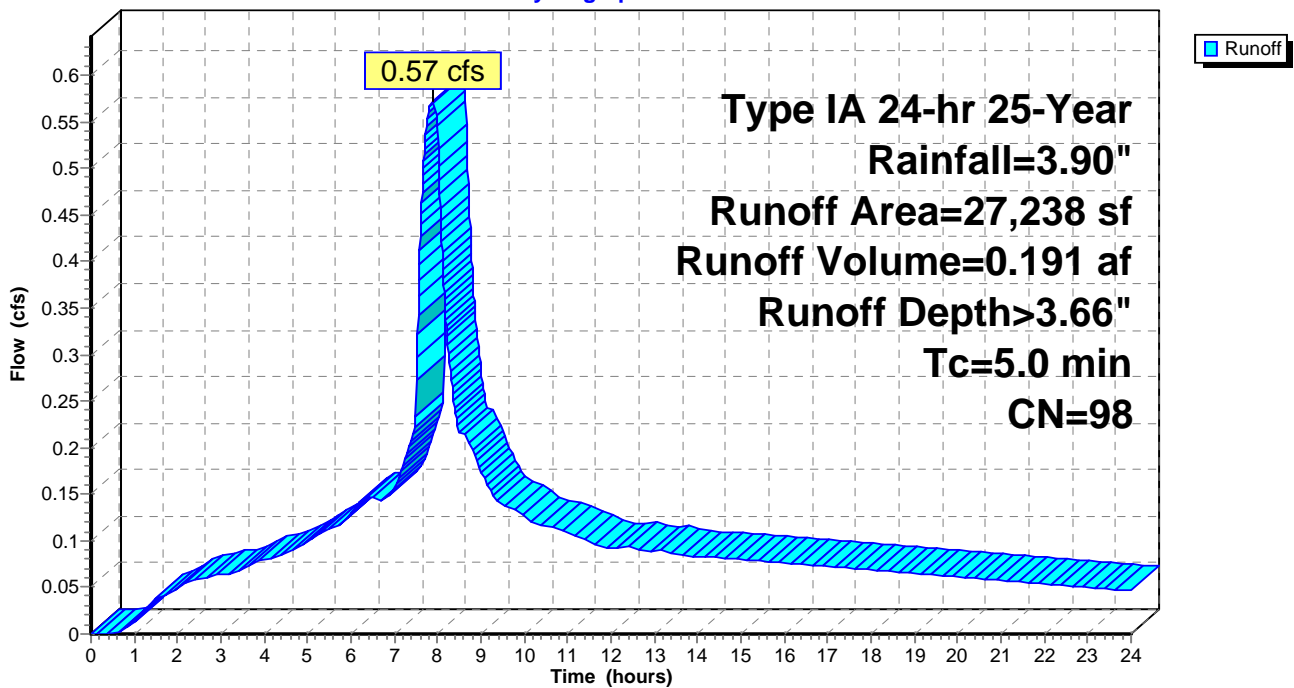
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 27,238	98	Street and sidewalk
27,238		Impervious Area

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

Subcatchment 1300S1: STREET

Hydrograph



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Type IA 24-hr 25-Year Rainfall=3.90"

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Summary for Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Runoff = 0.50 cfs @ 7.95 hrs, Volume= 0.171 af, Depth> 2.19"

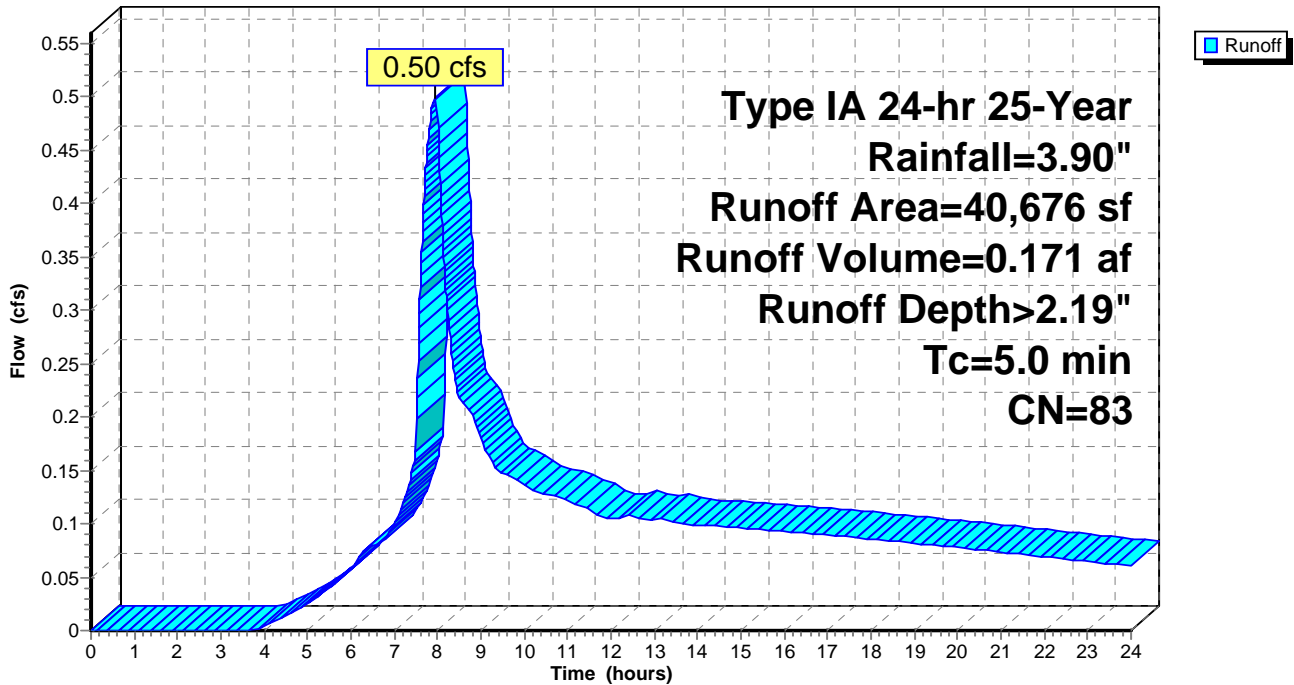
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
	32,756	79	50-75% Grass cover, Fair, HSG C
	40,676	83	Weighted Average
	32,756		Pervious Area
	7,920		Impervious Area

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

Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Hydrograph



Summary for Subcatchment 1300S3: LANDSCAPING AND HOUSES

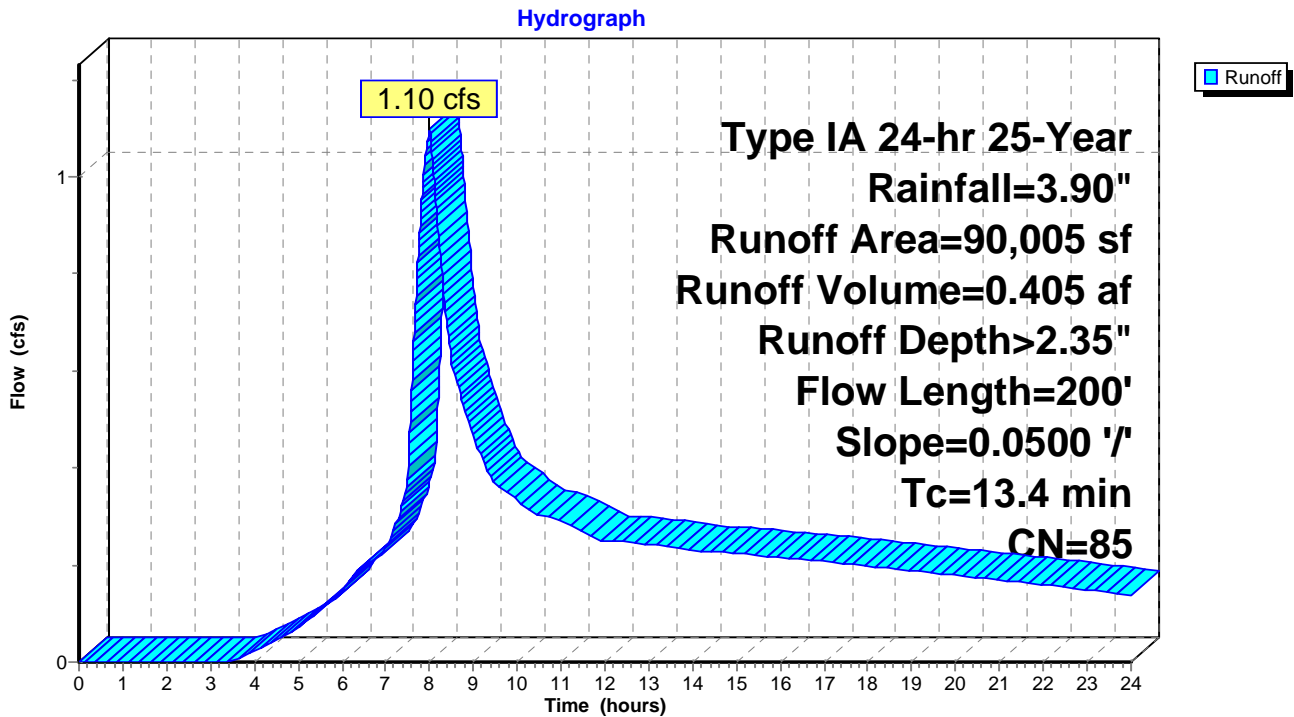
Runoff = 1.10 cfs @ 8.00 hrs, Volume= 0.405 af, Depth> 2.35"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	26,400	98	10 Lots at 2640 SF Impervious/Lot per CWS
	63,605	79	50-75% Grass cover, Fair, HSG C
	90,005	85	Weighted Average
	63,605		Pervious Area
	26,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	200	0.0500	0.25		Sheet Flow, LANDSCAPING SHEET FLOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 1300S3: LANDSCAPING AND HOUSES



Summary for Subcatchment 1900S1: POND SURFACE

Runoff = 7.99 cfs @ 7.87 hrs, Volume= 2.785 af, Depth> 3.89"

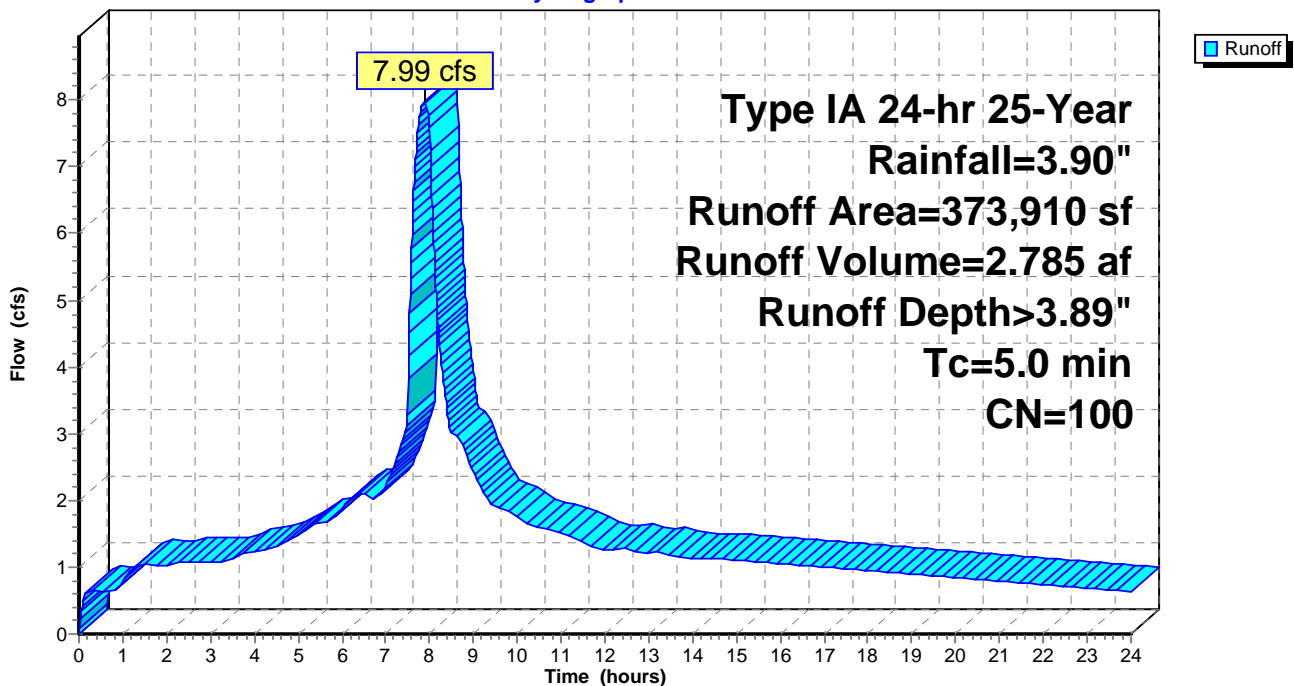
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 373,910	100	Water Surface
373,910		Impervious Area

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

Subcatchment 1900S1: POND SURFACE

Hydrograph



Summary for Subcatchment 1900S2: WOODED/ VEGETATED AREA

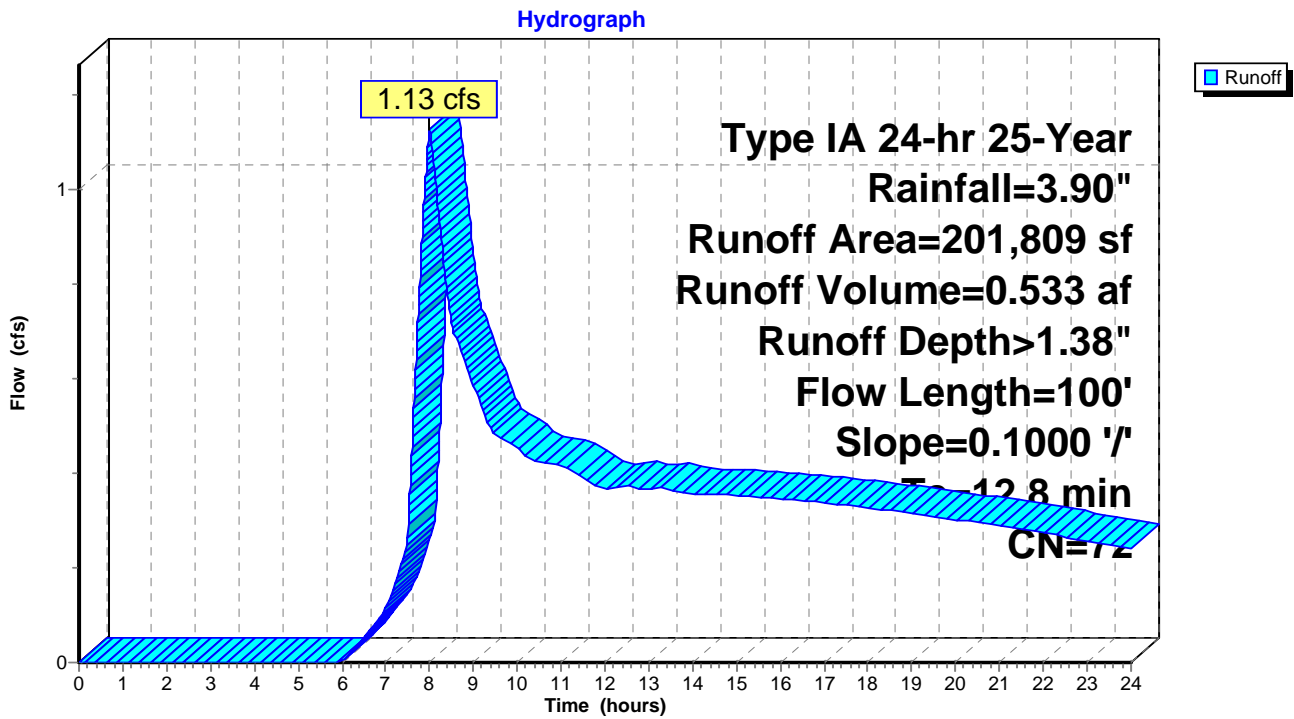
Runoff = 1.13 cfs @ 8.00 hrs, Volume= 0.533 af, Depth> 1.38"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
201,809	72	Woods/grass comb., Good, HSG C
201,809		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.50"

Subcatchment 1900S2: WOODED/ VEGETATED AREA



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Type IA 24-hr 25-Year Rainfall=3.90"

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Summary for Subcatchment 1900S3: DEVELOPMENT

Runoff = 22.38 cfs @ 8.01 hrs, Volume= 9.850 af, Depth> 2.09"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

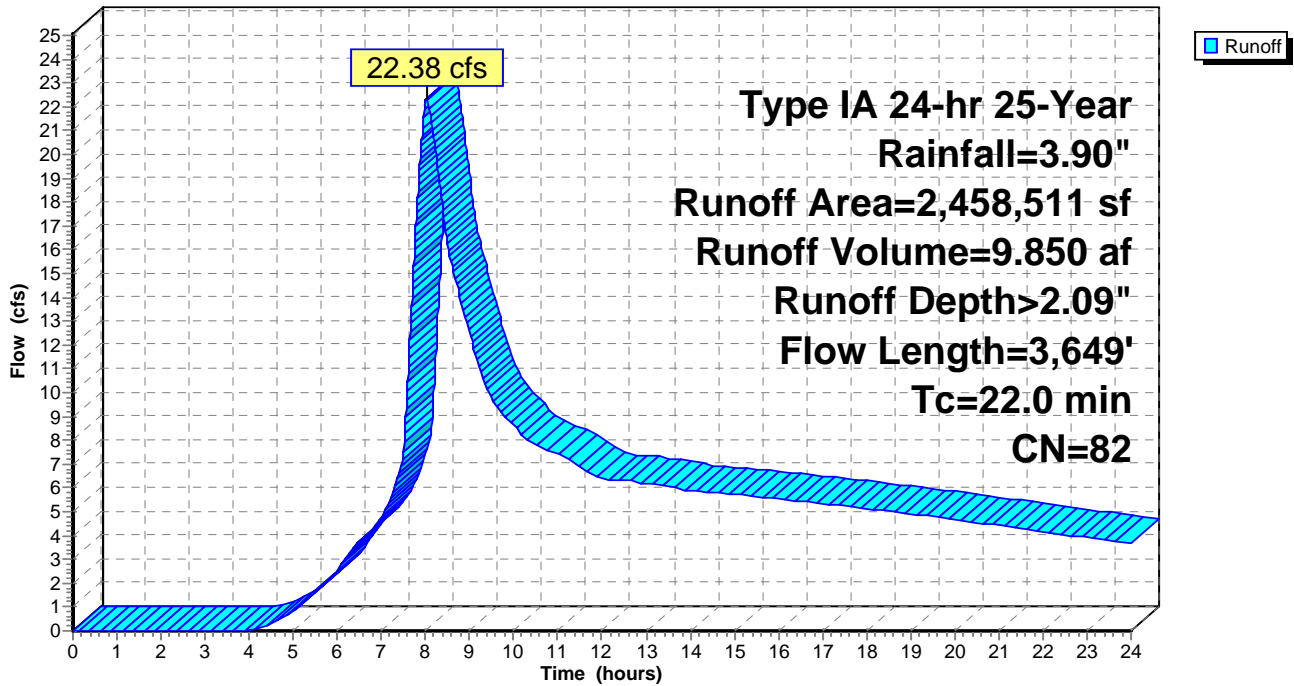
Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
2,289,111	83	1/4 acre lots, 38% imp, HSG C
169,400	75	1/4 acre lots, 38% imp, HSG B
2,458,511	82	Weighted Average
1,524,277		Pervious Area
934,234		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	250	0.0500	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.50"
6.0	3,399	0.0435	9.46	7.43	Circular Channel (pipe), Conveyance Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
22.0	3,649	Total			

Subcatchment 1900S3: DEVELOPMENT

Hydrograph



Summary for Pond 100R: 12"

Inflow Area = 3.956 ac, 20.38% Impervious, Inflow Depth > 2.61" for 25-Year event
 Inflow = 1.84 cfs @ 8.01 hrs, Volume= 0.859 af
 Outflow = 1.84 cfs @ 8.01 hrs, Volume= 0.859 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.84 cfs @ 8.01 hrs, Volume= 0.859 af

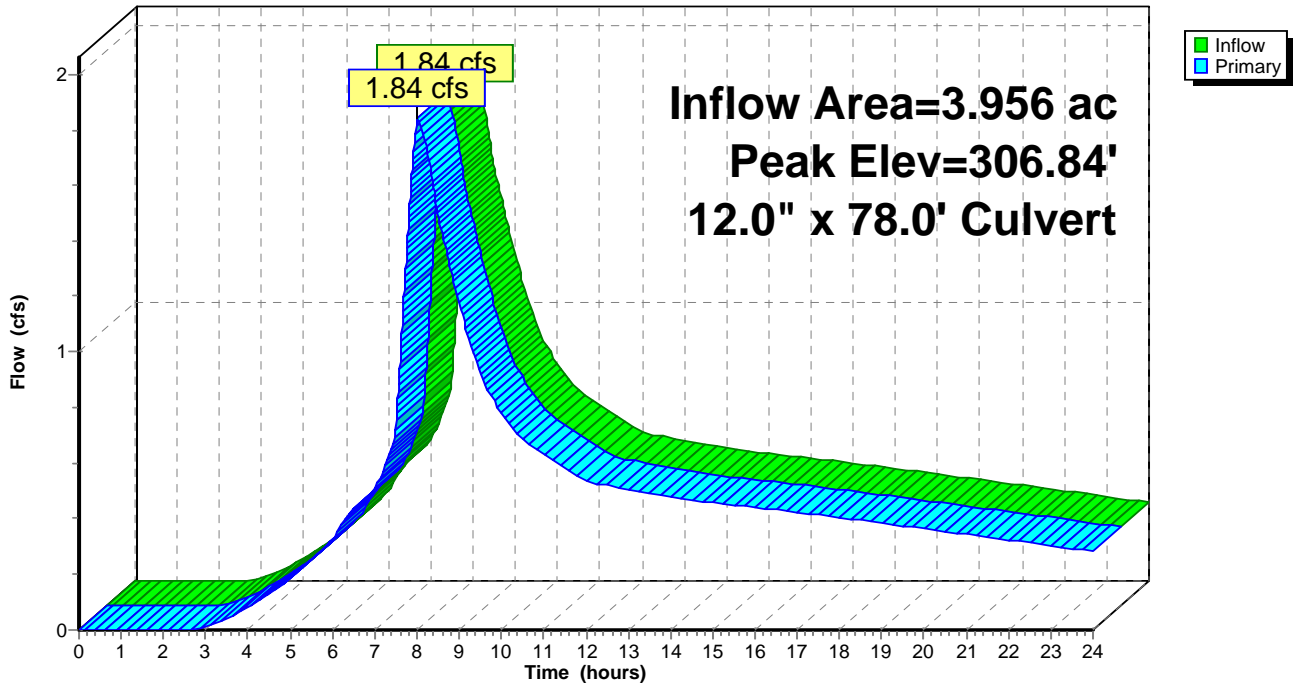
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.84' @ 8.01 hrs
 Flood Elev= 310.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.96'	12.0" x 78.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 305.57' S= 0.0050 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=1.84 cfs @ 8.01 hrs HW=306.84' (Free Discharge)
 ↳ **1=Culvert** (Barrel Controls 1.84 cfs @ 3.35 fps)

Pond 100R: 12"

Hydrograph



Summary for Pond 200R: 12"

Inflow Area = 4.449 ac, 28.94% Impervious, Inflow Depth > 2.72" for 25-Year event
 Inflow = 2.27 cfs @ 8.00 hrs, Volume= 1.008 af
 Outflow = 2.27 cfs @ 8.00 hrs, Volume= 1.008 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.27 cfs @ 8.00 hrs, Volume= 1.008 af

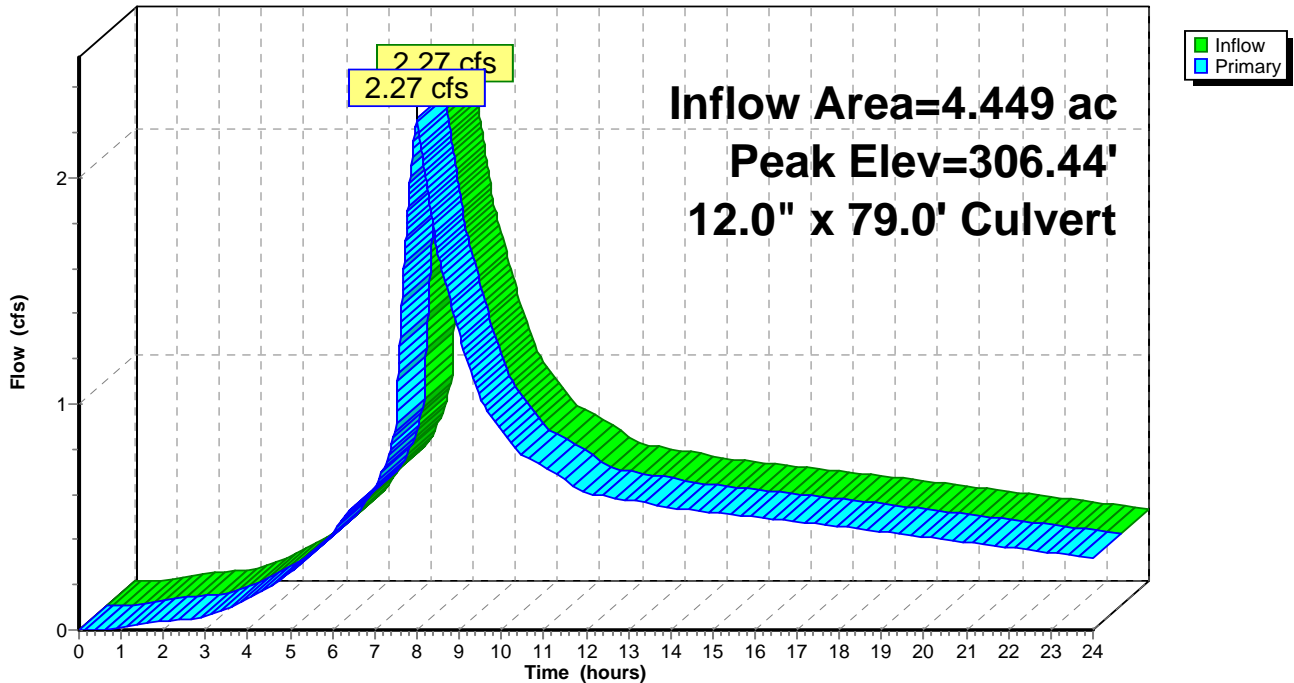
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.44' @ 8.00 hrs
 Flood Elev= 314.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.47'	12.0" x 79.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 304.97' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.27 cfs @ 8.00 hrs HW=306.44' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.27 cfs @ 3.72 fps)

Pond 200R: 12"

Hydrograph



Summary for Pond 300R: 12"

Inflow Area = 4.515 ac, 29.86% Impervious, Inflow Depth > 2.73" for 25-Year event
 Inflow = 2.33 cfs @ 8.00 hrs, Volume= 1.027 af
 Outflow = 2.33 cfs @ 8.00 hrs, Volume= 1.027 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.33 cfs @ 8.00 hrs, Volume= 1.027 af

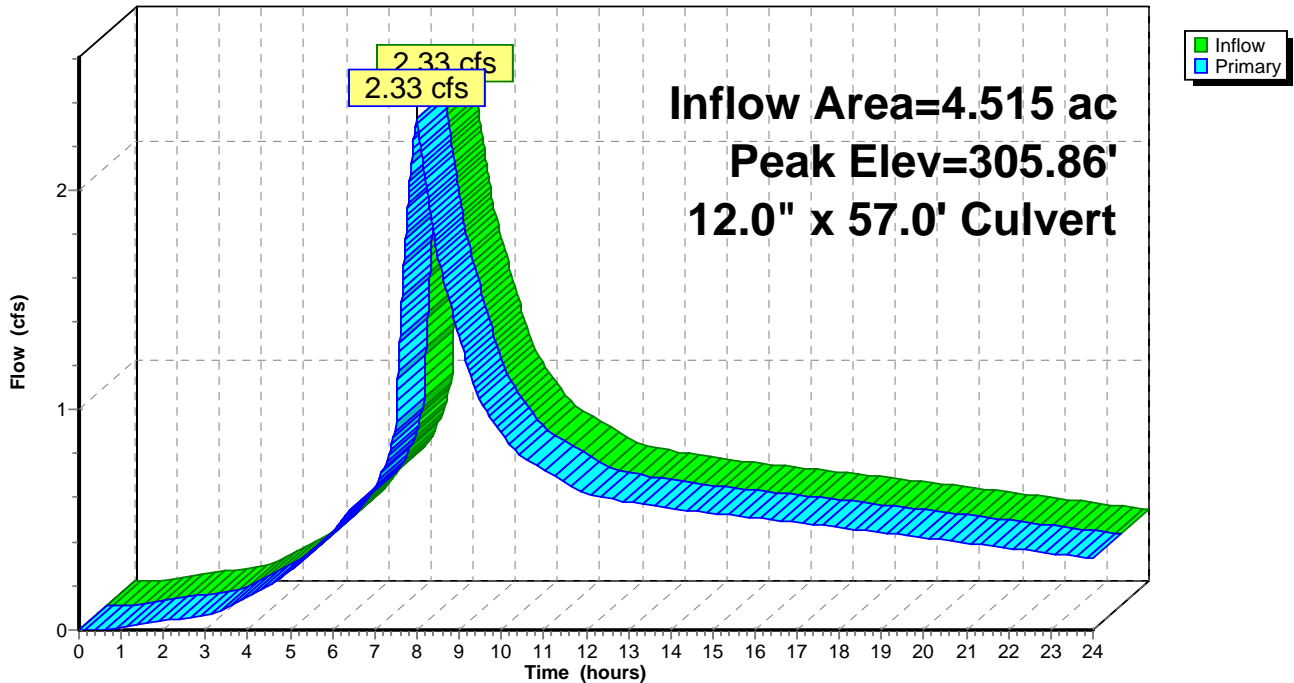
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 305.86' @ 8.00 hrs
 Flood Elev= 312.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	304.98'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.93' S= 0.0184 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.33 cfs @ 8.00 hrs HW=305.86' (Free Discharge)
 ↳ **1=Culvert** (Inlet Controls 2.33 cfs @ 3.19 fps)

Pond 300R: 12"

Hydrograph



Summary for Pond 400R: 12"

Inflow Area = 4.648 ac, 31.61% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 2.44 cfs @ 8.00 hrs, Volume= 1.067 af
 Outflow = 2.44 cfs @ 8.00 hrs, Volume= 1.067 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.44 cfs @ 8.00 hrs, Volume= 1.067 af

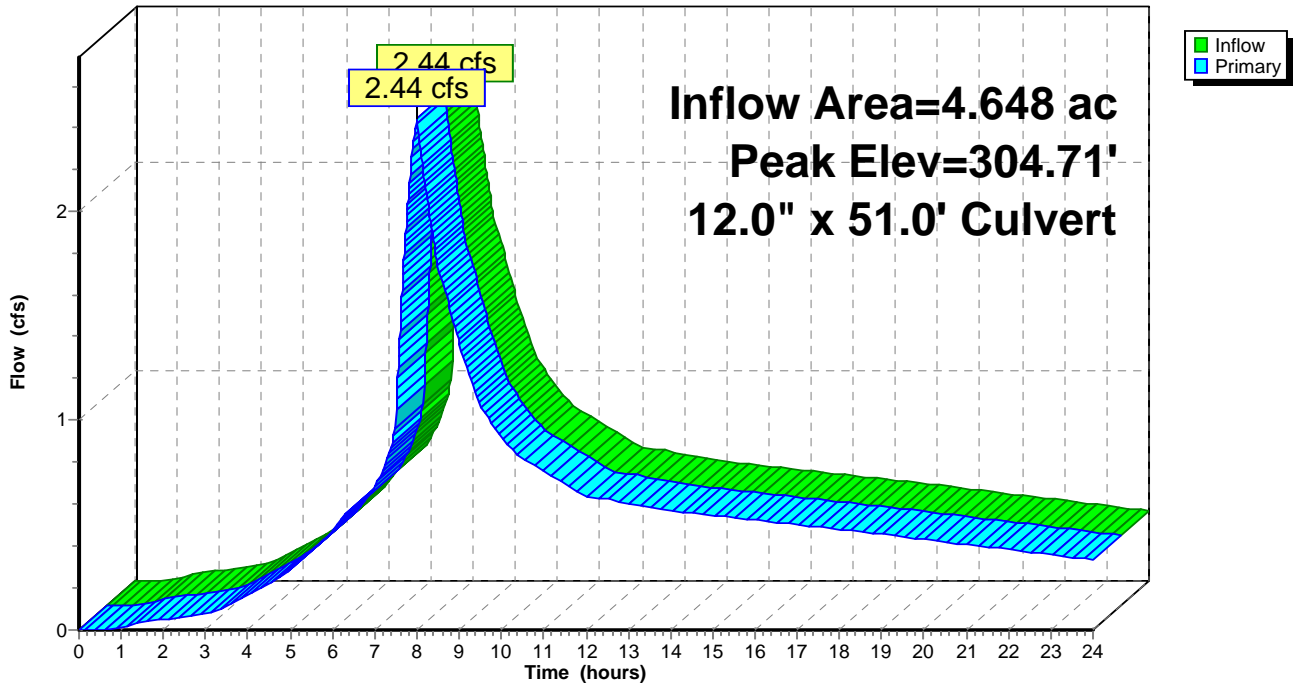
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 304.71' @ 8.00 hrs
 Flood Elev= 308.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	303.80'	12.0" x 51.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.23' S= 0.0112 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.44 cfs @ 8.00 hrs HW=304.71' (Free Discharge)
 ←1=Culvert (Inlet Controls 2.44 cfs @ 3.25 fps)

Pond 400R: 12"

Hydrograph



Summary for Pond 500R: 12"

Inflow Area = 4.714 ac, 32.45% Impervious, Inflow Depth > 2.76" for 25-Year event
 Inflow = 2.50 cfs @ 8.00 hrs, Volume= 1.086 af
 Outflow = 2.50 cfs @ 8.00 hrs, Volume= 1.086 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.50 cfs @ 8.00 hrs, Volume= 1.086 af

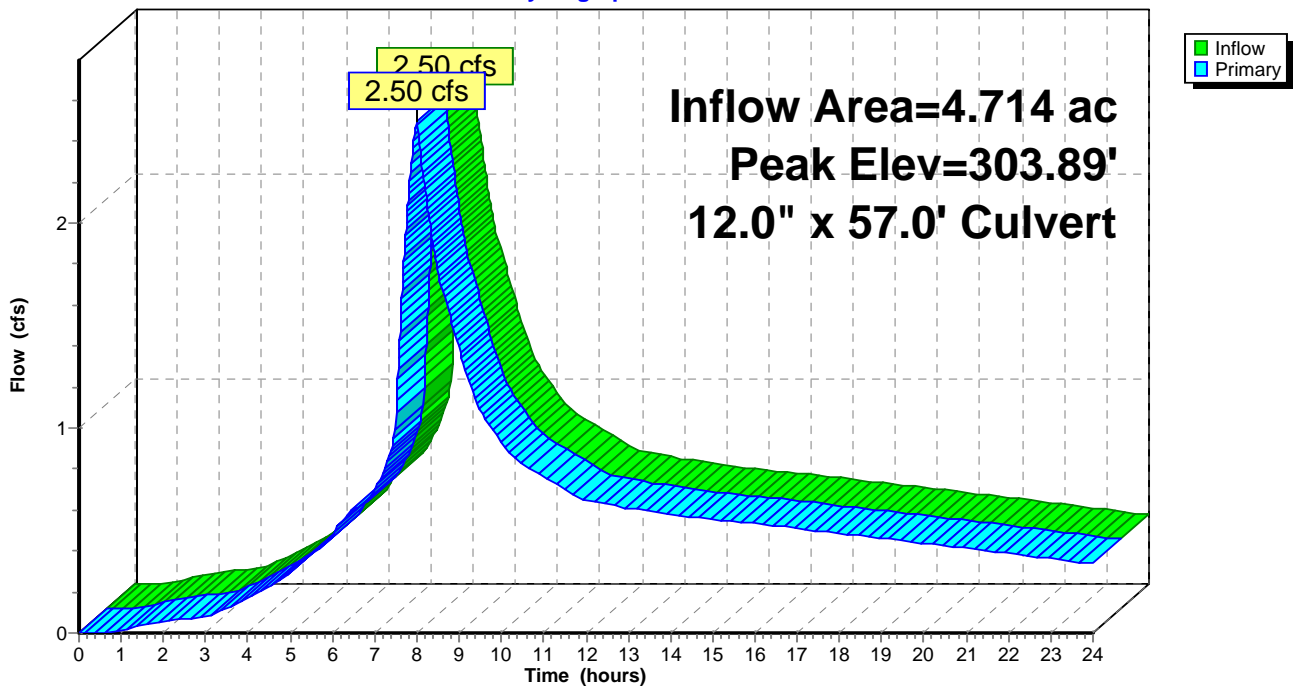
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.89' @ 8.00 hrs
 Flood Elev= 306.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.96'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 302.26' S= 0.0123 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.50 cfs @ 8.00 hrs HW=303.89' (Free Discharge)
 ←1=Culvert (Inlet Controls 2.50 cfs @ 3.28 fps)

Pond 500R: 12"

Hydrograph



Summary for Pond 600R: 12"

Inflow Area = 4.847 ac, 34.07% Impervious, Inflow Depth > 2.79" for 25-Year event
 Inflow = 2.61 cfs @ 8.00 hrs, Volume= 1.125 af
 Outflow = 2.61 cfs @ 8.00 hrs, Volume= 1.125 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.61 cfs @ 8.00 hrs, Volume= 1.125 af

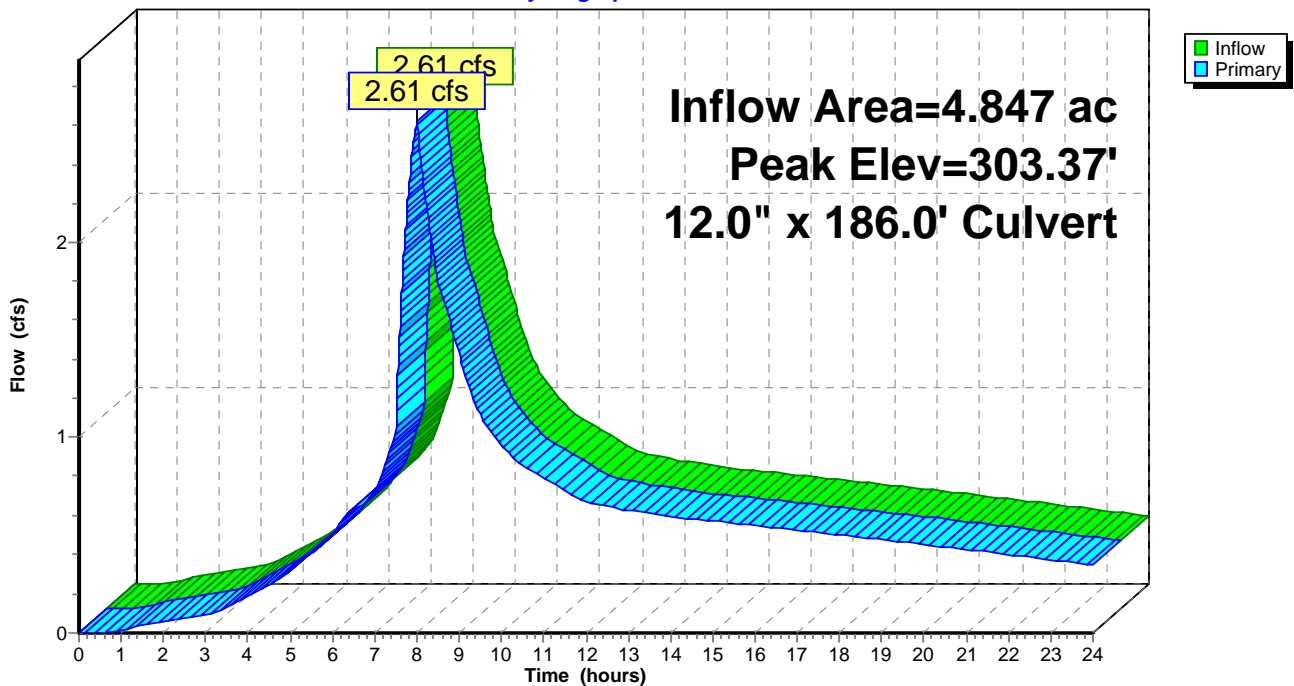
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.37' @ 8.00 hrs
 Flood Elev= 305.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.20'	12.0" x 186.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 301.28' S= 0.0049 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=2.61 cfs @ 8.00 hrs HW=303.37' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.61 cfs @ 3.59 fps)

Pond 600R: 12"

Hydrograph



Summary for Pond 700R: 12"

Inflow Area = 6.901 ac, 42.47% Impervious, Inflow Depth > 2.89" for 25-Year event
 Inflow = 4.24 cfs @ 8.00 hrs, Volume= 1.663 af
 Outflow = 4.24 cfs @ 8.00 hrs, Volume= 1.663 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.24 cfs @ 8.00 hrs, Volume= 1.663 af

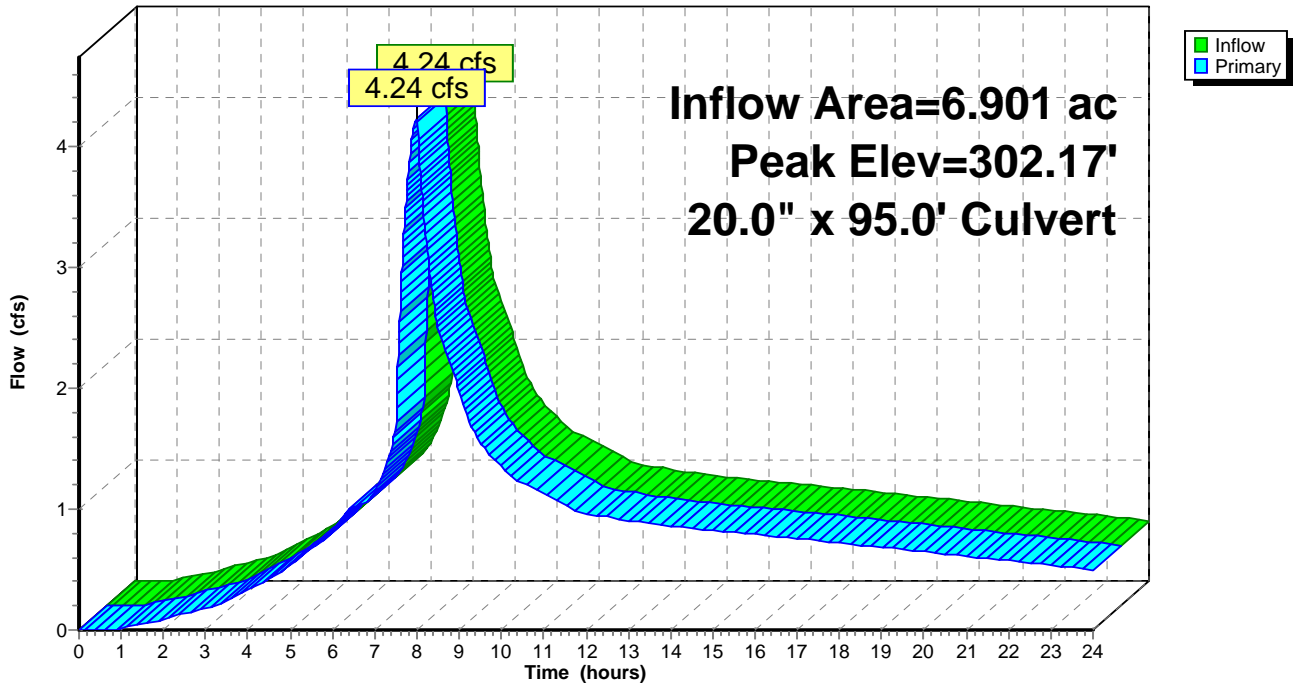
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 302.17' @ 8.00 hrs
 Flood Elev= 304.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	301.08'	20.0" x 95.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 300.60' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=4.23 cfs @ 8.00 hrs HW=302.17' (Free Discharge)
 ←1=Culvert (Barrel Controls 4.23 cfs @ 3.99 fps)

Pond 700R: 12"

Hydrograph



Summary for Pond 800R: 12"

Inflow Area = 7.034 ac, 43.39% Impervious, Inflow Depth > 2.90" for 25-Year event
 Inflow = 4.35 cfs @ 8.00 hrs, Volume= 1.702 af
 Outflow = 4.35 cfs @ 8.00 hrs, Volume= 1.702 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.35 cfs @ 8.00 hrs, Volume= 1.702 af

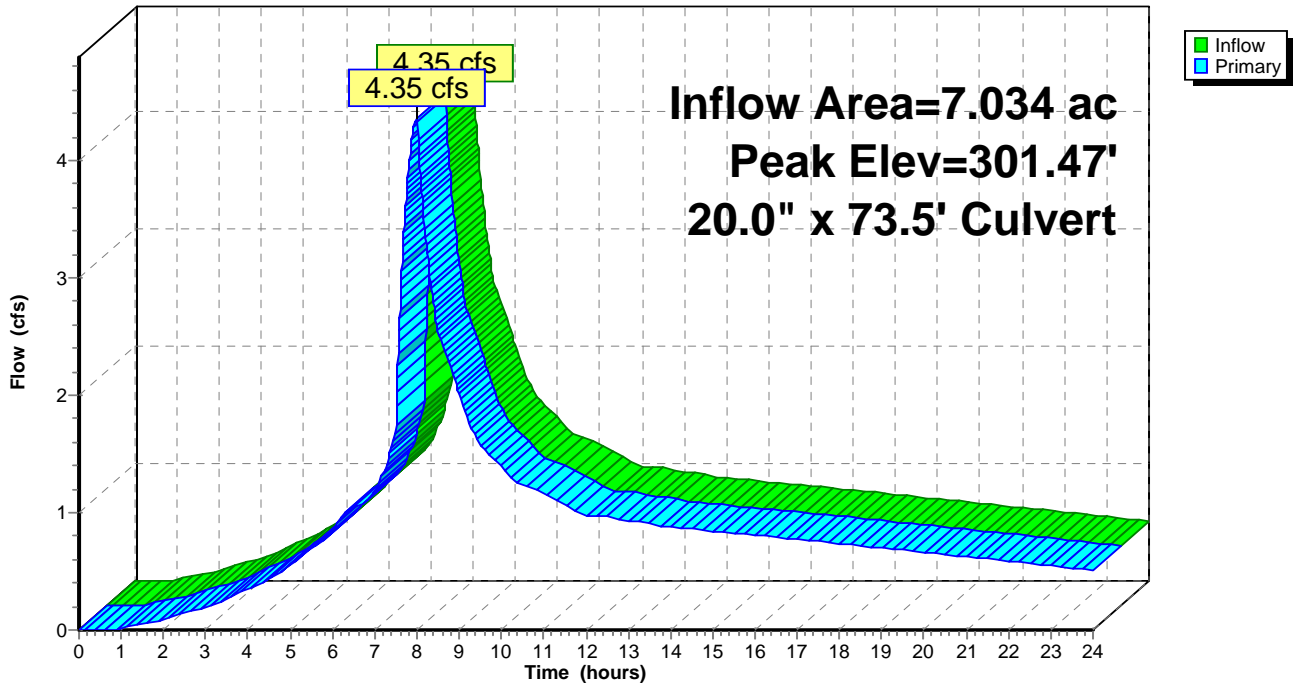
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.47' @ 8.00 hrs
 Flood Elev= 305.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.40'	20.0" x 73.5' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.94' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=4.35 cfs @ 8.00 hrs HW=301.47' (Free Discharge)
 ←1=Culvert (Barrel Controls 4.35 cfs @ 4.17 fps)

Pond 800R: 12"

Hydrograph



Summary for Pond 900R: 12"

Inflow Area = 7.100 ac, 43.84% Impervious, Inflow Depth > 2.91" for 25-Year event
 Inflow = 4.41 cfs @ 8.00 hrs, Volume= 1.722 af
 Outflow = 4.41 cfs @ 8.00 hrs, Volume= 1.722 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.41 cfs @ 8.00 hrs, Volume= 1.722 af

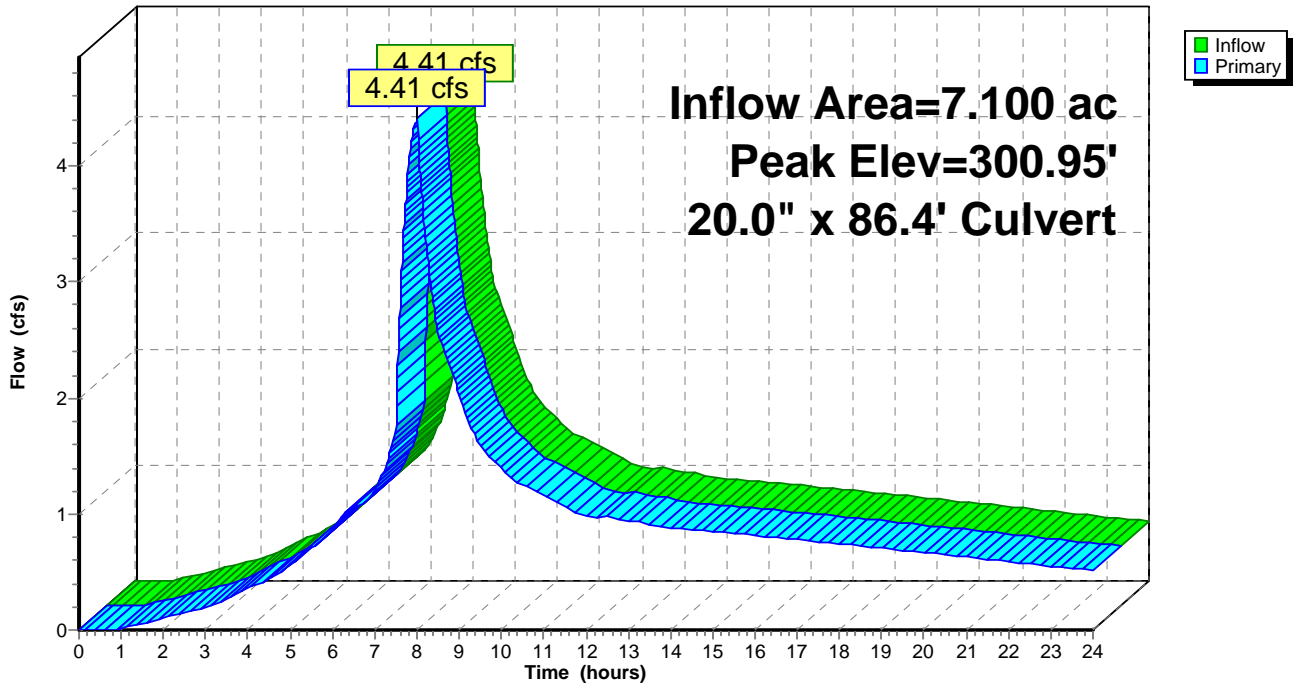
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.95' @ 8.00 hrs
 Flood Elev= 306.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.82'	20.0" x 86.4' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.40' S= 0.0049 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=4.40 cfs @ 8.00 hrs HW=300.94' (Free Discharge)
 ↳ **1=Culvert** (Barrel Controls 4.40 cfs @ 3.97 fps)

Pond 900R: 12"

Hydrograph



Summary for Pond 1000R: 12"

Inflow Area = 7.100 ac, 43.84% Impervious, Inflow Depth > 2.91" for 25-Year event
 Inflow = 4.41 cfs @ 8.00 hrs, Volume= 1.722 af
 Outflow = 4.41 cfs @ 8.00 hrs, Volume= 1.722 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.41 cfs @ 8.00 hrs, Volume= 1.722 af

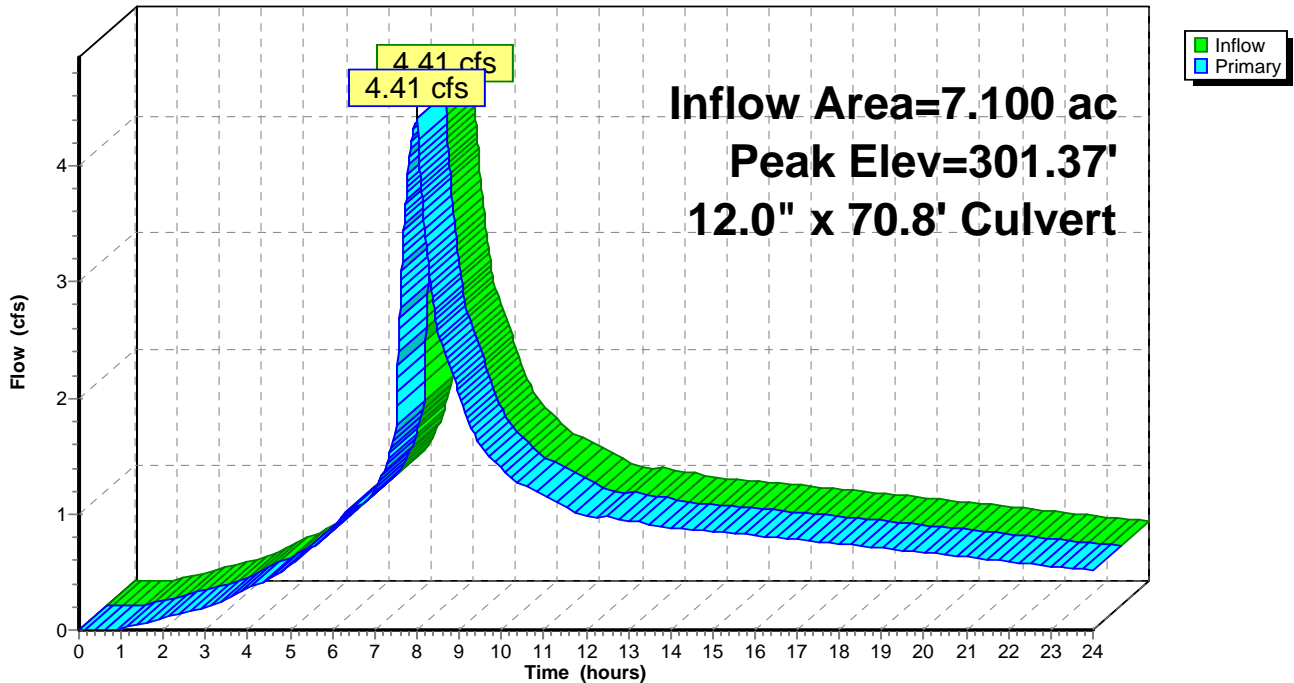
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.37' @ 8.00 hrs
 Flood Elev= 307.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.28'	12.0" x 70.8' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0103 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=4.41 cfs @ 8.00 hrs HW=301.37' (Free Discharge)
 ←1=Culvert (Barrel Controls 4.41 cfs @ 5.61 fps)

Pond 1000R: 12"

Hydrograph



Summary for Pond 1100R: 12"

Inflow Area = 0.303 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af
 Outflow = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af

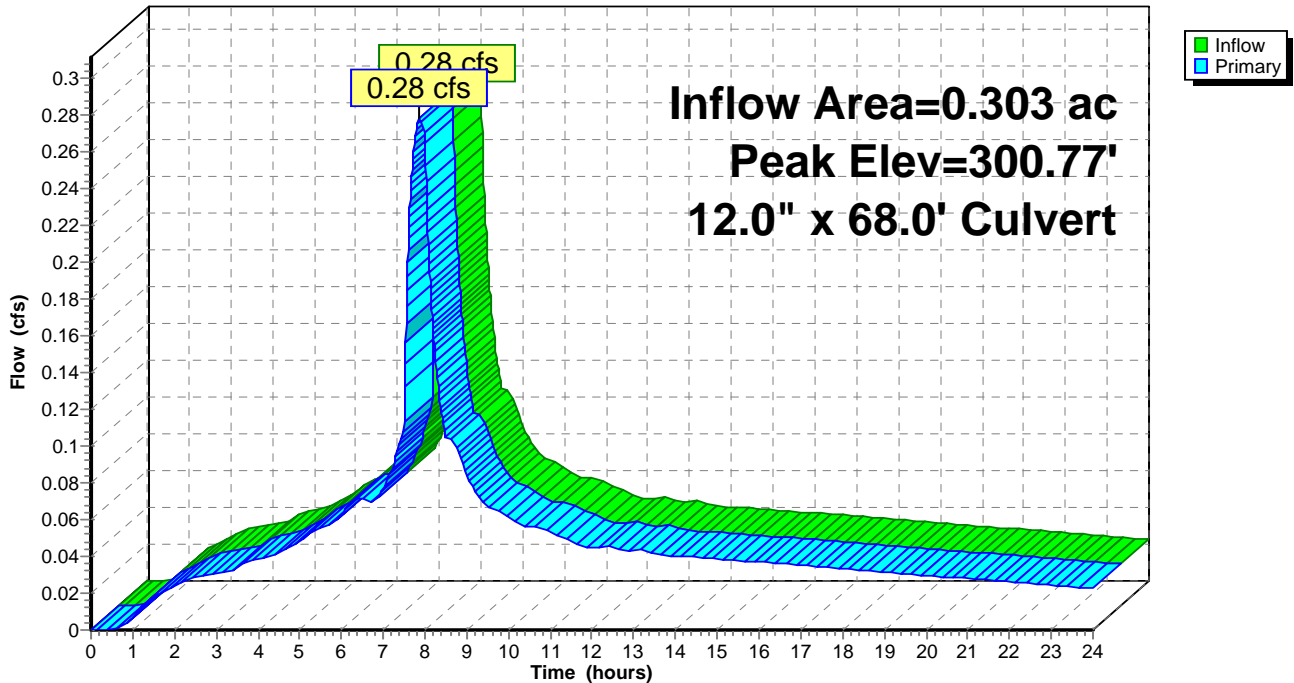
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.77' @ 7.88 hrs
 Flood Elev= 314.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.52'	12.0" x 68.0' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0290 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.27 cfs @ 7.88 hrs HW=300.77' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.27 cfs @ 1.72 fps)

Pond 1100R: 12"

Hydrograph



Summary for Pond 1200R: 12"

Inflow Area = 0.182 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af
 Outflow = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af

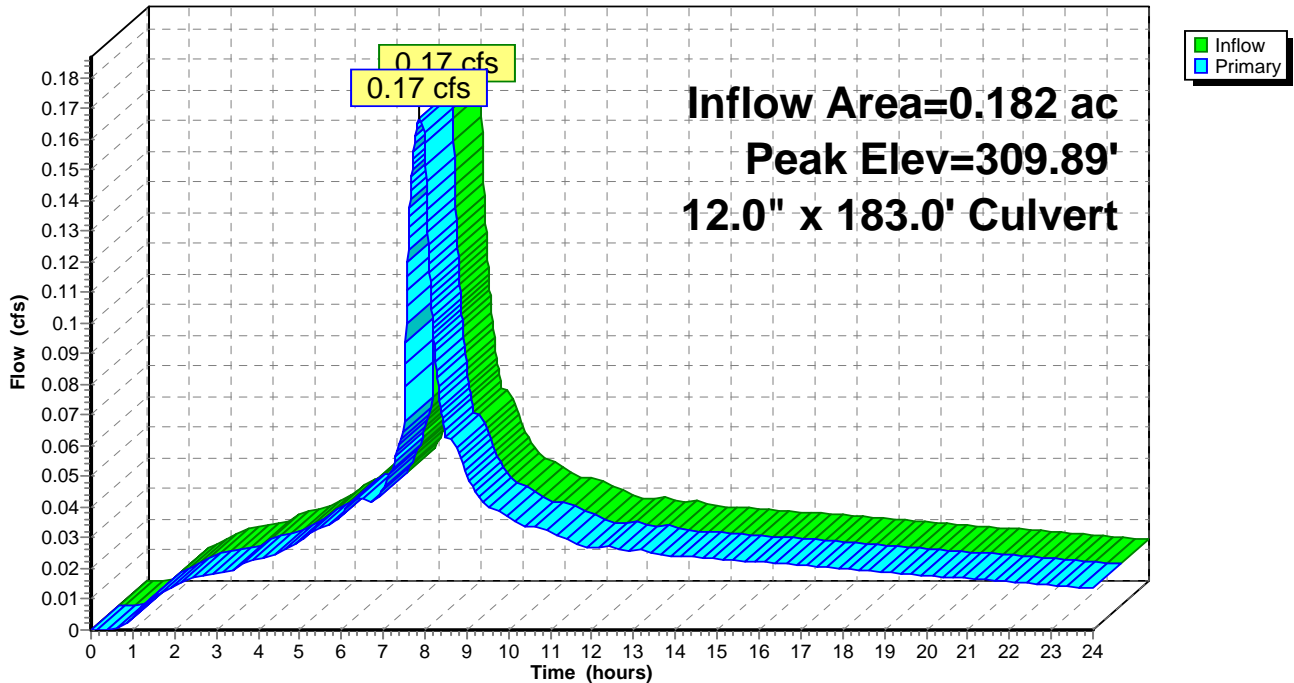
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 309.89' @ 7.88 hrs
 Flood Elev= 323.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	309.70'	12.0" x 183.0' long Culvert Ke= 0.500 Outlet Invert= 300.70' S= 0.0492 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.15 cfs @ 7.88 hrs HW=309.89' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.15 cfs @ 1.48 fps)

Pond 1200R: 12"

Hydrograph



Summary for Pond 1300R: 12"

Inflow Area = 11.029 ac, 43.78% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af
 Outflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af

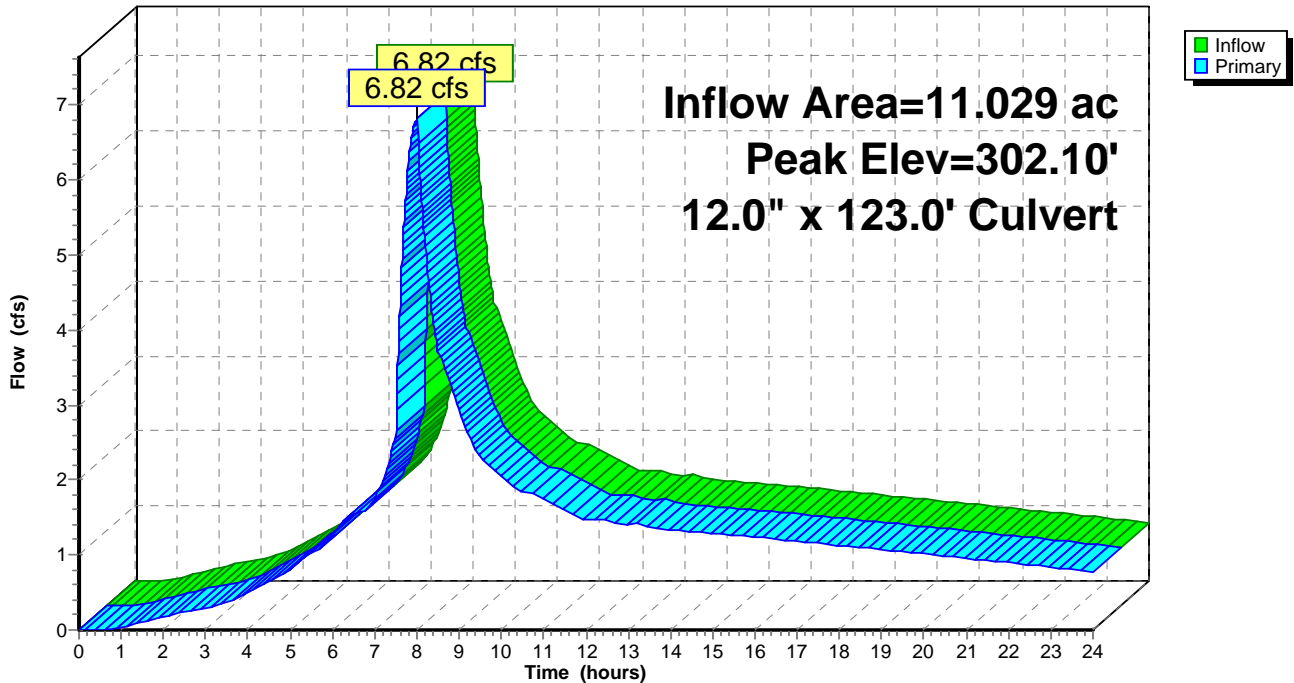
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 302.10' @ 8.00 hrs
 Flood Elev= 312.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.35'	12.0" x 123.0' long Culvert Ke= 0.500 Outlet Invert= 274.98' S= 0.1900 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=6.82 cfs @ 8.00 hrs HW=302.10' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.82 cfs @ 8.68 fps)

Pond 1300R: 12"

Hydrograph



Summary for Pond 1400R: 12"

Inflow Area = 11.029 ac, 43.78% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af
 Outflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af

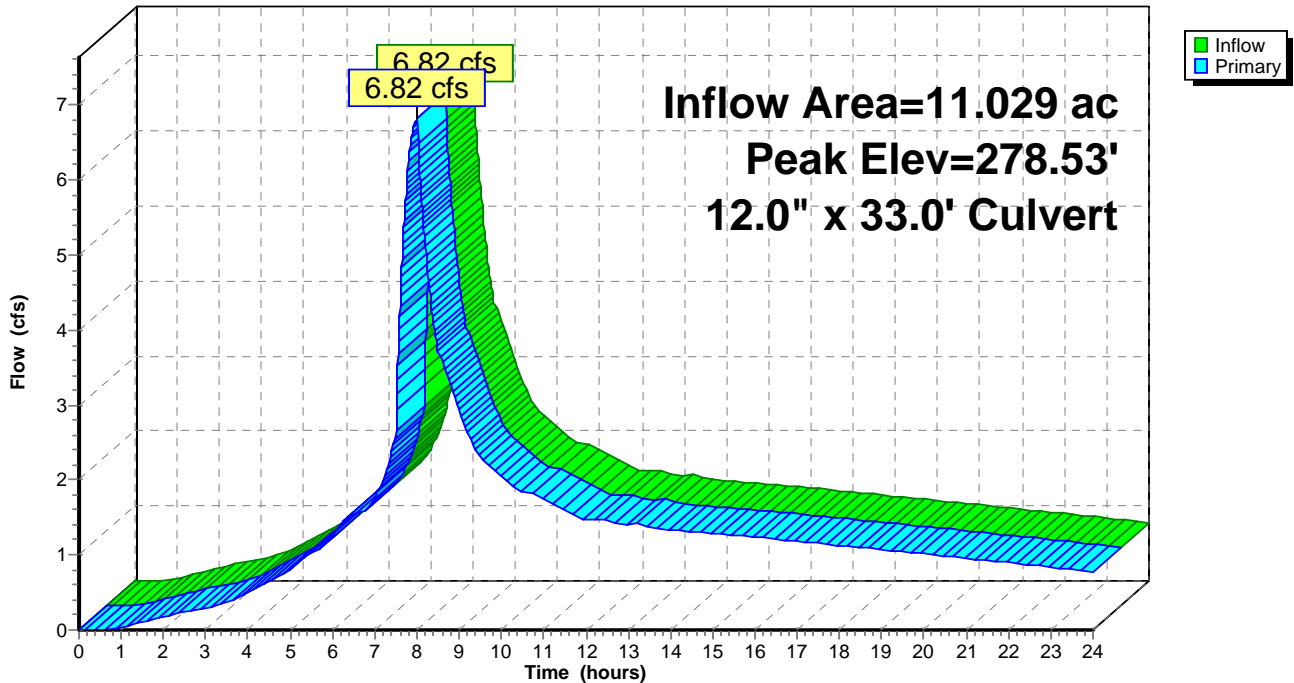
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 278.53' @ 8.00 hrs
 Flood Elev= 288.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.78'	12.0" x 33.0' long Culvert Ke= 0.500 Outlet Invert= 273.79' S= 0.0300 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=6.82 cfs @ 8.00 hrs HW=278.53' (Free Discharge)
 ↳ **1=Culvert** (Inlet Controls 6.82 cfs @ 8.68 fps)

Pond 1400R: 12"

Hydrograph



Summary for Pond 1500R: 12"

Inflow Area = 11.029 ac, 43.78% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af
 Outflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af

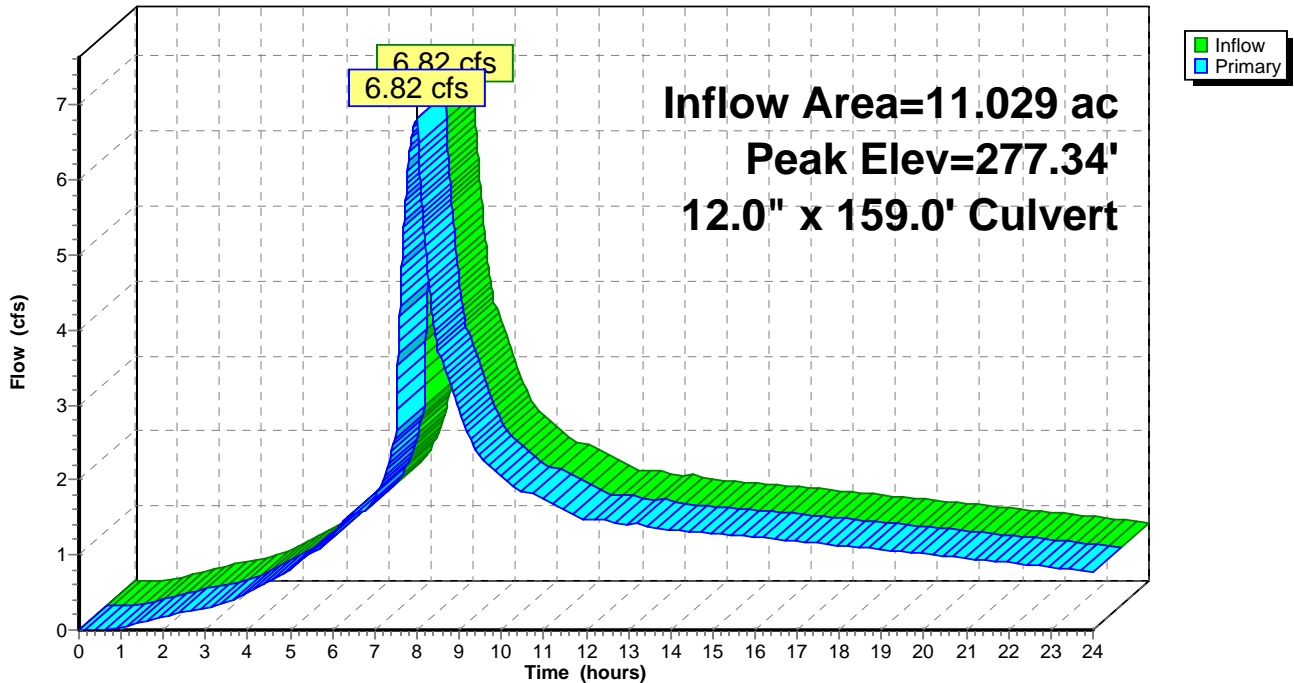
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 277.34' @ 8.00 hrs
 Flood Elev= 287.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.59'	12.0" x 159.0' long Culvert Ke= 0.500 Outlet Invert= 266.59' S= 0.0440 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.82 cfs @ 8.00 hrs HW=277.34' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.82 cfs @ 8.68 fps)

Pond 1500R: 12"

Hydrograph



Summary for Pond 1600R: 12"

Inflow Area = 11.029 ac, 43.78% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af
 Outflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af

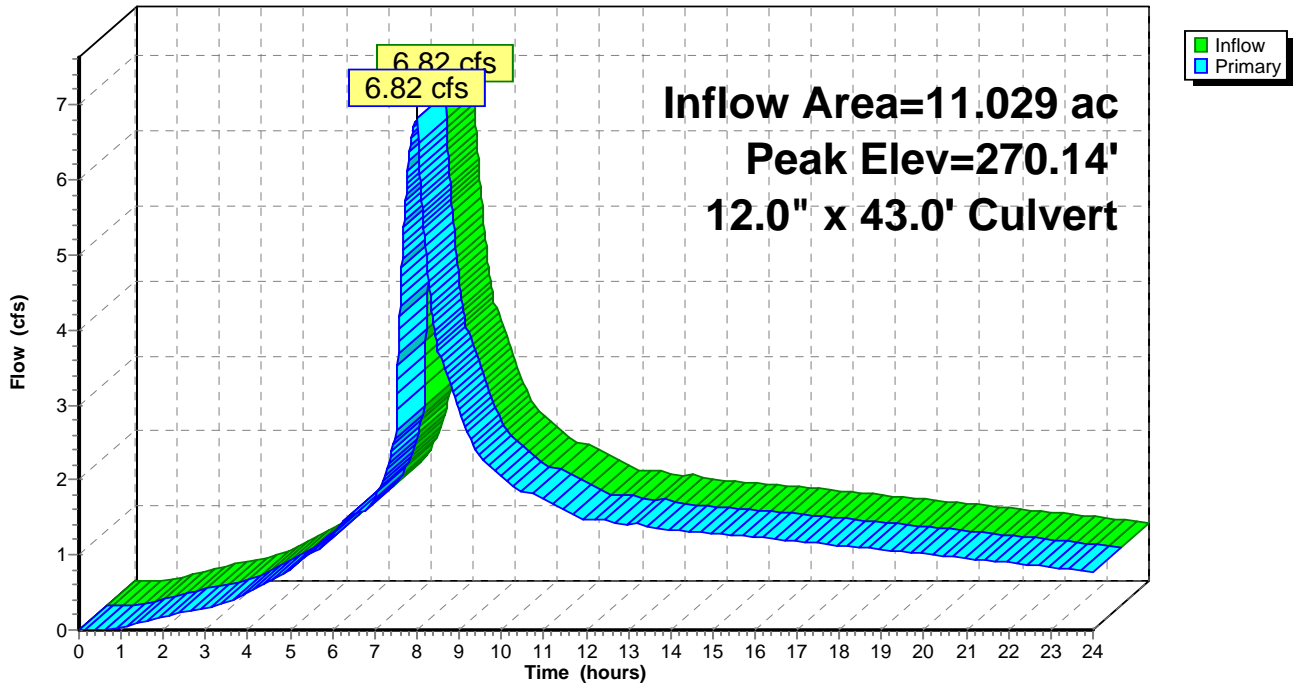
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 270.14' @ 8.00 hrs
 Flood Elev= 280.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	266.39'	12.0" x 43.0' long Culvert Ke= 0.500 Outlet Invert= 254.78' S= 0.2700 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=6.82 cfs @ 8.00 hrs HW=270.14' (Free Discharge)
 ↳ **1=Culvert** (Inlet Controls 6.82 cfs @ 8.68 fps)

Pond 1600R: 12"

Hydrograph



Summary for Pond 1700R: 12"

Inflow Area = 11.029 ac, 43.78% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af
 Outflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af

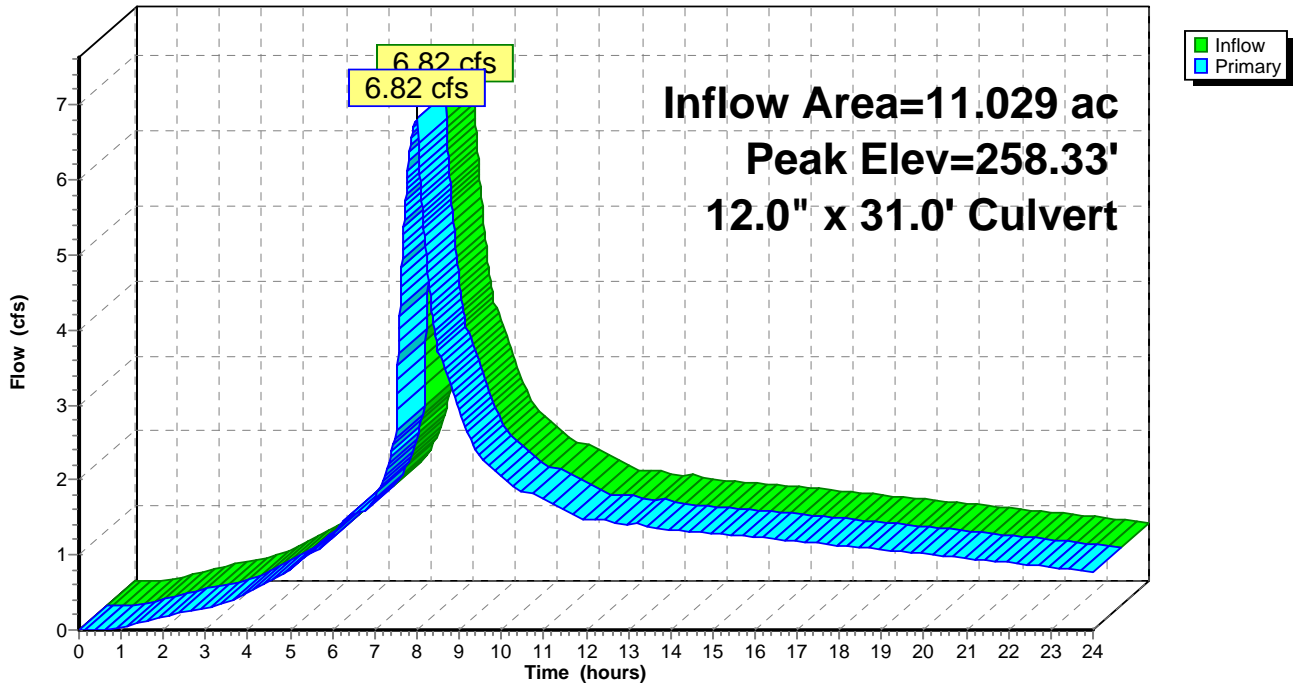
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 258.33' @ 8.00 hrs
 Flood Elev= 268.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	254.58'	12.0" x 31.0' long Culvert Ke= 0.500 Outlet Invert= 239.08' S= 0.5000 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.82 cfs @ 8.00 hrs HW=258.33' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.82 cfs @ 8.68 fps)

Pond 1700R: 12"

Hydrograph



Summary for Pond 1800R: 12"

Inflow Area = 11.029 ac, 43.78% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af
 Outflow = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.82 cfs @ 8.00 hrs, Volume= 2.581 af

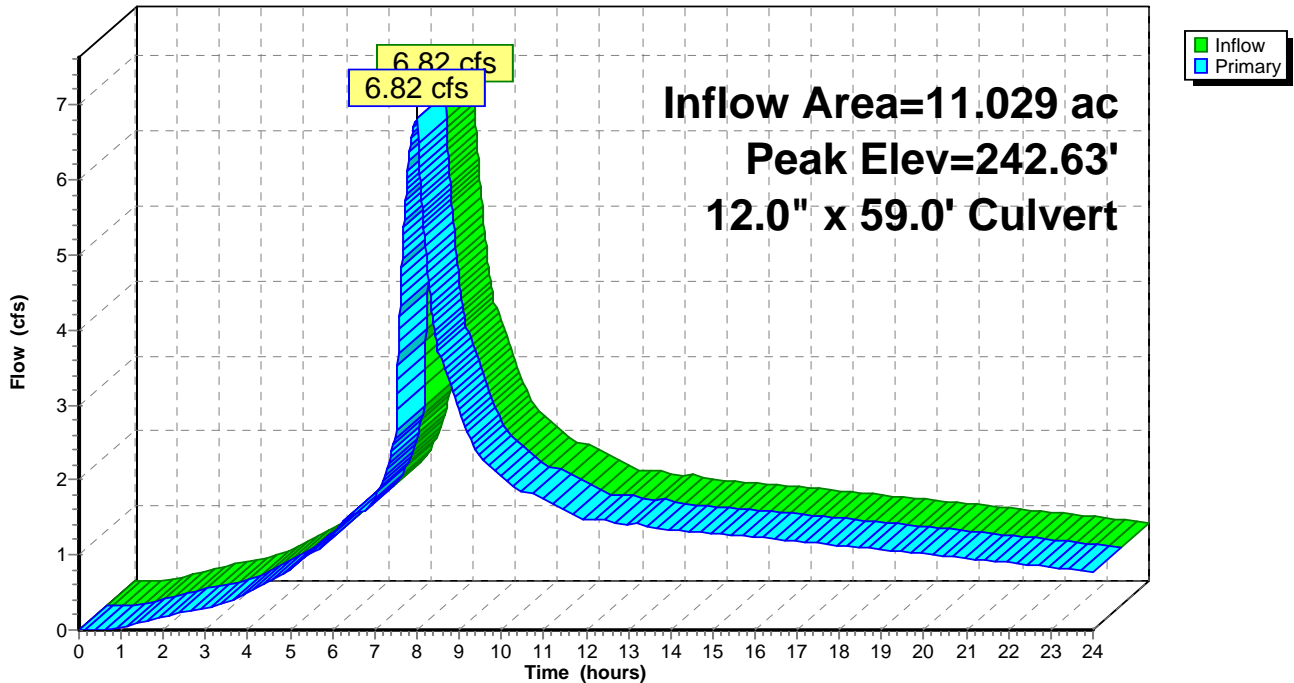
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 242.63' @ 8.00 hrs
 Flood Elev= 246.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.88'	12.0" x 59.0' long Culvert Ke= 0.500 Outlet Invert= 236.00' S= 0.0488 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=6.82 cfs @ 8.00 hrs HW=242.63' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.82 cfs @ 8.68 fps)

Pond 1800R: 12"

Hydrograph



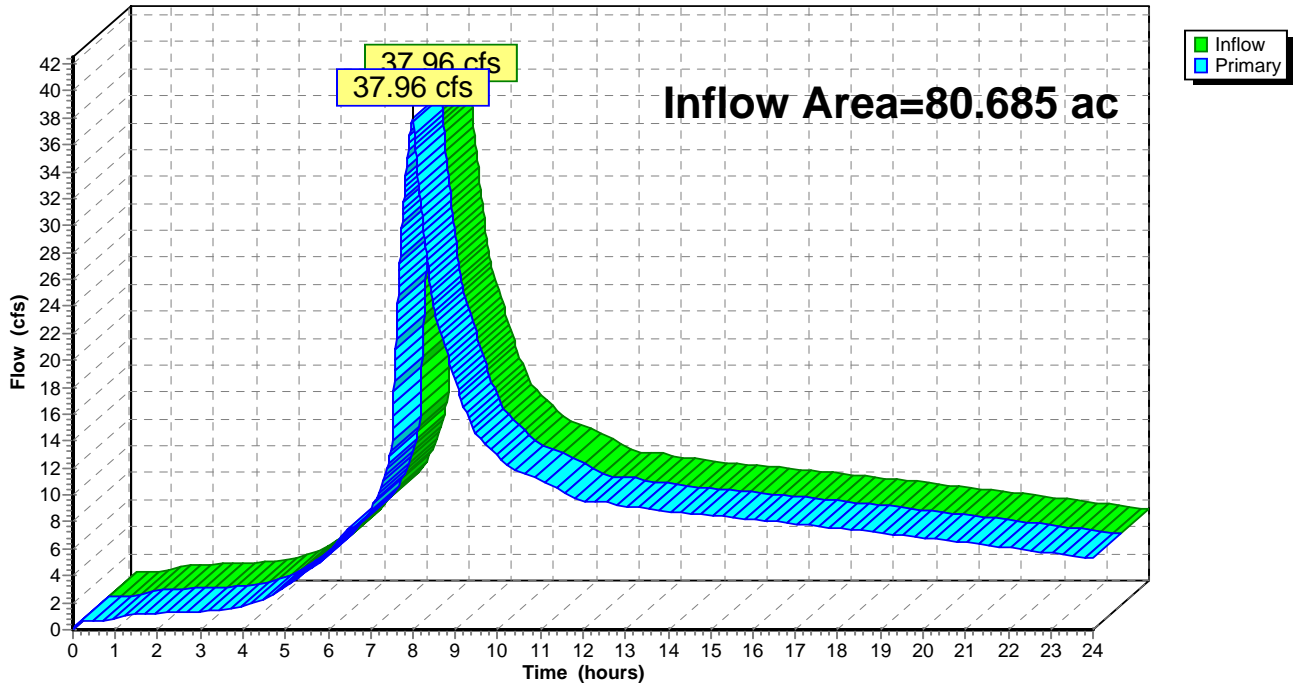
Summary for Link B: NATURAL POND 1900

Inflow Area = 80.685 ac, 43.20% Impervious, Inflow Depth > 2.34" for 25-Year event
Inflow = 37.96 cfs @ 8.00 hrs, Volume= 15.749 af
Primary = 37.96 cfs @ 8.00 hrs, Volume= 15.749 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

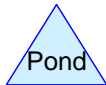
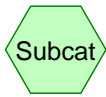
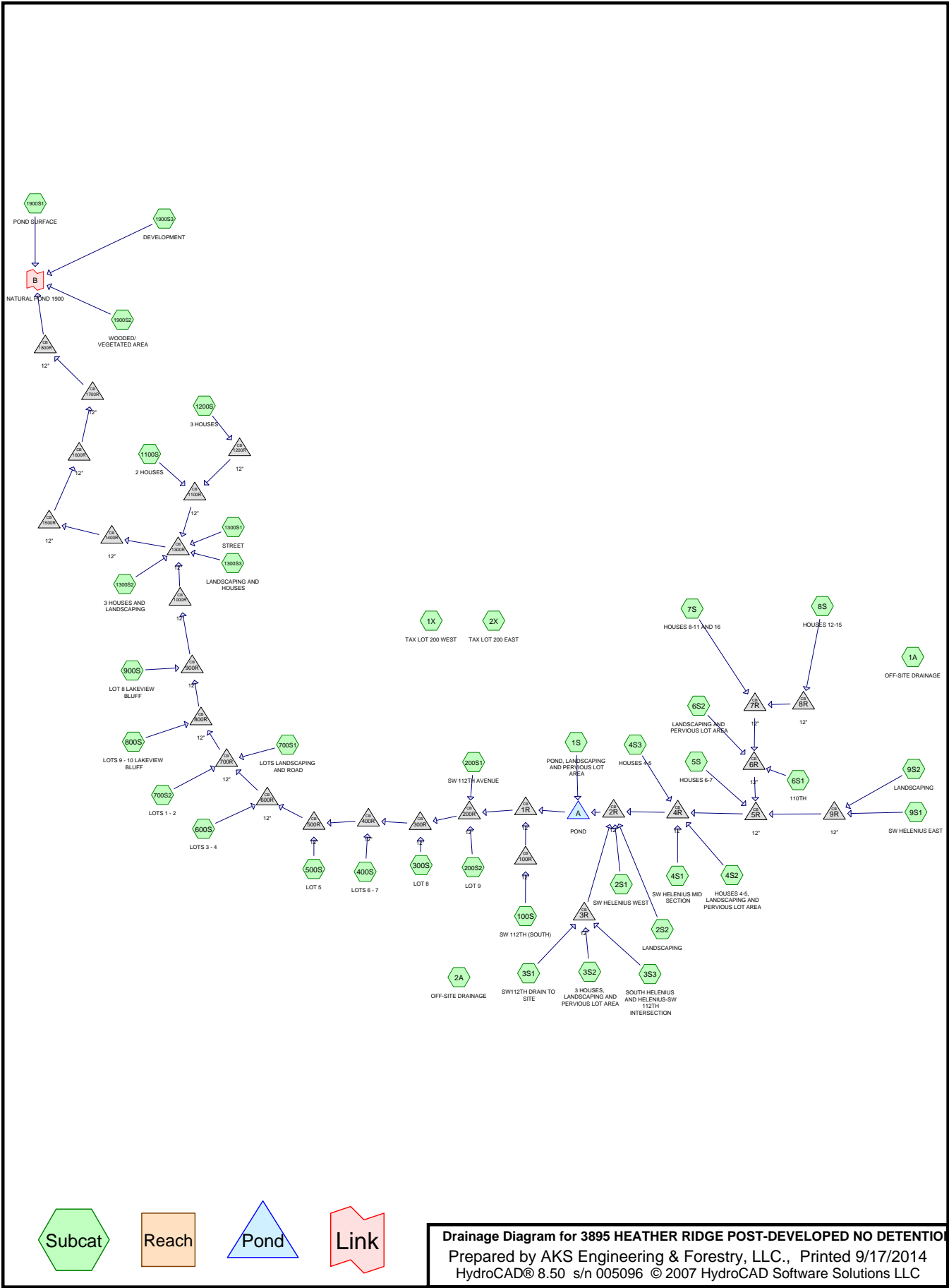
Link B: NATURAL POND 1900

Hydrograph



APPENDIX 2.2

POST-DEVELOPED WITHOUT DETENTION



Drainage Diagram for 3895 HEATHER RIDGE POST-DEVELOPED NO DETENTION
 Prepared by AKS Engineering & Forestry, LLC., Printed 9/17/2014
 HydroCAD® 8.5.0 s/n 005096 © 2007 HydroCAD Software Solutions LLC

Summary for Subcatchment 1A: OFF-SITE DRAINAGE

Runoff = 0.09 cfs @ 7.98 hrs, Volume= 0.034 af, Depth> 1.88"

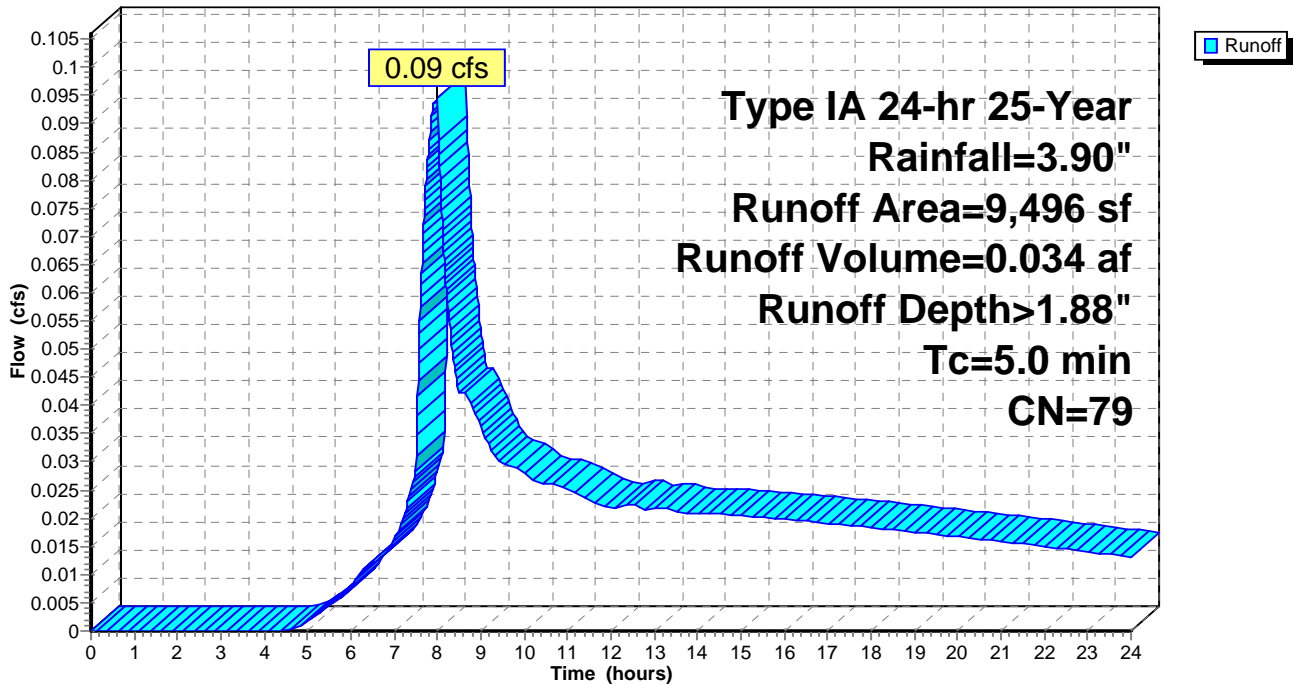
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
9,496	79	50-75% Grass cover, Fair, HSG C
9,496		Pervious Area

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

Subcatchment 1A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA

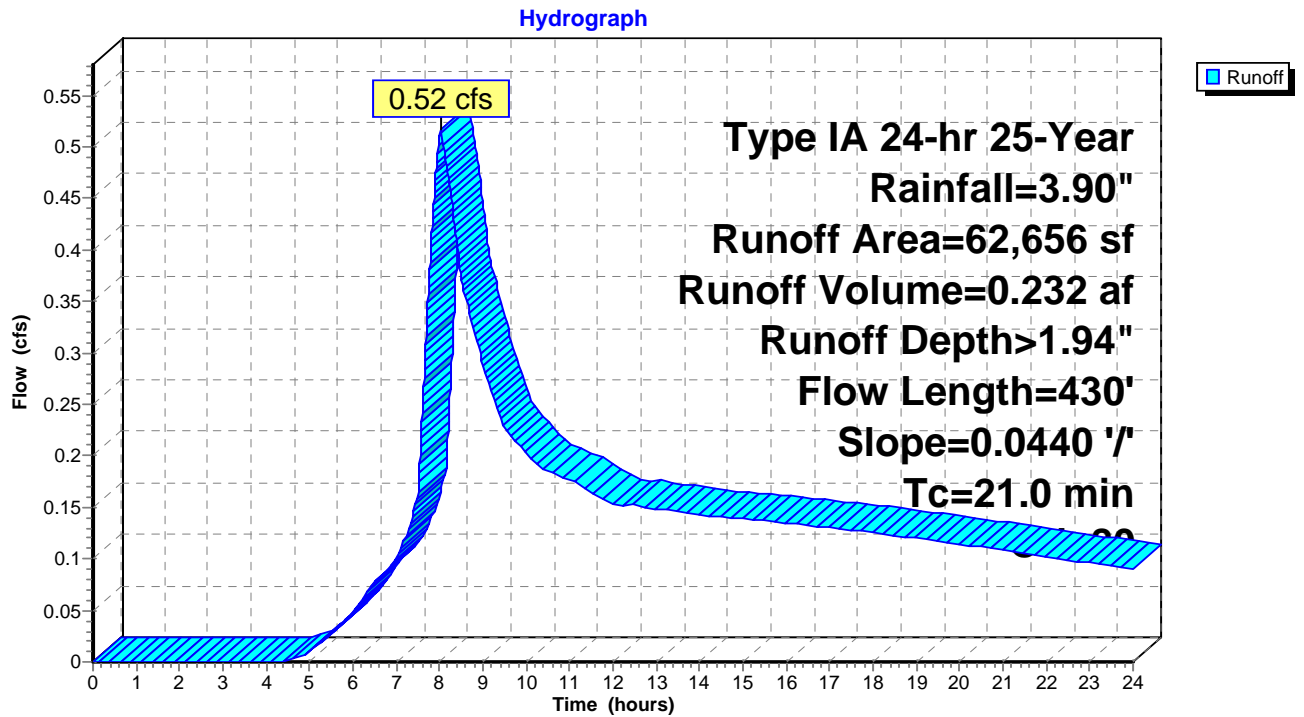
Runoff = 0.52 cfs @ 8.01 hrs, Volume= 0.232 af, Depth> 1.94"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
3,614	100	Water Quality Facility
59,042	79	50-75% Grass cover, Fair, HSG C
62,656	80	Weighted Average
59,042		Pervious Area
3,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	300	0.0440	0.26		Sheet Flow, Flow over lots Grass: Short n= 0.150 P2= 2.50"
1.5	130	0.0440	1.47		Shallow Concentrated Flow, Flow over lots Short Grass Pasture Kv= 7.0 fps
21.0	430	Total			

Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 1X: TAX LOT 200 WEST

Runoff = 1.82 cfs @ 8.01 hrs, Volume= 0.851 af, Depth> 2.60"

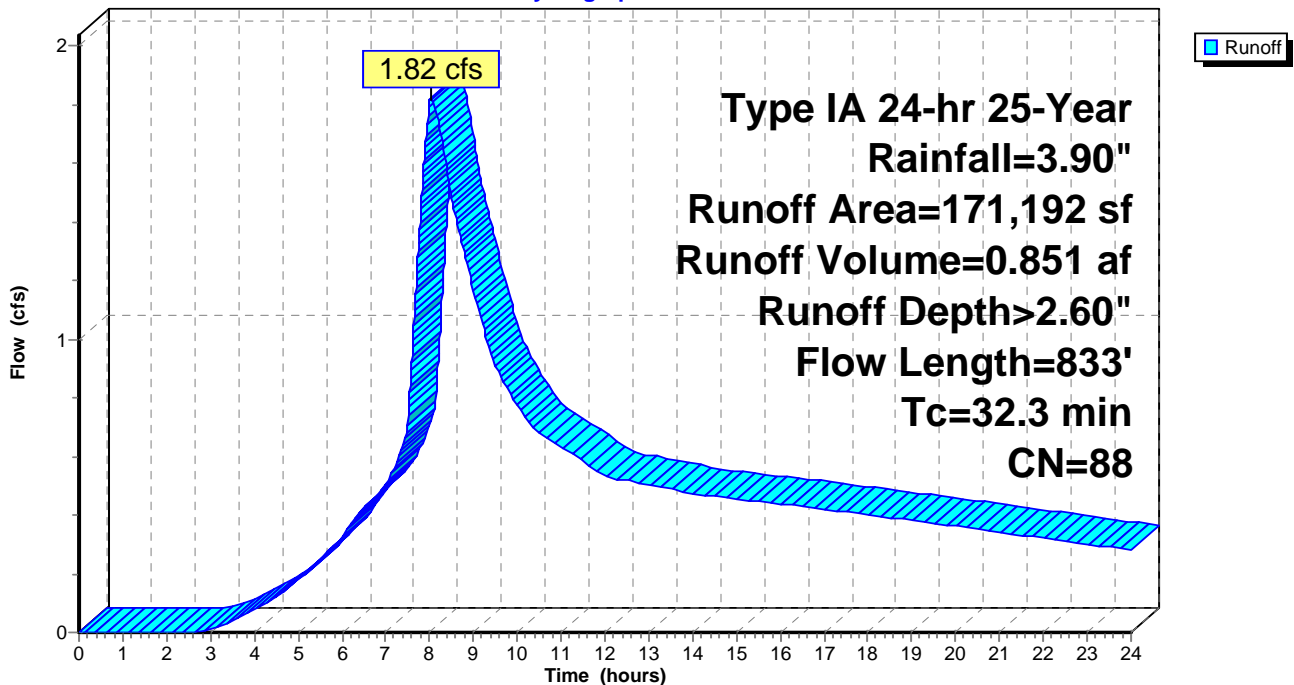
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
136,192	86	<50% Grass cover, Poor, HSG C
* 33,982	98	AC PAVEMENT, ROOFS
1,018	89	Gravel roads, HSG C
171,192	88	Weighted Average
137,210		Pervious Area
33,982		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	300	0.0220	0.19		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"
6.6	533	0.0375	1.36		Shallow Concentrated Flow, PASTURE/MEADOW Short Grass Pasture Kv= 7.0 fps
32.3	833	Total			

Subcatchment 1X: TAX LOT 200 WEST

Hydrograph



Summary for Subcatchment 2A: OFF-SITE DRAINAGE

Runoff = 0.01 cfs @ 7.88 hrs, Volume= 0.005 af, Depth> 3.66"

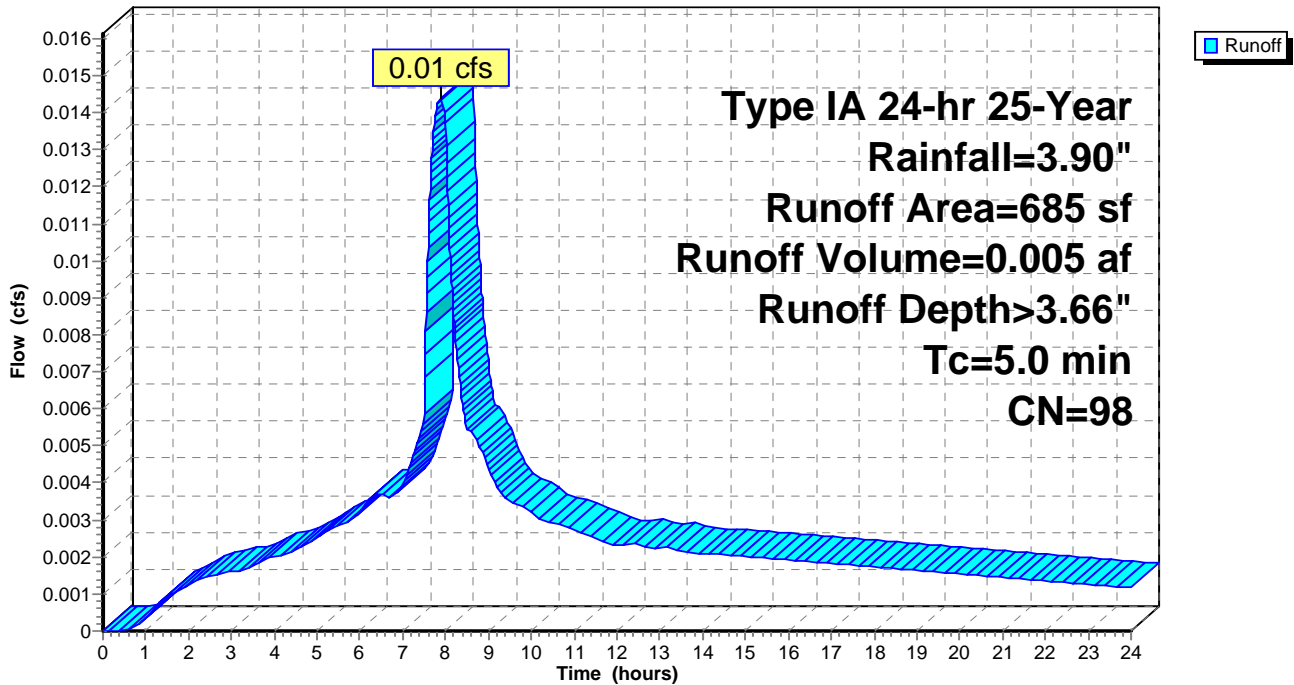
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 685	98	Street and sidewalk
685		Impervious Area

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

Subcatchment 2A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 2S1: SW HELENIUS WEST

Runoff = 0.13 cfs @ 7.89 hrs, Volume= 0.042 af, Depth> 3.33"

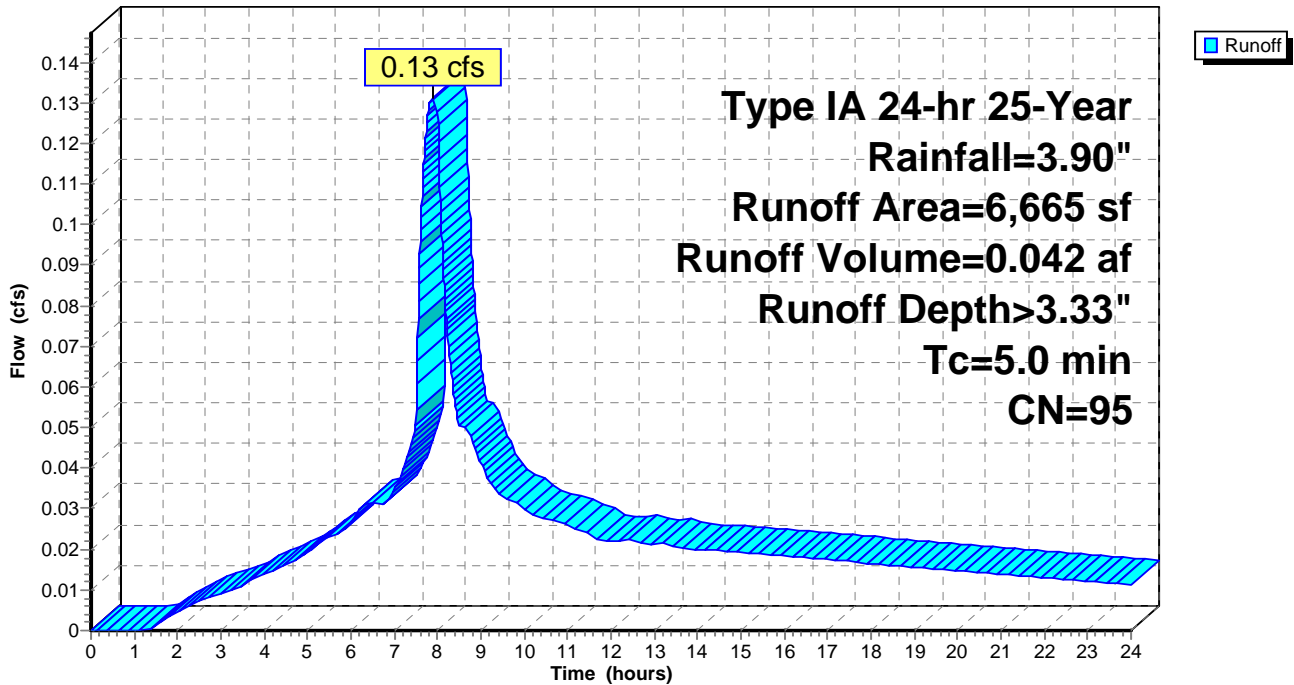
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,667	98	Street and sidewalk
998	79	50-75% Grass cover, Fair, HSG C
6,665	95	Weighted Average
998		Pervious Area
5,667		Impervious Area

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

Subcatchment 2S1: SW HELENIUS WEST

Hydrograph



Summary for Subcatchment 2S2: LANDSCAPING

Runoff = 0.01 cfs @ 7.98 hrs, Volume= 0.005 af, Depth> 1.88"

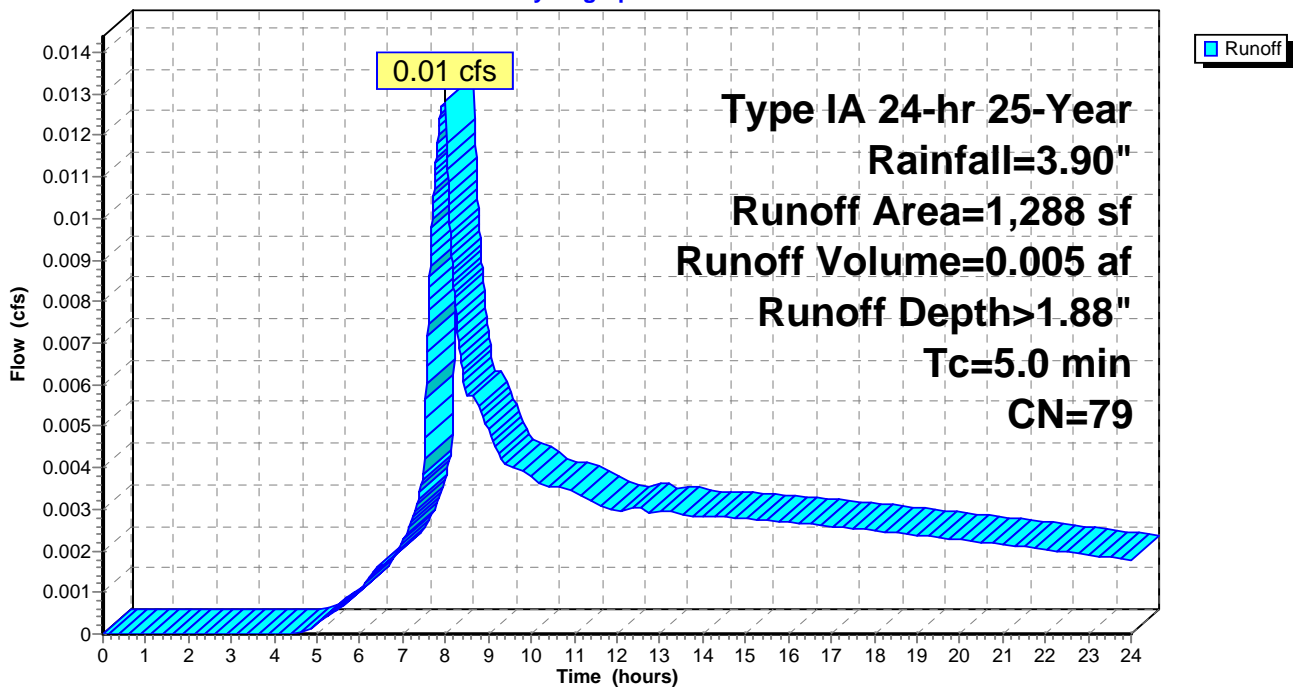
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
1,288	79	50-75% Grass cover, Fair, HSG C
1,288		Pervious Area

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

Subcatchment 2S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 2X: TAX LOT 200 EAST

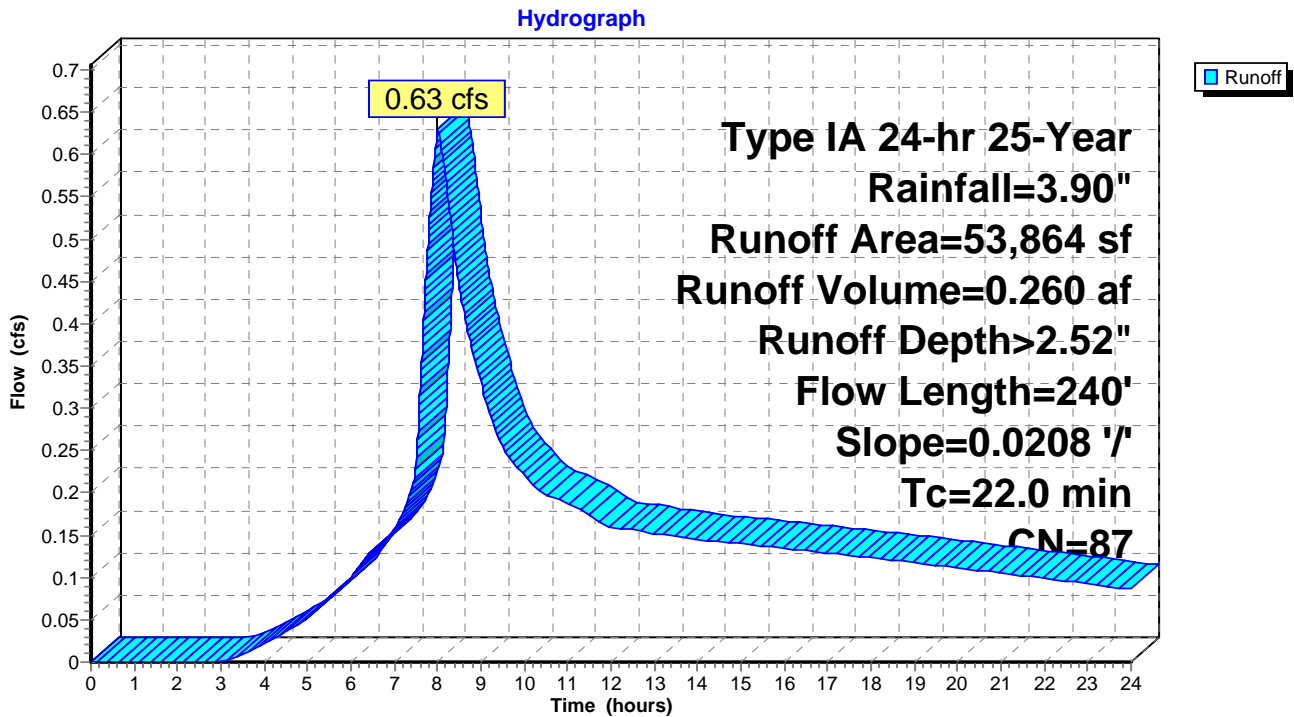
Runoff = 0.63 cfs @ 8.01 hrs, Volume= 0.260 af, Depth> 2.52"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
50,783	86	<50% Grass cover, Poor, HSG C
* 3,081	98	Roof
53,864	87	Weighted Average
50,783		Pervious Area
3,081		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	240	0.0208	0.18		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 2X: TAX LOT 200 EAST



Summary for Subcatchment 3S1: SW112TH DRAIN TO SITE

Runoff = 0.21 cfs @ 7.88 hrs, Volume= 0.069 af, Depth> 3.55"

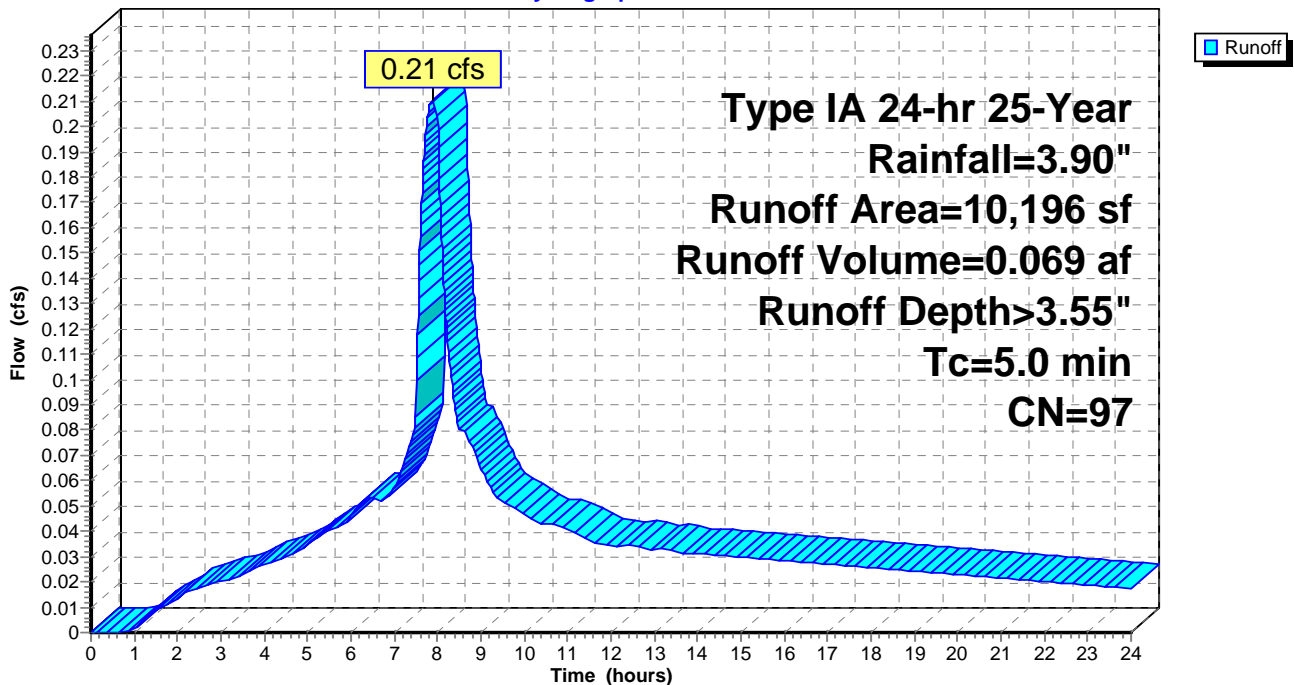
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 9,446	98	Street and sidewalk
750	79	50-75% Grass cover, Fair, HSG C
10,196	97	Weighted Average
750		Pervious Area
9,446		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S1: SW112TH DRAIN TO SITE

Hydrograph



Summary for Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA

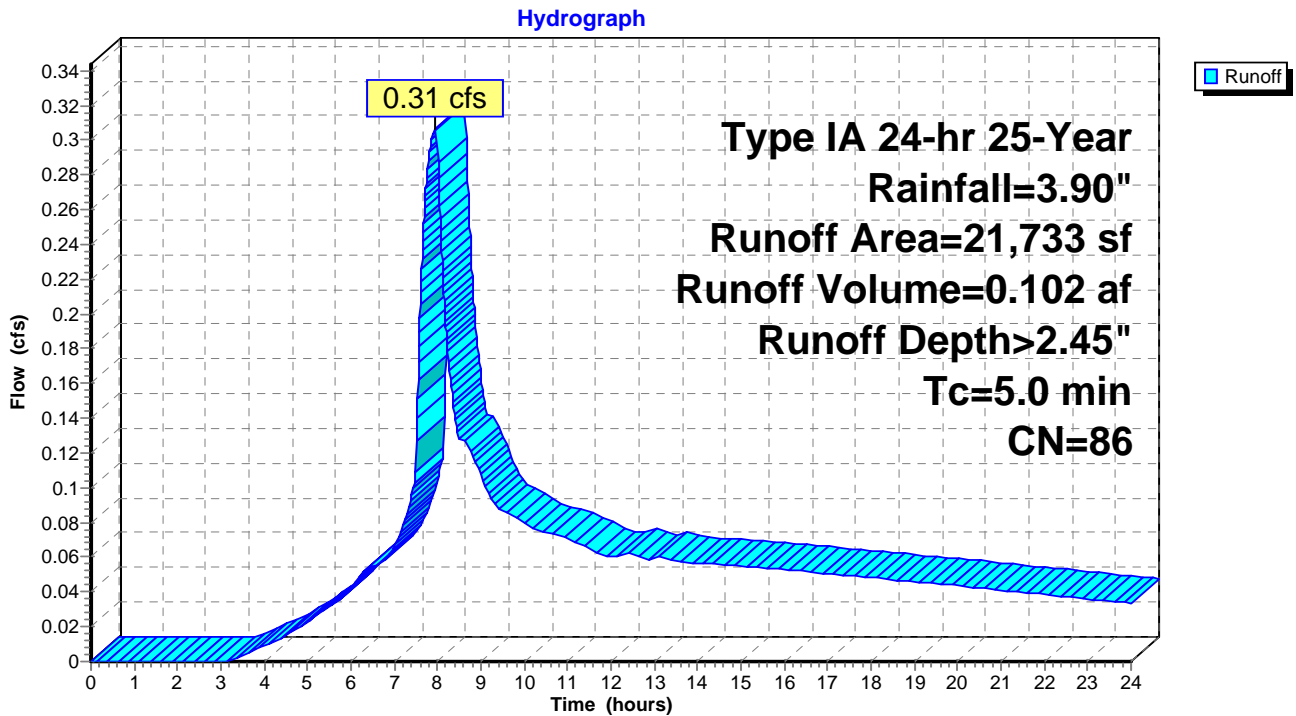
Runoff = 0.31 cfs @ 7.94 hrs, Volume= 0.102 af, Depth> 2.45"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
13,813	79	50-75% Grass cover, Fair, HSG C
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
21,733	86	Weighted Average
13,813		Pervious Area
7,920		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION

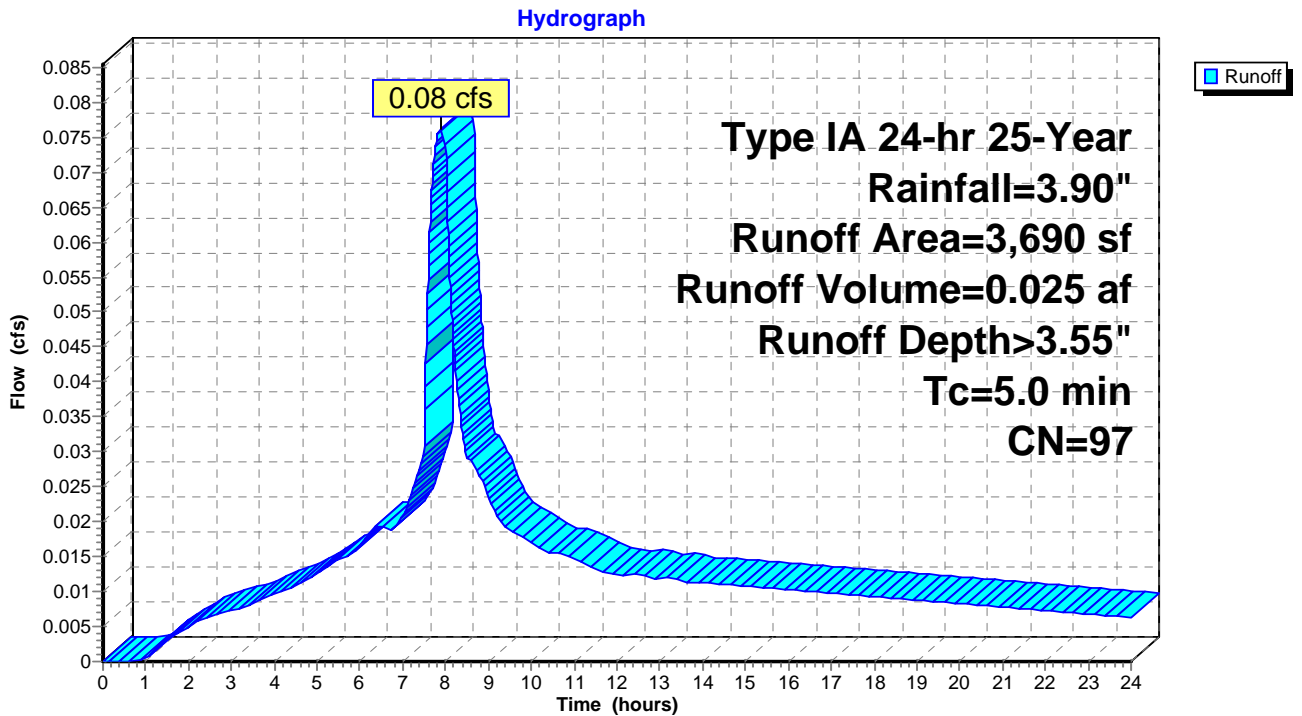
Runoff = 0.08 cfs @ 7.88 hrs, Volume= 0.025 af, Depth> 3.55"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 3,540	98	Street and sidewalk
150	79	50-75% Grass cover, Fair, HSG C
3,690	97	Weighted Average
150		Pervious Area
3,540		Impervious Area

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

Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION



Summary for Subcatchment 4S1: SW HELENIUS MID SECTION

Runoff = 0.16 cfs @ 7.89 hrs, Volume= 0.051 af, Depth> 3.33"

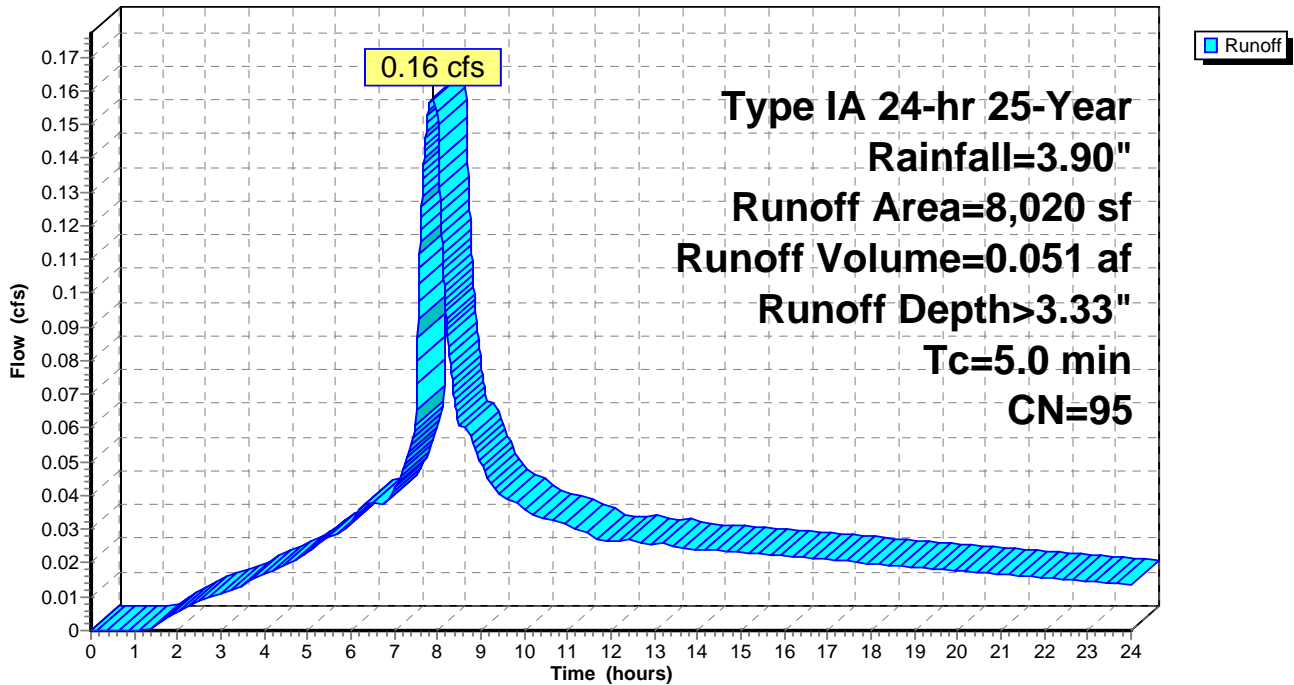
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
6,943	98	Streets and sidewalks
1,077	79	50-75% Grass cover, Fair, HSG C
8,020	95	Weighted Average
1,077		Pervious Area
6,943		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREETS AND ROOFTOP RUNOFF

Subcatchment 4S1: SW HELENIUS MID SECTION

Hydrograph



Summary for Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA

Runoff = 0.18 cfs @ 7.92 hrs, Volume= 0.057 af, Depth> 2.63"

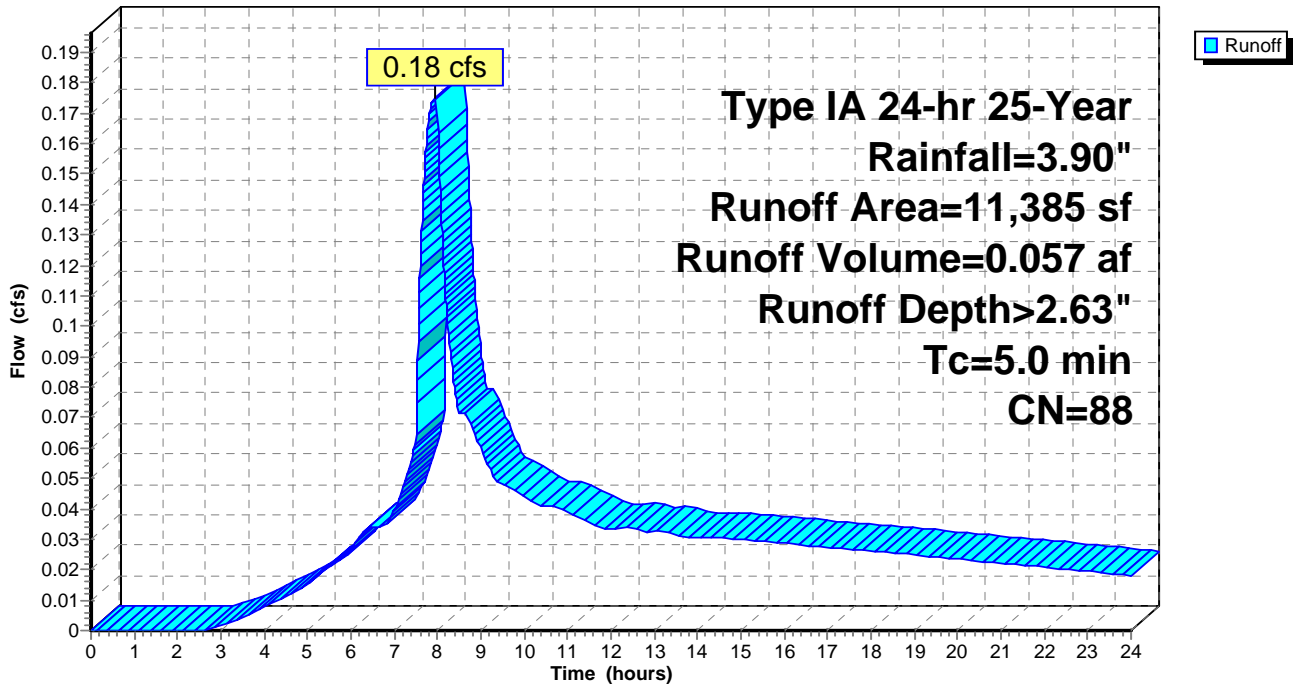
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
6,105	79	50-75% Grass cover, Fair, HSG C
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
11,385	88	Weighted Average
6,105		Pervious Area
5,280		Impervious Area

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

Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA

Hydrograph



Summary for Subcatchment 4S3: HOUSES 4-5

Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.037 af, Depth> 3.66"

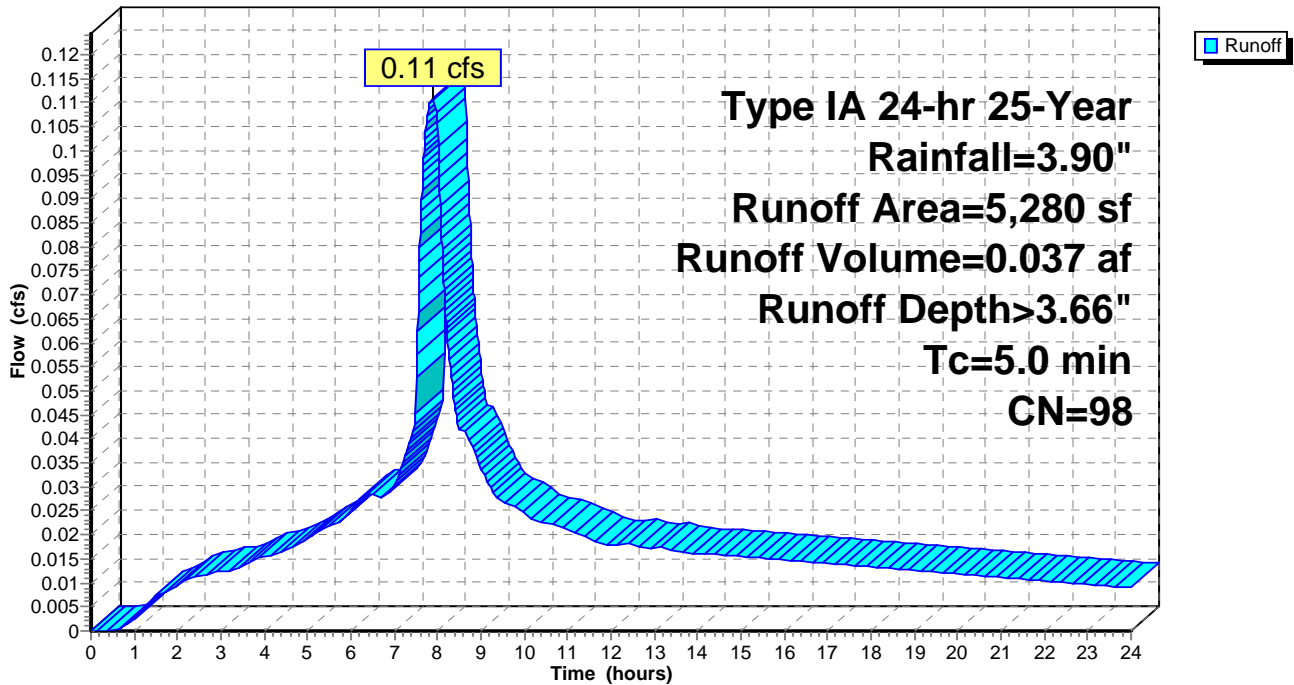
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 4S3: HOUSES 4-5

Hydrograph



Summary for Subcatchment 5S: HOUSES 6-7

Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.037 af, Depth> 3.66"

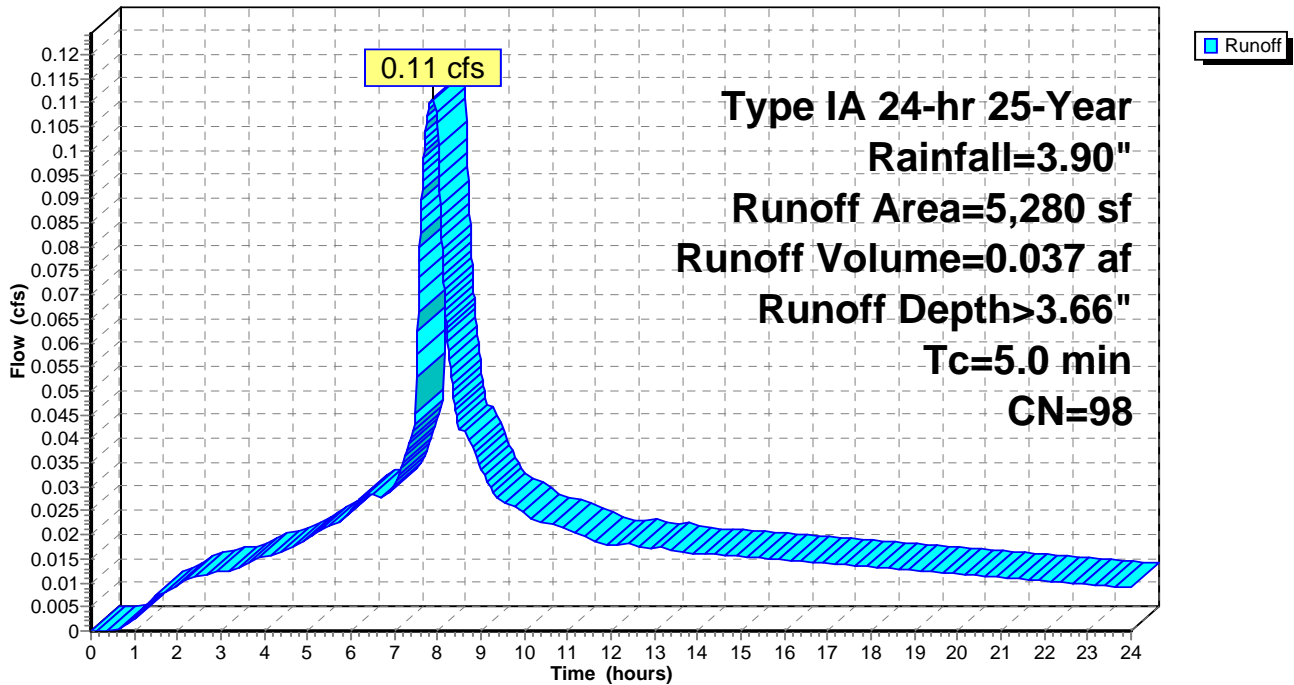
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 5S: HOUSES 6-7

Hydrograph



Summary for Subcatchment 6S1: 110TH

Runoff = 0.31 cfs @ 7.88 hrs, Volume= 0.102 af, Depth> 3.55"

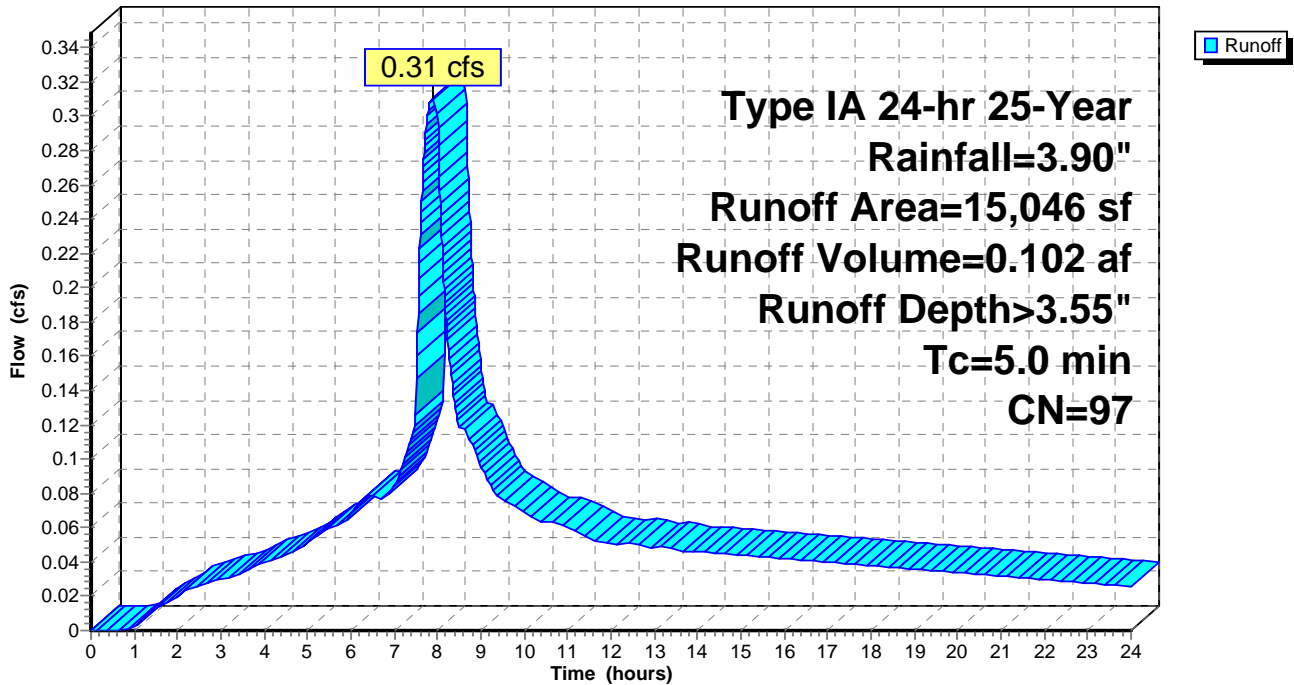
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 14,121	98	Street and sidewalk
925	79	50-75% Grass cover, Fair, HSG C
15,046	97	Weighted Average
925		Pervious Area
14,121		Impervious Area

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

Subcatchment 6S1: 110TH

Hydrograph



Summary for Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Runoff = 0.31 cfs @ 7.98 hrs, Volume= 0.111 af, Depth> 1.88"

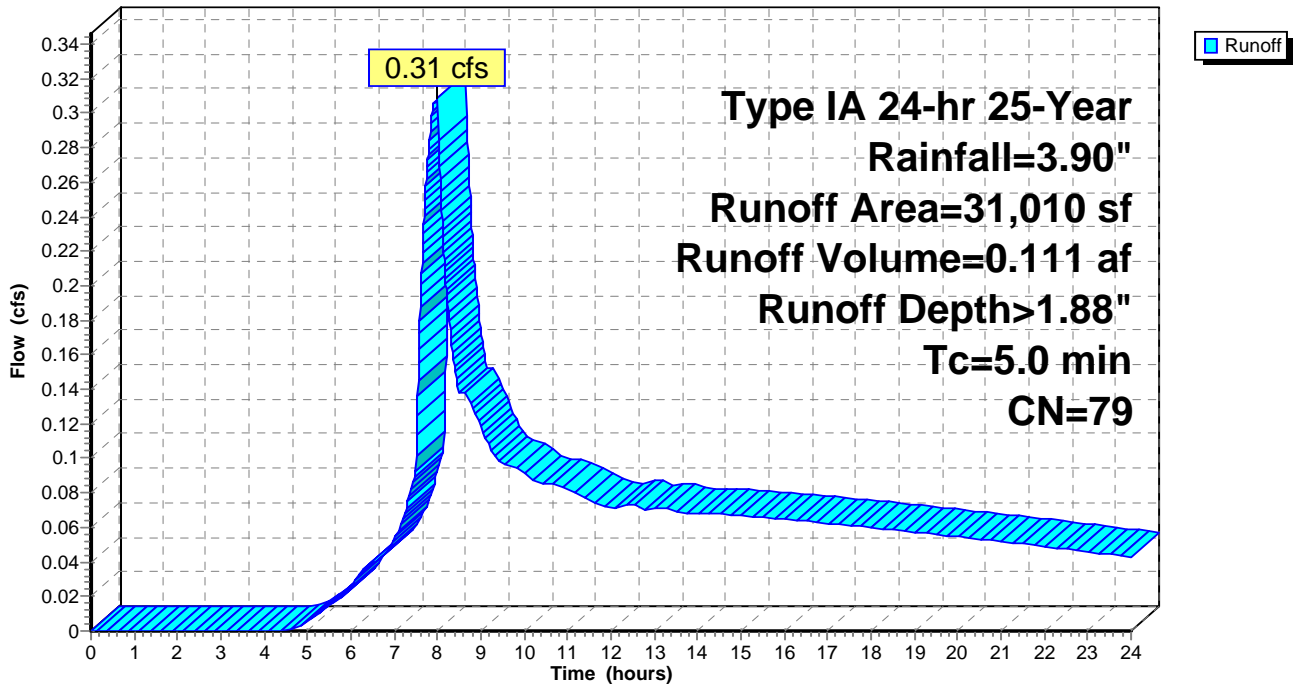
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
31,010	79	50-75% Grass cover, Fair, HSG C
31,010		Pervious Area

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

Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Hydrograph



Summary for Subcatchment 7S: HOUSES 8-11 AND 16

Runoff = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af, Depth> 3.66"

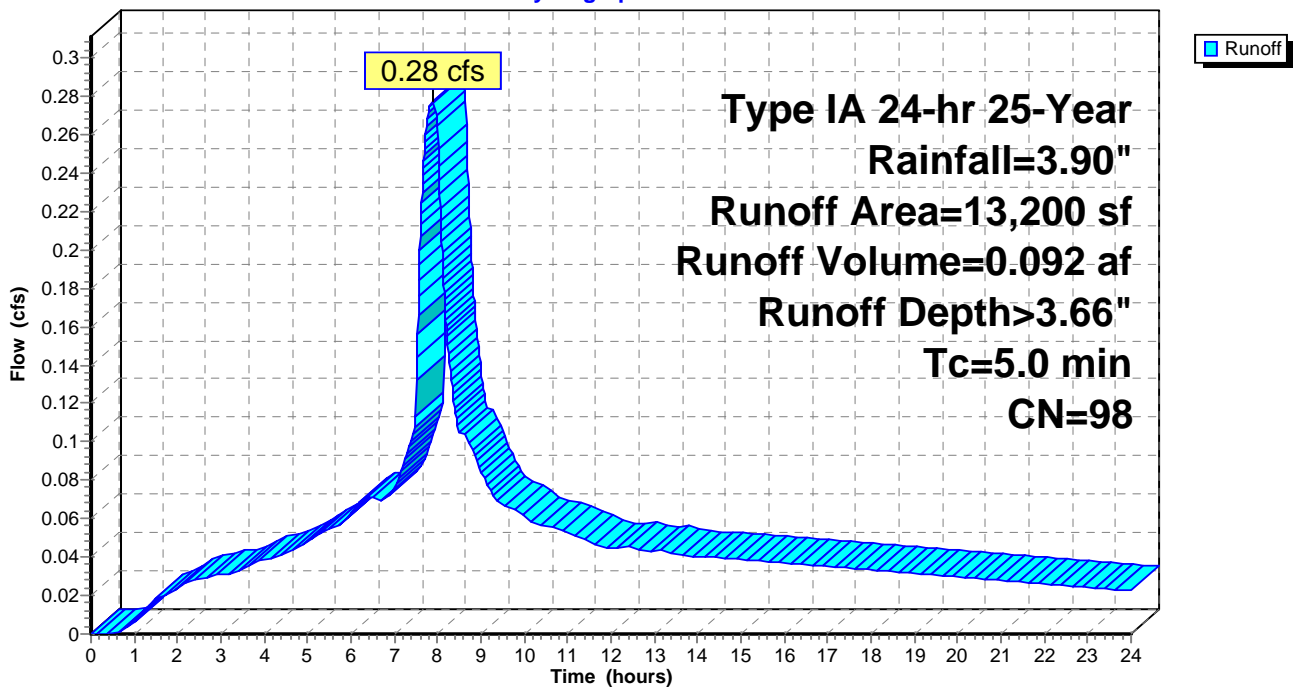
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 13,200	98	5 Lots at 2640 SF Impervious/Lot per CWS
13,200		Impervious Area

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

Subcatchment 7S: HOUSES 8-11 AND 16

Hydrograph



Summary for Subcatchment 8S: HOUSES 12-15

Runoff = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af, Depth> 3.66"

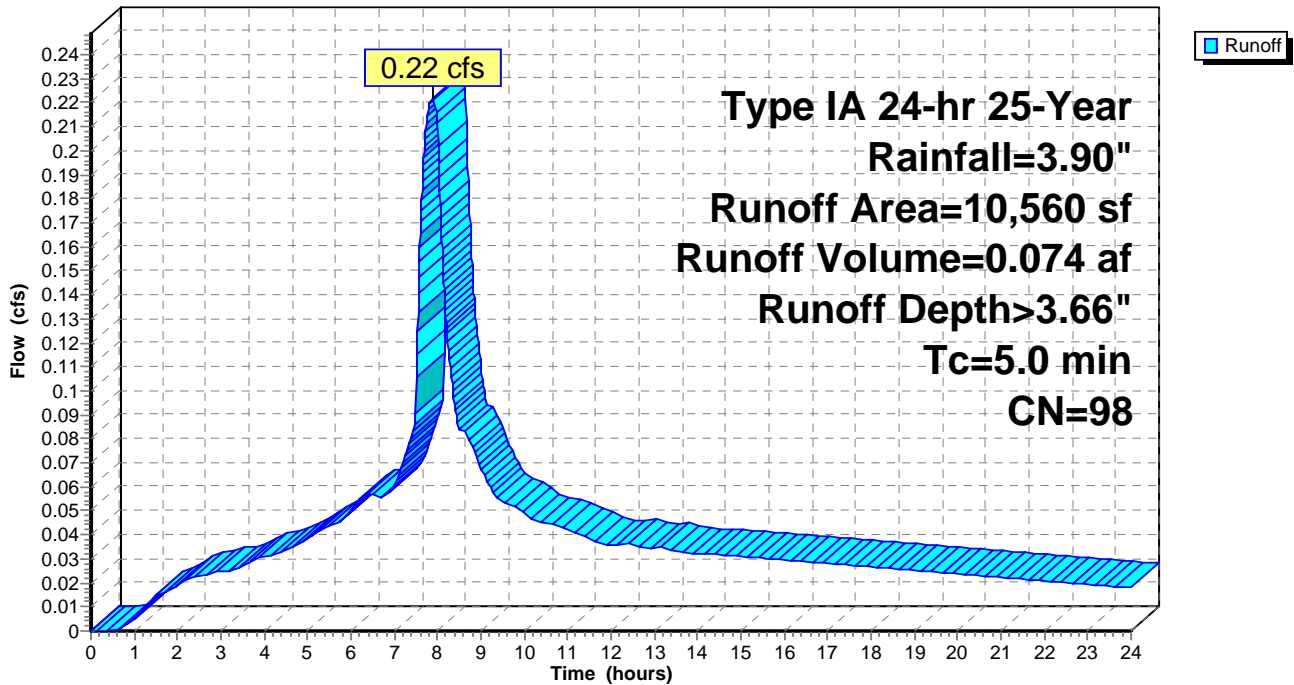
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 10,560	98	4 Lots at 2640 SF Impervious/Lot per CWS
10,560		Impervious Area

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

Subcatchment 8S: HOUSES 12-15

Hydrograph



Summary for Subcatchment 9S1: SW HELENIUS EAST

Runoff = 0.15 cfs @ 7.89 hrs, Volume= 0.049 af, Depth> 3.33"

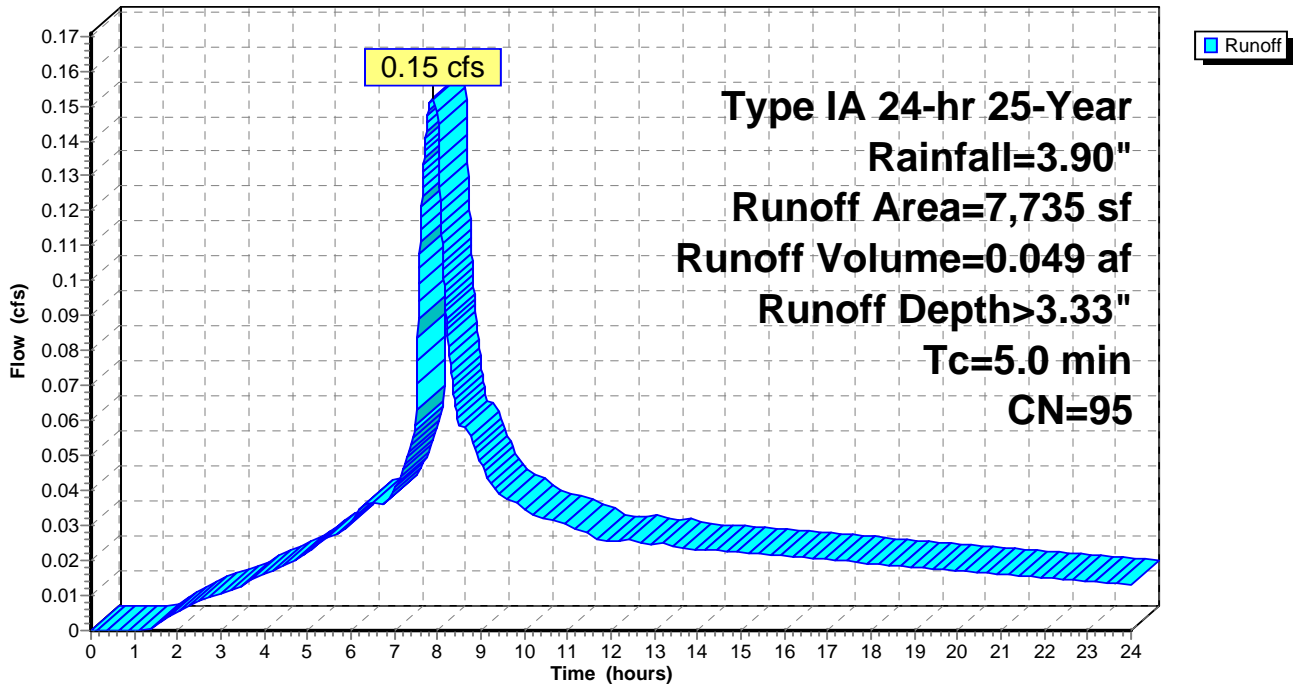
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	6,616	98	Streets and sidewalks
	1,119	79	50-75% Grass cover, Fair, HSG C
	7,735	95	Weighted Average
	1,119		Pervious Area
	6,616		Impervious Area

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

Subcatchment 9S1: SW HELENIUS EAST

Hydrograph



Summary for Subcatchment 9S2: LANDSCAPING

Runoff = 0.05 cfs @ 7.98 hrs, Volume= 0.018 af, Depth> 1.88"

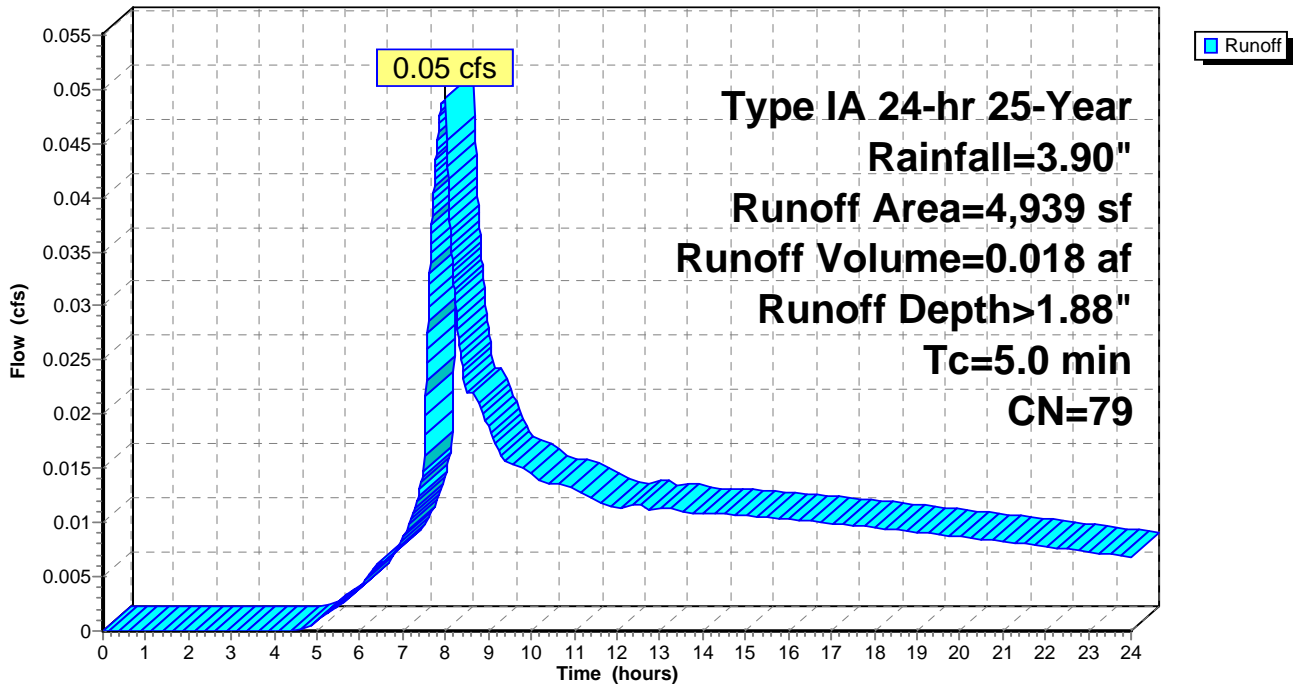
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
4,939	79	50-75% Grass cover, Fair, HSG C
4,939		Pervious Area

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

Subcatchment 9S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 100S: SW 112TH (SOUTH)

Runoff = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af, Depth> 3.66"

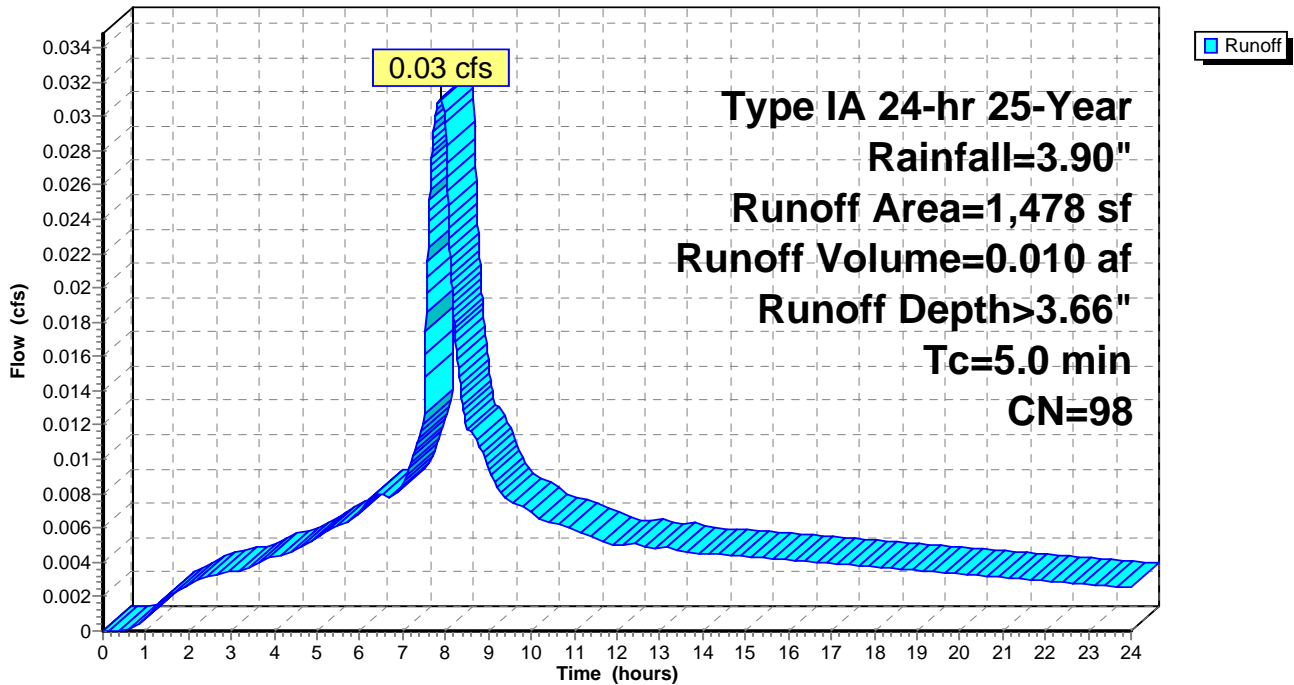
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 1,478	98	Street and sidewalk
1,478		Impervious Area

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

Subcatchment 100S: SW 112TH (SOUTH)

Hydrograph



Summary for Subcatchment 200S1: SW 112TH AVENUE

Runoff = 0.39 cfs @ 7.88 hrs, Volume= 0.128 af, Depth> 3.66"

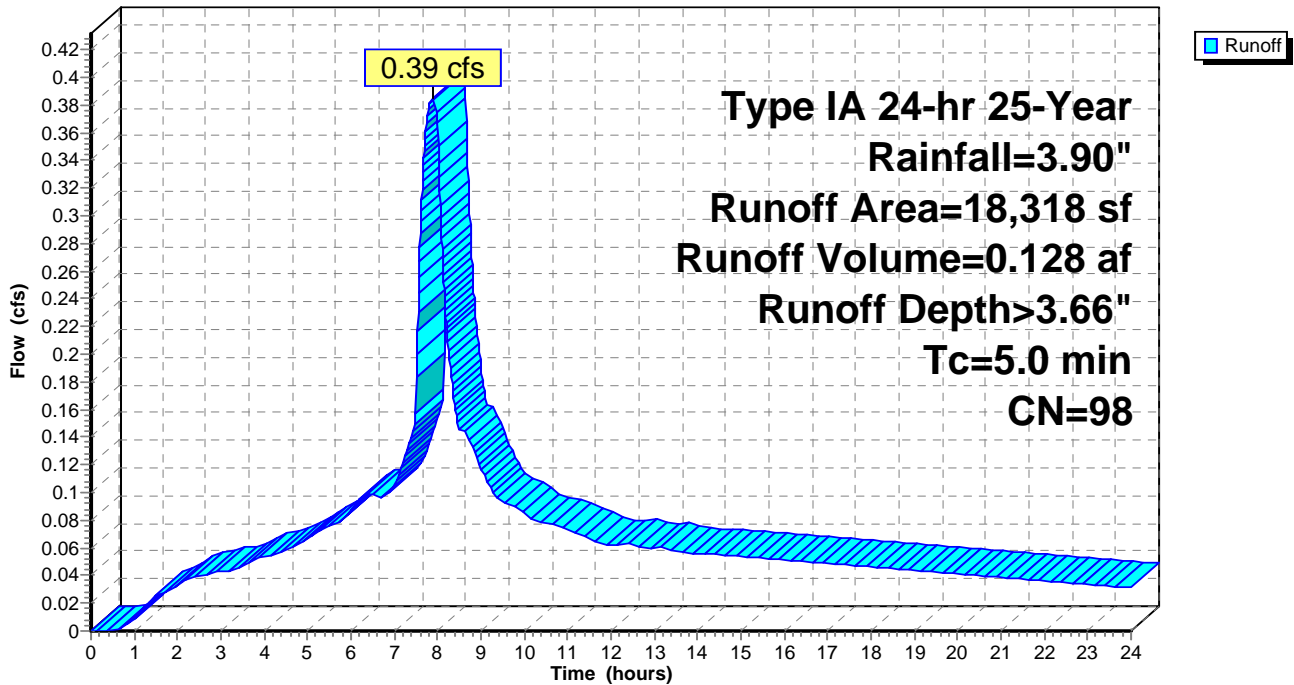
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 18,318	98	Street and sidewalk
18,318		Impervious Area

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

Subcatchment 200S1: SW 112TH AVENUE

Hydrograph



Summary for Subcatchment 200S2: LOT 9

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.021 af, Depth> 3.43"

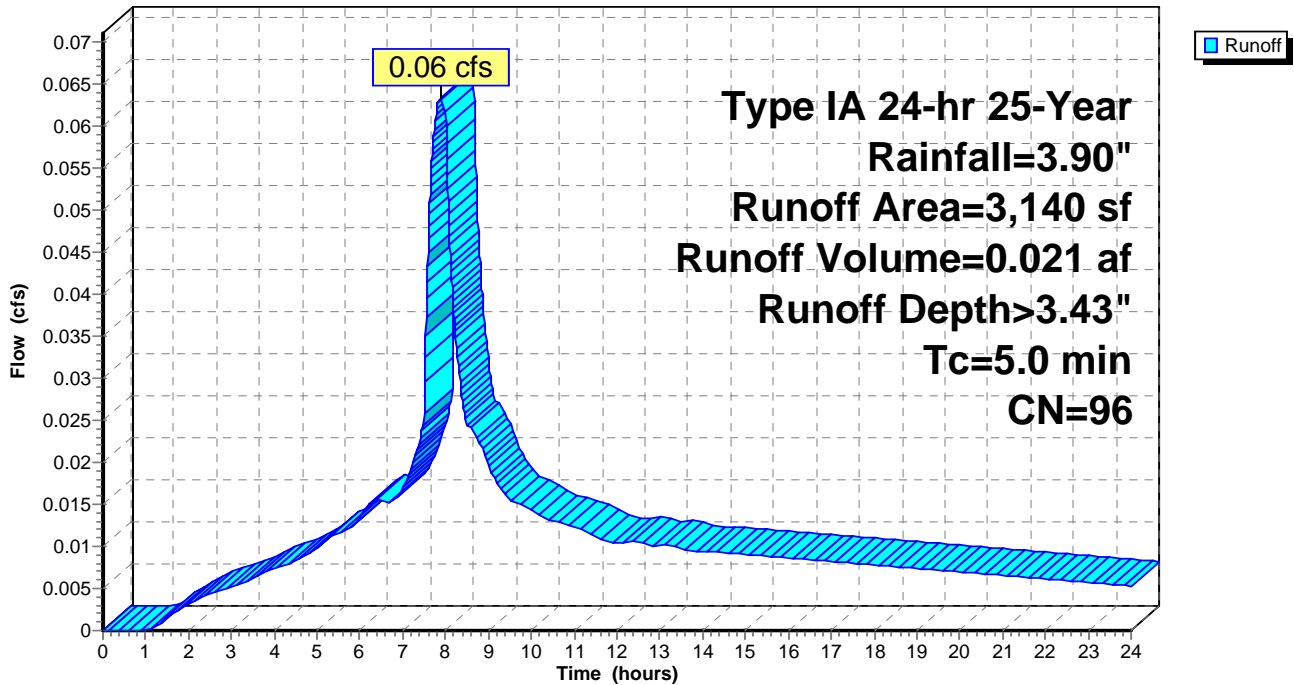
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
3,140	96	Weighted Average
500		Pervious Area
2,640		Impervious Area

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

Subcatchment 200S2: LOT 9

Hydrograph



Summary for Subcatchment 300S: LOT 8

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

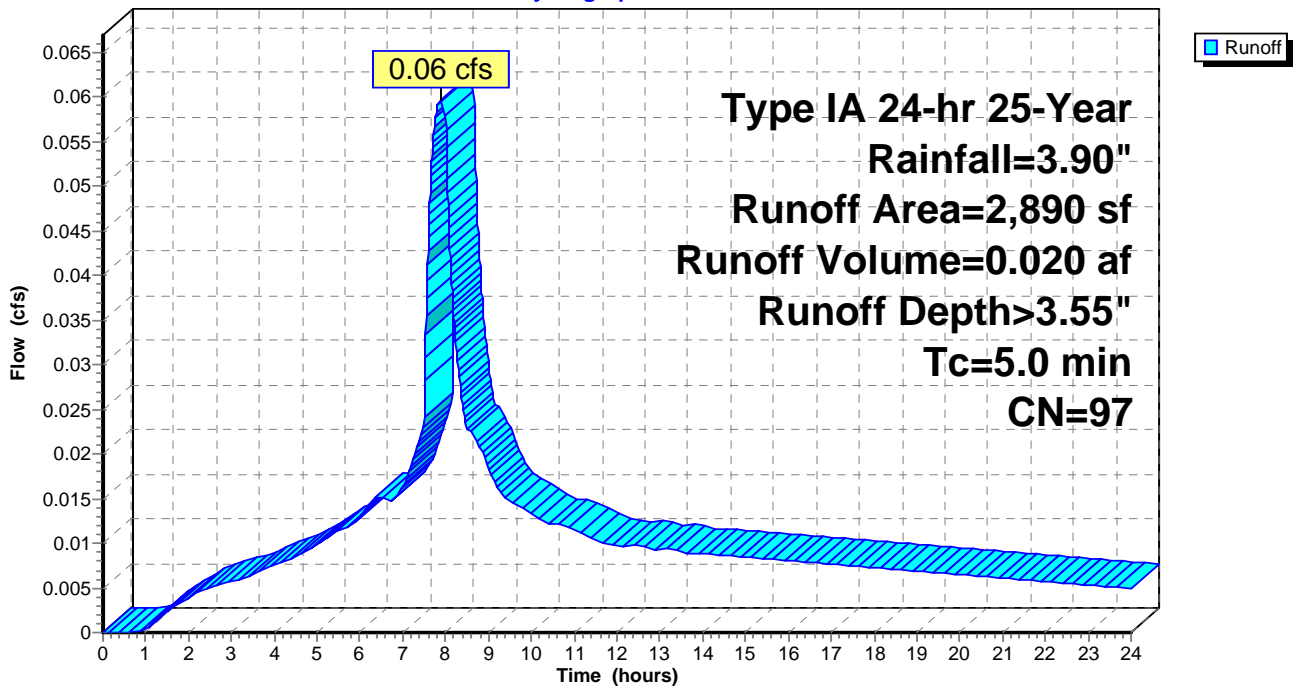
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 300S: LOT 8

Hydrograph



Summary for Subcatchment 400S: LOTS 6 - 7

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

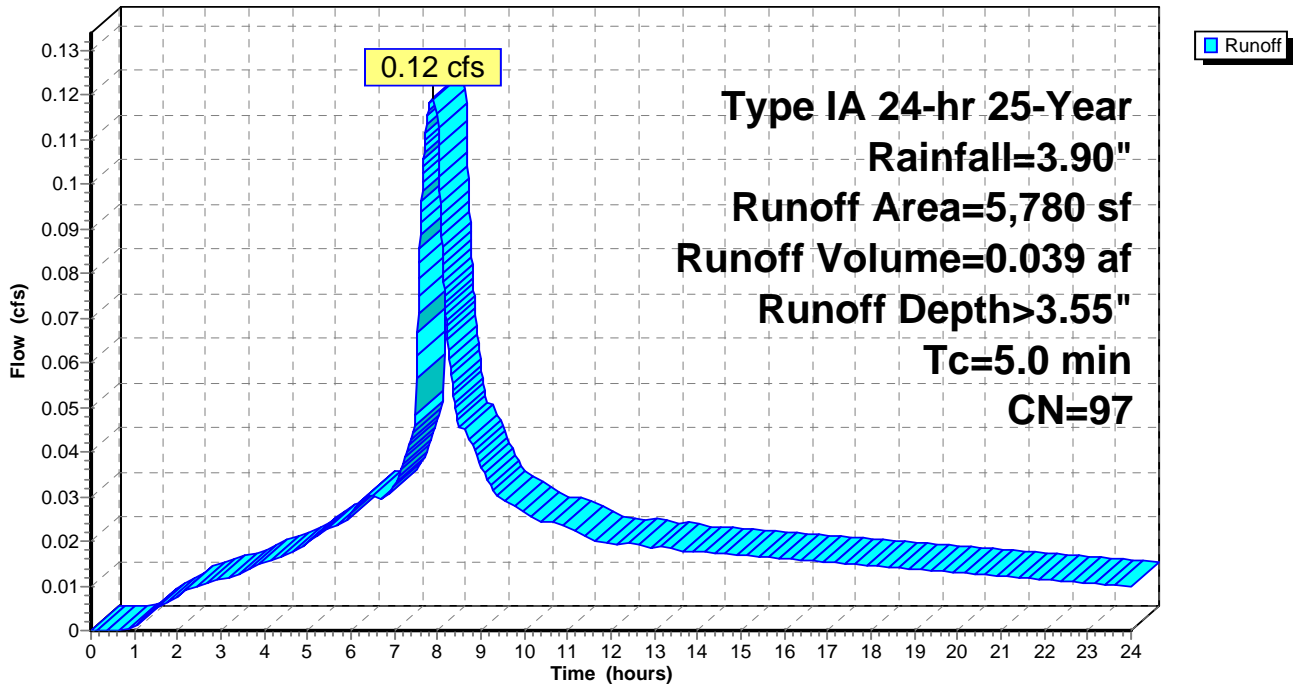
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 400S: LOTS 6 - 7

Hydrograph



Summary for Subcatchment 500S: LOT 5

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

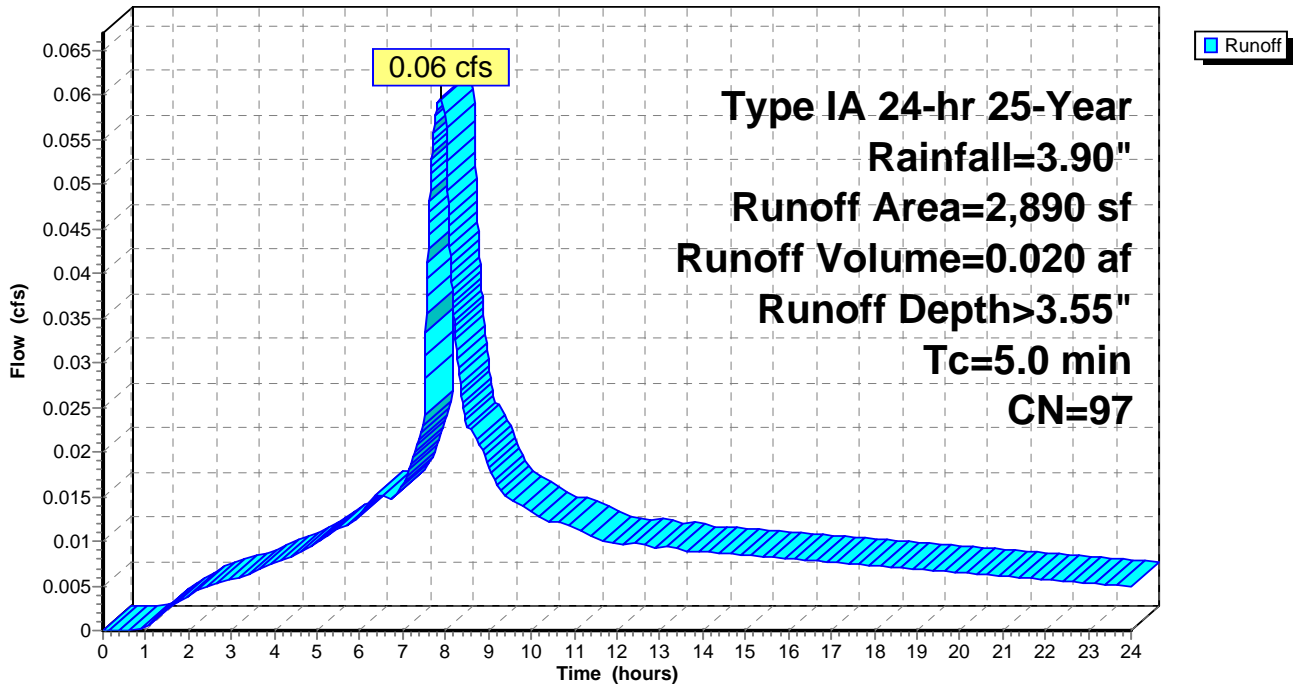
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 500S: LOT 5

Hydrograph



Summary for Subcatchment 600S: LOTS 3 - 4

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

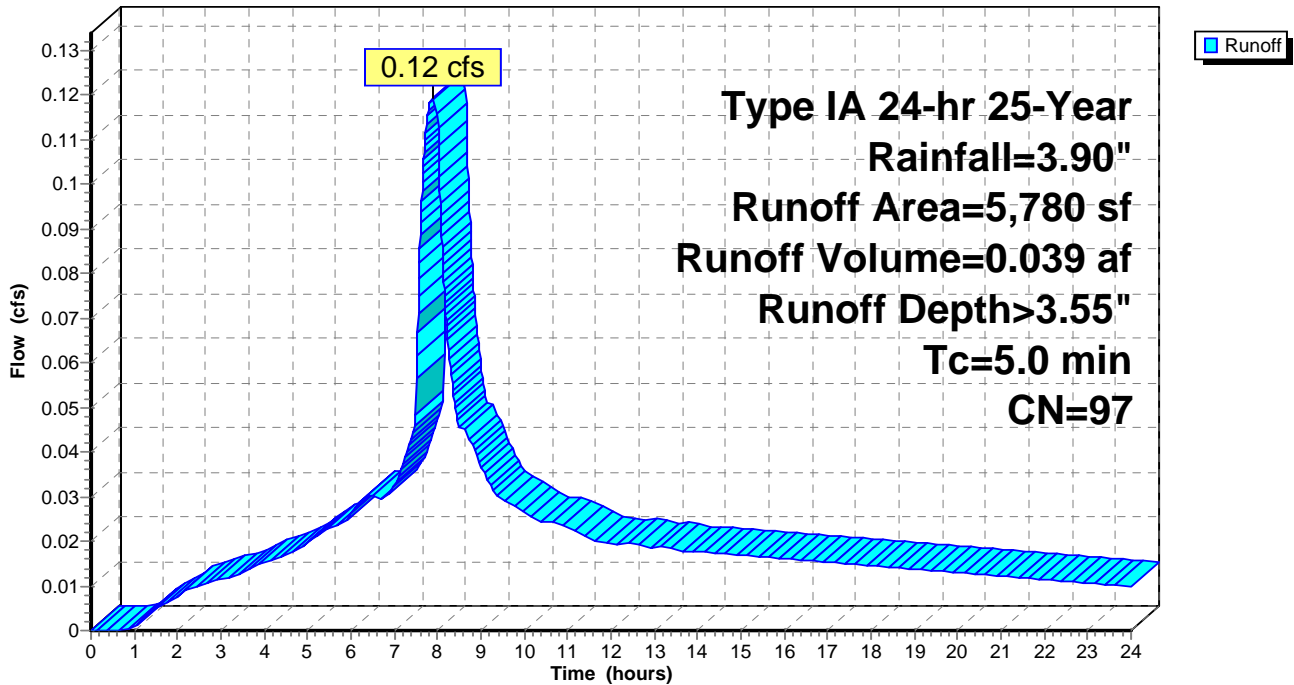
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 600S: LOTS 3 - 4

Hydrograph



Summary for Subcatchment 700S1: LOTS LANDSCAPING AND ROAD

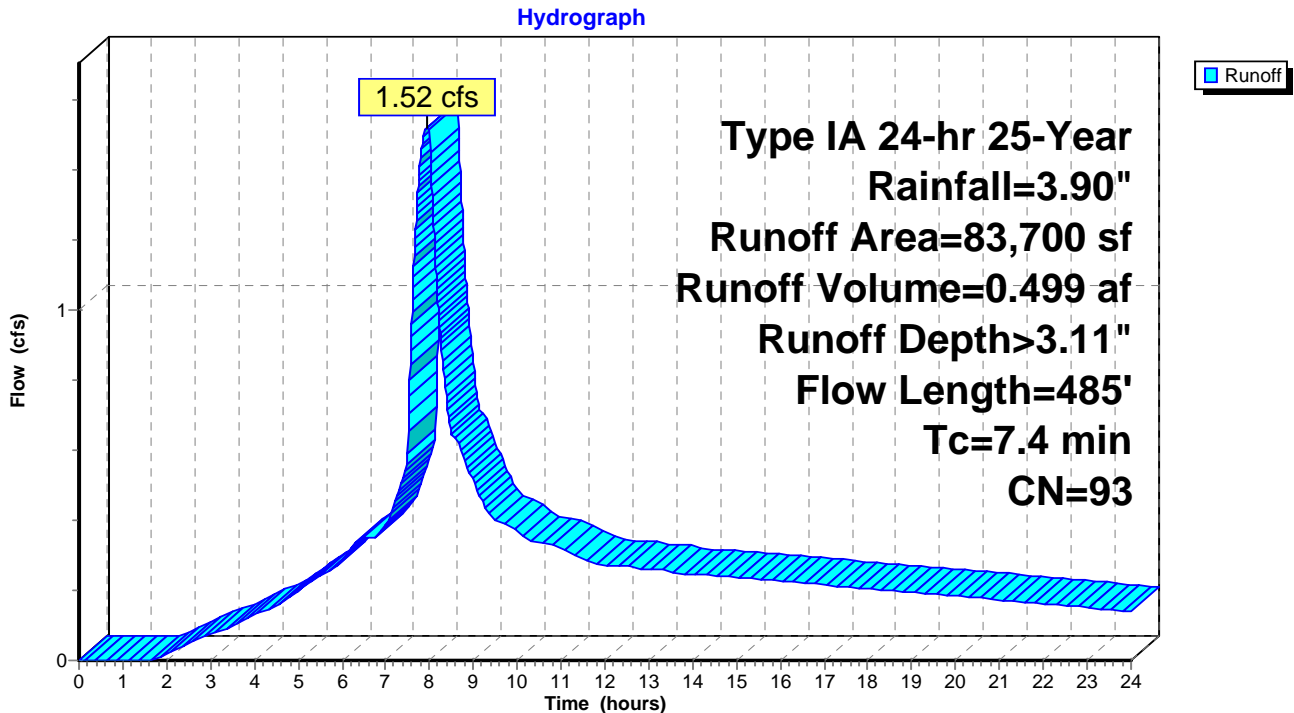
Runoff = 1.52 cfs @ 7.94 hrs, Volume= 0.499 af, Depth> 3.11"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	26,696	98	Street and sidewalk
*	23,760	98	9 Lots at 2640 SF Impervious/Lot per CWS
	33,244	86	<50% Grass cover, Poor, HSG C
	83,700	93	Weighted Average
	33,244		Pervious Area
	50,456		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	85	0.1000	0.28		Sheet Flow, LANDSCAPE Grass: Short n= 0.150 P2= 2.50"
2.3	400	0.0200	2.87		Shallow Concentrated Flow, GUTTER Paved Kv= 20.3 fps
7.4	485	Total			

Subcatchment 700S1: LOTS LANDSCAPING AND ROAD



Summary for Subcatchment 700S2: LOTS 1 - 2

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

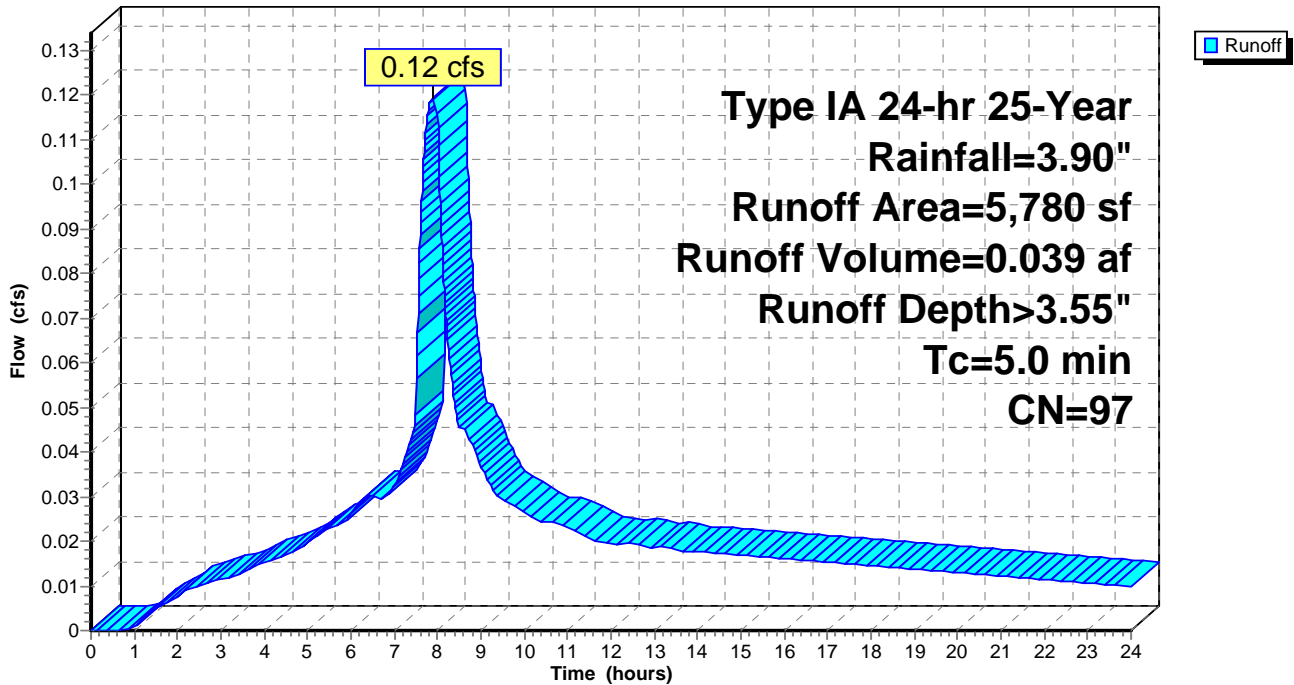
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 700S2: LOTS 1 - 2

Hydrograph



Summary for Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

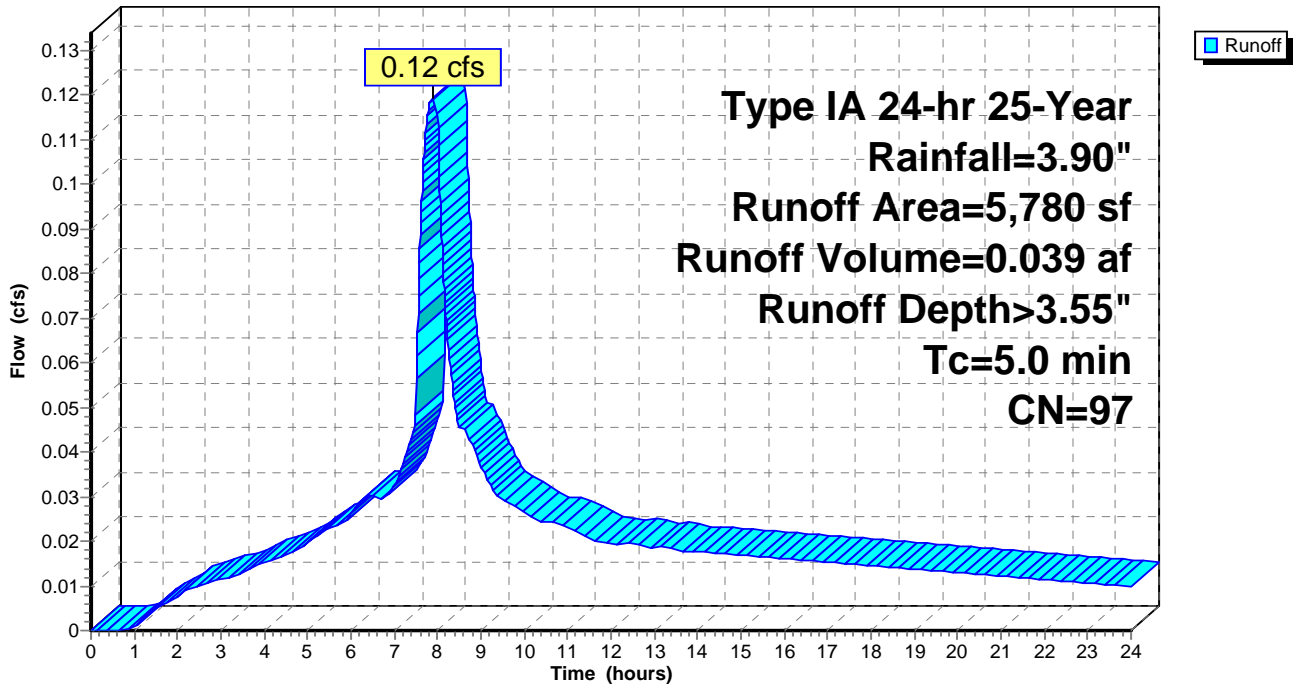
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

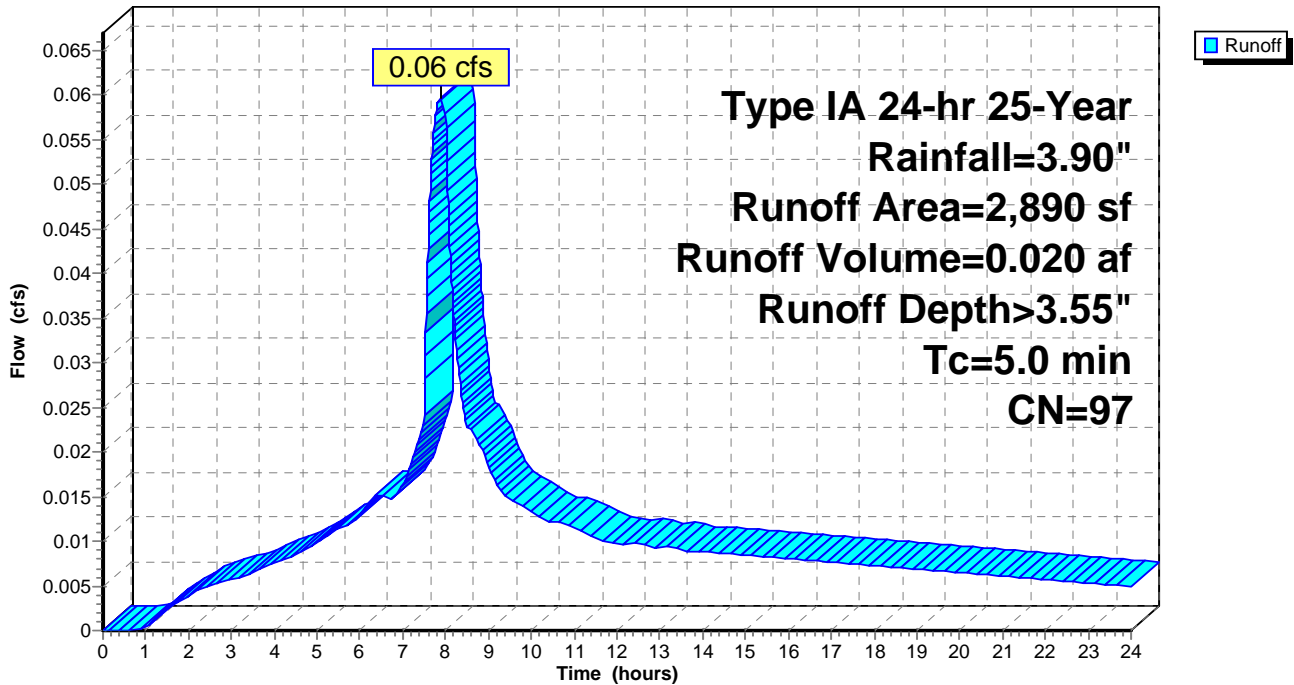
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 1100S: 2 HOUSES

Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.037 af, Depth> 3.66"

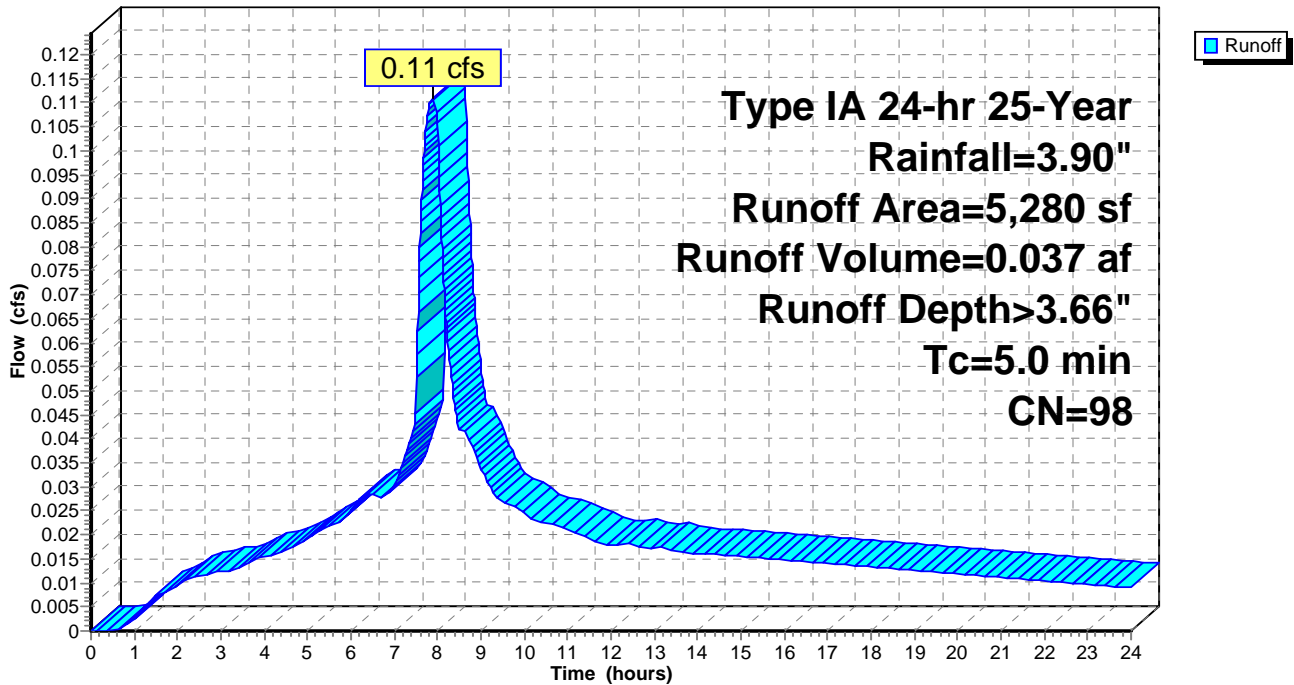
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 1100S: 2 HOUSES

Hydrograph



Summary for Subcatchment 1200S: 3 HOUSES

Runoff = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af, Depth> 3.66"

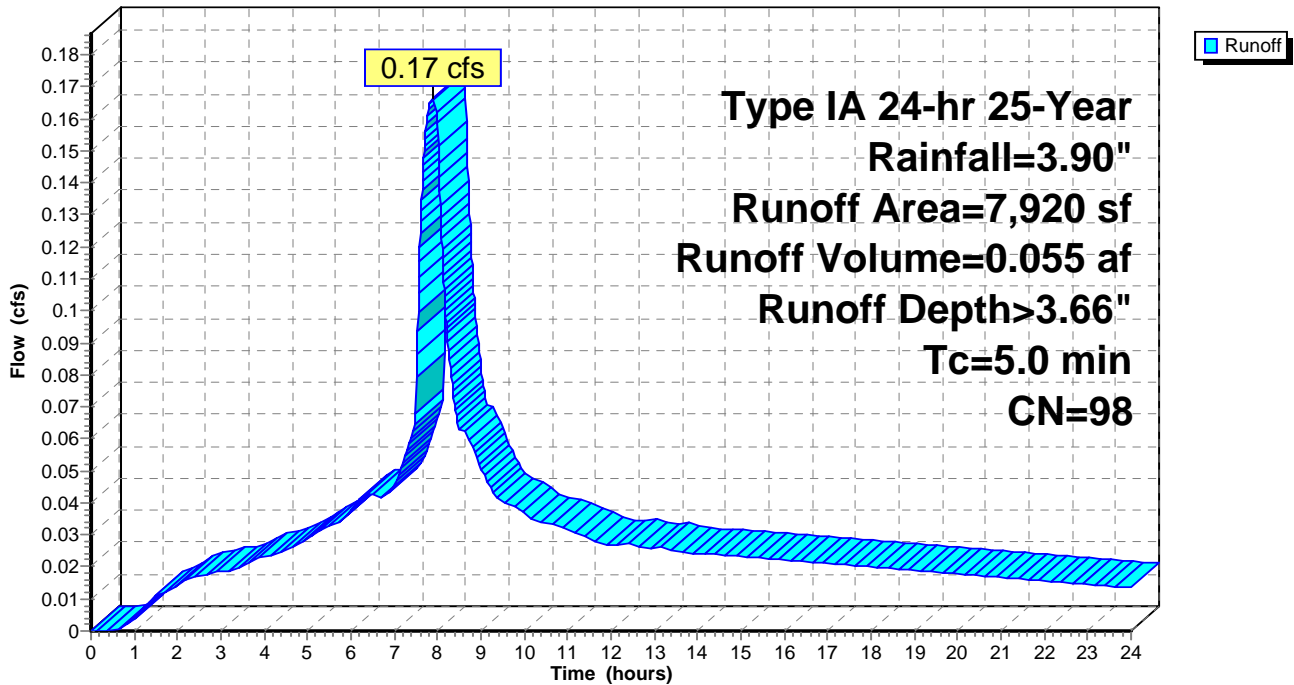
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
7,920		Impervious Area

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

Subcatchment 1200S: 3 HOUSES

Hydrograph



Summary for Subcatchment 1300S1: STREET

Runoff = 0.57 cfs @ 7.88 hrs, Volume= 0.191 af, Depth> 3.66"

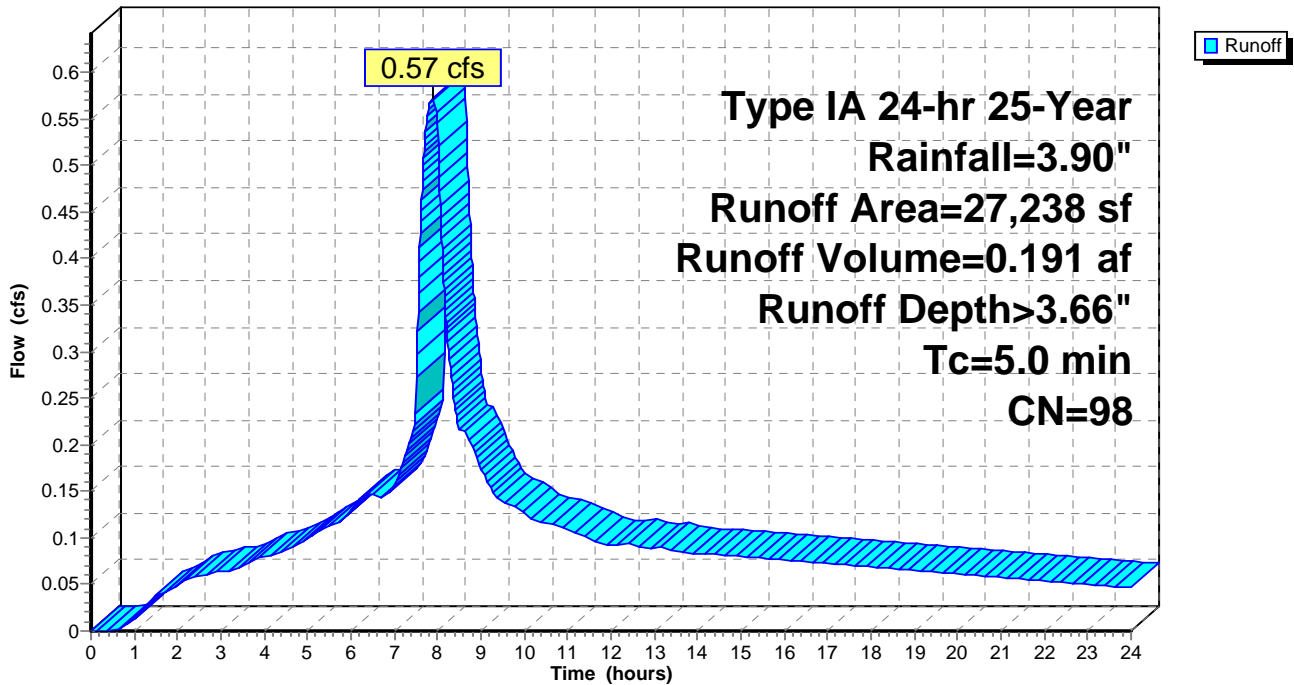
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 27,238	98	Street and sidewalk
27,238		Impervious Area

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

Subcatchment 1300S1: STREET

Hydrograph



Summary for Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Runoff = 0.50 cfs @ 7.95 hrs, Volume= 0.171 af, Depth> 2.19"

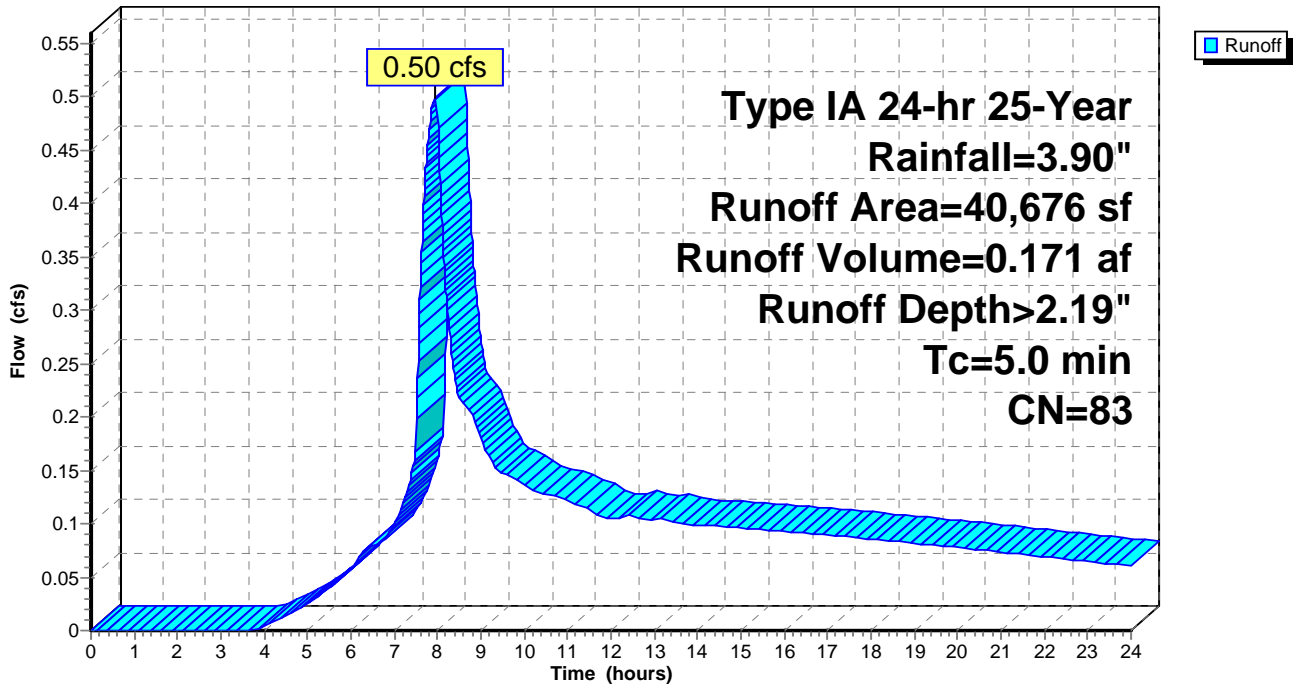
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
	32,756	79	50-75% Grass cover, Fair, HSG C
	40,676	83	Weighted Average
	32,756		Pervious Area
	7,920		Impervious Area

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

Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Hydrograph



Summary for Subcatchment 1300S3: LANDSCAPING AND HOUSES

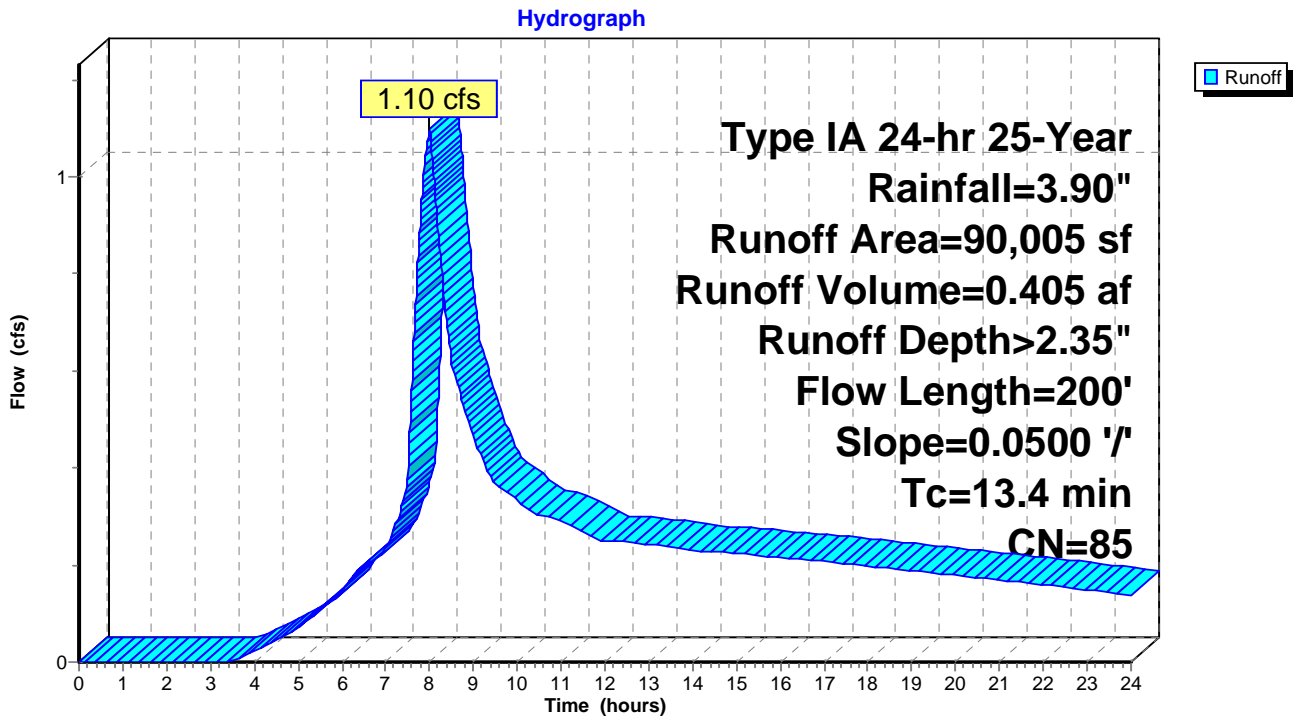
Runoff = 1.10 cfs @ 8.00 hrs, Volume= 0.405 af, Depth> 2.35"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	26,400	98	10 Lots at 2640 SF Impervious/Lot per CWS
	63,605	79	50-75% Grass cover, Fair, HSG C
	90,005	85	Weighted Average
	63,605		Pervious Area
	26,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	200	0.0500	0.25		Sheet Flow, LANDSCAPING SHEET FLOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 1300S3: LANDSCAPING AND HOUSES



Summary for Subcatchment 1900S1: POND SURFACE

Runoff = 7.99 cfs @ 7.87 hrs, Volume= 2.785 af, Depth> 3.89"

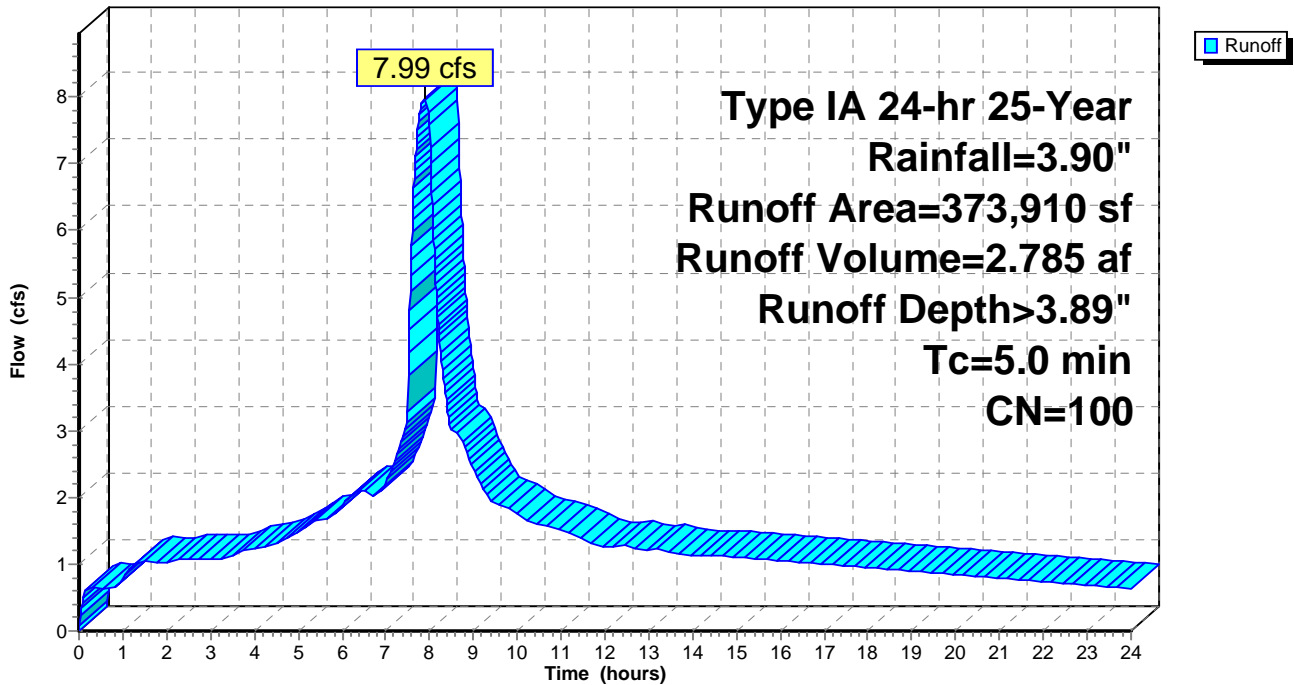
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 373,910	100	Water Surface
373,910		Impervious Area

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

Subcatchment 1900S1: POND SURFACE

Hydrograph



Summary for Subcatchment 1900S2: WOODED/ VEGETATED AREA

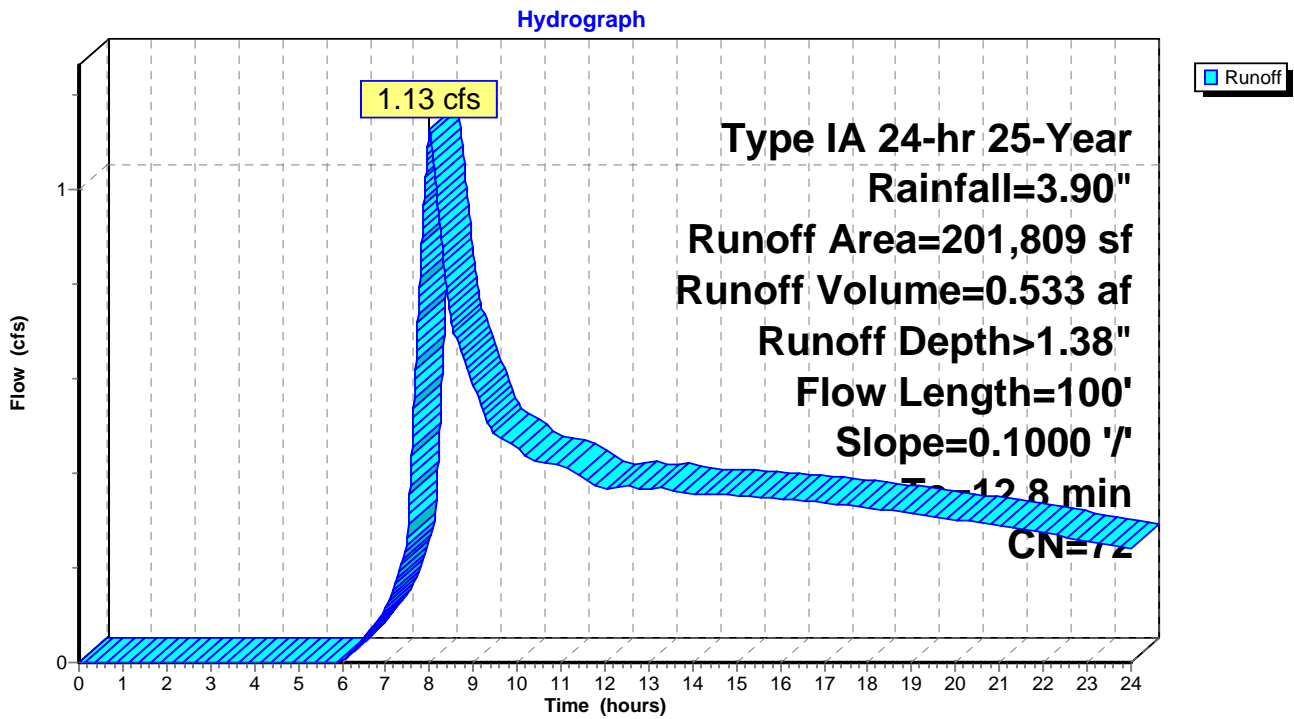
Runoff = 1.13 cfs @ 8.00 hrs, Volume= 0.533 af, Depth> 1.38"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
201,809	72	Woods/grass comb., Good, HSG C
201,809		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.50"

Subcatchment 1900S2: WOODED/ VEGETATED AREA



Summary for Subcatchment 1900S3: DEVELOPMENT

Runoff = 22.38 cfs @ 8.01 hrs, Volume= 9.850 af, Depth> 2.09"

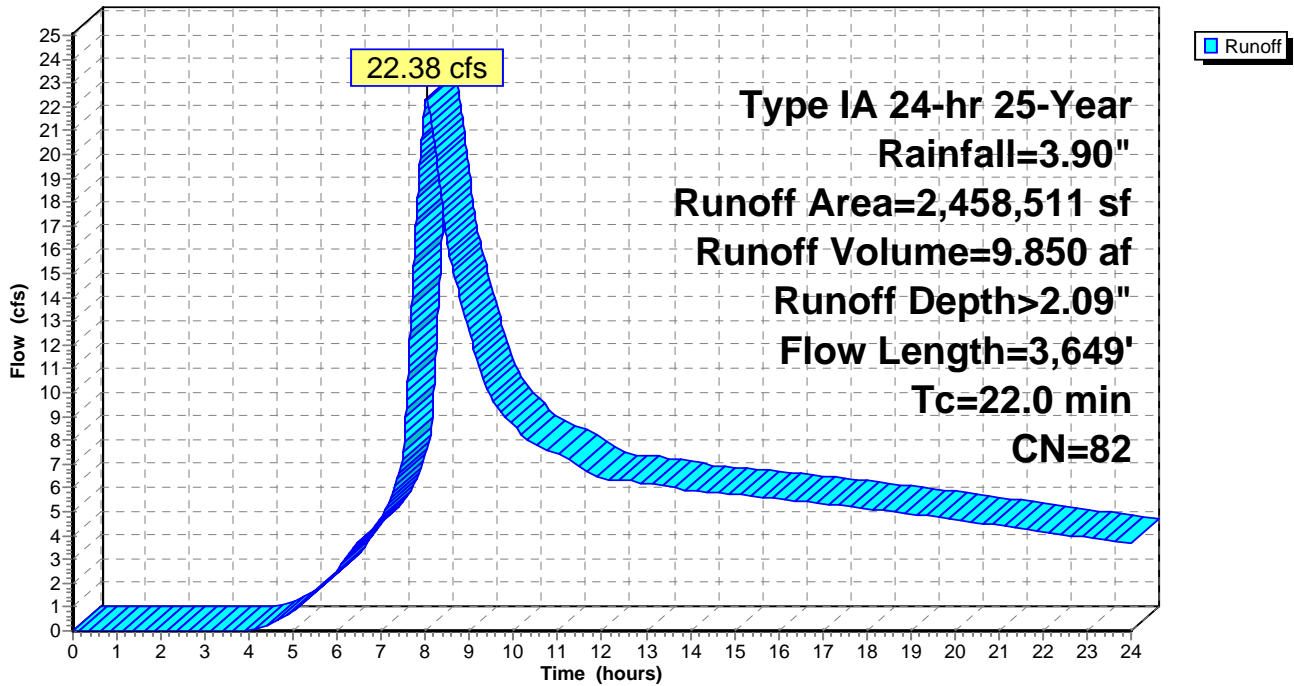
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
2,289,111	83	1/4 acre lots, 38% imp, HSG C
169,400	75	1/4 acre lots, 38% imp, HSG B
2,458,511	82	Weighted Average
1,524,277		Pervious Area
934,234		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	250	0.0500	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.50"
6.0	3,399	0.0435	9.46	7.43	Circular Channel (pipe), Conveyance Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
22.0	3,649	Total			

Subcatchment 1900S3: DEVELOPMENT

Hydrograph



Summary for Pond 1R: 12"

Inflow Area = 5.054 ac, 44.94% Impervious, Inflow Depth > 2.51" for 25-Year event
 Inflow = 3.11 cfs @ 7.97 hrs, Volume= 1.055 af
 Outflow = 3.11 cfs @ 7.97 hrs, Volume= 1.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.11 cfs @ 7.97 hrs, Volume= 1.055 af

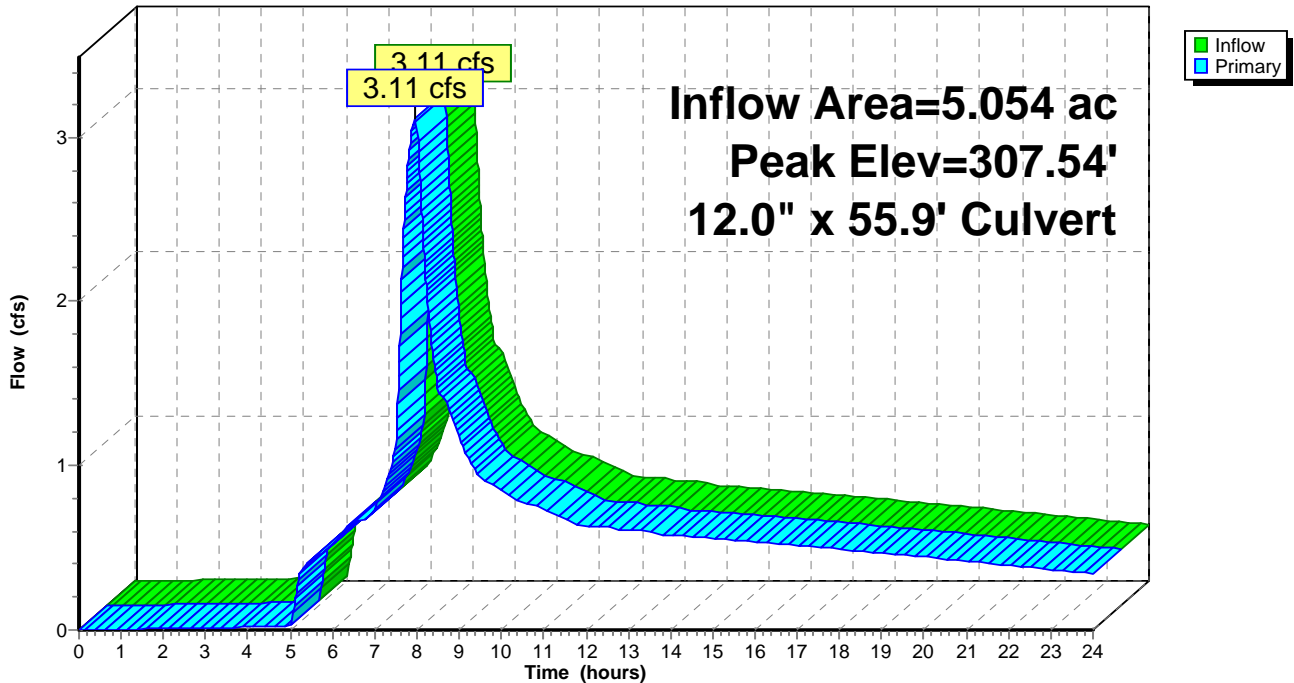
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 307.54' @ 7.97 hrs
 Flood Elev= 312.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	306.03'	12.0" x 55.9' long Culvert Ke= 0.500 Outlet Invert= 305.75' S= 0.0050 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.11 cfs @ 7.97 hrs HW=307.54' (Free Discharge)
 ←1=Culvert (Barrel Controls 3.11 cfs @ 3.96 fps)

Pond 1R: 12"

Hydrograph



Summary for Pond 2R: 12"

Inflow Area = 3.582 ac, 60.15% Impervious, Inflow Depth > 2.92" for 25-Year event
 Inflow = 2.61 cfs @ 7.91 hrs, Volume= 0.872 af
 Outflow = 2.61 cfs @ 7.91 hrs, Volume= 0.872 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.61 cfs @ 7.91 hrs, Volume= 0.872 af

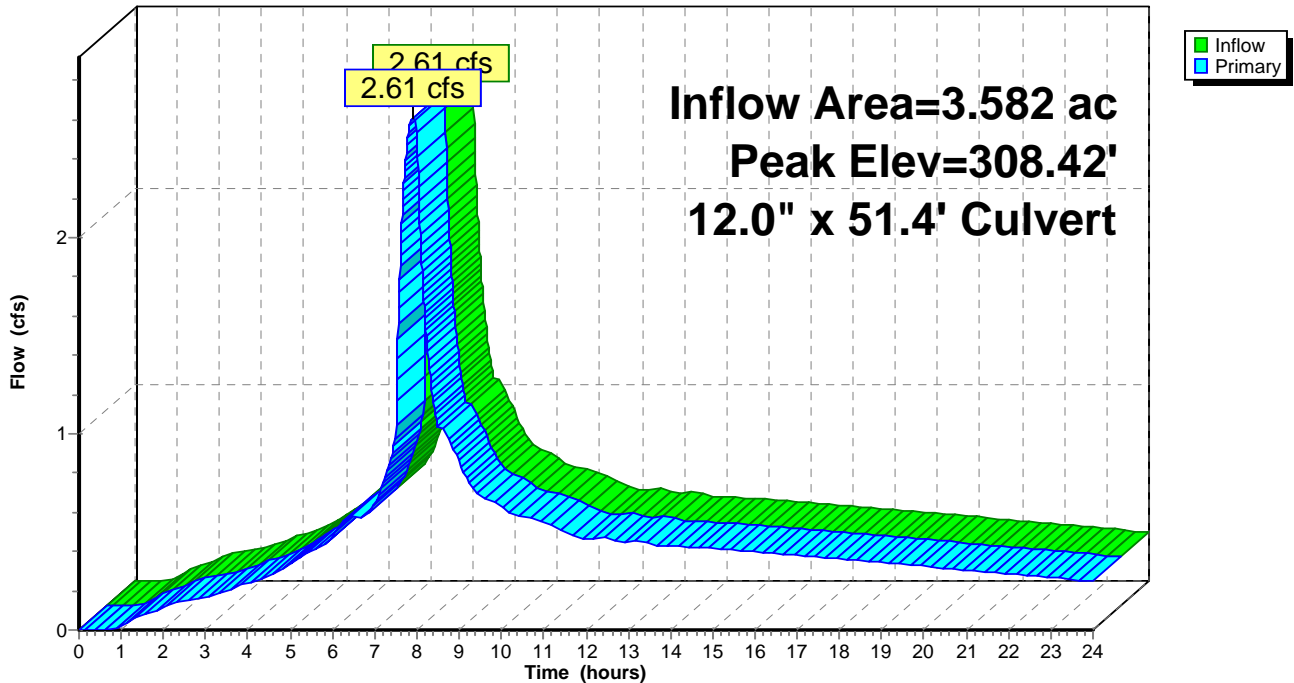
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.42' @ 7.91 hrs
 Flood Elev= 312.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.26'	12.0" x 51.4' long Culvert Ke= 0.500 Outlet Invert= 307.00' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.61 cfs @ 7.91 hrs HW=308.42' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.61 cfs @ 3.59 fps)

Pond 2R: 12"

Hydrograph



Summary for Pond 3R: 12"

Inflow Area = 0.818 ac, 58.69% Impervious, Inflow Depth > 2.88" for 25-Year event
 Inflow = 0.59 cfs @ 7.91 hrs, Volume= 0.196 af
 Outflow = 0.59 cfs @ 7.91 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.59 cfs @ 7.91 hrs, Volume= 0.196 af

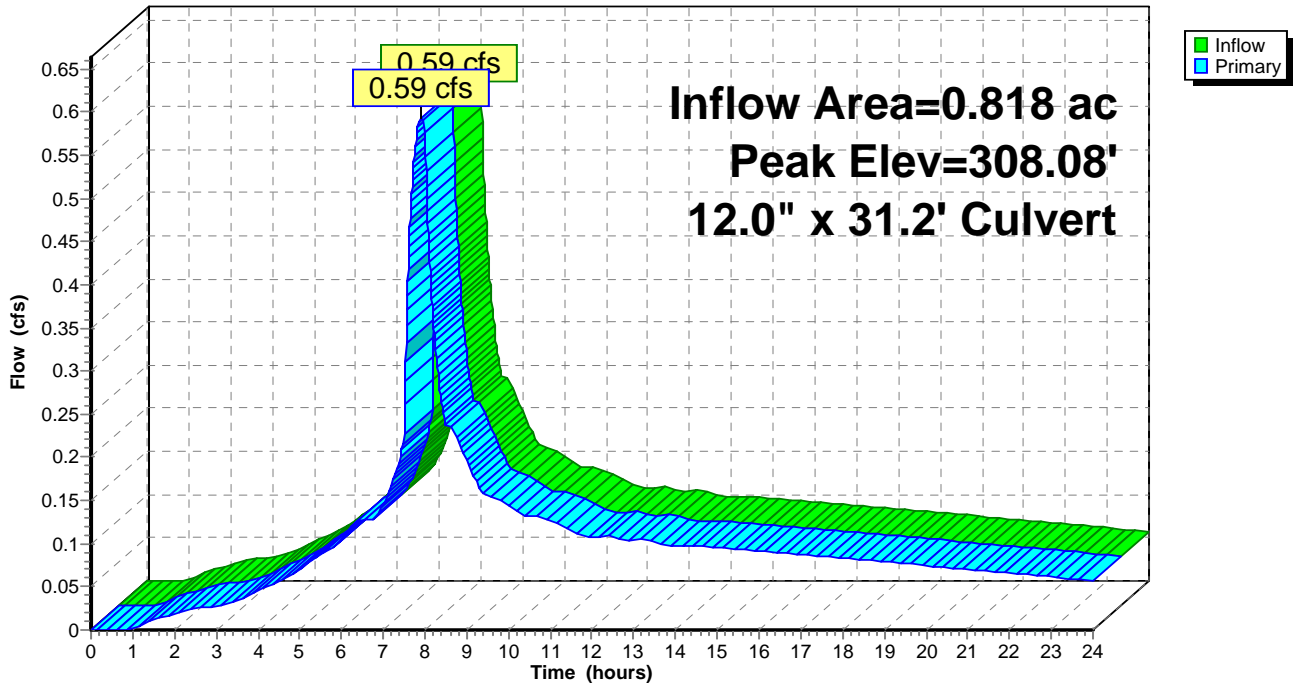
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.08' @ 7.91 hrs
 Flood Elev= 311.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.62'	12.0" x 31.2' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.59 cfs @ 7.91 hrs HW=308.08' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.59 cfs @ 2.47 fps)

Pond 3R: 12"

Hydrograph



Summary for Pond 4R: 12"

Inflow Area = 2.582 ac, 59.83% Impervious, Inflow Depth > 2.92" for 25-Year event
 Inflow = 1.87 cfs @ 7.90 hrs, Volume= 0.629 af
 Outflow = 1.87 cfs @ 7.90 hrs, Volume= 0.629 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.87 cfs @ 7.90 hrs, Volume= 0.629 af

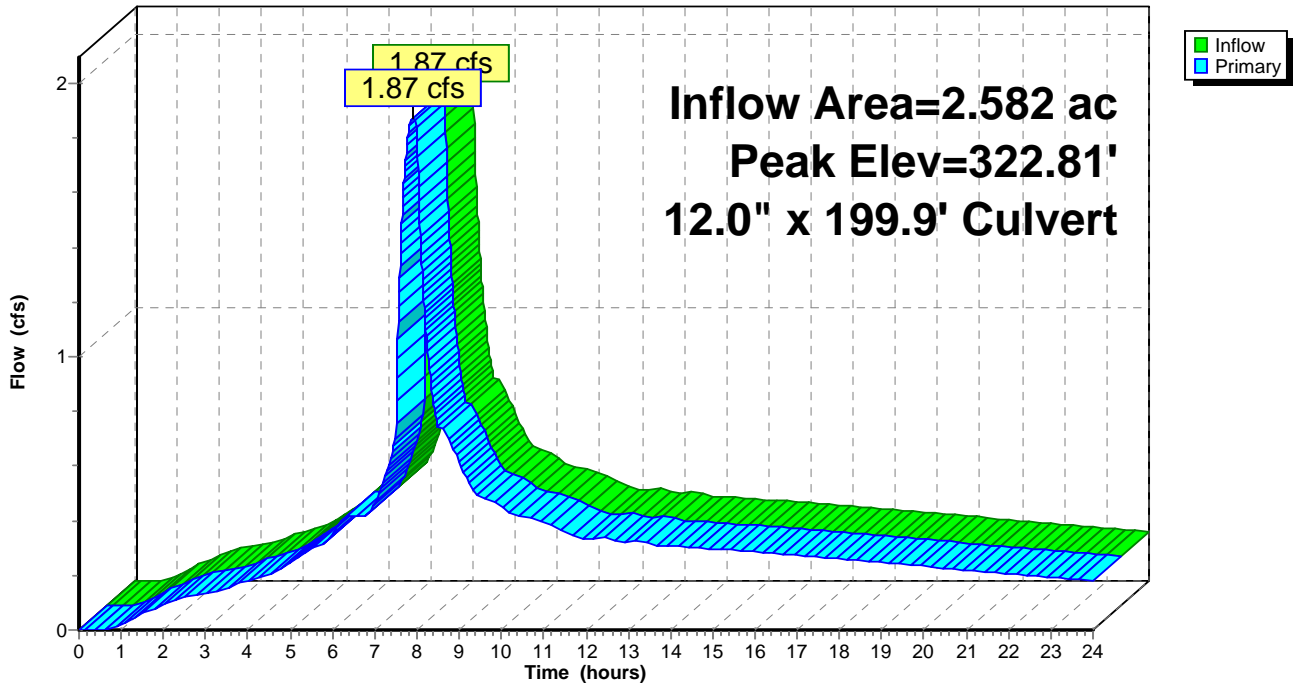
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 322.81' @ 7.90 hrs
 Flood Elev= 329.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.06'	12.0" x 199.9' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0730 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.87 cfs @ 7.90 hrs HW=322.81' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.87 cfs @ 2.95 fps)

Pond 4R: 12"

Hydrograph



Summary for Pond 5R: 12"

Inflow Area = 2.015 ac, 56.71% Impervious, Inflow Depth > 2.88" for 25-Year event
 Inflow = 1.43 cfs @ 7.91 hrs, Volume= 0.484 af
 Outflow = 1.43 cfs @ 7.91 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.43 cfs @ 7.91 hrs, Volume= 0.484 af

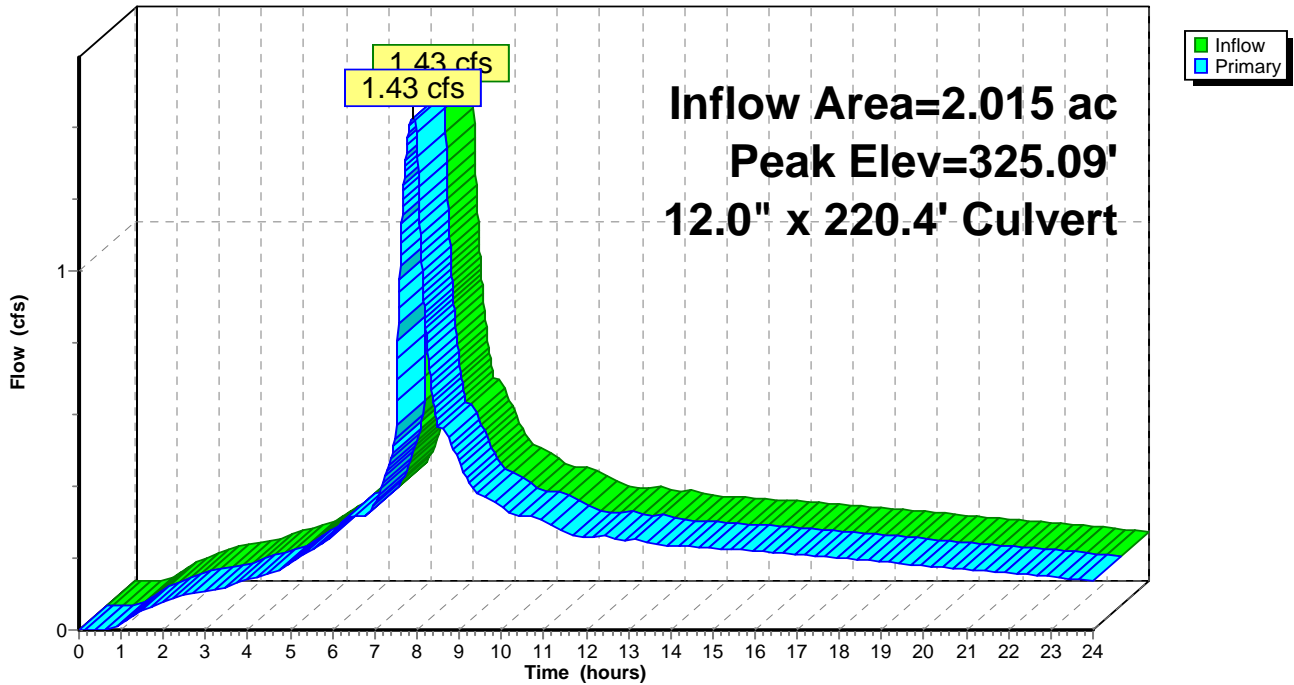
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 325.09' @ 7.91 hrs
 Flood Elev= 336.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	324.46'	12.0" x 220.4' long Culvert Ke= 0.500 Outlet Invert= 322.26' S= 0.0100 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.42 cfs @ 7.91 hrs HW=325.09' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.42 cfs @ 2.71 fps)

Pond 5R: 12"

Hydrograph



Summary for Pond 6R: 12"

Inflow Area = 1.603 ac, 54.26% Impervious, Inflow Depth > 2.84" for 25-Year event
 Inflow = 1.11 cfs @ 7.91 hrs, Volume= 0.380 af
 Outflow = 1.11 cfs @ 7.91 hrs, Volume= 0.380 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.11 cfs @ 7.91 hrs, Volume= 0.380 af

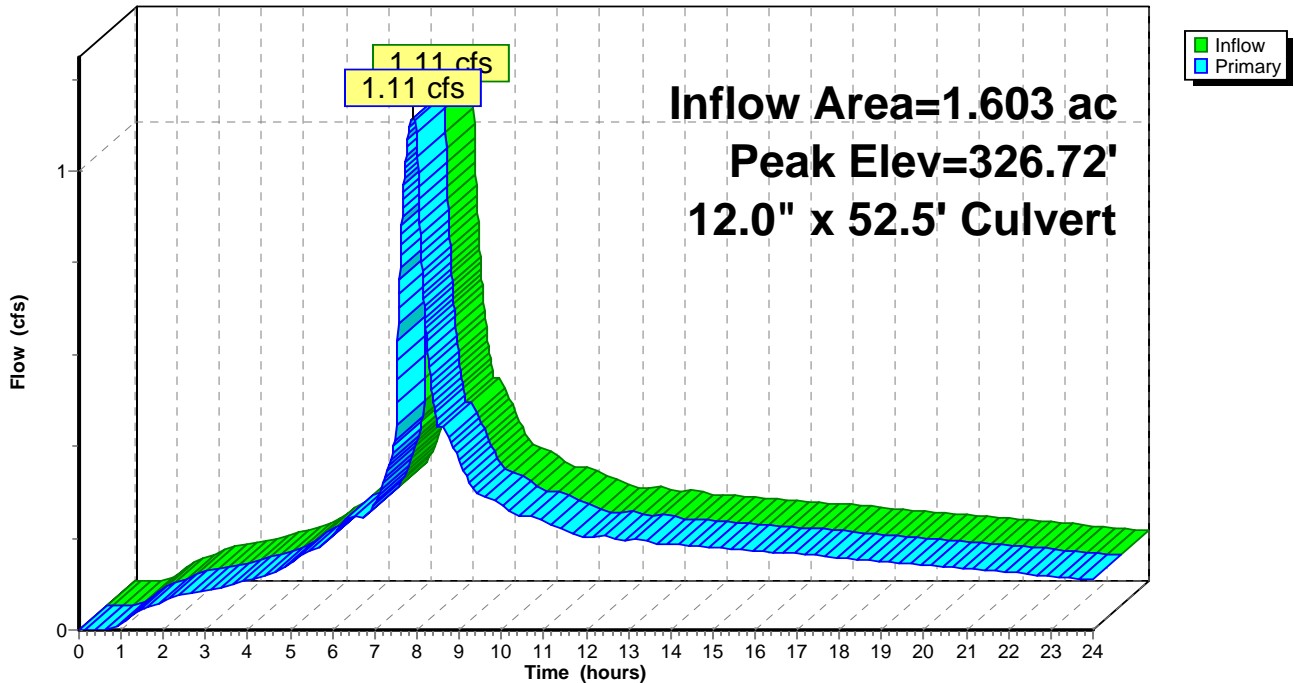
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.72' @ 7.91 hrs
 Flood Elev= 335.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.17'	12.0" x 52.5' long Culvert Ke= 0.500 Outlet Invert= 324.86' S= 0.0250 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.11 cfs @ 7.91 hrs HW=326.72' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.11 cfs @ 2.52 fps)

Pond 6R: 12"

Hydrograph



Summary for Pond 7R: 12"

Inflow Area = 0.545 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.50 cfs @ 7.88 hrs, Volume= 0.166 af
 Outflow = 0.50 cfs @ 7.88 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.50 cfs @ 7.88 hrs, Volume= 0.166 af

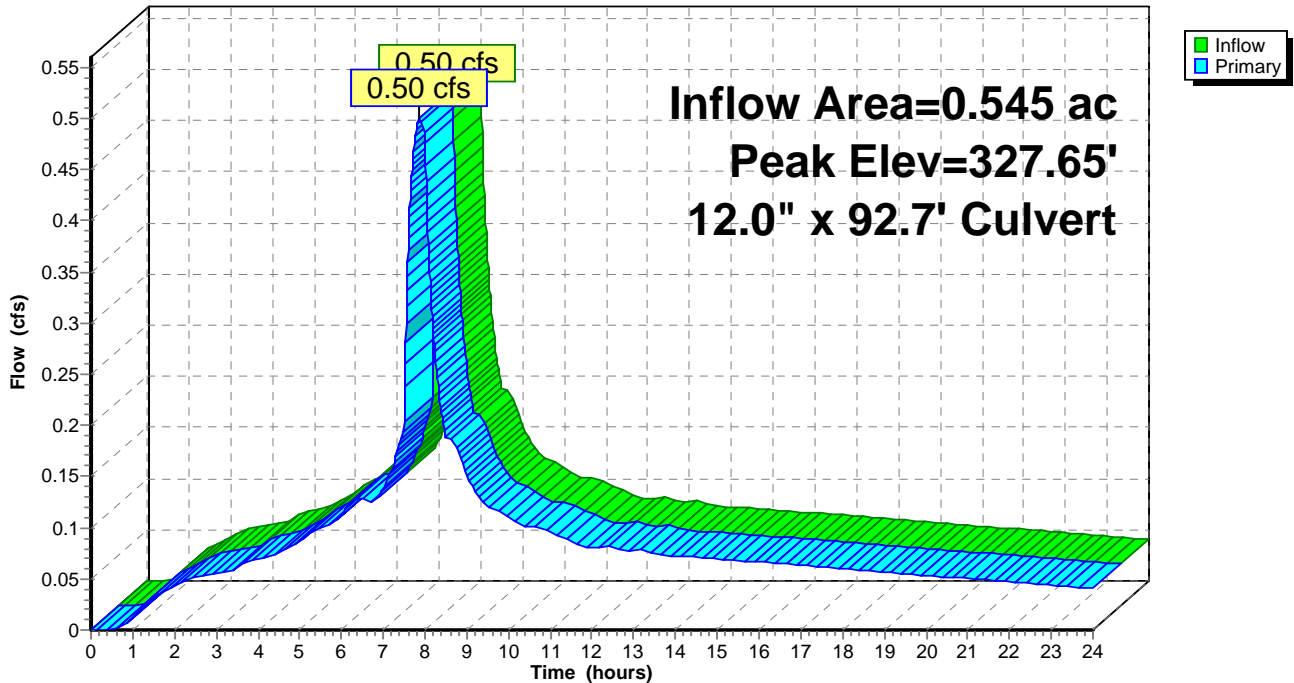
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 327.65' @ 7.88 hrs
 Flood Elev= 336.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	327.30'	12.0" x 92.7' long Culvert Ke= 0.500 Outlet Invert= 326.37' S= 0.0100 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.50 cfs @ 7.88 hrs HW=327.65' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.50 cfs @ 2.02 fps)

Pond 7R: 12"

Hydrograph



Summary for Pond 8R: 12"

Inflow Area = 0.242 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af
 Outflow = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af

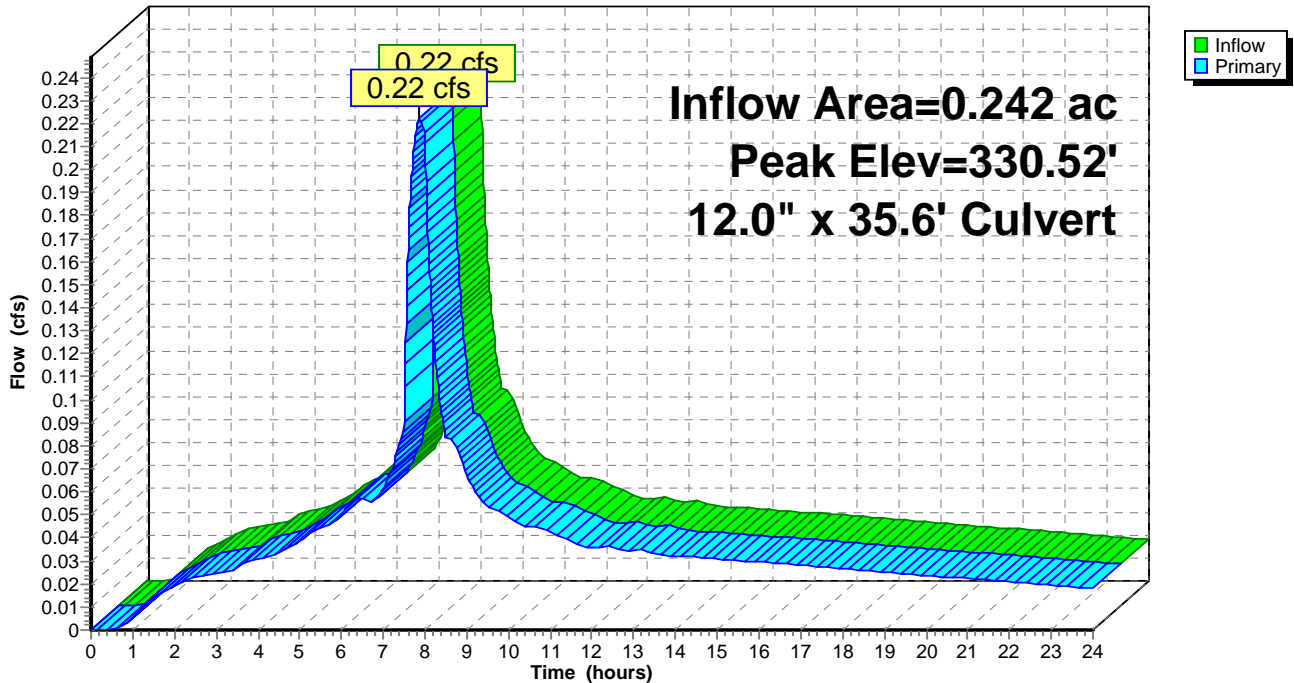
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 330.52' @ 7.88 hrs
 Flood Elev= 336.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.29'	12.0" x 35.6' long Culvert Ke= 0.500 Outlet Invert= 327.50' S= 0.0784 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.22 cfs @ 7.88 hrs HW=330.52' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.22 cfs @ 1.63 fps)

Pond 8R: 12"

Hydrograph



Summary for Pond 9R: 12"

Inflow Area = 0.291 ac, 52.20% Impervious, Inflow Depth > 2.76" for 25-Year event
 Inflow = 0.20 cfs @ 7.91 hrs, Volume= 0.067 af
 Outflow = 0.20 cfs @ 7.91 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.20 cfs @ 7.91 hrs, Volume= 0.067 af

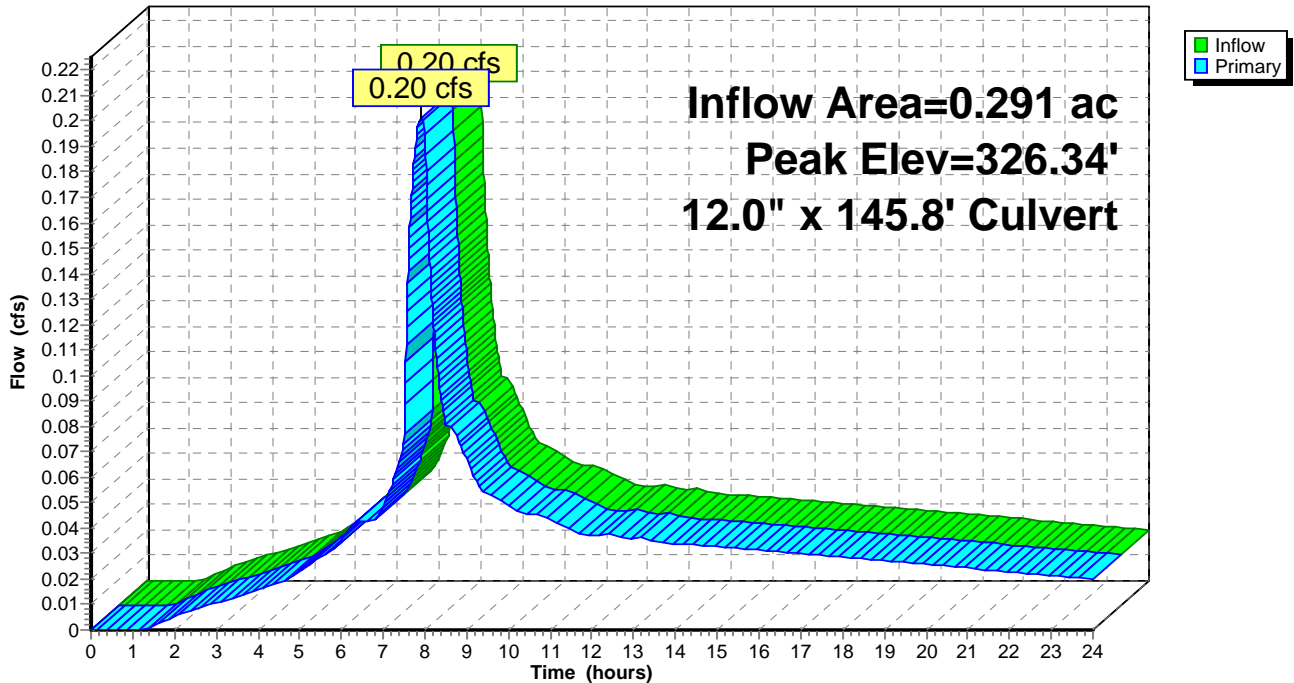
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.34' @ 7.91 hrs
 Flood Elev= 333.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.12'	12.0" x 145.8' long Culvert Ke= 0.500 Outlet Invert= 324.66' S= 0.0100 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.20 cfs @ 7.91 hrs HW=326.34' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.20 cfs @ 2.40 fps)

Pond 9R: 12"

Hydrograph



Summary for Pond 100R: 12"

Inflow Area = 0.034 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af
 Outflow = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af

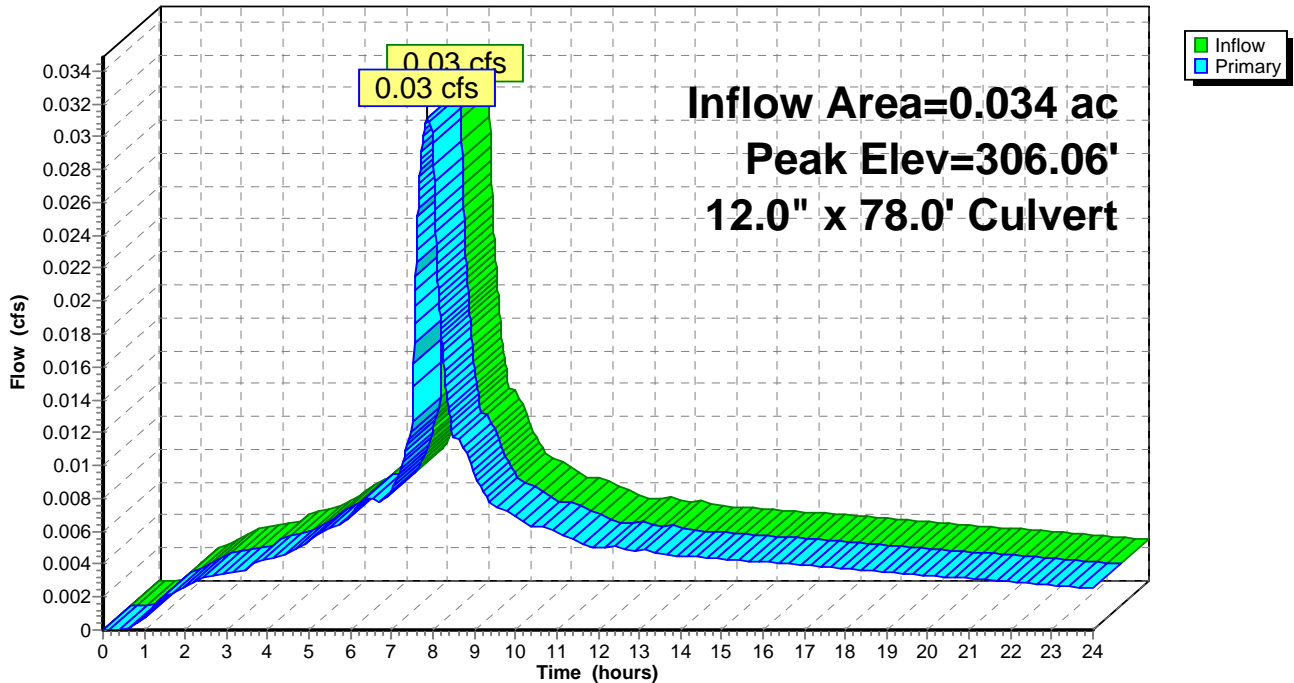
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.06' @ 7.88 hrs
 Flood Elev= 310.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.96'	12.0" x 78.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 305.57' S= 0.0050 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.03 cfs @ 7.88 hrs HW=306.06' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.03 cfs @ 1.08 fps)

Pond 100R: 12"

Hydrograph



Summary for Pond 200R: 12"

Inflow Area = 5.547 ac, 49.62% Impervious, Inflow Depth > 2.61" for 25-Year event
 Inflow = 3.55 cfs @ 7.96 hrs, Volume= 1.204 af
 Outflow = 3.55 cfs @ 7.96 hrs, Volume= 1.204 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.55 cfs @ 7.96 hrs, Volume= 1.204 af

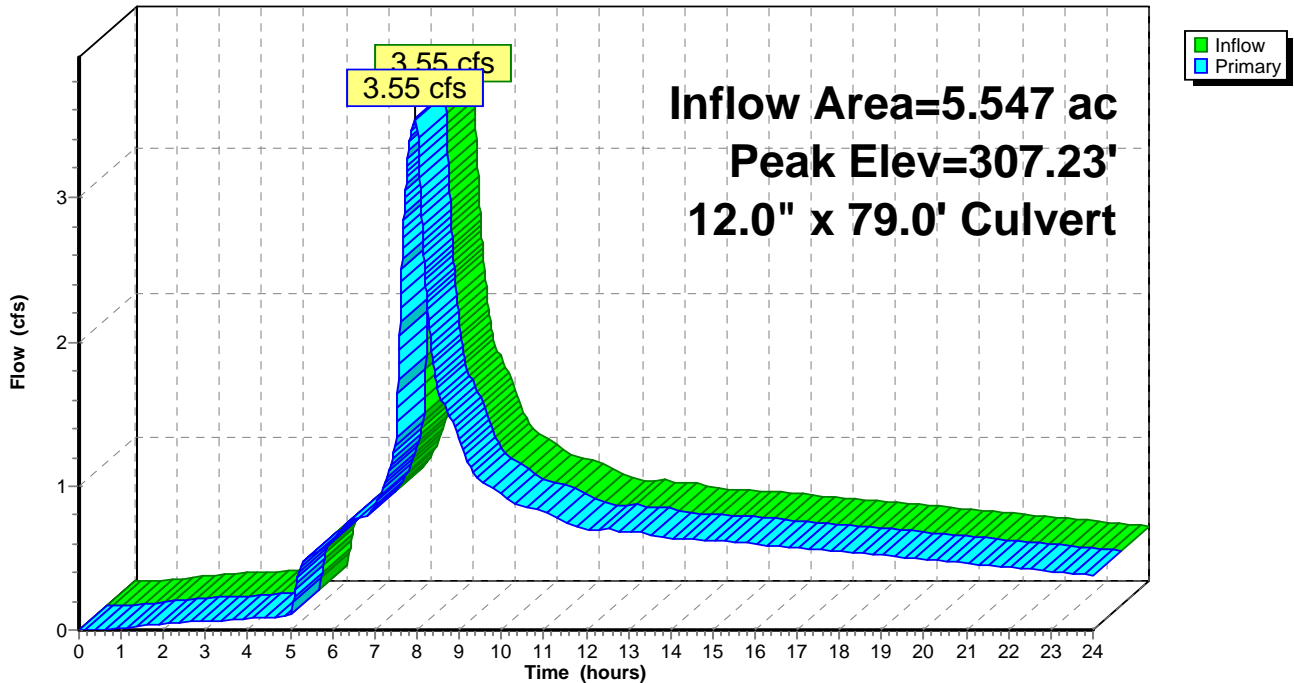
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 307.23' @ 7.96 hrs
 Flood Elev= 314.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.47'	12.0" x 79.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 304.97' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.55 cfs @ 7.96 hrs HW=307.23' (Free Discharge)
 ←1=Culvert (Barrel Controls 3.55 cfs @ 4.52 fps)

Pond 200R: 12"

Hydrograph



Summary for Pond 300R: 12"

Inflow Area = 5.613 ac, 50.12% Impervious, Inflow Depth > 2.62" for 25-Year event
 Inflow = 3.61 cfs @ 7.96 hrs, Volume= 1.224 af
 Outflow = 3.61 cfs @ 7.96 hrs, Volume= 1.224 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.61 cfs @ 7.96 hrs, Volume= 1.224 af

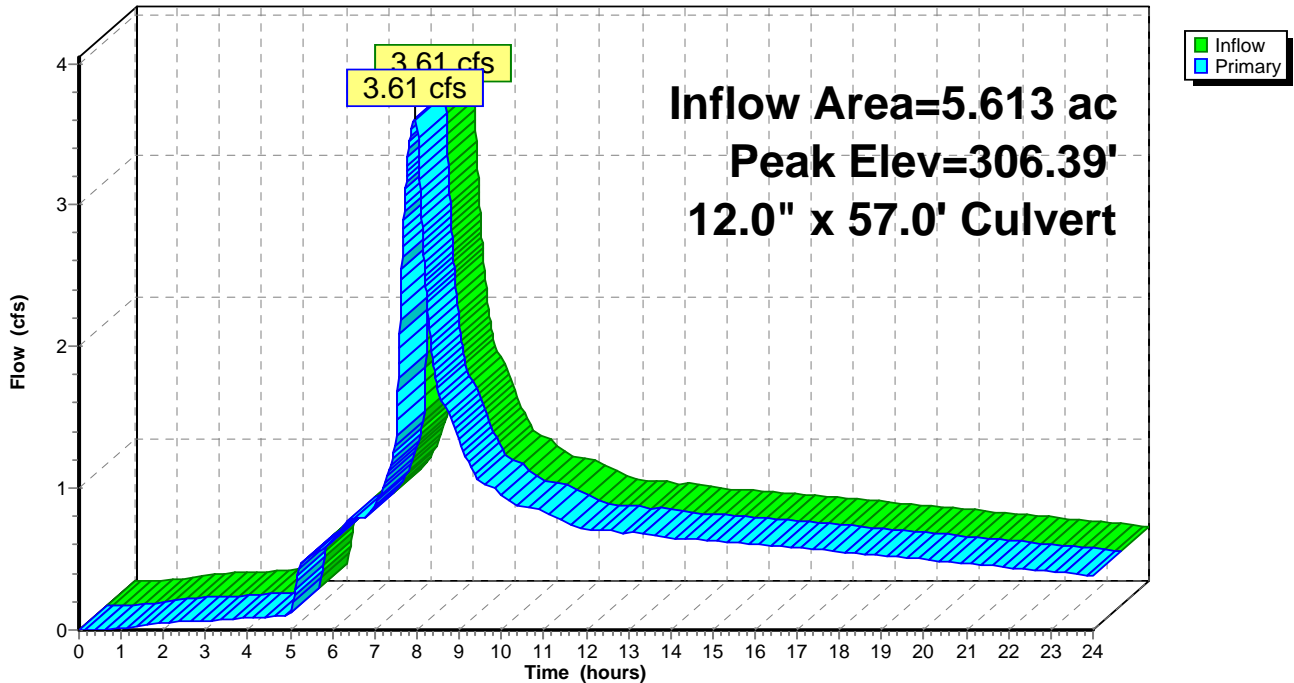
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.39' @ 7.96 hrs
 Flood Elev= 312.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	304.98'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.93' S= 0.0184 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=3.61 cfs @ 7.96 hrs HW=306.39' (Free Discharge)
 ←1=Culvert (Inlet Controls 3.61 cfs @ 4.60 fps)

Pond 300R: 12"

Hydrograph



Summary for Pond 400R: 12"

Inflow Area = 5.746 ac, 51.07% Impervious, Inflow Depth > 2.64" for 25-Year event
 Inflow = 3.73 cfs @ 7.96 hrs, Volume= 1.263 af
 Outflow = 3.73 cfs @ 7.96 hrs, Volume= 1.263 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.73 cfs @ 7.96 hrs, Volume= 1.263 af

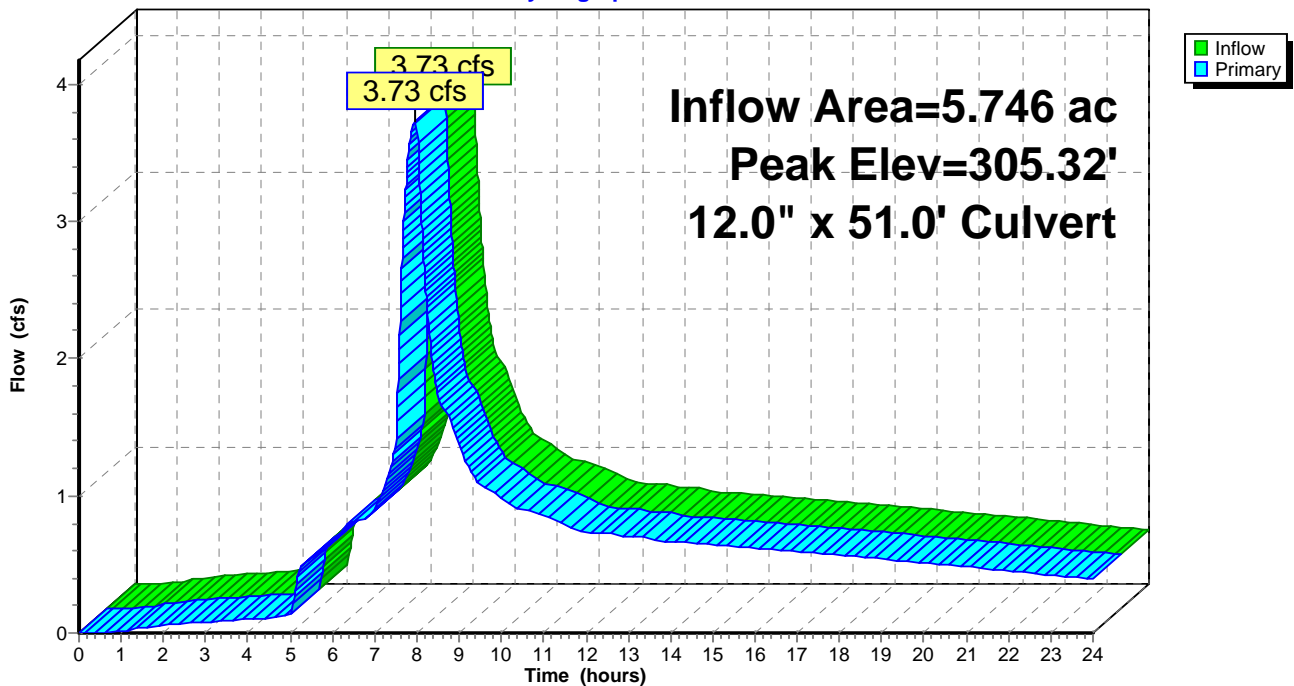
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 305.32' @ 7.96 hrs
 Flood Elev= 308.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	303.80'	12.0" x 51.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.23' S= 0.0112 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.73 cfs @ 7.96 hrs HW=305.32' (Free Discharge)
 ←1=Culvert (Barrel Controls 3.73 cfs @ 4.75 fps)

Pond 400R: 12"

Hydrograph



Summary for Pond 500R: 12"

Inflow Area = 5.812 ac, 51.53% Impervious, Inflow Depth > 2.65" for 25-Year event
 Inflow = 3.79 cfs @ 7.96 hrs, Volume= 1.283 af
 Outflow = 3.79 cfs @ 7.96 hrs, Volume= 1.283 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.79 cfs @ 7.96 hrs, Volume= 1.283 af

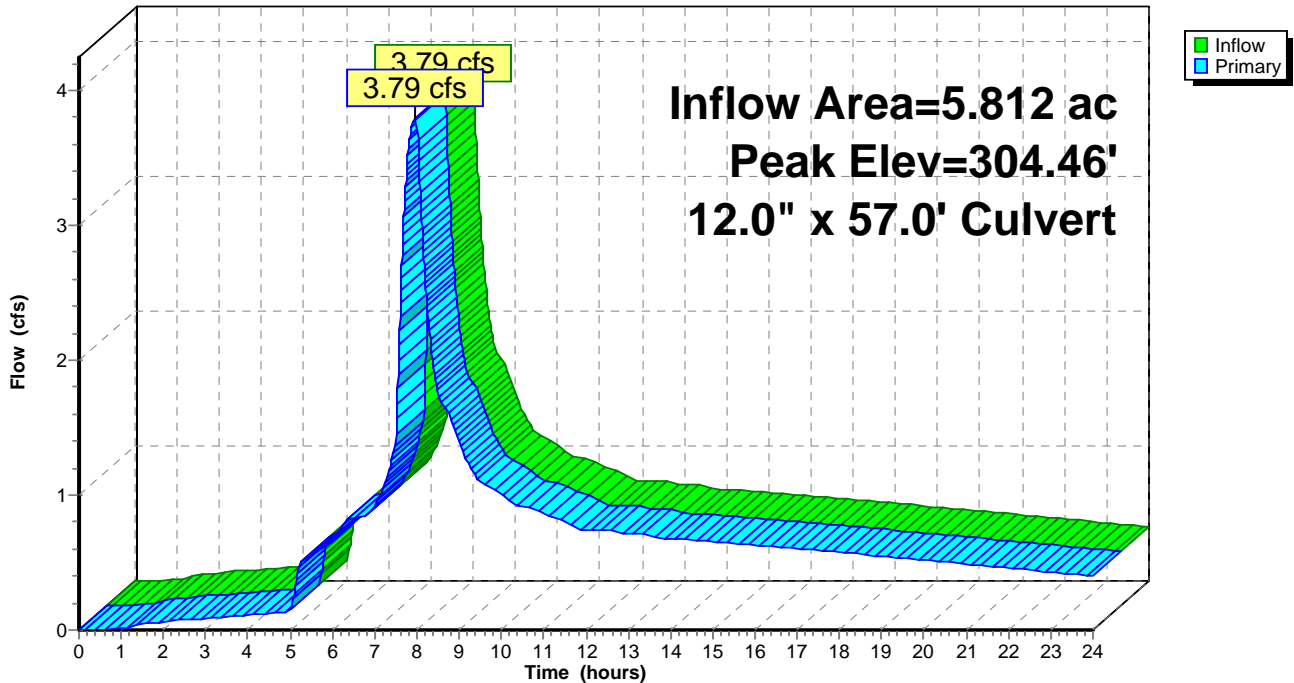
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 304.46' @ 7.96 hrs
 Flood Elev= 306.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.96'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 302.26' S= 0.0123 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=3.79 cfs @ 7.96 hrs HW=304.46' (Free Discharge)
 ←1=Culvert (Inlet Controls 3.79 cfs @ 4.82 fps)

Pond 500R: 12"

Hydrograph



Summary for Pond 600R: 12"

Inflow Area = 5.945 ac, 52.42% Impervious, Inflow Depth > 2.67" for 25-Year event
 Inflow = 3.91 cfs @ 7.95 hrs, Volume= 1.322 af
 Outflow = 3.91 cfs @ 7.95 hrs, Volume= 1.322 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.91 cfs @ 7.95 hrs, Volume= 1.322 af

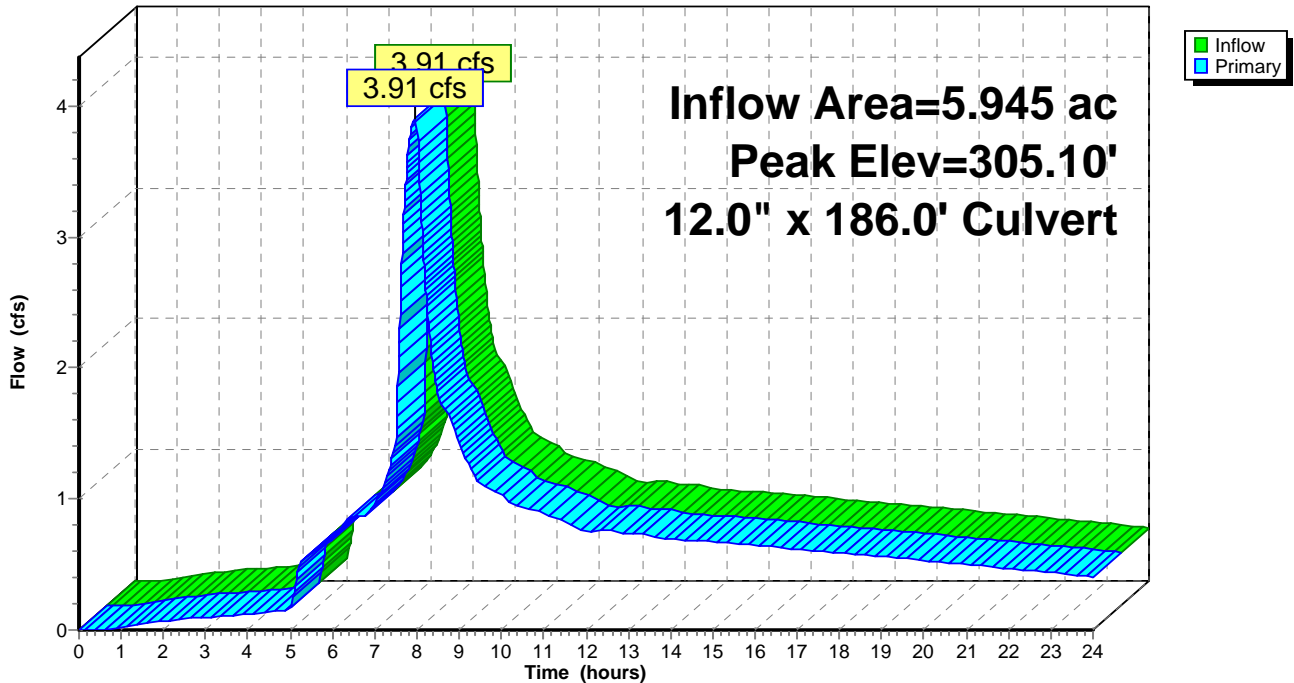
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 305.10' @ 7.95 hrs
 Flood Elev= 305.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.20'	12.0" x 186.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 301.28' S= 0.0049 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=3.91 cfs @ 7.95 hrs HW=305.10' (Free Discharge)
 ←1=Culvert (Barrel Controls 3.91 cfs @ 4.97 fps)

Pond 600R: 12"

Hydrograph



Summary for Pond 700R: 12"

Inflow Area = 7.999 ac, 54.95% Impervious, Inflow Depth > 2.79" for 25-Year event
 Inflow = 5.54 cfs @ 7.95 hrs, Volume= 1.860 af
 Outflow = 5.54 cfs @ 7.95 hrs, Volume= 1.860 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.54 cfs @ 7.95 hrs, Volume= 1.860 af

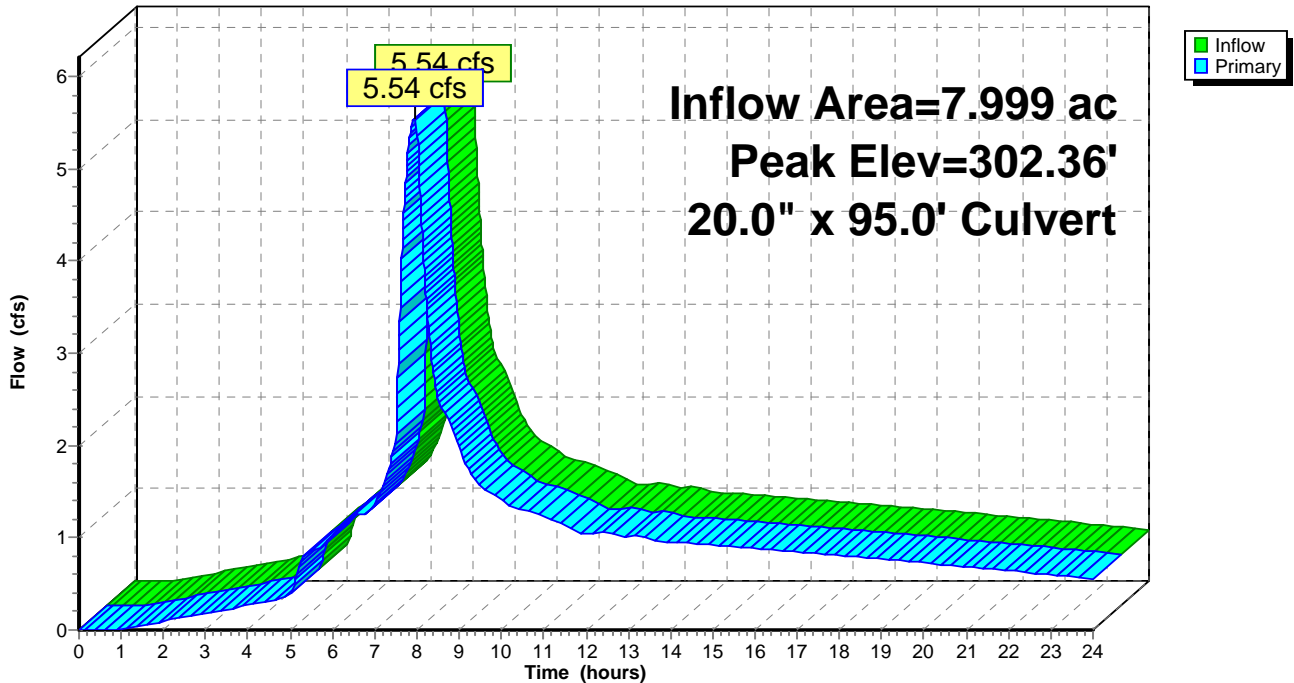
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 302.36' @ 7.95 hrs
 Flood Elev= 304.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	301.08'	20.0" x 95.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 300.60' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.54 cfs @ 7.95 hrs HW=302.36' (Free Discharge)
 ←1=Culvert (Barrel Controls 5.54 cfs @ 4.25 fps)

Pond 700R: 12"

Hydrograph



Summary for Pond 800R: 12"

Inflow Area = 8.132 ac, 55.55% Impervious, Inflow Depth > 2.80" for 25-Year event
 Inflow = 5.66 cfs @ 7.95 hrs, Volume= 1.899 af
 Outflow = 5.66 cfs @ 7.95 hrs, Volume= 1.899 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.66 cfs @ 7.95 hrs, Volume= 1.899 af

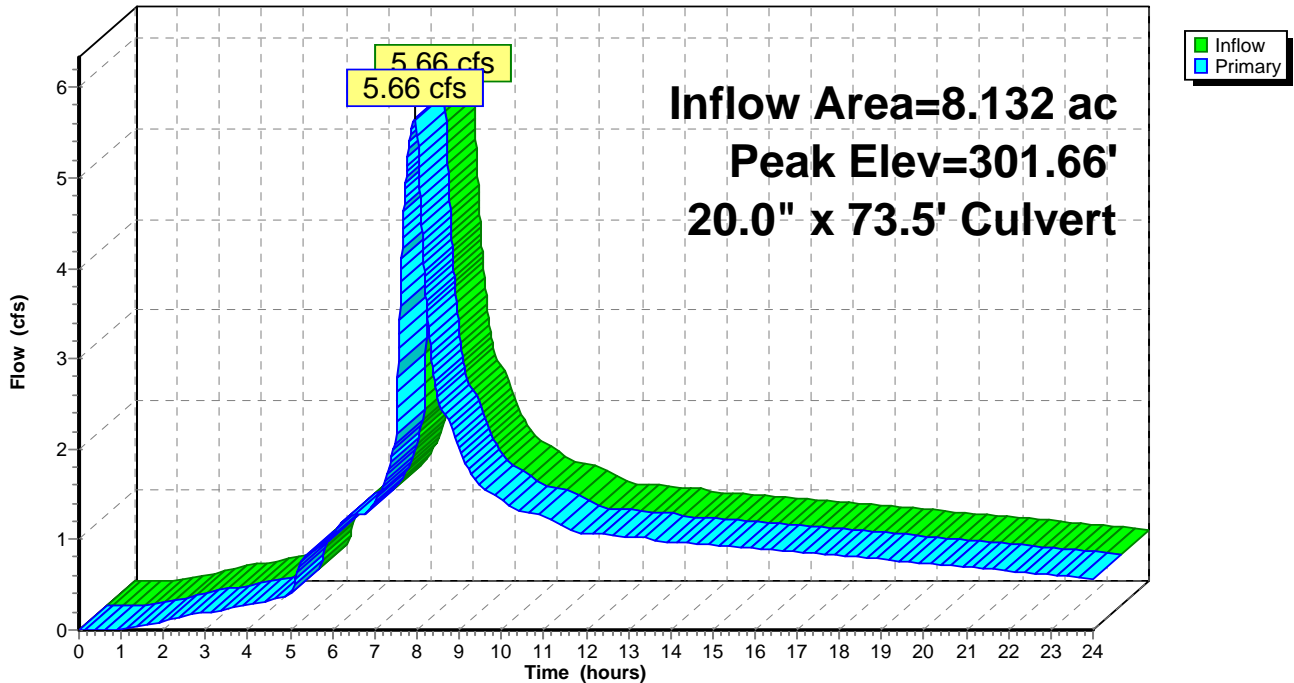
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.66' @ 7.95 hrs
 Flood Elev= 305.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.40'	20.0" x 73.5' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.94' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.66 cfs @ 7.95 hrs HW=301.66' (Free Discharge)
 ←1=Culvert (Barrel Controls 5.66 cfs @ 4.42 fps)

Pond 800R: 12"

Hydrograph



Summary for Pond 900R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 5.72 cfs @ 7.95 hrs, Volume= 1.918 af
 Outflow = 5.72 cfs @ 7.95 hrs, Volume= 1.918 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.72 cfs @ 7.95 hrs, Volume= 1.918 af

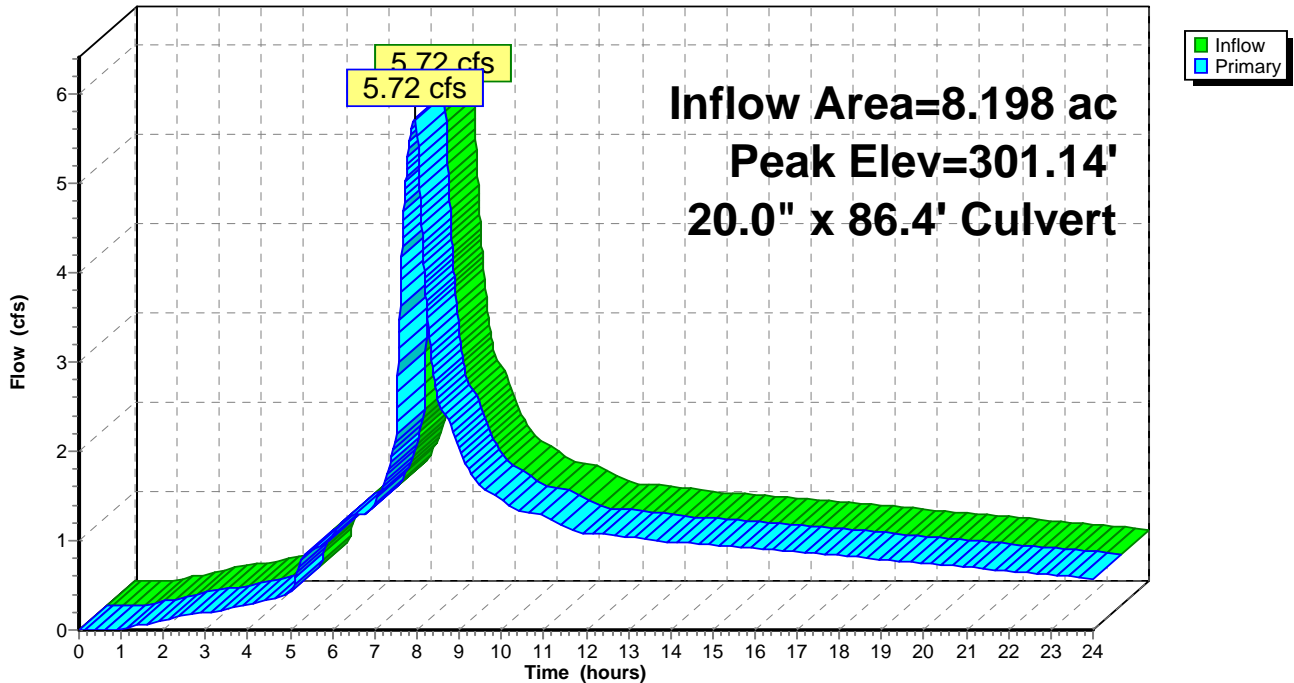
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.14' @ 7.95 hrs
 Flood Elev= 306.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.82'	20.0" x 86.4' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.40' S= 0.0049 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.72 cfs @ 7.95 hrs HW=301.14' (Free Discharge)
 ←1=Culvert (Barrel Controls 5.72 cfs @ 4.23 fps)

Pond 900R: 12"

Hydrograph



Summary for Pond 1000R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 5.72 cfs @ 7.95 hrs, Volume= 1.918 af
 Outflow = 5.72 cfs @ 7.95 hrs, Volume= 1.918 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.72 cfs @ 7.95 hrs, Volume= 1.918 af

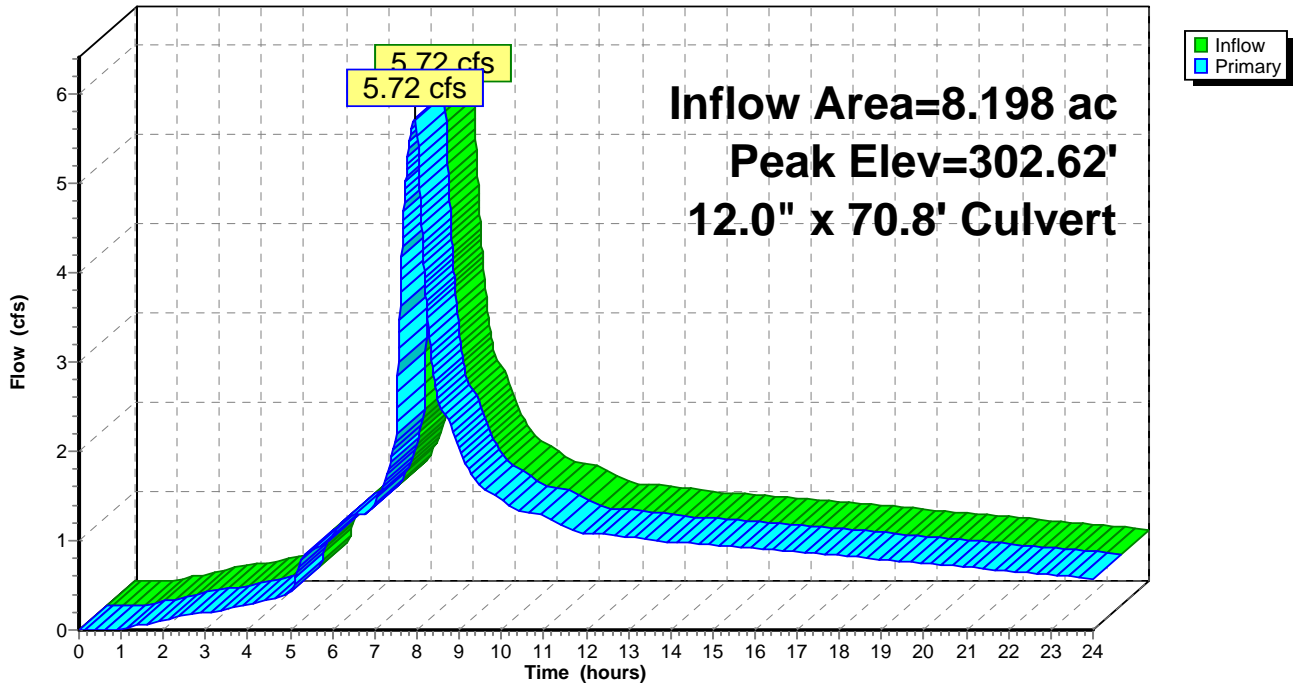
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 302.62' @ 7.95 hrs
 Flood Elev= 307.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.28'	12.0" x 70.8' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0103 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.72 cfs @ 7.95 hrs HW=302.62' (Free Discharge)
 ←1=Culvert (Barrel Controls 5.72 cfs @ 7.28 fps)

Pond 1000R: 12"

Hydrograph



Summary for Pond 1100R: 12"

Inflow Area = 0.303 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af
 Outflow = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af

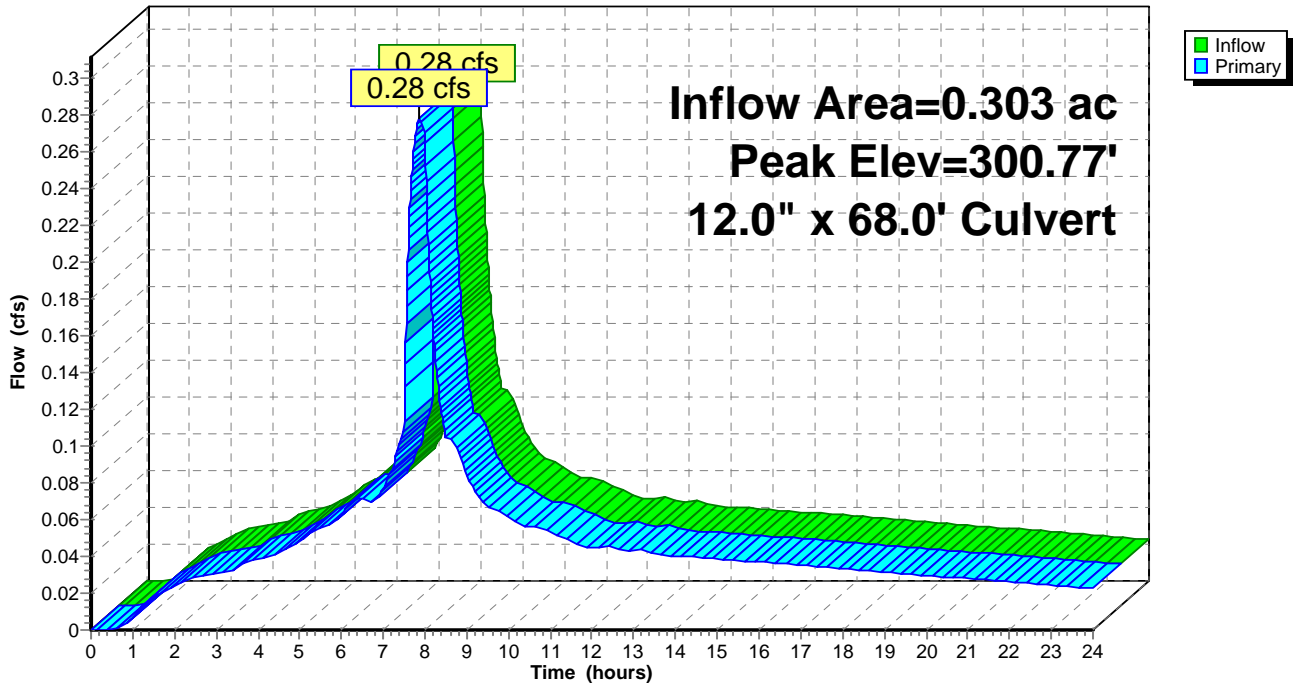
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.77' @ 7.88 hrs
 Flood Elev= 314.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.52'	12.0" x 68.0' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0290 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.27 cfs @ 7.88 hrs HW=300.77' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.27 cfs @ 1.72 fps)

Pond 1100R: 12"

Hydrograph



Summary for Pond 1200R: 12"

Inflow Area = 0.182 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af
 Outflow = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af

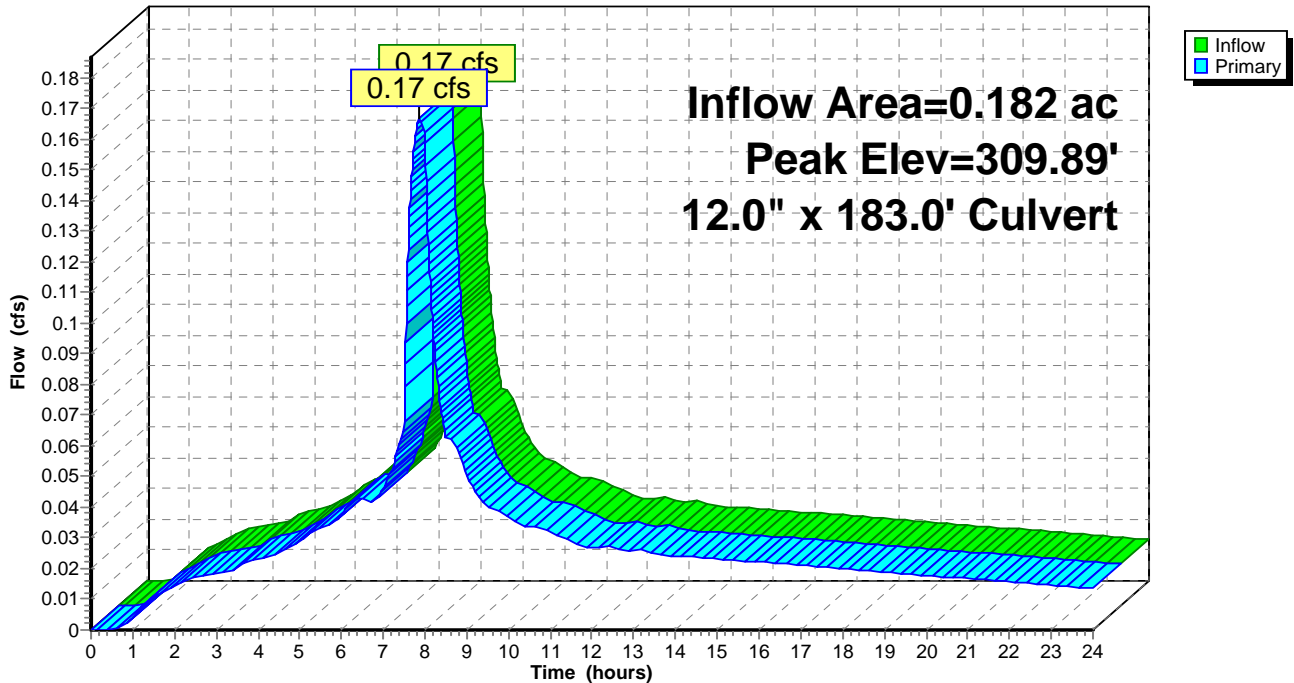
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 309.89' @ 7.88 hrs
 Flood Elev= 323.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	309.70'	12.0" x 183.0' long Culvert Ke= 0.500 Outlet Invert= 300.70' S= 0.0492 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.15 cfs @ 7.88 hrs HW=309.89' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.15 cfs @ 1.48 fps)

Pond 1200R: 12"

Hydrograph



Summary for Pond 1300R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af
 Outflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af

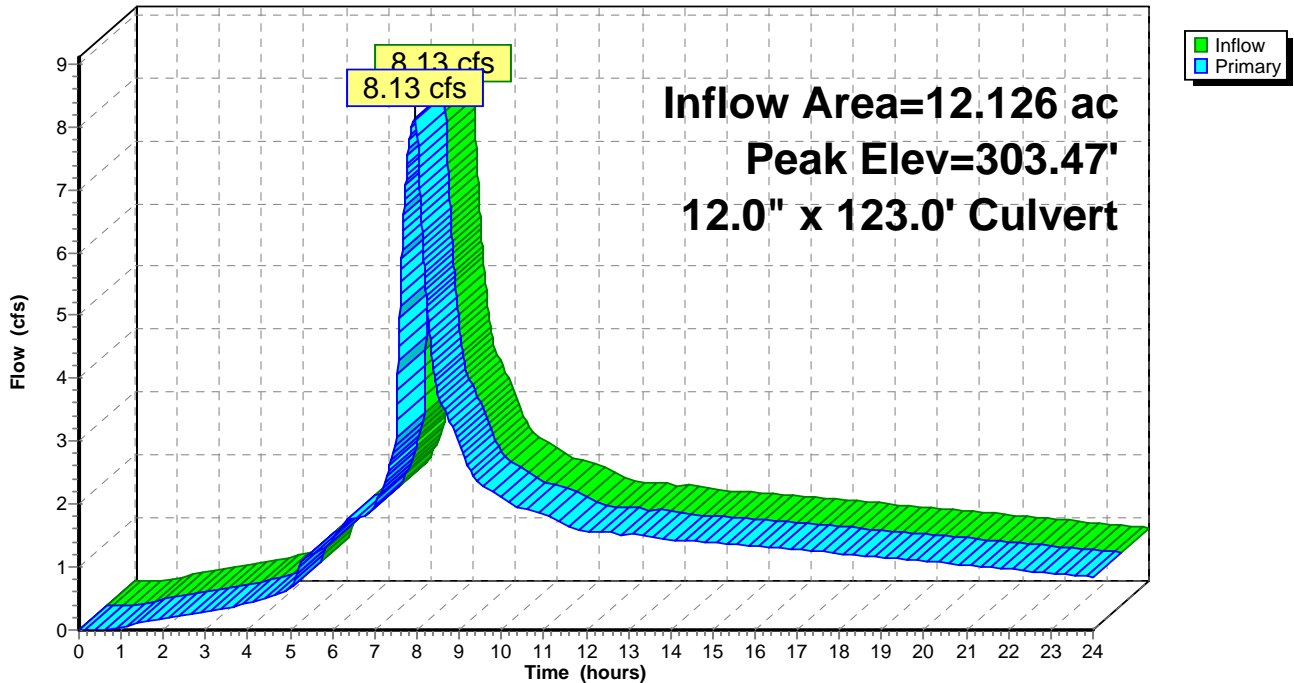
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.47' @ 7.95 hrs
 Flood Elev= 312.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.35'	12.0" x 123.0' long Culvert Ke= 0.500 Outlet Invert= 274.98' S= 0.1900 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=8.13 cfs @ 7.95 hrs HW=303.47' (Free Discharge)
 ←1=Culvert (Inlet Controls 8.13 cfs @ 10.35 fps)

Pond 1300R: 12"

Hydrograph



Summary for Pond 1400R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af
 Outflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af

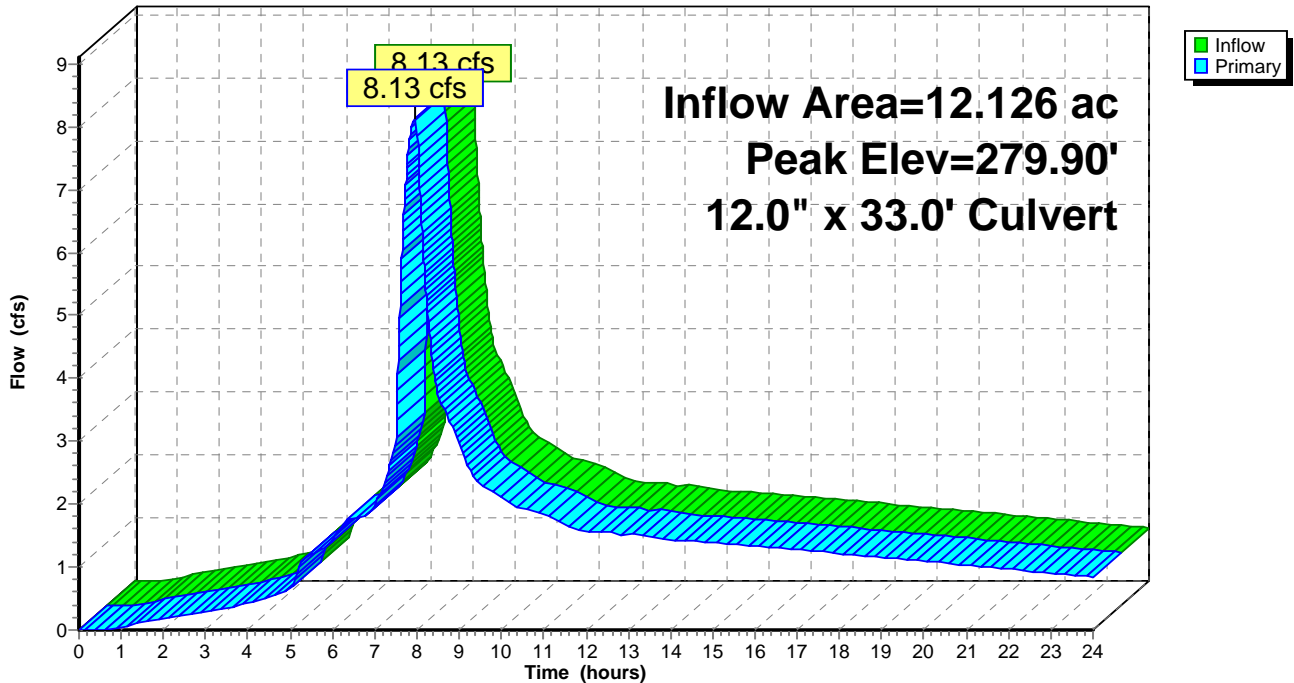
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 279.90' @ 7.95 hrs
 Flood Elev= 288.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.78'	12.0" x 33.0' long Culvert Ke= 0.500 Outlet Invert= 273.79' S= 0.0300 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=8.13 cfs @ 7.95 hrs HW=279.90' (Free Discharge)
 ←1=Culvert (Inlet Controls 8.13 cfs @ 10.35 fps)

Pond 1400R: 12"

Hydrograph



Summary for Pond 1500R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af
 Outflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af

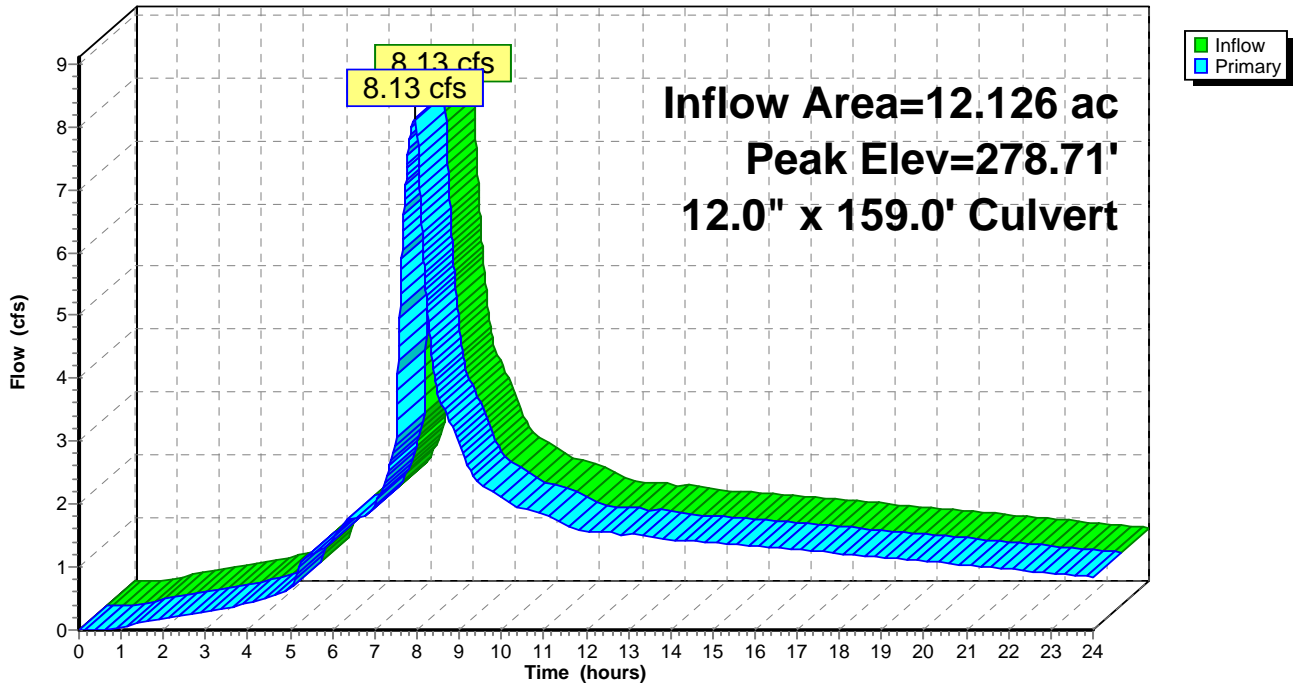
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 278.71' @ 7.95 hrs
 Flood Elev= 287.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.59'	12.0" x 159.0' long Culvert Ke= 0.500 Outlet Invert= 266.59' S= 0.0440 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=8.13 cfs @ 7.95 hrs HW=278.71' (Free Discharge)
 ←1=Culvert (Inlet Controls 8.13 cfs @ 10.35 fps)

Pond 1500R: 12"

Hydrograph



Summary for Pond 1600R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af
 Outflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af

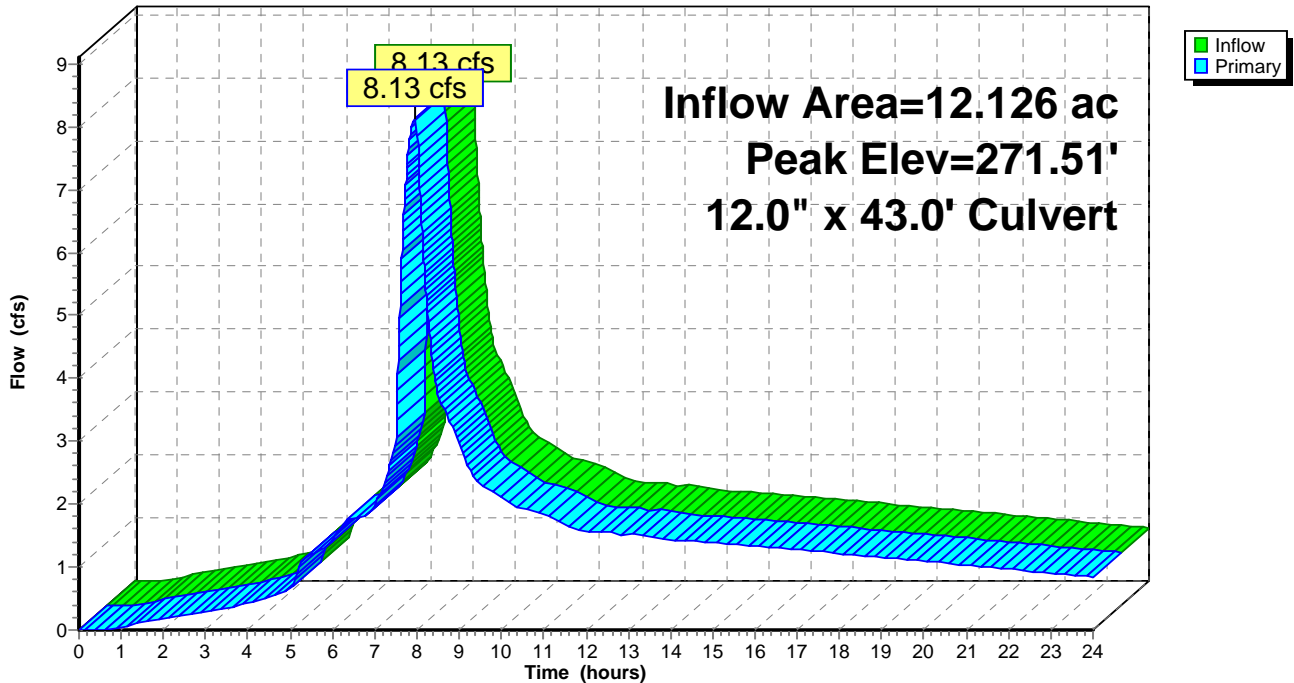
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 271.51' @ 7.95 hrs
 Flood Elev= 280.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	266.39'	12.0" x 43.0' long Culvert Ke= 0.500 Outlet Invert= 254.78' S= 0.2700 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=8.13 cfs @ 7.95 hrs HW=271.51' (Free Discharge)
 ←1=Culvert (Inlet Controls 8.13 cfs @ 10.35 fps)

Pond 1600R: 12"

Hydrograph



Summary for Pond 1700R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af
 Outflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af

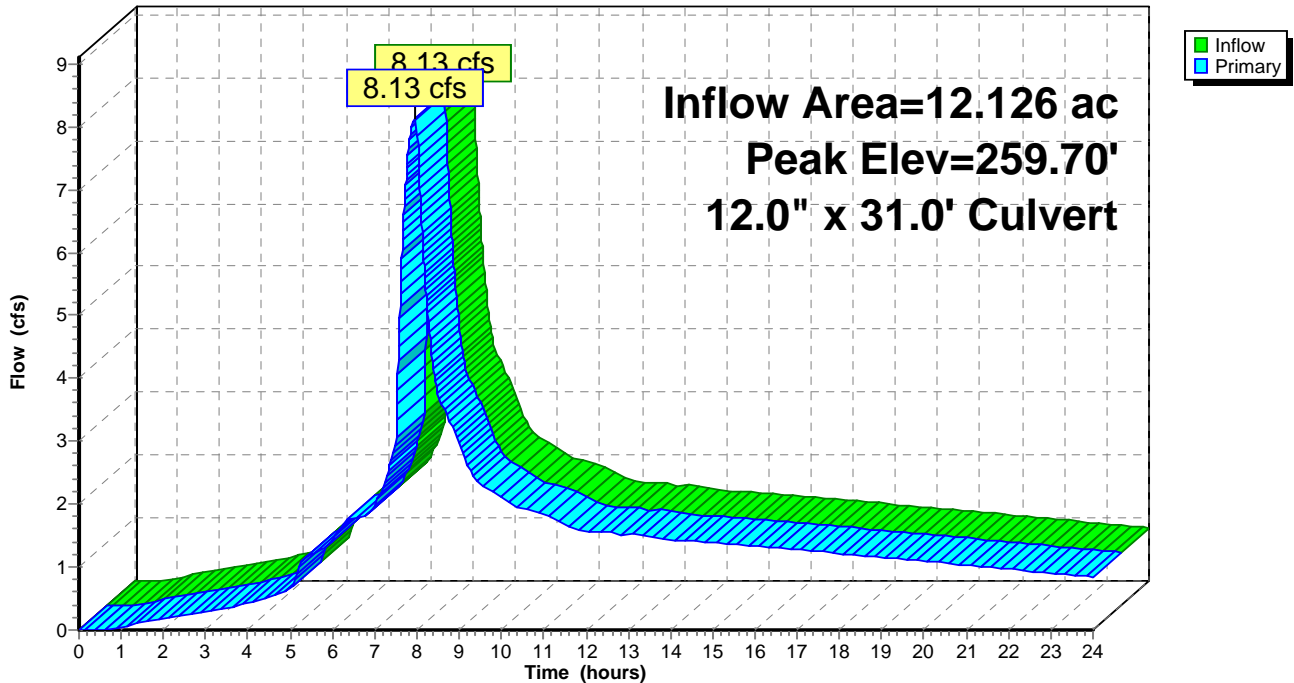
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 259.70' @ 7.95 hrs
 Flood Elev= 268.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	254.58'	12.0" x 31.0' long Culvert Ke= 0.500 Outlet Invert= 239.08' S= 0.5000 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=8.13 cfs @ 7.95 hrs HW=259.70' (Free Discharge)
 ←1=Culvert (Inlet Controls 8.13 cfs @ 10.35 fps)

Pond 1700R: 12"

Hydrograph



Summary for Pond 1800R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.75" for 25-Year event
 Inflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af
 Outflow = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.13 cfs @ 7.95 hrs, Volume= 2.778 af

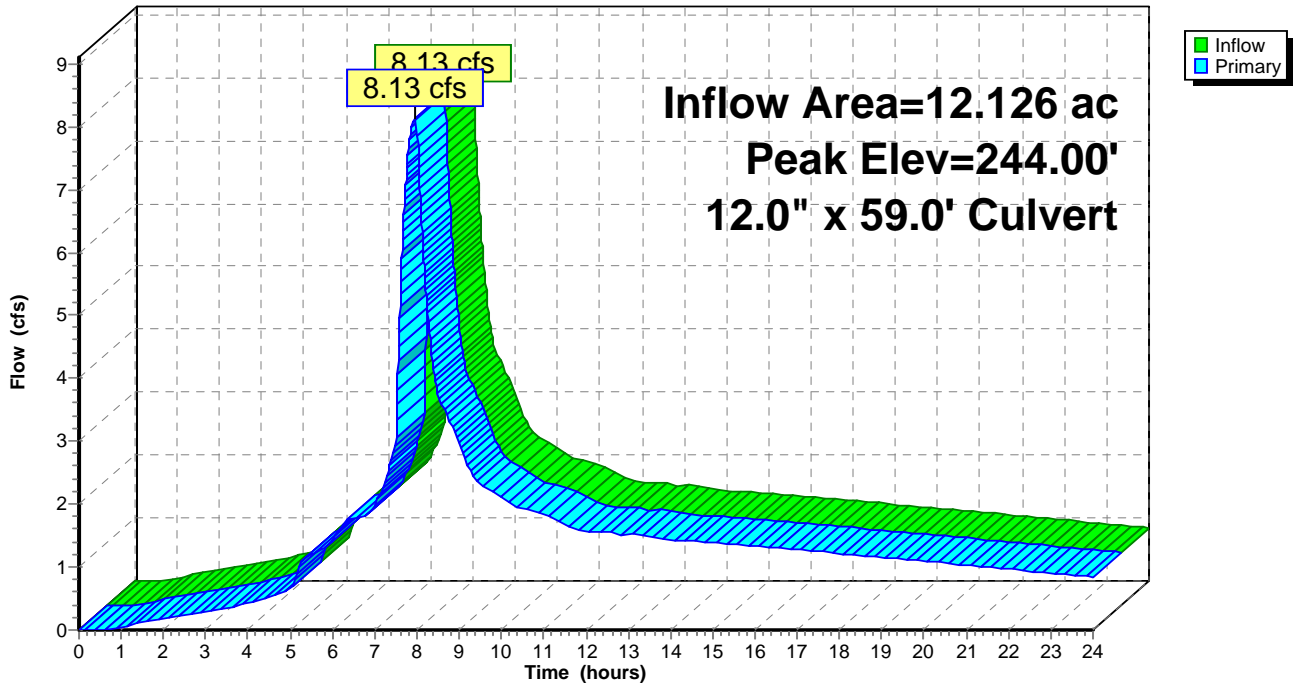
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 244.00' @ 7.95 hrs
 Flood Elev= 246.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.88'	12.0" x 59.0' long Culvert Ke= 0.500 Outlet Invert= 236.00' S= 0.0488 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=8.13 cfs @ 7.95 hrs HW=244.00' (Free Discharge)
 ←1=Culvert (Inlet Controls 8.13 cfs @ 10.35 fps)

Pond 1800R: 12"

Hydrograph



Summary for Pond A: POND

Inflow Area = 5.020 ac, 44.57% Impervious, Inflow Depth > 2.64" for 25-Year event
 Inflow = 3.09 cfs @ 7.94 hrs, Volume= 1.104 af
 Outflow = 3.08 cfs @ 7.97 hrs, Volume= 1.045 af, Atten= 0%, Lag= 1.8 min
 Primary = 3.08 cfs @ 7.97 hrs, Volume= 1.045 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.57' @ 7.97 hrs Surf.Area= 2,190 sf Storage= 2,973 cf

Plug-Flow detention time= 67.6 min calculated for 1.045 af (95% of inflow)
 Center-of-Mass det. time= 30.6 min (758.5 - 728.0)

Volume	Invert	Avail.Storage	Storage Description
#1	306.90'	10,088 cf	Custom Stage Data (Prismatic) Listed below

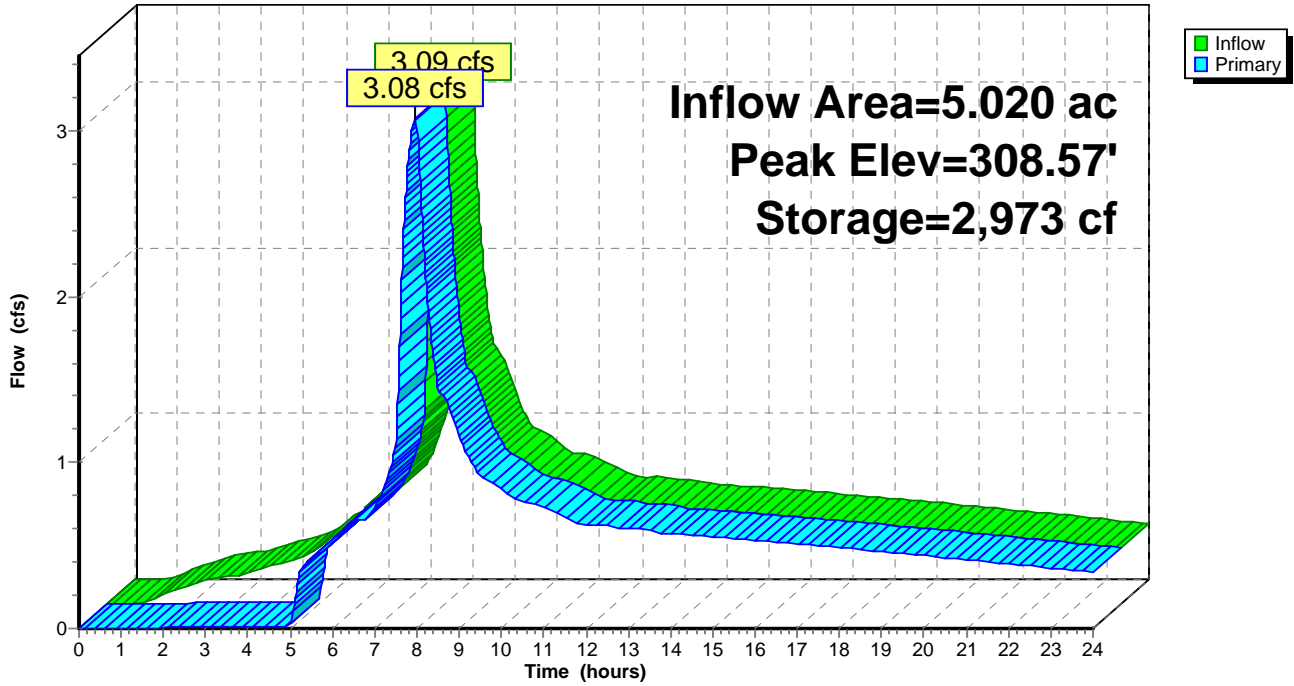
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
306.90	1,318	0	0
307.00	1,364	134	134
308.00	1,865	1,615	1,749
309.00	2,436	2,151	3,899
310.00	3,078	2,757	6,656
311.00	3,785	3,432	10,088

Device	Routing	Invert	Outlet Devices
#1	Primary	306.90'	0.7" Vert. Orifice/Grate C= 0.620
#2	Primary	308.34'	2.25' x 2.00' Horiz. Orifice/Grate Limited to weir flow C= 0.620

Primary OutFlow Max=3.07 cfs @ 7.97 hrs HW=308.57' (Free Discharge)
 1=Orifice/Grate (Orifice Controls 0.02 cfs @ 6.37 fps)
 2=Orifice/Grate (Weir Controls 3.06 cfs @ 1.57 fps)

Pond A: POND

Hydrograph

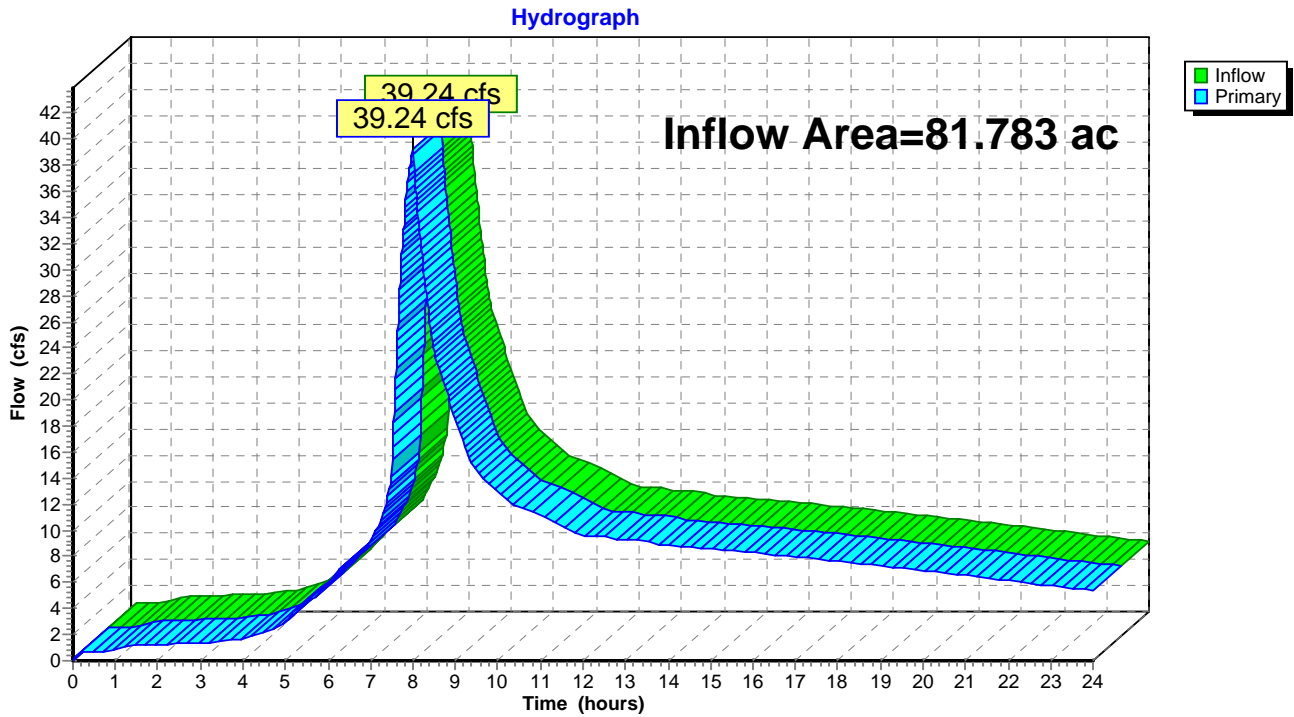


Summary for Link B: NATURAL POND 1900

Inflow Area = 81.783 ac, 44.42% Impervious, Inflow Depth > 2.34" for 25-Year event
Inflow = 39.24 cfs @ 8.00 hrs, Volume= 15.946 af
Primary = 39.24 cfs @ 8.00 hrs, Volume= 15.946 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

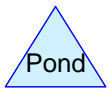
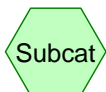
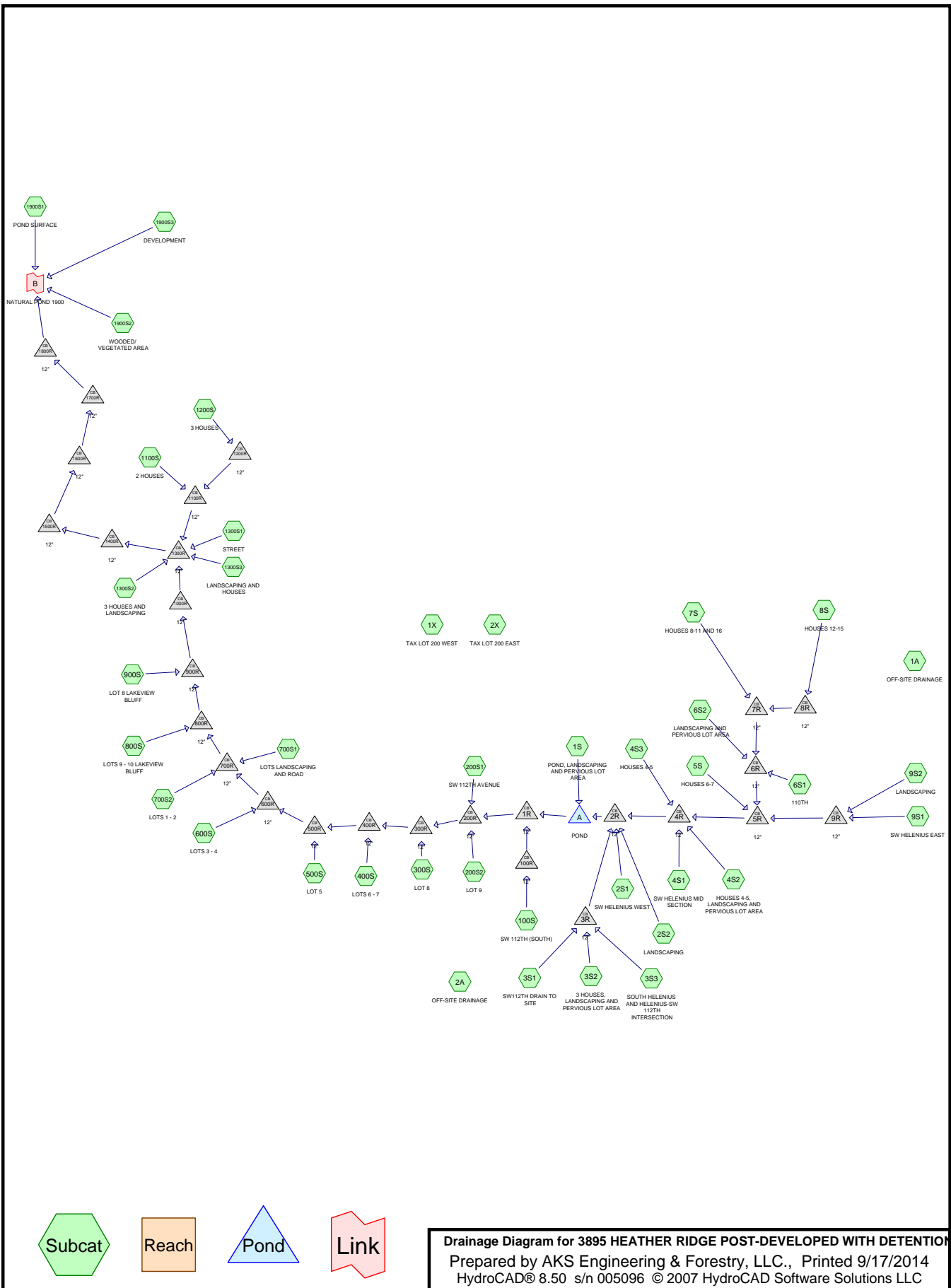
Link B: NATURAL POND 1900



APPENDIX 2.3

POST-DEVELOPED WITH DETENTION

APPENDIX 2.3a
2 YEAR (2.50") STORM EVENT



Drainage Diagram for 3895 HEATHER RIDGE POST-DEVELOPED WITH DETENTION
 Prepared by AKS Engineering & Forestry, LLC., Printed 9/17/2014
 HydroCAD® 8.5.0 s/n 005096 © 2007 HydroCAD Software Solutions LLC

Summary for Subcatchment 1A: OFF-SITE DRAINAGE

Runoff = 0.04 cfs @ 8.00 hrs, Volume= 0.015 af, Depth> 0.83"

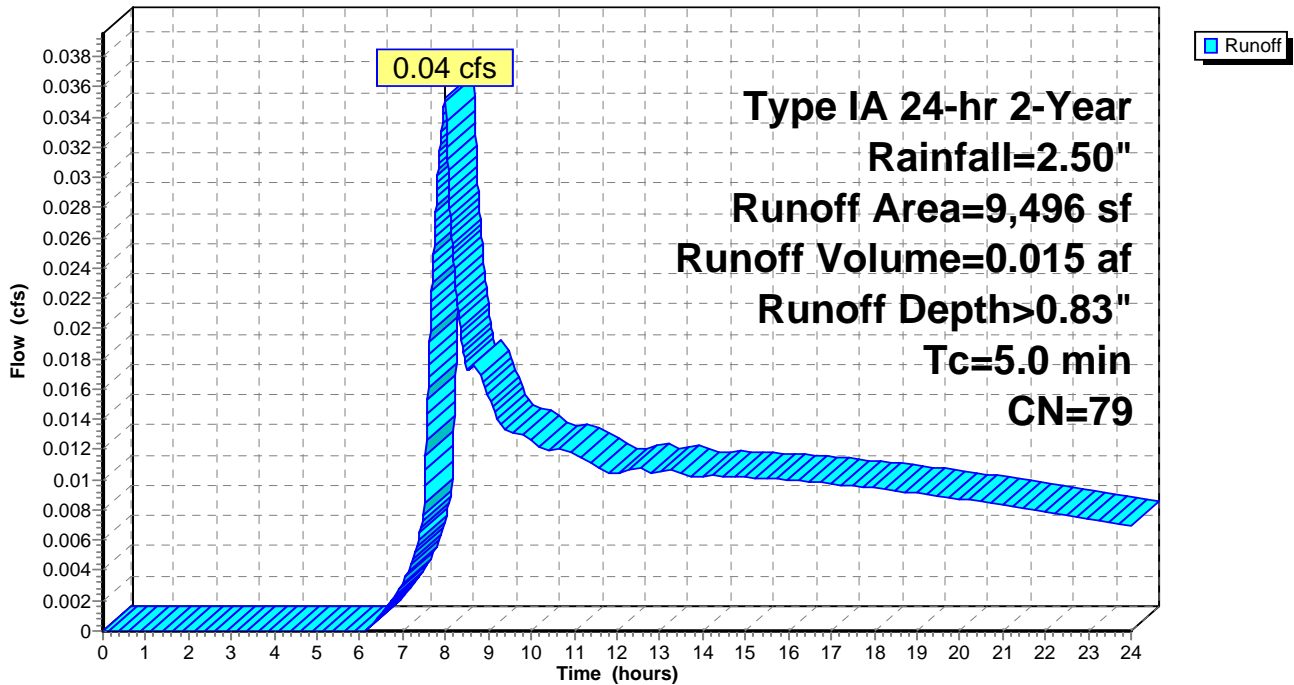
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
9,496	79	50-75% Grass cover, Fair, HSG C
9,496		Pervious Area

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

Subcatchment 1A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA

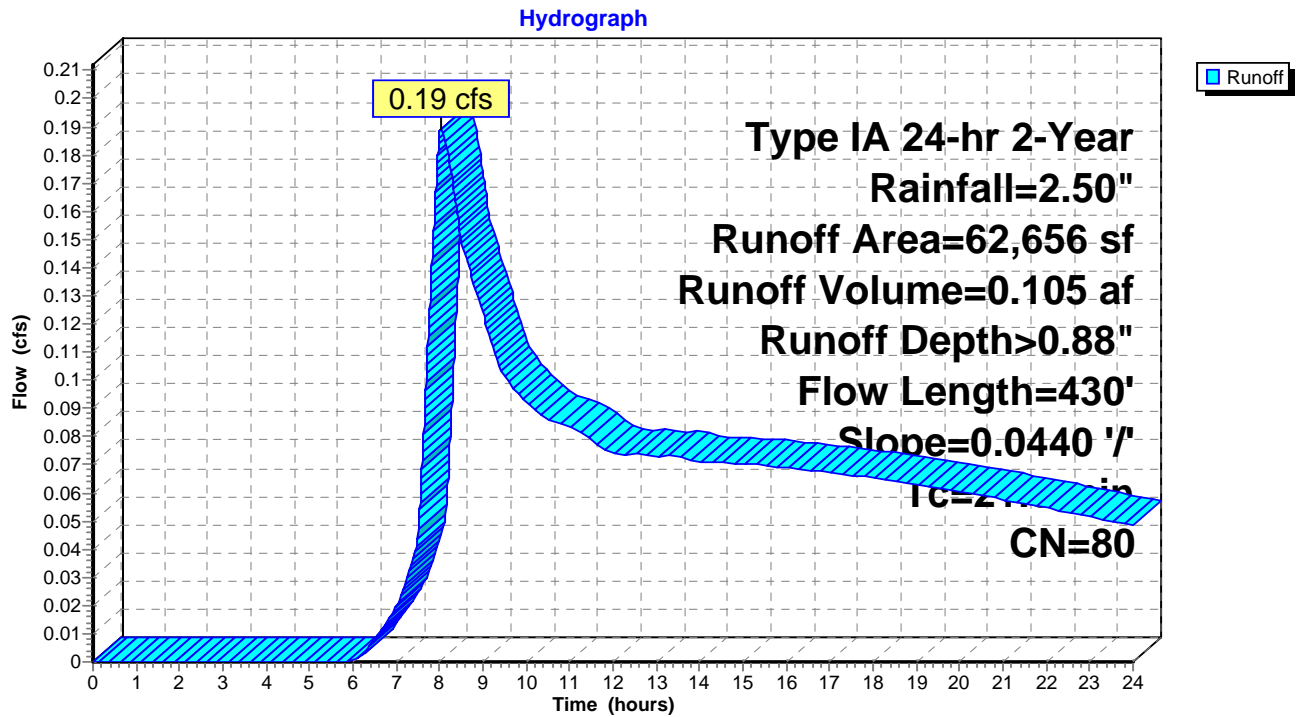
Runoff = 0.19 cfs @ 8.01 hrs, Volume= 0.105 af, Depth> 0.88"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
3,614	100	Water Quality Facility
59,042	79	50-75% Grass cover, Fair, HSG C
62,656	80	Weighted Average
59,042		Pervious Area
3,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	300	0.0440	0.26		Sheet Flow, Flow over lots Grass: Short n= 0.150 P2= 2.50"
1.5	130	0.0440	1.47		Shallow Concentrated Flow, Flow over lots Short Grass Pasture Kv= 7.0 fps
21.0	430	Total			

Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 1X: TAX LOT 200 WEST

Runoff = 0.88 cfs @ 8.04 hrs, Volume= 0.445 af, Depth> 1.36"

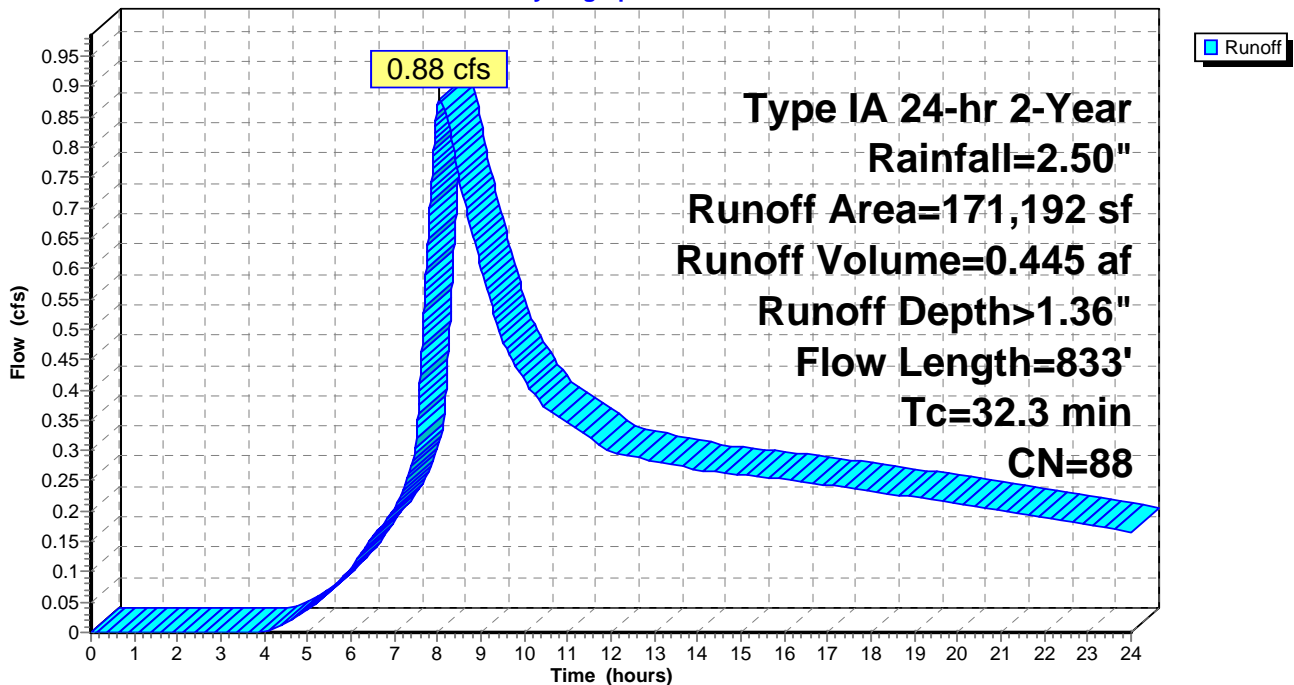
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
136,192	86	<50% Grass cover, Poor, HSG C
* 33,982	98	AC PAVEMENT, ROOFS
1,018	89	Gravel roads, HSG C
171,192	88	Weighted Average
137,210		Pervious Area
33,982		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	300	0.0220	0.19		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"
6.6	533	0.0375	1.36		Shallow Concentrated Flow, PASTURE/MEADOW Short Grass Pasture Kv= 7.0 fps
32.3	833	Total			

Subcatchment 1X: TAX LOT 200 WEST

Hydrograph



Summary for Subcatchment 2A: OFF-SITE DRAINAGE

Runoff = 0.01 cfs @ 7.88 hrs, Volume= 0.003 af, Depth> 2.27"

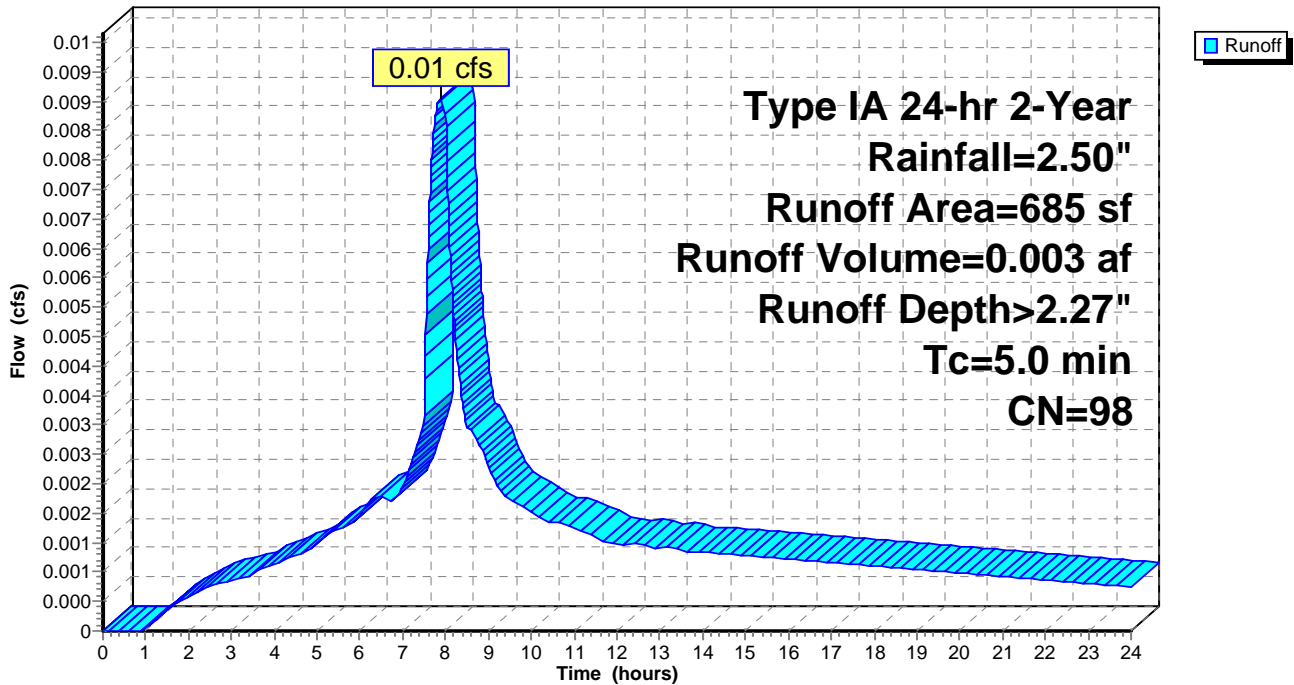
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 685	98	Street and sidewalk
685		Impervious Area

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

Subcatchment 2A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 2S1: SW HELENIUS WEST

Runoff = 0.08 cfs @ 7.90 hrs, Volume= 0.025 af, Depth> 1.96"

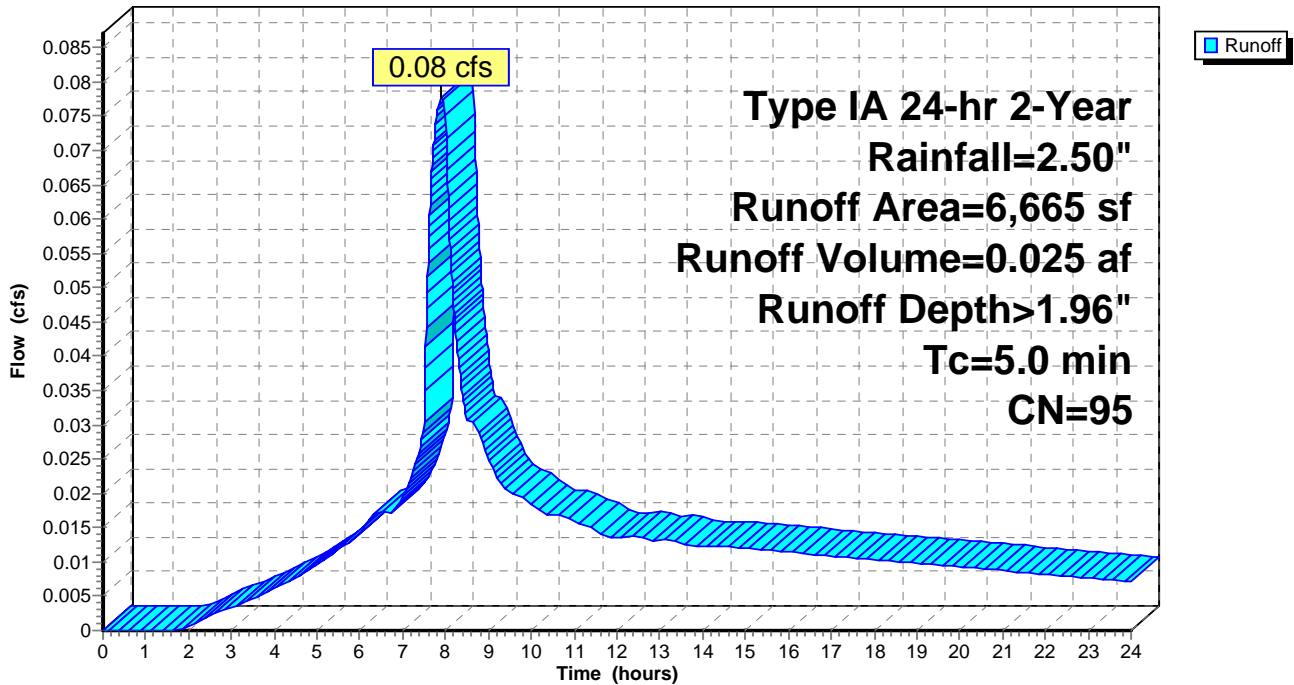
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 5,667	98	Street and sidewalk
998	79	50-75% Grass cover, Fair, HSG C
6,665	95	Weighted Average
998		Pervious Area
5,667		Impervious Area

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

Subcatchment 2S1: SW HELENIUS WEST

Hydrograph



Summary for Subcatchment 2S2: LANDSCAPING

Runoff = 0.00 cfs @ 8.00 hrs, Volume= 0.002 af, Depth> 0.83"

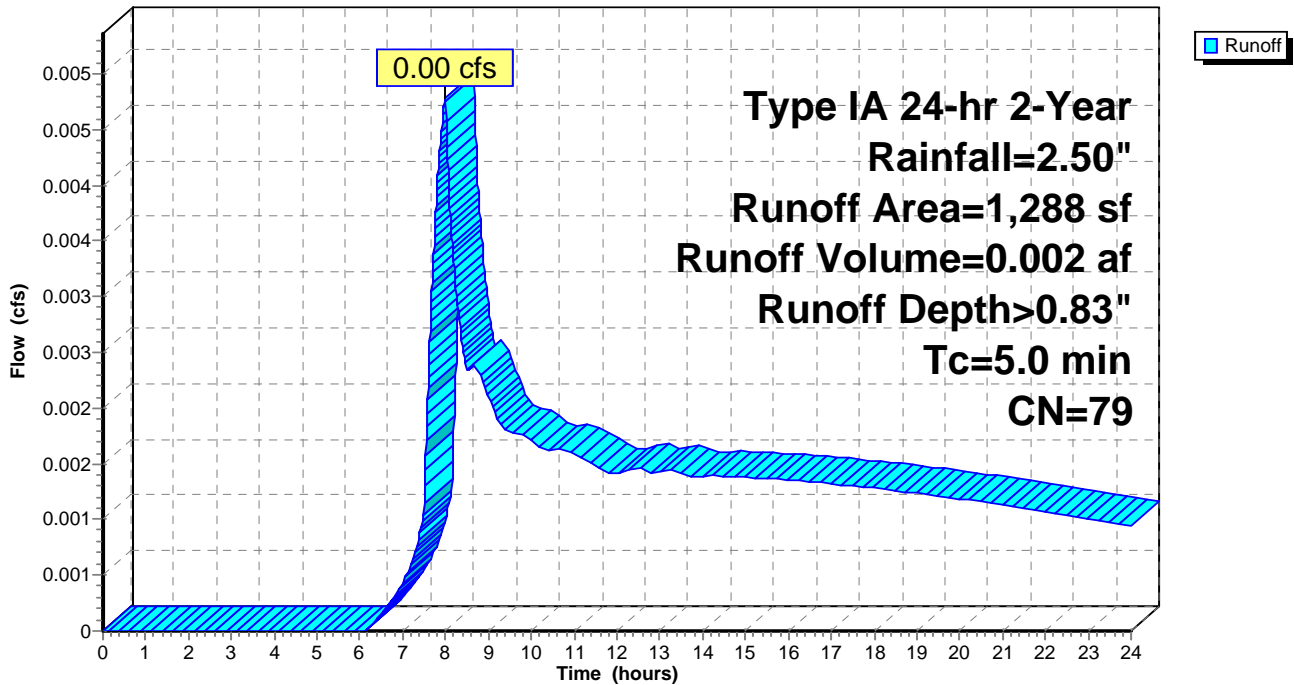
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
1,288	79	50-75% Grass cover, Fair, HSG C
1,288		Pervious Area

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

Subcatchment 2S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 2X: TAX LOT 200 EAST

Runoff = 0.30 cfs @ 8.01 hrs, Volume= 0.134 af, Depth> 1.30"

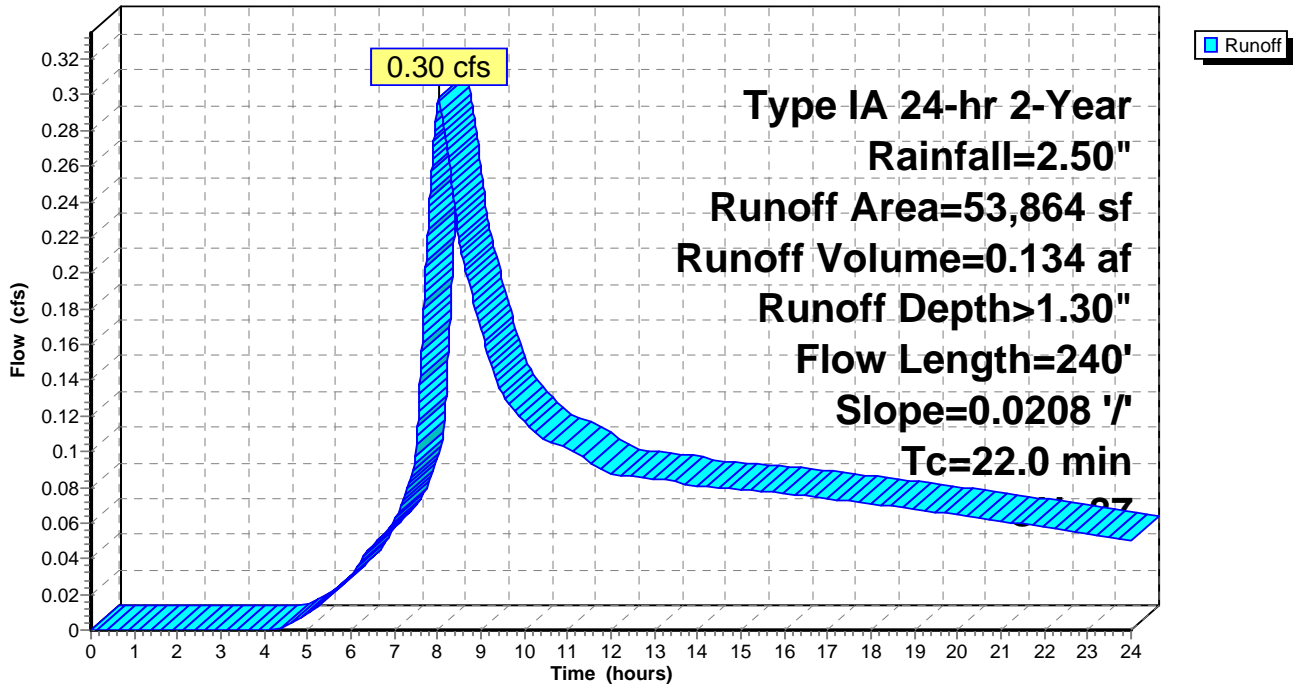
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
50,783	86	<50% Grass cover, Poor, HSG C
* 3,081	98	Roof
53,864	87	Weighted Average
50,783		Pervious Area
3,081		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	240	0.0208	0.18		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 2X: TAX LOT 200 EAST

Hydrograph



Summary for Subcatchment 3S1: SW112TH DRAIN TO SITE

Runoff = 0.13 cfs @ 7.89 hrs, Volume= 0.042 af, Depth> 2.16"

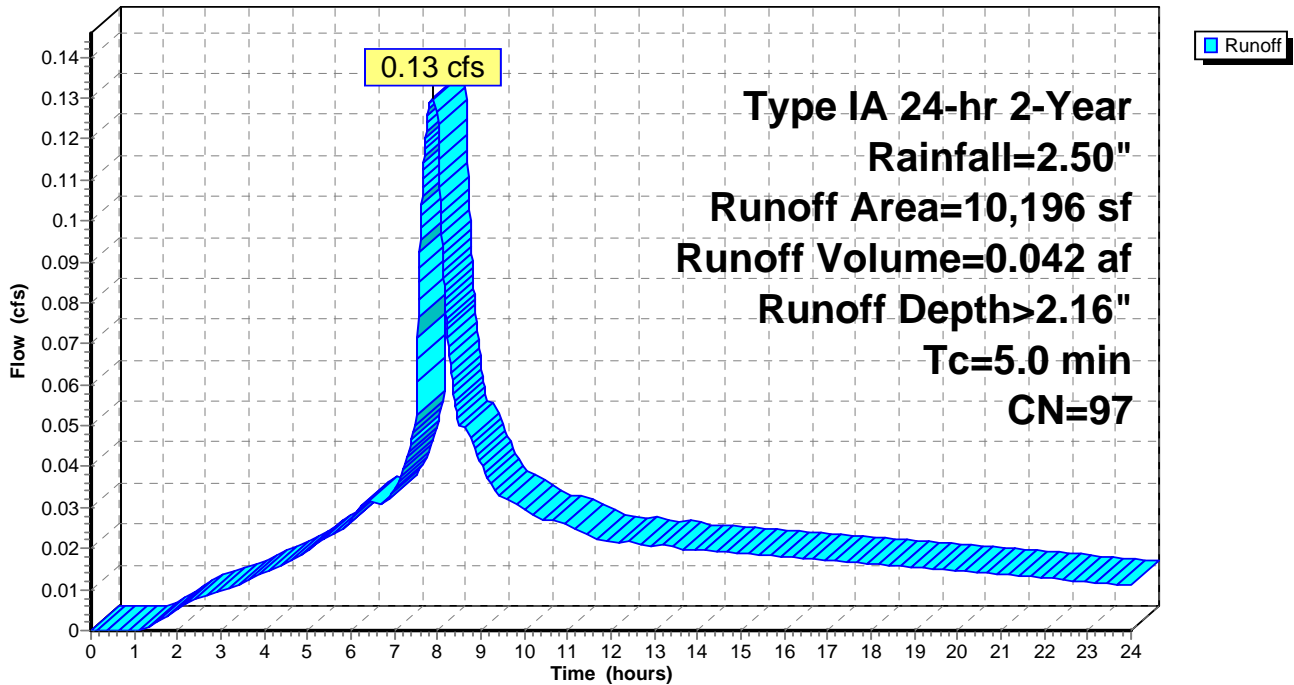
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 9,446	98	Street and sidewalk
750	79	50-75% Grass cover, Fair, HSG C
10,196	97	Weighted Average
750		Pervious Area
9,446		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S1: SW112TH DRAIN TO SITE

Hydrograph



Summary for Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA

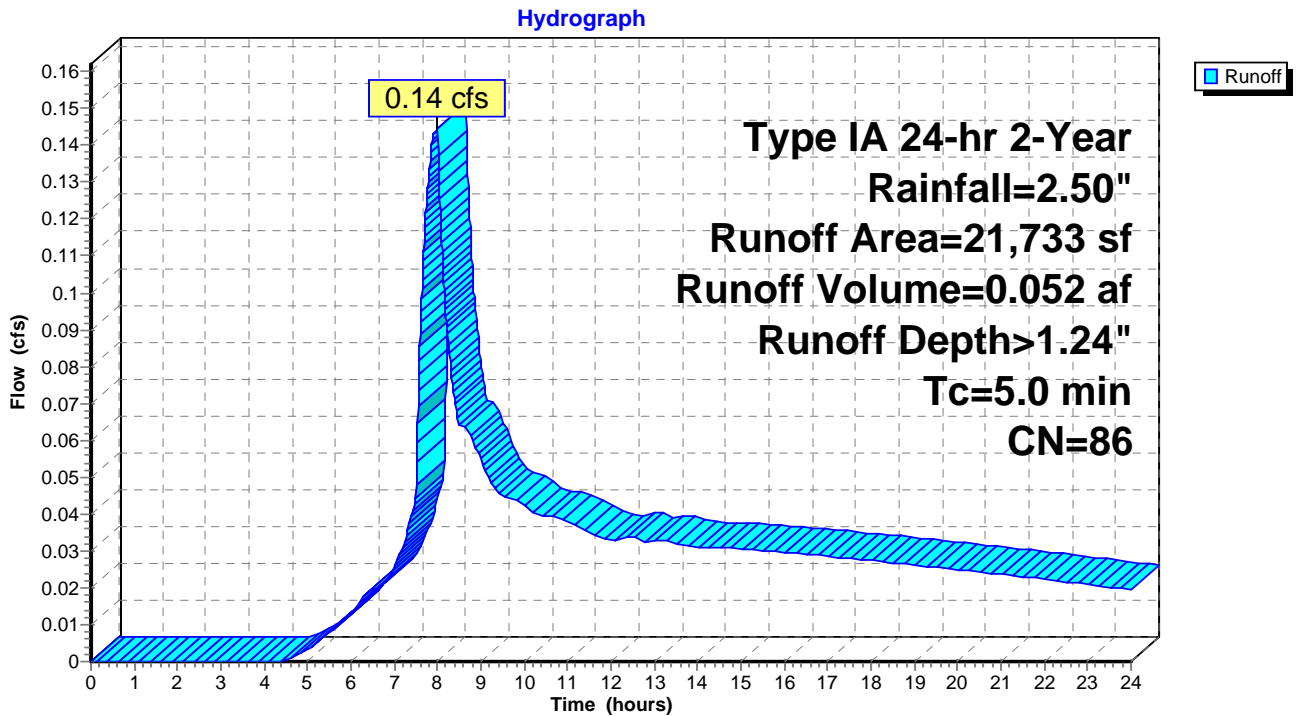
Runoff = 0.14 cfs @ 7.97 hrs, Volume= 0.052 af, Depth> 1.24"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
13,813	79	50-75% Grass cover, Fair, HSG C
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
21,733	86	Weighted Average
13,813		Pervious Area
7,920		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION

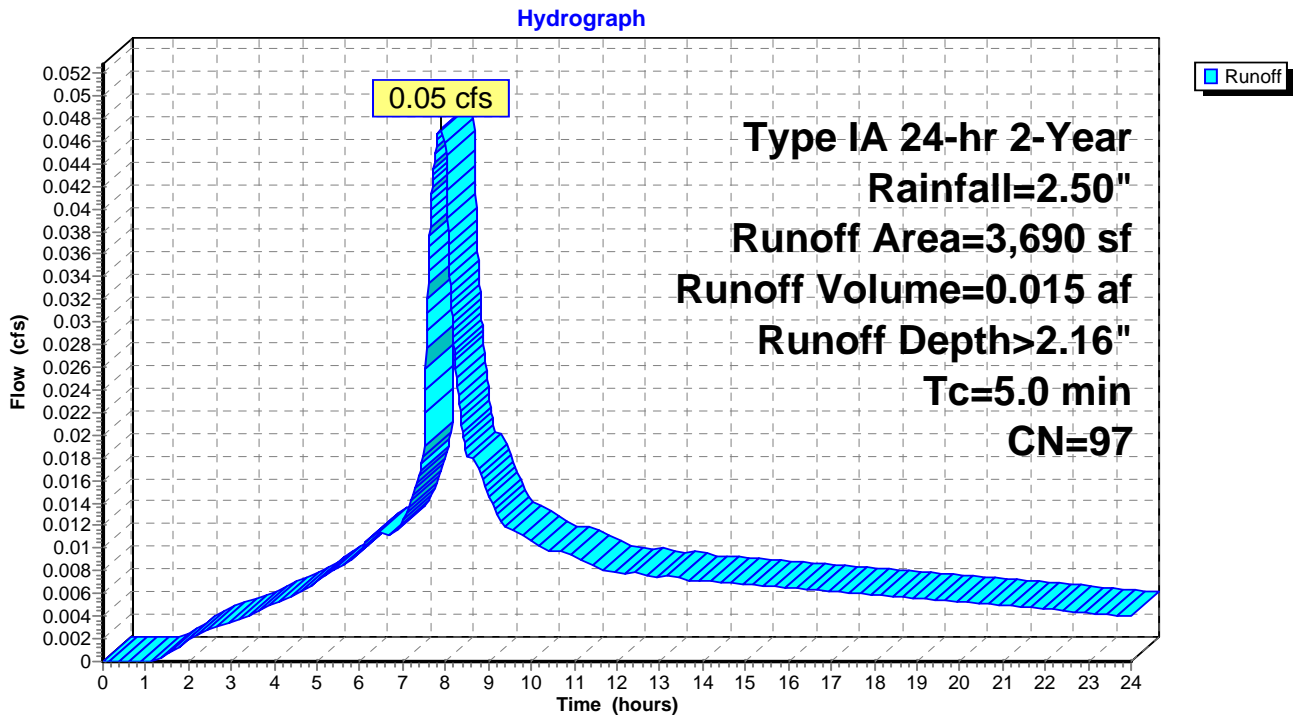
Runoff = 0.05 cfs @ 7.89 hrs, Volume= 0.015 af, Depth> 2.16"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 3,540	98	Street and sidewalk
150	79	50-75% Grass cover, Fair, HSG C
3,690	97	Weighted Average
150		Pervious Area
3,540		Impervious Area

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

Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION



Summary for Subcatchment 4S1: SW HELENIUS MID SECTION

Runoff = 0.09 cfs @ 7.90 hrs, Volume= 0.030 af, Depth> 1.96"

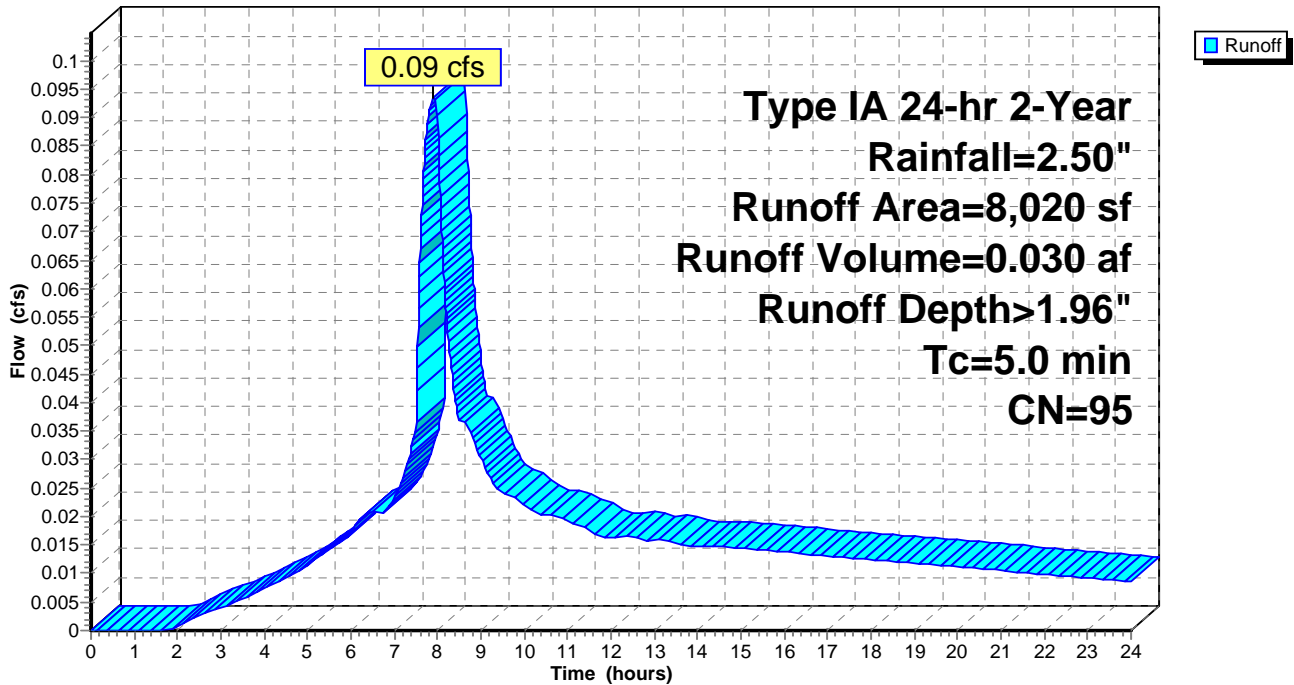
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
6,943	98	Streets and sidewalks
1,077	79	50-75% Grass cover, Fair, HSG C
8,020	95	Weighted Average
1,077		Pervious Area
6,943		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREETS AND ROOFTOP RUNOFF

Subcatchment 4S1: SW HELENIUS MID SECTION

Hydrograph



Summary for Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA

Runoff = 0.09 cfs @ 7.96 hrs, Volume= 0.030 af, Depth> 1.38"

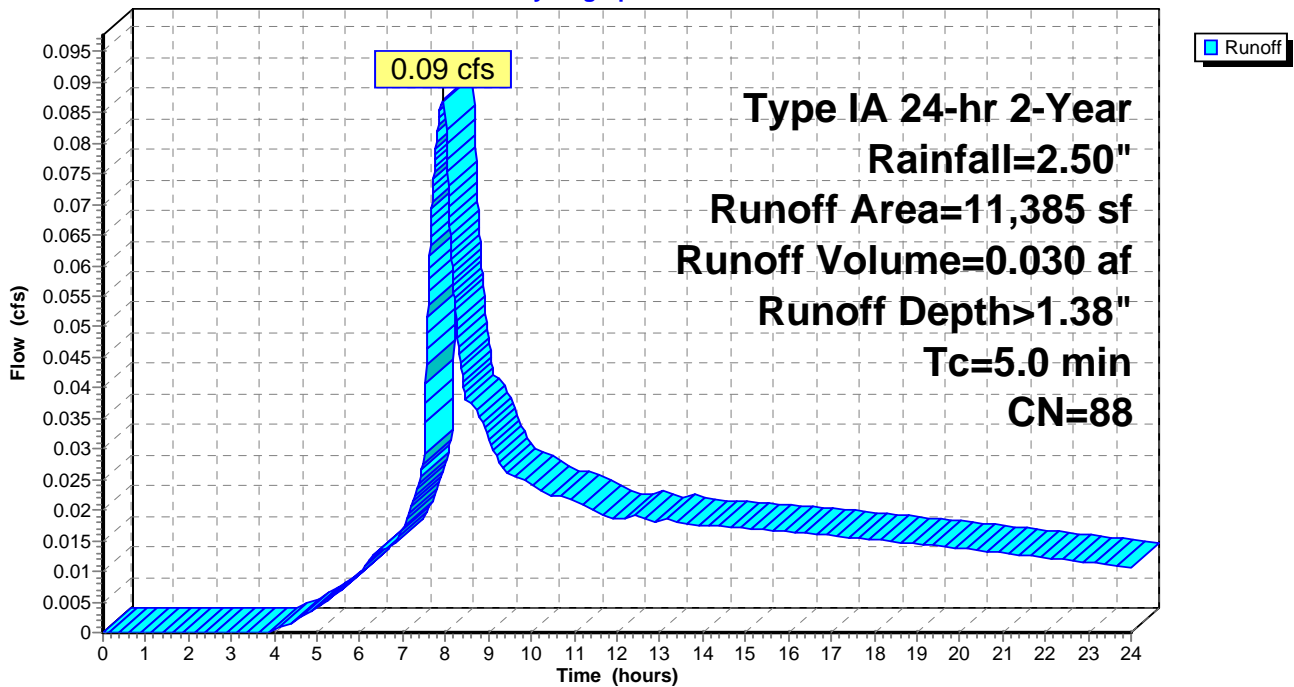
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
6,105	79	50-75% Grass cover, Fair, HSG C
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
11,385	88	Weighted Average
6,105		Pervious Area
5,280		Impervious Area

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

Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA

Hydrograph



Summary for Subcatchment 4S3: HOUSES 4-5

Runoff = 0.07 cfs @ 7.88 hrs, Volume= 0.023 af, Depth> 2.27"

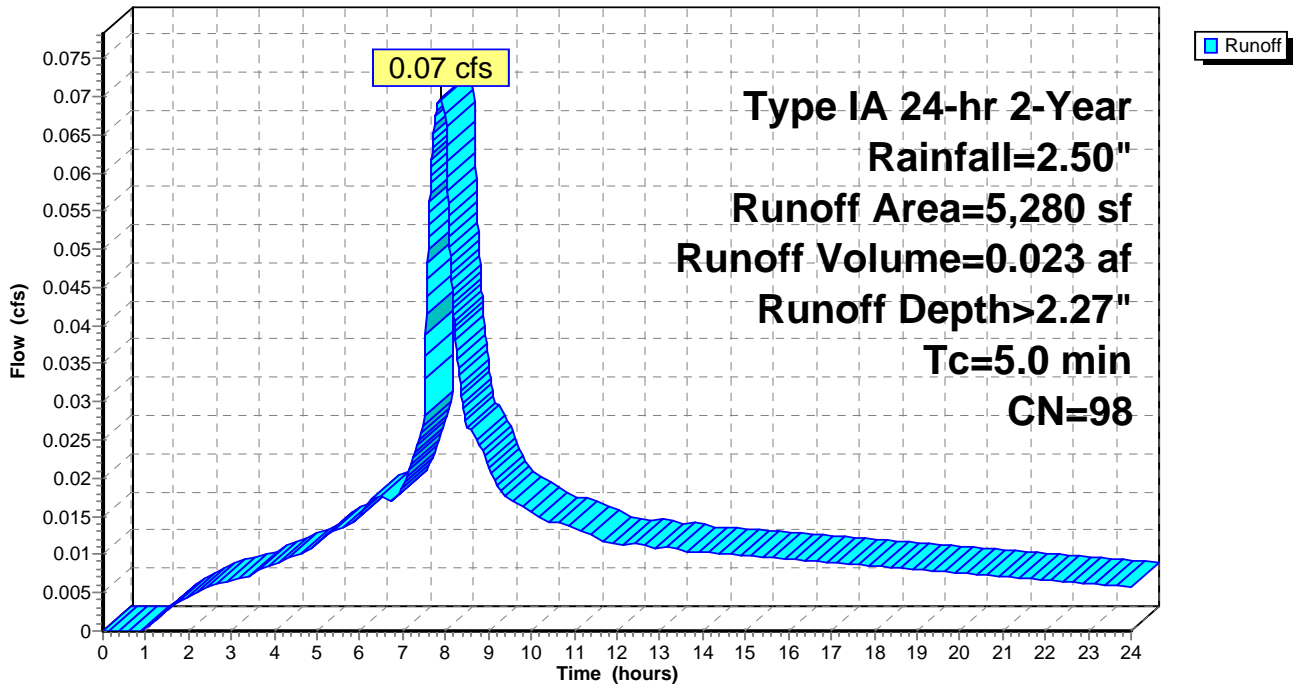
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 4S3: HOUSES 4-5

Hydrograph



Summary for Subcatchment 5S: HOUSES 6-7

Runoff = 0.07 cfs @ 7.88 hrs, Volume= 0.023 af, Depth> 2.27"

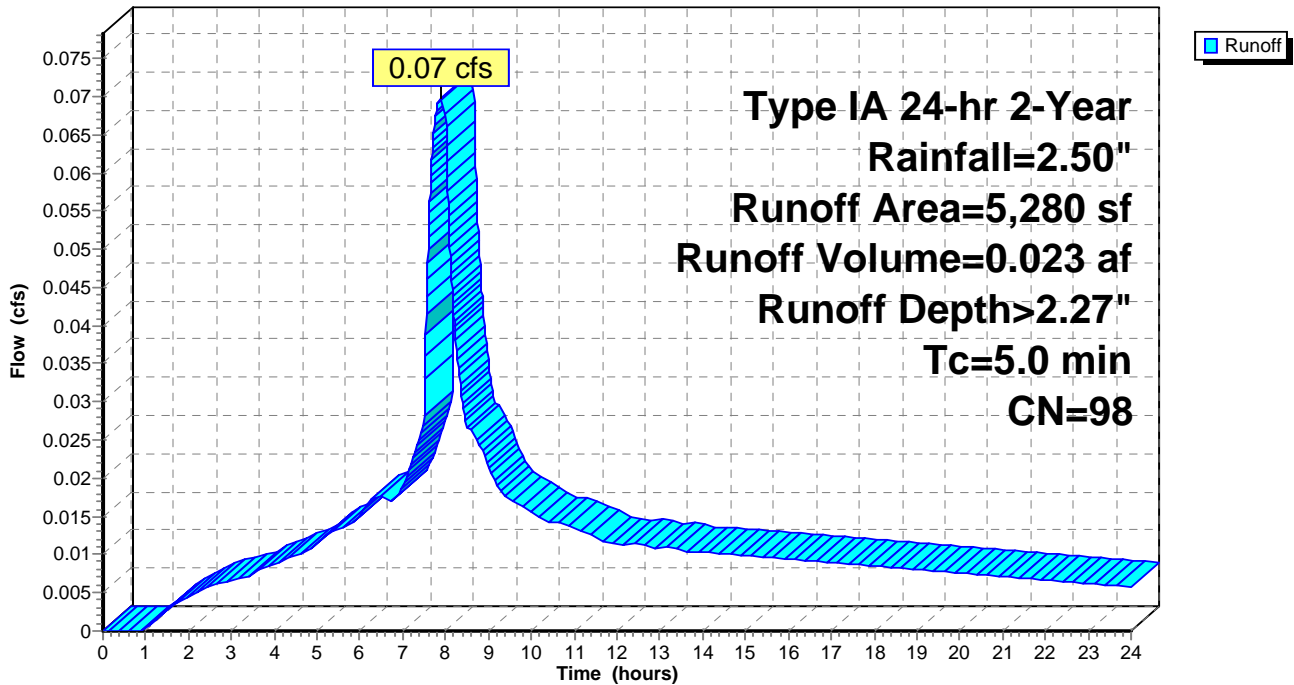
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 5S: HOUSES 6-7

Hydrograph



Summary for Subcatchment 6S1: 110TH

Runoff = 0.19 cfs @ 7.89 hrs, Volume= 0.062 af, Depth> 2.16"

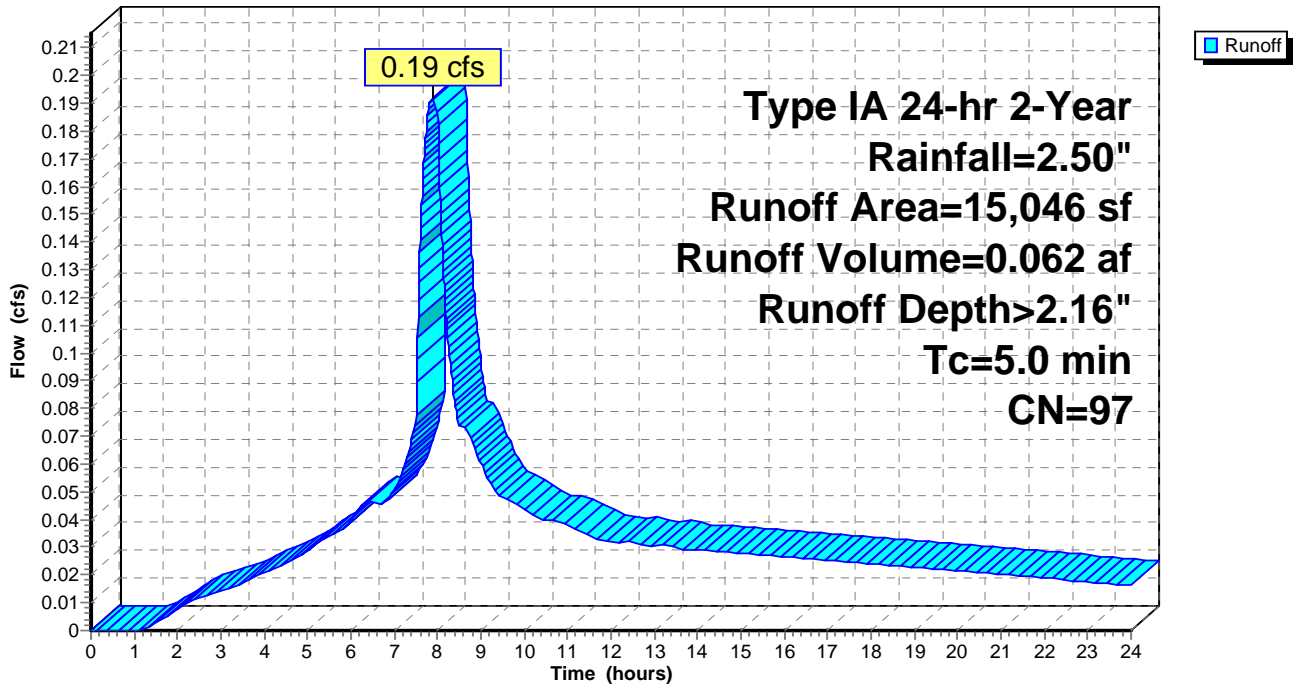
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 14,121	98	Street and sidewalk
925	79	50-75% Grass cover, Fair, HSG C
15,046	97	Weighted Average
925		Pervious Area
14,121		Impervious Area

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

Subcatchment 6S1: 110TH

Hydrograph



Summary for Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Runoff = 0.12 cfs @ 8.00 hrs, Volume= 0.050 af, Depth> 0.83"

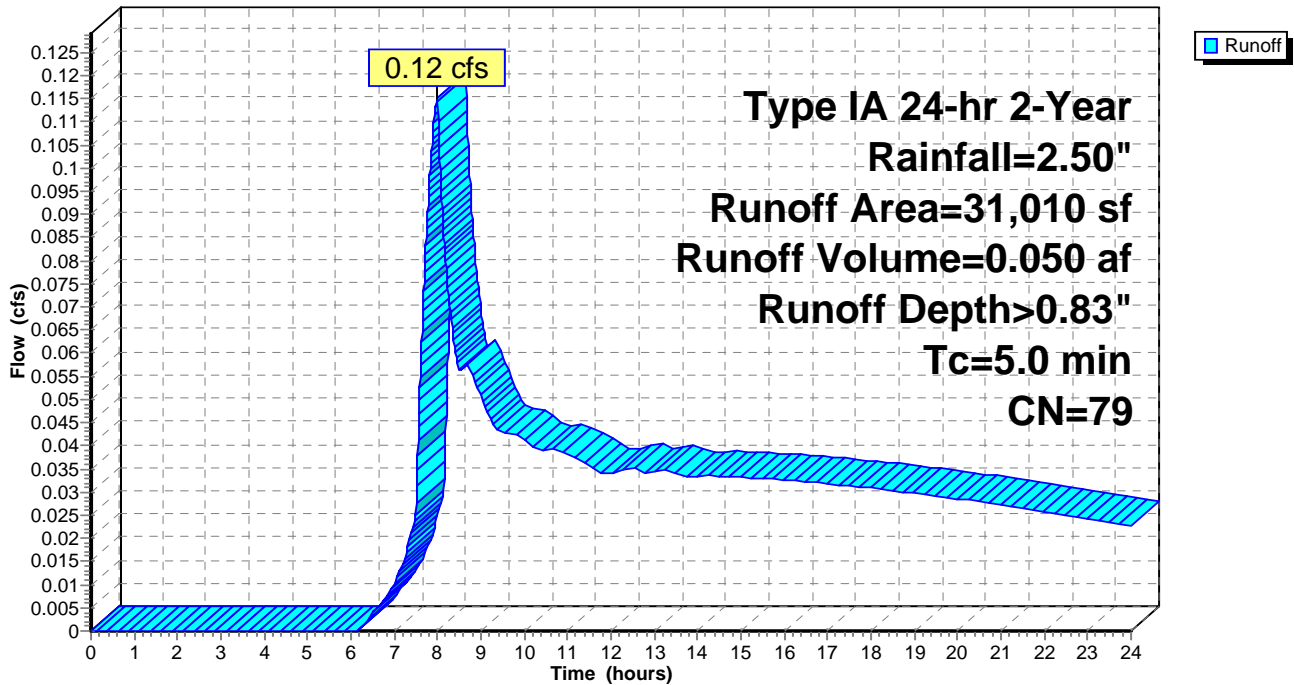
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
31,010	79	50-75% Grass cover, Fair, HSG C
31,010		Pervious Area

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

Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Hydrograph



Summary for Subcatchment 7S: HOUSES 8-11 AND 16

Runoff = 0.17 cfs @ 7.88 hrs, Volume= 0.057 af, Depth> 2.27"

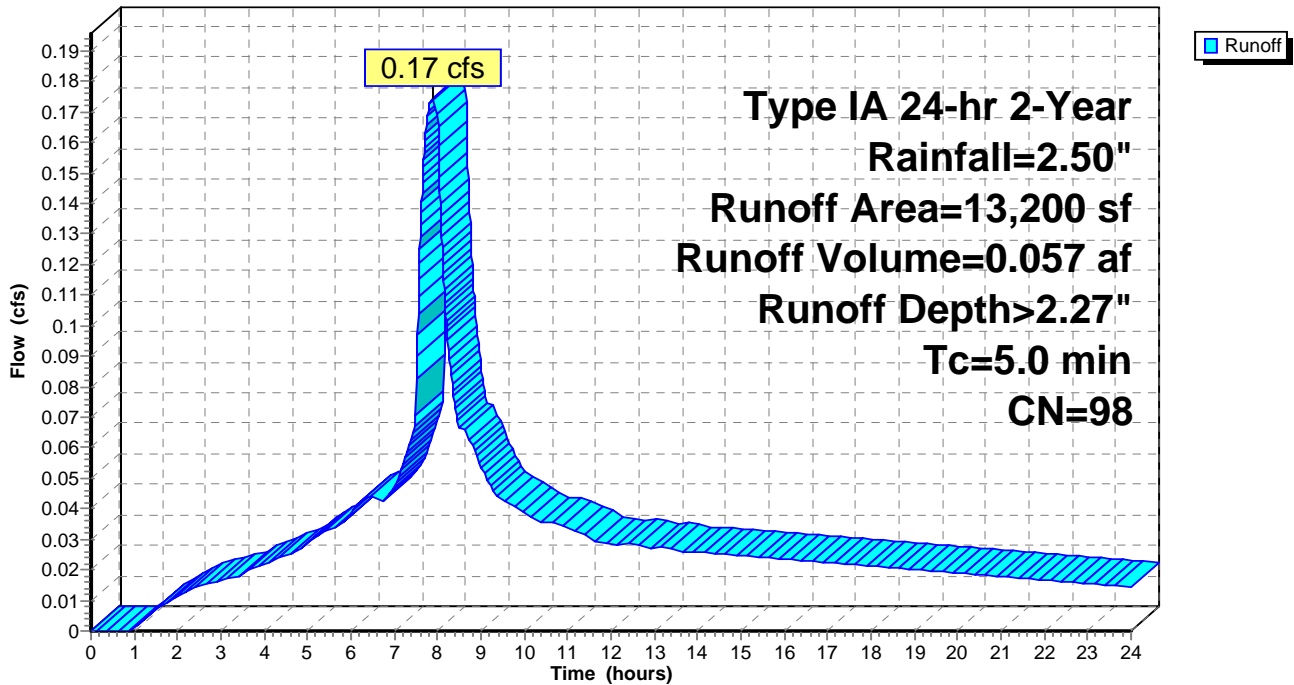
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 13,200	98	5 Lots at 2640 SF Impervious/Lot per CWS
13,200		Impervious Area

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

Subcatchment 7S: HOUSES 8-11 AND 16

Hydrograph



Summary for Subcatchment 8S: HOUSES 12-15

Runoff = 0.14 cfs @ 7.88 hrs, Volume= 0.046 af, Depth> 2.27"

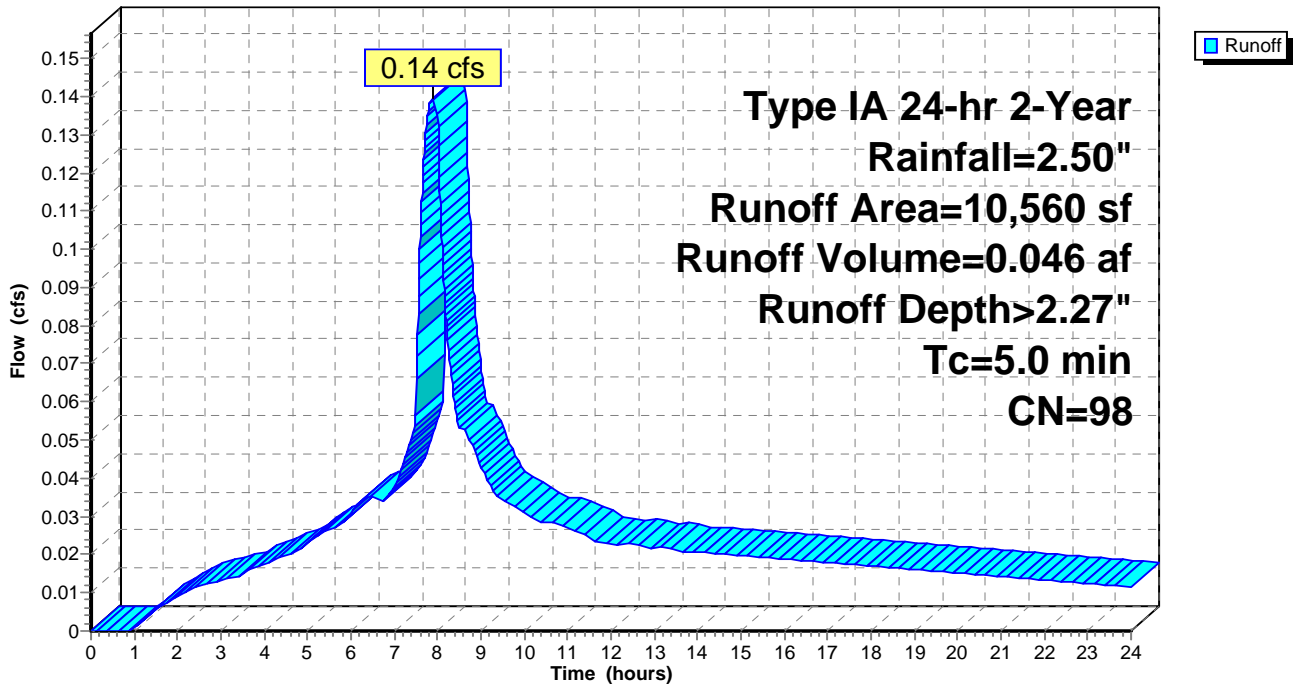
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 10,560	98	4 Lots at 2640 SF Impervious/Lot per CWS
10,560		Impervious Area

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

Subcatchment 8S: HOUSES 12-15

Hydrograph



Summary for Subcatchment 9S1: SW HELENIUS EAST

Runoff = 0.09 cfs @ 7.90 hrs, Volume= 0.029 af, Depth> 1.96"

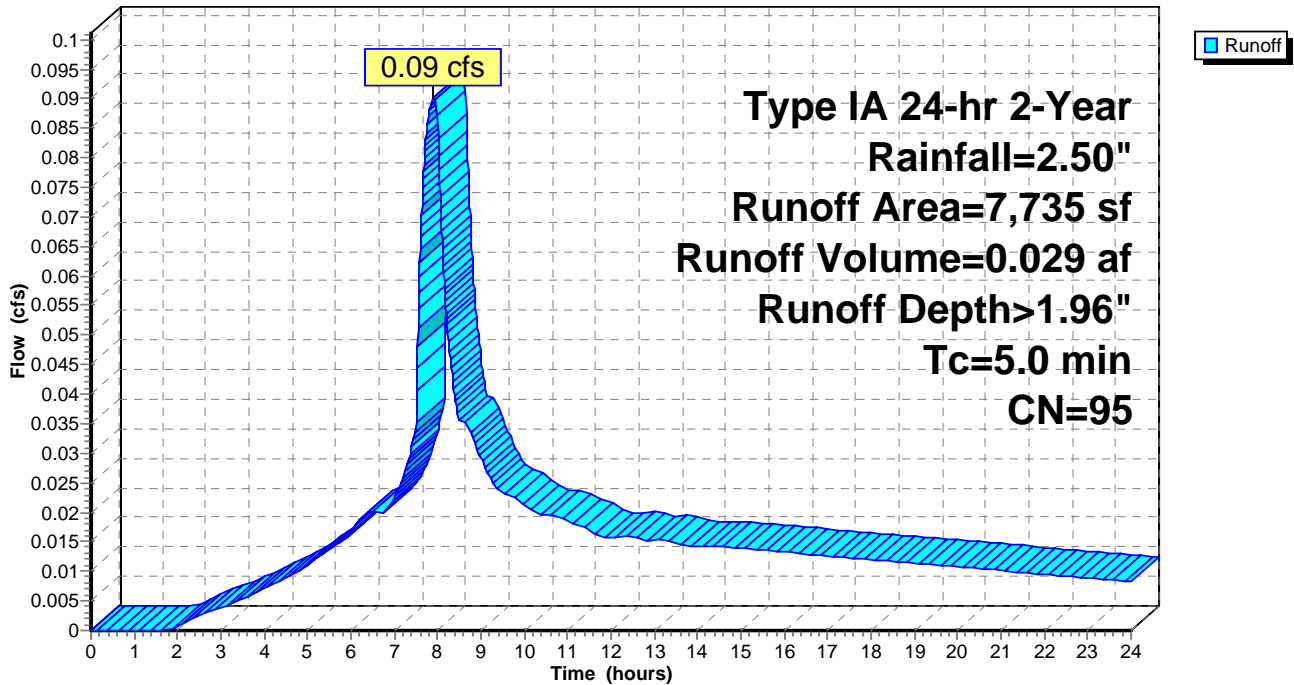
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
6,616	98	Streets and sidewalks
1,119	79	50-75% Grass cover, Fair, HSG C
7,735	95	Weighted Average
1,119		Pervious Area
6,616		Impervious Area

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

Subcatchment 9S1: SW HELENIUS EAST

Hydrograph



Summary for Subcatchment 9S2: LANDSCAPING

Runoff = 0.02 cfs @ 8.00 hrs, Volume= 0.008 af, Depth> 0.83"

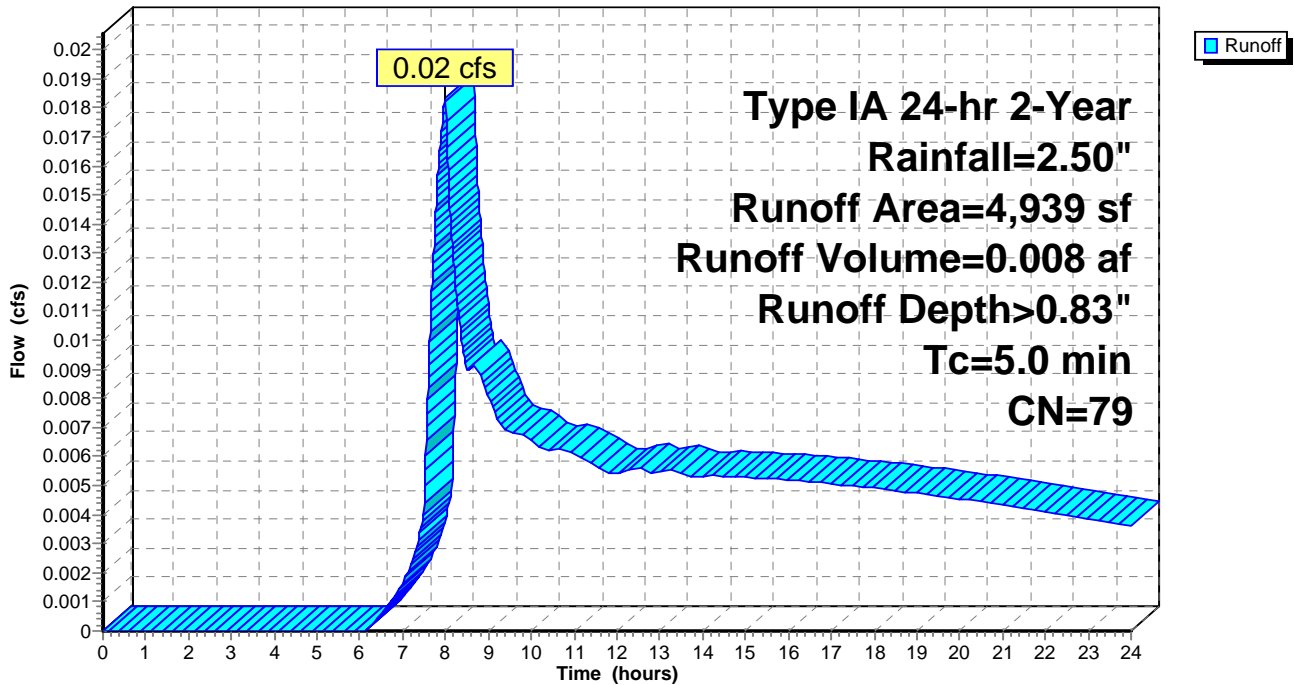
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
4,939	79	50-75% Grass cover, Fair, HSG C
4,939		Pervious Area

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

Subcatchment 9S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 100S: SW 112TH (SOUTH)

Runoff = 0.02 cfs @ 7.88 hrs, Volume= 0.006 af, Depth> 2.27"

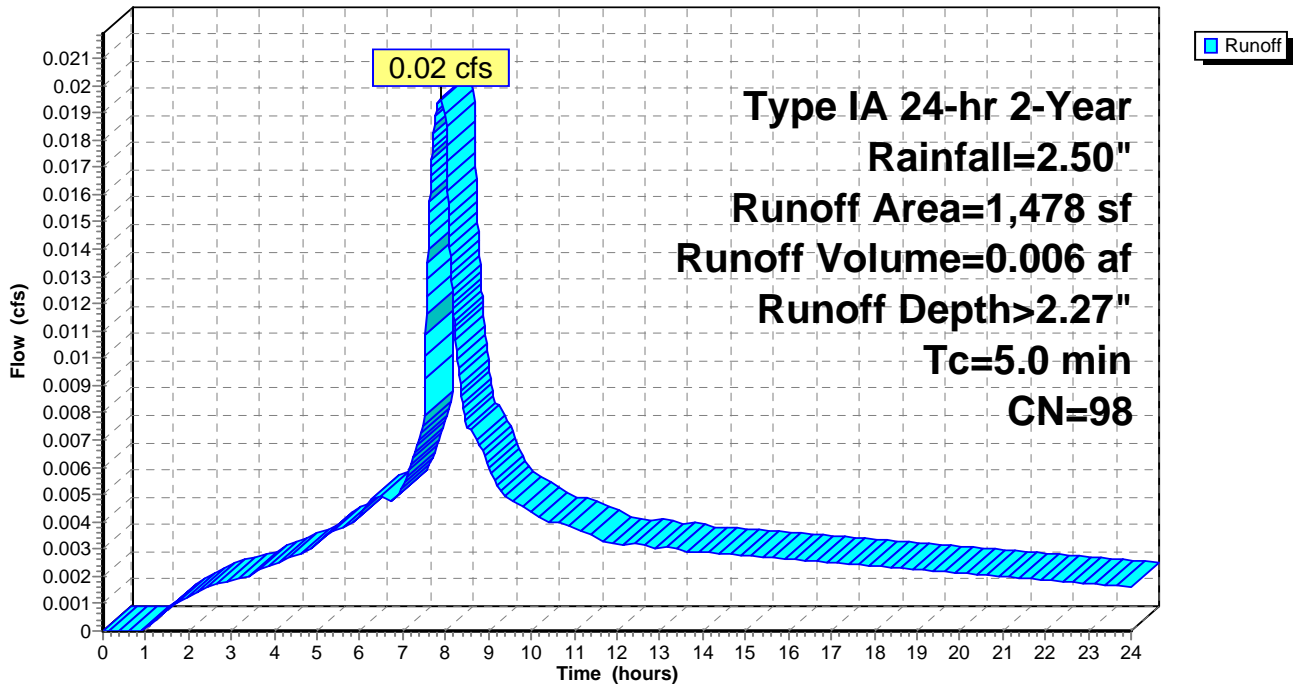
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 1,478	98	Street and sidewalk
1,478		Impervious Area

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

Subcatchment 100S: SW 112TH (SOUTH)

Hydrograph



Summary for Subcatchment 200S1: SW 112TH AVENUE

Runoff = 0.24 cfs @ 7.88 hrs, Volume= 0.079 af, Depth> 2.27"

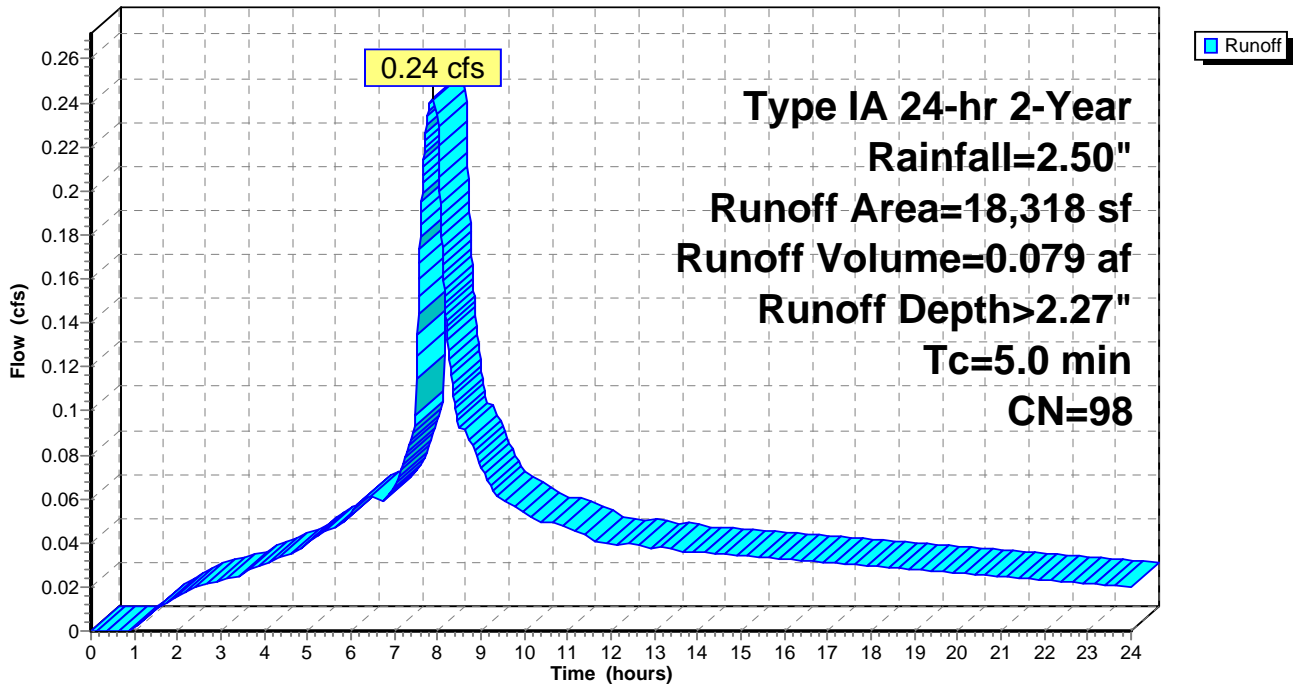
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 18,318	98	Street and sidewalk
18,318		Impervious Area

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

Subcatchment 200S1: SW 112TH AVENUE

Hydrograph



Summary for Subcatchment 200S2: LOT 9

Runoff = 0.04 cfs @ 7.89 hrs, Volume= 0.012 af, Depth> 2.06"

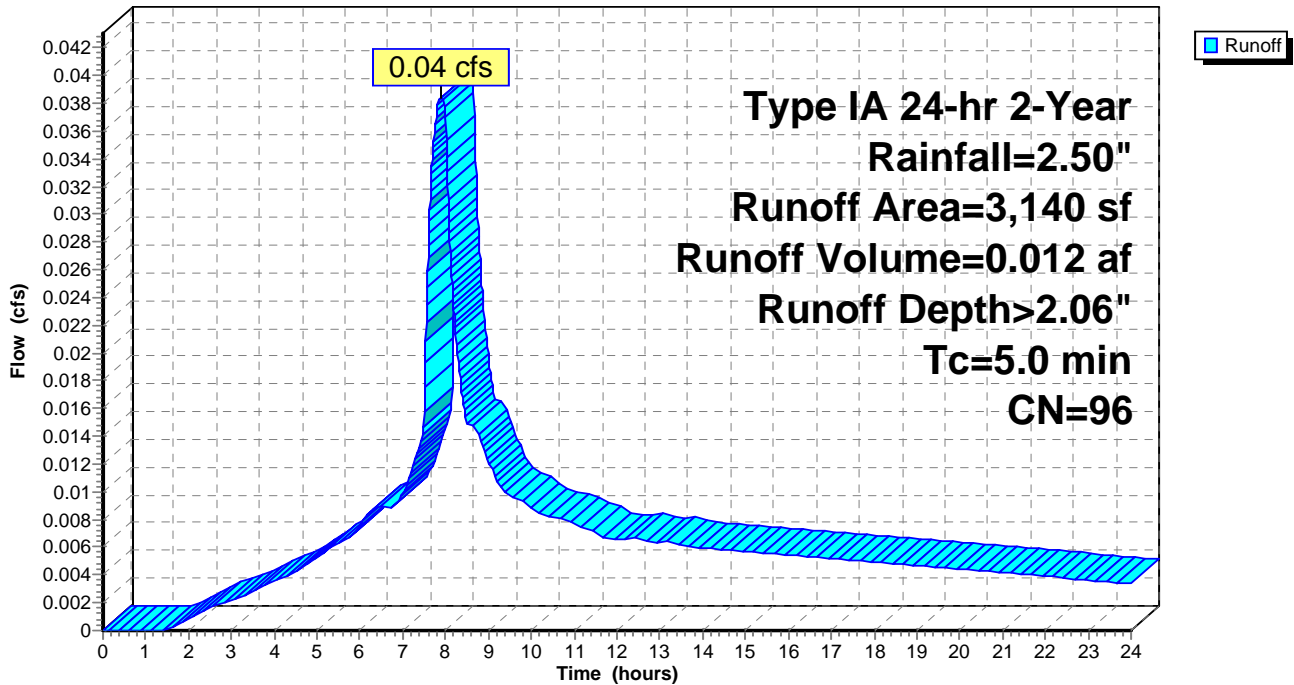
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	3,140	96	Weighted Average
	500		Pervious Area
	2,640		Impervious Area

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

Subcatchment 200S2: LOT 9

Hydrograph



Summary for Subcatchment 300S: LOT 8

Runoff = 0.04 cfs @ 7.89 hrs, Volume= 0.012 af, Depth> 2.16"

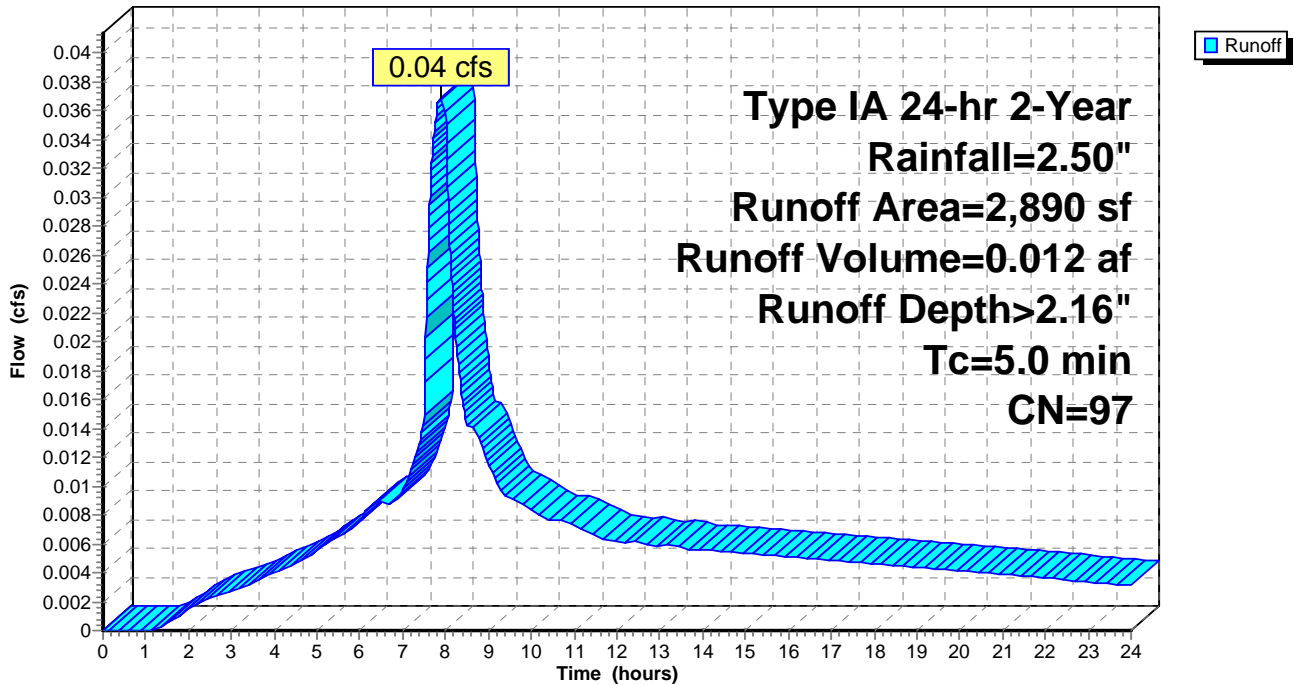
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
	250	86	<50% Grass cover, Poor, HSG C
	2,890	97	Weighted Average
	250		Pervious Area
	2,640		Impervious Area

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

Subcatchment 300S: LOT 8

Hydrograph



Summary for Subcatchment 400S: LOTS 6 - 7

Runoff = 0.07 cfs @ 7.89 hrs, Volume= 0.024 af, Depth> 2.16"

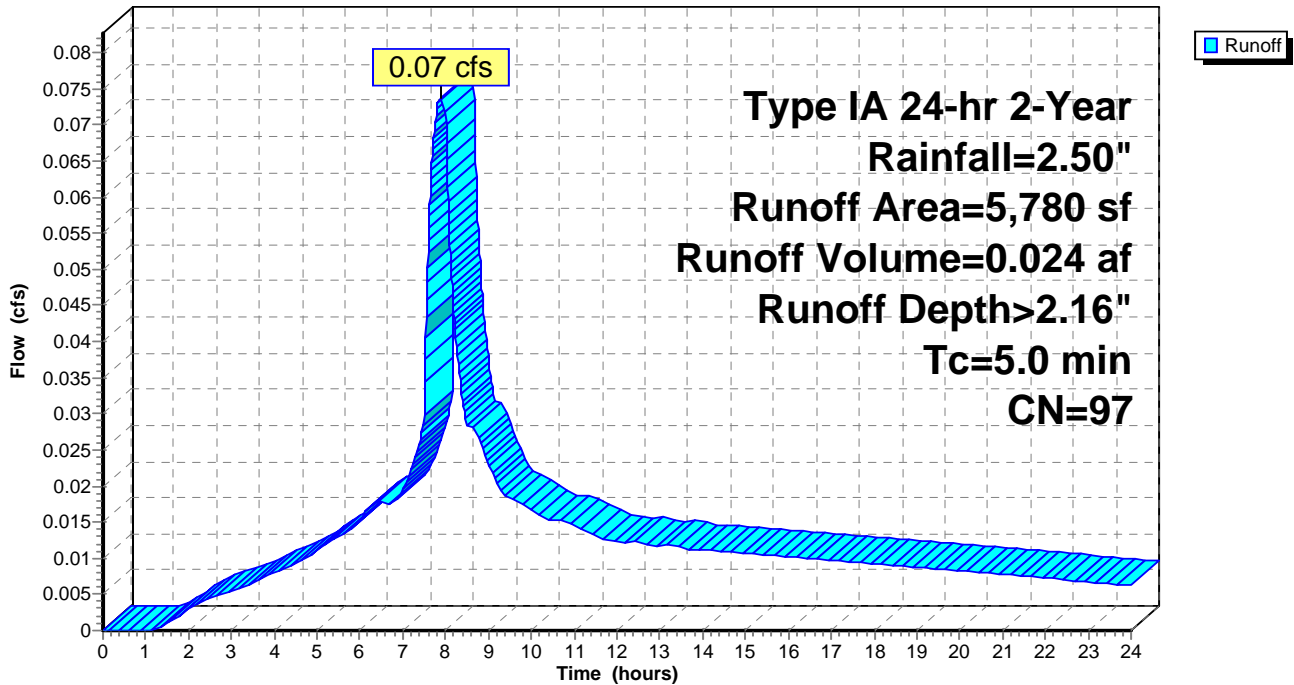
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 400S: LOTS 6 - 7

Hydrograph



Summary for Subcatchment 500S: LOT 5

Runoff = 0.04 cfs @ 7.89 hrs, Volume= 0.012 af, Depth> 2.16"

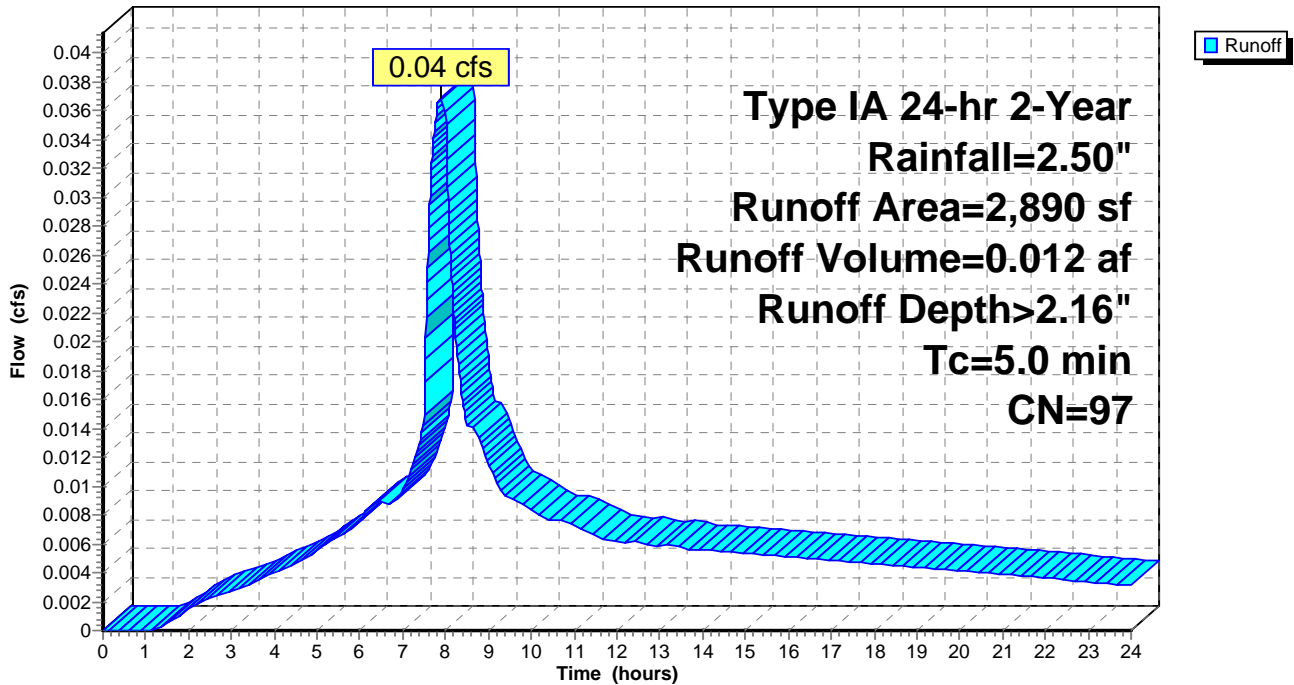
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
	250	86	<50% Grass cover, Poor, HSG C
	2,890	97	Weighted Average
	250		Pervious Area
	2,640		Impervious Area

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

Subcatchment 500S: LOT 5

Hydrograph



Summary for Subcatchment 600S: LOTS 3 - 4

Runoff = 0.07 cfs @ 7.89 hrs, Volume= 0.024 af, Depth> 2.16"

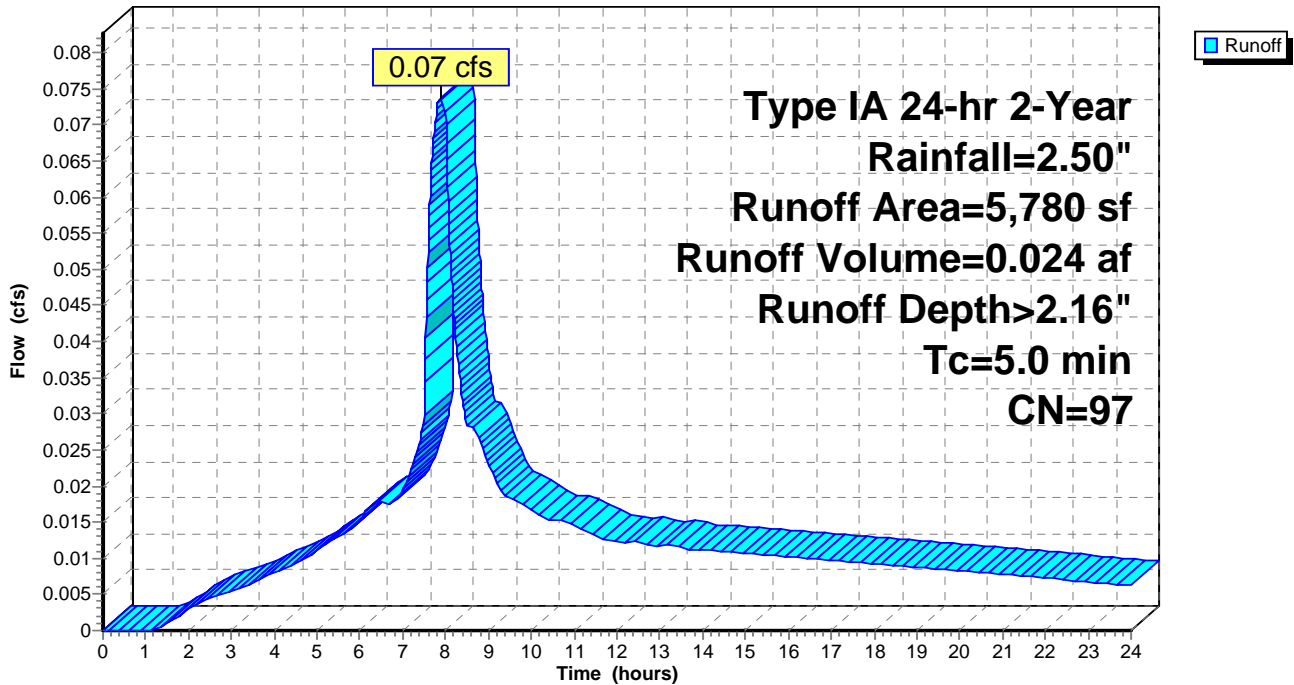
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 600S: LOTS 3 - 4

Hydrograph



Summary for Subcatchment 700S1: LOTS LANDSCAPING AND ROAD

Runoff = 0.86 cfs @ 7.96 hrs, Volume= 0.284 af, Depth> 1.77"

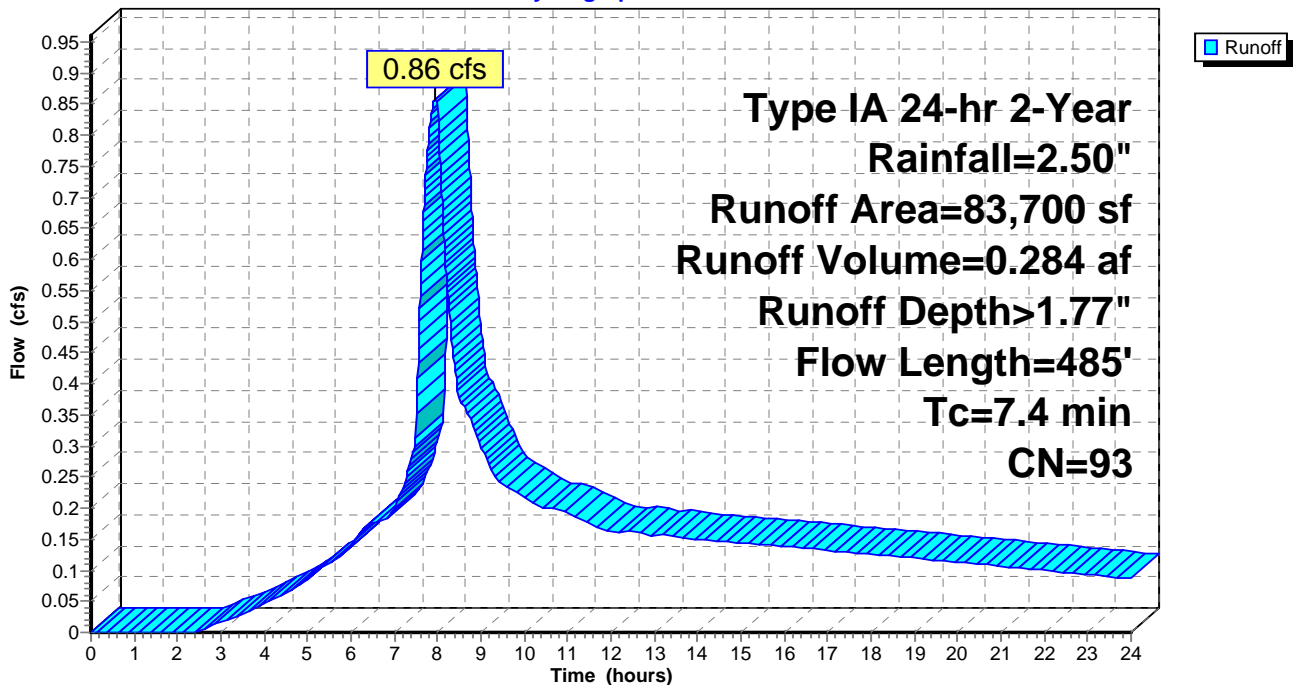
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	26,696	98	Street and sidewalk
*	23,760	98	9 Lots at 2640 SF Impervious/Lot per CWS
	33,244	86	<50% Grass cover, Poor, HSG C
	83,700	93	Weighted Average
	33,244		Pervious Area
	50,456		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	85	0.1000	0.28		Sheet Flow, LANDSCAPE Grass: Short n= 0.150 P2= 2.50"
2.3	400	0.0200	2.87		Shallow Concentrated Flow, GUTTER Paved Kv= 20.3 fps
7.4	485	Total			

Subcatchment 700S1: LOTS LANDSCAPING AND ROAD

Hydrograph



Summary for Subcatchment 700S2: LOTS 1 - 2

Runoff = 0.07 cfs @ 7.89 hrs, Volume= 0.024 af, Depth> 2.16"

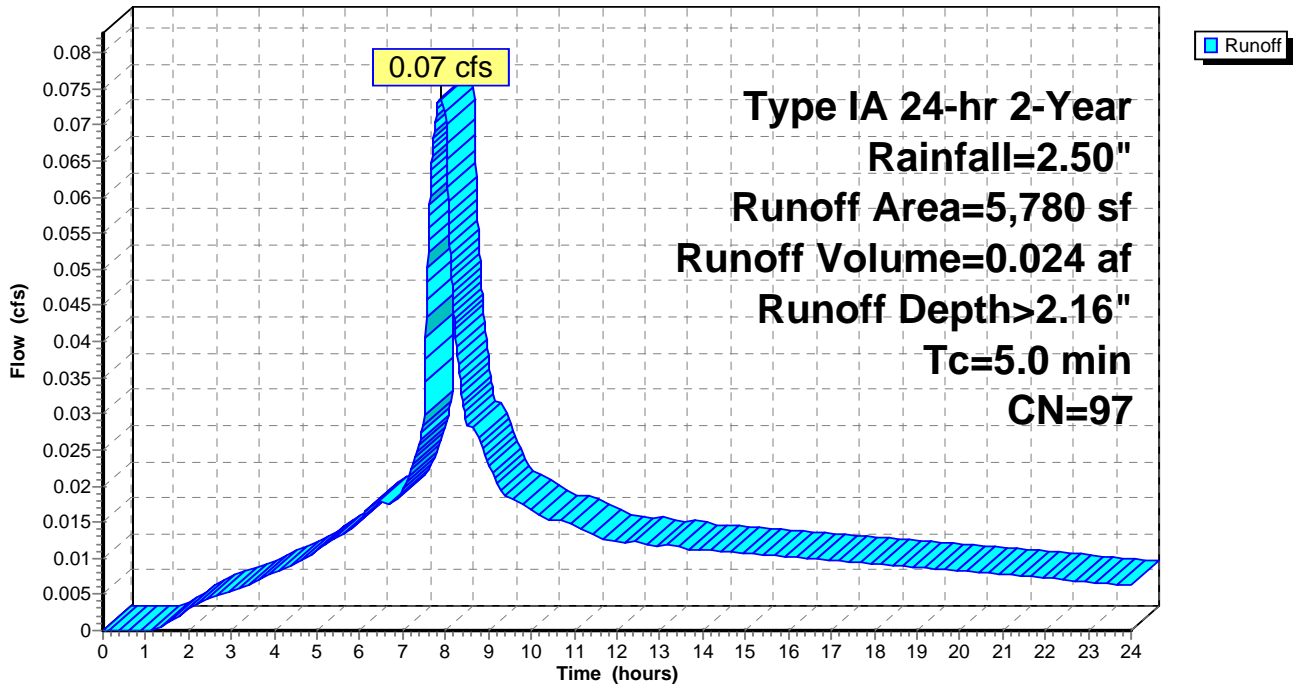
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 700S2: LOTS 1 - 2

Hydrograph



Summary for Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Runoff = 0.07 cfs @ 7.89 hrs, Volume= 0.024 af, Depth> 2.16"

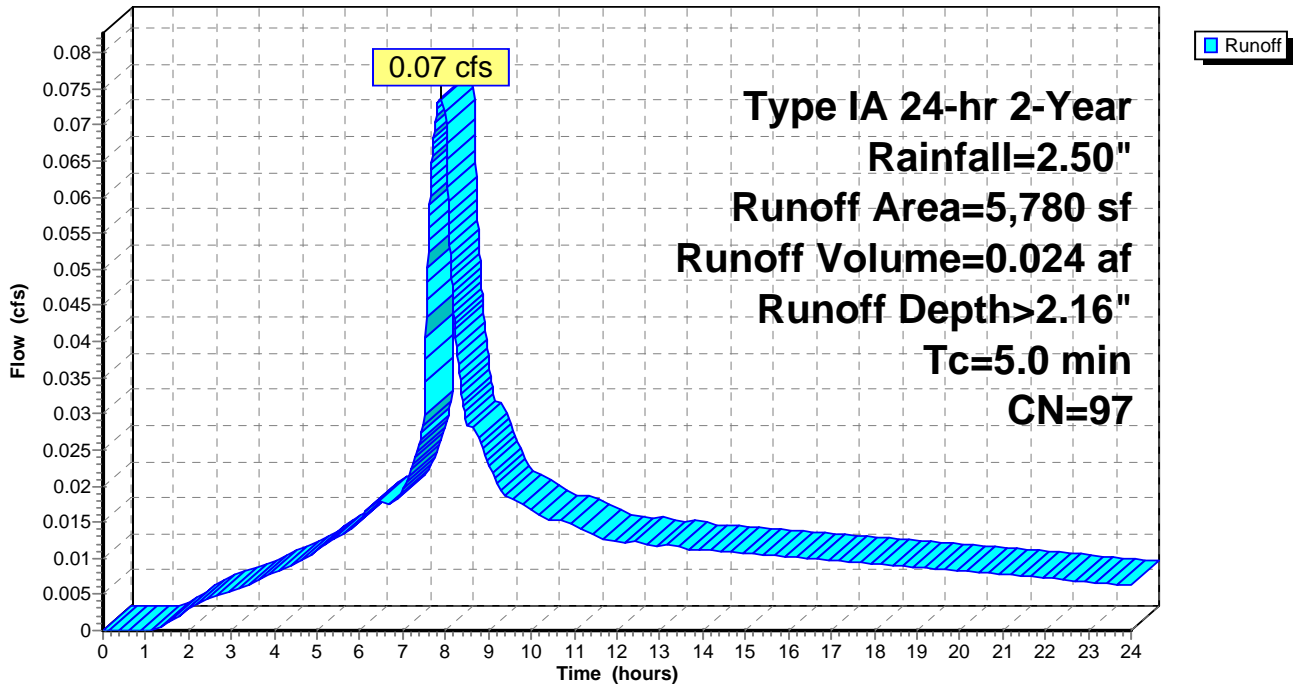
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Runoff = 0.04 cfs @ 7.89 hrs, Volume= 0.012 af, Depth> 2.16"

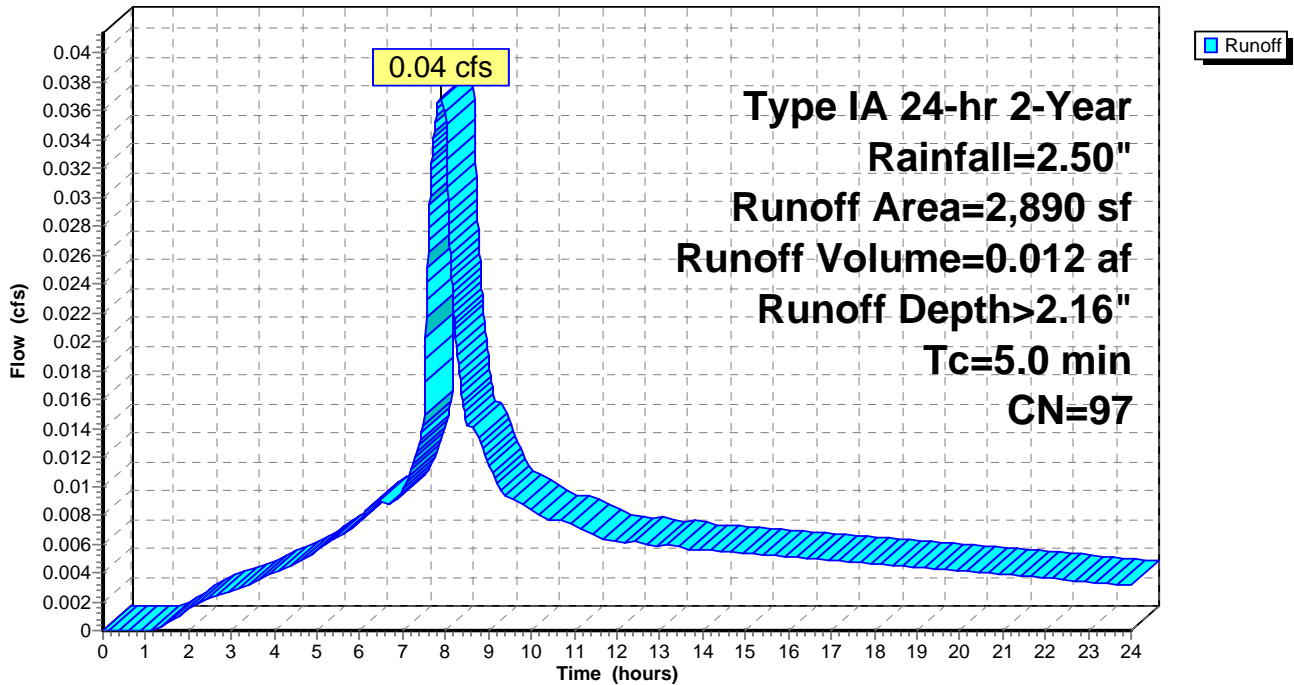
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 1100S: 2 HOUSES

Runoff = 0.07 cfs @ 7.88 hrs, Volume= 0.023 af, Depth> 2.27"

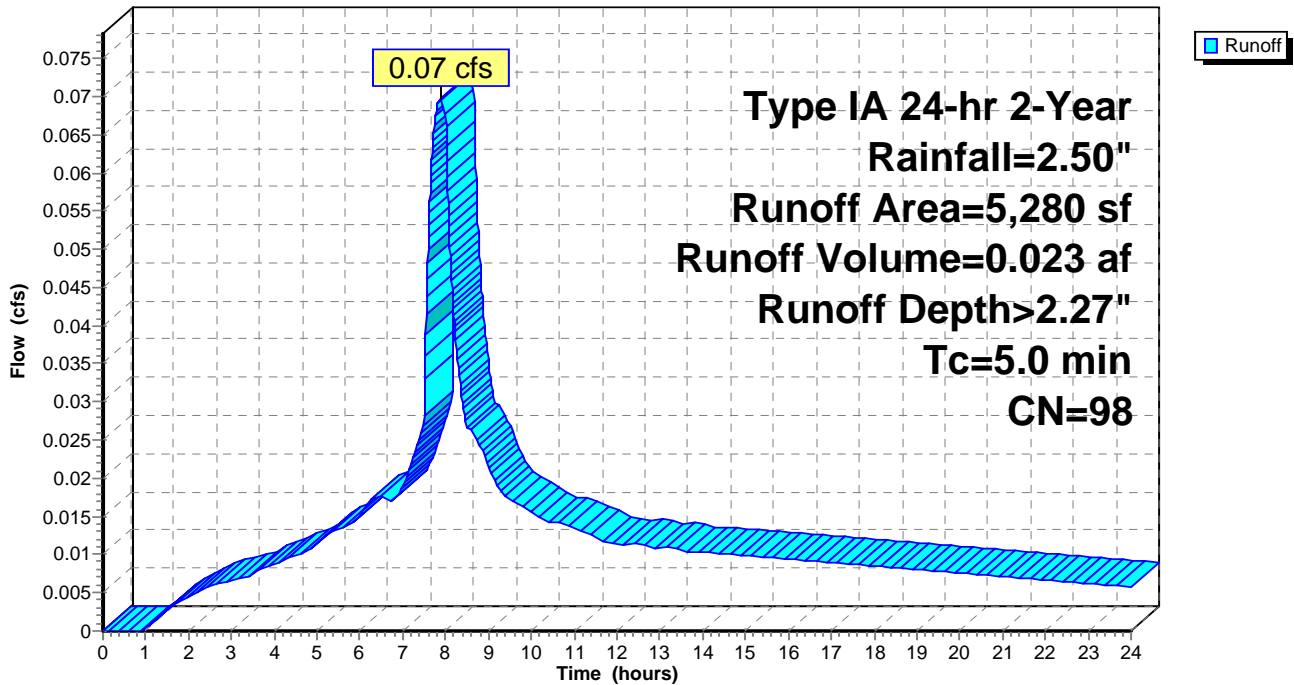
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 1100S: 2 HOUSES

Hydrograph



Summary for Subcatchment 1200S: 3 HOUSES

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af, Depth> 2.27"

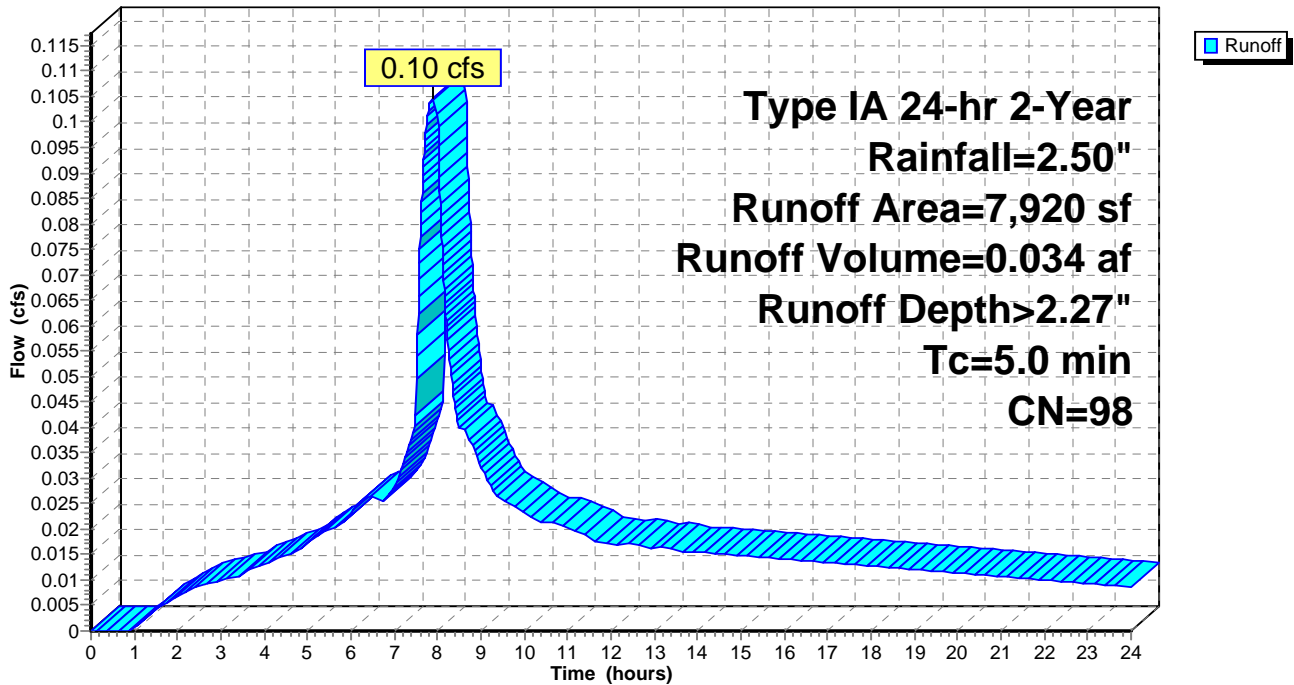
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
7,920		Impervious Area

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

Subcatchment 1200S: 3 HOUSES

Hydrograph



Summary for Subcatchment 1300S1: STREET

Runoff = 0.36 cfs @ 7.88 hrs, Volume= 0.118 af, Depth> 2.27"

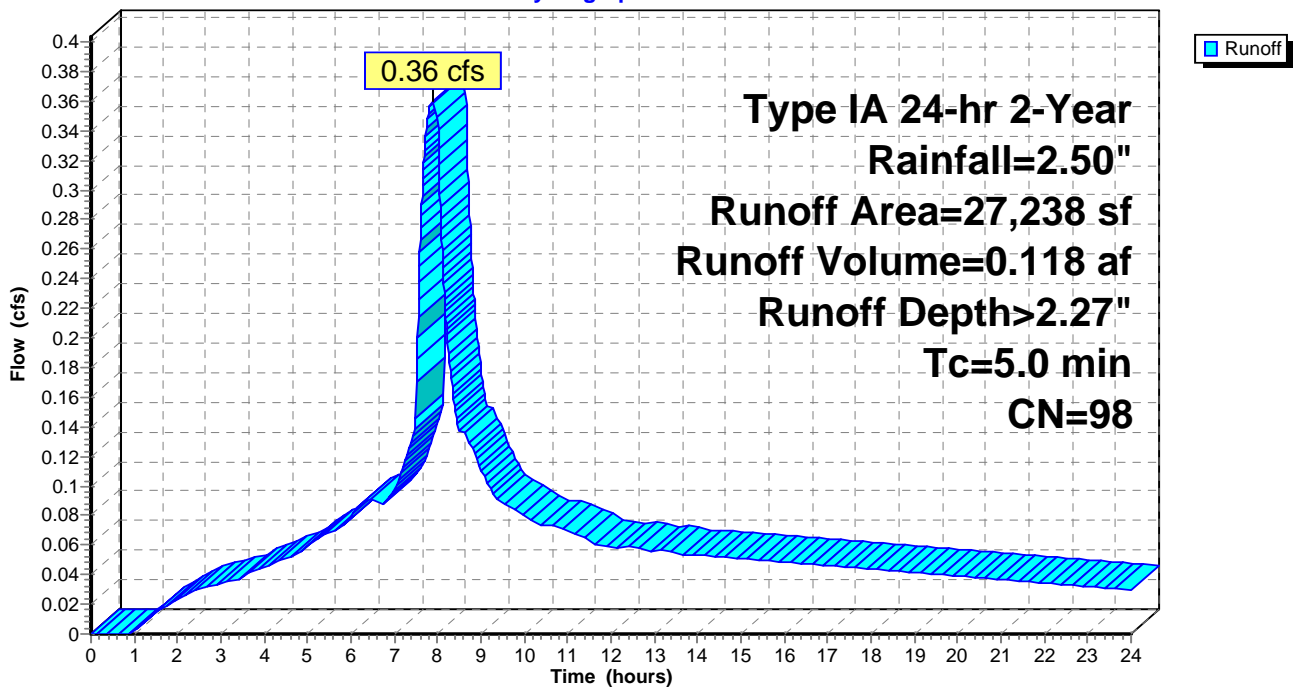
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 27,238	98	Street and sidewalk
27,238		Impervious Area

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

Subcatchment 1300S1: STREET

Hydrograph



Summary for Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Runoff = 0.22 cfs @ 8.00 hrs, Volume= 0.082 af, Depth> 1.05"

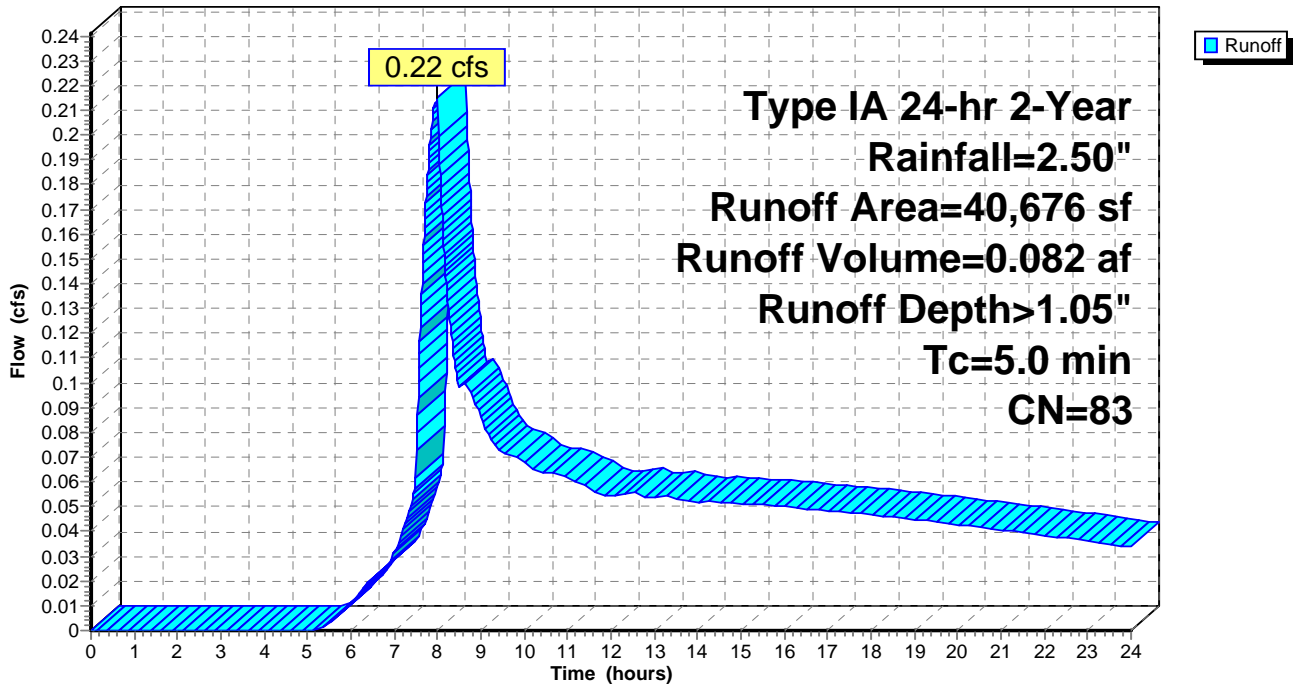
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
	32,756	79	50-75% Grass cover, Fair, HSG C
	40,676	83	Weighted Average
	32,756		Pervious Area
	7,920		Impervious Area

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

Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Hydrograph



Summary for Subcatchment 1300S3: LANDSCAPING AND HOUSES

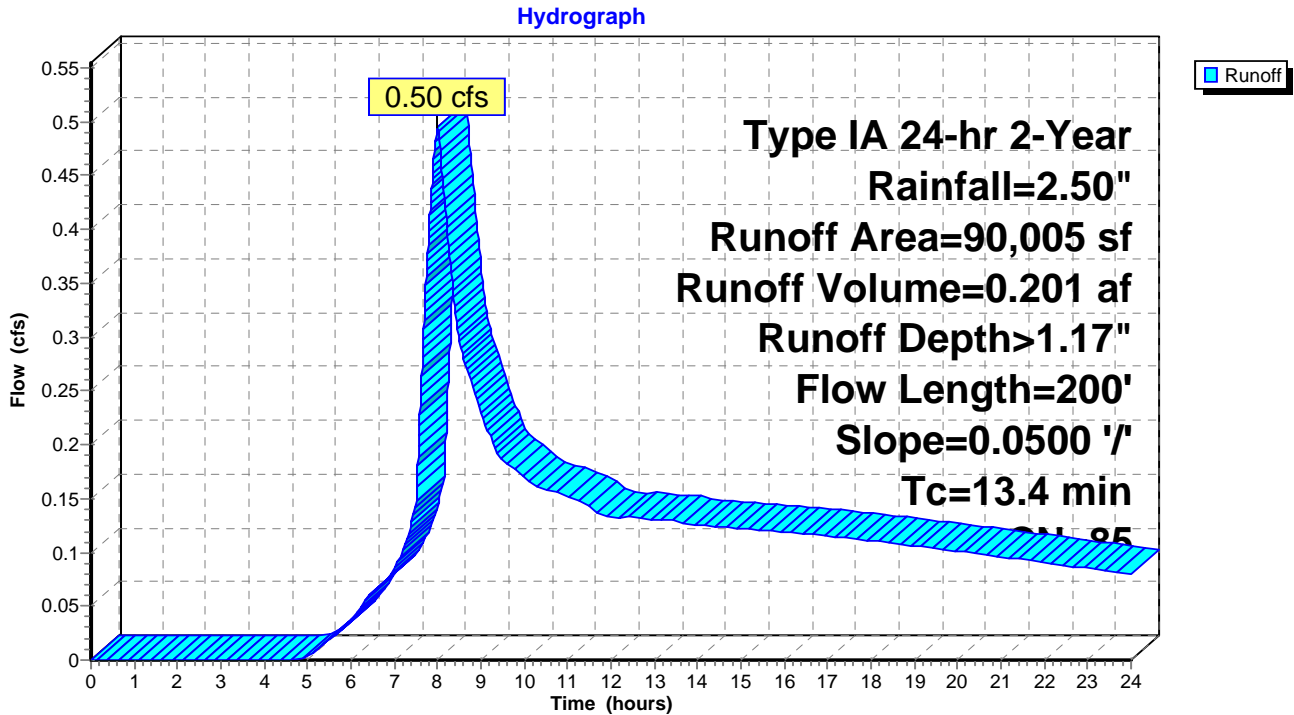
Runoff = 0.50 cfs @ 8.00 hrs, Volume= 0.201 af, Depth> 1.17"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

	Area (sf)	CN	Description
*	26,400	98	10 Lots at 2640 SF Impervious/Lot per CWS
	63,605	79	50-75% Grass cover, Fair, HSG C
	90,005	85	Weighted Average
	63,605		Pervious Area
	26,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	200	0.0500	0.25		Sheet Flow, LANDSCAPING SHEET FLOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 1300S3: LANDSCAPING AND HOUSES



Summary for Subcatchment 1900S1: POND SURFACE

Runoff = 5.12 cfs @ 7.87 hrs, Volume= 1.785 af, Depth> 2.50"

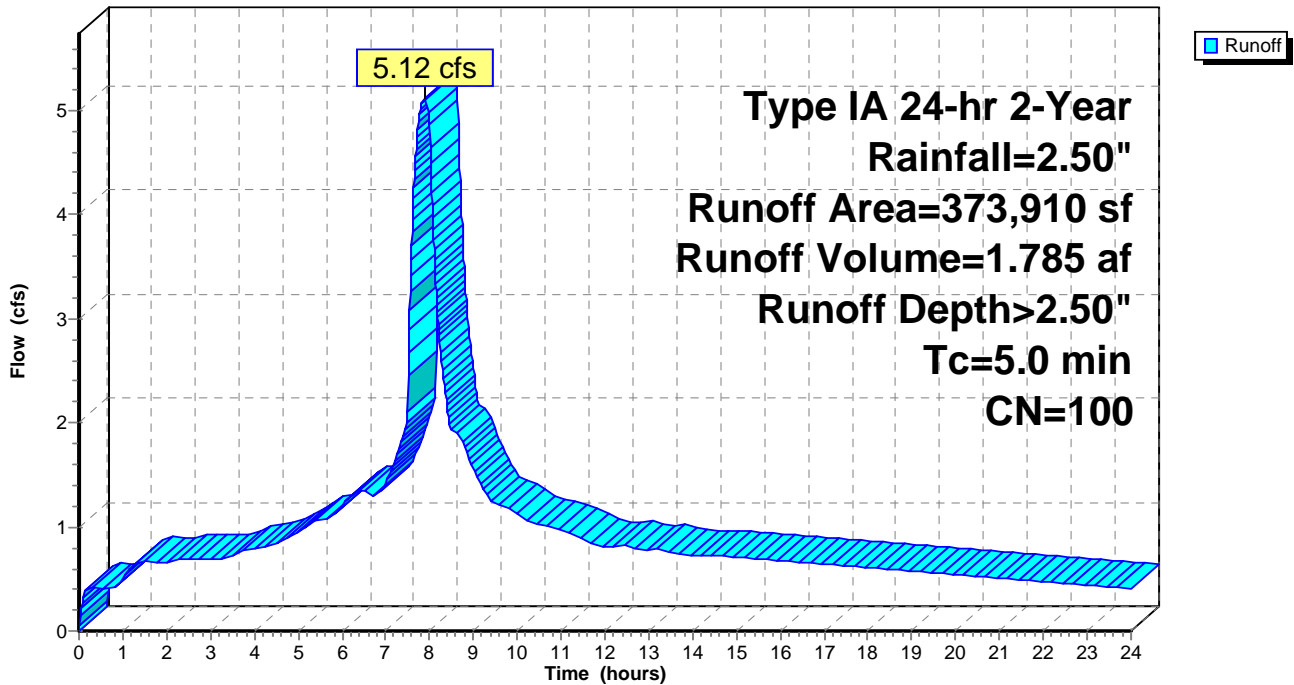
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
* 373,910	100	Water Surface
373,910		Impervious Area

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

Subcatchment 1900S1: POND SURFACE

Hydrograph



Summary for Subcatchment 1900S2: WOODED/ VEGETATED AREA

Runoff = 0.23 cfs @ 8.12 hrs, Volume= 0.202 af, Depth> 0.52"

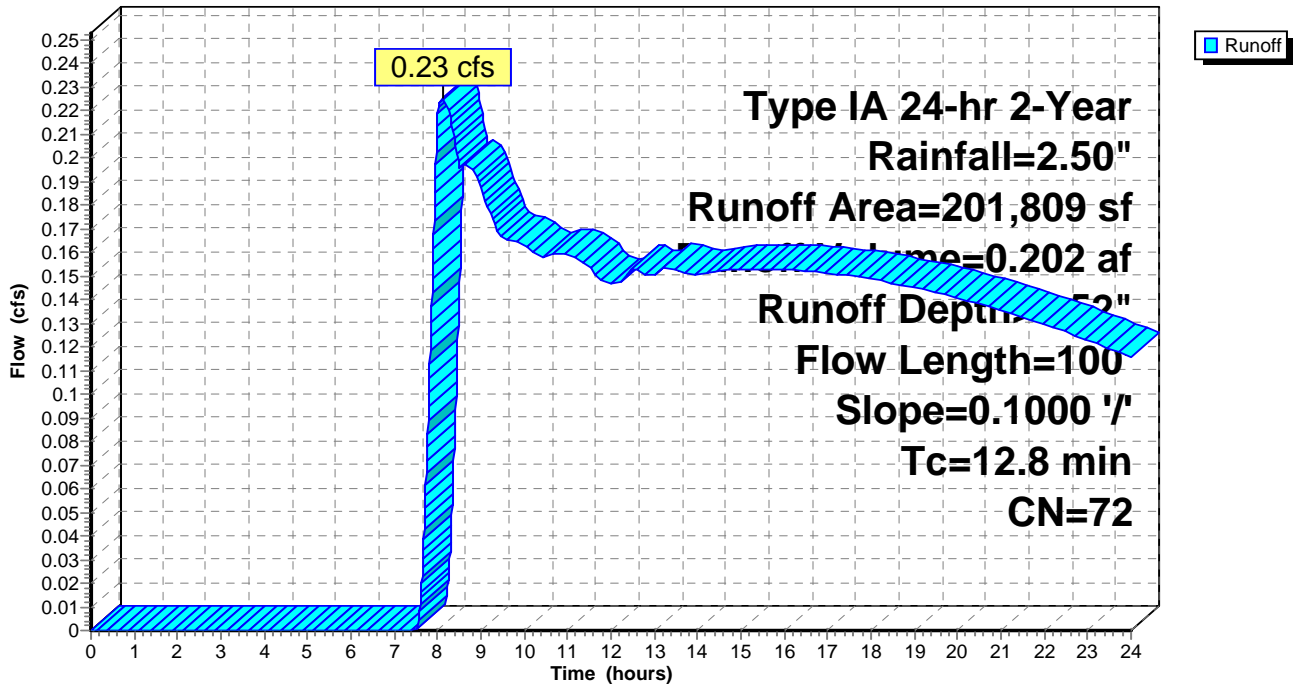
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
201,809	72	Woods/grass comb., Good, HSG C
201,809		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.50"

Subcatchment 1900S2: WOODED/ VEGETATED AREA

Hydrograph



Summary for Subcatchment 1900S3: DEVELOPMENT

Runoff = 8.92 cfs @ 8.01 hrs, Volume= 4.633 af, Depth> 0.99"

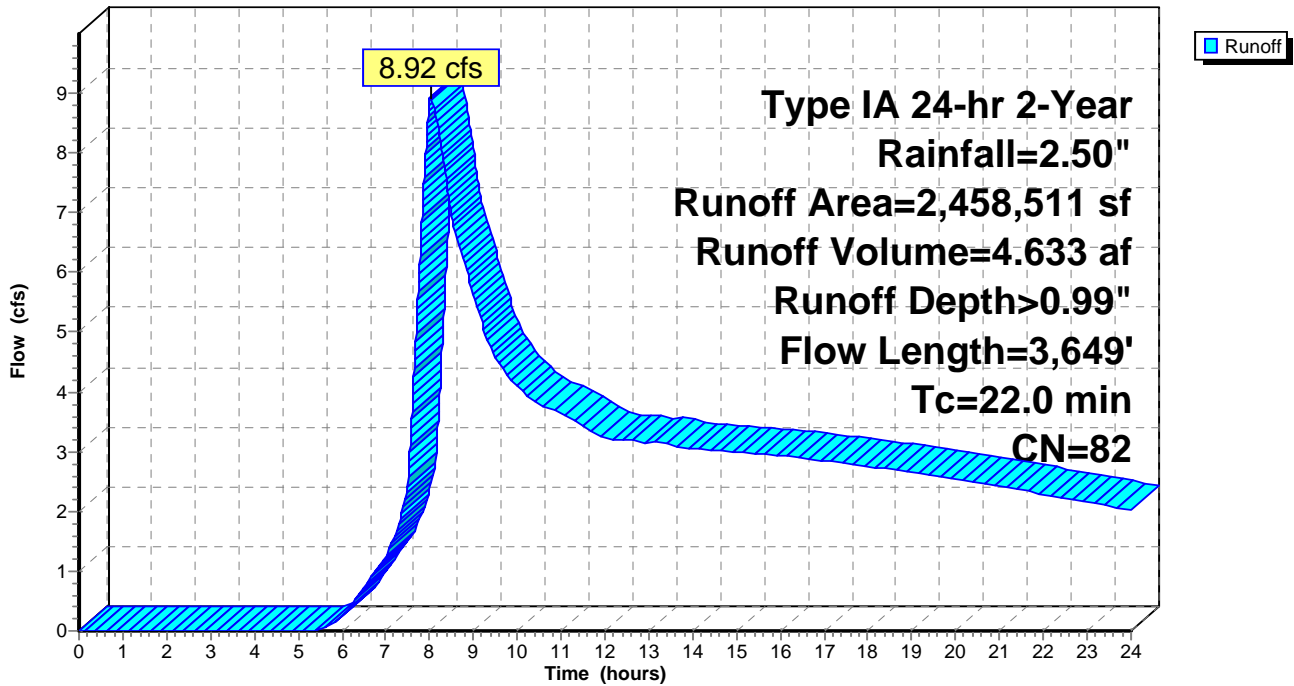
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
2,289,111	83	1/4 acre lots, 38% imp, HSG C
169,400	75	1/4 acre lots, 38% imp, HSG B
2,458,511	82	Weighted Average
1,524,277		Pervious Area
934,234		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	250	0.0500	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.50"
6.0	3,399	0.0435	9.46	7.43	Circular Channel (pipe), Conveyance Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
22.0	3,649	Total			

Subcatchment 1900S3: DEVELOPMENT

Hydrograph



Summary for Pond 1R: 12"

Inflow Area = 5.054 ac, 44.94% Impervious, Inflow Depth > 1.27" for 2-Year event
 Inflow = 0.86 cfs @ 8.34 hrs, Volume= 0.535 af
 Outflow = 0.86 cfs @ 8.34 hrs, Volume= 0.535 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.86 cfs @ 8.34 hrs, Volume= 0.535 af

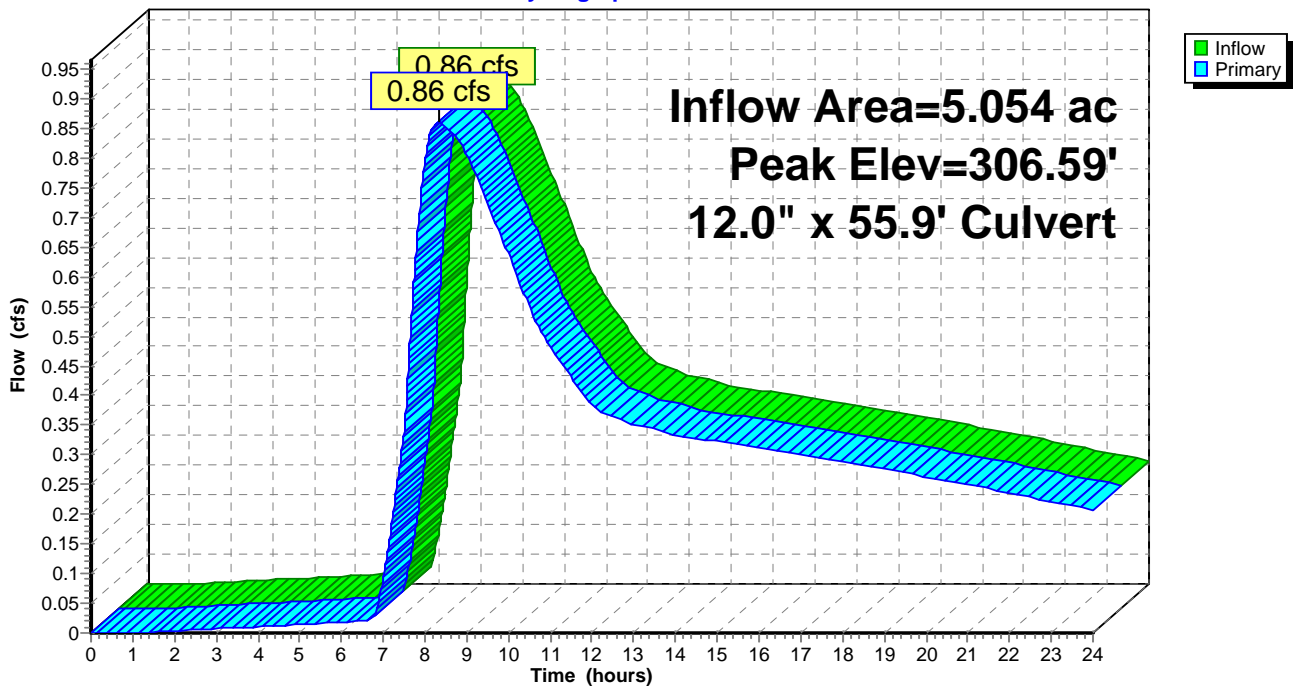
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.59' @ 8.34 hrs
 Flood Elev= 312.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	306.03'	12.0" x 55.9' long Culvert Ke= 0.500 Outlet Invert= 305.75' S= 0.0050 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.86 cfs @ 8.34 hrs HW=306.59' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.86 cfs @ 2.76 fps)

Pond 1R: 12"

Hydrograph



Summary for Pond 2R: 12"

Inflow Area = 3.582 ac, 60.15% Impervious, Inflow Depth > 1.65" for 2-Year event
 Inflow = 1.45 cfs @ 7.92 hrs, Volume= 0.493 af
 Outflow = 1.45 cfs @ 7.92 hrs, Volume= 0.493 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.45 cfs @ 7.92 hrs, Volume= 0.493 af

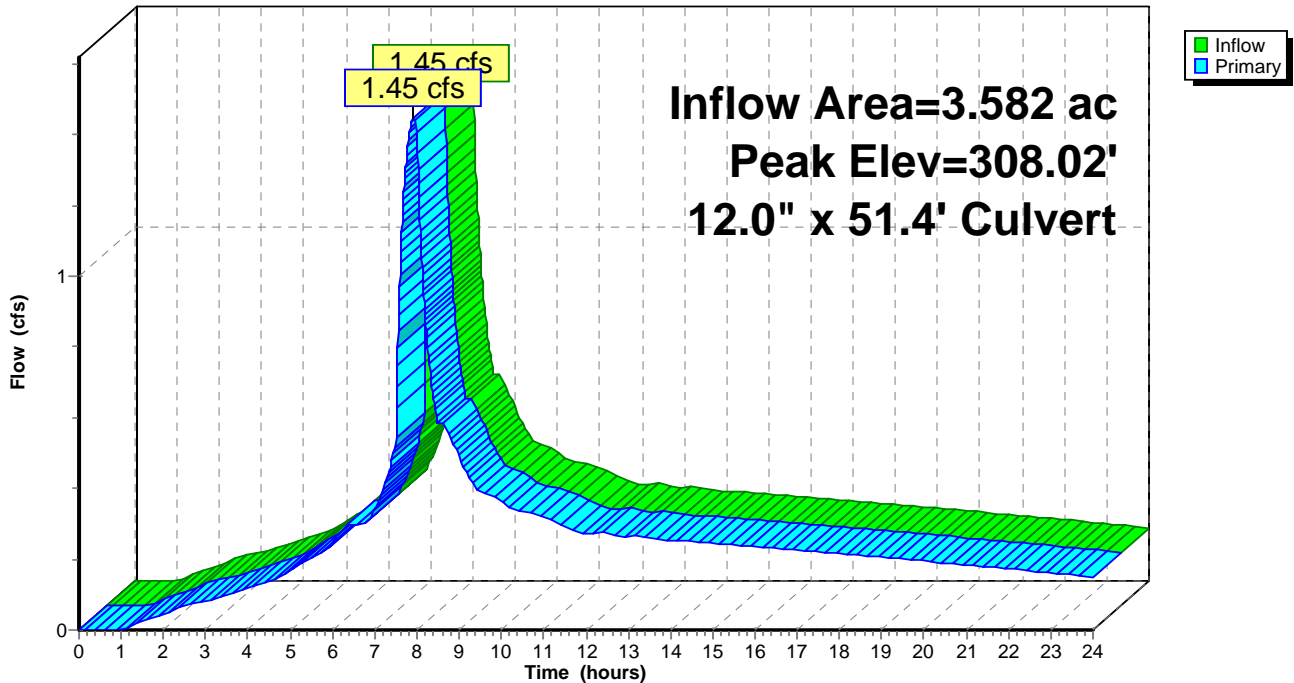
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.02' @ 7.92 hrs
 Flood Elev= 312.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.26'	12.0" x 51.4' long Culvert Ke= 0.500 Outlet Invert= 307.00' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.44 cfs @ 7.92 hrs HW=308.02' (Free Discharge)
 ←1=Culvert (Barrel Controls 1.44 cfs @ 3.13 fps)

Pond 2R: 12"

Hydrograph



Summary for Pond 3R: 12"

Inflow Area = 0.818 ac, 58.69% Impervious, Inflow Depth > 1.60" for 2-Year event
 Inflow = 0.32 cfs @ 7.93 hrs, Volume= 0.109 af
 Outflow = 0.32 cfs @ 7.93 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.32 cfs @ 7.93 hrs, Volume= 0.109 af

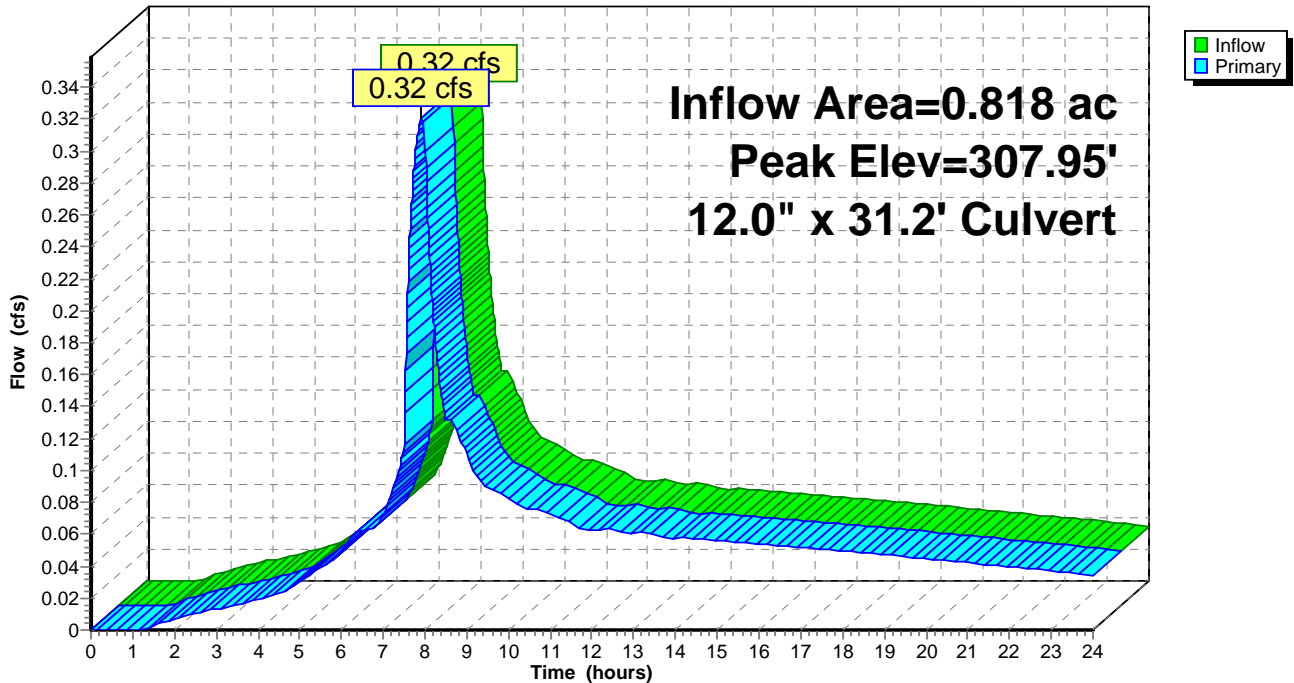
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 307.95' @ 7.93 hrs
 Flood Elev= 311.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.62'	12.0" x 31.2' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.32 cfs @ 7.93 hrs HW=307.95' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.32 cfs @ 2.11 fps)

Pond 3R: 12"

Hydrograph



Summary for Pond 4R: 12"

Inflow Area = 2.582 ac, 59.83% Impervious, Inflow Depth > 1.66" for 2-Year event
 Inflow = 1.04 cfs @ 7.92 hrs, Volume= 0.357 af
 Outflow = 1.04 cfs @ 7.92 hrs, Volume= 0.357 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.04 cfs @ 7.92 hrs, Volume= 0.357 af

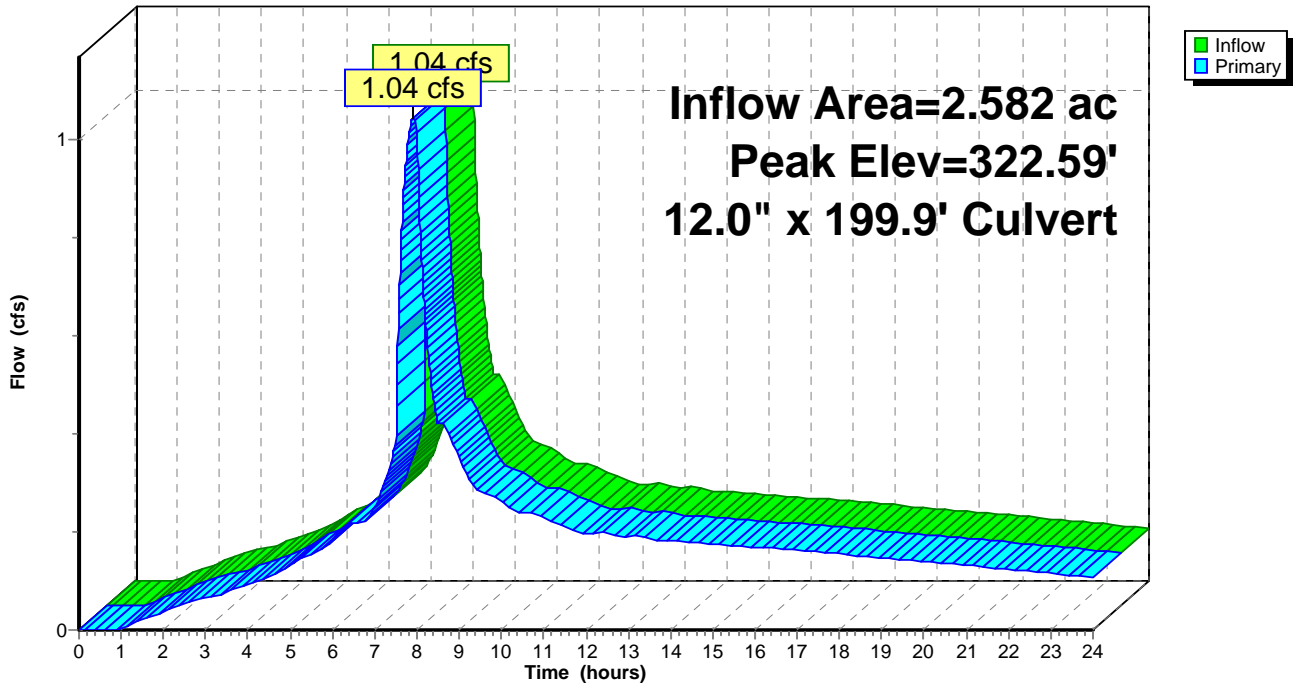
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 322.59' @ 7.92 hrs
 Flood Elev= 329.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.06'	12.0" x 199.9' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0730 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.04 cfs @ 7.92 hrs HW=322.59' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.04 cfs @ 2.47 fps)

Pond 4R: 12"

Hydrograph



Summary for Pond 5R: 12"

Inflow Area = 2.015 ac, 56.71% Impervious, Inflow Depth > 1.63" for 2-Year event
 Inflow = 0.79 cfs @ 7.92 hrs, Volume= 0.275 af
 Outflow = 0.79 cfs @ 7.92 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.79 cfs @ 7.92 hrs, Volume= 0.275 af

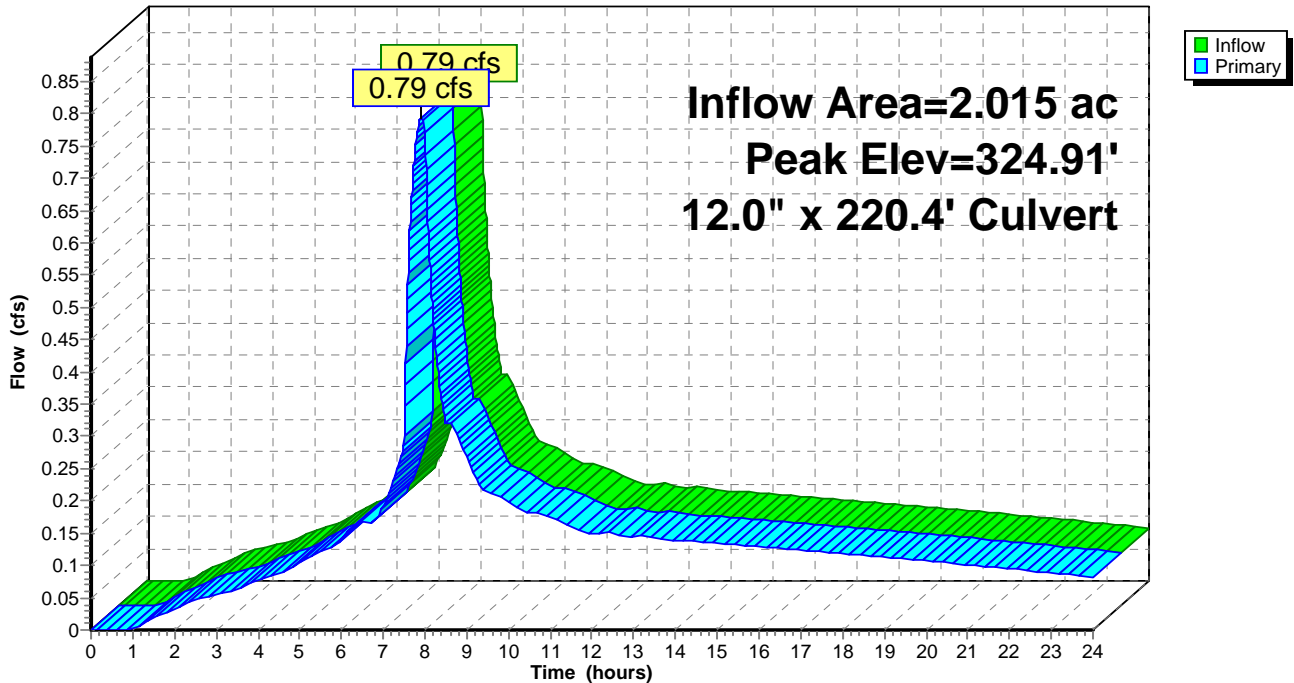
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 324.91' @ 7.92 hrs
 Flood Elev= 336.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	324.46'	12.0" x 220.4' long Culvert Ke= 0.500 Outlet Invert= 322.26' S= 0.0100 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.79 cfs @ 7.92 hrs HW=324.91' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.79 cfs @ 2.29 fps)

Pond 5R: 12"

Hydrograph



Summary for Pond 6R: 12"

Inflow Area = 1.603 ac, 54.26% Impervious, Inflow Depth > 1.61" for 2-Year event
 Inflow = 0.62 cfs @ 7.92 hrs, Volume= 0.215 af
 Outflow = 0.62 cfs @ 7.92 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.62 cfs @ 7.92 hrs, Volume= 0.215 af

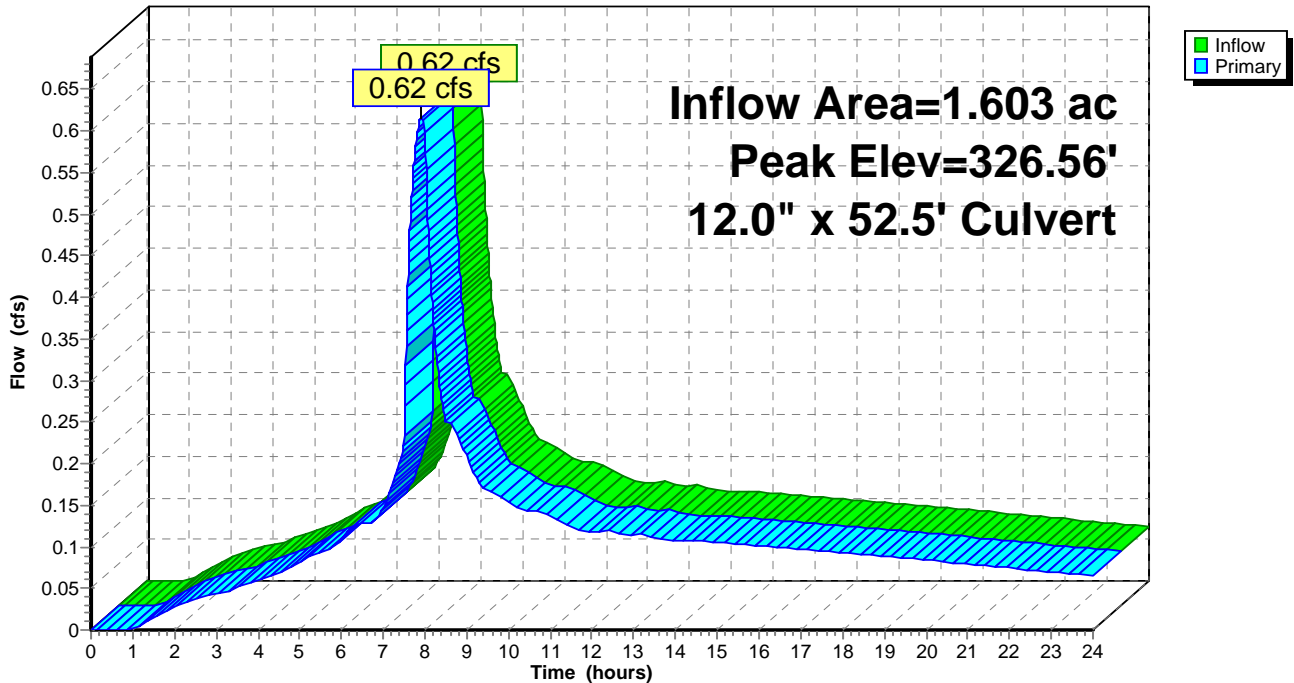
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.56' @ 7.92 hrs
 Flood Elev= 335.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.17'	12.0" x 52.5' long Culvert Ke= 0.500 Outlet Invert= 324.86' S= 0.0250 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.61 cfs @ 7.92 hrs HW=326.56' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.61 cfs @ 2.13 fps)

Pond 6R: 12"

Hydrograph



Summary for Pond 7R: 12"

Inflow Area = 0.545 ac, 100.00% Impervious, Inflow Depth > 2.27" for 2-Year event
 Inflow = 0.31 cfs @ 7.88 hrs, Volume= 0.103 af
 Outflow = 0.31 cfs @ 7.88 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.31 cfs @ 7.88 hrs, Volume= 0.103 af

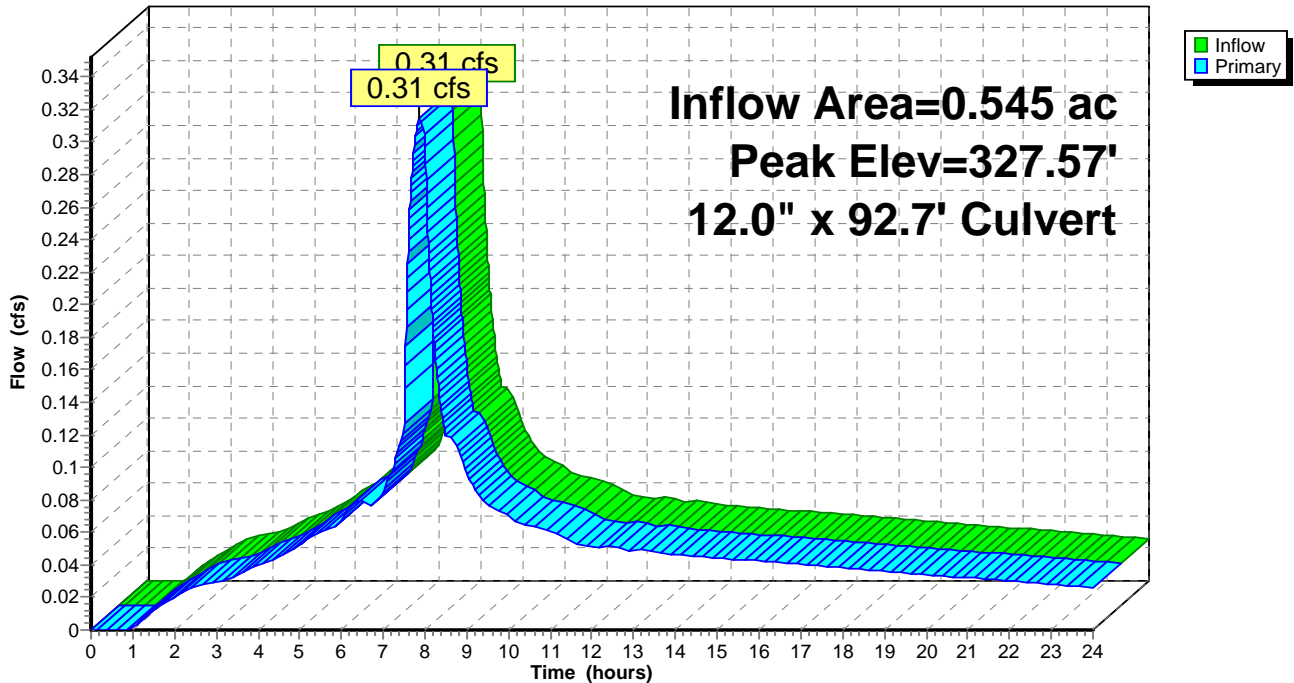
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 327.57' @ 7.88 hrs
 Flood Elev= 336.04'

Device #	Routing	Invert	Outlet Devices
#1	Primary	327.30'	12.0" x 92.7' long Culvert Ke= 0.500 Outlet Invert= 326.37' S= 0.0100 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.31 cfs @ 7.88 hrs HW=327.57' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.31 cfs @ 1.78 fps)

Pond 7R: 12"

Hydrograph



Summary for Pond 8R: 12"

Inflow Area = 0.242 ac, 100.00% Impervious, Inflow Depth > 2.27" for 2-Year event
 Inflow = 0.14 cfs @ 7.88 hrs, Volume= 0.046 af
 Outflow = 0.14 cfs @ 7.88 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.14 cfs @ 7.88 hrs, Volume= 0.046 af

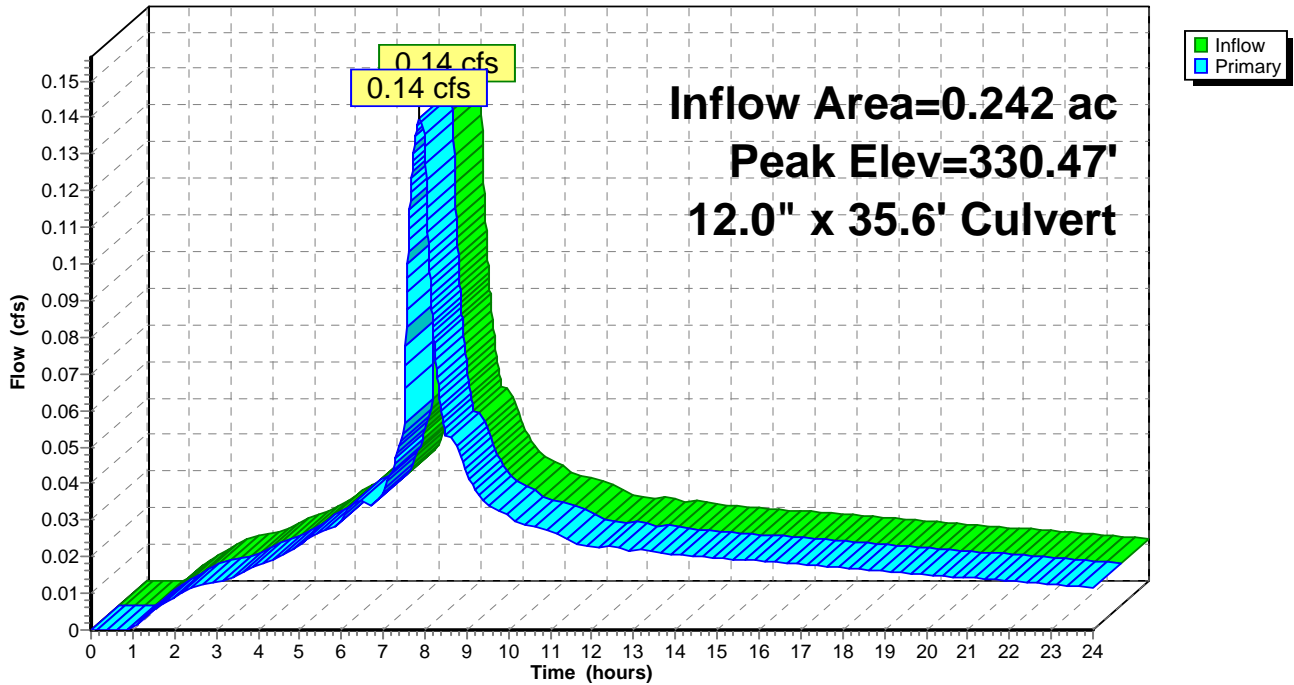
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 330.47' @ 7.88 hrs
 Flood Elev= 336.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.29'	12.0" x 35.6' long Culvert Ke= 0.500 Outlet Invert= 327.50' S= 0.0784 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.14 cfs @ 7.88 hrs HW=330.47' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.14 cfs @ 1.45 fps)

Pond 8R: 12"

Hydrograph



Summary for Pond 9R: 12"

Inflow Area = 0.291 ac, 52.20% Impervious, Inflow Depth > 1.52" for 2-Year event
 Inflow = 0.11 cfs @ 7.93 hrs, Volume= 0.037 af
 Outflow = 0.11 cfs @ 7.93 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.11 cfs @ 7.93 hrs, Volume= 0.037 af

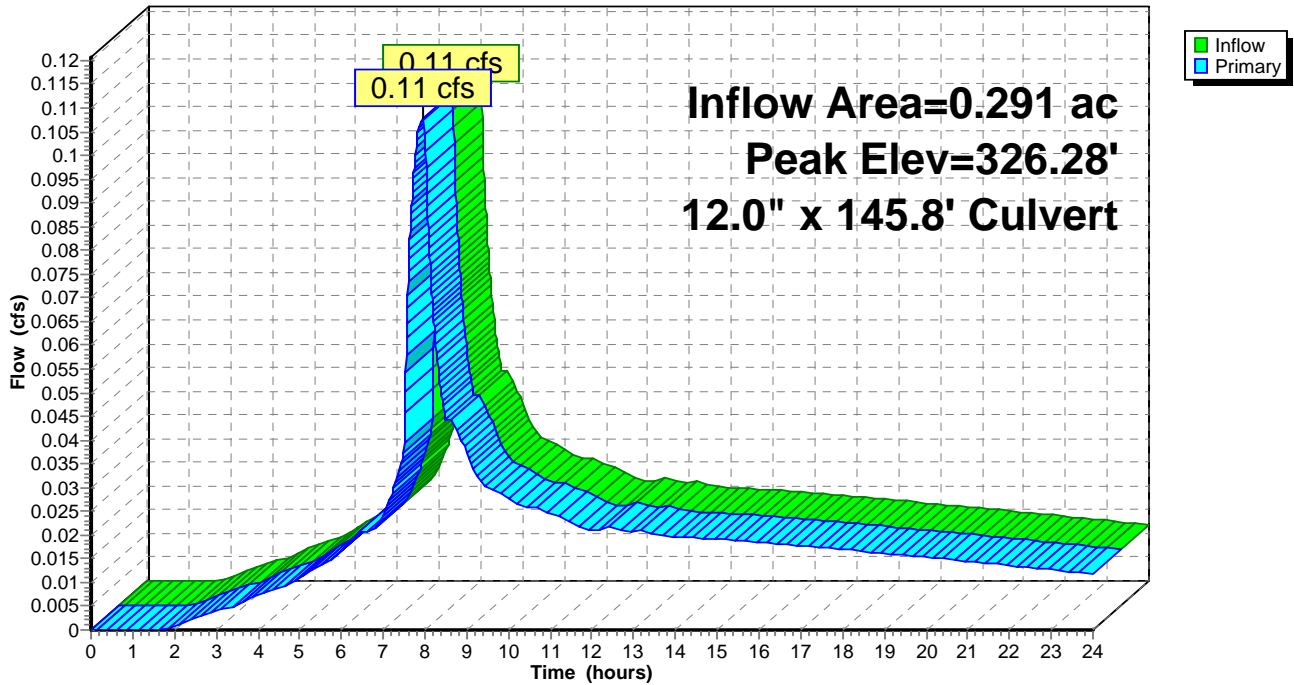
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.28' @ 7.93 hrs
 Flood Elev= 333.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.12'	12.0" x 145.8' long Culvert Ke= 0.500 Outlet Invert= 324.66' S= 0.0100 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.11 cfs @ 7.93 hrs HW=326.28' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.11 cfs @ 1.99 fps)

Pond 9R: 12"

Hydrograph



Summary for Pond 100R: 12"

Inflow Area = 0.034 ac, 100.00% Impervious, Inflow Depth > 2.27" for 2-Year event
 Inflow = 0.02 cfs @ 7.88 hrs, Volume= 0.006 af
 Outflow = 0.02 cfs @ 7.88 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.02 cfs @ 7.88 hrs, Volume= 0.006 af

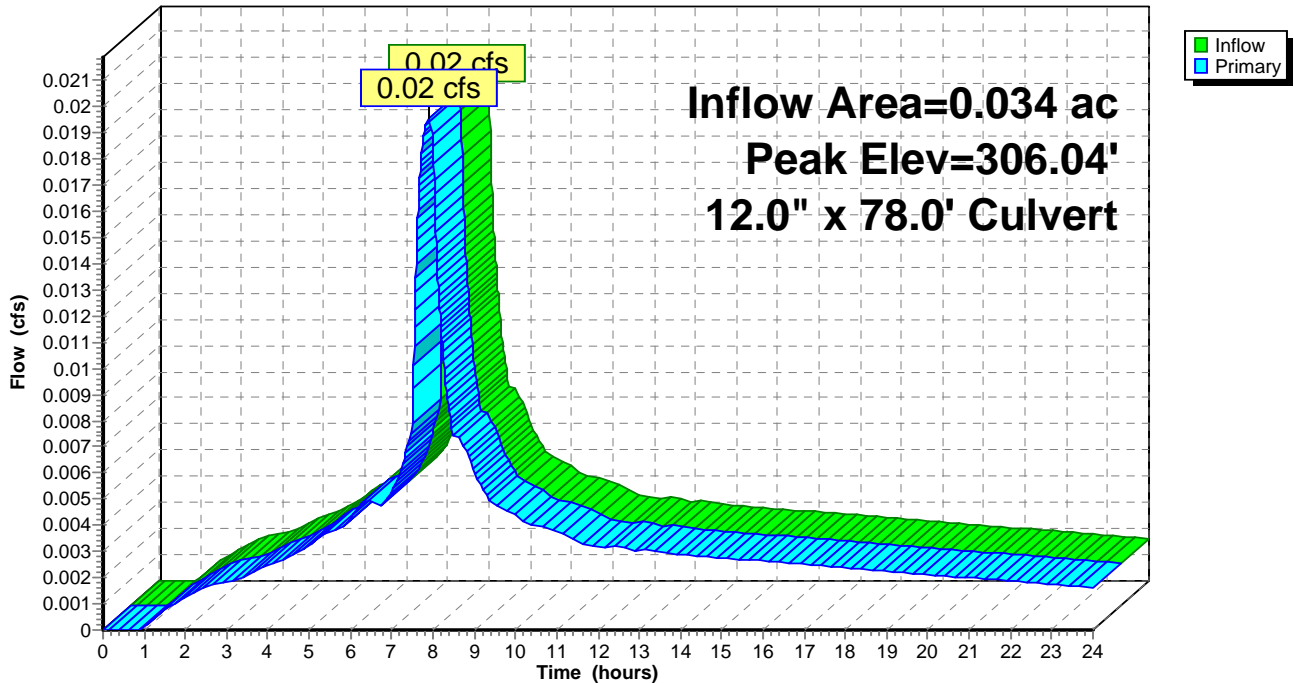
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.04' @ 7.88 hrs
 Flood Elev= 310.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.96'	12.0" x 78.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 305.57' S= 0.0050 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.02 cfs @ 7.88 hrs HW=306.04' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.02 cfs @ 0.94 fps)

Pond 100R: 12"

Hydrograph



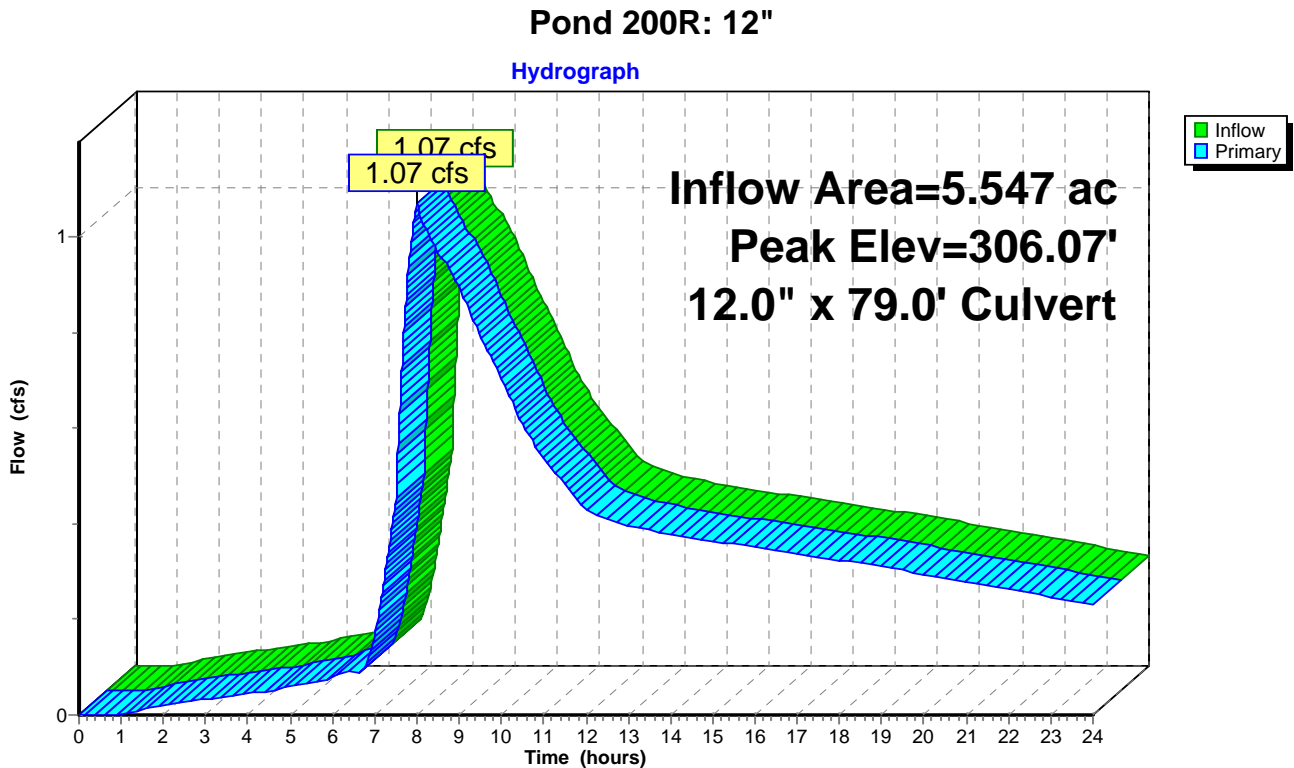
Summary for Pond 200R: 12"

Inflow Area = 5.547 ac, 49.62% Impervious, Inflow Depth > 1.36" for 2-Year event
 Inflow = 1.07 cfs @ 8.00 hrs, Volume= 0.627 af
 Outflow = 1.07 cfs @ 8.00 hrs, Volume= 0.627 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.07 cfs @ 8.00 hrs, Volume= 0.627 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.07' @ 8.00 hrs
 Flood Elev= 314.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.47'	12.0" x 79.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 304.97' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.07 cfs @ 8.00 hrs HW=306.07' (Free Discharge)
 ←1=Culvert (Barrel Controls 1.07 cfs @ 3.14 fps)



Summary for Pond 300R: 12"

Inflow Area = 5.613 ac, 50.12% Impervious, Inflow Depth > 1.37" for 2-Year event
 Inflow = 1.10 cfs @ 8.00 hrs, Volume= 0.639 af
 Outflow = 1.10 cfs @ 8.00 hrs, Volume= 0.639 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.10 cfs @ 8.00 hrs, Volume= 0.639 af

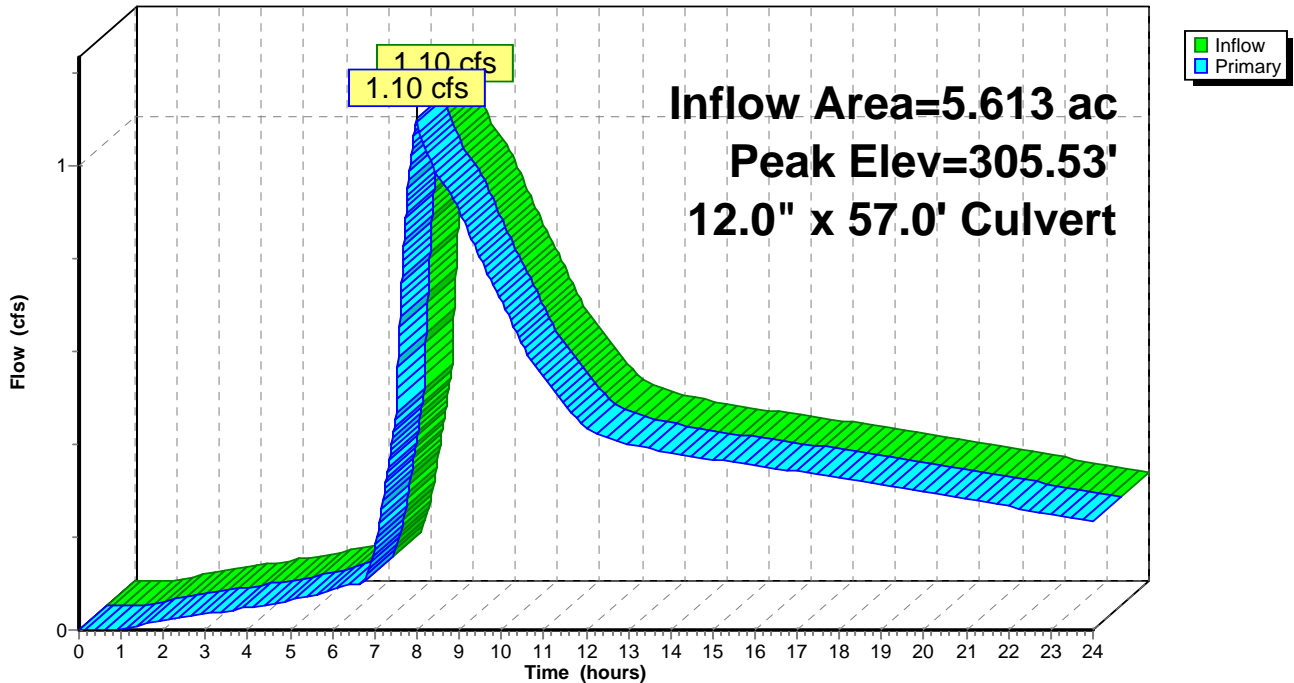
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 305.53' @ 8.00 hrs
 Flood Elev= 312.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	304.98'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.93' S= 0.0184 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=1.10 cfs @ 8.00 hrs HW=305.53' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.10 cfs @ 2.51 fps)

Pond 300R: 12"

Hydrograph



Summary for Pond 400R: 12"

Inflow Area = 5.746 ac, 51.07% Impervious, Inflow Depth > 1.38" for 2-Year event
 Inflow = 1.17 cfs @ 8.00 hrs, Volume= 0.663 af
 Outflow = 1.17 cfs @ 8.00 hrs, Volume= 0.663 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.17 cfs @ 8.00 hrs, Volume= 0.663 af

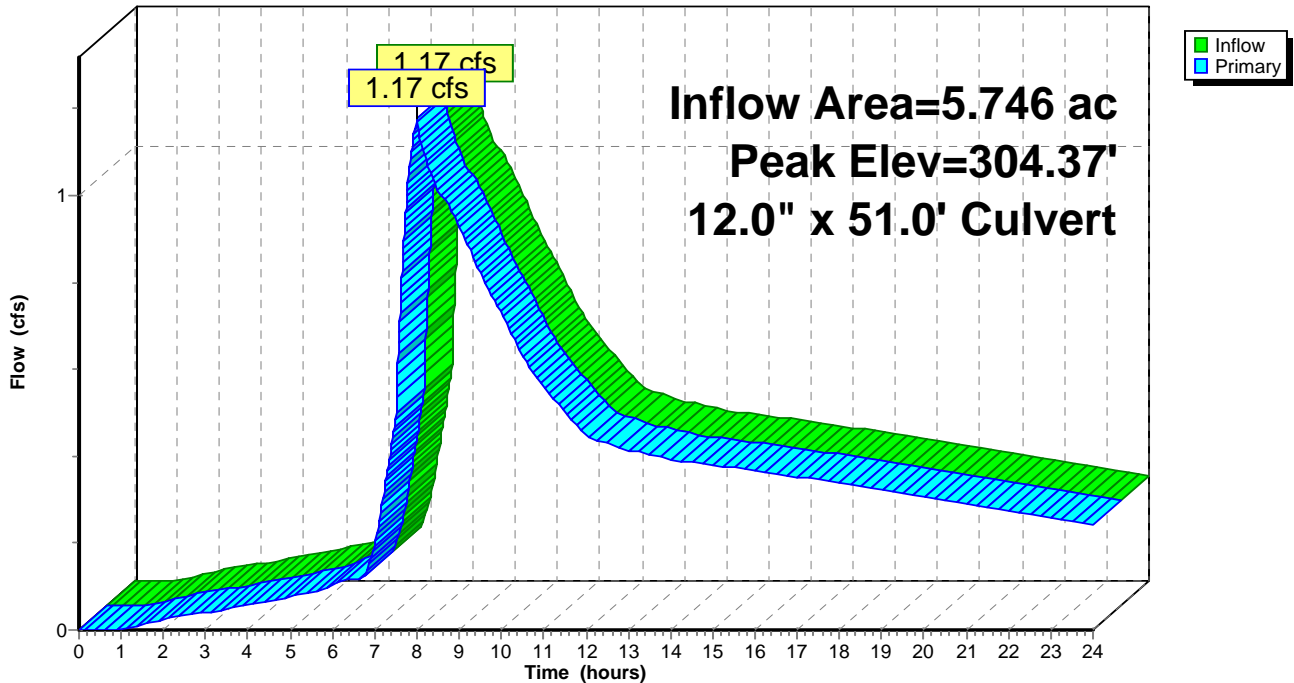
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 304.37' @ 8.00 hrs
 Flood Elev= 308.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	303.80'	12.0" x 51.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.23' S= 0.0112 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.17 cfs @ 8.00 hrs HW=304.37' (Free Discharge)
 ←1=Culvert (Barrel Controls 1.17 cfs @ 3.70 fps)

Pond 400R: 12"

Hydrograph



Summary for Pond 500R: 12"

Inflow Area = 5.812 ac, 51.53% Impervious, Inflow Depth > 1.39" for 2-Year event
 Inflow = 1.21 cfs @ 8.00 hrs, Volume= 0.675 af
 Outflow = 1.21 cfs @ 8.00 hrs, Volume= 0.675 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.21 cfs @ 8.00 hrs, Volume= 0.675 af

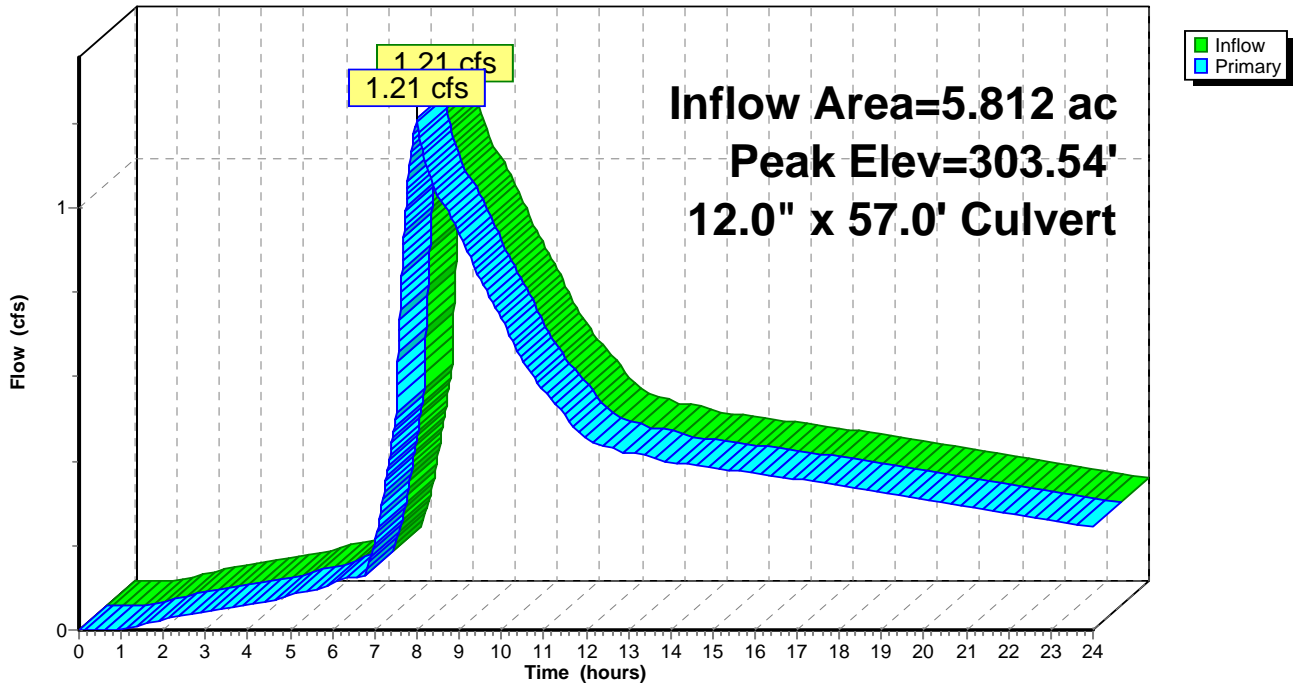
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.54' @ 8.00 hrs
 Flood Elev= 306.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.96'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 302.26' S= 0.0123 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.21 cfs @ 8.00 hrs HW=303.54' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.21 cfs @ 2.58 fps)

Pond 500R: 12"

Hydrograph



Summary for Pond 600R: 12"

Inflow Area = 5.945 ac, 52.42% Impervious, Inflow Depth > 1.41" for 2-Year event
 Inflow = 1.28 cfs @ 8.00 hrs, Volume= 0.698 af
 Outflow = 1.28 cfs @ 8.00 hrs, Volume= 0.698 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.28 cfs @ 8.00 hrs, Volume= 0.698 af

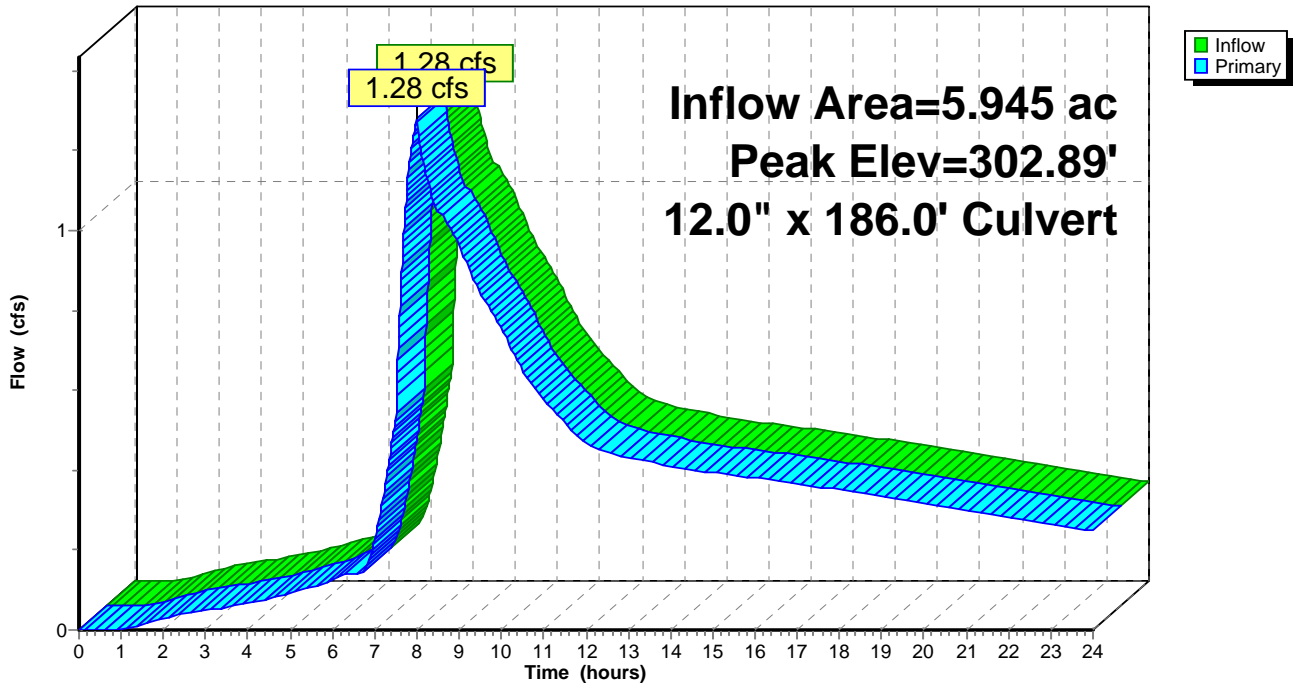
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 302.89' @ 8.00 hrs
 Flood Elev= 305.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.20'	12.0" x 186.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 301.28' S= 0.0049 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.28 cfs @ 8.00 hrs HW=302.89' (Free Discharge)
 ↳ **1=Culvert** (Barrel Controls 1.28 cfs @ 3.13 fps)

Pond 600R: 12"

Hydrograph



Summary for Pond 700R: 12"

Inflow Area = 7.999 ac, 54.95% Impervious, Inflow Depth > 1.51" for 2-Year event
 Inflow = 2.21 cfs @ 8.00 hrs, Volume= 1.006 af
 Outflow = 2.21 cfs @ 8.00 hrs, Volume= 1.006 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.21 cfs @ 8.00 hrs, Volume= 1.006 af

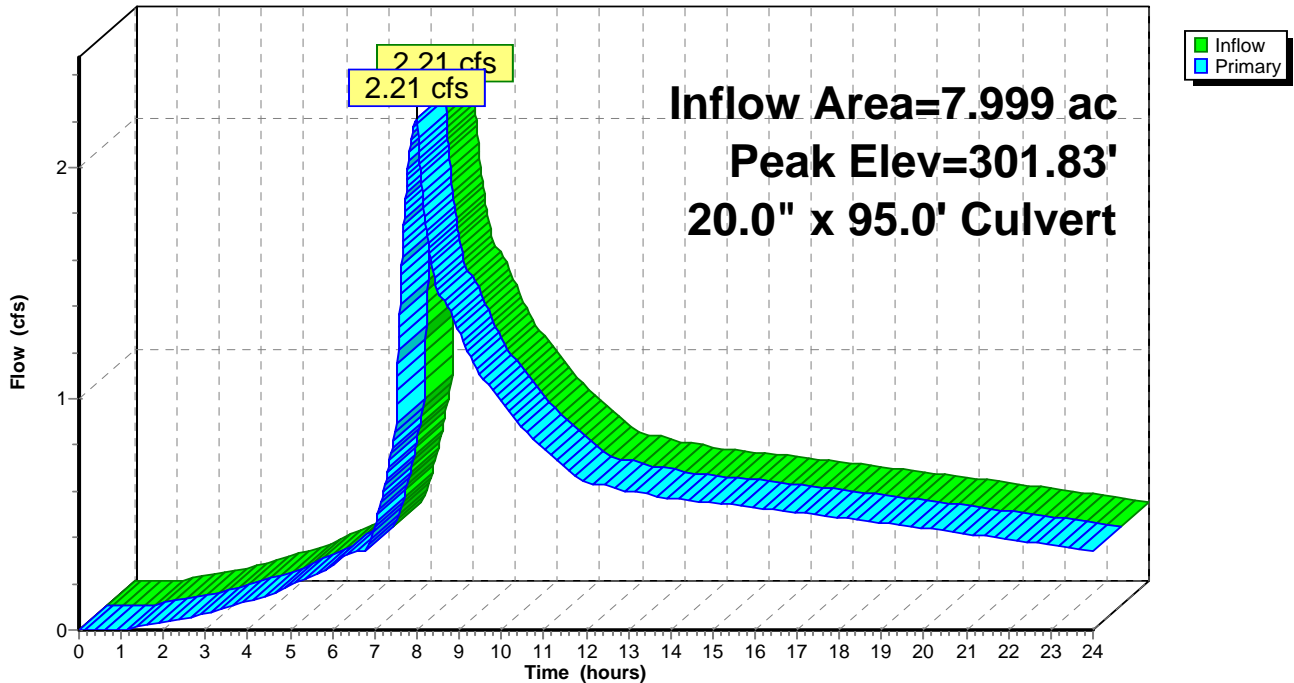
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.83' @ 8.00 hrs
 Flood Elev= 304.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	301.08'	20.0" x 95.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 300.60' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.21 cfs @ 8.00 hrs HW=301.83' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.21 cfs @ 3.41 fps)

Pond 700R: 12"

Hydrograph



Summary for Pond 800R: 12"

Inflow Area = 8.132 ac, 55.55% Impervious, Inflow Depth > 1.52" for 2-Year event
 Inflow = 2.28 cfs @ 8.00 hrs, Volume= 1.030 af
 Outflow = 2.28 cfs @ 8.00 hrs, Volume= 1.030 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.28 cfs @ 8.00 hrs, Volume= 1.030 af

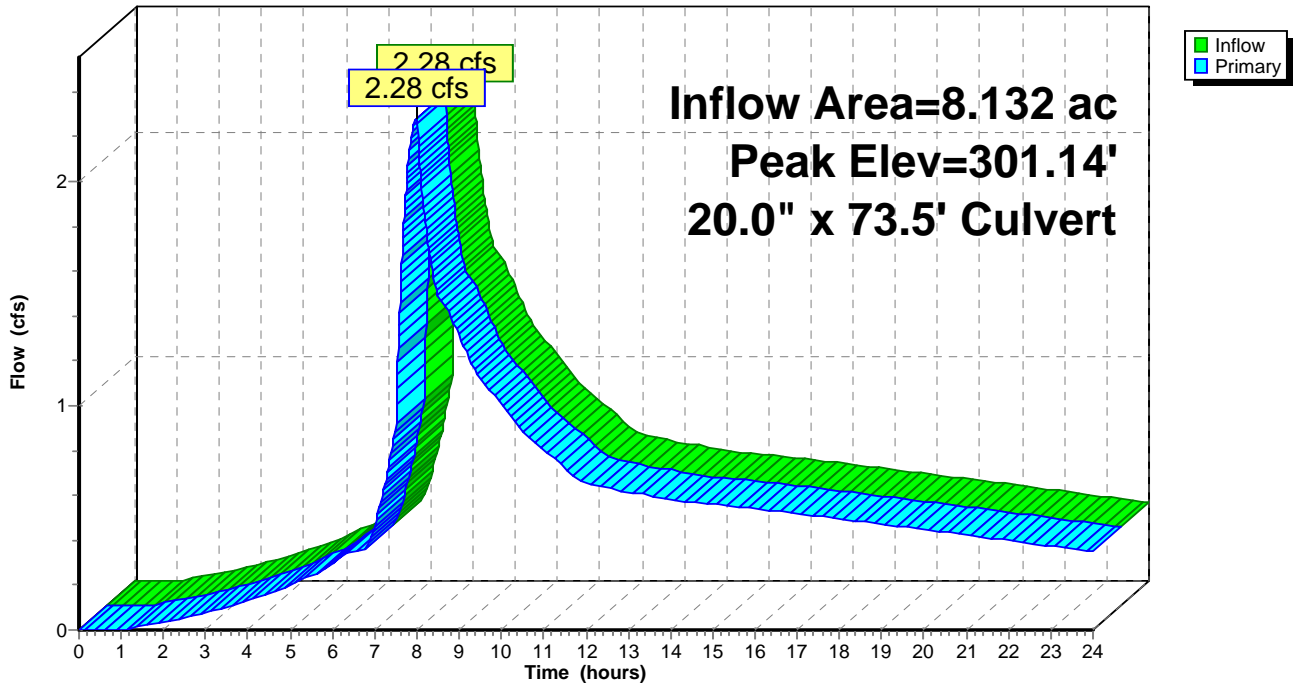
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.14' @ 8.00 hrs
 Flood Elev= 305.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.40'	20.0" x 73.5' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.94' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.28 cfs @ 8.00 hrs HW=301.14' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.28 cfs @ 3.58 fps)

Pond 800R: 12"

Hydrograph



Summary for Pond 900R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 1.53" for 2-Year event
 Inflow = 2.31 cfs @ 8.00 hrs, Volume= 1.042 af
 Outflow = 2.31 cfs @ 8.00 hrs, Volume= 1.042 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.31 cfs @ 8.00 hrs, Volume= 1.042 af

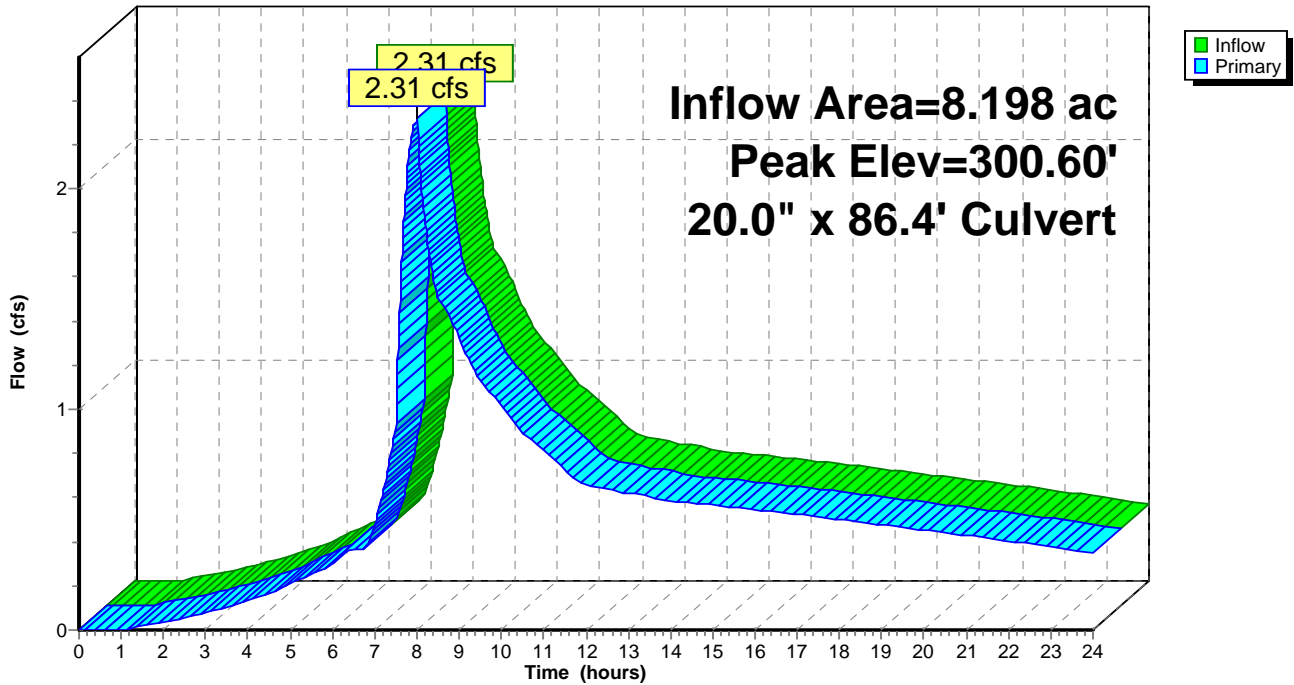
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.60' @ 8.00 hrs
 Flood Elev= 306.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.82'	20.0" x 86.4' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.40' S= 0.0049 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=2.31 cfs @ 8.00 hrs HW=300.60' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.31 cfs @ 3.40 fps)

Pond 900R: 12"

Hydrograph



Summary for Pond 1000R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 1.53" for 2-Year event
 Inflow = 2.31 cfs @ 8.00 hrs, Volume= 1.042 af
 Outflow = 2.31 cfs @ 8.00 hrs, Volume= 1.042 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.31 cfs @ 8.00 hrs, Volume= 1.042 af

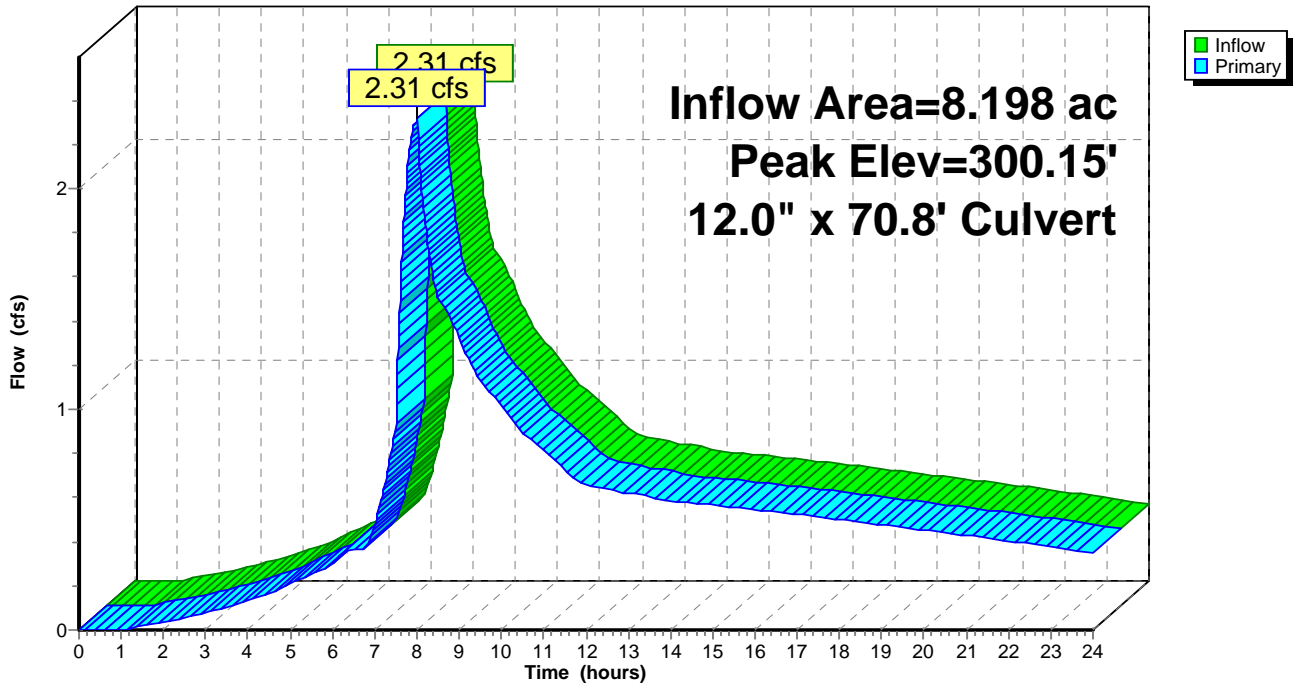
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.15' @ 8.00 hrs
 Flood Elev= 307.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.28'	12.0" x 70.8' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0103 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.32 cfs @ 8.00 hrs HW=300.15' (Free Discharge)
 ↳ **1=Culvert** (Inlet Controls 2.32 cfs @ 3.18 fps)

Pond 1000R: 12"

Hydrograph



Summary for Pond 1100R: 12"

Inflow Area = 0.303 ac, 100.00% Impervious, Inflow Depth > 2.27" for 2-Year event
 Inflow = 0.17 cfs @ 7.88 hrs, Volume= 0.057 af
 Outflow = 0.17 cfs @ 7.88 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 7.88 hrs, Volume= 0.057 af

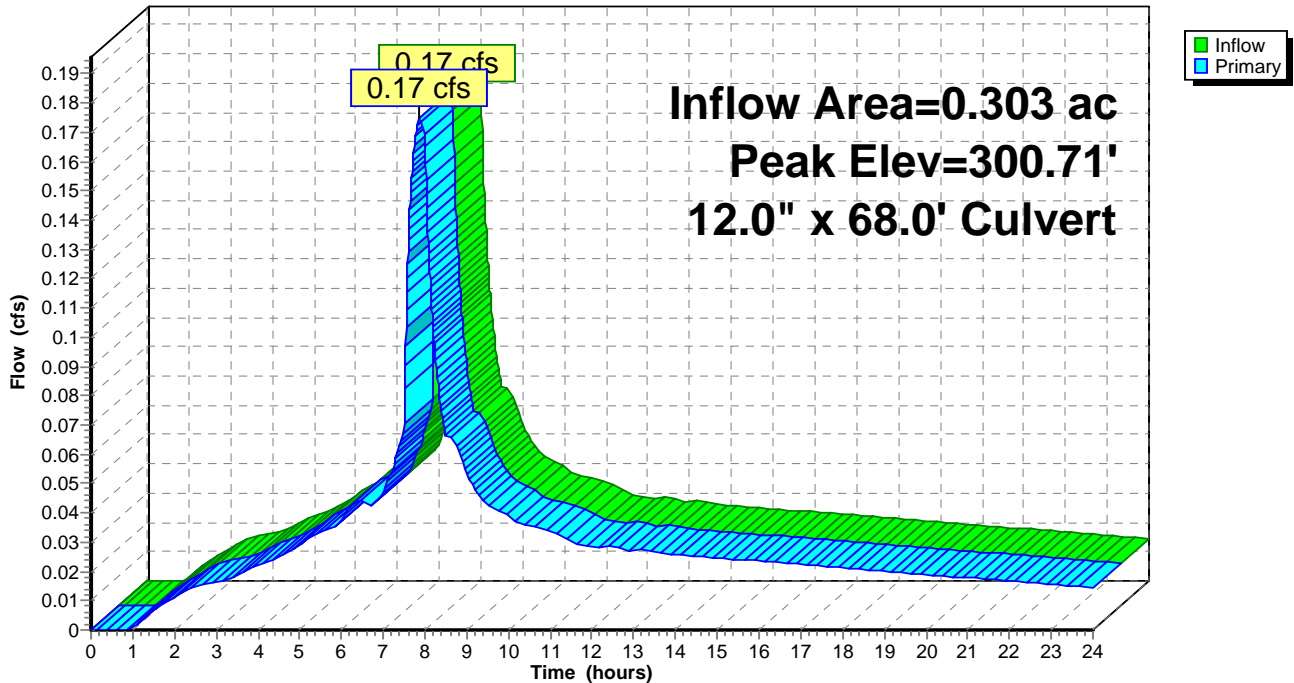
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.71' @ 7.88 hrs
 Flood Elev= 314.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.52'	12.0" x 68.0' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0290 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.16 cfs @ 7.88 hrs HW=300.71' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.16 cfs @ 1.49 fps)

Pond 1100R: 12"

Hydrograph



Summary for Pond 1200R: 12"

Inflow Area = 0.182 ac, 100.00% Impervious, Inflow Depth > 2.27" for 2-Year event
 Inflow = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af
 Outflow = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af

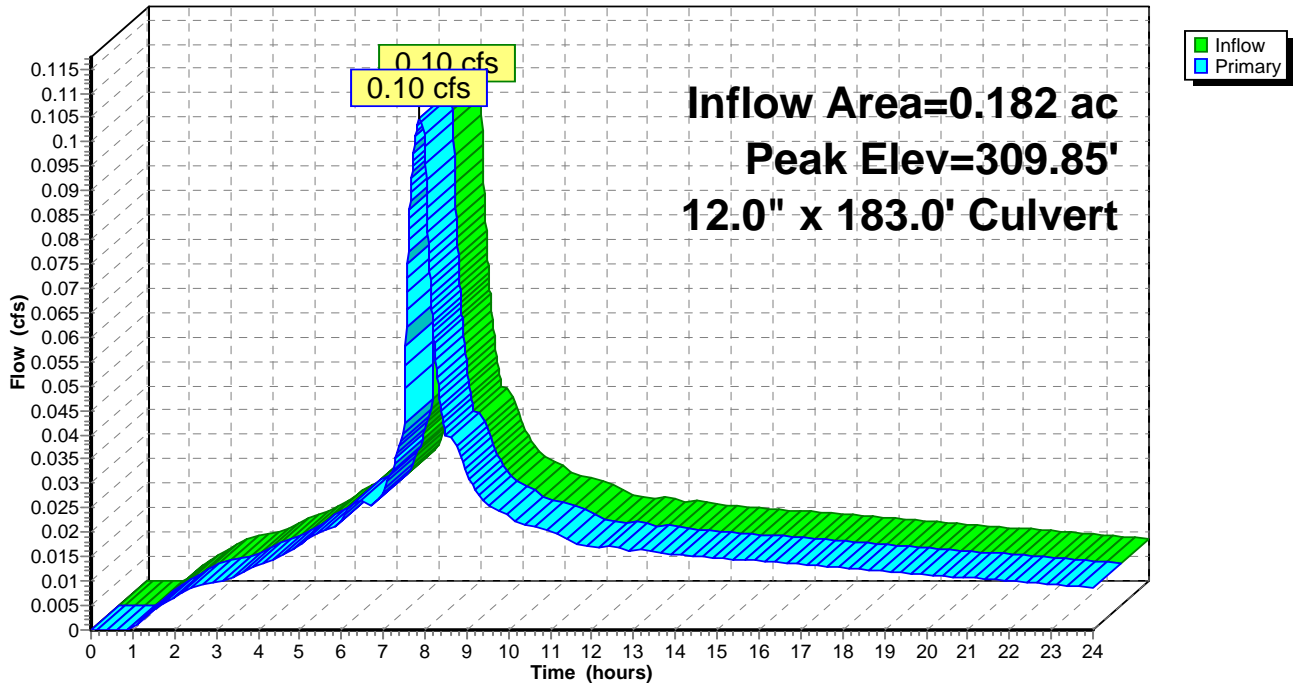
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 309.85' @ 7.88 hrs
 Flood Elev= 323.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	309.70'	12.0" x 183.0' long Culvert Ke= 0.500 Outlet Invert= 300.70' S= 0.0492 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.10 cfs @ 7.88 hrs HW=309.85' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.10 cfs @ 1.32 fps)

Pond 1200R: 12"

Hydrograph



Summary for Pond 1300R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 1.49" for 2-Year event
 Inflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af
 Outflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af

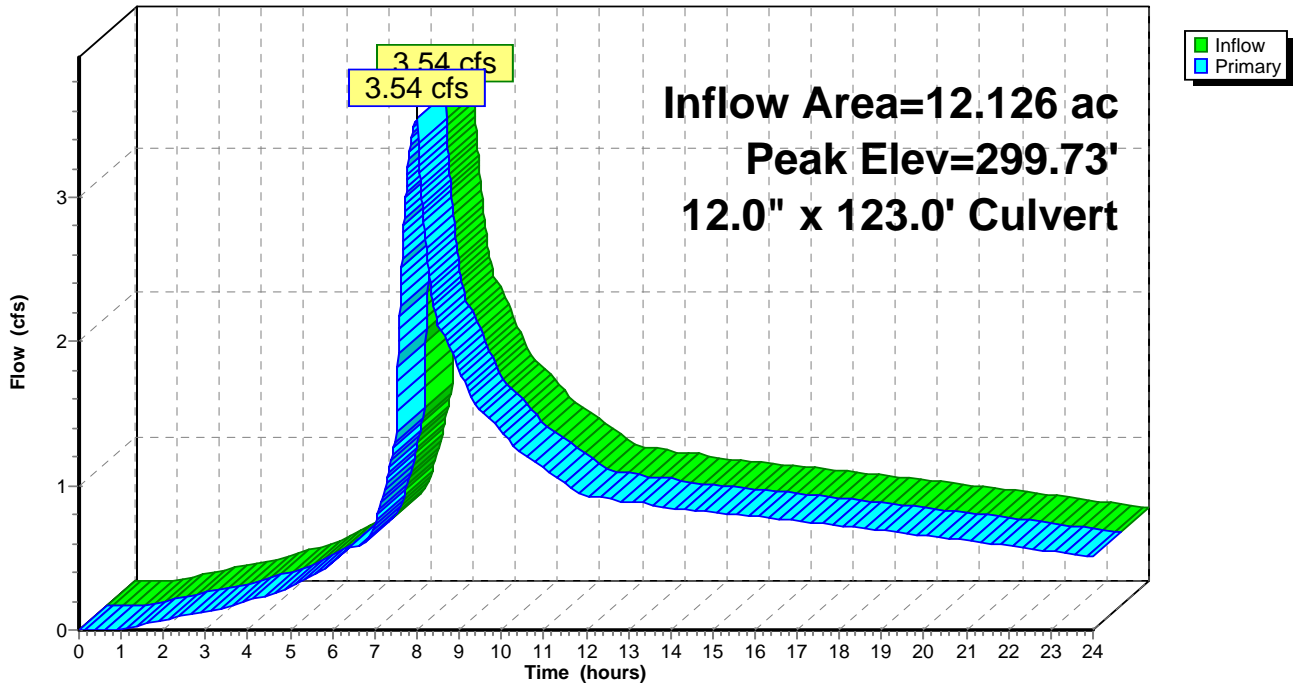
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 299.73' @ 8.00 hrs
 Flood Elev= 312.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.35'	12.0" x 123.0' long Culvert Ke= 0.500 Outlet Invert= 274.98' S= 0.1900 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.54 cfs @ 8.00 hrs HW=299.73' (Free Discharge)
 ←1=Culvert (Inlet Controls 3.54 cfs @ 4.51 fps)

Pond 1300R: 12"

Hydrograph



Summary for Pond 1400R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 1.49" for 2-Year event
 Inflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af
 Outflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af

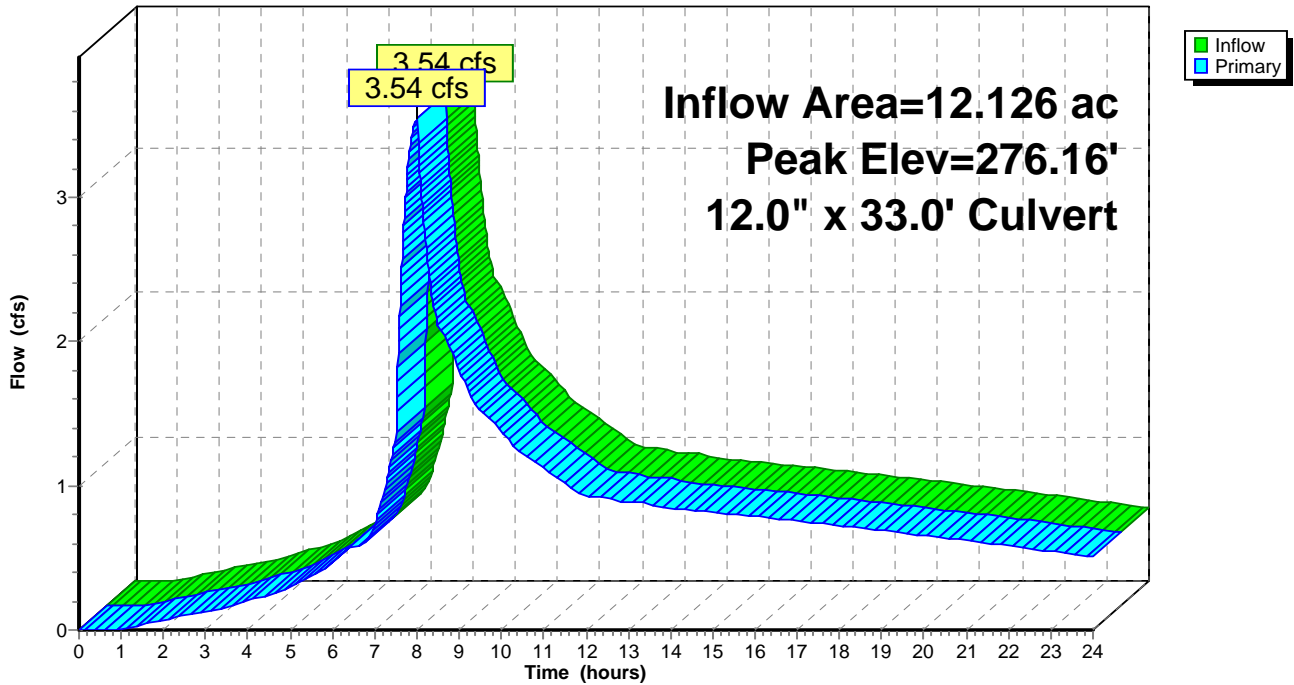
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 276.16' @ 8.00 hrs
 Flood Elev= 288.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.78'	12.0" x 33.0' long Culvert Ke= 0.500 Outlet Invert= 273.79' S= 0.0300 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.54 cfs @ 8.00 hrs HW=276.16' (Free Discharge)
 ↳1=Culvert (Inlet Controls 3.54 cfs @ 4.51 fps)

Pond 1400R: 12"

Hydrograph



Summary for Pond 1500R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 1.49" for 2-Year event
 Inflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af
 Outflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af

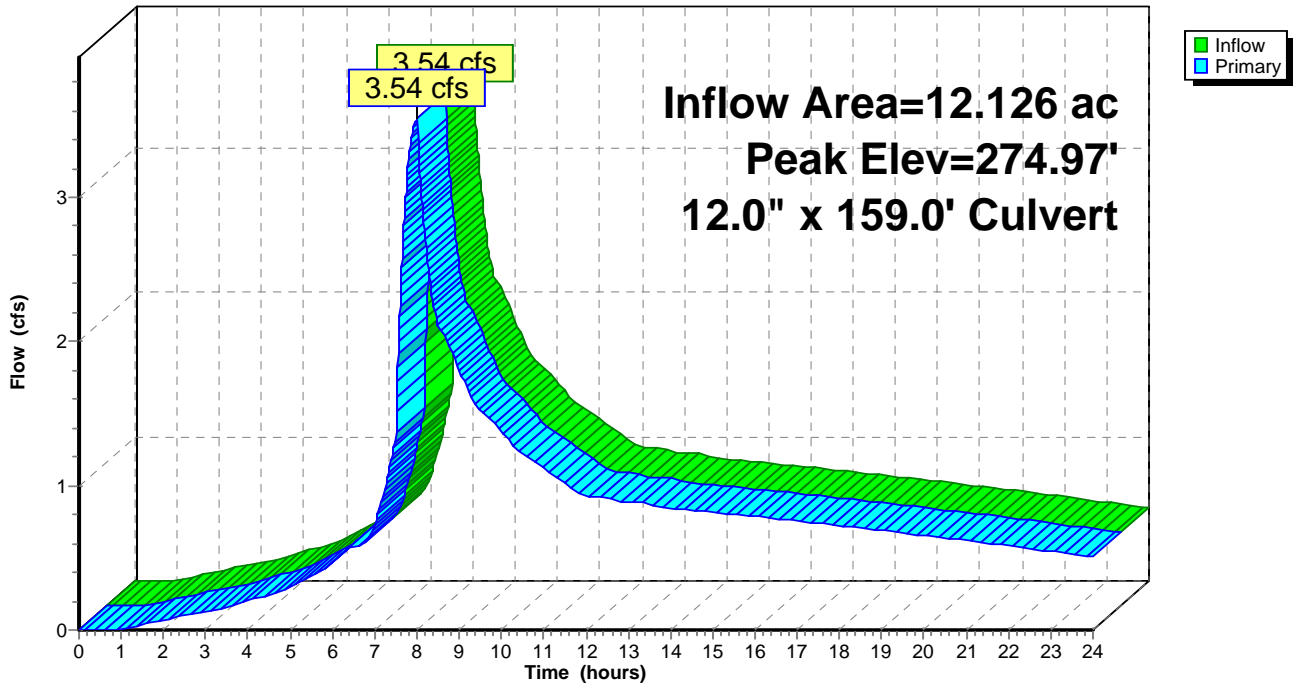
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 274.97' @ 8.00 hrs
 Flood Elev= 287.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.59'	12.0" x 159.0' long Culvert Ke= 0.500 Outlet Invert= 266.59' S= 0.0440 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.54 cfs @ 8.00 hrs HW=274.97' (Free Discharge)
 ←1=Culvert (Inlet Controls 3.54 cfs @ 4.51 fps)

Pond 1500R: 12"

Hydrograph



Summary for Pond 1600R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 1.49" for 2-Year event
 Inflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af
 Outflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af

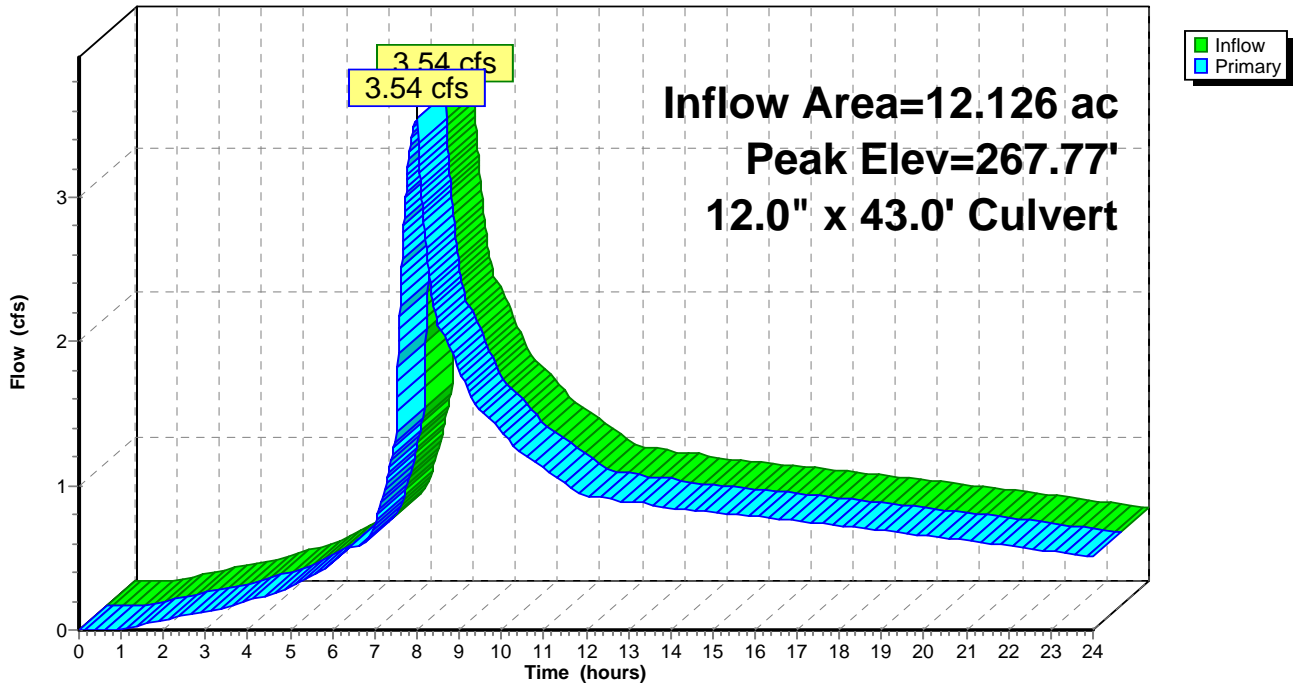
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 267.77' @ 8.00 hrs
 Flood Elev= 280.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	266.39'	12.0" x 43.0' long Culvert Ke= 0.500 Outlet Invert= 254.78' S= 0.2700 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.54 cfs @ 8.00 hrs HW=267.77' (Free Discharge)
 ←1=Culvert (Inlet Controls 3.54 cfs @ 4.51 fps)

Pond 1600R: 12"

Hydrograph



Summary for Pond 1700R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 1.49" for 2-Year event
 Inflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af
 Outflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af

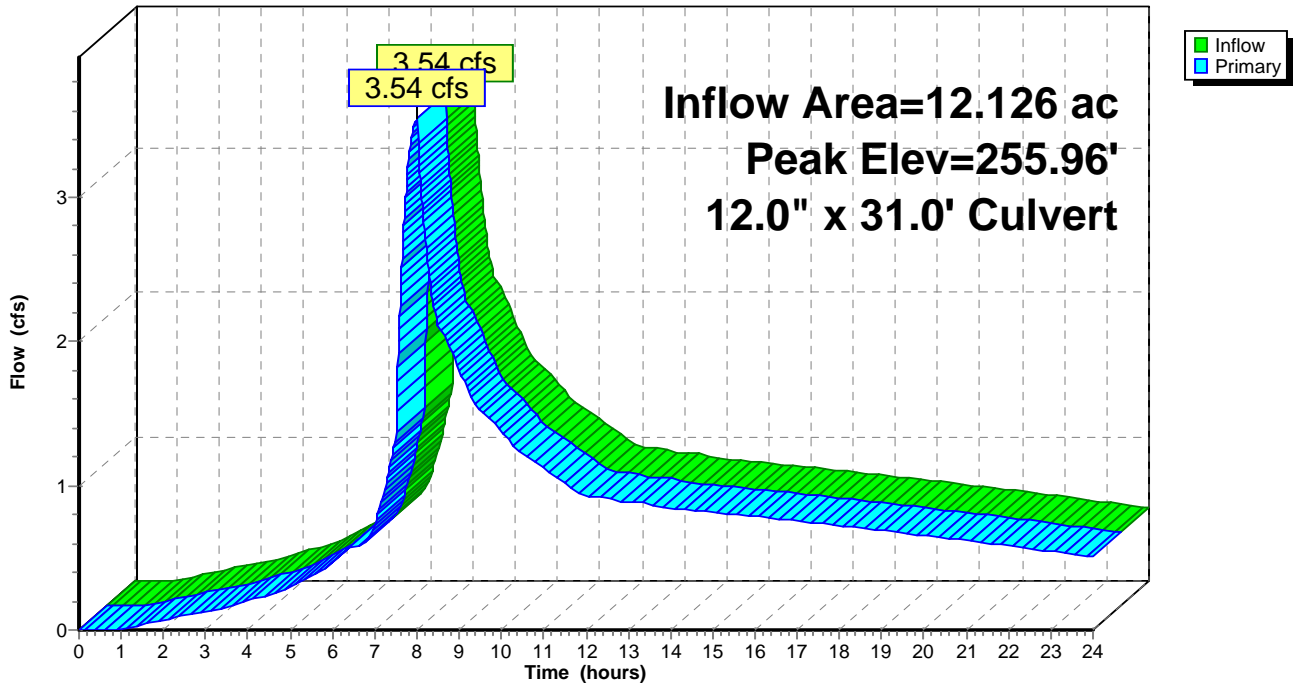
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 255.96' @ 8.00 hrs
 Flood Elev= 268.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	254.58'	12.0" x 31.0' long Culvert Ke= 0.500 Outlet Invert= 239.08' S= 0.5000 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.54 cfs @ 8.00 hrs HW=255.96' (Free Discharge)
 ←1=Culvert (Inlet Controls 3.54 cfs @ 4.51 fps)

Pond 1700R: 12"

Hydrograph



Summary for Pond 1800R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 1.49" for 2-Year event
 Inflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af
 Outflow = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.54 cfs @ 8.00 hrs, Volume= 1.501 af

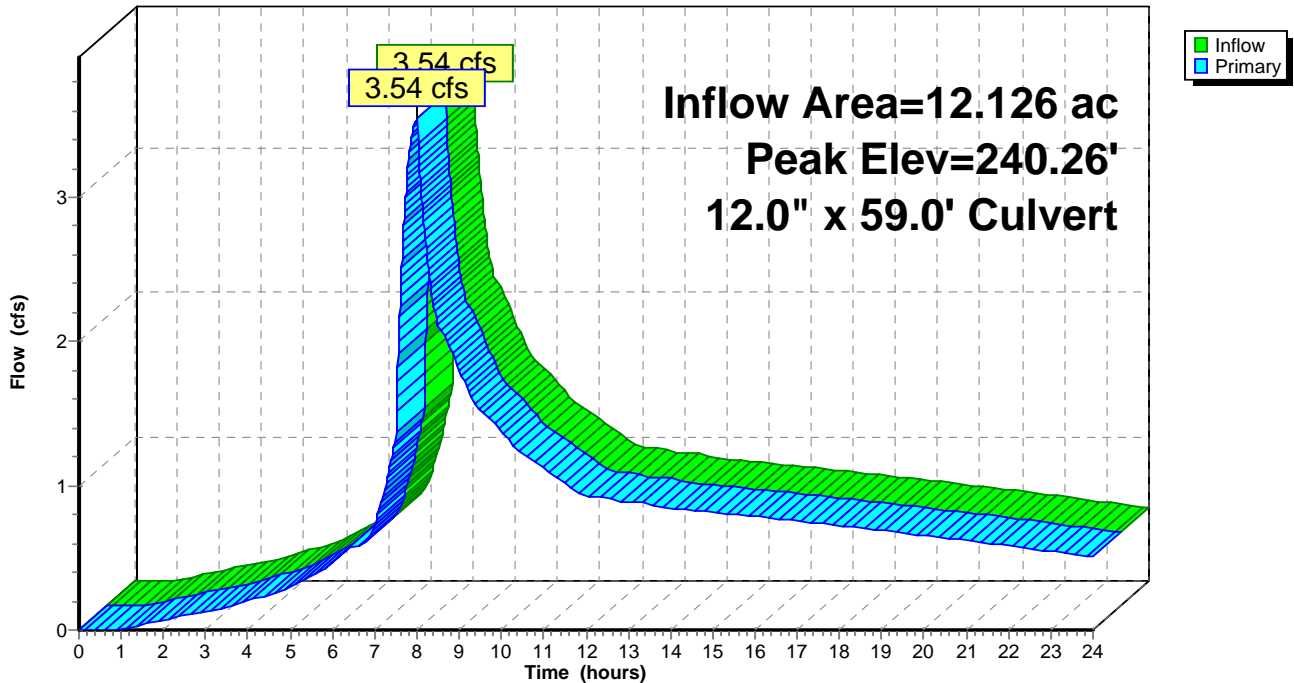
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 240.26' @ 8.00 hrs
 Flood Elev= 246.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.88'	12.0" x 59.0' long Culvert Ke= 0.500 Outlet Invert= 236.00' S= 0.0488 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.54 cfs @ 8.00 hrs HW=240.26' (Free Discharge)
 ←1=Culvert (Inlet Controls 3.54 cfs @ 4.51 fps)

Pond 1800R: 12"

Hydrograph



Summary for Pond A: POND

Inflow Area = 5.020 ac, 44.57% Impervious, Inflow Depth > 1.43" for 2-Year event
 Inflow = 1.62 cfs @ 7.95 hrs, Volume= 0.599 af
 Outflow = 0.85 cfs @ 8.36 hrs, Volume= 0.529 af, Atten= 47%, Lag= 24.3 min
 Primary = 0.85 cfs @ 8.36 hrs, Volume= 0.529 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 309.41' @ 8.36 hrs Surf.Area= 2,701 sf Storage= 5,035 cf

Plug-Flow detention time= 149.7 min calculated for 0.529 af (88% of inflow)
 Center-of-Mass det. time= 73.5 min (821.8 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1	306.90'	10,088 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
306.90	1,318	0	0
307.00	1,364	134	134
308.00	1,865	1,615	1,749
309.00	2,436	2,151	3,899
310.00	3,078	2,757	6,656
311.00	3,785	3,432	10,088

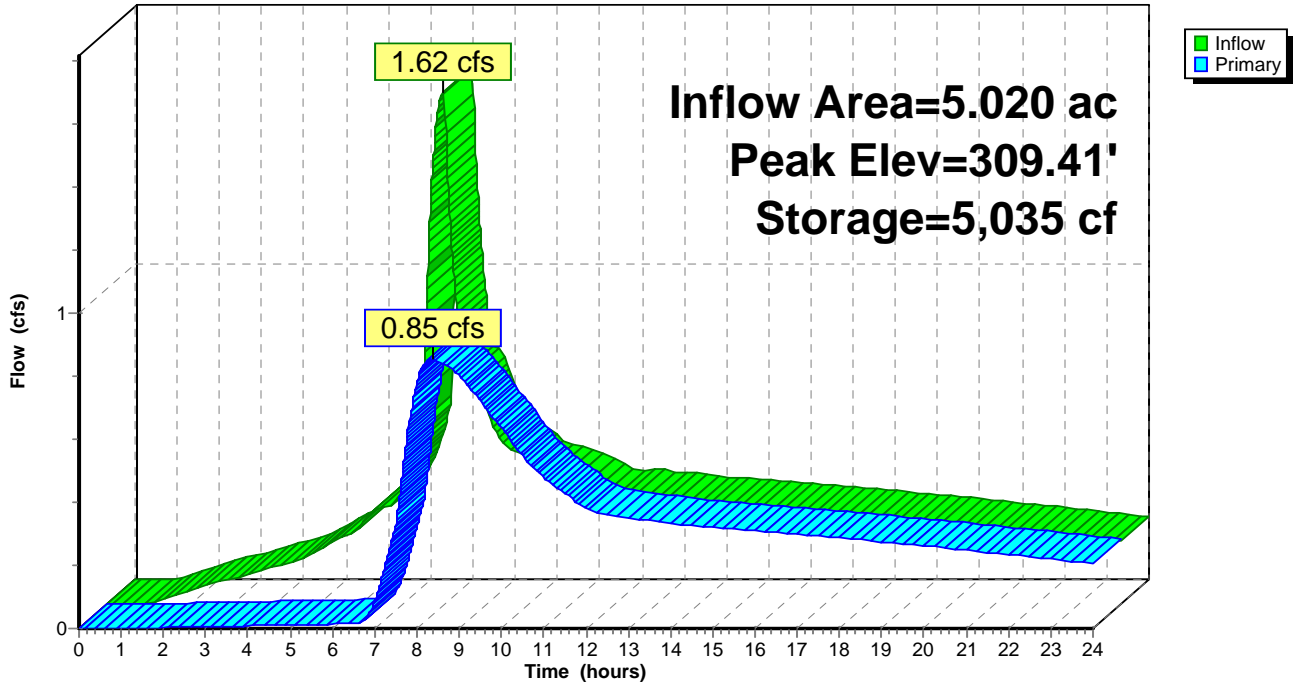
Device	Routing	Invert	Outlet Devices
#1	Primary	306.90'	0.7" Vert. Orifice/Grate C= 0.620
#2	Primary	308.34'	5.8" Vert. Orifice/Grate C= 0.620
#3	Primary	309.45'	4.4" Vert. Orifice/Grate C= 0.620
#4	Primary	310.10'	3.4" Vert. Orifice/Grate C= 0.620

Primary OutFlow Max=0.85 cfs @ 8.36 hrs HW=309.41' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.02 cfs @ 7.84 fps)
- 2=Orifice/Grate (Orifice Controls 0.83 cfs @ 4.53 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Orifice/Grate (Controls 0.00 cfs)

Pond A: POND

Hydrograph

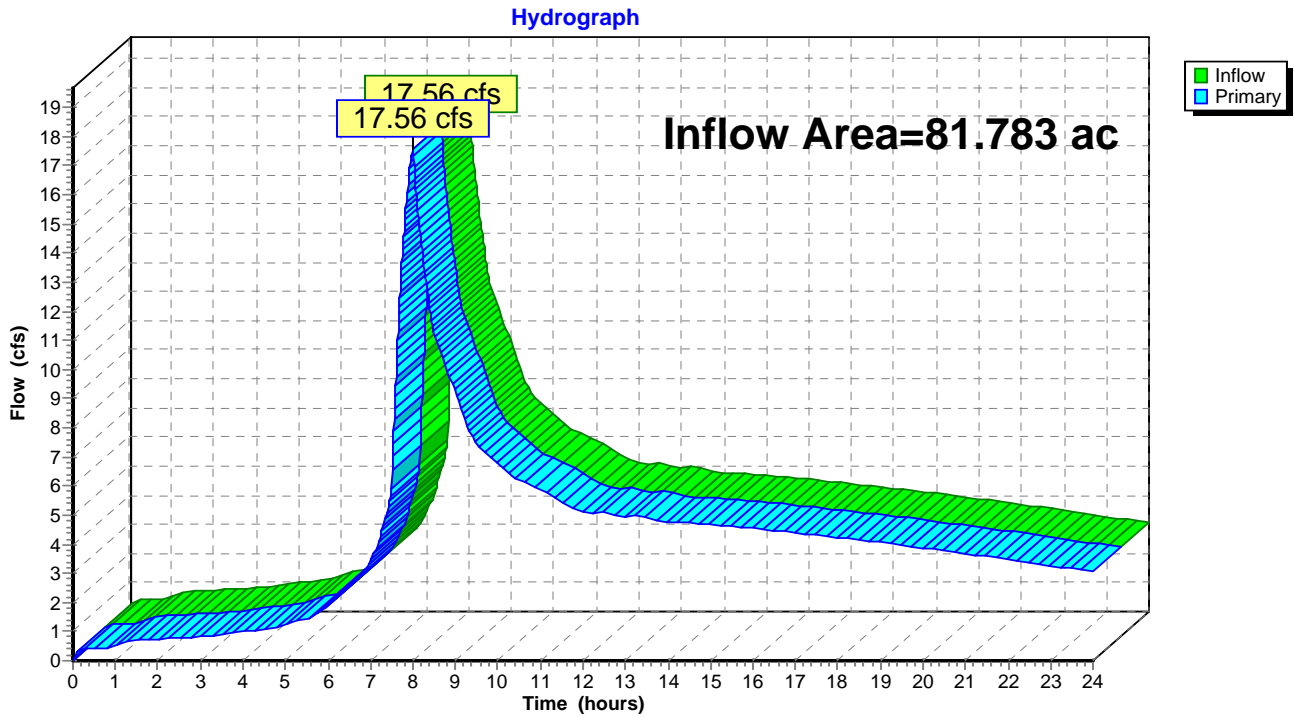


Summary for Link B: NATURAL POND 1900

Inflow Area = 81.783 ac, 44.42% Impervious, Inflow Depth > 1.19" for 2-Year event
Inflow = 17.56 cfs @ 8.00 hrs, Volume= 8.121 af
Primary = 17.56 cfs @ 8.00 hrs, Volume= 8.121 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link B: NATURAL POND 1900



**APPENDIX 2.3b
10 YEAR (3.45") STORM EVENT**

Summary for Subcatchment 1A: OFF-SITE DRAINAGE

Runoff = 0.07 cfs @ 7.99 hrs, Volume= 0.028 af, Depth> 1.52"

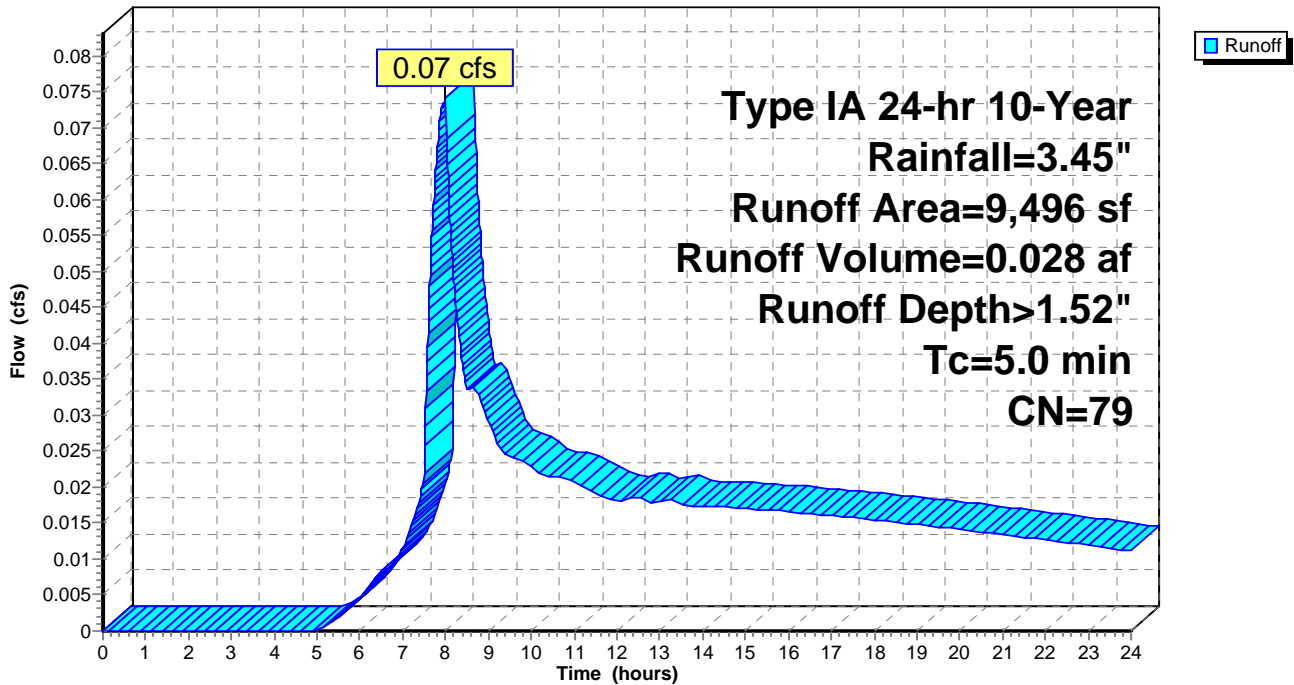
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
9,496	79	50-75% Grass cover, Fair, HSG C
9,496		Pervious Area

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

Subcatchment 1A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA

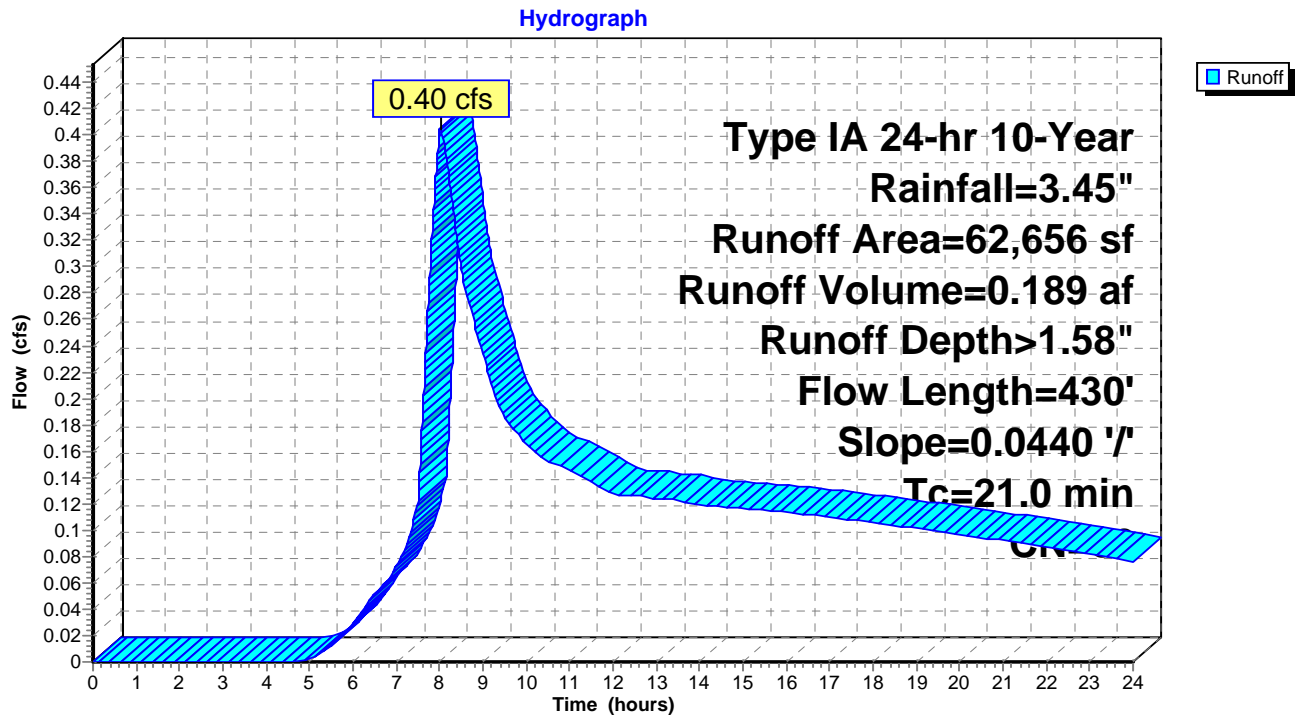
Runoff = 0.40 cfs @ 8.01 hrs, Volume= 0.189 af, Depth> 1.58"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
3,614	100	Water Quality Facility
59,042	79	50-75% Grass cover, Fair, HSG C
62,656	80	Weighted Average
59,042		Pervious Area
3,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	300	0.0440	0.26		Sheet Flow, Flow over lots Grass: Short n= 0.150 P2= 2.50"
1.5	130	0.0440	1.47		Shallow Concentrated Flow, Flow over lots Short Grass Pasture Kv= 7.0 fps
21.0	430	Total			

Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 1X: TAX LOT 200 WEST

Runoff = 1.51 cfs @ 8.01 hrs, Volume= 0.717 af, Depth> 2.19"

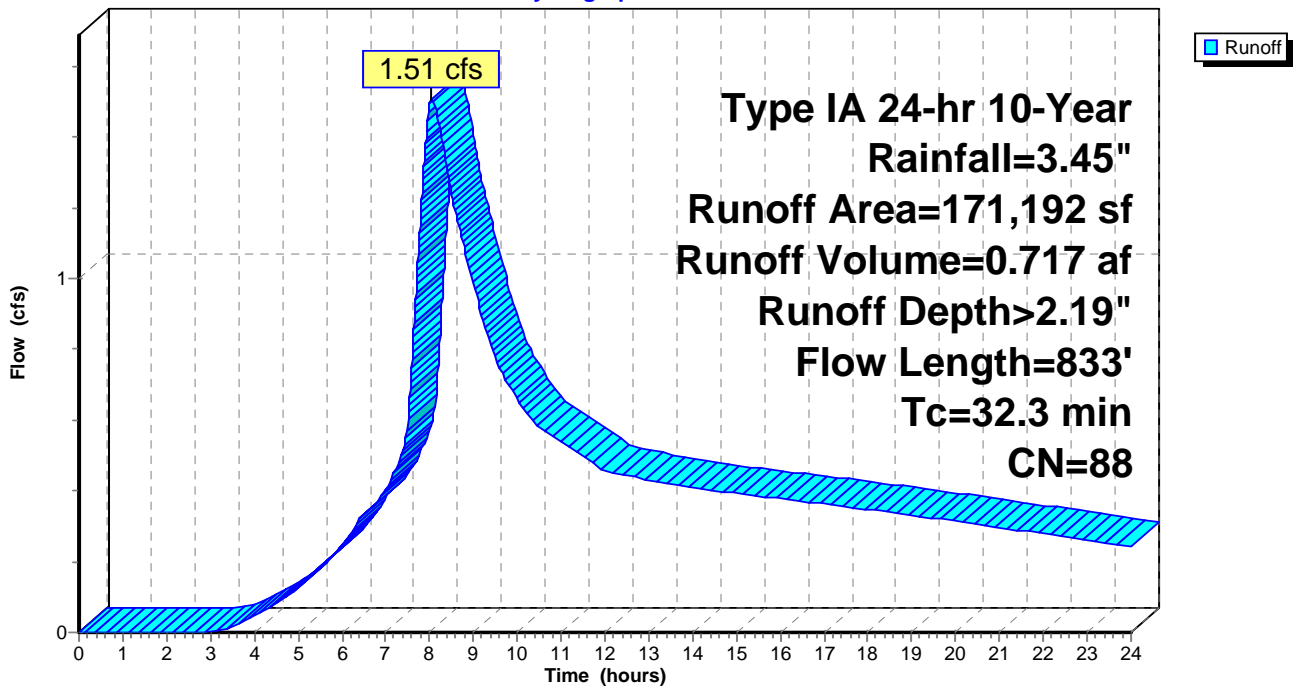
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
136,192	86	<50% Grass cover, Poor, HSG C
* 33,982	98	AC PAVEMENT, ROOFS
1,018	89	Gravel roads, HSG C
171,192	88	Weighted Average
137,210		Pervious Area
33,982		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	300	0.0220	0.19		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"
6.6	533	0.0375	1.36		Shallow Concentrated Flow, PASTURE/MEADOW Short Grass Pasture Kv= 7.0 fps
32.3	833	Total			

Subcatchment 1X: TAX LOT 200 WEST

Hydrograph



Summary for Subcatchment 2A: OFF-SITE DRAINAGE

Runoff = 0.01 cfs @ 7.88 hrs, Volume= 0.004 af, Depth> 3.21"

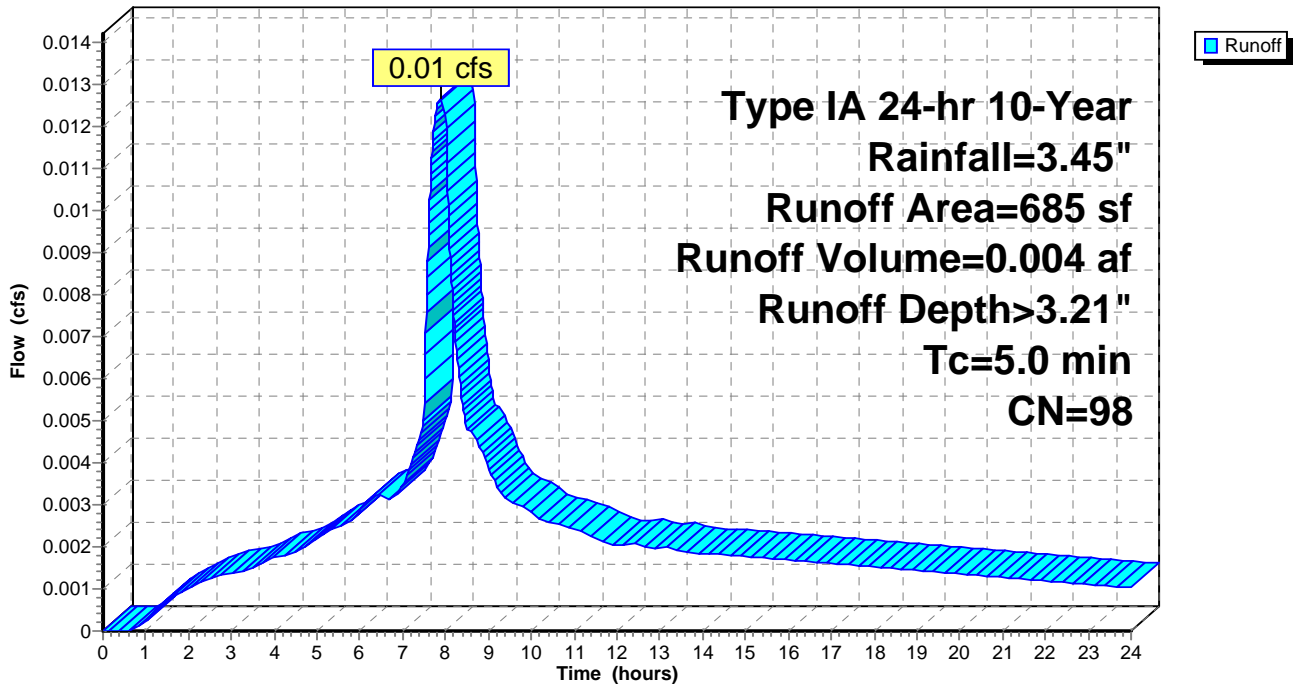
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 685	98	Street and sidewalk
685		Impervious Area

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

Subcatchment 2A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 2S1: SW HELENIUS WEST

Runoff = 0.11 cfs @ 7.89 hrs, Volume= 0.037 af, Depth> 2.88"

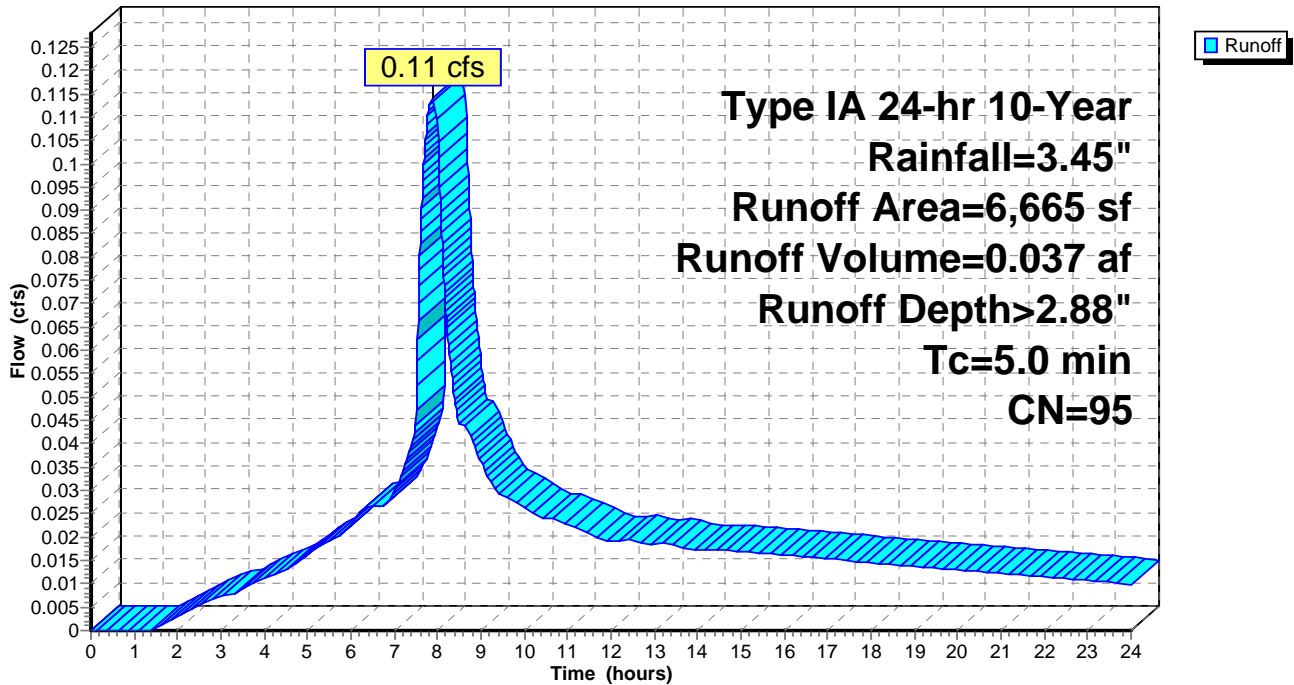
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 5,667	98	Street and sidewalk
998	79	50-75% Grass cover, Fair, HSG C
6,665	95	Weighted Average
998		Pervious Area
5,667		Impervious Area

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

Subcatchment 2S1: SW HELENIUS WEST

Hydrograph



Summary for Subcatchment 2S2: LANDSCAPING

Runoff = 0.01 cfs @ 7.99 hrs, Volume= 0.004 af, Depth> 1.52"

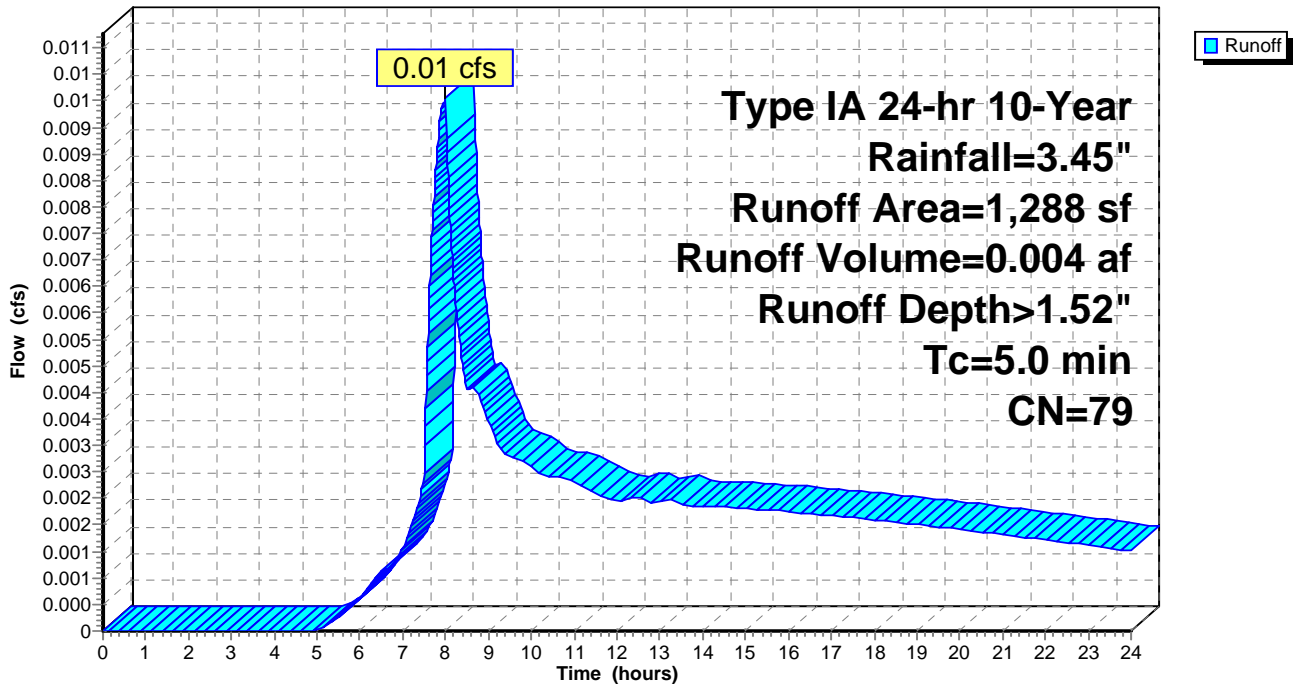
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
1,288	79	50-75% Grass cover, Fair, HSG C
1,288		Pervious Area

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

Subcatchment 2S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 2X: TAX LOT 200 EAST

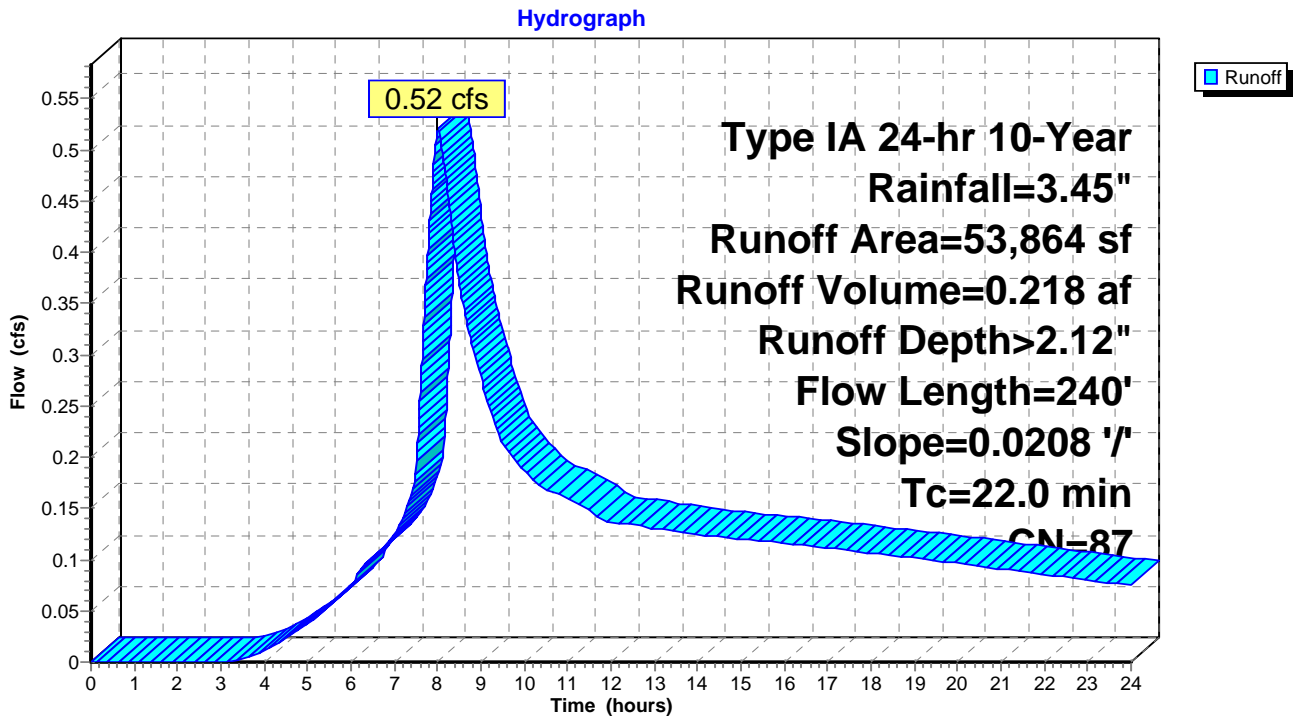
Runoff = 0.52 cfs @ 8.01 hrs, Volume= 0.218 af, Depth> 2.12"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
50,783	86	<50% Grass cover, Poor, HSG C
* 3,081	98	Roof
53,864	87	Weighted Average
50,783		Pervious Area
3,081		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	240	0.0208	0.18		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 2X: TAX LOT 200 EAST



Summary for Subcatchment 3S1: SW112TH DRAIN TO SITE

Runoff = 0.19 cfs @ 7.88 hrs, Volume= 0.060 af, Depth> 3.10"

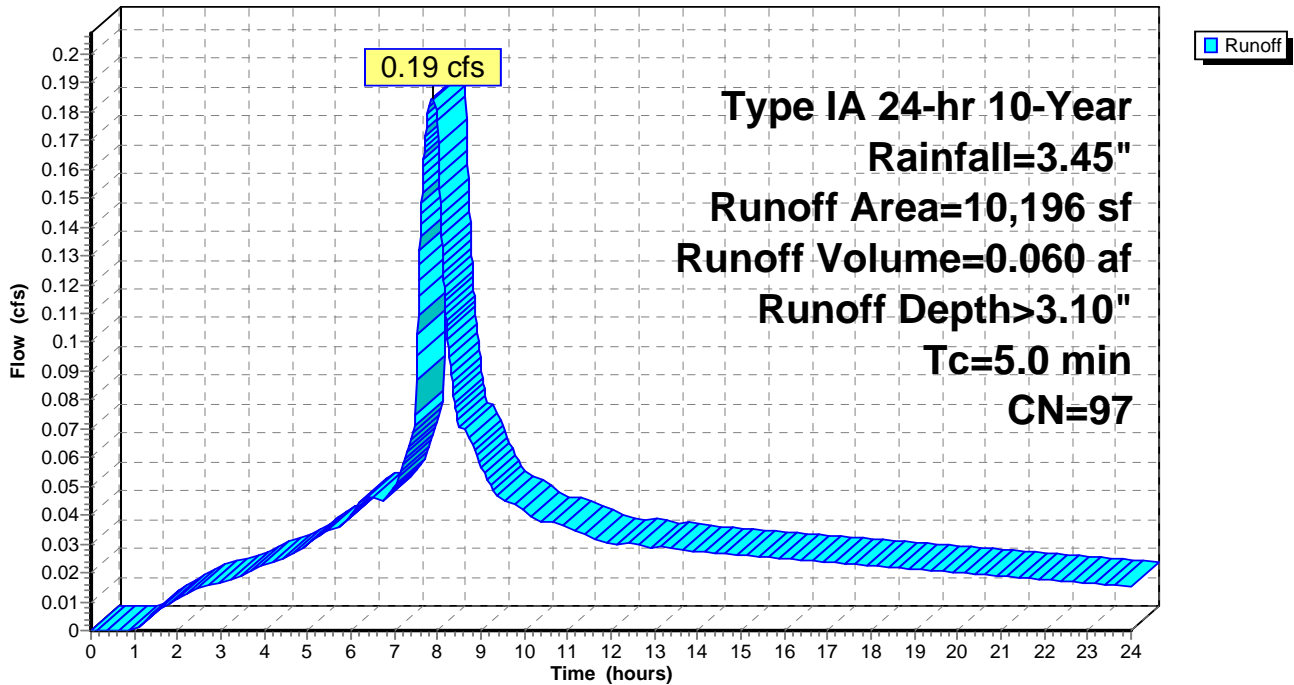
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 9,446	98	Street and sidewalk
750	79	50-75% Grass cover, Fair, HSG C
10,196	97	Weighted Average
750		Pervious Area
9,446		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S1: SW112TH DRAIN TO SITE

Hydrograph



Summary for Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA

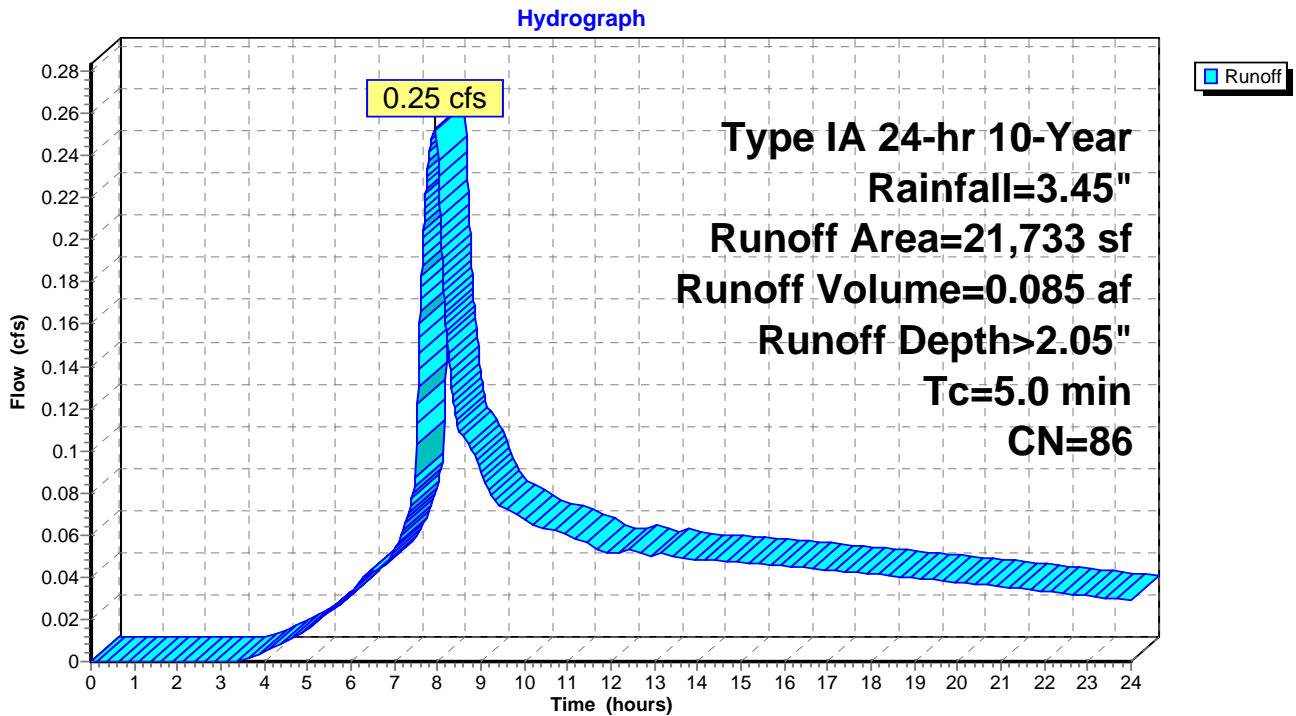
Runoff = 0.25 cfs @ 7.94 hrs, Volume= 0.085 af, Depth> 2.05"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
13,813	79	50-75% Grass cover, Fair, HSG C
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
21,733	86	Weighted Average
13,813		Pervious Area
7,920		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION

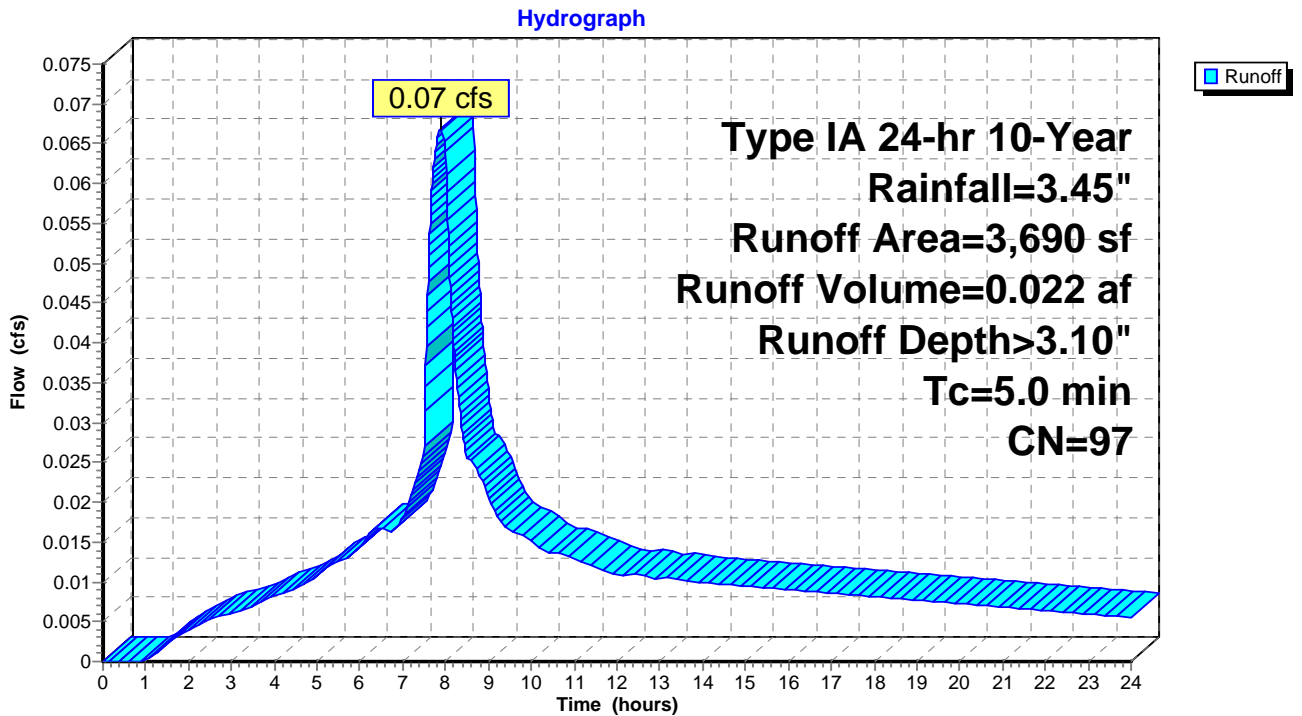
Runoff = 0.07 cfs @ 7.88 hrs, Volume= 0.022 af, Depth> 3.10"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 3,540	98	Street and sidewalk
150	79	50-75% Grass cover, Fair, HSG C
3,690	97	Weighted Average
150		Pervious Area
3,540		Impervious Area

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

Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION



Summary for Subcatchment 4S1: SW HELENIUS MID SECTION

Runoff = 0.14 cfs @ 7.89 hrs, Volume= 0.044 af, Depth> 2.88"

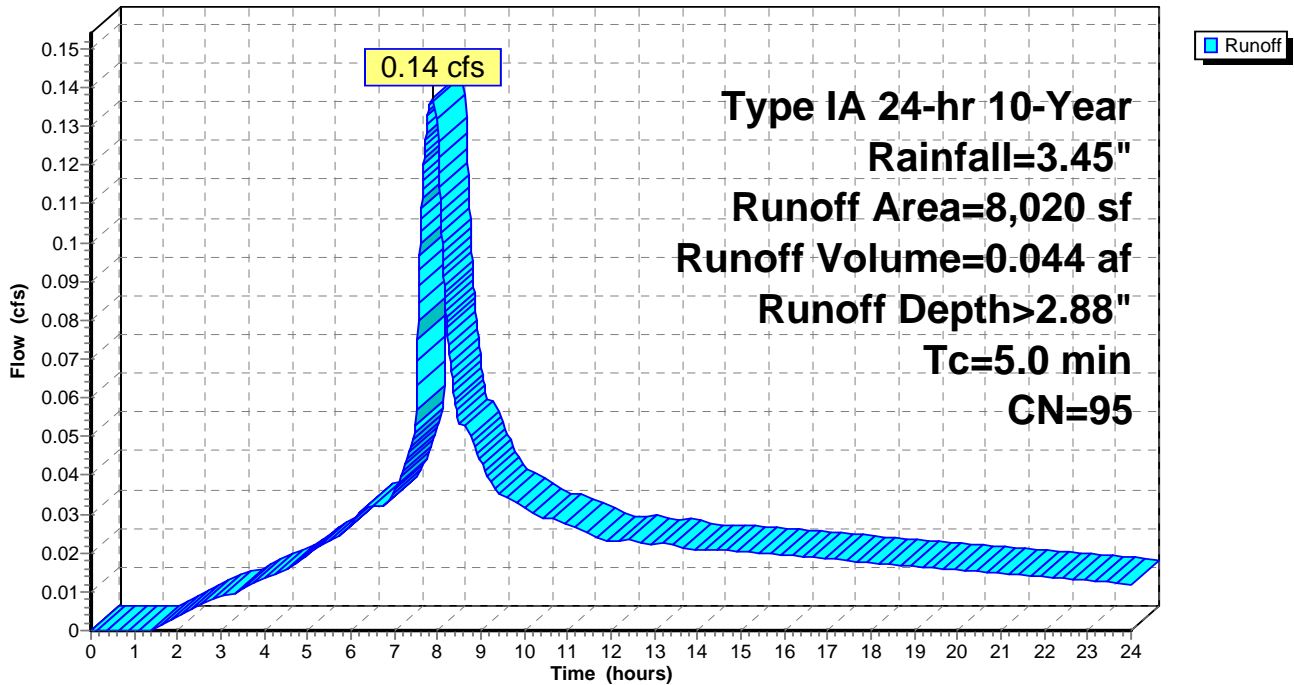
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
6,943	98	Streets and sidewalks
1,077	79	50-75% Grass cover, Fair, HSG C
8,020	95	Weighted Average
1,077		Pervious Area
6,943		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREETS AND ROOFTOP RUNOFF

Subcatchment 4S1: SW HELENIUS MID SECTION

Hydrograph



Summary for Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA

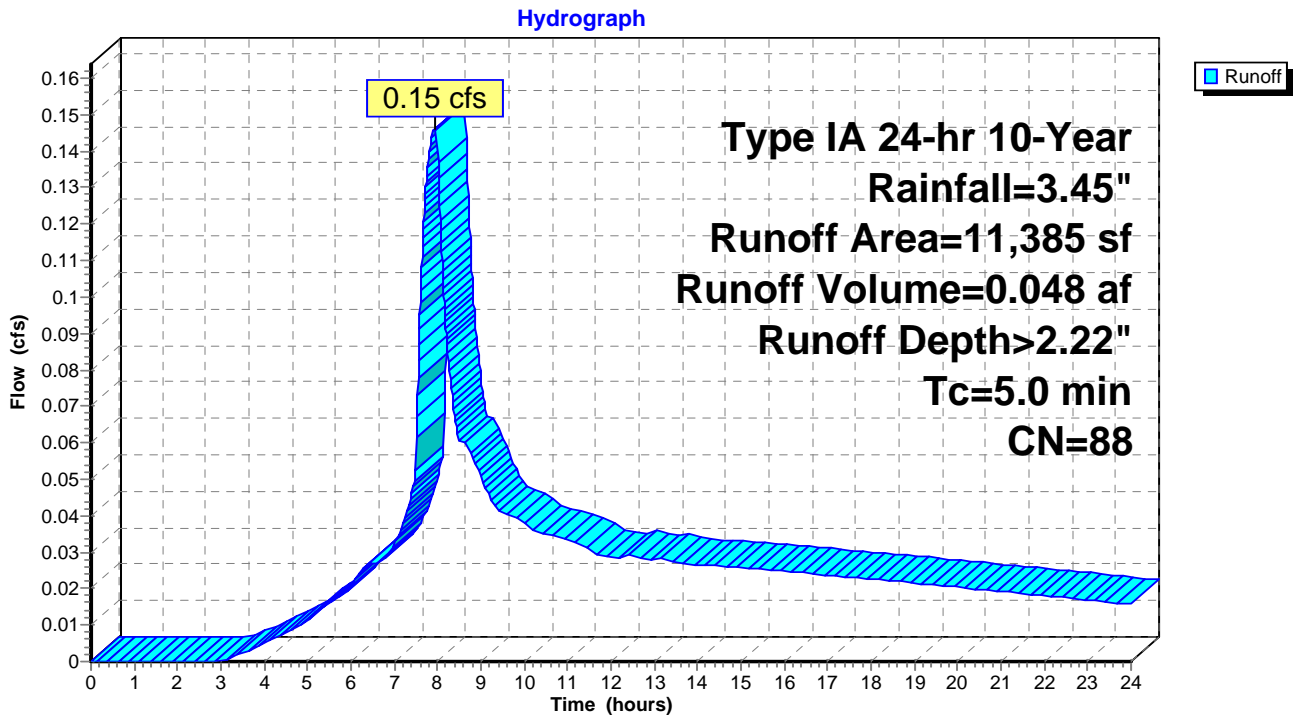
Runoff = 0.15 cfs @ 7.93 hrs, Volume= 0.048 af, Depth> 2.22"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
6,105	79	50-75% Grass cover, Fair, HSG C
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
11,385	88	Weighted Average
6,105		Pervious Area
5,280		Impervious Area

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

Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 4S3: HOUSES 4-5

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.032 af, Depth> 3.21"

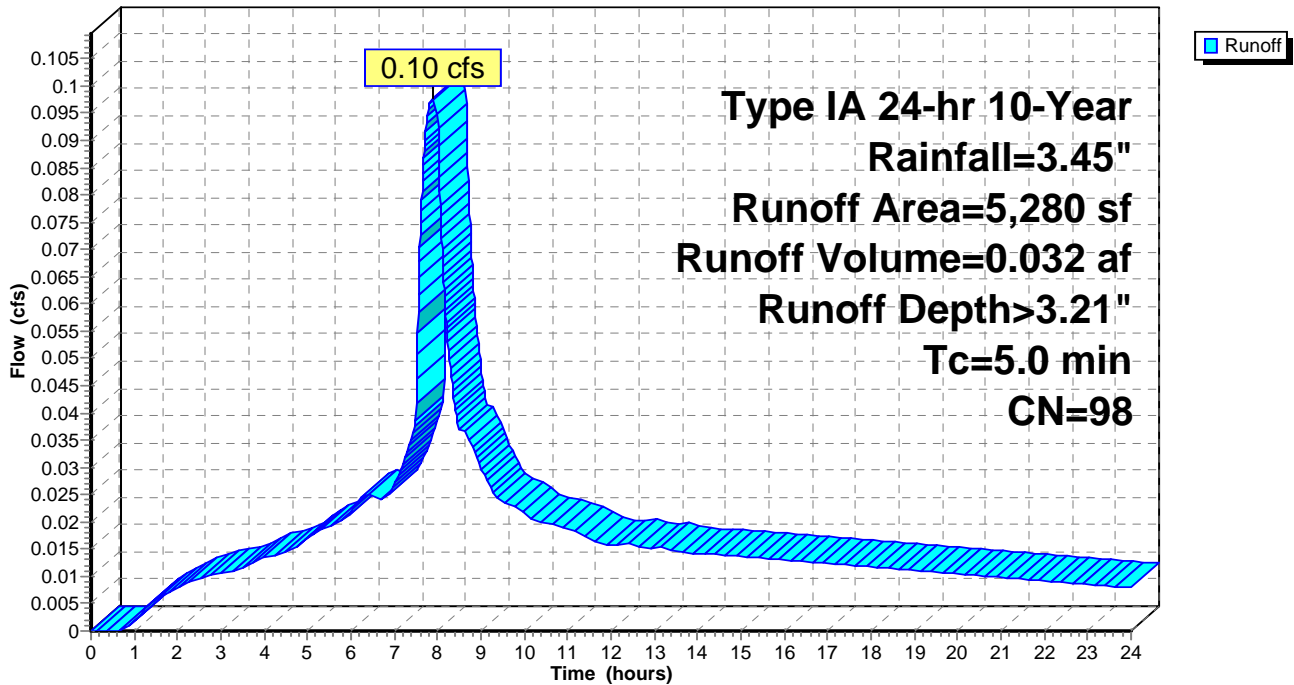
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 4S3: HOUSES 4-5

Hydrograph



Summary for Subcatchment 5S: HOUSES 6-7

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.032 af, Depth> 3.21"

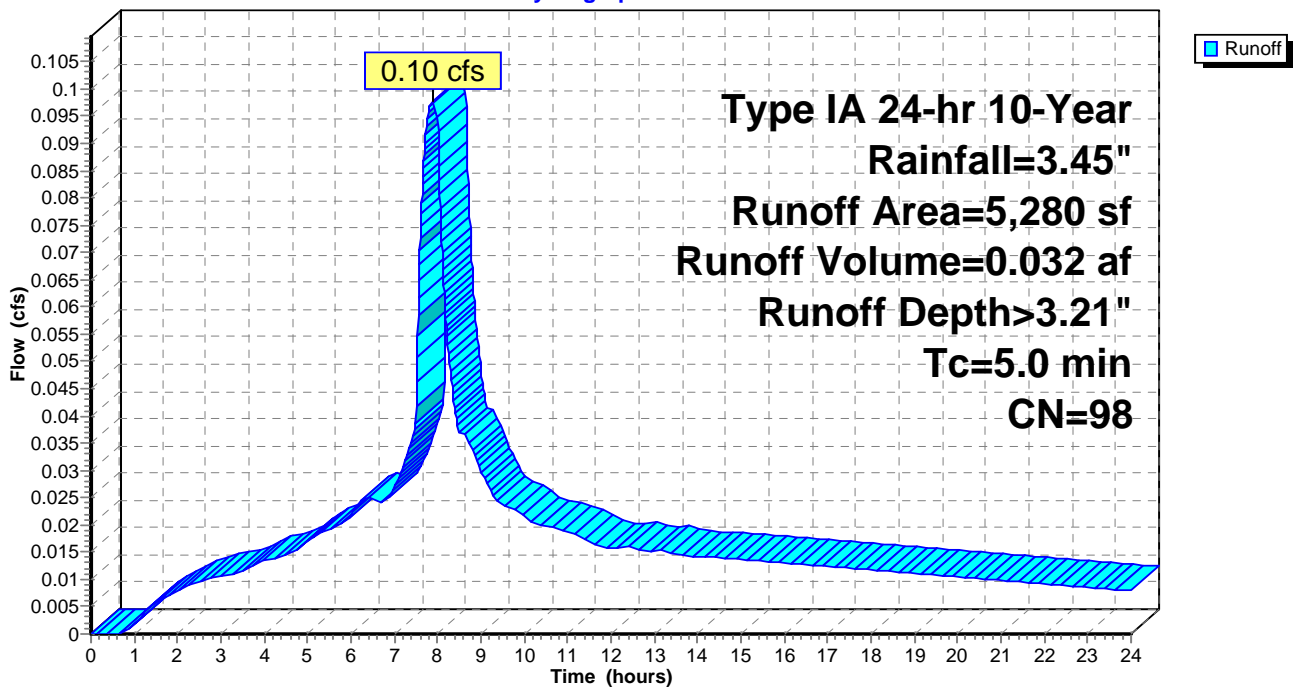
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 5S: HOUSES 6-7

Hydrograph



Summary for Subcatchment 6S1: 110TH

Runoff = 0.27 cfs @ 7.88 hrs, Volume= 0.089 af, Depth> 3.10"

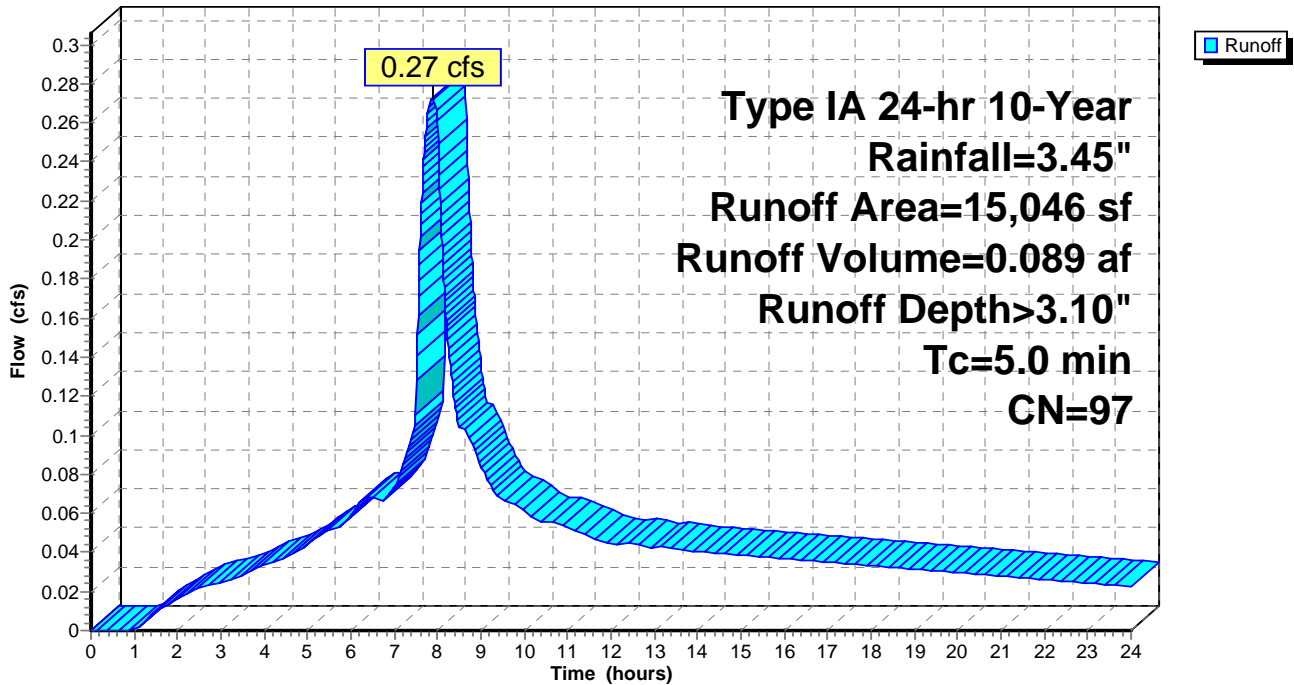
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	14,121	98	Street and sidewalk
	925	79	50-75% Grass cover, Fair, HSG C
	15,046	97	Weighted Average
	925		Pervious Area
	14,121		Impervious Area

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

Subcatchment 6S1: 110TH

Hydrograph



Summary for Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Runoff = 0.24 cfs @ 7.99 hrs, Volume= 0.090 af, Depth> 1.52"

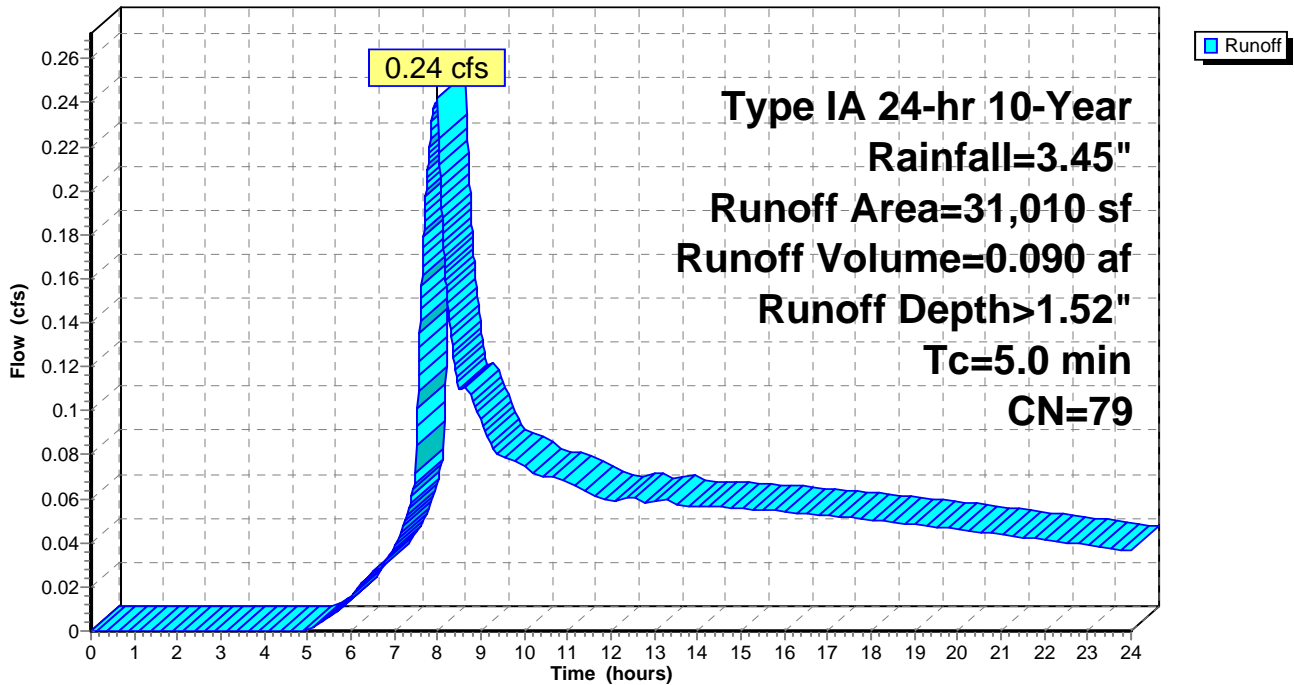
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
31,010	79	50-75% Grass cover, Fair, HSG C
31,010		Pervious Area

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

Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Hydrograph



Summary for Subcatchment 7S: HOUSES 8-11 AND 16

Runoff = 0.24 cfs @ 7.88 hrs, Volume= 0.081 af, Depth> 3.21"

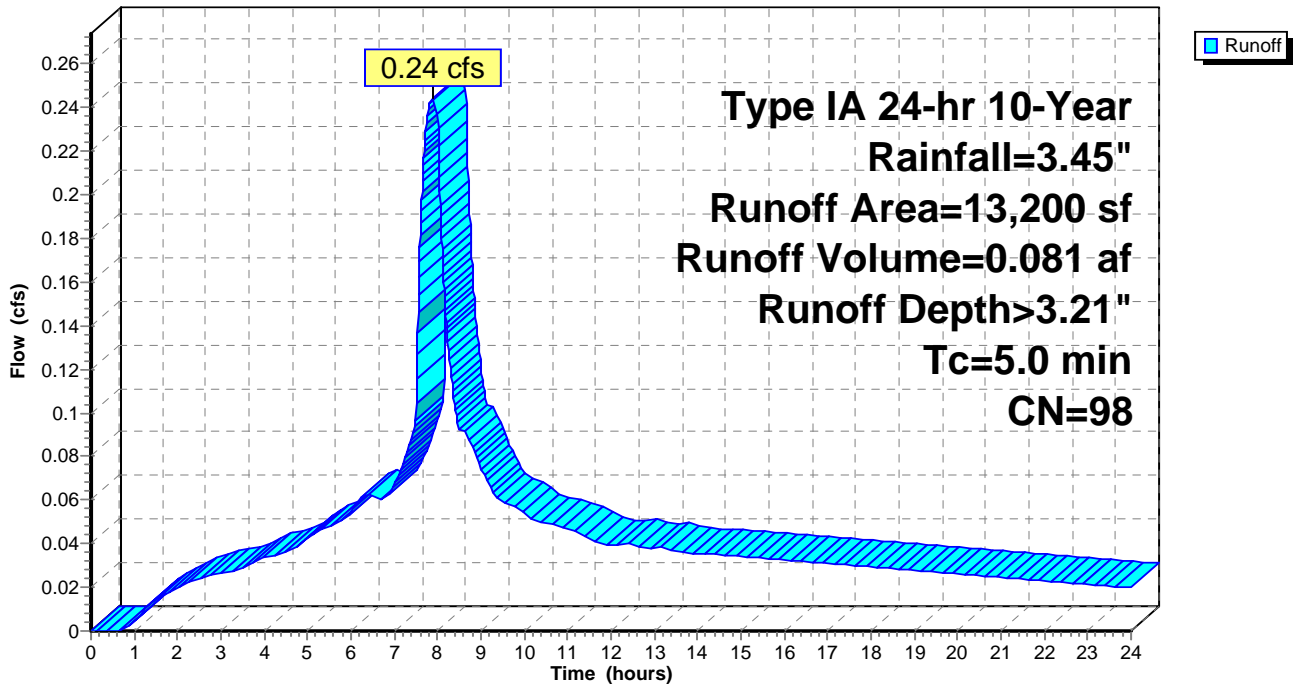
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 13,200	98	5 Lots at 2640 SF Impervious/Lot per CWS
13,200		Impervious Area

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

Subcatchment 7S: HOUSES 8-11 AND 16

Hydrograph



Summary for Subcatchment 8S: HOUSES 12-15

Runoff = 0.20 cfs @ 7.88 hrs, Volume= 0.065 af, Depth> 3.21"

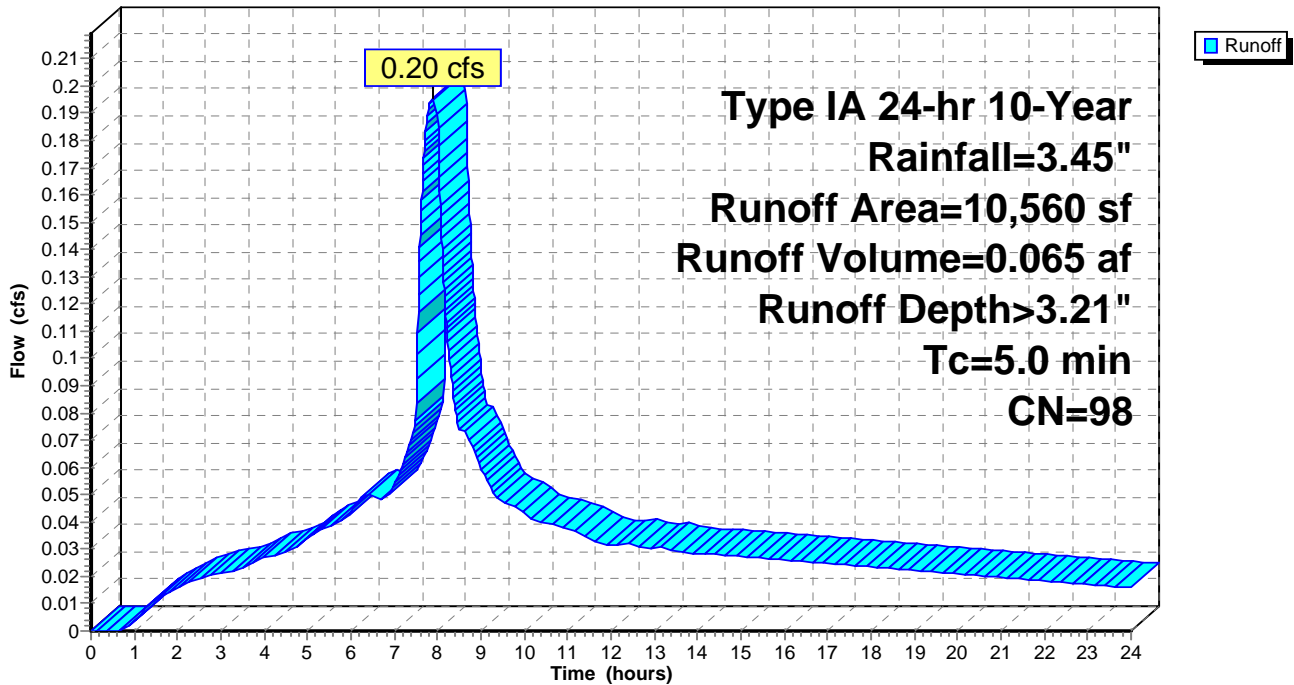
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 10,560	98	4 Lots at 2640 SF Impervious/Lot per CWS
10,560		Impervious Area

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

Subcatchment 8S: HOUSES 12-15

Hydrograph



Summary for Subcatchment 9S1: SW HELENIUS EAST

Runoff = 0.13 cfs @ 7.89 hrs, Volume= 0.043 af, Depth> 2.88"

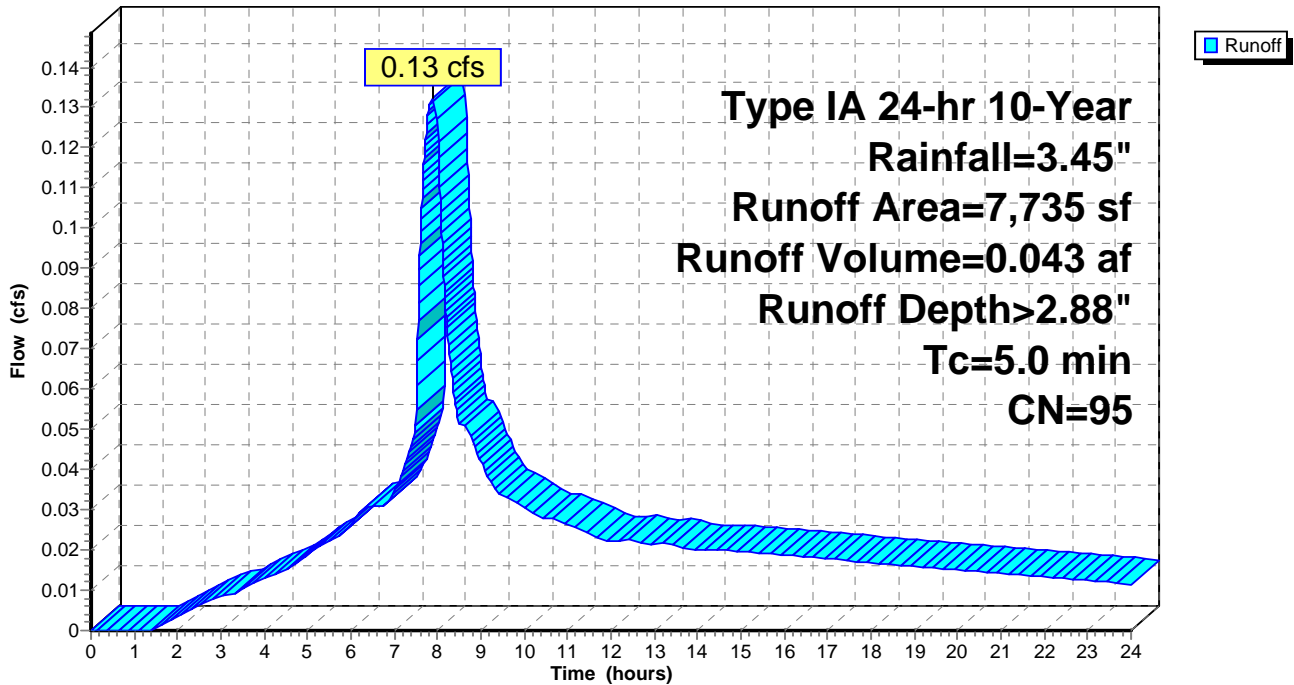
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	6,616	98	Streets and sidewalks
	1,119	79	50-75% Grass cover, Fair, HSG C
	7,735	95	Weighted Average
	1,119		Pervious Area
	6,616		Impervious Area

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

Subcatchment 9S1: SW HELENIUS EAST

Hydrograph



Summary for Subcatchment 9S2: LANDSCAPING

Runoff = 0.04 cfs @ 7.99 hrs, Volume= 0.014 af, Depth> 1.52"

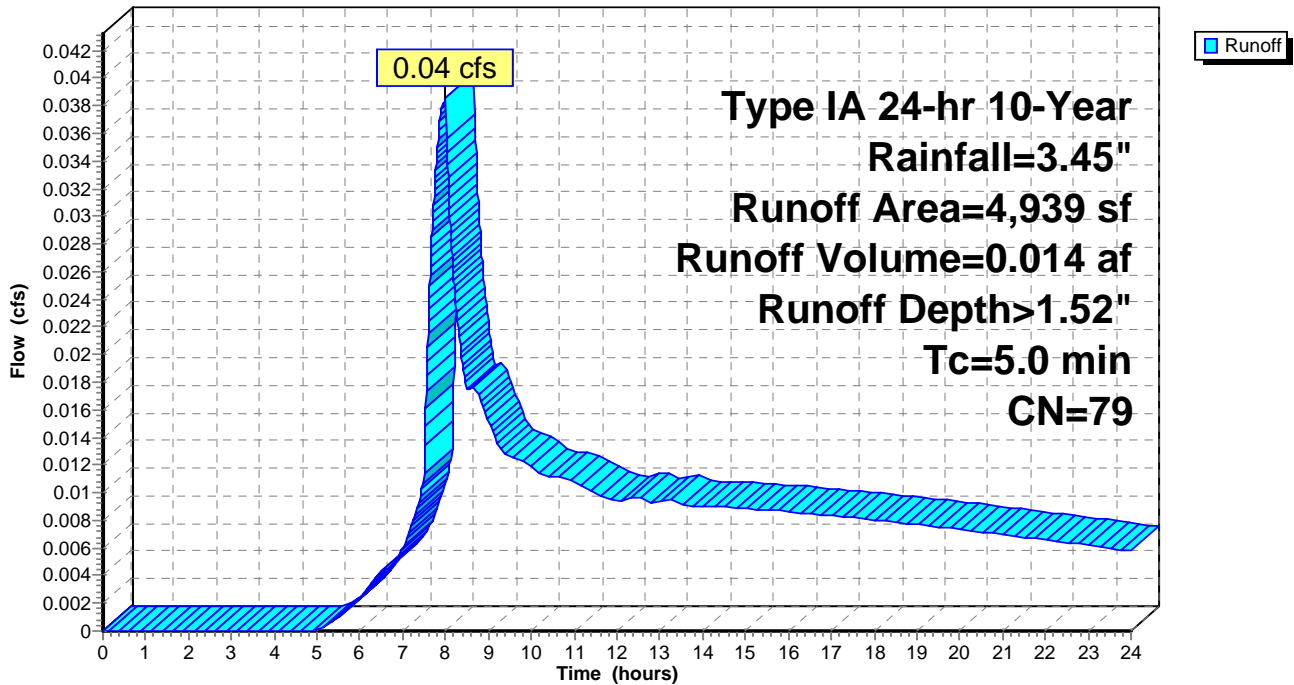
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
4,939	79	50-75% Grass cover, Fair, HSG C
4,939		Pervious Area

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

Subcatchment 9S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 100S: SW 112TH (SOUTH)

Runoff = 0.03 cfs @ 7.88 hrs, Volume= 0.009 af, Depth> 3.21"

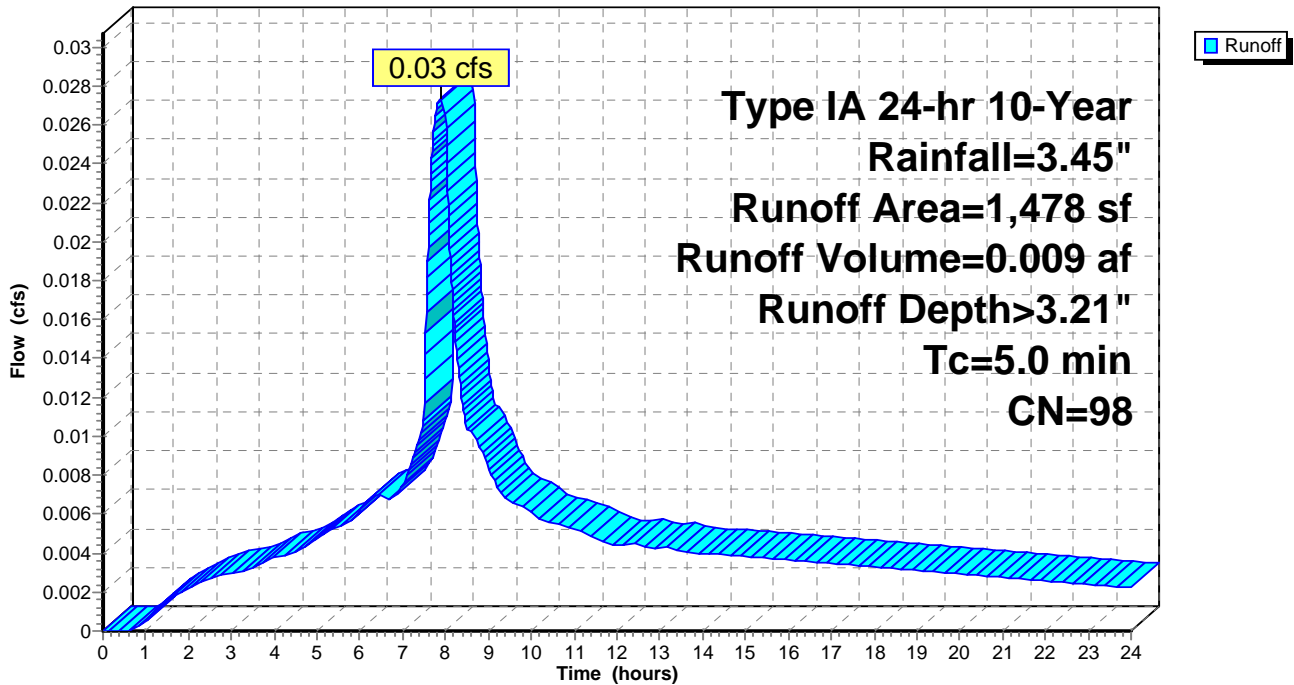
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 1,478	98	Street and sidewalk
1,478		Impervious Area

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

Subcatchment 100S: SW 112TH (SOUTH)

Hydrograph



Summary for Subcatchment 200S1: SW 112TH AVENUE

Runoff = 0.34 cfs @ 7.88 hrs, Volume= 0.113 af, Depth> 3.21"

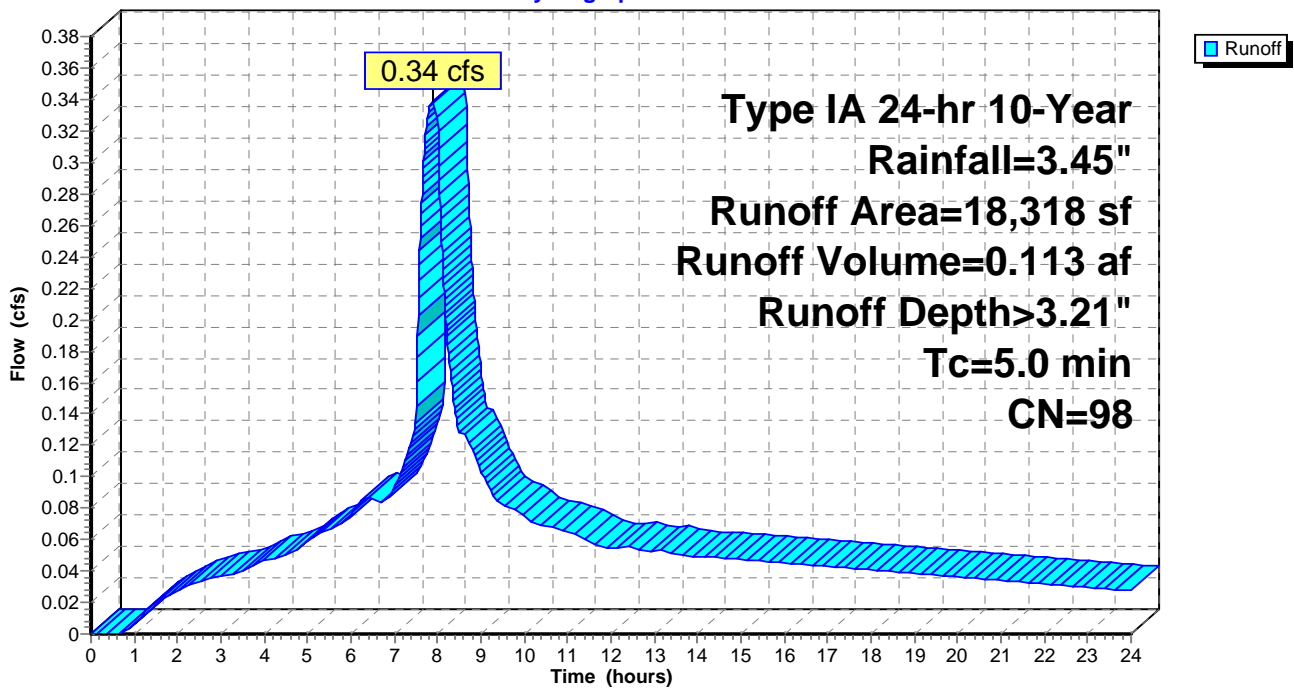
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 18,318	98	Street and sidewalk
18,318		Impervious Area

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

Subcatchment 200S1: SW 112TH AVENUE

Hydrograph



Summary for Subcatchment 200S2: LOT 9

Runoff = 0.06 cfs @ 7.89 hrs, Volume= 0.018 af, Depth> 2.99"

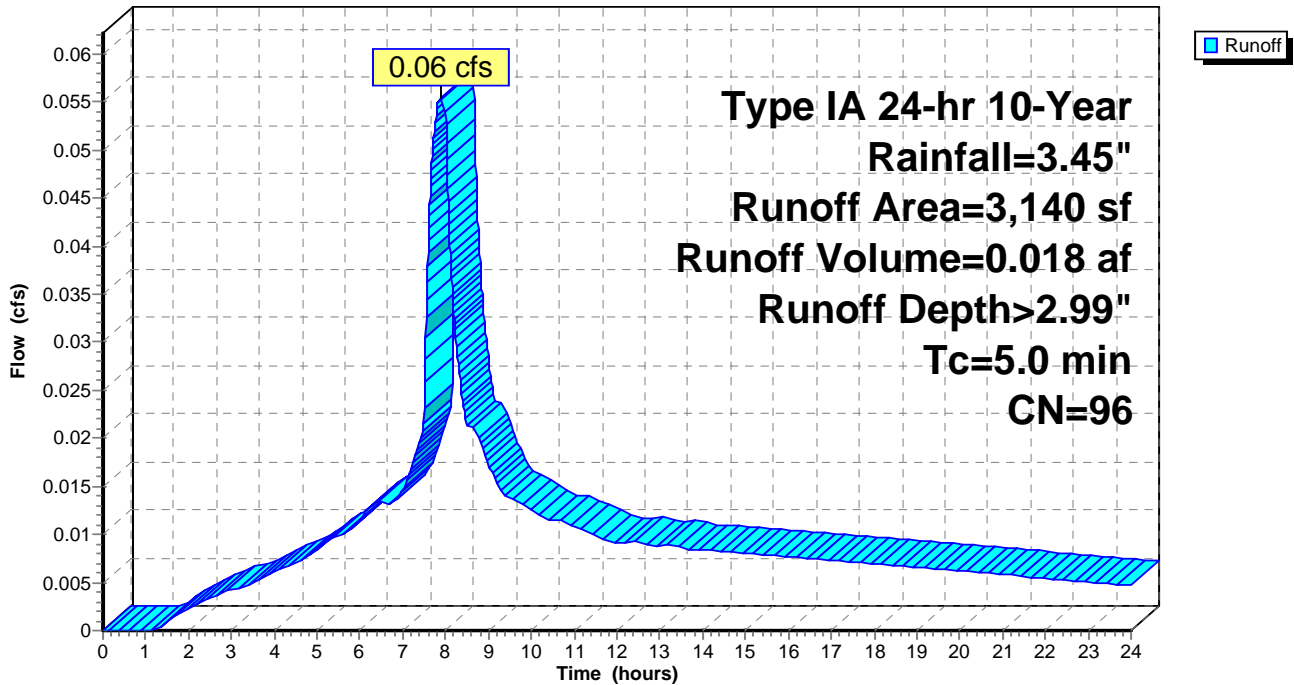
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
3,140	96	Weighted Average
500		Pervious Area
2,640		Impervious Area

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

Subcatchment 200S2: LOT 9

Hydrograph



Summary for Subcatchment 300S: LOT 8

Runoff = 0.05 cfs @ 7.88 hrs, Volume= 0.017 af, Depth> 3.10"

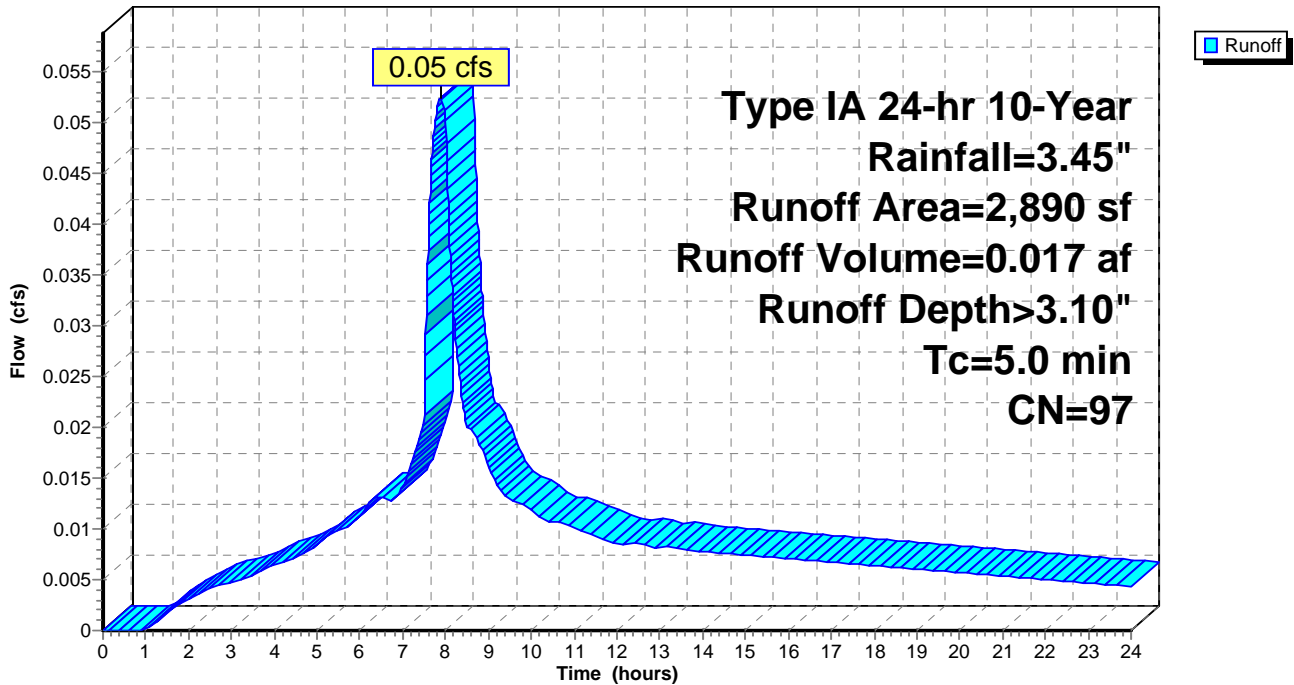
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 300S: LOT 8

Hydrograph



Summary for Subcatchment 400S: LOTS 6 - 7

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af, Depth> 3.10"

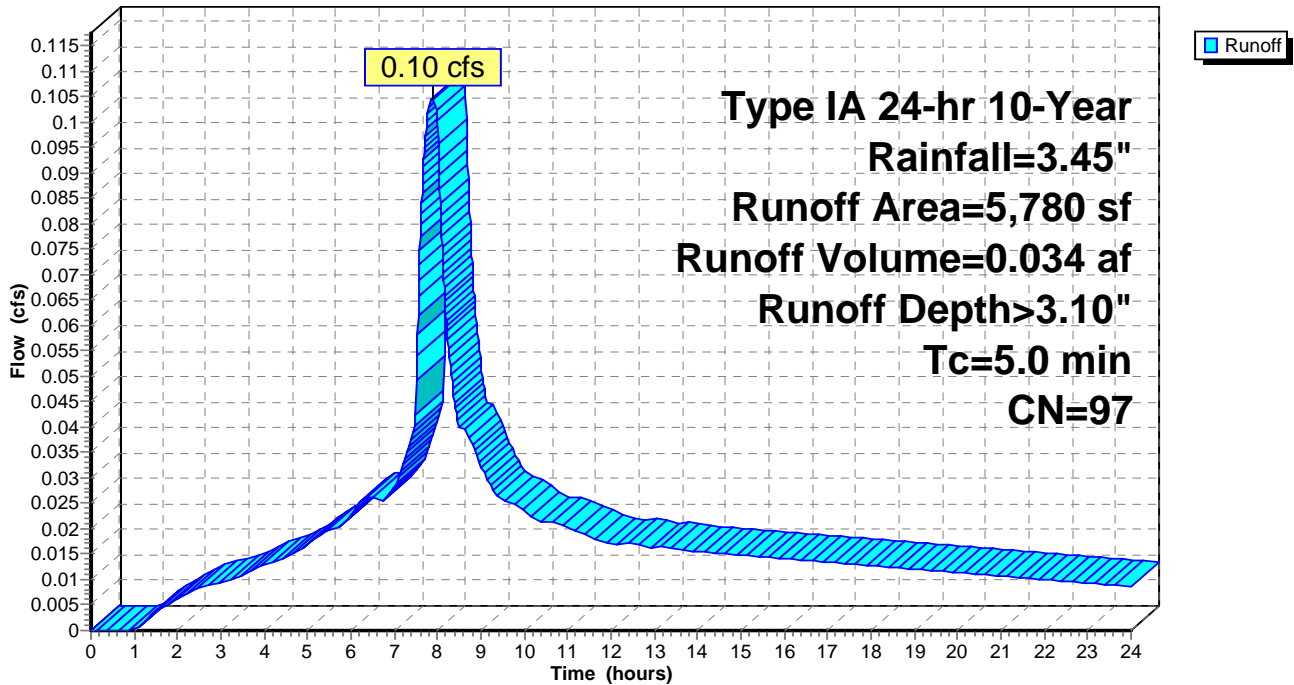
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 400S: LOTS 6 - 7

Hydrograph



Summary for Subcatchment 500S: LOT 5

Runoff = 0.05 cfs @ 7.88 hrs, Volume= 0.017 af, Depth> 3.10"

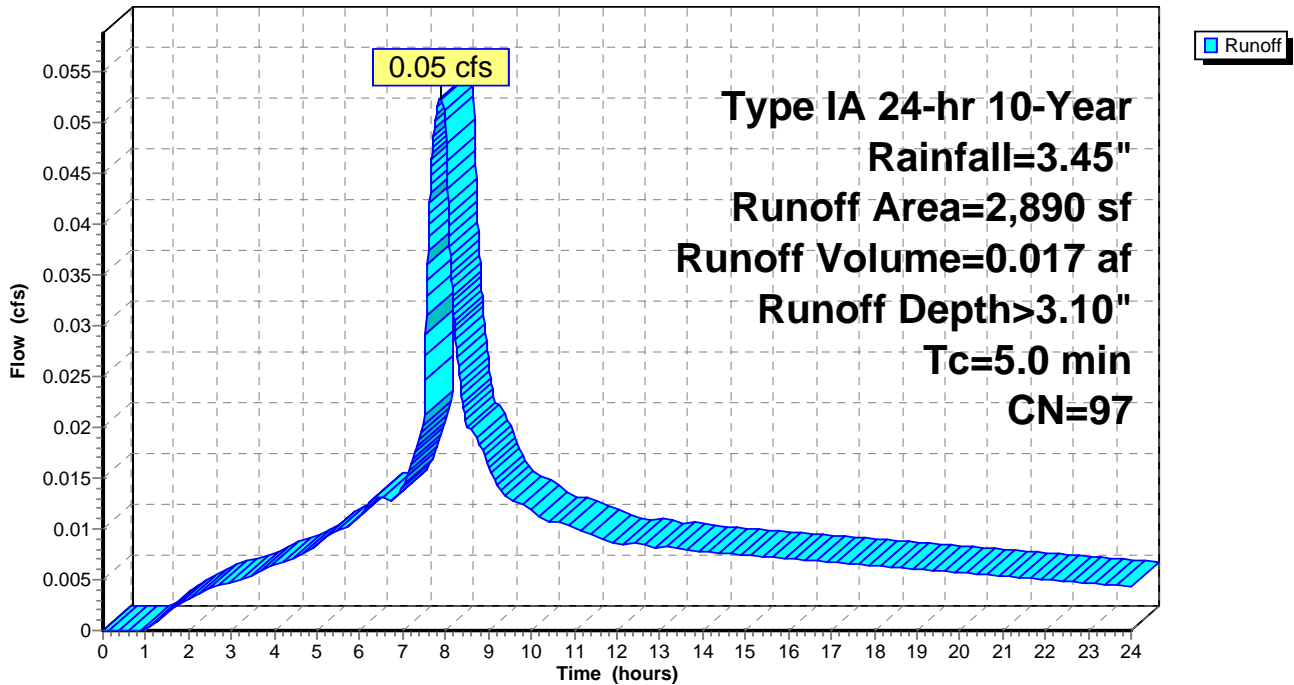
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 500S: LOT 5

Hydrograph



Summary for Subcatchment 600S: LOTS 3 - 4

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af, Depth> 3.10"

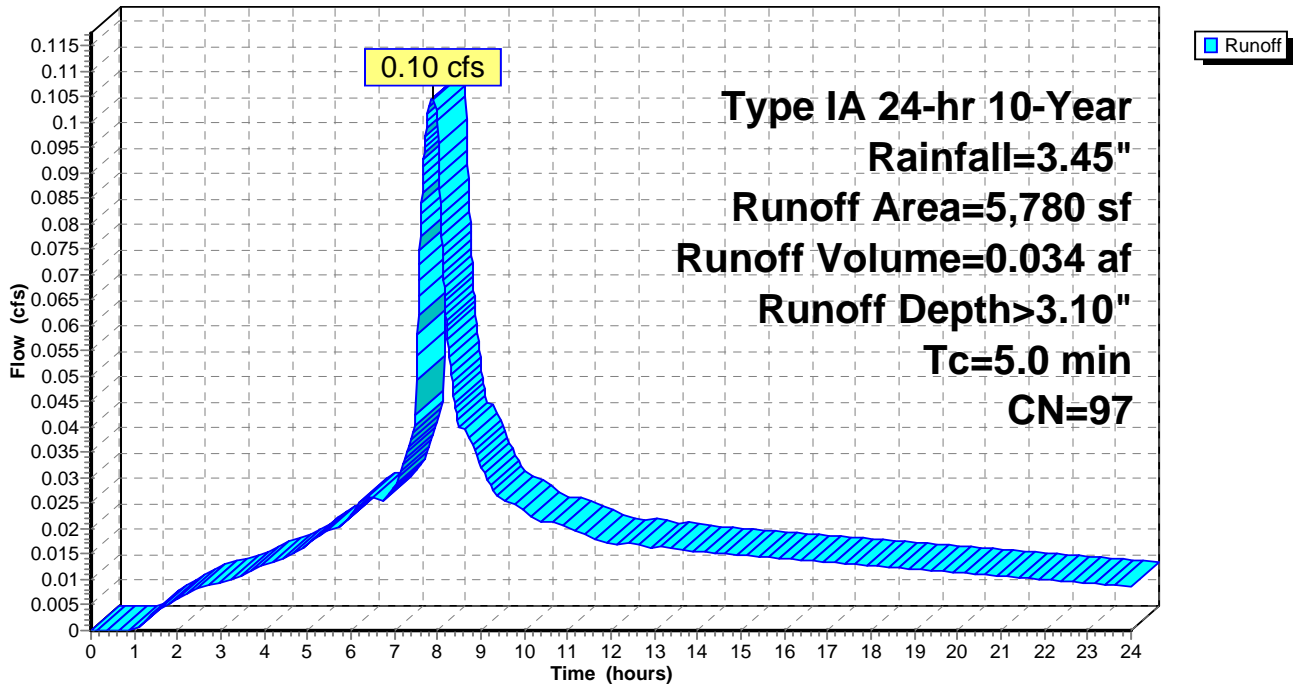
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 600S: LOTS 3 - 4

Hydrograph



Summary for Subcatchment 700S1: LOTS LANDSCAPING AND ROAD

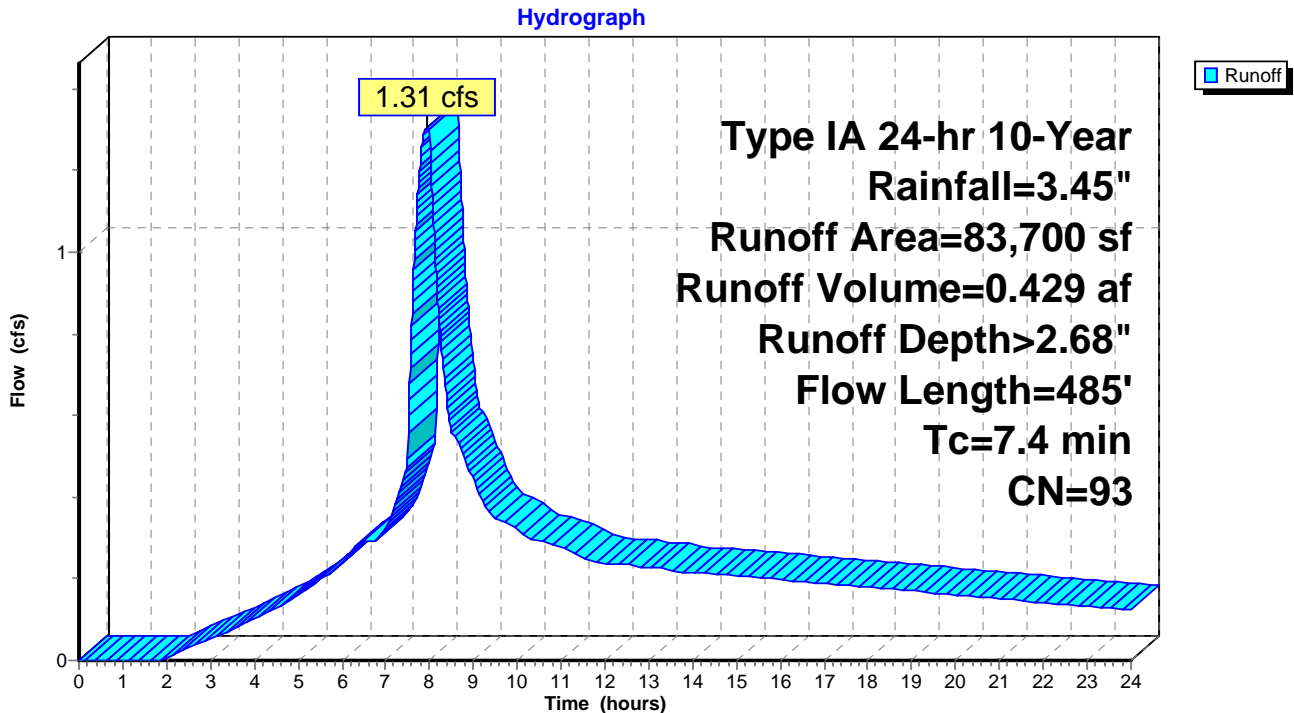
Runoff = 1.31 cfs @ 7.94 hrs, Volume= 0.429 af, Depth> 2.68"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	26,696	98	Street and sidewalk
*	23,760	98	9 Lots at 2640 SF Impervious/Lot per CWS
	33,244	86	<50% Grass cover, Poor, HSG C
	83,700	93	Weighted Average
	33,244		Pervious Area
	50,456		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	85	0.1000	0.28		Sheet Flow, LANDSCAPE Grass: Short n= 0.150 P2= 2.50"
2.3	400	0.0200	2.87		Shallow Concentrated Flow, GUTTER Paved Kv= 20.3 fps
7.4	485	Total			

Subcatchment 700S1: LOTS LANDSCAPING AND ROAD



Summary for Subcatchment 700S2: LOTS 1 - 2

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af, Depth> 3.10"

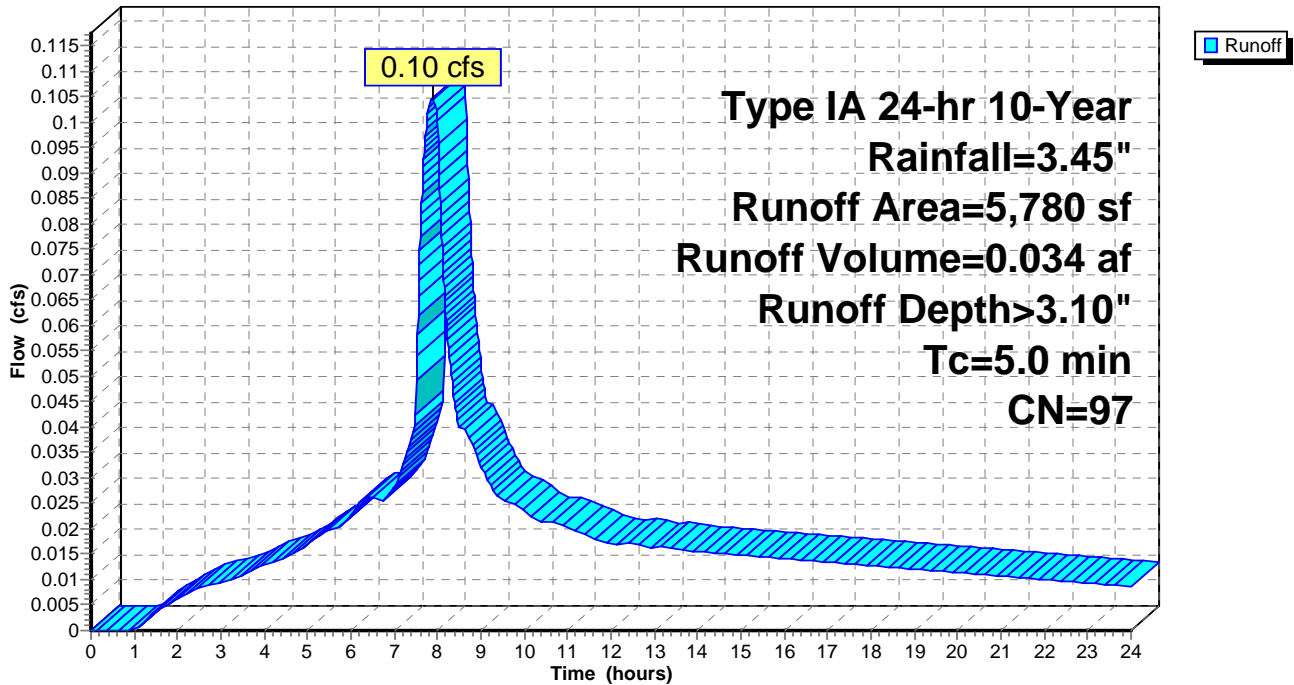
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 700S2: LOTS 1 - 2

Hydrograph



Summary for Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.034 af, Depth> 3.10"

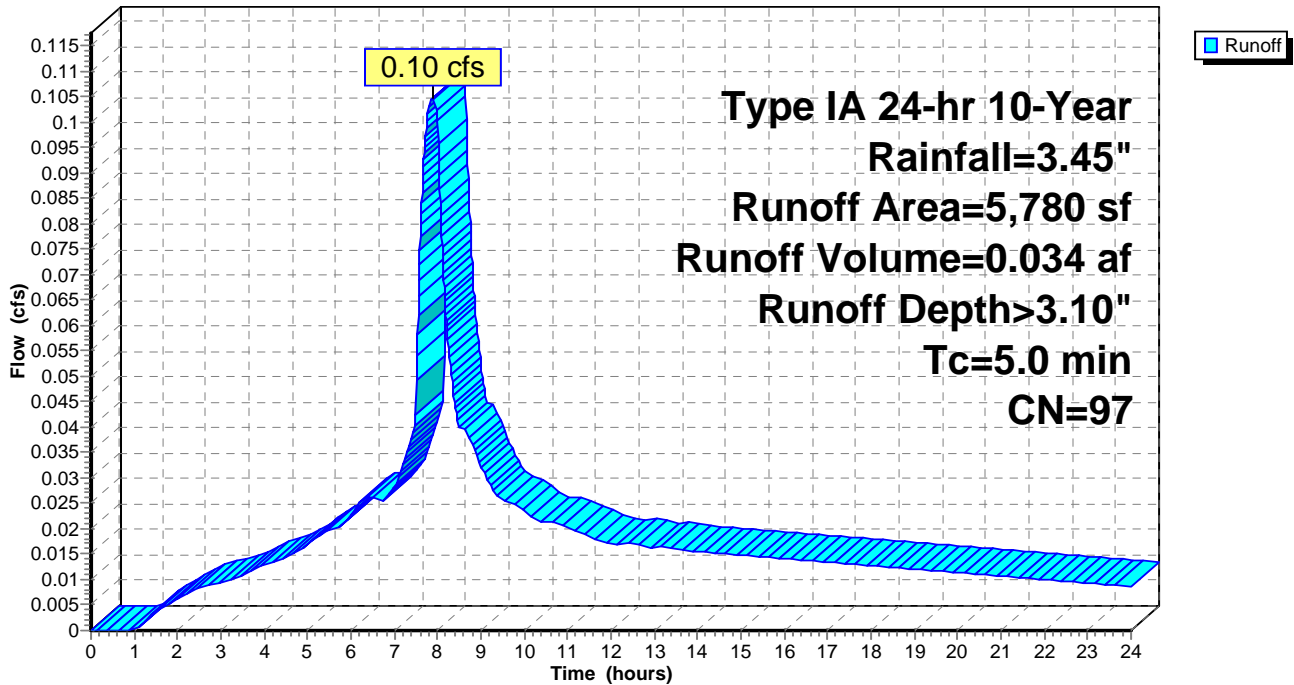
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Runoff = 0.05 cfs @ 7.88 hrs, Volume= 0.017 af, Depth> 3.10"

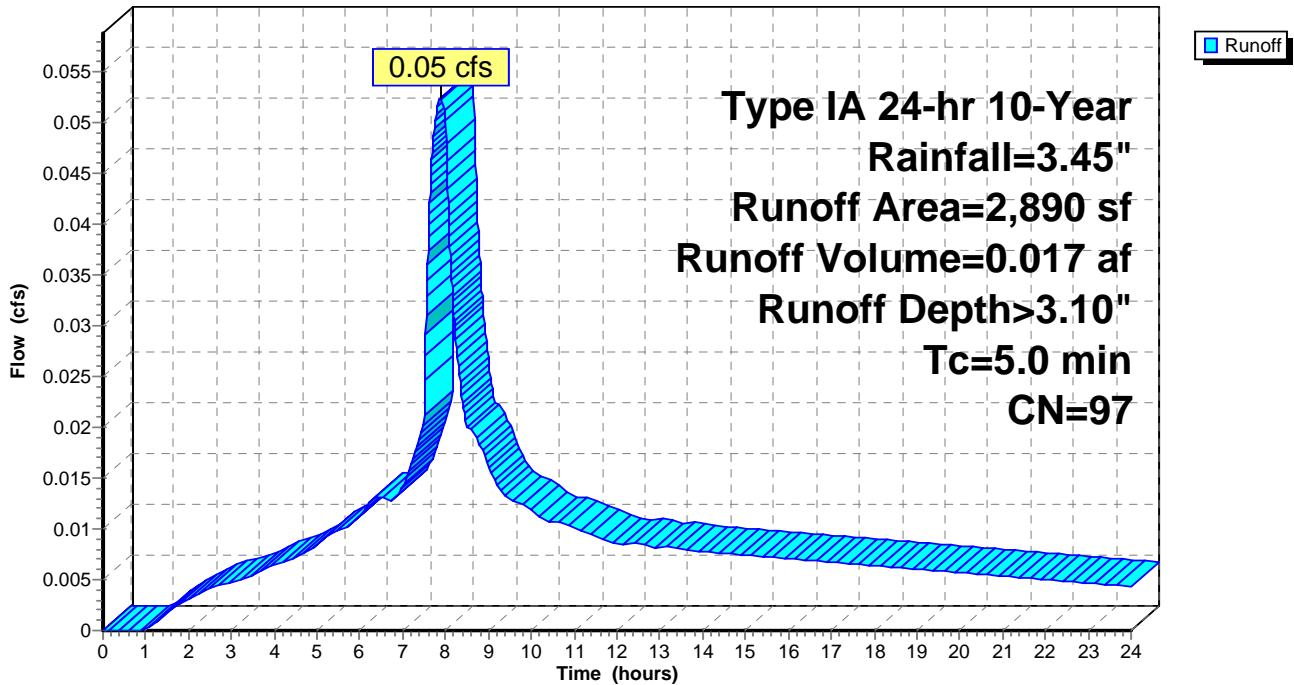
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 1100S: 2 HOUSES

Runoff = 0.10 cfs @ 7.88 hrs, Volume= 0.032 af, Depth> 3.21"

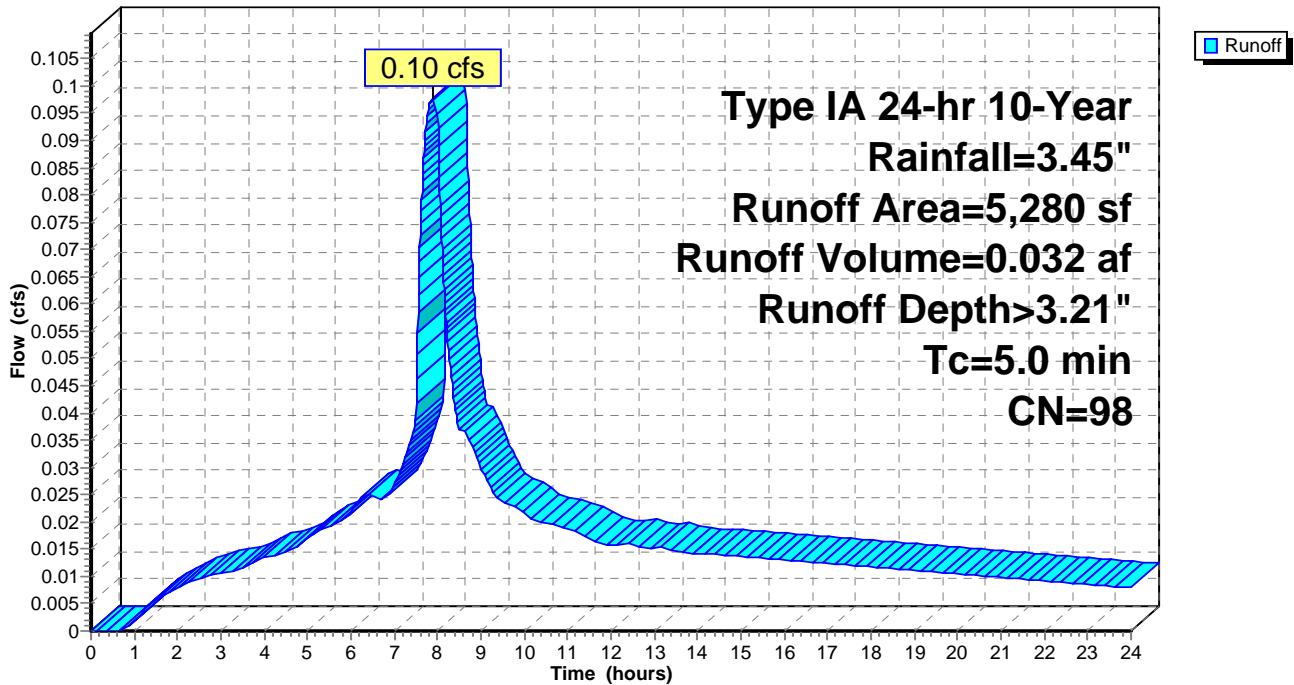
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 1100S: 2 HOUSES

Hydrograph



Summary for Subcatchment 1200S: 3 HOUSES

Runoff = 0.15 cfs @ 7.88 hrs, Volume= 0.049 af, Depth> 3.21"

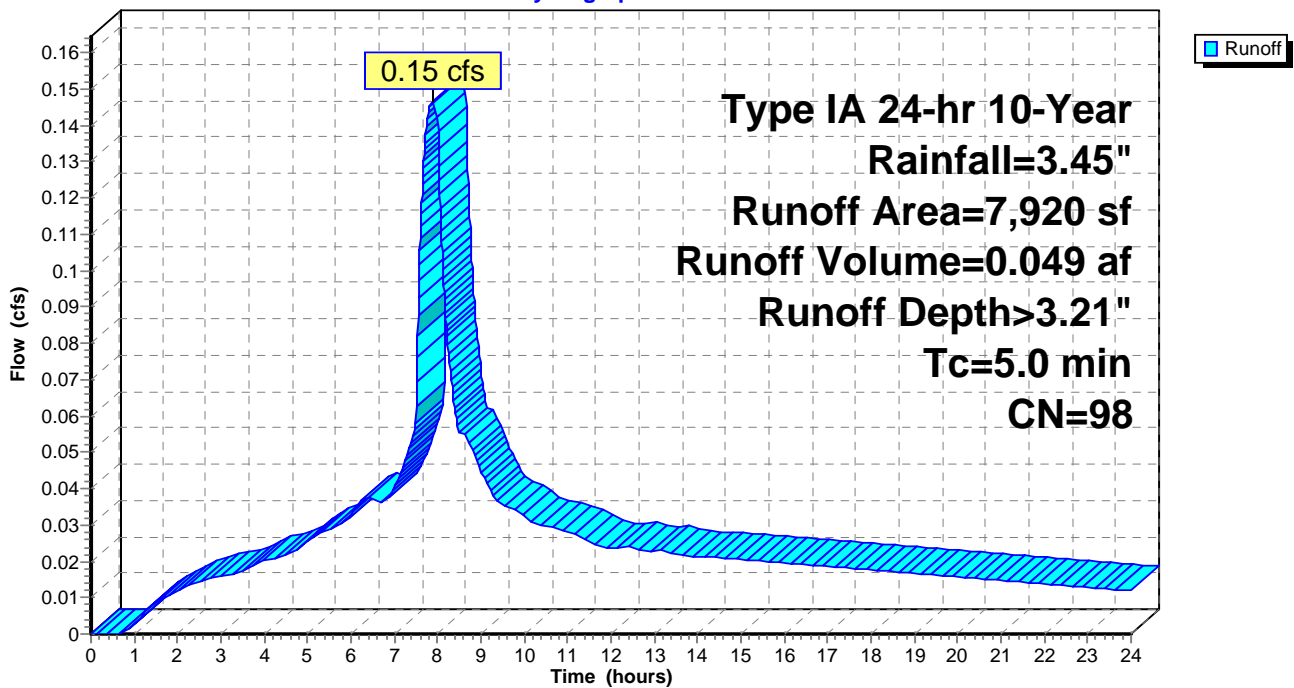
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
7,920		Impervious Area

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

Subcatchment 1200S: 3 HOUSES

Hydrograph



Summary for Subcatchment 1300S1: STREET

Runoff = 0.50 cfs @ 7.88 hrs, Volume= 0.167 af, Depth> 3.21"

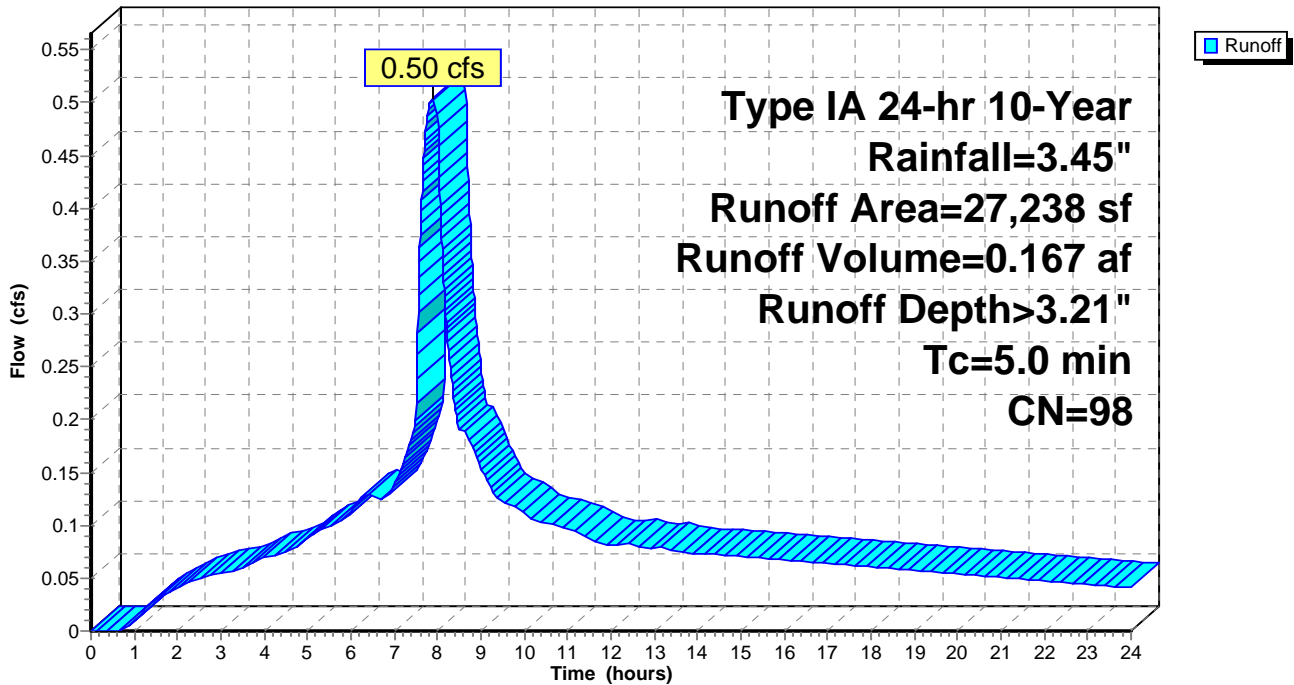
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 27,238	98	Street and sidewalk
27,238		Impervious Area

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

Subcatchment 1300S1: STREET

Hydrograph



Summary for Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Runoff = 0.40 cfs @ 7.96 hrs, Volume= 0.141 af, Depth> 1.81"

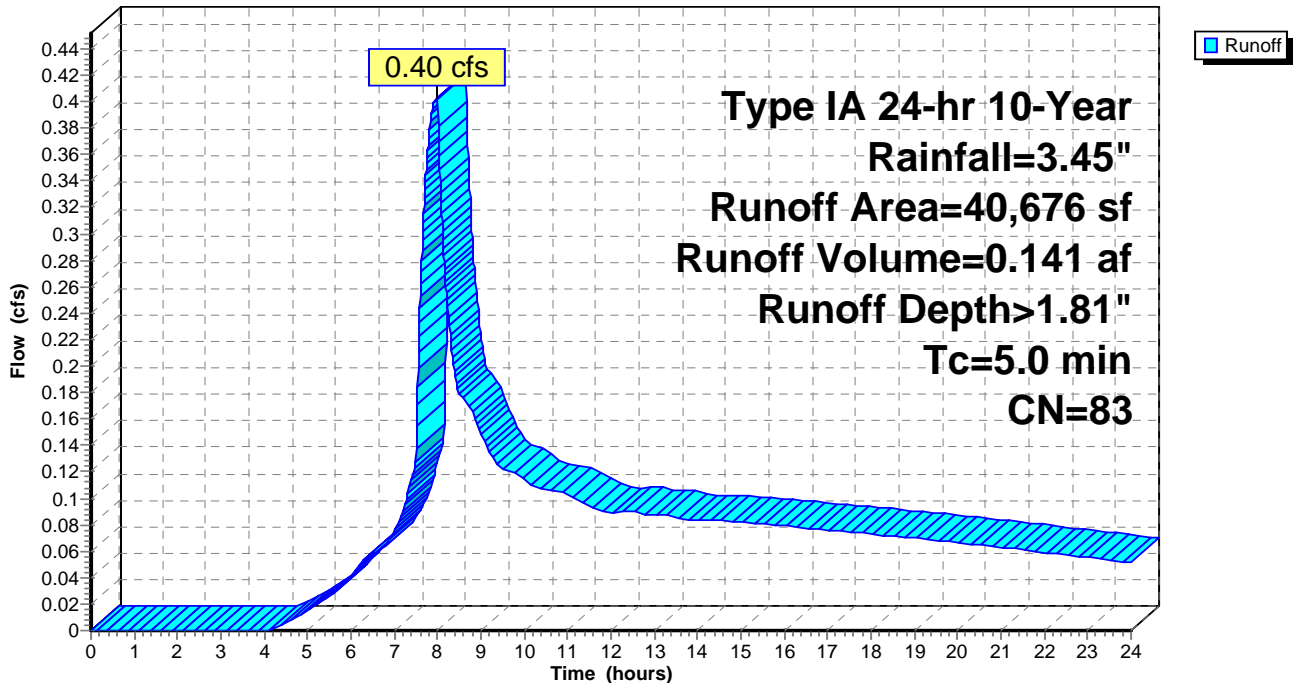
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

	Area (sf)	CN	Description
*	7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
	32,756	79	50-75% Grass cover, Fair, HSG C
	40,676	83	Weighted Average
	32,756		Pervious Area
	7,920		Impervious Area

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

Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Hydrograph



Summary for Subcatchment 1300S3: LANDSCAPING AND HOUSES

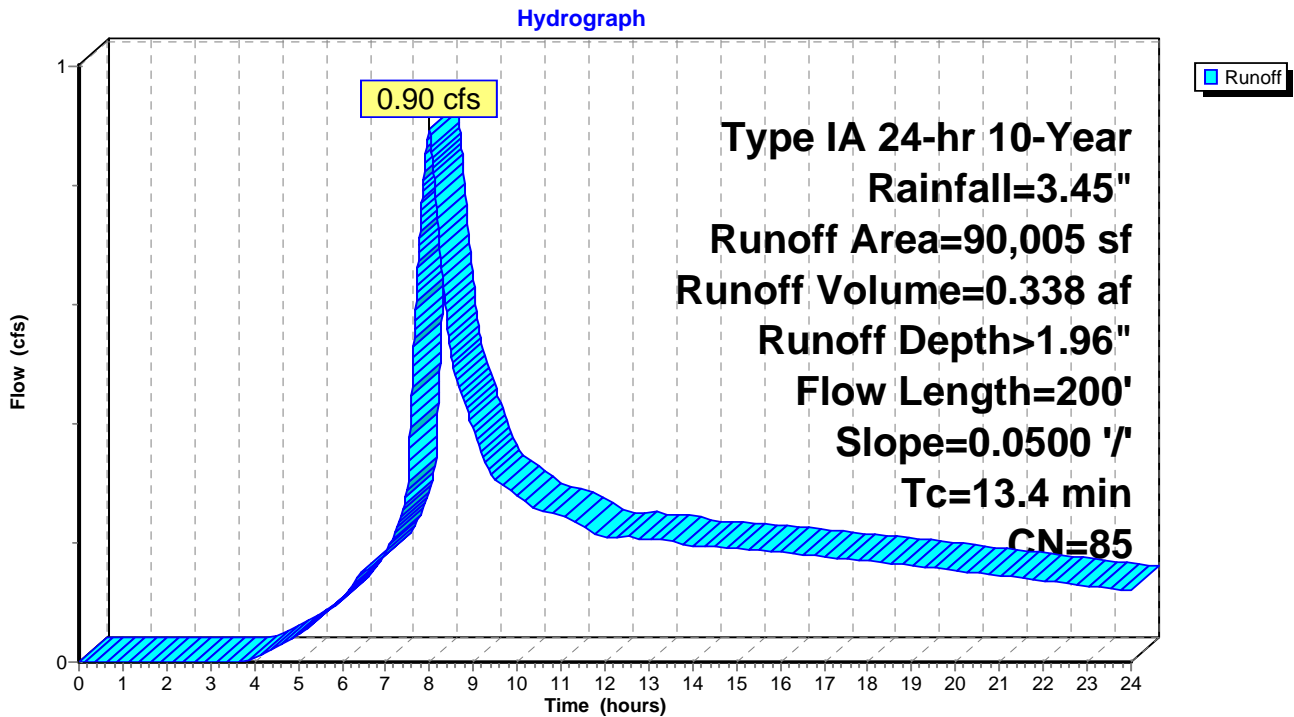
Runoff = 0.90 cfs @ 8.00 hrs, Volume= 0.338 af, Depth> 1.96"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
26,400	98	10 Lots at 2640 SF Impervious/Lot per CWS
63,605	79	50-75% Grass cover, Fair, HSG C
90,005	85	Weighted Average
63,605		Pervious Area
26,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	200	0.0500	0.25		Sheet Flow, LANDSCAPING SHEET FLOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 1300S3: LANDSCAPING AND HOUSES



Summary for Subcatchment 1900S1: POND SURFACE

Runoff = 7.07 cfs @ 7.87 hrs, Volume= 2.464 af, Depth> 3.44"

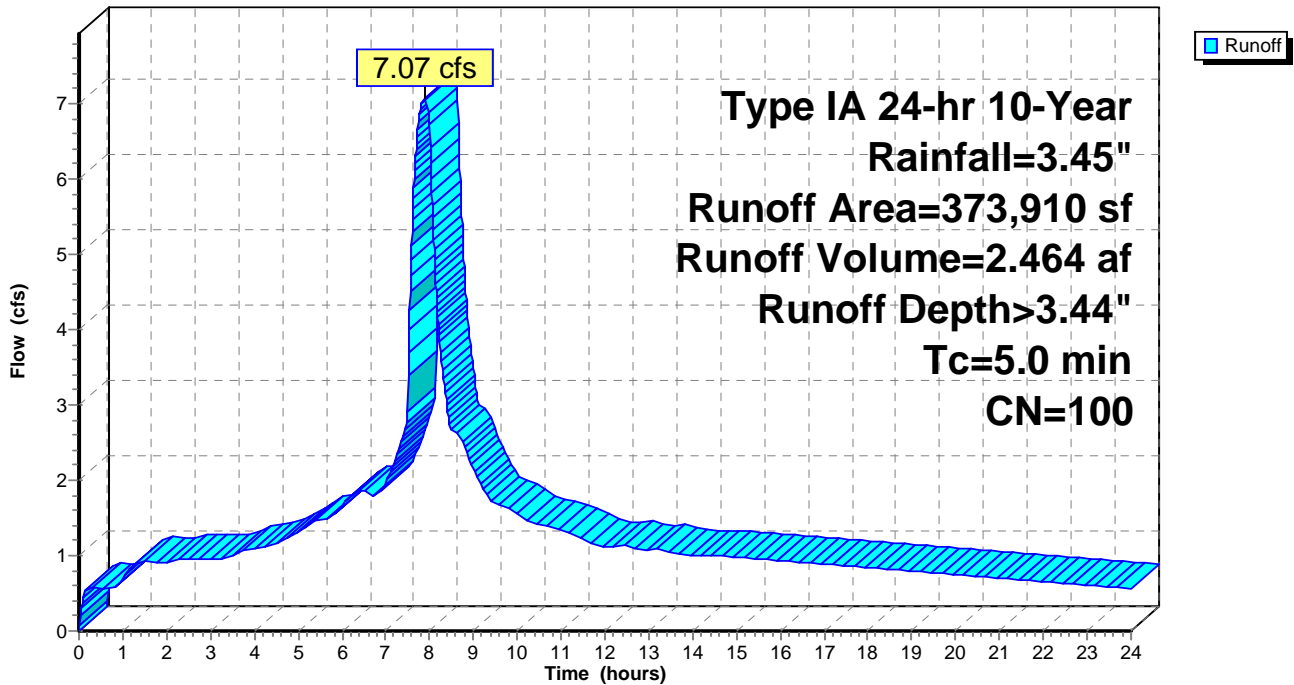
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
* 373,910	100	Water Surface
373,910		Impervious Area

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

Subcatchment 1900S1: POND SURFACE

Hydrograph



Summary for Subcatchment 1900S2: WOODED/ VEGETATED AREA

Runoff = 0.80 cfs @ 8.01 hrs, Volume= 0.417 af, Depth> 1.08"

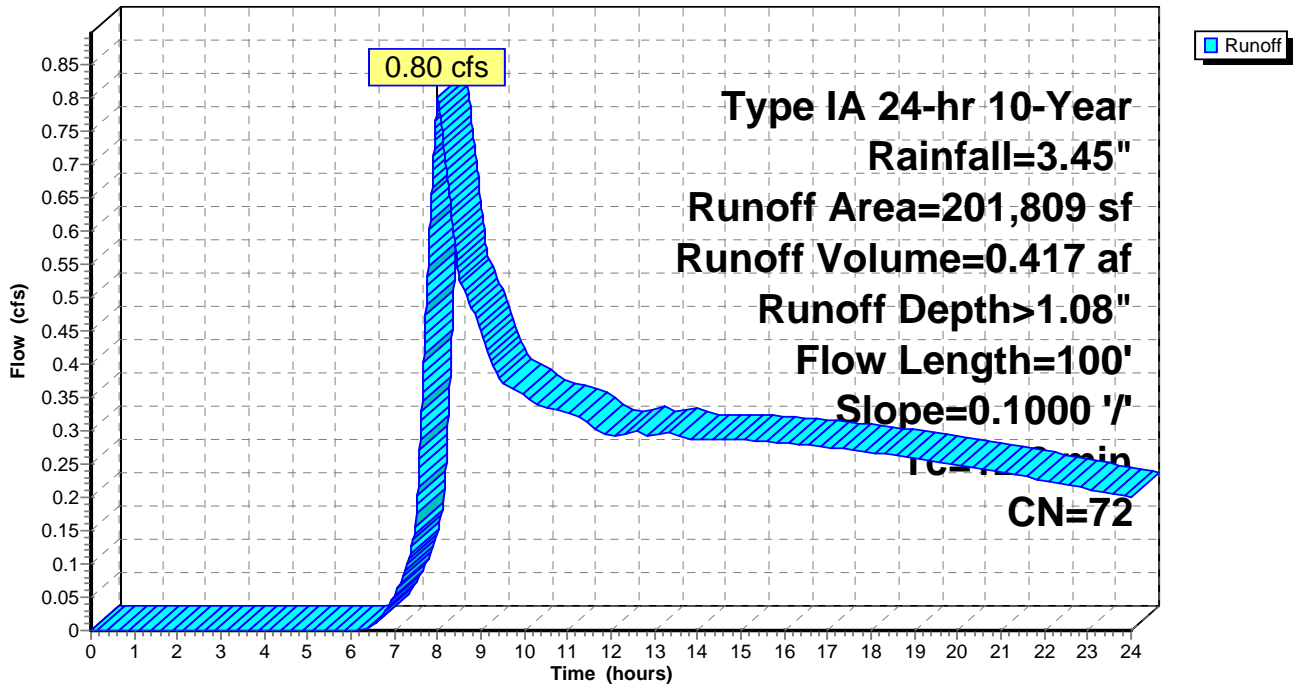
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
201,809	72	Woods/grass comb., Good, HSG C
201,809		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.50"

Subcatchment 1900S2: WOODED/ VEGETATED AREA

Hydrograph



Summary for Subcatchment 1900S3: DEVELOPMENT

Runoff = 17.80 cfs @ 8.01 hrs, Volume= 8.096 af, Depth> 1.72"

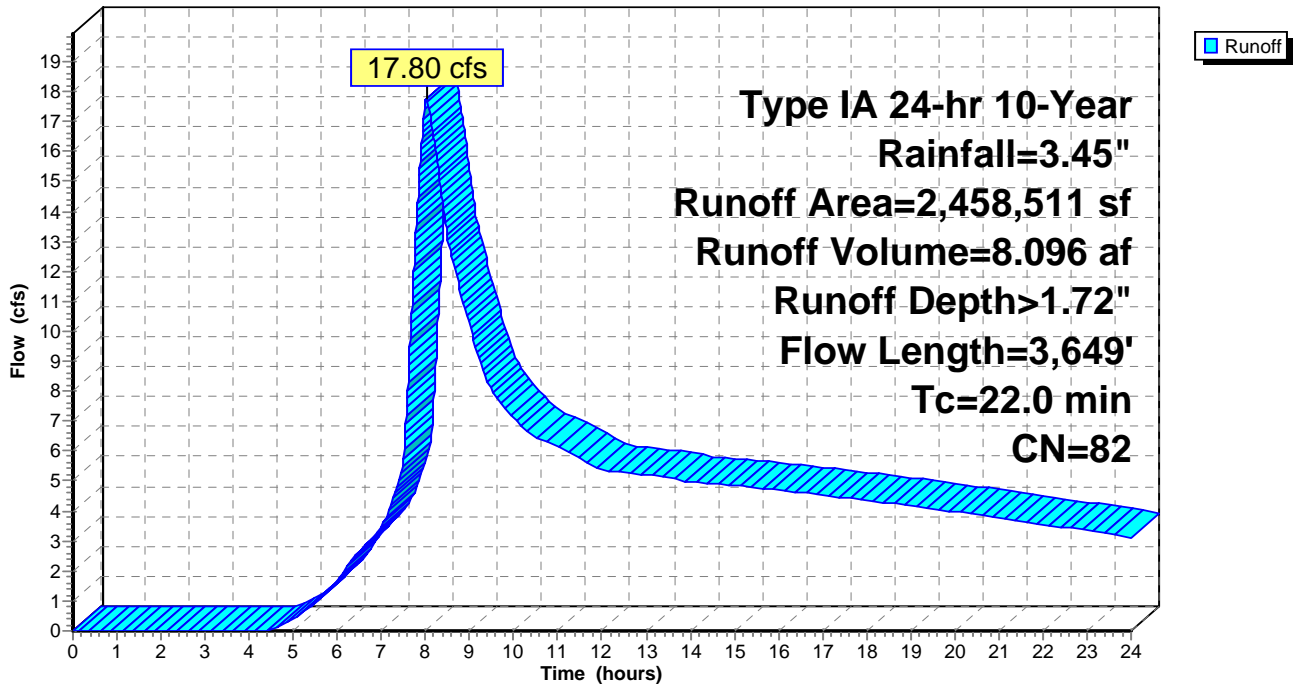
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
2,289,111	83	1/4 acre lots, 38% imp, HSG C
169,400	75	1/4 acre lots, 38% imp, HSG B
2,458,511	82	Weighted Average
1,524,277		Pervious Area
934,234		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	250	0.0500	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.50"
6.0	3,399	0.0435	9.46	7.43	Circular Channel (pipe), Conveyance Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
22.0	3,649	Total			

Subcatchment 1900S3: DEVELOPMENT

Hydrograph



Summary for Pond 1R: 12"

Inflow Area = 5.054 ac, 44.94% Impervious, Inflow Depth > 2.07" for 10-Year event
 Inflow = 1.48 cfs @ 8.30 hrs, Volume= 0.873 af
 Outflow = 1.48 cfs @ 8.30 hrs, Volume= 0.873 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.48 cfs @ 8.30 hrs, Volume= 0.873 af

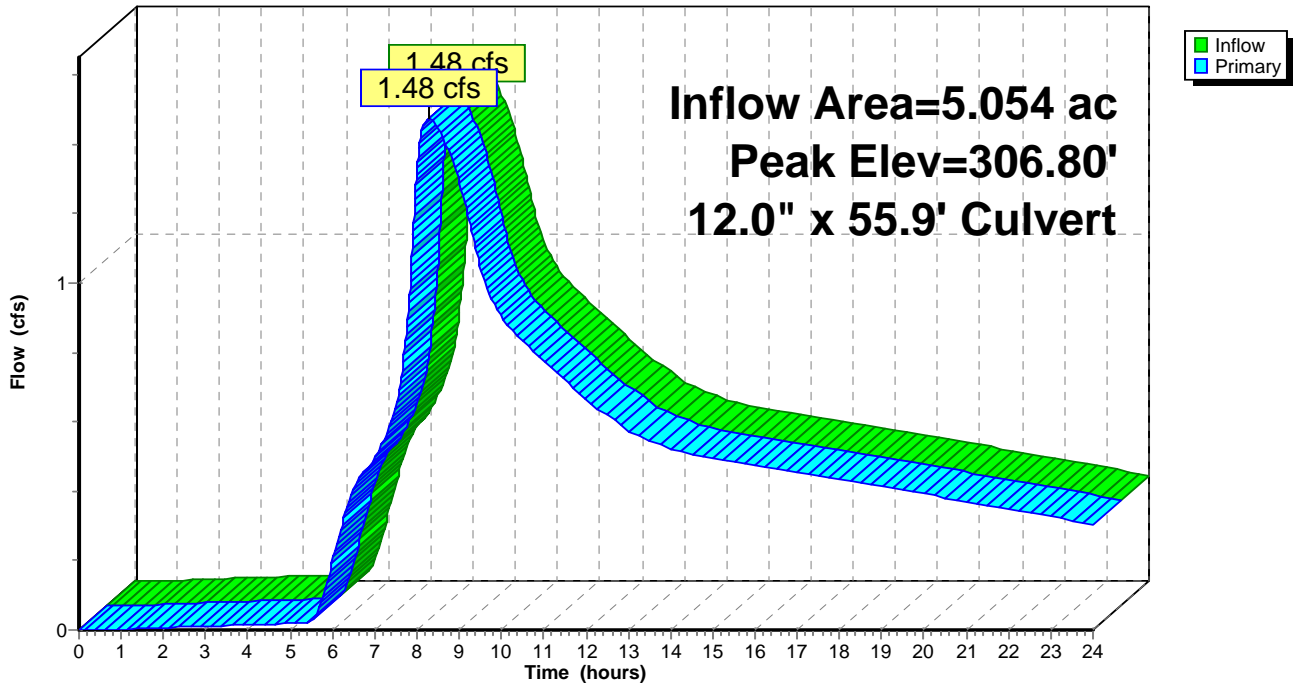
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.80' @ 8.30 hrs
 Flood Elev= 312.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	306.03'	12.0" x 55.9' long Culvert Ke= 0.500 Outlet Invert= 305.75' S= 0.0050 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.48 cfs @ 8.30 hrs HW=306.80' (Free Discharge)
 ↳1=Culvert (Barrel Controls 1.48 cfs @ 3.15 fps)

Pond 1R: 12"

Hydrograph



Summary for Pond 2R: 12"

Inflow Area = 3.582 ac, 60.15% Impervious, Inflow Depth > 2.51" for 10-Year event
 Inflow = 2.23 cfs @ 7.91 hrs, Volume= 0.748 af
 Outflow = 2.23 cfs @ 7.91 hrs, Volume= 0.748 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.23 cfs @ 7.91 hrs, Volume= 0.748 af

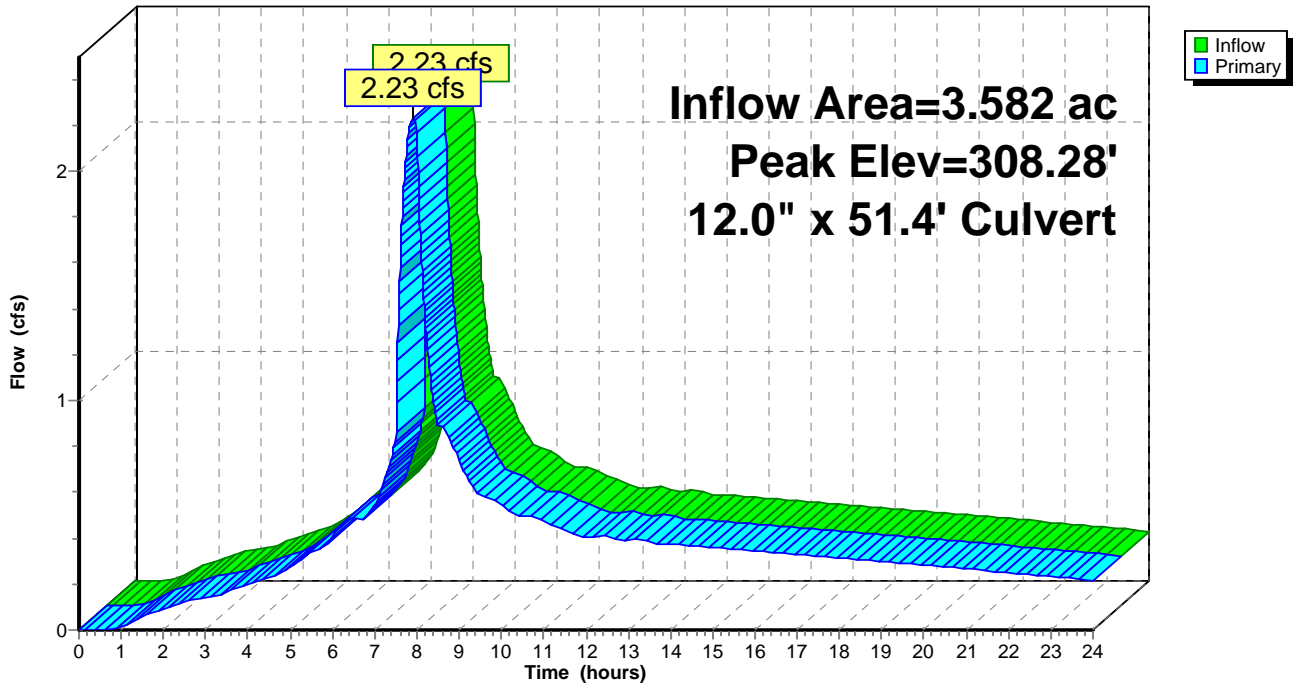
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.28' @ 7.91 hrs
 Flood Elev= 312.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.26'	12.0" x 51.4' long Culvert Ke= 0.500 Outlet Invert= 307.00' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.23 cfs @ 7.91 hrs HW=308.28' (Free Discharge)
 ↳ **1=Culvert** (Barrel Controls 2.23 cfs @ 3.47 fps)

Pond 2R: 12"

Hydrograph



Summary for Pond 3R: 12"

Inflow Area = 0.818 ac, 58.69% Impervious, Inflow Depth > 2.46" for 10-Year event
 Inflow = 0.50 cfs @ 7.91 hrs, Volume= 0.168 af
 Outflow = 0.50 cfs @ 7.91 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.50 cfs @ 7.91 hrs, Volume= 0.168 af

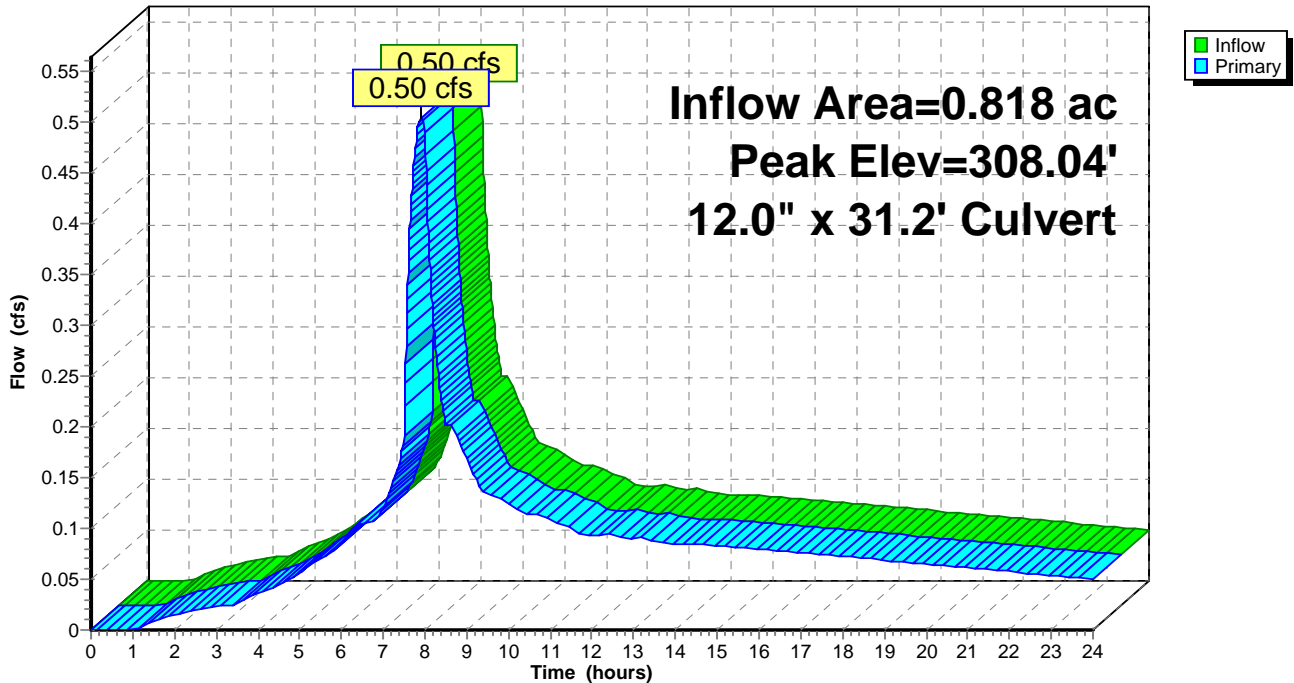
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.04' @ 7.91 hrs
 Flood Elev= 311.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.62'	12.0" x 31.2' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.50 cfs @ 7.91 hrs HW=308.04' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.50 cfs @ 2.37 fps)

Pond 3R: 12"

Hydrograph



Summary for Pond 4R: 12"

Inflow Area = 2.582 ac, 59.83% Impervious, Inflow Depth > 2.51" for 10-Year event
 Inflow = 1.60 cfs @ 7.91 hrs, Volume= 0.540 af
 Outflow = 1.60 cfs @ 7.91 hrs, Volume= 0.540 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.60 cfs @ 7.91 hrs, Volume= 0.540 af

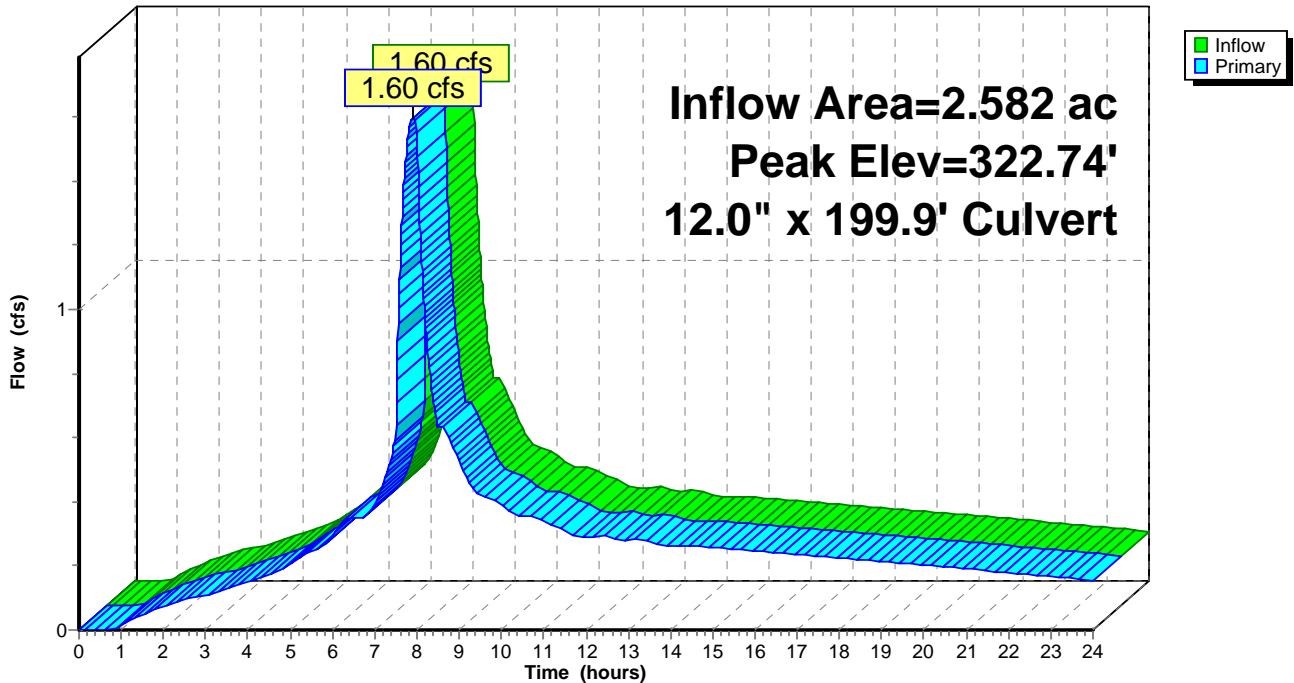
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 322.74' @ 7.91 hrs
 Flood Elev= 329.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.06'	12.0" x 199.9' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0730 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.60 cfs @ 7.91 hrs HW=322.74' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.60 cfs @ 2.81 fps)

Pond 4R: 12"

Hydrograph



Summary for Pond 5R: 12"

Inflow Area = 2.015 ac, 56.71% Impervious, Inflow Depth > 2.47" for 10-Year event
 Inflow = 1.22 cfs @ 7.91 hrs, Volume= 0.415 af
 Outflow = 1.22 cfs @ 7.91 hrs, Volume= 0.415 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.22 cfs @ 7.91 hrs, Volume= 0.415 af

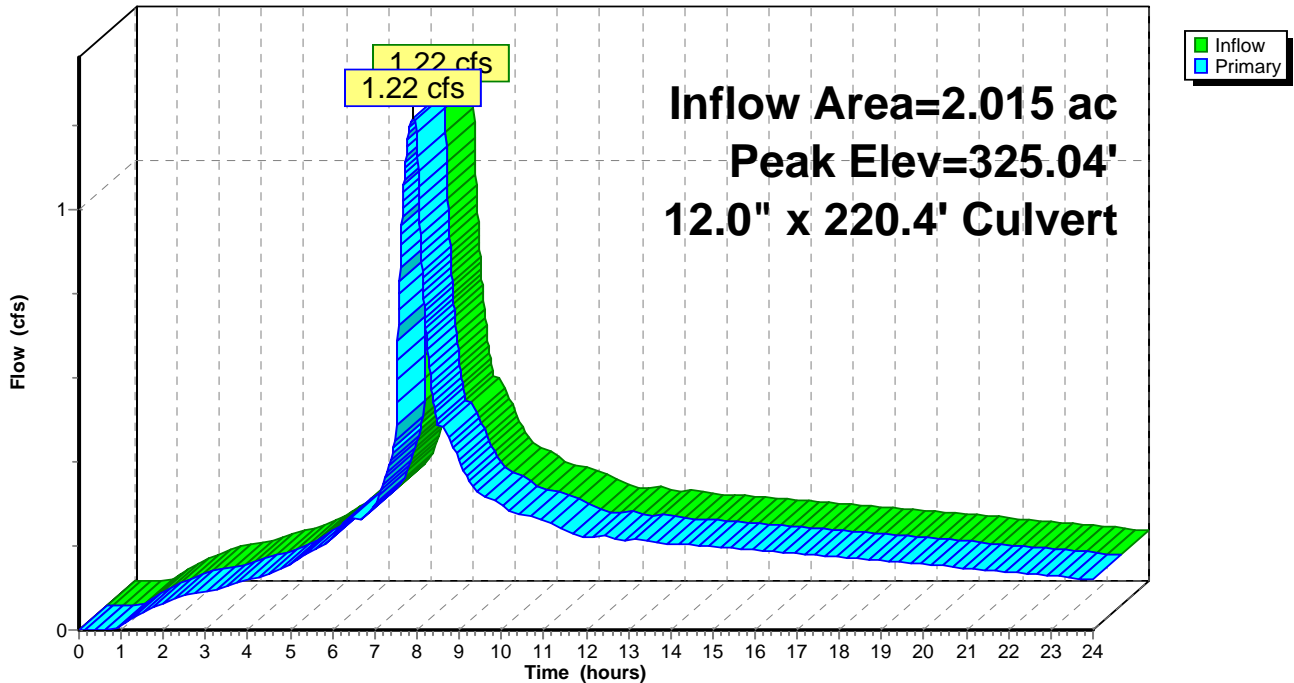
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 325.04' @ 7.91 hrs
 Flood Elev= 336.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	324.46'	12.0" x 220.4' long Culvert Ke= 0.500 Outlet Invert= 322.26' S= 0.0100 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.22 cfs @ 7.91 hrs HW=325.04' (Free Discharge)
 ↳1=Culvert (Inlet Controls 1.22 cfs @ 2.59 fps)

Pond 5R: 12"

Hydrograph



Summary for Pond 6R: 12"

Inflow Area = 1.603 ac, 54.26% Impervious, Inflow Depth > 2.44" for 10-Year event
 Inflow = 0.95 cfs @ 7.91 hrs, Volume= 0.326 af
 Outflow = 0.95 cfs @ 7.91 hrs, Volume= 0.326 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.95 cfs @ 7.91 hrs, Volume= 0.326 af

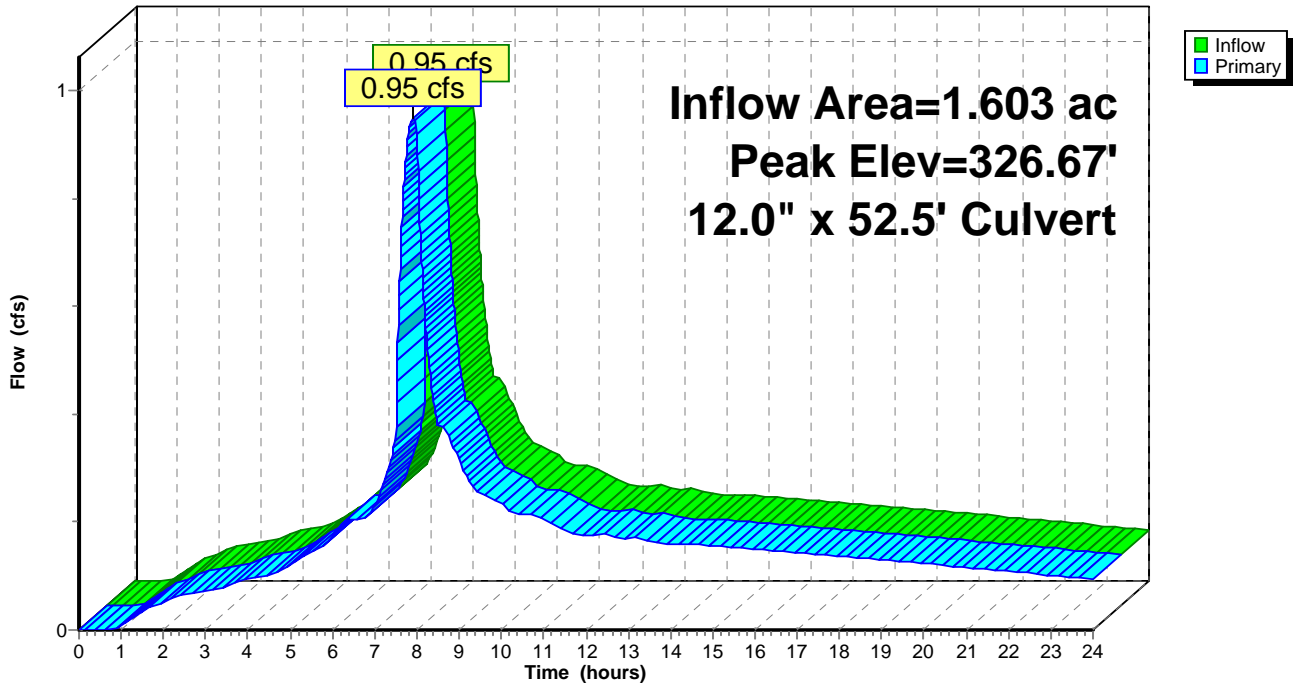
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.67' @ 7.91 hrs
 Flood Elev= 335.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.17'	12.0" x 52.5' long Culvert Ke= 0.500 Outlet Invert= 324.86' S= 0.0250 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.95 cfs @ 7.91 hrs HW=326.67' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.95 cfs @ 2.41 fps)

Pond 6R: 12"

Hydrograph



Summary for Pond 7R: 12"

Inflow Area = 0.545 ac, 100.00% Impervious, Inflow Depth > 3.21" for 10-Year event
 Inflow = 0.44 cfs @ 7.88 hrs, Volume= 0.146 af
 Outflow = 0.44 cfs @ 7.88 hrs, Volume= 0.146 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.44 cfs @ 7.88 hrs, Volume= 0.146 af

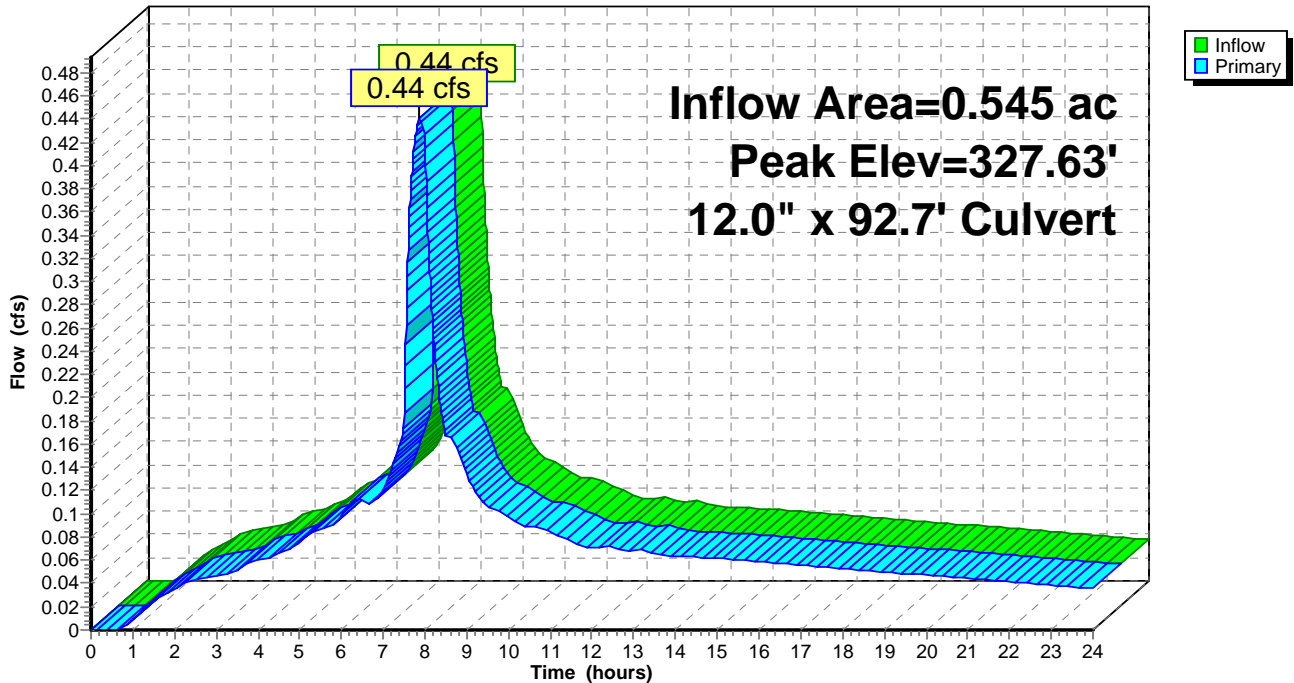
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 327.63' @ 7.88 hrs
 Flood Elev= 336.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	327.30'	12.0" x 92.7' long Culvert Ke= 0.500 Outlet Invert= 326.37' S= 0.0100 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.44 cfs @ 7.88 hrs HW=327.63' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.44 cfs @ 1.95 fps)

Pond 7R: 12"

Hydrograph



Summary for Pond 8R: 12"

Inflow Area = 0.242 ac, 100.00% Impervious, Inflow Depth > 3.21" for 10-Year event
 Inflow = 0.20 cfs @ 7.88 hrs, Volume= 0.065 af
 Outflow = 0.20 cfs @ 7.88 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.20 cfs @ 7.88 hrs, Volume= 0.065 af

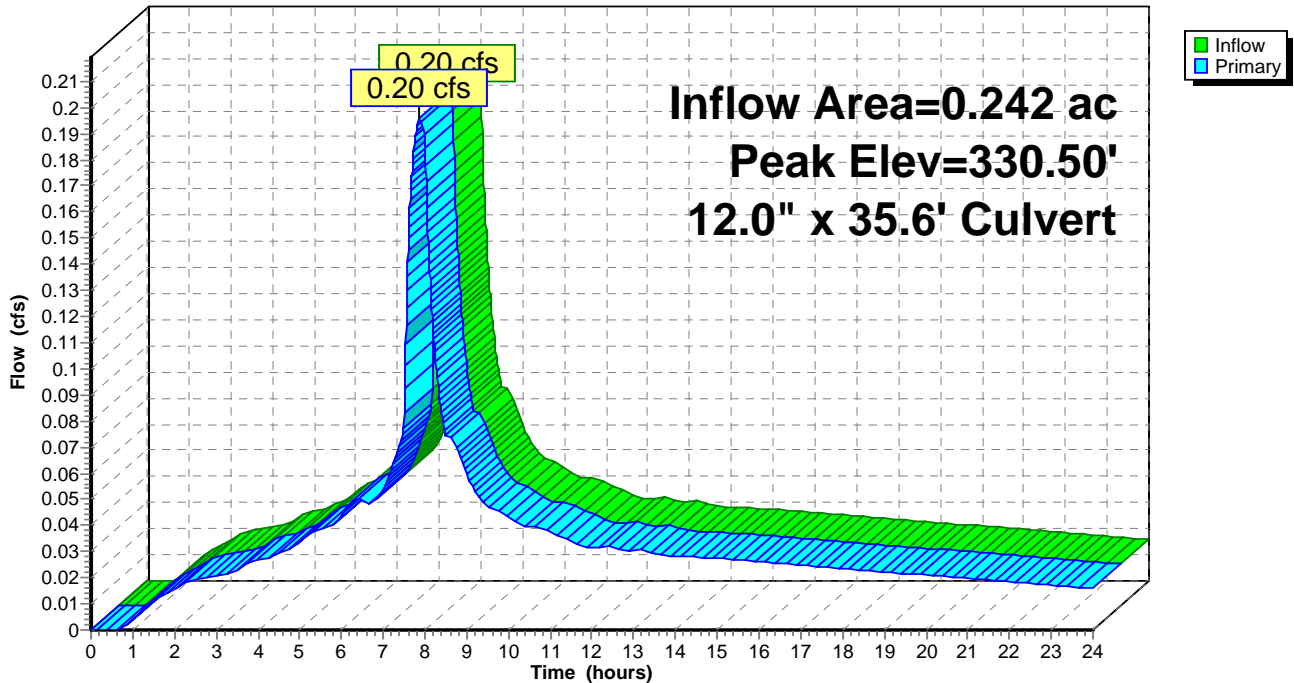
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 330.50' @ 7.88 hrs
 Flood Elev= 336.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.29'	12.0" x 35.6' long Culvert Ke= 0.500 Outlet Invert= 327.50' S= 0.0784 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.19 cfs @ 7.88 hrs HW=330.50' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.19 cfs @ 1.57 fps)

Pond 8R: 12"

Hydrograph



Summary for Pond 9R: 12"

Inflow Area = 0.291 ac, 52.20% Impervious, Inflow Depth > 2.35" for 10-Year event
 Inflow = 0.17 cfs @ 7.92 hrs, Volume= 0.057 af
 Outflow = 0.17 cfs @ 7.92 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 7.92 hrs, Volume= 0.057 af

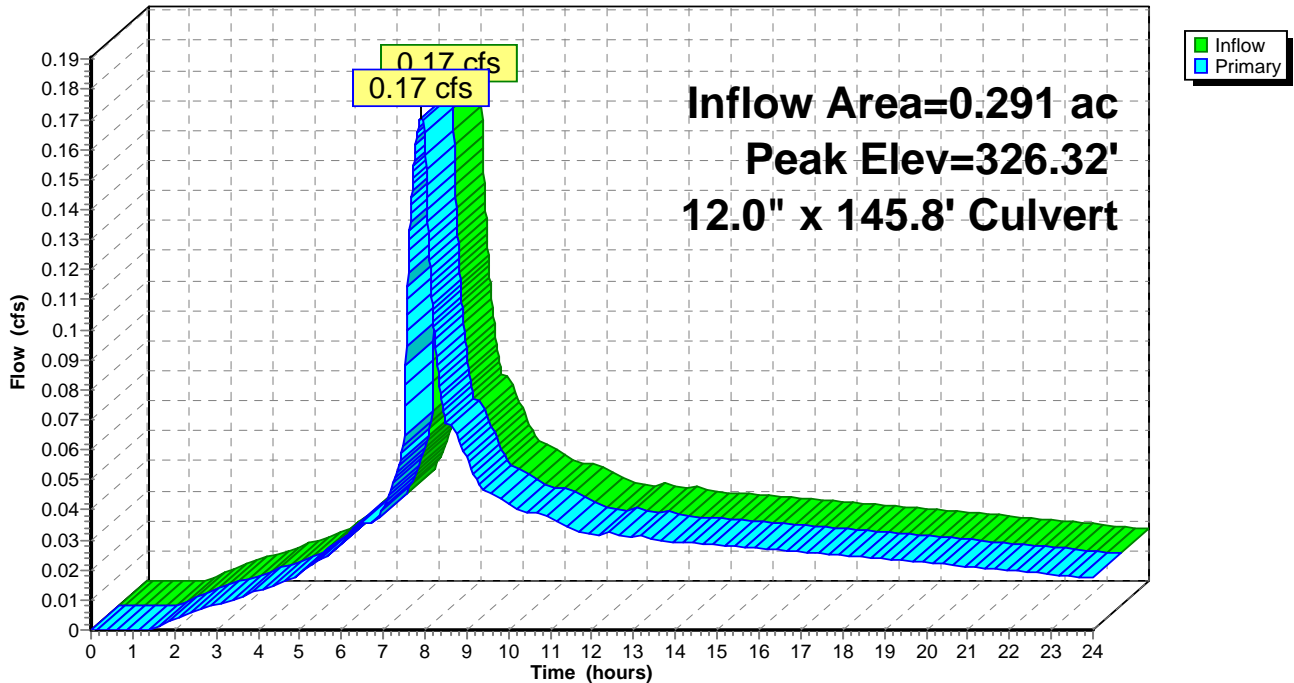
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.32' @ 7.92 hrs
 Flood Elev= 333.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.12'	12.0" x 145.8' long Culvert Ke= 0.500 Outlet Invert= 324.66' S= 0.0100 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.17 cfs @ 7.92 hrs HW=326.32' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.17 cfs @ 2.27 fps)

Pond 9R: 12"

Hydrograph



Summary for Pond 100R: 12"

Inflow Area = 0.034 ac, 100.00% Impervious, Inflow Depth > 3.21" for 10-Year event
 Inflow = 0.03 cfs @ 7.88 hrs, Volume= 0.009 af
 Outflow = 0.03 cfs @ 7.88 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.03 cfs @ 7.88 hrs, Volume= 0.009 af

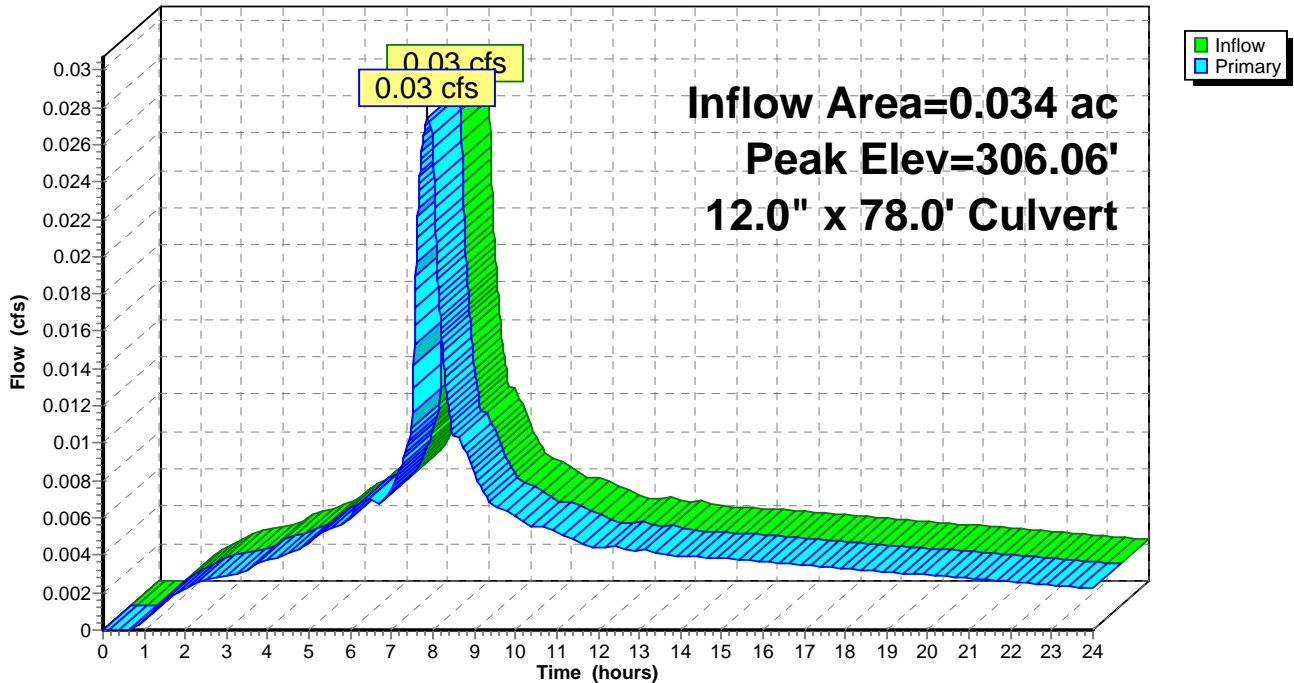
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.06' @ 7.88 hrs
 Flood Elev= 310.42'

Device #	Routing	Invert	Outlet Devices
#1	Primary	305.96'	12.0" x 78.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 305.57' S= 0.0050 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.03 cfs @ 7.88 hrs HW=306.06' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.03 cfs @ 1.04 fps)

Pond 100R: 12"

Hydrograph



Summary for Pond 200R: 12"

Inflow Area = 5.547 ac, 49.62% Impervious, Inflow Depth > 2.17" for 10-Year event
 Inflow = 1.72 cfs @ 8.02 hrs, Volume= 1.003 af
 Outflow = 1.72 cfs @ 8.02 hrs, Volume= 1.003 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.72 cfs @ 8.02 hrs, Volume= 1.003 af

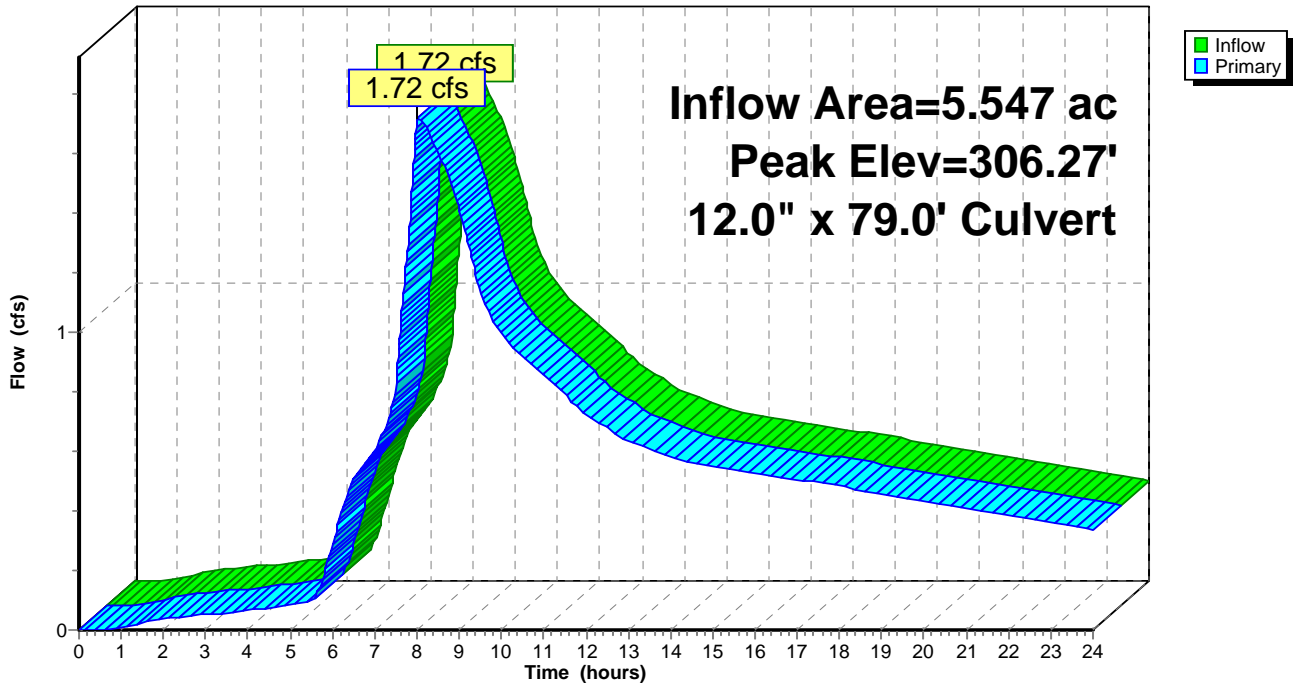
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.27' @ 8.02 hrs
 Flood Elev= 314.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.47'	12.0" x 79.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 304.97' S= 0.0063 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=1.72 cfs @ 8.02 hrs HW=306.27' (Free Discharge)
 ←1=Culvert (Barrel Controls 1.72 cfs @ 3.51 fps)

Pond 200R: 12"

Hydrograph



Summary for Pond 300R: 12"

Inflow Area = 5.613 ac, 50.12% Impervious, Inflow Depth > 2.18" for 10-Year event
 Inflow = 1.77 cfs @ 8.01 hrs, Volume= 1.020 af
 Outflow = 1.77 cfs @ 8.01 hrs, Volume= 1.020 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.77 cfs @ 8.01 hrs, Volume= 1.020 af

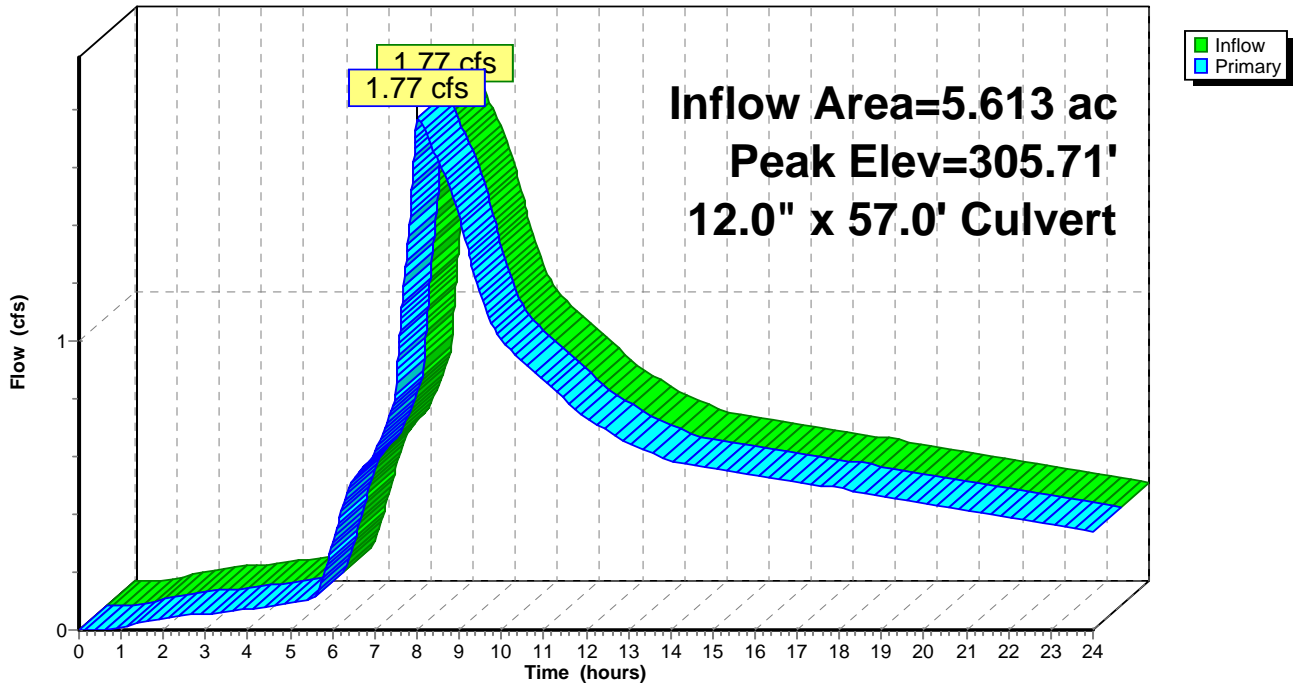
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 305.71' @ 8.01 hrs
 Flood Elev= 312.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	304.98'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.93' S= 0.0184 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=1.77 cfs @ 8.01 hrs HW=305.71' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.77 cfs @ 2.90 fps)

Pond 300R: 12"

Hydrograph



Summary for Pond 400R: 12"

Inflow Area = 5.746 ac, 51.07% Impervious, Inflow Depth > 2.20" for 10-Year event
 Inflow = 1.87 cfs @ 8.01 hrs, Volume= 1.055 af
 Outflow = 1.87 cfs @ 8.01 hrs, Volume= 1.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.87 cfs @ 8.01 hrs, Volume= 1.055 af

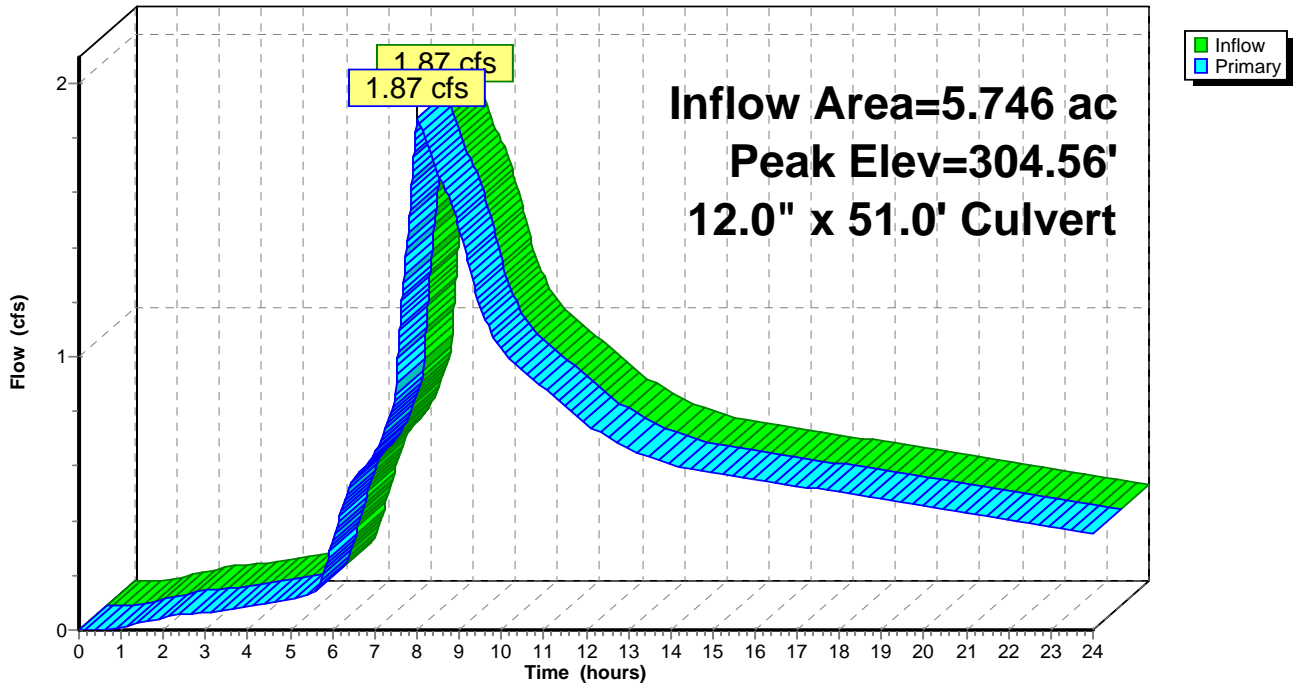
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 304.56' @ 8.01 hrs
 Flood Elev= 308.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	303.80'	12.0" x 51.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.23' S= 0.0112 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.87 cfs @ 8.01 hrs HW=304.56' (Free Discharge)
 ↳1=Culvert (Barrel Controls 1.87 cfs @ 4.07 fps)

Pond 400R: 12"

Hydrograph



Summary for Pond 500R: 12"

Inflow Area = 5.812 ac, 51.53% Impervious, Inflow Depth > 2.21" for 10-Year event
 Inflow = 1.92 cfs @ 8.01 hrs, Volume= 1.072 af
 Outflow = 1.92 cfs @ 8.01 hrs, Volume= 1.072 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.92 cfs @ 8.01 hrs, Volume= 1.072 af

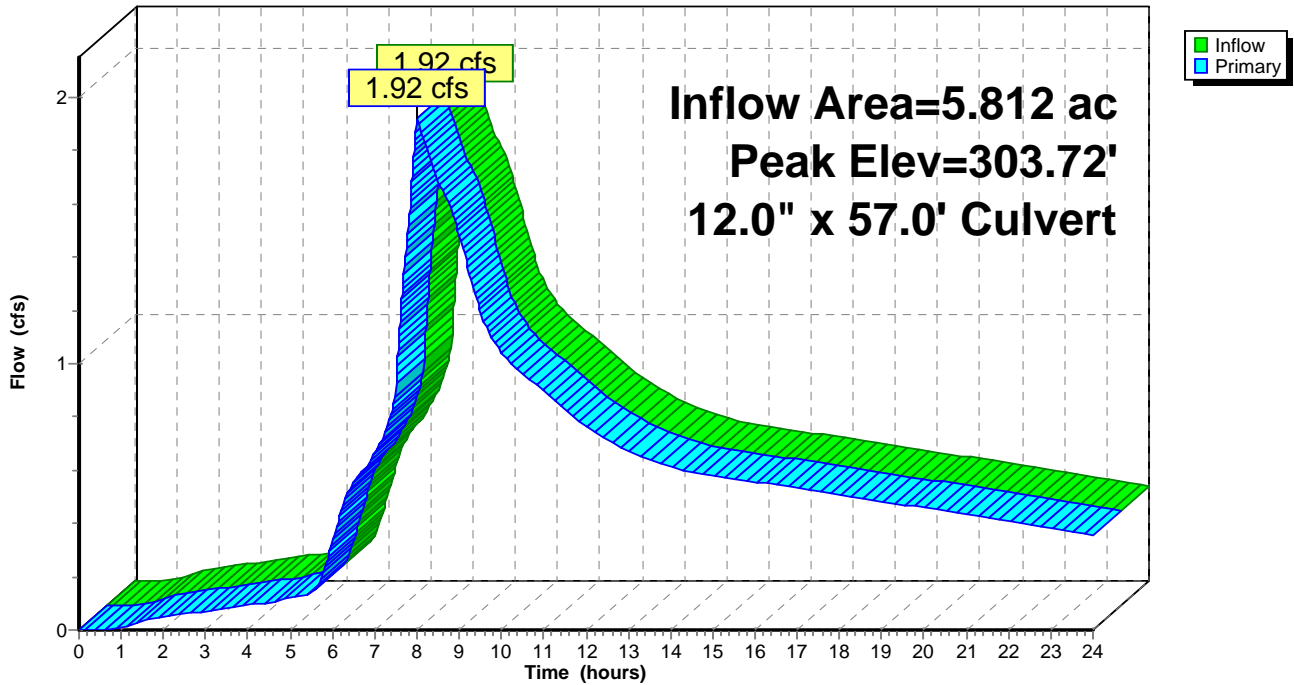
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.72' @ 8.01 hrs
 Flood Elev= 306.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.96'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 302.26' S= 0.0123 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.92 cfs @ 8.01 hrs HW=303.72' (Free Discharge)
 ↳ **1=Culvert** (Inlet Controls 1.92 cfs @ 2.98 fps)

Pond 500R: 12"

Hydrograph



Summary for Pond 600R: 12"

Inflow Area = 5.945 ac, 52.42% Impervious, Inflow Depth > 2.23" for 10-Year event
 Inflow = 2.02 cfs @ 8.01 hrs, Volume= 1.106 af
 Outflow = 2.02 cfs @ 8.01 hrs, Volume= 1.106 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.02 cfs @ 8.01 hrs, Volume= 1.106 af

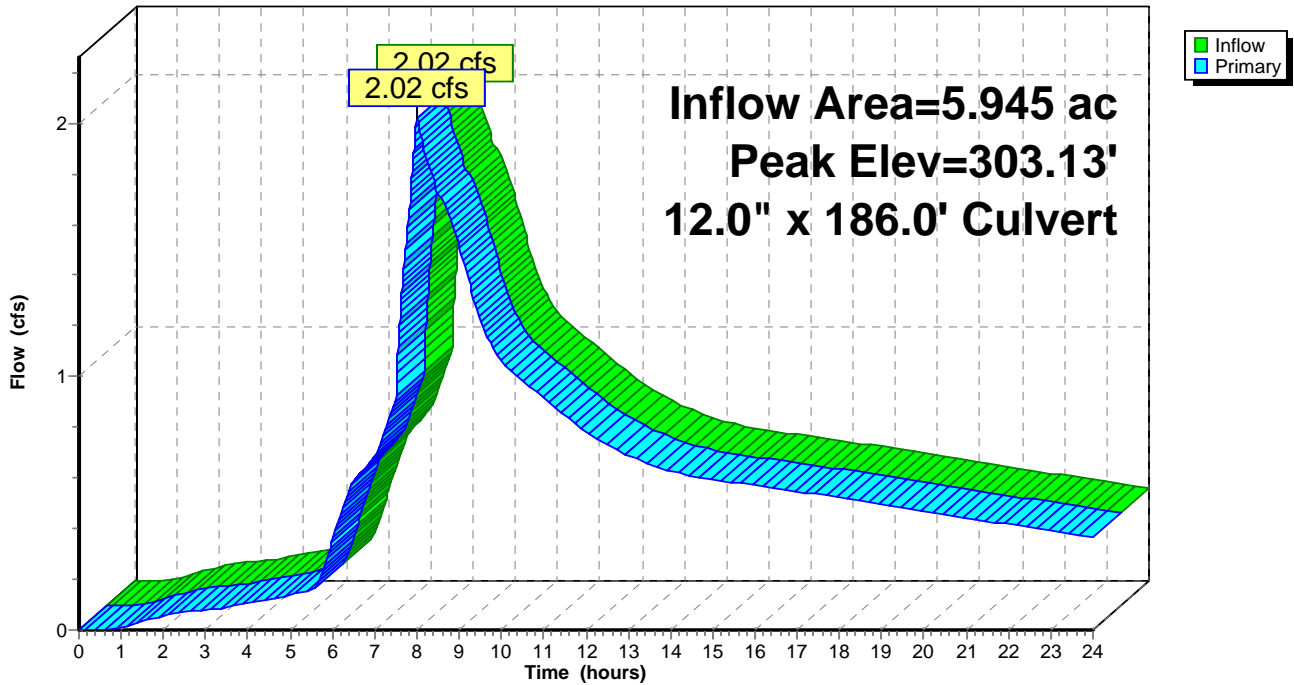
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.13' @ 8.01 hrs
 Flood Elev= 305.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.20'	12.0" x 186.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 301.28' S= 0.0049 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=2.02 cfs @ 8.01 hrs HW=303.13' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.02 cfs @ 3.47 fps)

Pond 600R: 12"

Hydrograph



Summary for Pond 700R: 12"

Inflow Area = 7.999 ac, 54.95% Impervious, Inflow Depth > 2.35" for 10-Year event
 Inflow = 3.42 cfs @ 8.00 hrs, Volume= 1.569 af
 Outflow = 3.42 cfs @ 8.00 hrs, Volume= 1.569 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.42 cfs @ 8.00 hrs, Volume= 1.569 af

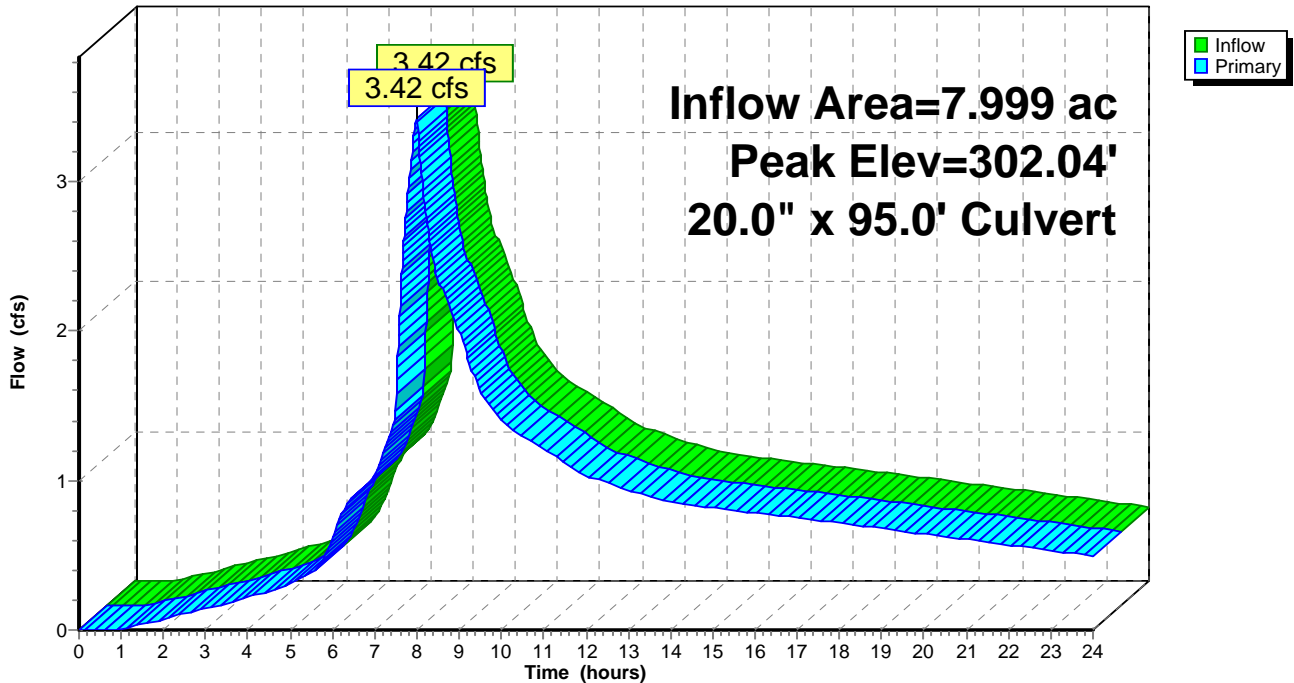
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 302.04' @ 8.00 hrs
 Flood Elev= 304.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	301.08'	20.0" x 95.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 300.60' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.41 cfs @ 8.00 hrs HW=302.04' (Free Discharge)
 ↳ **1=Culvert** (Barrel Controls 3.41 cfs @ 3.79 fps)

Pond 700R: 12"

Hydrograph



Summary for Pond 800R: 12"

Inflow Area = 8.132 ac, 55.55% Impervious, Inflow Depth > 2.37" for 10-Year event
 Inflow = 3.52 cfs @ 8.00 hrs, Volume= 1.603 af
 Outflow = 3.52 cfs @ 8.00 hrs, Volume= 1.603 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.52 cfs @ 8.00 hrs, Volume= 1.603 af

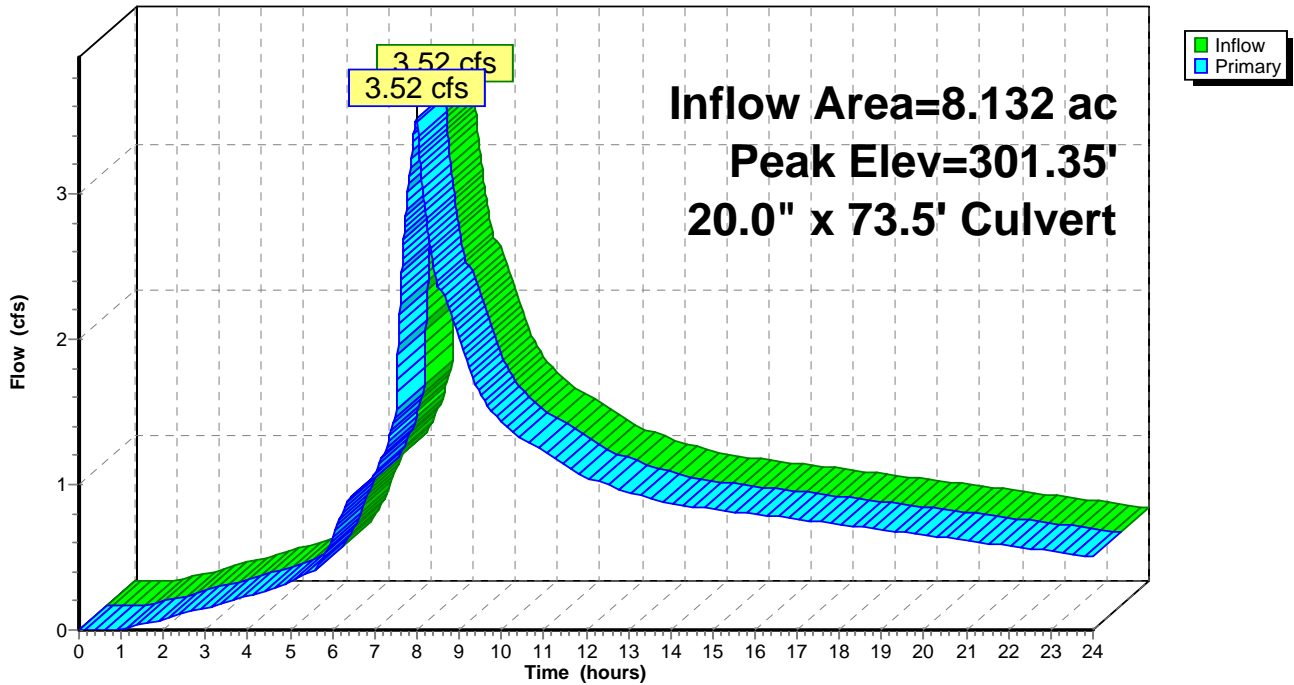
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.35' @ 8.00 hrs
 Flood Elev= 305.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.40'	20.0" x 73.5' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.94' S= 0.0063 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=3.51 cfs @ 8.00 hrs HW=301.35' (Free Discharge)
 ←1=Culvert (Barrel Controls 3.51 cfs @ 3.97 fps)

Pond 800R: 12"

Hydrograph



Summary for Pond 900R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 2.37" for 10-Year event
 Inflow = 3.57 cfs @ 8.00 hrs, Volume= 1.621 af
 Outflow = 3.57 cfs @ 8.00 hrs, Volume= 1.621 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.57 cfs @ 8.00 hrs, Volume= 1.621 af

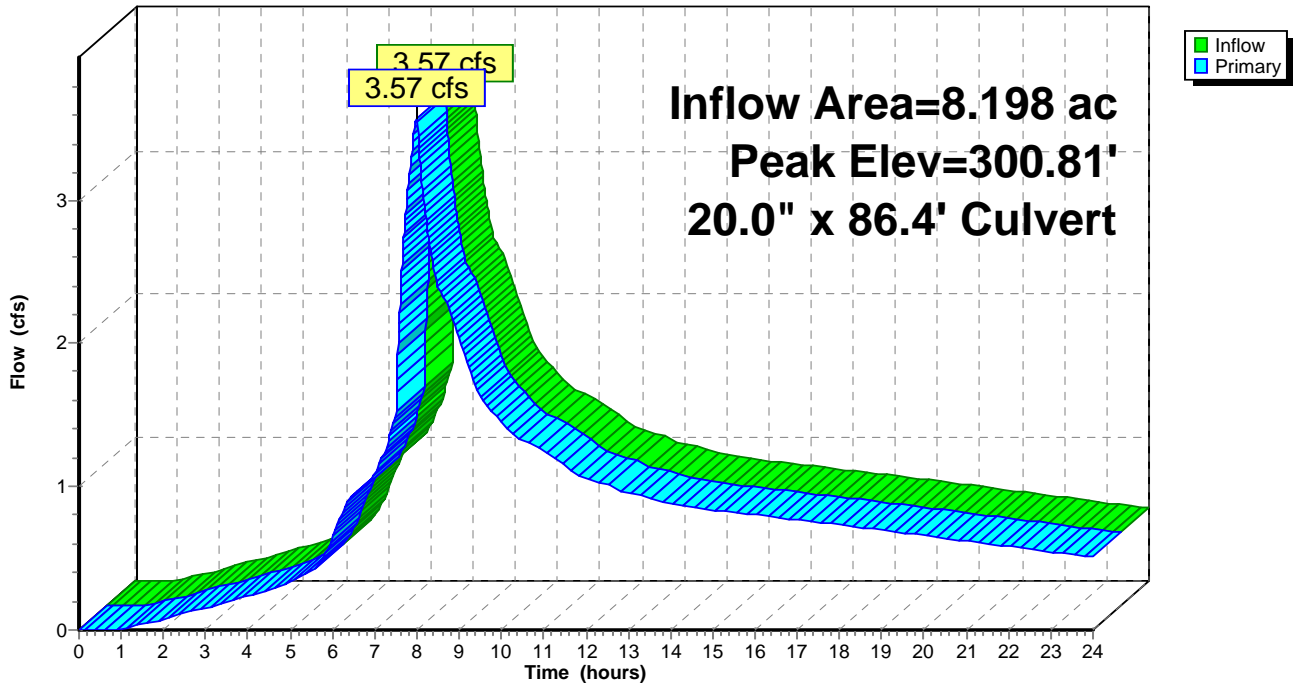
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.81' @ 8.00 hrs
 Flood Elev= 306.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.82'	20.0" x 86.4' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.40' S= 0.0049 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=3.56 cfs @ 8.00 hrs HW=300.81' (Free Discharge)
 ↳1=Culvert (Barrel Controls 3.56 cfs @ 3.78 fps)

Pond 900R: 12"

Hydrograph



Summary for Pond 1000R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 2.37" for 10-Year event
 Inflow = 3.57 cfs @ 8.00 hrs, Volume= 1.621 af
 Outflow = 3.57 cfs @ 8.00 hrs, Volume= 1.621 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.57 cfs @ 8.00 hrs, Volume= 1.621 af

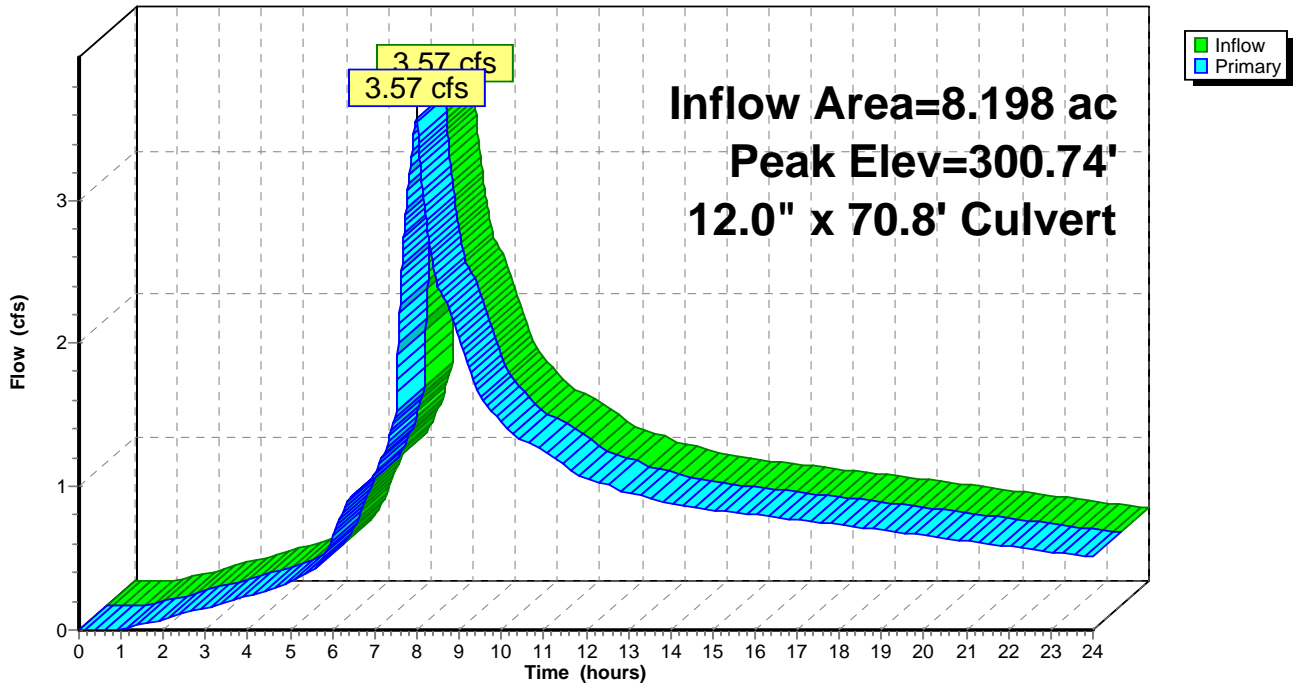
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.74' @ 8.00 hrs
 Flood Elev= 307.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.28'	12.0" x 70.8' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0103 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=3.57 cfs @ 8.00 hrs HW=300.74' (Free Discharge)
 ↳1=Culvert (Barrel Controls 3.57 cfs @ 4.54 fps)

Pond 1000R: 12"

Hydrograph



Summary for Pond 1100R: 12"

Inflow Area = 0.303 ac, 100.00% Impervious, Inflow Depth > 3.21" for 10-Year event
 Inflow = 0.24 cfs @ 7.88 hrs, Volume= 0.081 af
 Outflow = 0.24 cfs @ 7.88 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.24 cfs @ 7.88 hrs, Volume= 0.081 af

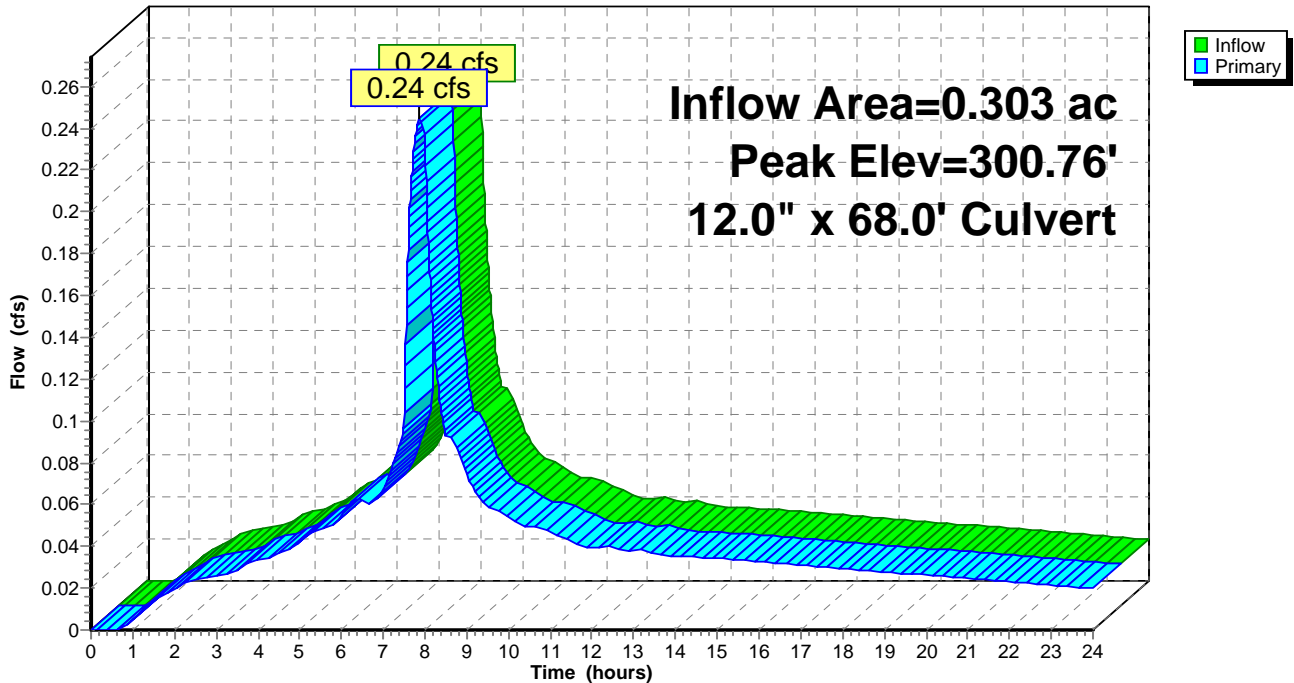
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.76' @ 7.88 hrs
 Flood Elev= 314.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.52'	12.0" x 68.0' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0290 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.23 cfs @ 7.88 hrs HW=300.76' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.23 cfs @ 1.65 fps)

Pond 1100R: 12"

Hydrograph



Summary for Pond 1200R: 12"

Inflow Area = 0.182 ac, 100.00% Impervious, Inflow Depth > 3.21" for 10-Year event
 Inflow = 0.15 cfs @ 7.88 hrs, Volume= 0.049 af
 Outflow = 0.15 cfs @ 7.88 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 7.88 hrs, Volume= 0.049 af

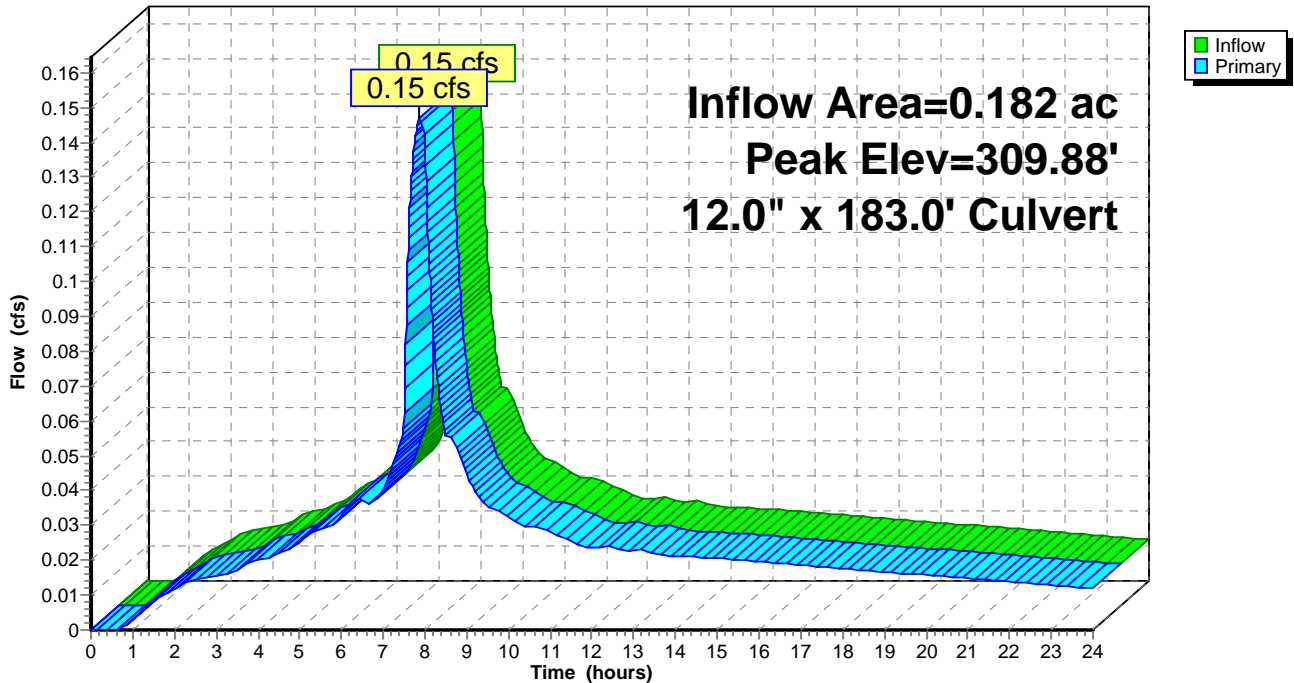
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 309.88' @ 7.88 hrs
 Flood Elev= 323.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	309.70'	12.0" x 183.0' long Culvert Ke= 0.500 Outlet Invert= 300.70' S= 0.0492 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.13 cfs @ 7.88 hrs HW=309.88' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.13 cfs @ 1.43 fps)

Pond 1200R: 12"

Hydrograph



Summary for Pond 1300R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.32" for 10-Year event
 Inflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af
 Outflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af

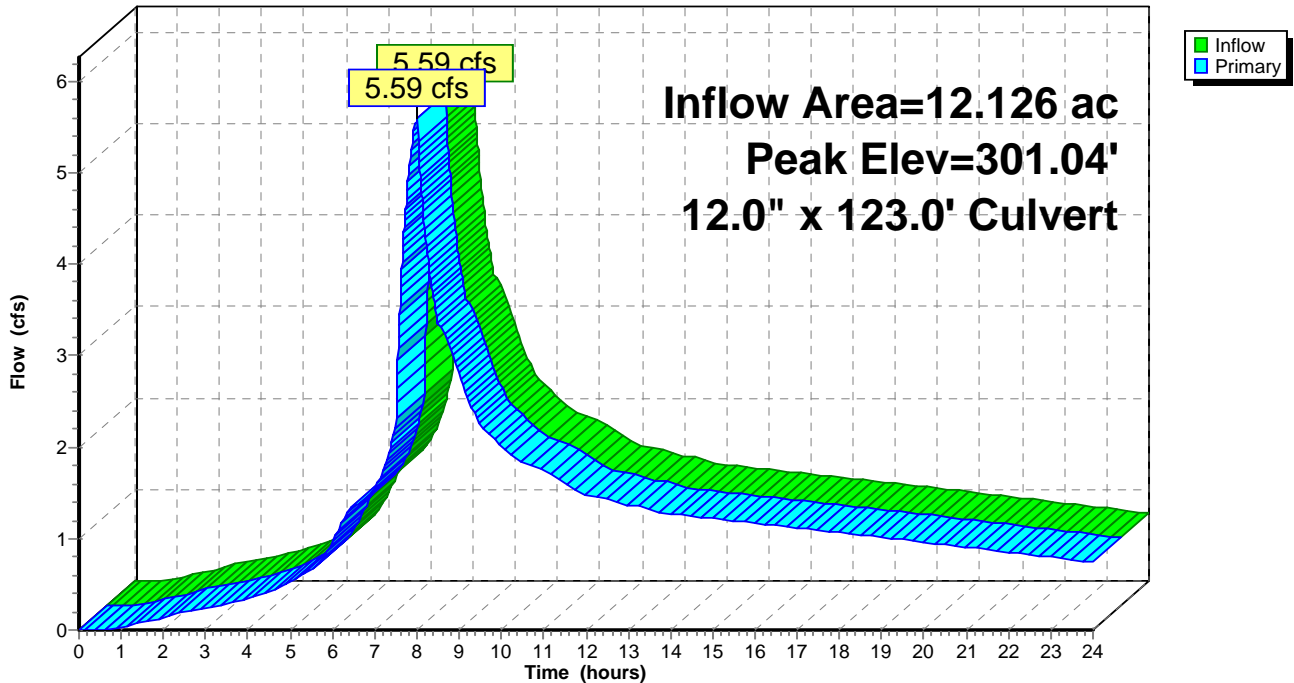
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.04' @ 8.00 hrs
 Flood Elev= 312.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.35'	12.0" x 123.0' long Culvert Ke= 0.500 Outlet Invert= 274.98' S= 0.1900 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.59 cfs @ 8.00 hrs HW=301.03' (Free Discharge)
 ←1=Culvert (Inlet Controls 5.59 cfs @ 7.11 fps)

Pond 1300R: 12"

Hydrograph



Summary for Pond 1400R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.32" for 10-Year event
 Inflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af
 Outflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af

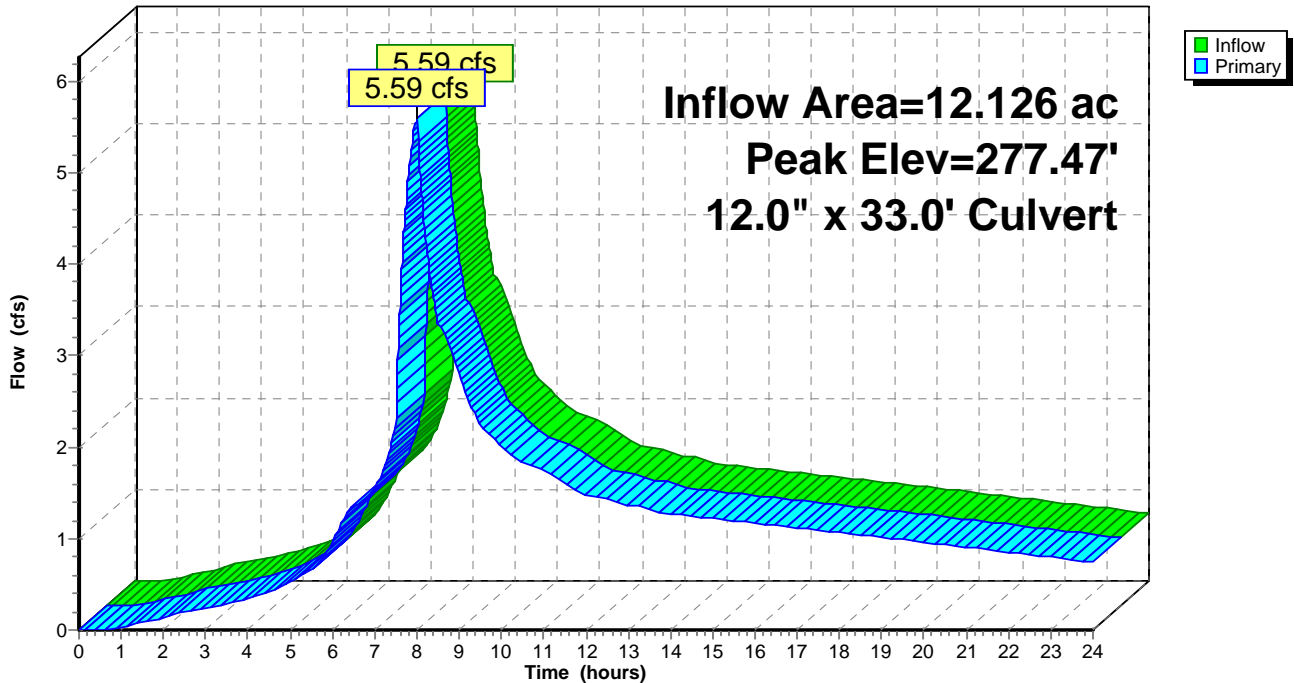
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 277.47' @ 8.00 hrs
 Flood Elev= 288.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.78'	12.0" x 33.0' long Culvert Ke= 0.500 Outlet Invert= 273.79' S= 0.0300 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.59 cfs @ 8.00 hrs HW=277.46' (Free Discharge)
 ←1=Culvert (Inlet Controls 5.59 cfs @ 7.11 fps)

Pond 1400R: 12"

Hydrograph



Summary for Pond 1500R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.32" for 10-Year event
 Inflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af
 Outflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af

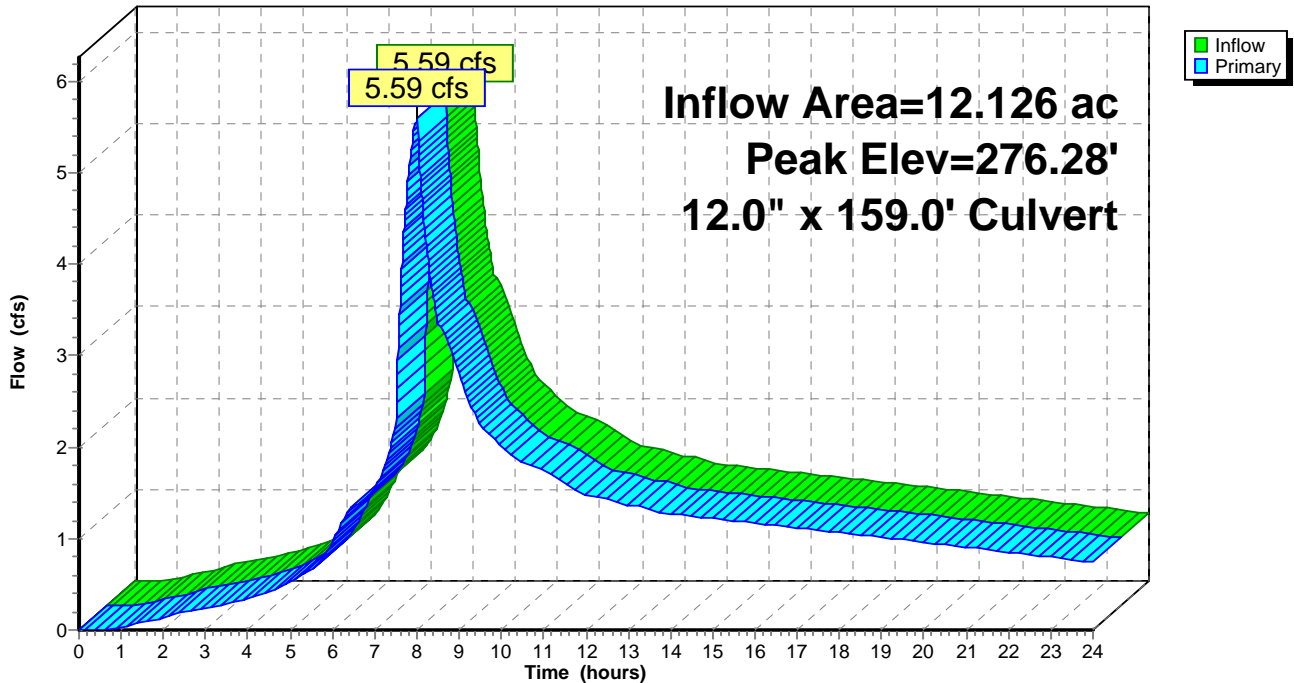
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 276.28' @ 8.00 hrs
 Flood Elev= 287.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.59'	12.0" x 159.0' long Culvert Ke= 0.500 Outlet Invert= 266.59' S= 0.0440 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.59 cfs @ 8.00 hrs HW=276.27' (Free Discharge)
 ←1=Culvert (Inlet Controls 5.59 cfs @ 7.11 fps)

Pond 1500R: 12"

Hydrograph



Summary for Pond 1600R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.32" for 10-Year event
 Inflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af
 Outflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af

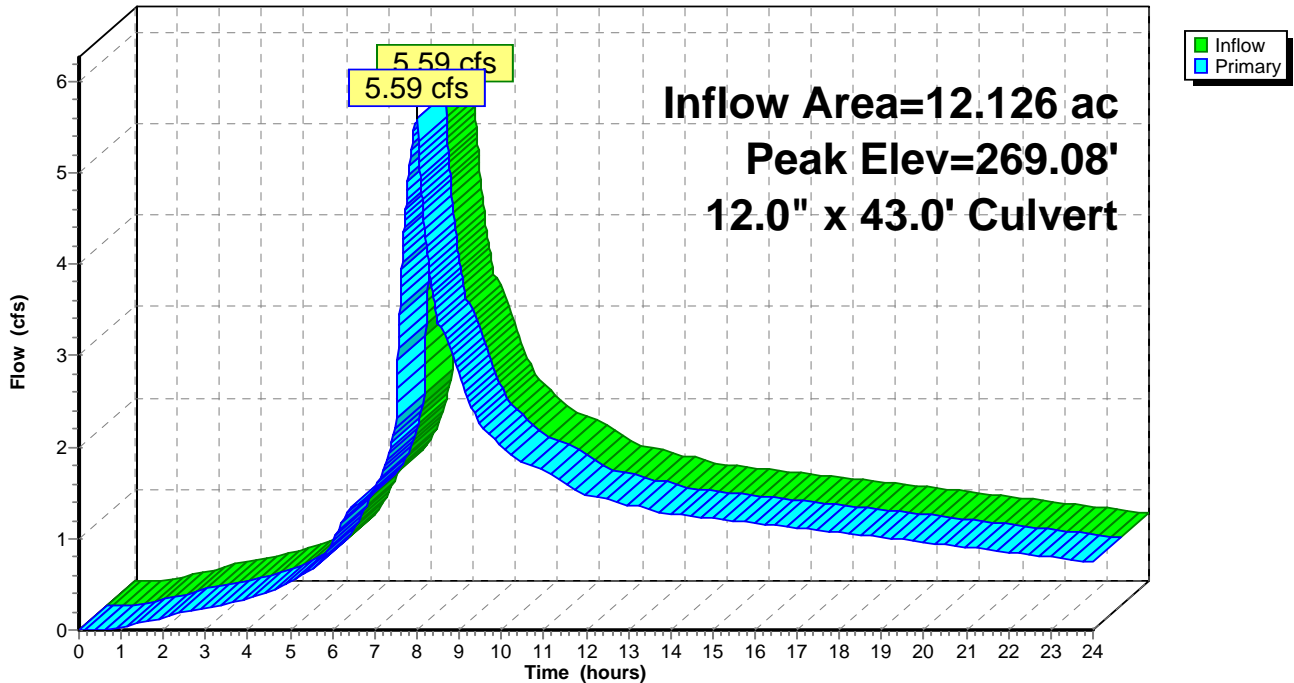
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 269.08' @ 8.00 hrs
 Flood Elev= 280.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	266.39'	12.0" x 43.0' long Culvert Ke= 0.500 Outlet Invert= 254.78' S= 0.2700 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.59 cfs @ 8.00 hrs HW=269.07' (Free Discharge)
 ←1=Culvert (Inlet Controls 5.59 cfs @ 7.11 fps)

Pond 1600R: 12"

Hydrograph



Summary for Pond 1700R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.32" for 10-Year event
 Inflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af
 Outflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af

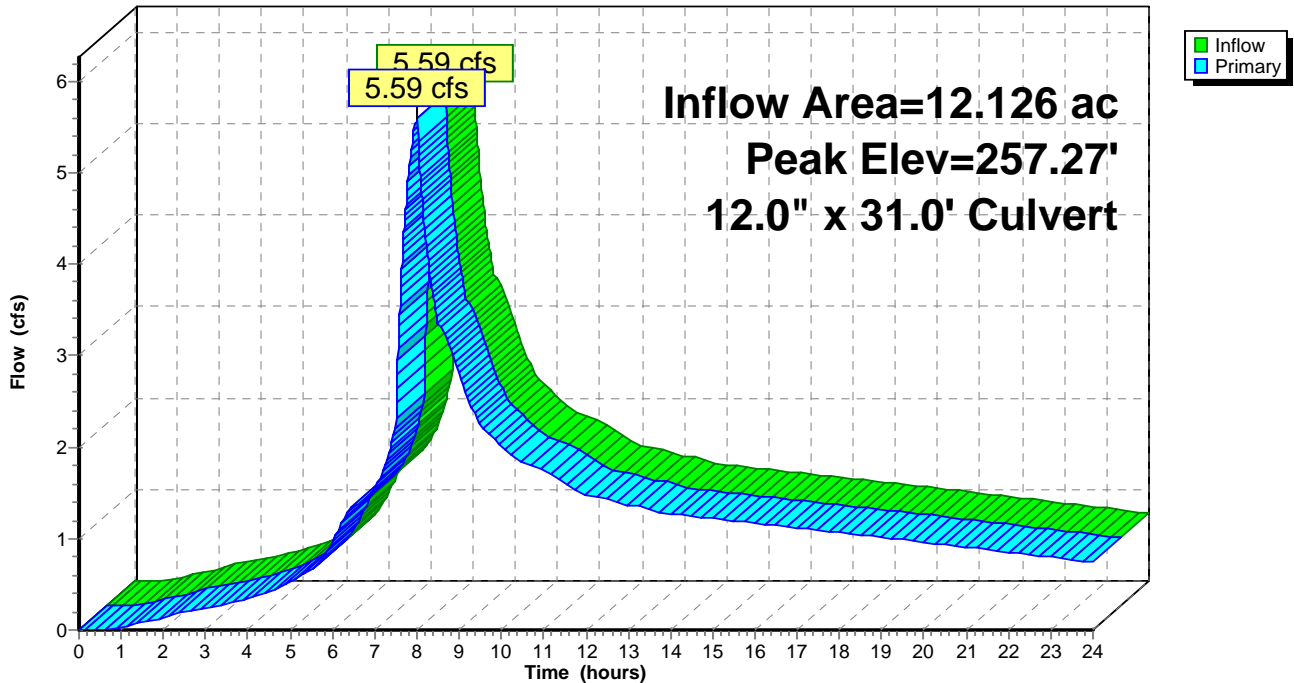
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 257.27' @ 8.00 hrs
 Flood Elev= 268.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	254.58'	12.0" x 31.0' long Culvert Ke= 0.500 Outlet Invert= 239.08' S= 0.5000 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.59 cfs @ 8.00 hrs HW=257.26' (Free Discharge)
 ←1=Culvert (Inlet Controls 5.59 cfs @ 7.11 fps)

Pond 1700R: 12"

Hydrograph



Summary for Pond 1800R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.32" for 10-Year event
 Inflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af
 Outflow = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.59 cfs @ 8.00 hrs, Volume= 2.347 af

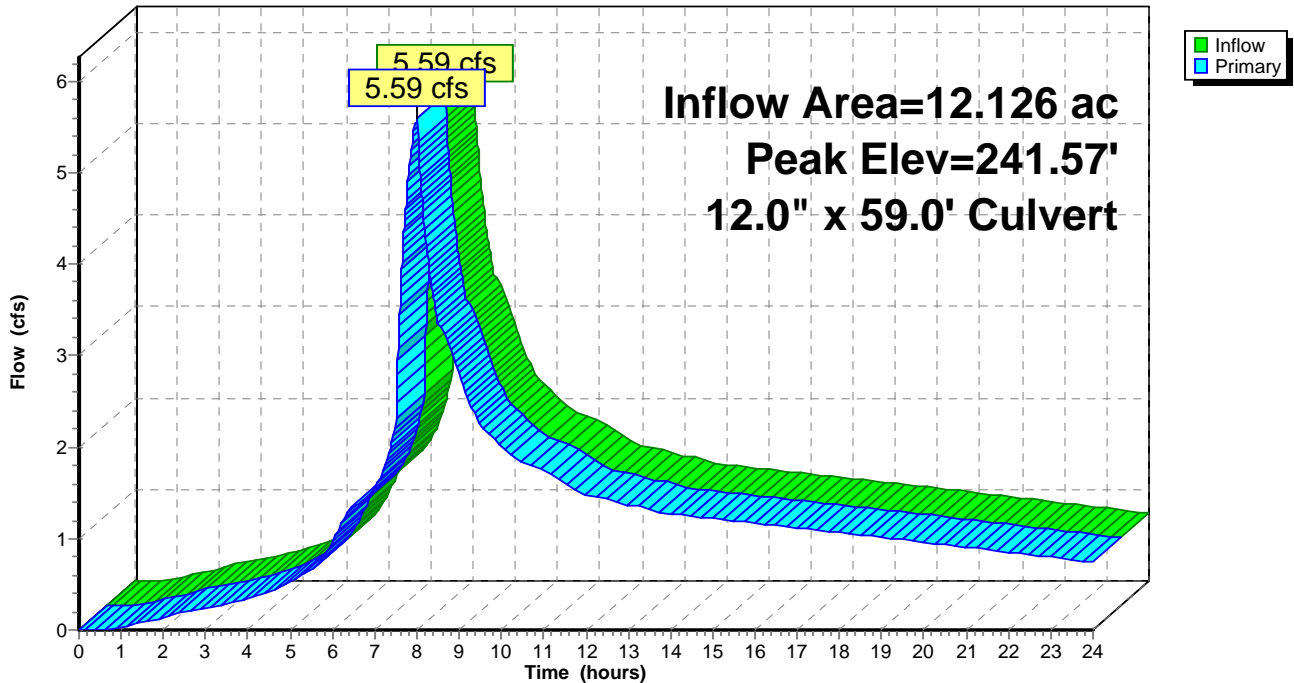
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 241.57' @ 8.00 hrs
 Flood Elev= 246.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.88'	12.0" x 59.0' long Culvert Ke= 0.500 Outlet Invert= 236.00' S= 0.0488 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=5.59 cfs @ 8.00 hrs HW=241.56' (Free Discharge)
 ←1=Culvert (Inlet Controls 5.59 cfs @ 7.11 fps)

Pond 1800R: 12"

Hydrograph



Summary for Pond A: POND

Inflow Area = 5.020 ac, 44.57% Impervious, Inflow Depth > 2.24" for 10-Year event
 Inflow = 2.60 cfs @ 7.95 hrs, Volume= 0.937 af
 Outflow = 1.46 cfs @ 8.31 hrs, Volume= 0.864 af, Atten= 44%, Lag= 21.8 min
 Primary = 1.46 cfs @ 8.31 hrs, Volume= 0.864 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 310.04' @ 8.31 hrs Surf.Area= 3,109 sf Storage= 6,806 cf

Plug-Flow detention time= 114.5 min calculated for 0.864 af (92% of inflow)
 Center-of-Mass det. time= 61.4 min (794.9 - 733.5)

Volume	Invert	Avail.Storage	Storage Description
#1	306.90'	10,088 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
306.90	1,318	0	0
307.00	1,364	134	134
308.00	1,865	1,615	1,749
309.00	2,436	2,151	3,899
310.00	3,078	2,757	6,656
311.00	3,785	3,432	10,088

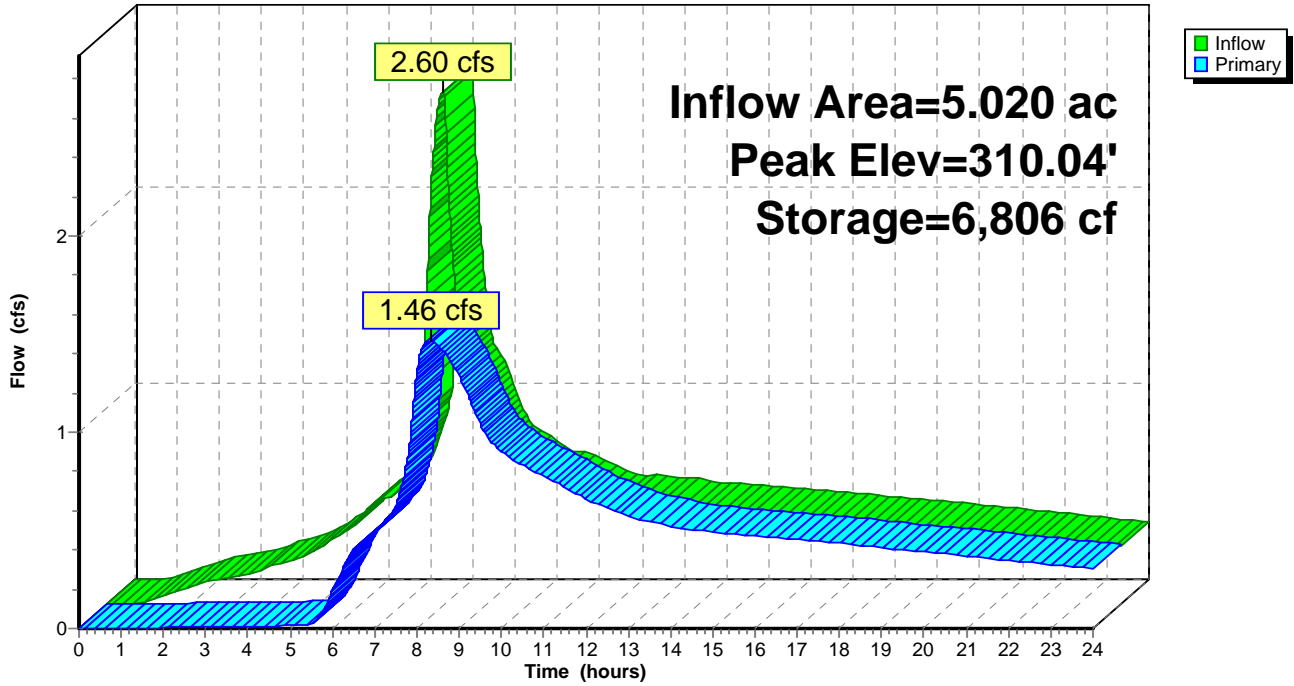
Device	Routing	Invert	Outlet Devices
#1	Primary	306.90'	0.7" Vert. Orifice/Grate C= 0.620
#2	Primary	308.34'	5.8" Vert. Orifice/Grate C= 0.620
#3	Primary	309.45'	4.4" Vert. Orifice/Grate C= 0.620
#4	Primary	310.10'	3.4" Vert. Orifice/Grate C= 0.620

Primary OutFlow Max=1.46 cfs @ 8.31 hrs HW=310.04' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.02 cfs @ 8.78 fps)
- 2=Orifice/Grate (Orifice Controls 1.10 cfs @ 6.02 fps)
- 3=Orifice/Grate (Orifice Controls 0.34 cfs @ 3.19 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)

Pond A: POND

Hydrograph

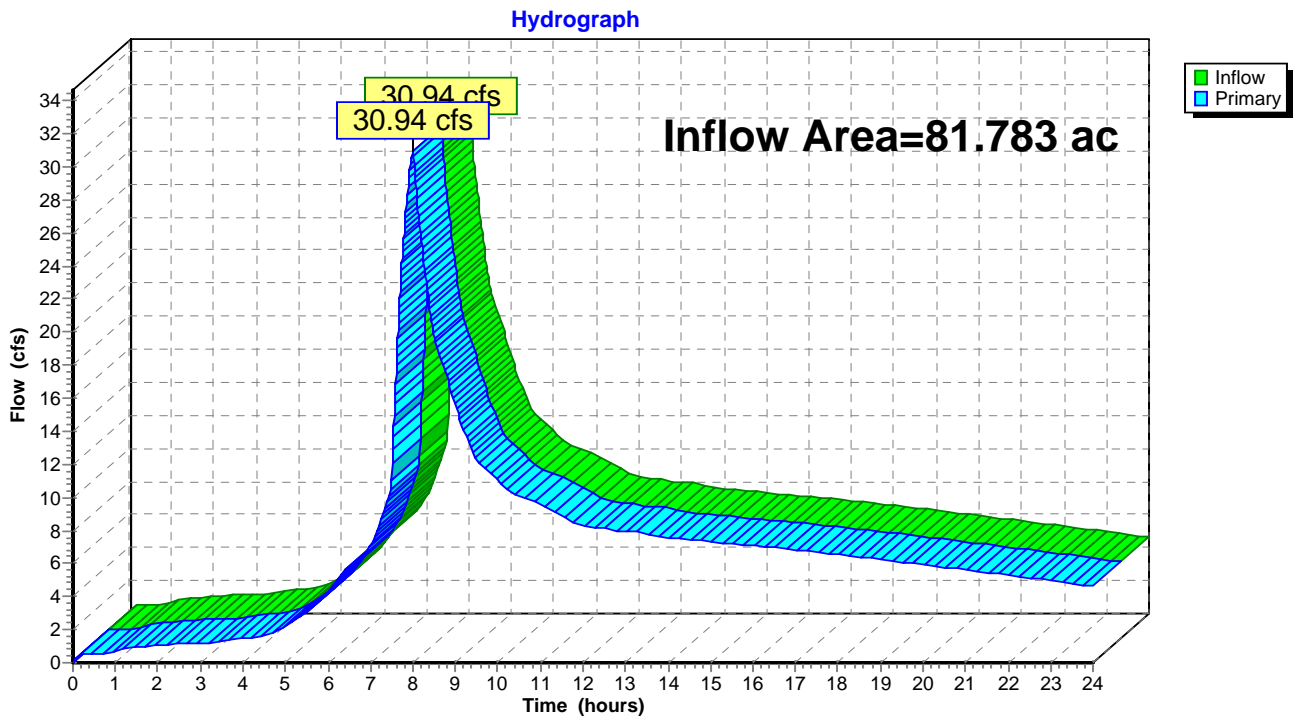


Summary for Link B: NATURAL POND 1900

Inflow Area = 81.783 ac, 44.42% Impervious, Inflow Depth > 1.96" for 10-Year event
Inflow = 30.94 cfs @ 8.00 hrs, Volume= 13.324 af
Primary = 30.94 cfs @ 8.00 hrs, Volume= 13.324 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link B: NATURAL POND 1900



APPENDIX 2.3C
25-YEAR STORM EVENT (3.90")

Summary for Subcatchment 1A: OFF-SITE DRAINAGE

Runoff = 0.09 cfs @ 7.98 hrs, Volume= 0.034 af, Depth> 1.88"

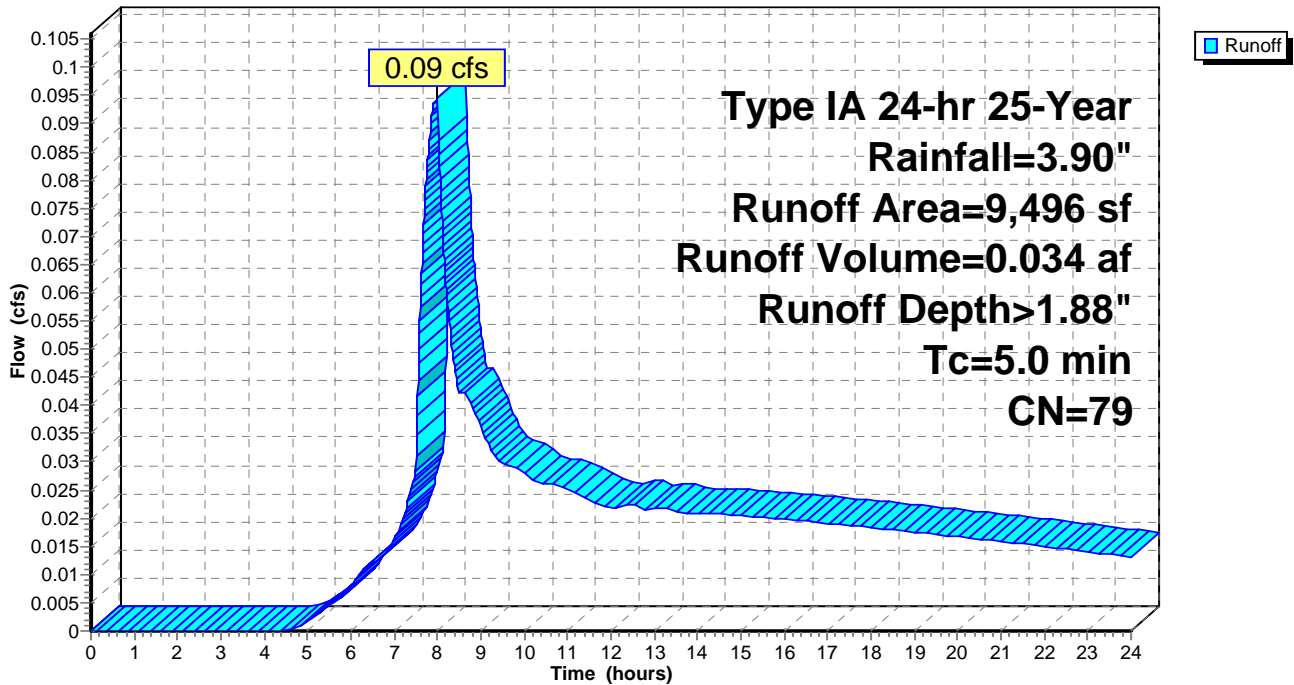
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
9,496	79	50-75% Grass cover, Fair, HSG C
9,496		Pervious Area

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

Subcatchment 1A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA

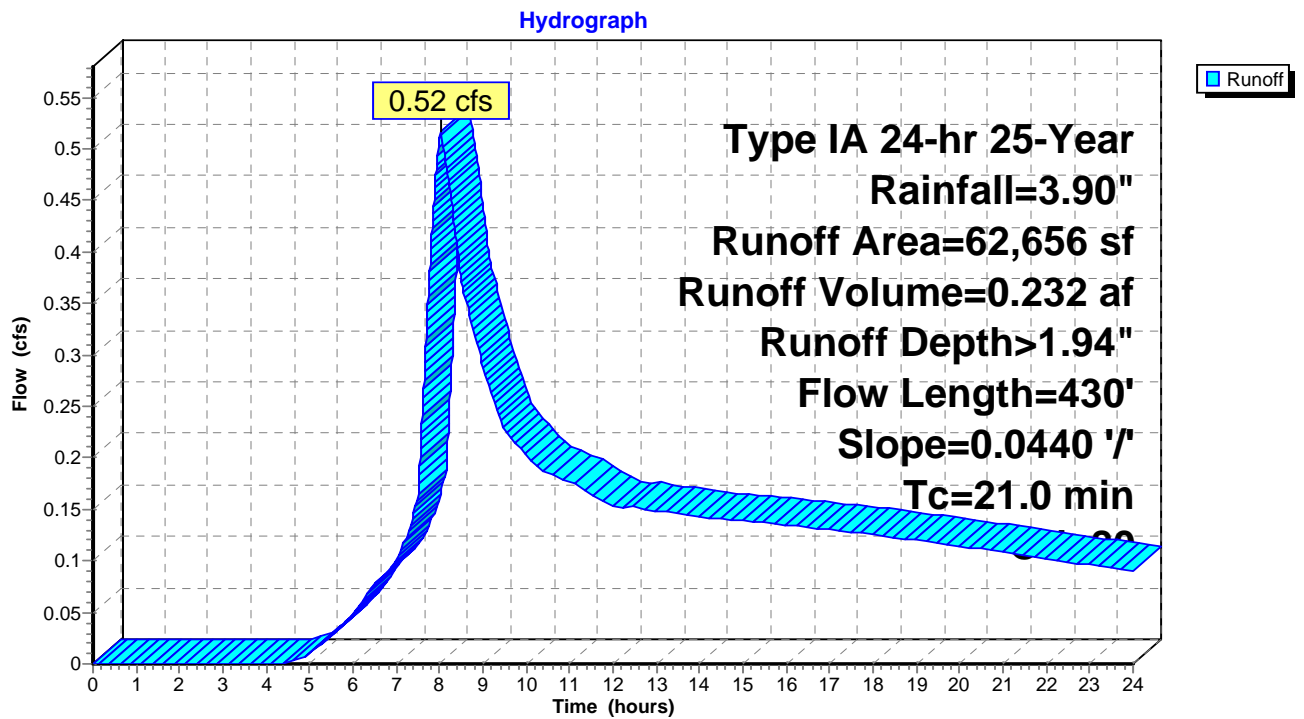
Runoff = 0.52 cfs @ 8.01 hrs, Volume= 0.232 af, Depth> 1.94"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
3,614	100	Water Quality Facility
59,042	79	50-75% Grass cover, Fair, HSG C
62,656	80	Weighted Average
59,042		Pervious Area
3,614		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	300	0.0440	0.26		Sheet Flow, Flow over lots Grass: Short n= 0.150 P2= 2.50"
1.5	130	0.0440	1.47		Shallow Concentrated Flow, Flow over lots Short Grass Pasture Kv= 7.0 fps
21.0	430	Total			

Subcatchment 1S: POND, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 1X: TAX LOT 200 WEST

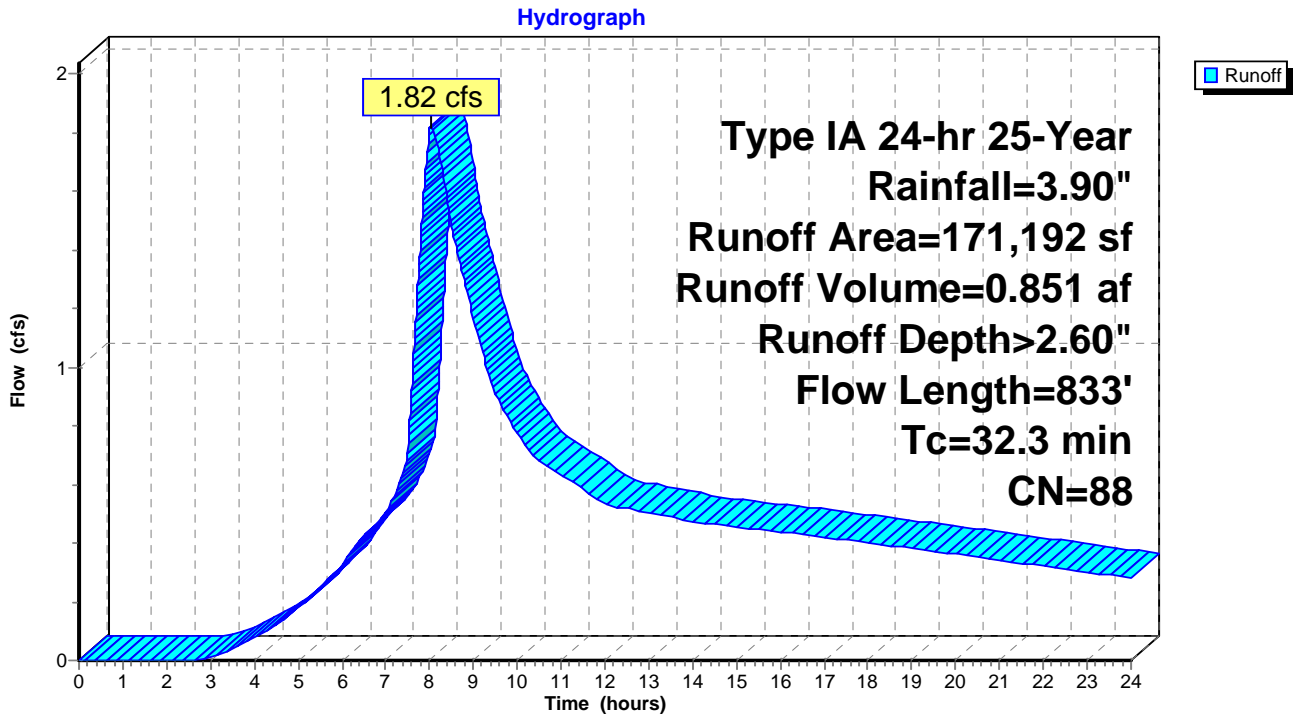
Runoff = 1.82 cfs @ 8.01 hrs, Volume= 0.851 af, Depth> 2.60"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
136,192	86	<50% Grass cover, Poor, HSG C
* 33,982	98	AC PAVEMENT, ROOFS
1,018	89	Gravel roads, HSG C
171,192	88	Weighted Average
137,210		Pervious Area
33,982		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	300	0.0220	0.19		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"
6.6	533	0.0375	1.36		Shallow Concentrated Flow, PASTURE/MEADOW Short Grass Pasture Kv= 7.0 fps
32.3	833	Total			

Subcatchment 1X: TAX LOT 200 WEST



Summary for Subcatchment 2A: OFF-SITE DRAINAGE

Runoff = 0.01 cfs @ 7.88 hrs, Volume= 0.005 af, Depth> 3.66"

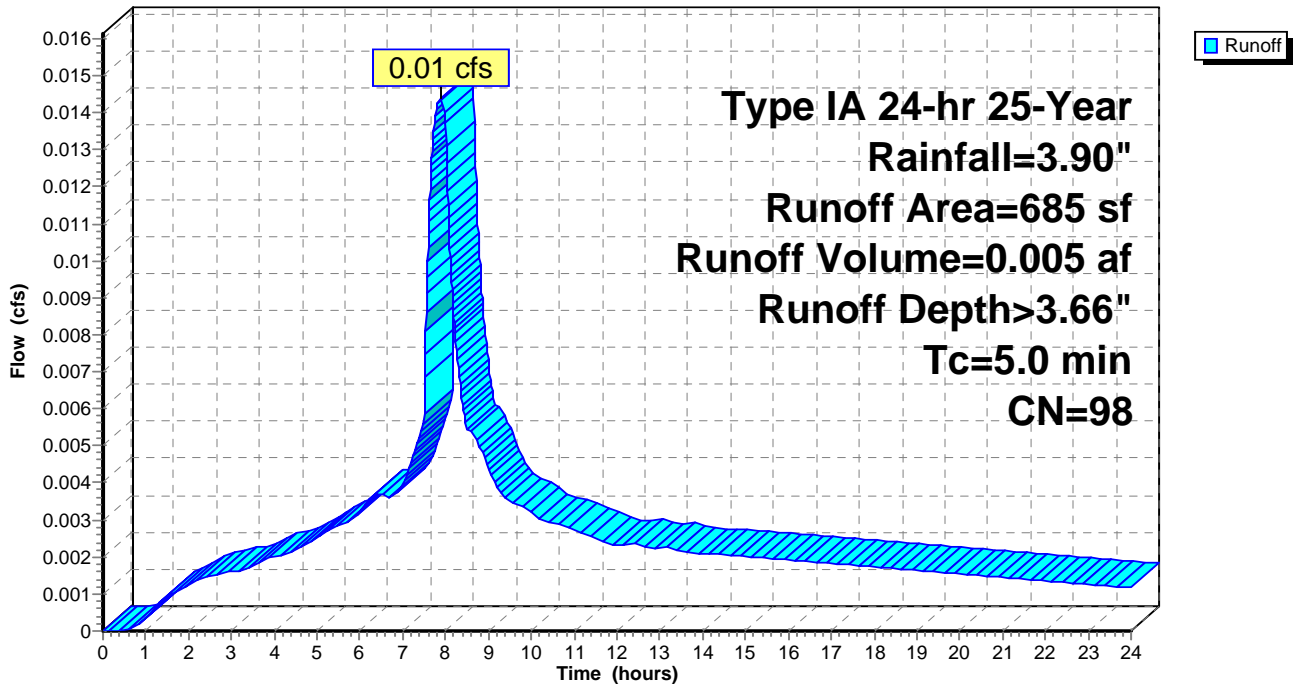
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 685	98	Street and sidewalk
685		Impervious Area

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

Subcatchment 2A: OFF-SITE DRAINAGE

Hydrograph



Summary for Subcatchment 2S1: SW HELENIUS WEST

Runoff = 0.13 cfs @ 7.89 hrs, Volume= 0.042 af, Depth> 3.33"

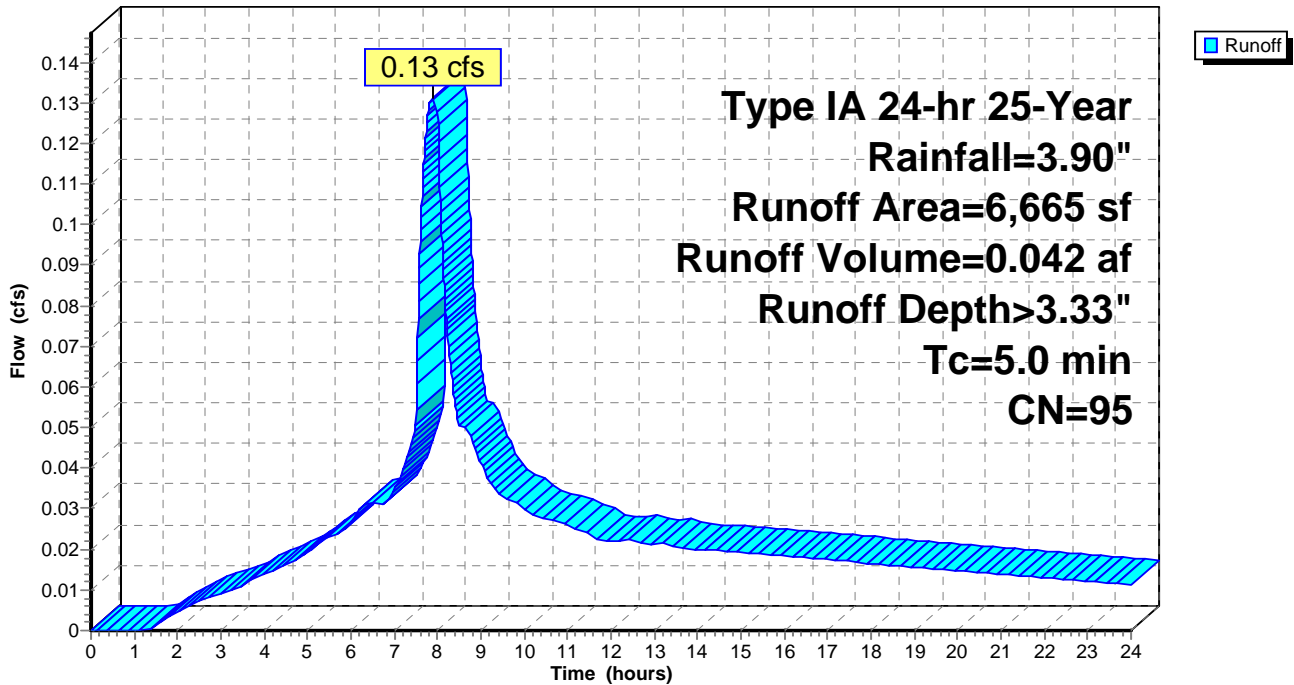
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,667	98	Street and sidewalk
998	79	50-75% Grass cover, Fair, HSG C
6,665	95	Weighted Average
998		Pervious Area
5,667		Impervious Area

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

Subcatchment 2S1: SW HELENIUS WEST

Hydrograph



Summary for Subcatchment 2S2: LANDSCAPING

Runoff = 0.01 cfs @ 7.98 hrs, Volume= 0.005 af, Depth> 1.88"

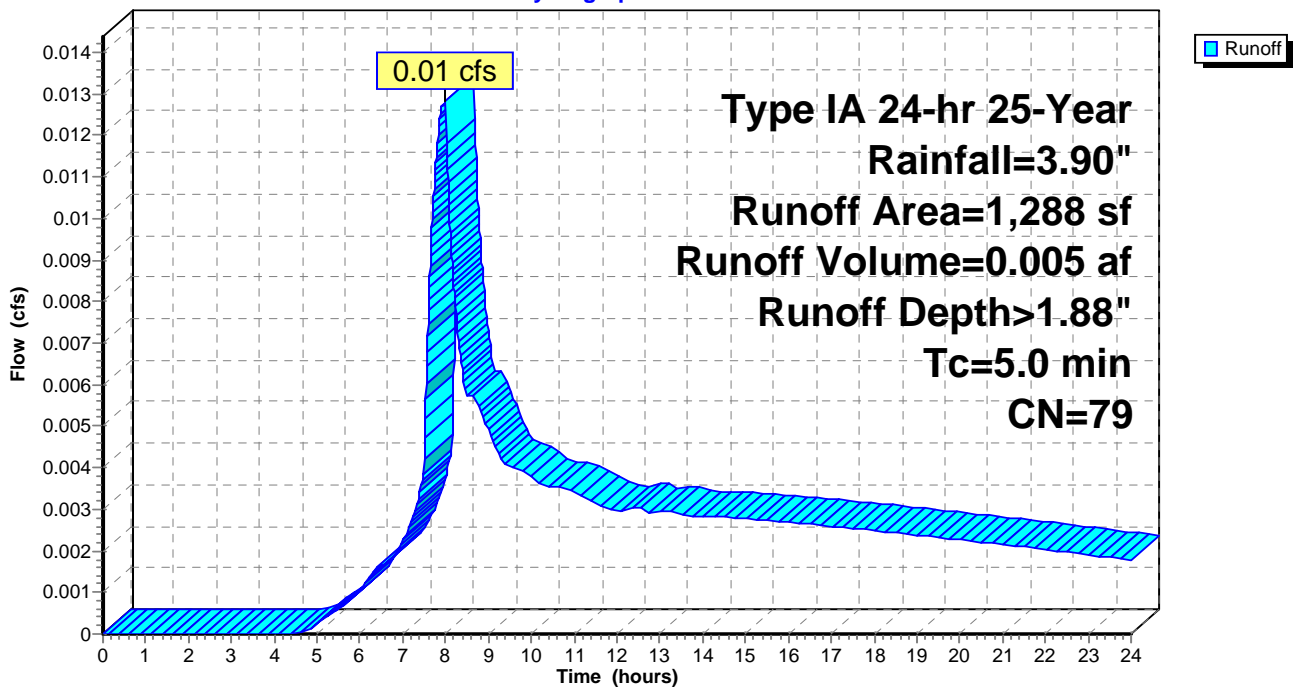
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
1,288	79	50-75% Grass cover, Fair, HSG C
1,288		Pervious Area

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

Subcatchment 2S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 2X: TAX LOT 200 EAST

Runoff = 0.63 cfs @ 8.01 hrs, Volume= 0.260 af, Depth> 2.52"

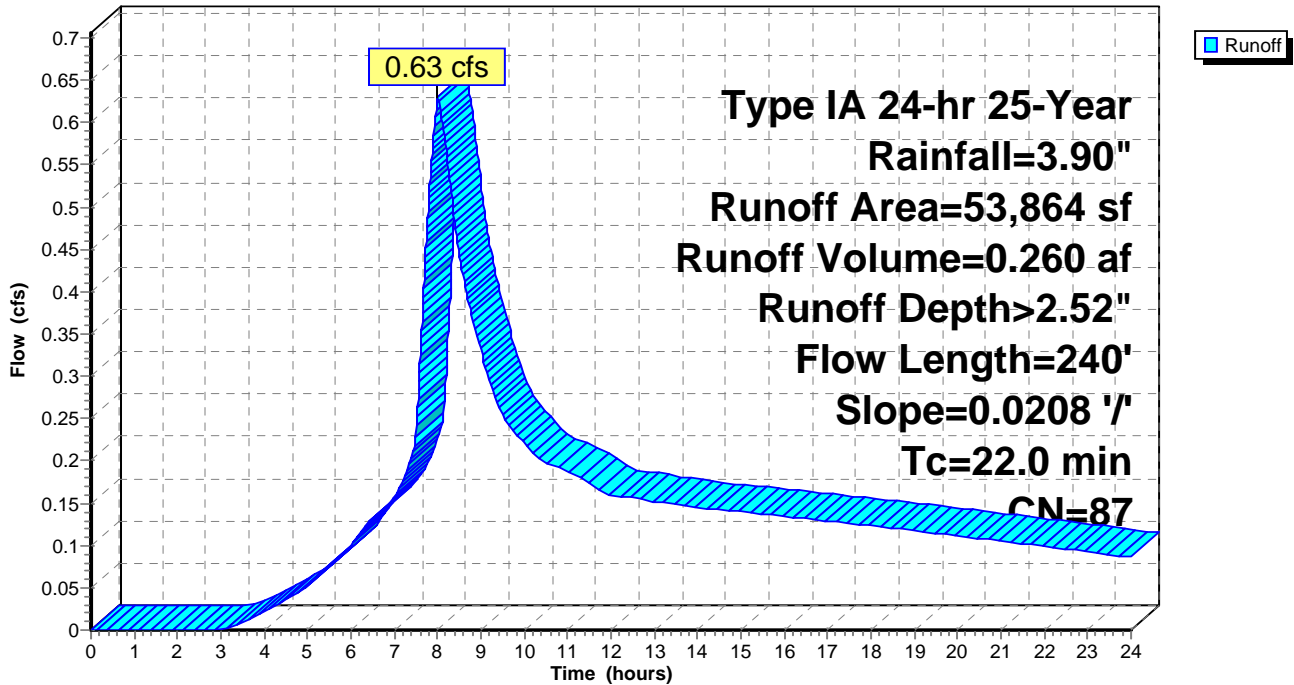
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
50,783	86	<50% Grass cover, Poor, HSG C
* 3,081	98	Roof
53,864	87	Weighted Average
50,783		Pervious Area
3,081		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	240	0.0208	0.18		Sheet Flow, PASTURE/MEADOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 2X: TAX LOT 200 EAST

Hydrograph



Summary for Subcatchment 3S1: SW112TH DRAIN TO SITE

Runoff = 0.21 cfs @ 7.88 hrs, Volume= 0.069 af, Depth> 3.55"

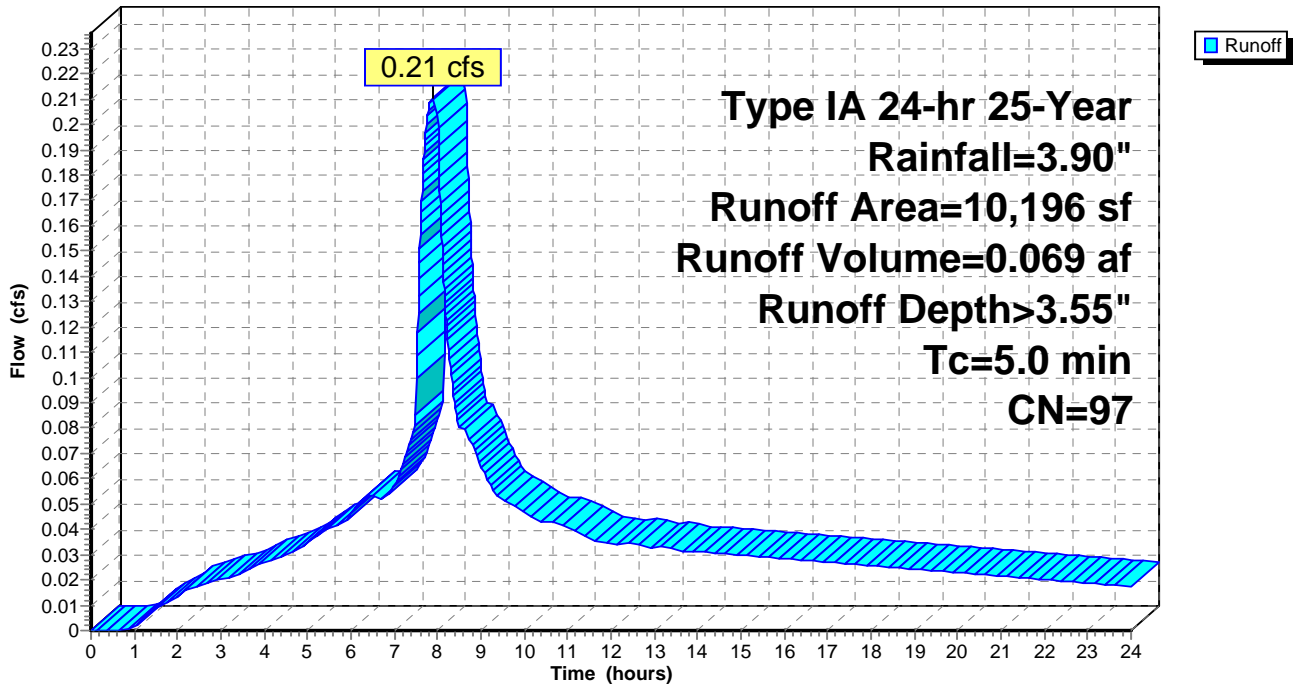
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
9,446	98	Street and sidewalk
750	79	50-75% Grass cover, Fair, HSG C
10,196	97	Weighted Average
750		Pervious Area
9,446		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S1: SW112TH DRAIN TO SITE

Hydrograph



Summary for Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA

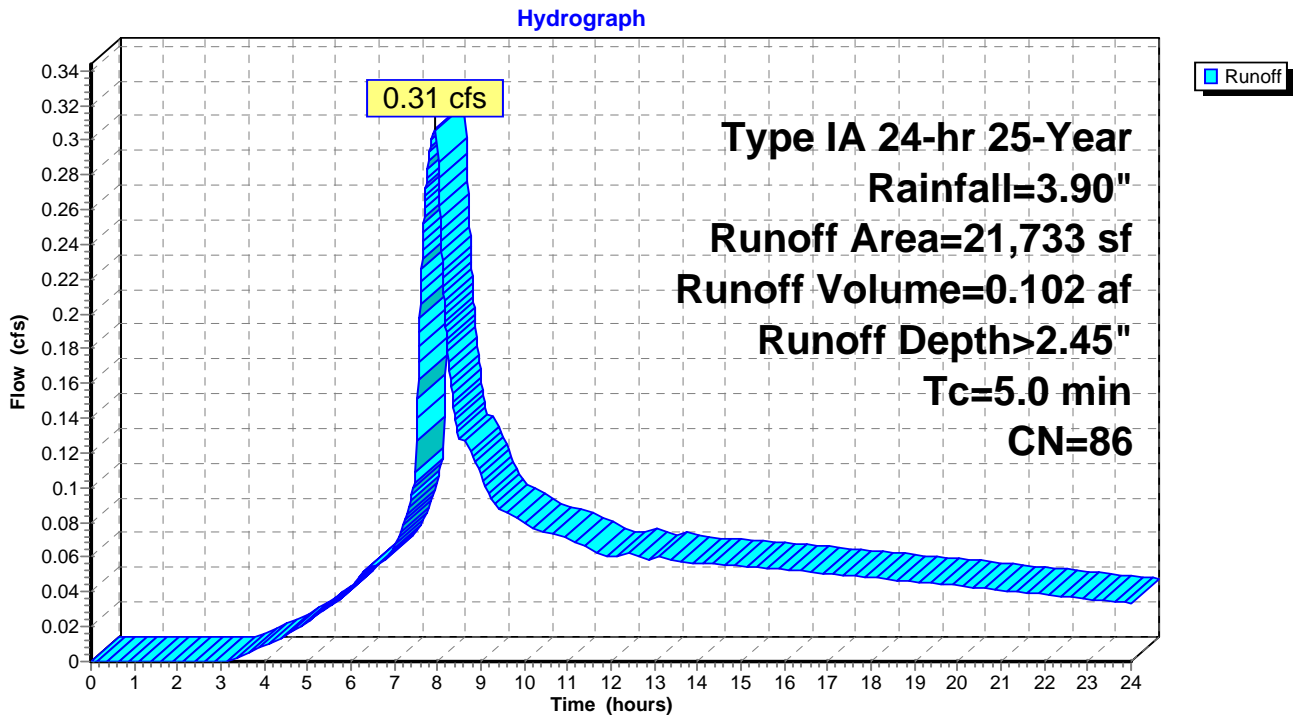
Runoff = 0.31 cfs @ 7.94 hrs, Volume= 0.102 af, Depth> 2.45"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
13,813	79	50-75% Grass cover, Fair, HSG C
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
21,733	86	Weighted Average
13,813		Pervious Area
7,920		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREET AND ROOFTOP RUNOFF

Subcatchment 3S2: 3 HOUSES, LANDSCAPING AND PERVIOUS LOT AREA



Summary for Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION

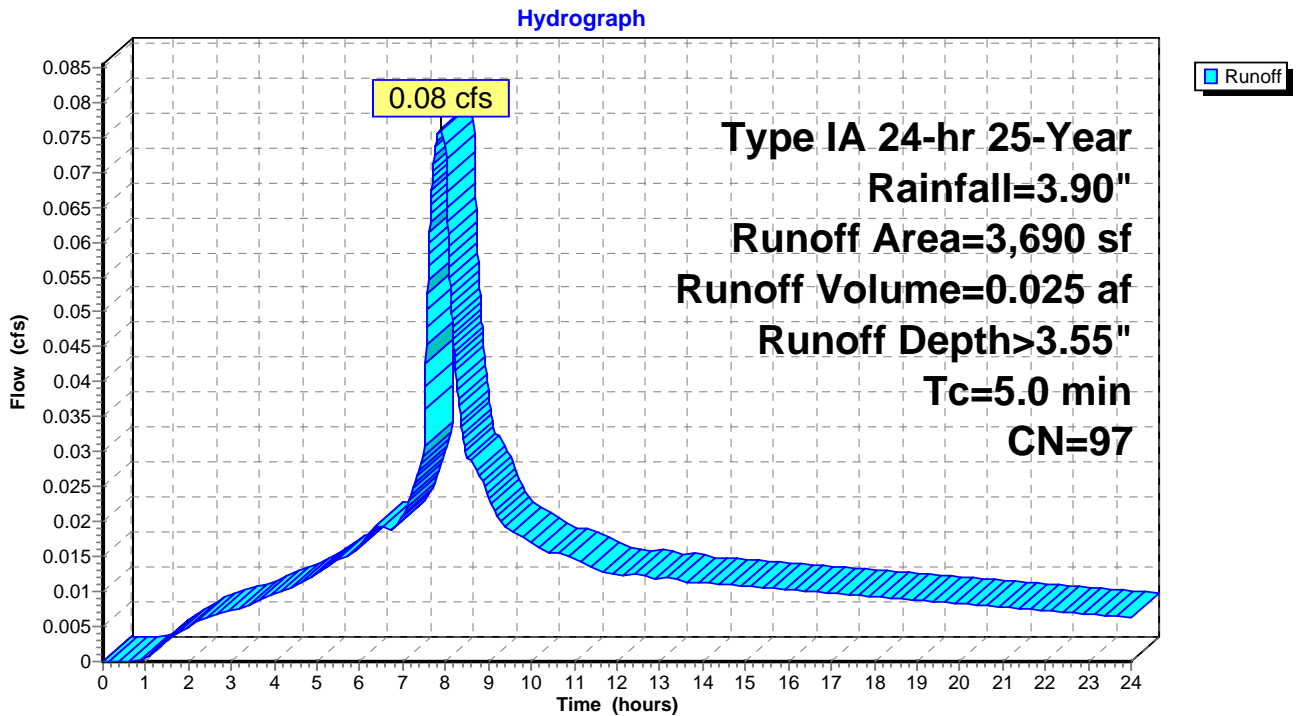
Runoff = 0.08 cfs @ 7.88 hrs, Volume= 0.025 af, Depth> 3.55"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 3,540	98	Street and sidewalk
150	79	50-75% Grass cover, Fair, HSG C
3,690	97	Weighted Average
150		Pervious Area
3,540		Impervious Area

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

Subcatchment 3S3: SOUTH HELENIUS AND HELENIUS-SW 112TH INTERSECTION



Summary for Subcatchment 4S1: SW HELENIUS MID SECTION

Runoff = 0.16 cfs @ 7.89 hrs, Volume= 0.051 af, Depth> 3.33"

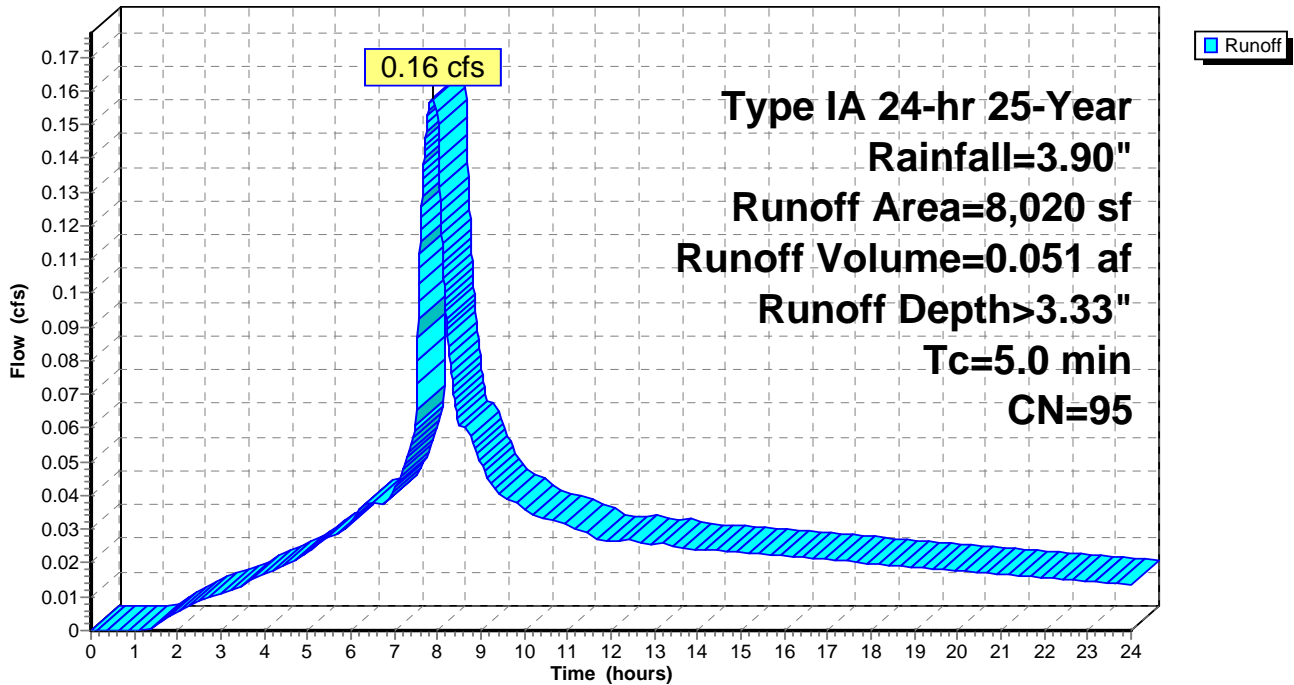
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
6,943	98	Streets and sidewalks
1,077	79	50-75% Grass cover, Fair, HSG C
8,020	95	Weighted Average
1,077		Pervious Area
6,943		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, STREETS AND ROOFTOP RUNOFF

Subcatchment 4S1: SW HELENIUS MID SECTION

Hydrograph



Summary for Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA

Runoff = 0.18 cfs @ 7.92 hrs, Volume= 0.057 af, Depth> 2.63"

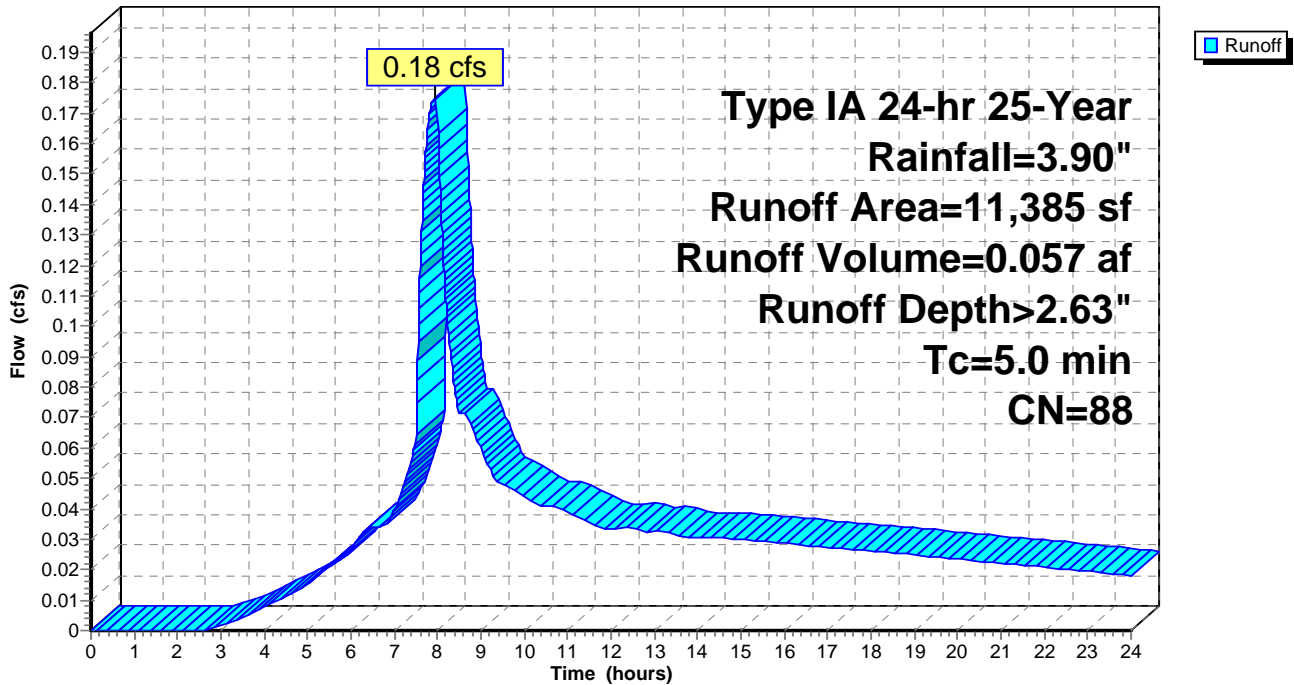
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
6,105	79	50-75% Grass cover, Fair, HSG C
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
11,385	88	Weighted Average
6,105		Pervious Area
5,280		Impervious Area

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

Subcatchment 4S2: HOUSES 4-5, LANDSCAPING AND PERVIOUS LOT AREA

Hydrograph



Summary for Subcatchment 4S3: HOUSES 4-5

Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.037 af, Depth> 3.66"

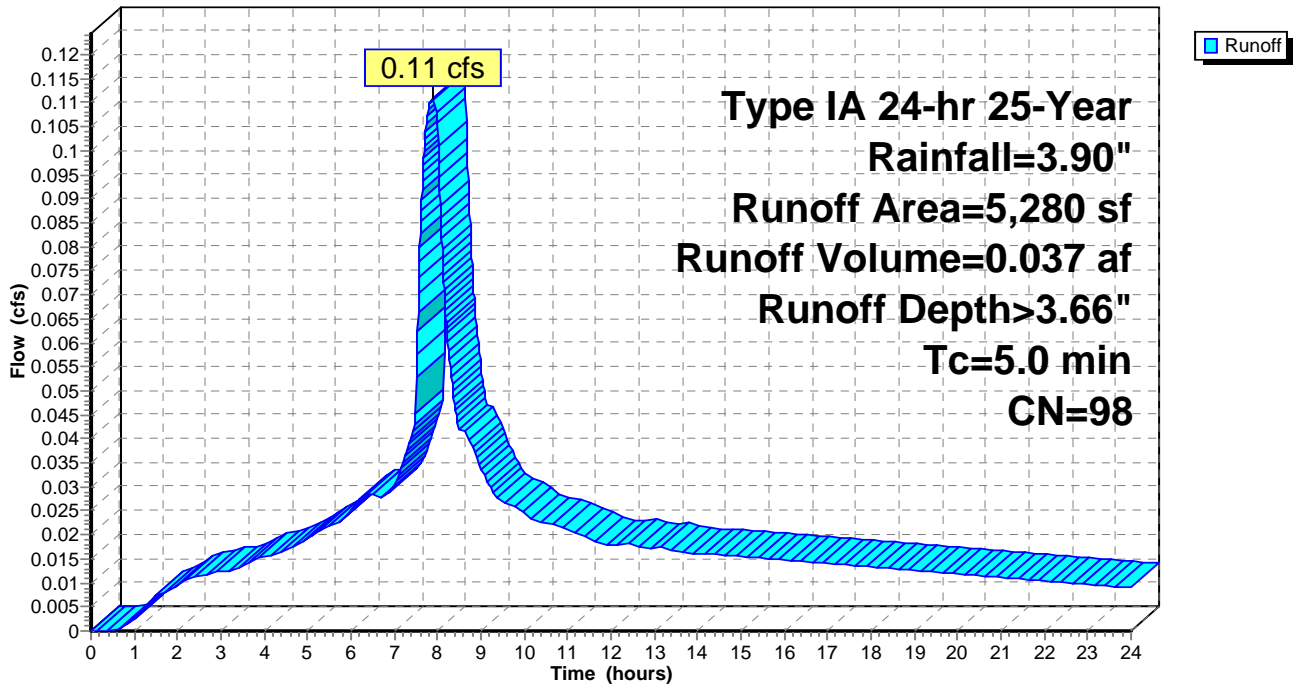
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 4S3: HOUSES 4-5

Hydrograph



Summary for Subcatchment 5S: HOUSES 6-7

Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.037 af, Depth> 3.66"

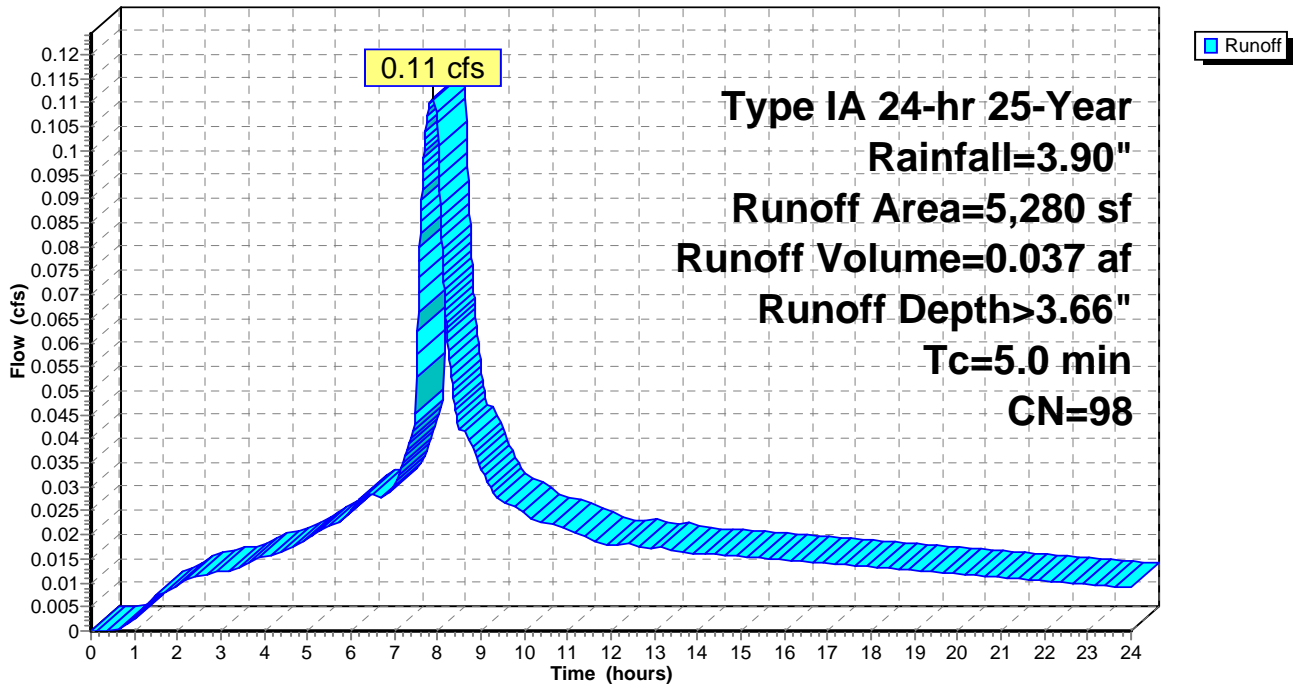
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 5S: HOUSES 6-7

Hydrograph



Summary for Subcatchment 6S1: 110TH

Runoff = 0.31 cfs @ 7.88 hrs, Volume= 0.102 af, Depth> 3.55"

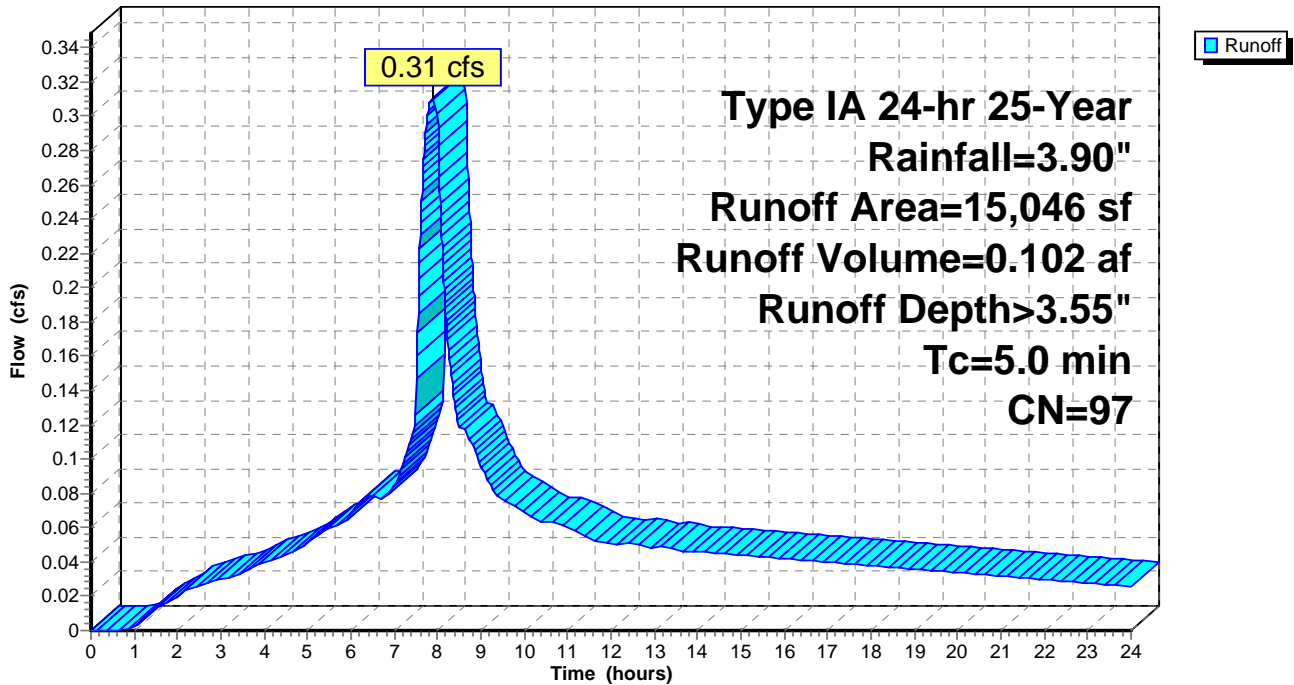
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	14,121	98	Street and sidewalk
	925	79	50-75% Grass cover, Fair, HSG C
	15,046	97	Weighted Average
	925		Pervious Area
	14,121		Impervious Area

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

Subcatchment 6S1: 110TH

Hydrograph



Summary for Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Runoff = 0.31 cfs @ 7.98 hrs, Volume= 0.111 af, Depth> 1.88"

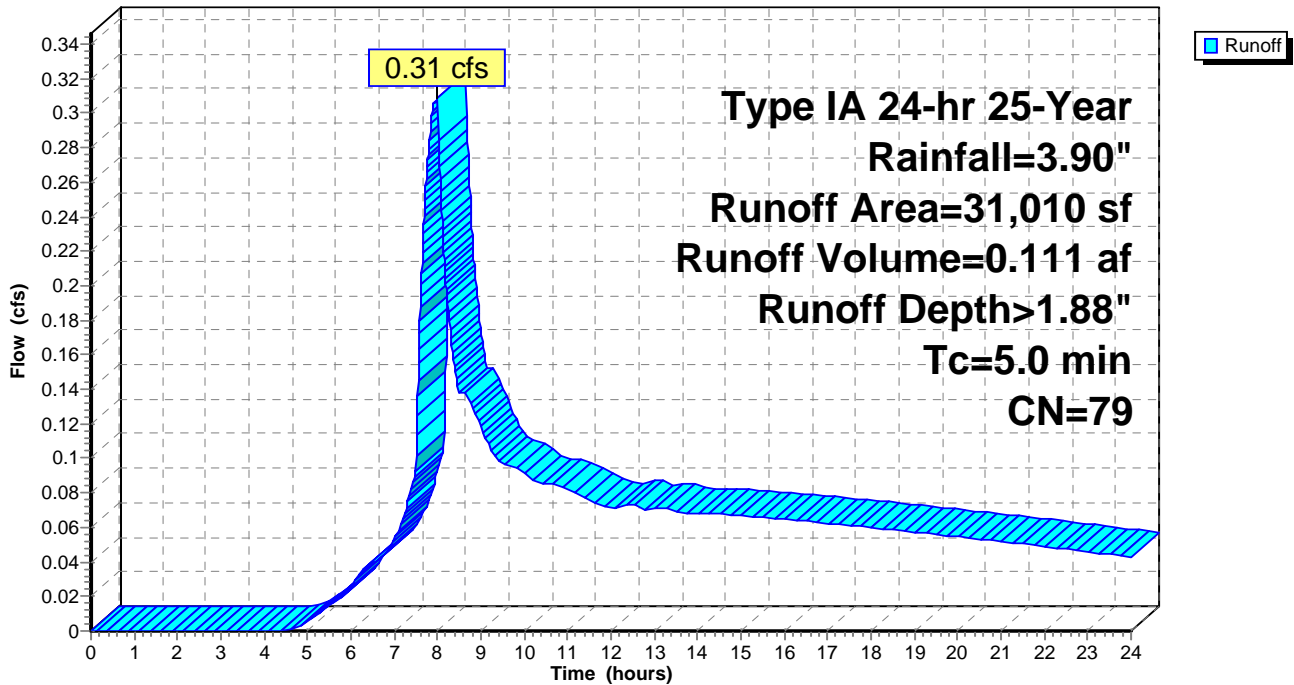
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
31,010	79	50-75% Grass cover, Fair, HSG C
31,010		Pervious Area

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

Subcatchment 6S2: LANDSCAPING AND PERVIOUS LOT AREA

Hydrograph



Summary for Subcatchment 7S: HOUSES 8-11 AND 16

Runoff = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af, Depth> 3.66"

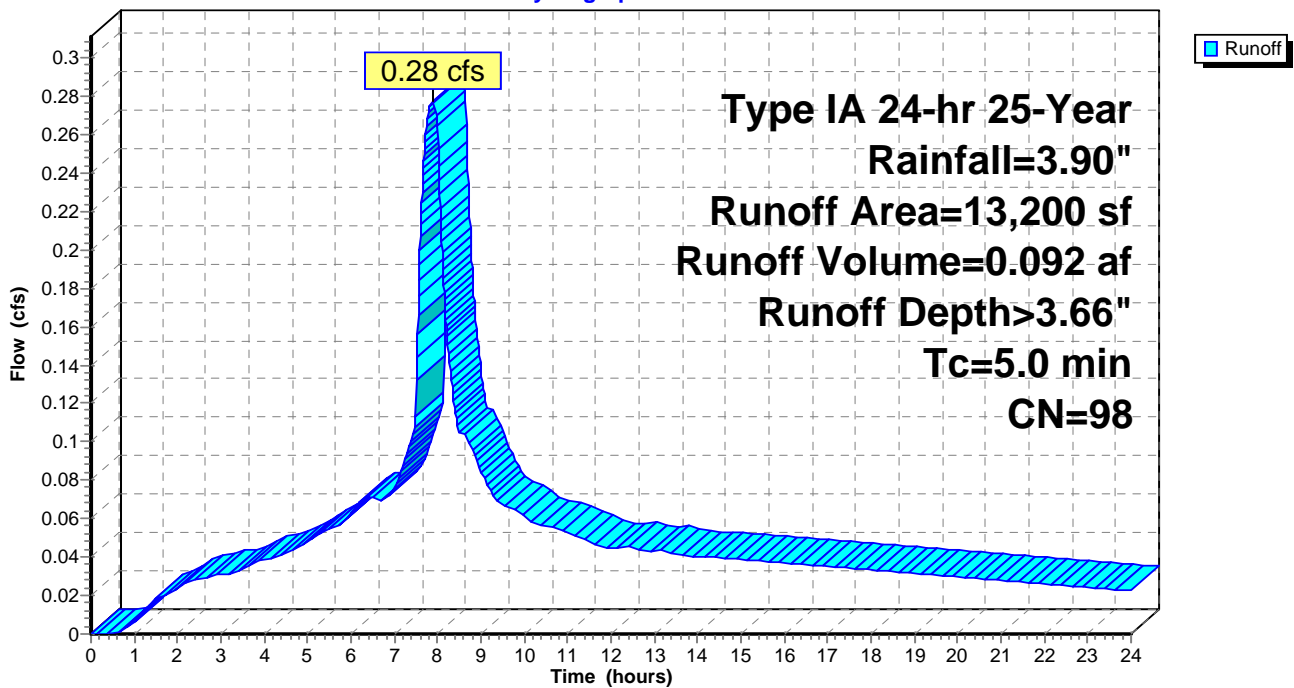
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 13,200	98	5 Lots at 2640 SF Impervious/Lot per CWS
13,200		Impervious Area

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

Subcatchment 7S: HOUSES 8-11 AND 16

Hydrograph



Summary for Subcatchment 8S: HOUSES 12-15

Runoff = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af, Depth> 3.66"

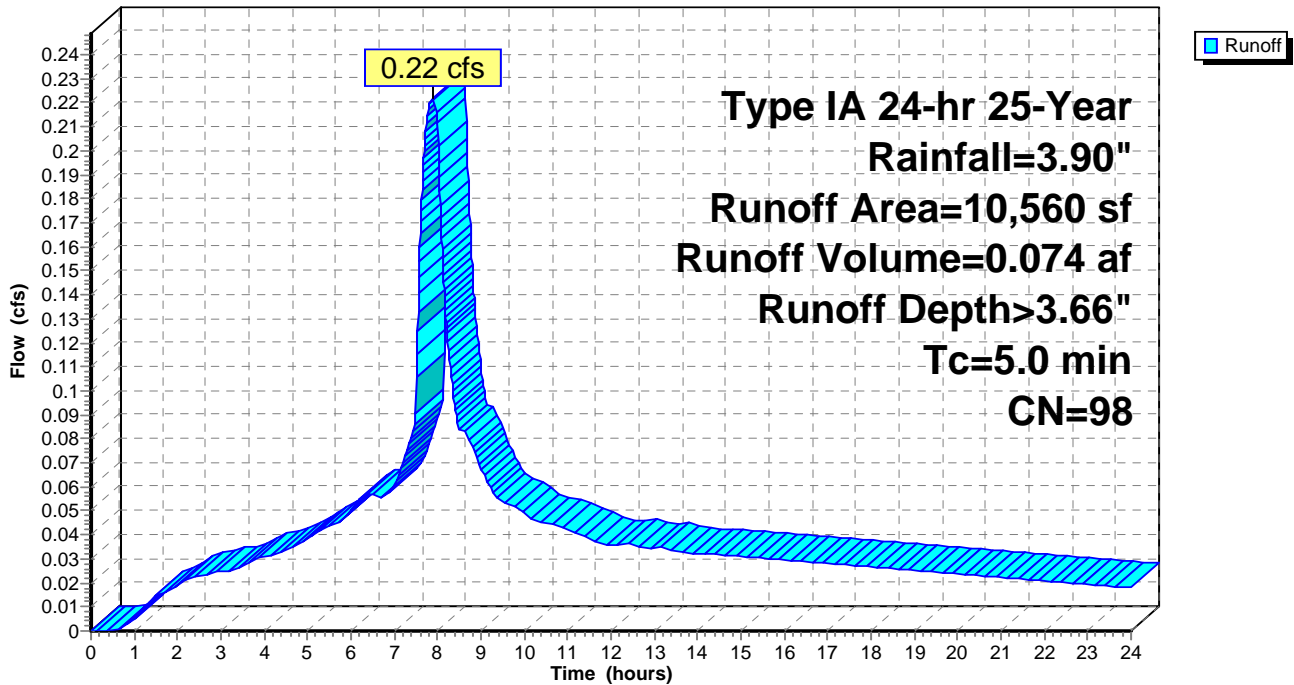
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 10,560	98	4 Lots at 2640 SF Impervious/Lot per CWS
10,560		Impervious Area

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

Subcatchment 8S: HOUSES 12-15

Hydrograph



Summary for Subcatchment 9S1: SW HELENIUS EAST

Runoff = 0.15 cfs @ 7.89 hrs, Volume= 0.049 af, Depth> 3.33"

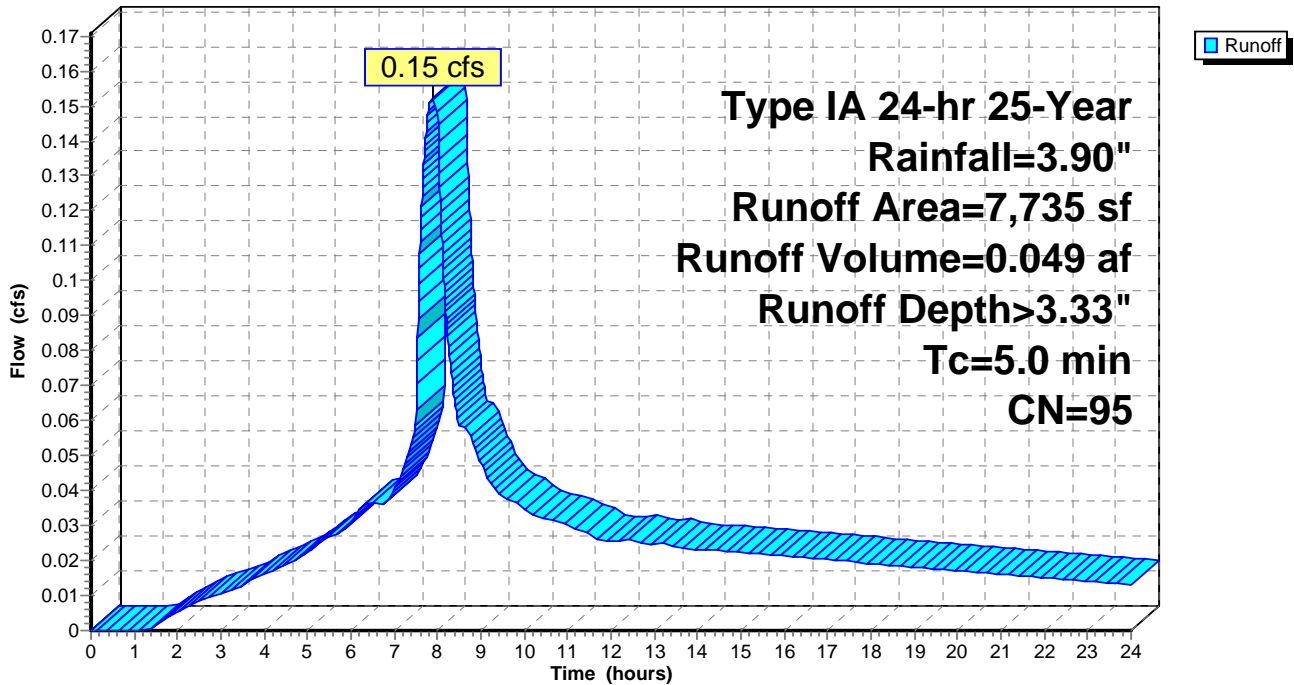
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
6,616	98	Streets and sidewalks
1,119	79	50-75% Grass cover, Fair, HSG C
7,735	95	Weighted Average
1,119		Pervious Area
6,616		Impervious Area

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

Subcatchment 9S1: SW HELENIUS EAST

Hydrograph



Summary for Subcatchment 9S2: LANDSCAPING

Runoff = 0.05 cfs @ 7.98 hrs, Volume= 0.018 af, Depth> 1.88"

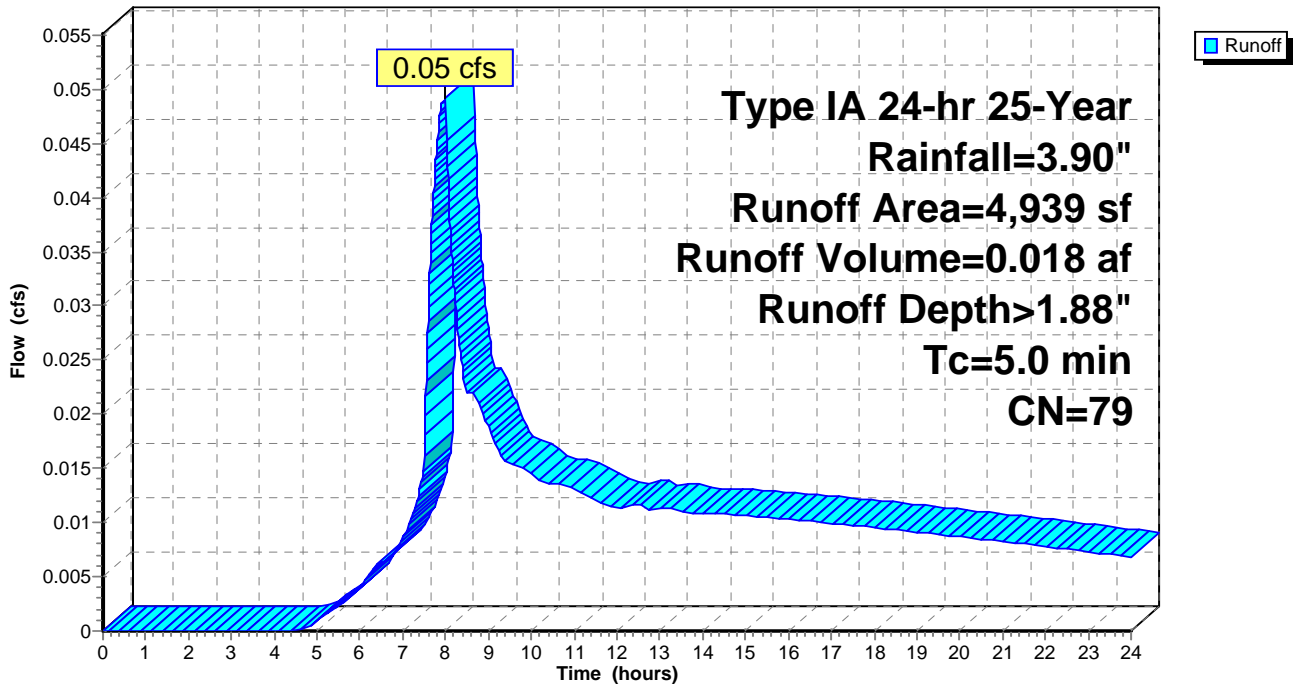
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
4,939	79	50-75% Grass cover, Fair, HSG C
4,939		Pervious Area

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

Subcatchment 9S2: LANDSCAPING

Hydrograph



Summary for Subcatchment 100S: SW 112TH (SOUTH)

Runoff = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af, Depth> 3.66"

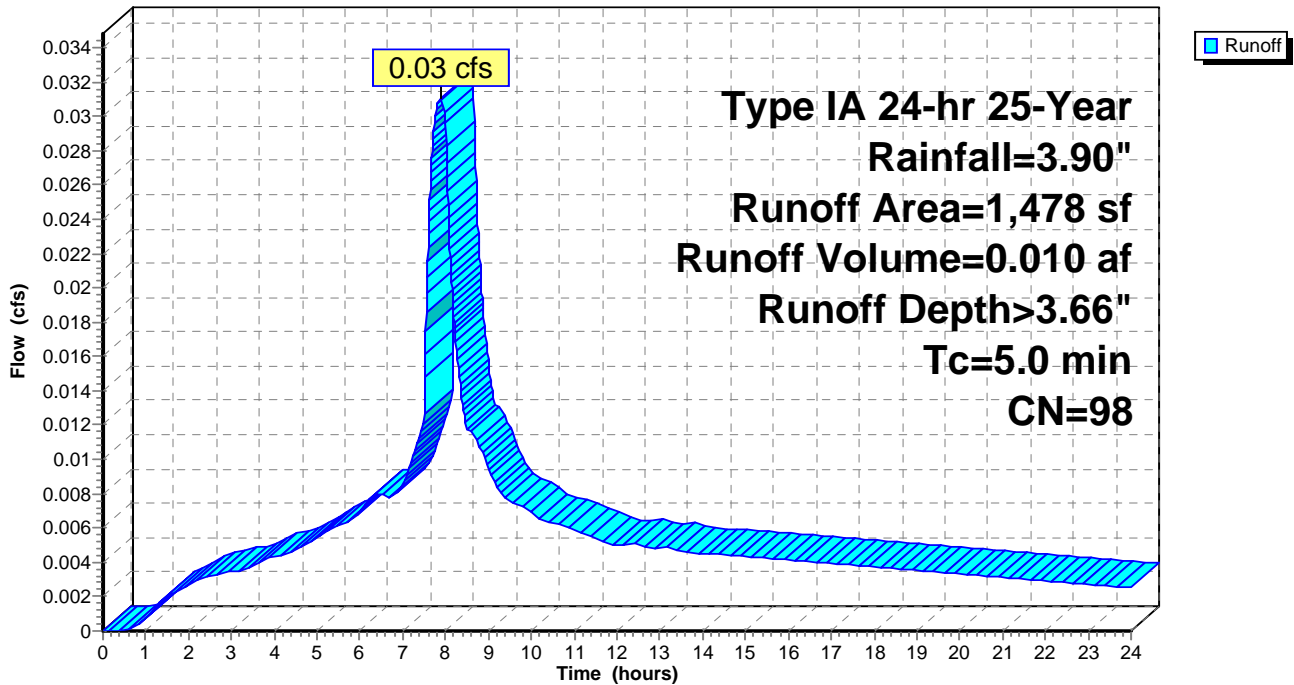
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 1,478	98	Street and sidewalk
1,478		Impervious Area

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

Subcatchment 100S: SW 112TH (SOUTH)

Hydrograph



Summary for Subcatchment 200S1: SW 112TH AVENUE

Runoff = 0.39 cfs @ 7.88 hrs, Volume= 0.128 af, Depth> 3.66"

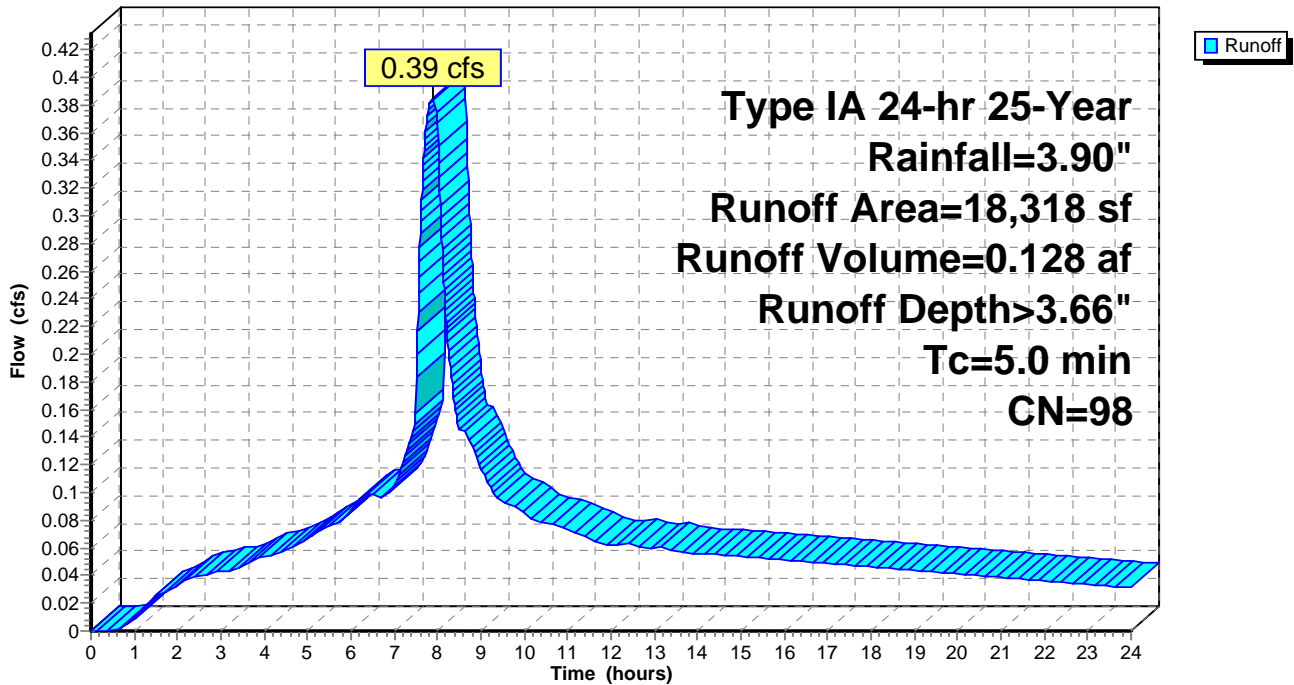
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 18,318	98	Street and sidewalk
18,318		Impervious Area

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

Subcatchment 200S1: SW 112TH AVENUE

Hydrograph



Summary for Subcatchment 200S2: LOT 9

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.021 af, Depth> 3.43"

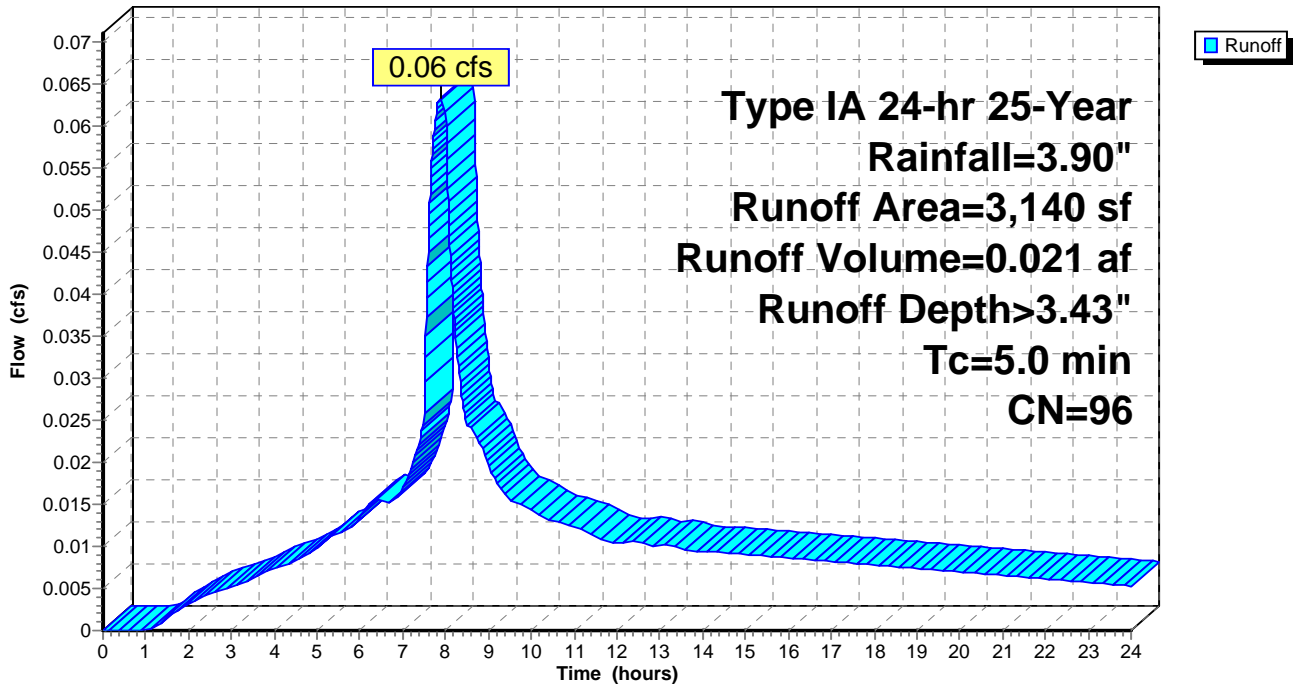
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
3,140	96	Weighted Average
500		Pervious Area
2,640		Impervious Area

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

Subcatchment 200S2: LOT 9

Hydrograph



Summary for Subcatchment 300S: LOT 8

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

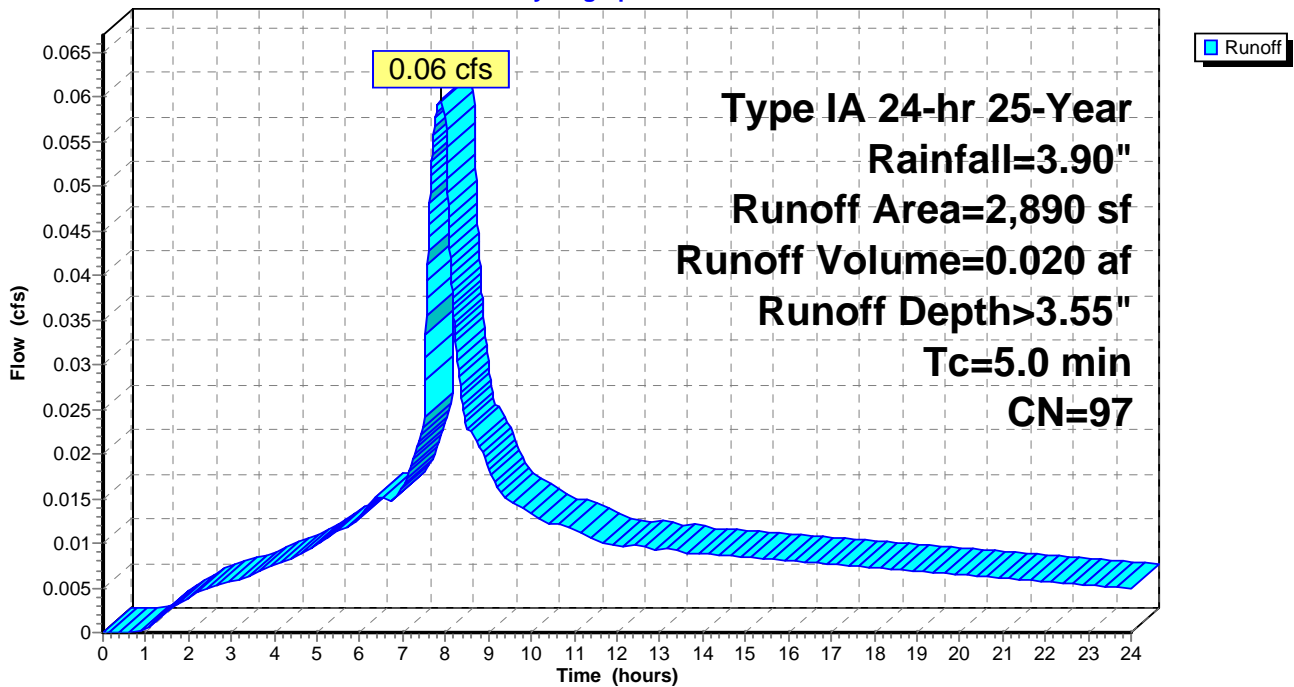
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 300S: LOT 8

Hydrograph



Summary for Subcatchment 400S: LOTS 6 - 7

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

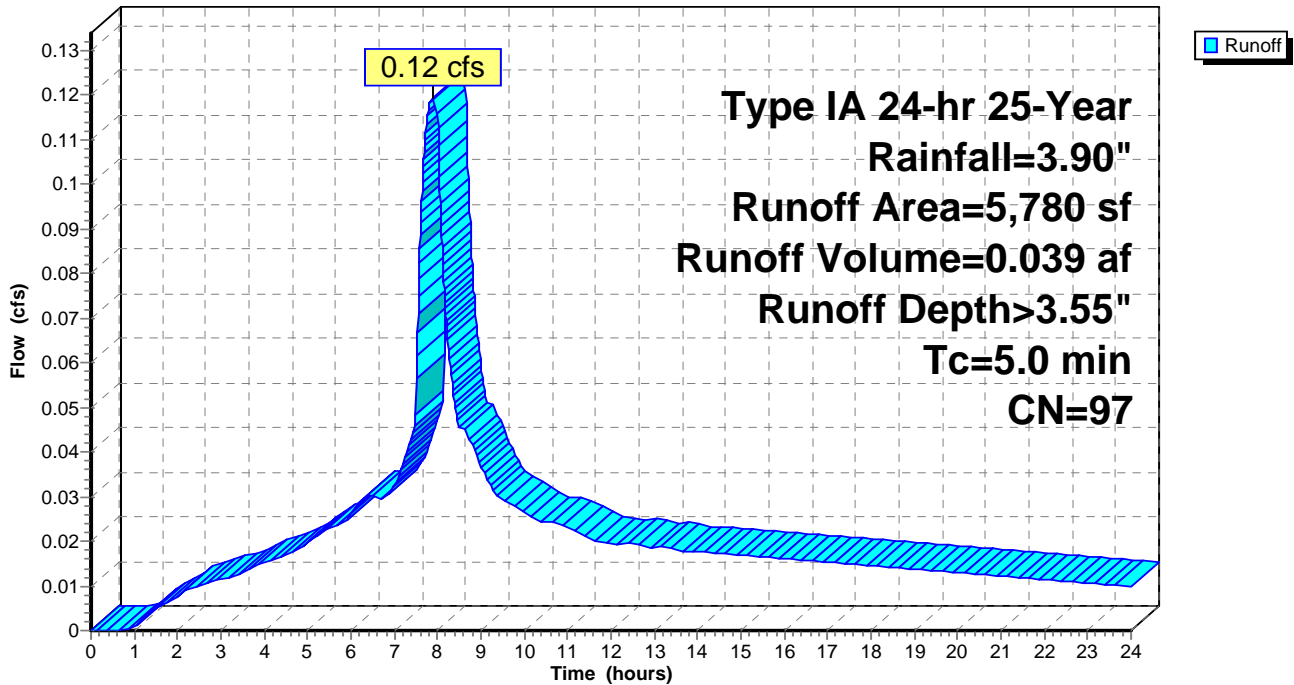
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 400S: LOTS 6 - 7

Hydrograph



Summary for Subcatchment 500S: LOT 5

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

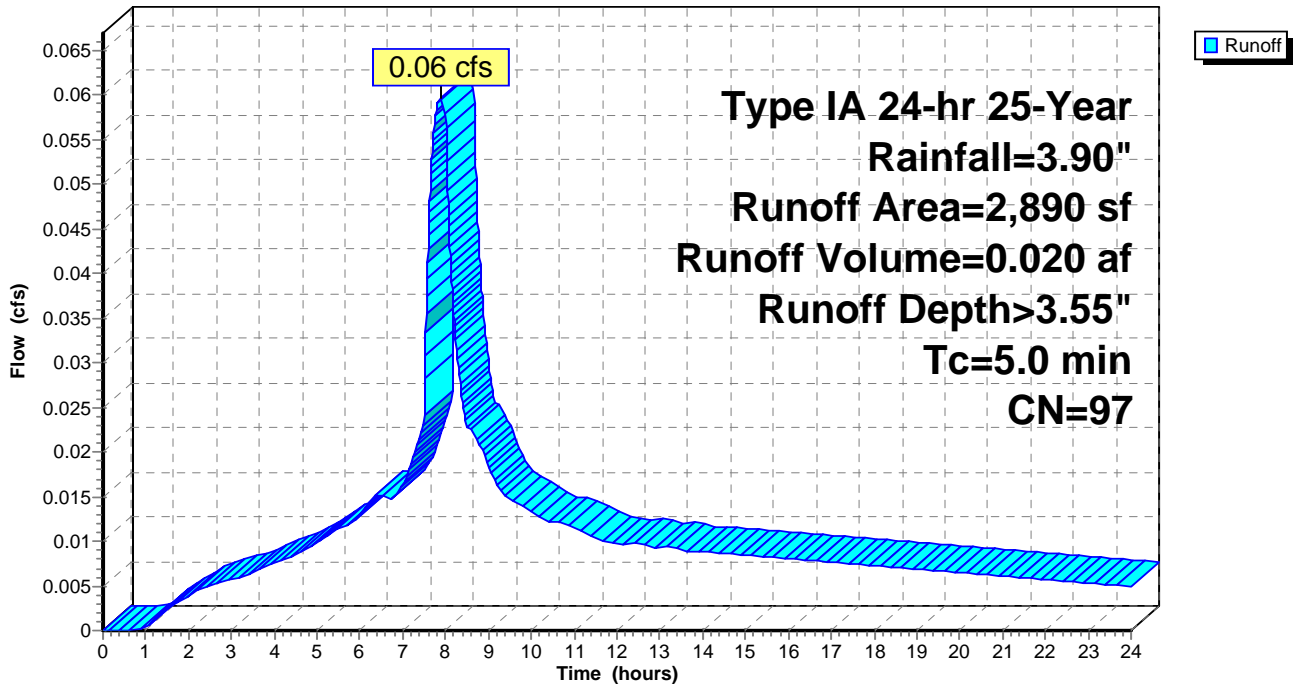
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 500S: LOT 5

Hydrograph



Summary for Subcatchment 600S: LOTS 3 - 4

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

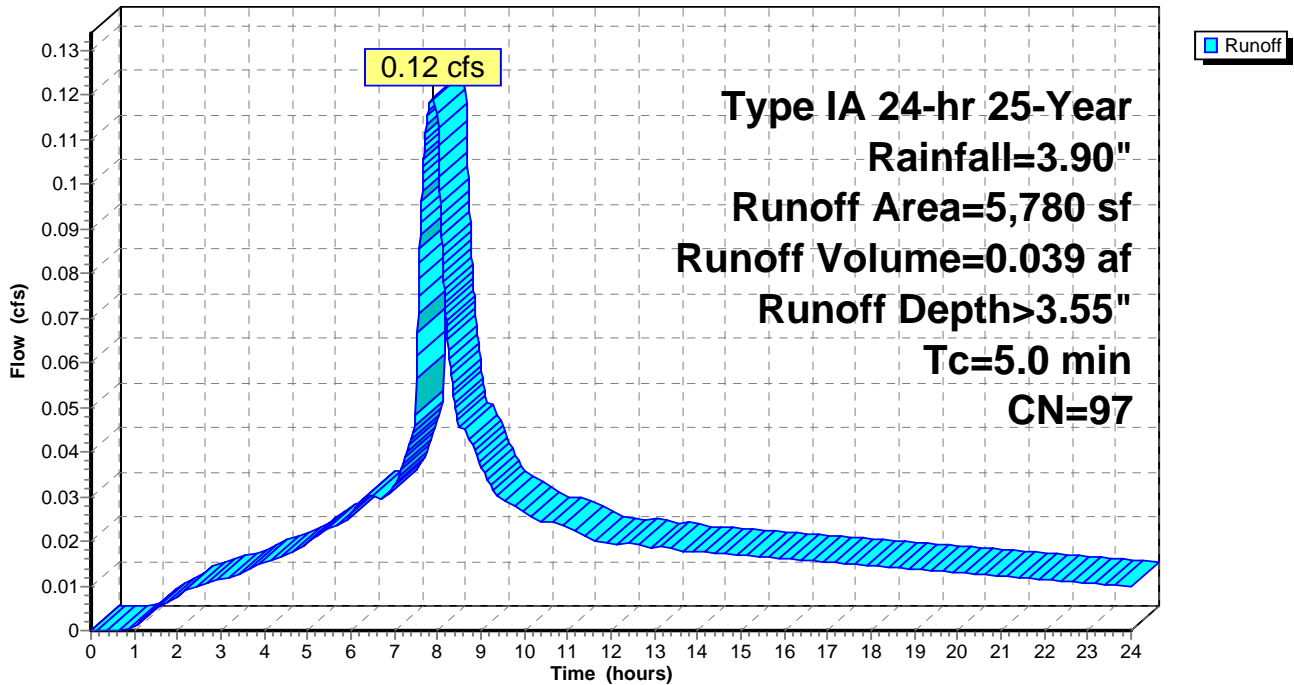
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 600S: LOTS 3 - 4

Hydrograph



Summary for Subcatchment 700S1: LOTS LANDSCAPING AND ROAD

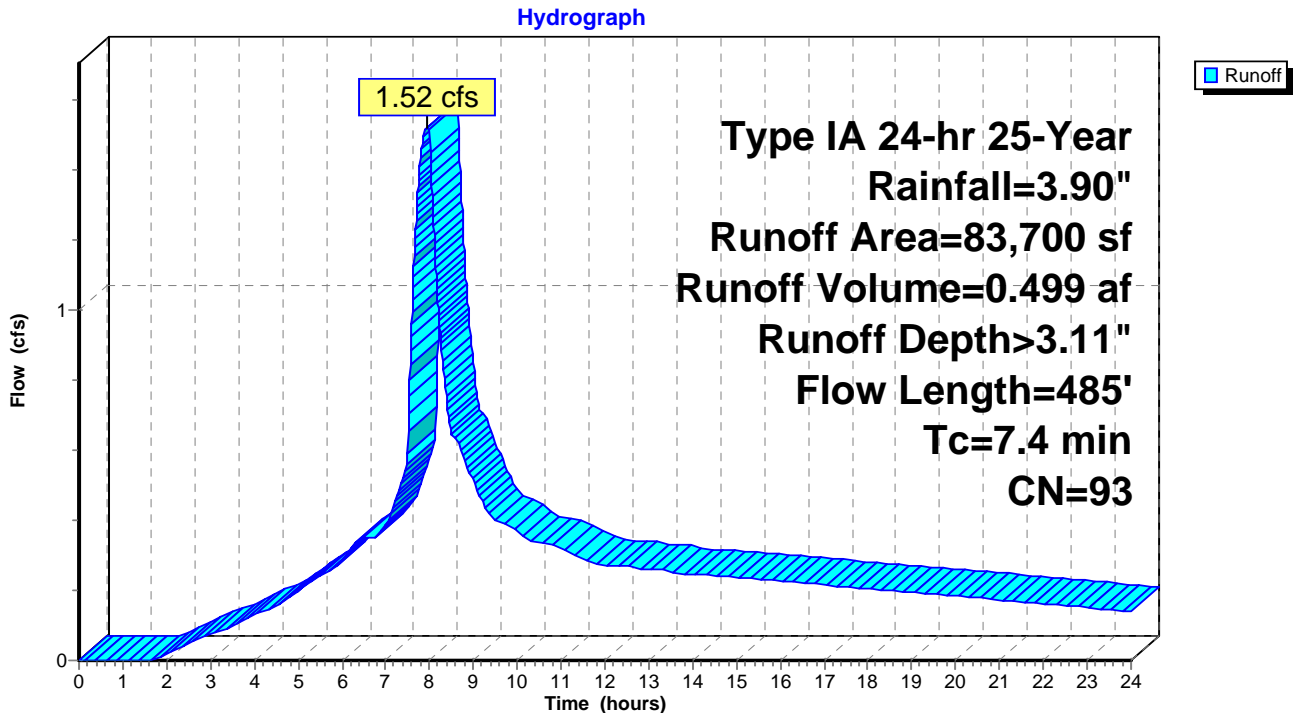
Runoff = 1.52 cfs @ 7.94 hrs, Volume= 0.499 af, Depth> 3.11"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	26,696	98	Street and sidewalk
*	23,760	98	9 Lots at 2640 SF Impervious/Lot per CWS
	33,244	86	<50% Grass cover, Poor, HSG C
	83,700	93	Weighted Average
	33,244		Pervious Area
	50,456		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	85	0.1000	0.28		Sheet Flow, LANDSCAPE Grass: Short n= 0.150 P2= 2.50"
2.3	400	0.0200	2.87		Shallow Concentrated Flow, GUTTER Paved Kv= 20.3 fps
7.4	485	Total			

Subcatchment 700S1: LOTS LANDSCAPING AND ROAD



Summary for Subcatchment 700S2: LOTS 1 - 2

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

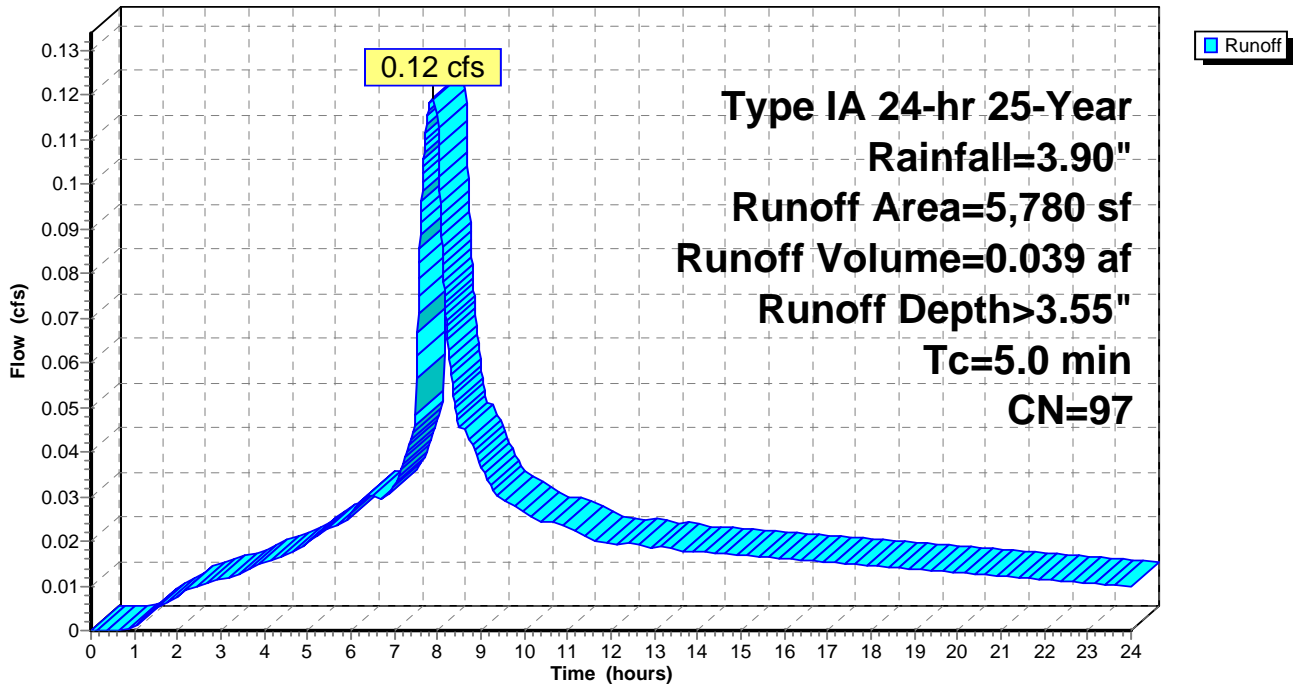
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
500	86	<50% Grass cover, Poor, HSG C
5,780	97	Weighted Average
500		Pervious Area
5,280		Impervious Area

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

Subcatchment 700S2: LOTS 1 - 2

Hydrograph



Summary for Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.039 af, Depth> 3.55"

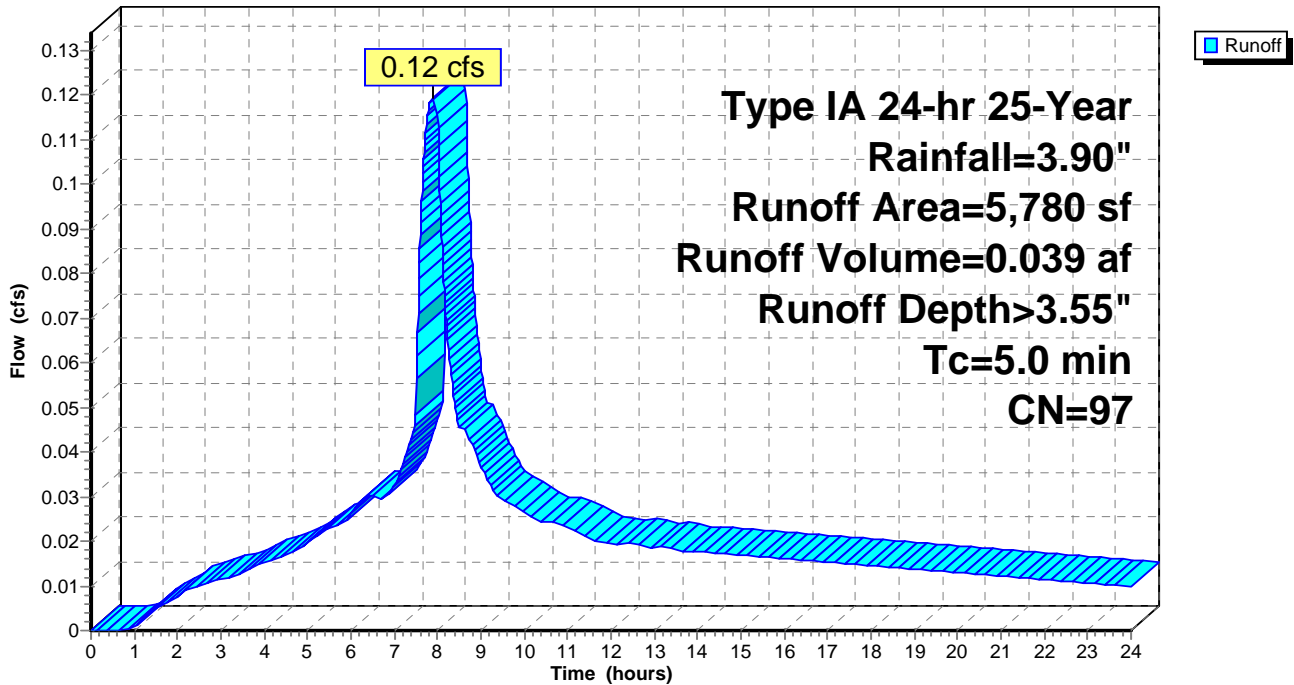
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
	500	86	<50% Grass cover, Poor, HSG C
	5,780	97	Weighted Average
	500		Pervious Area
	5,280		Impervious Area

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

Subcatchment 800S: LOTS 9 - 10 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Runoff = 0.06 cfs @ 7.88 hrs, Volume= 0.020 af, Depth> 3.55"

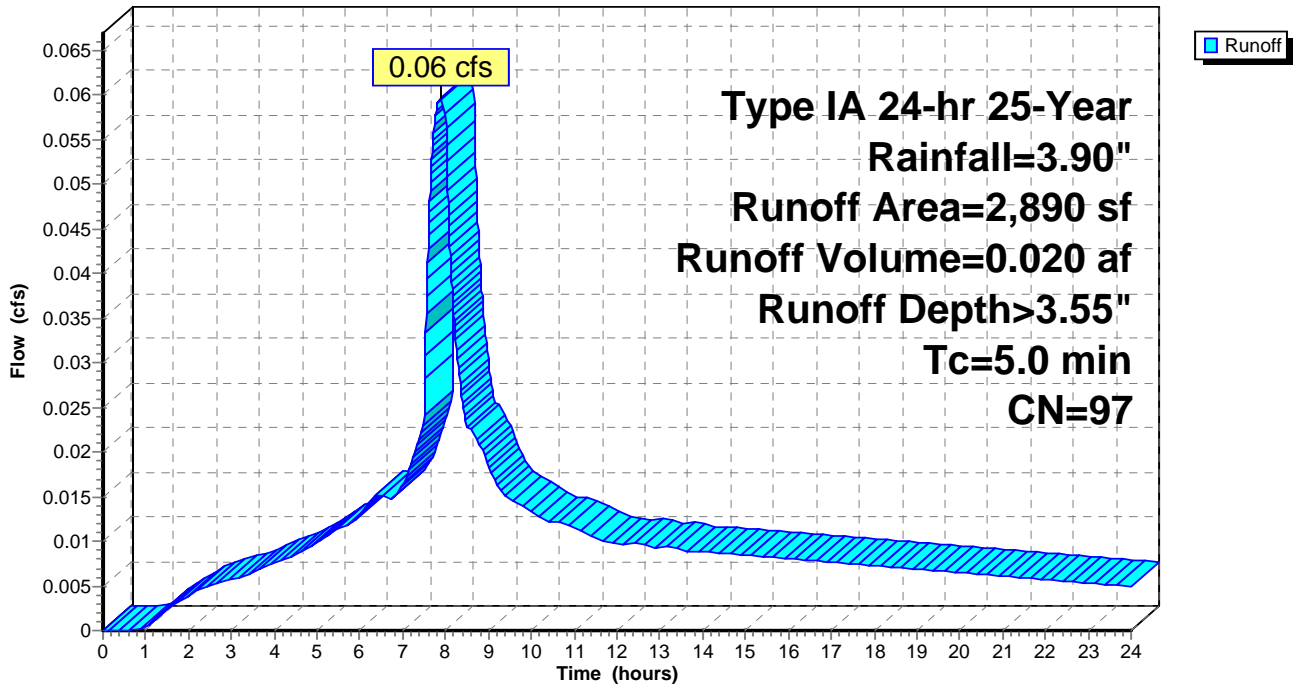
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 2,640	98	1 Lot at 2640 SF Impervious/Lot per CWS
250	86	<50% Grass cover, Poor, HSG C
2,890	97	Weighted Average
250		Pervious Area
2,640		Impervious Area

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

Subcatchment 900S: LOT 8 LAKEVIEW BLUFF

Hydrograph



Summary for Subcatchment 1100S: 2 HOUSES

Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.037 af, Depth> 3.66"

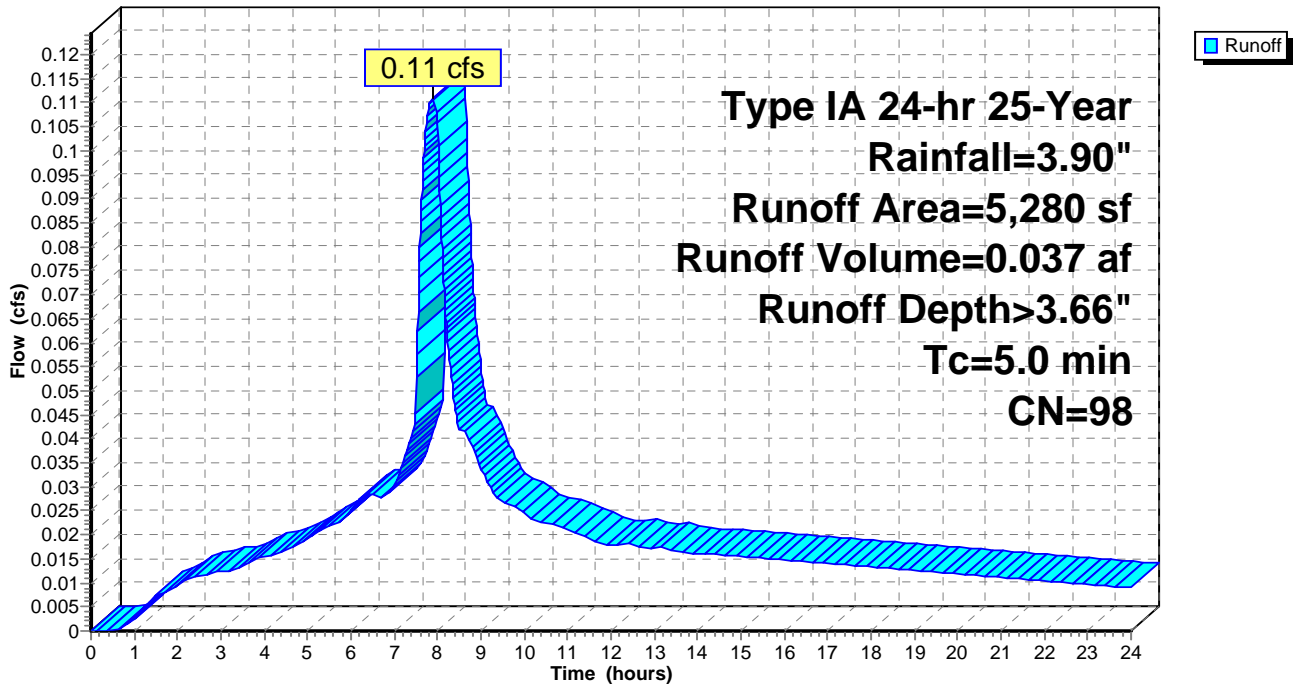
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 5,280	98	2 Lots at 2640 SF Impervious/Lot per CWS
5,280		Impervious Area

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

Subcatchment 1100S: 2 HOUSES

Hydrograph



Summary for Subcatchment 1200S: 3 HOUSES

Runoff = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af, Depth> 3.66"

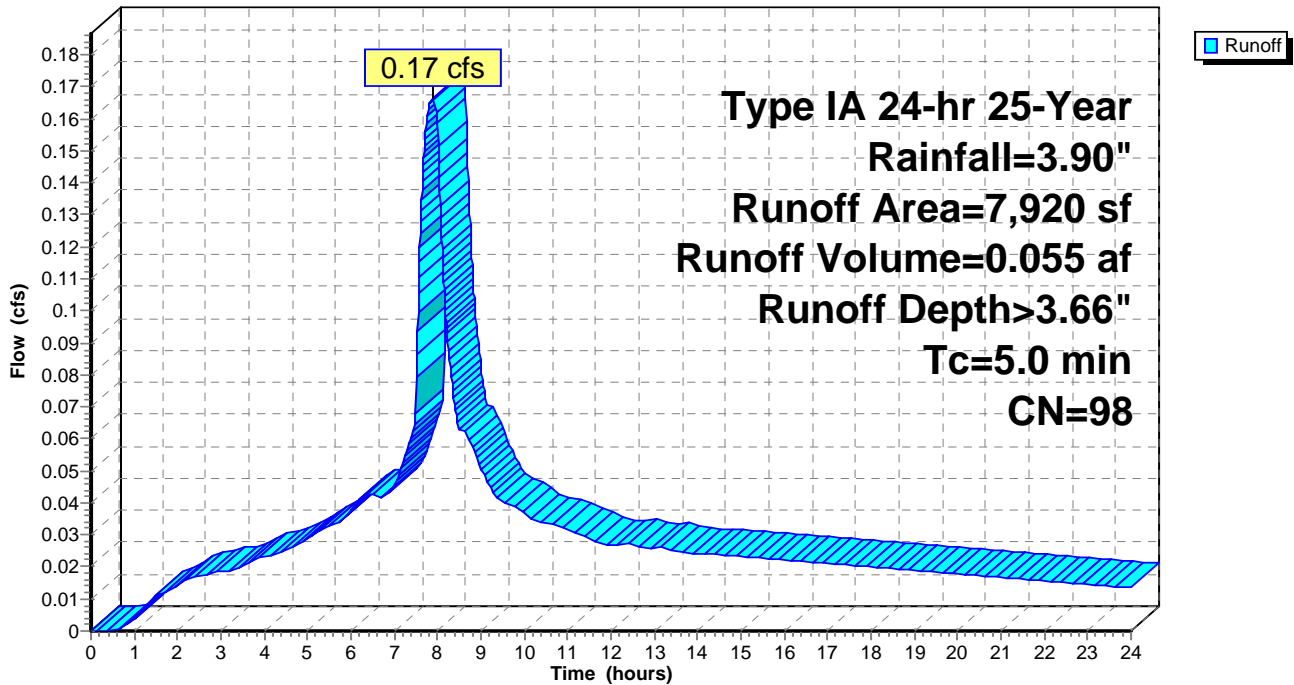
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
7,920		Impervious Area

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

Subcatchment 1200S: 3 HOUSES

Hydrograph



Summary for Subcatchment 1300S1: STREET

Runoff = 0.57 cfs @ 7.88 hrs, Volume= 0.191 af, Depth> 3.66"

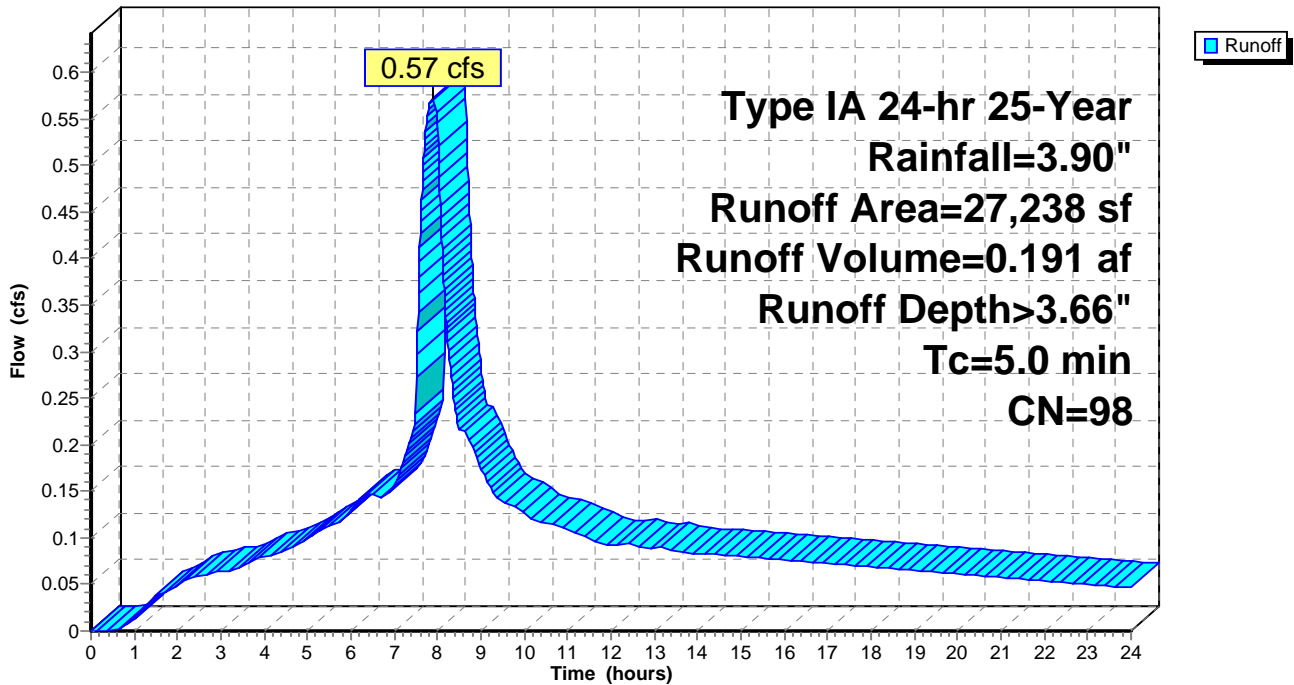
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 27,238	98	Street and sidewalk
27,238		Impervious Area

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

Subcatchment 1300S1: STREET

Hydrograph



Summary for Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Runoff = 0.50 cfs @ 7.95 hrs, Volume= 0.171 af, Depth> 2.19"

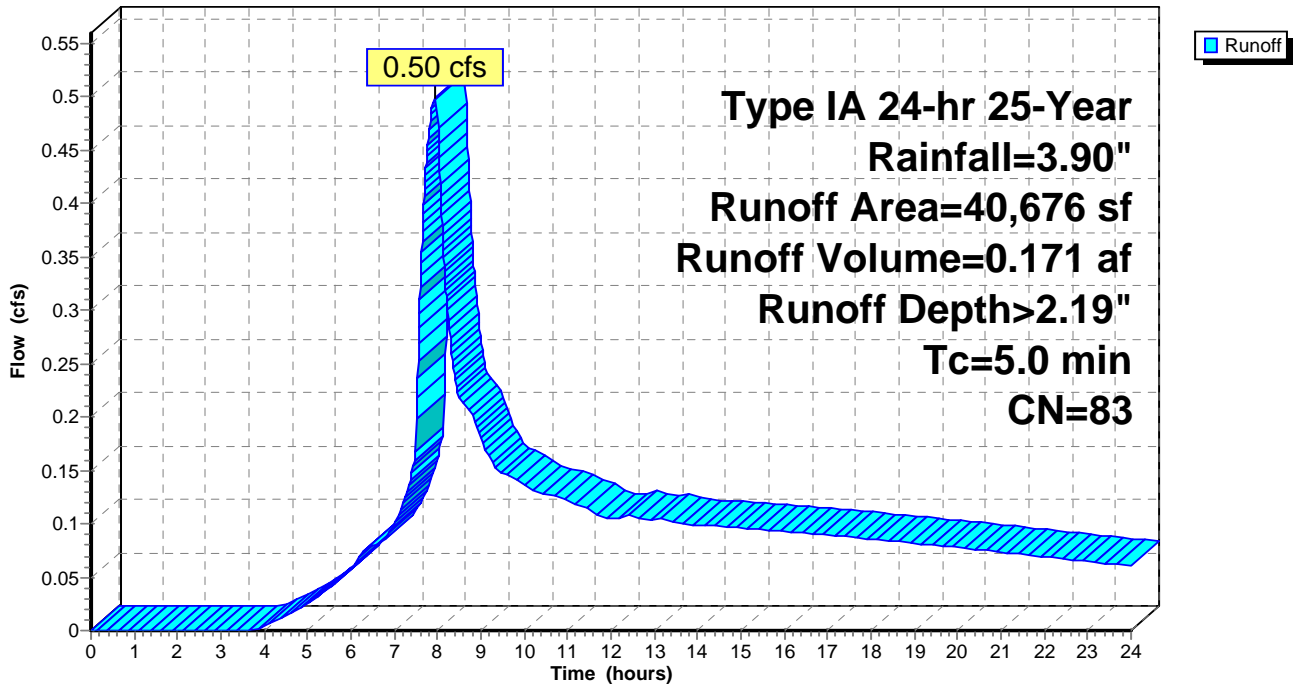
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	7,920	98	3 Lots at 2640 SF Impervious/Lot per CWS
	32,756	79	50-75% Grass cover, Fair, HSG C
	40,676	83	Weighted Average
	32,756		Pervious Area
	7,920		Impervious Area

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

Subcatchment 1300S2: 3 HOUSES AND LANDSCAPING

Hydrograph



Summary for Subcatchment 1300S3: LANDSCAPING AND HOUSES

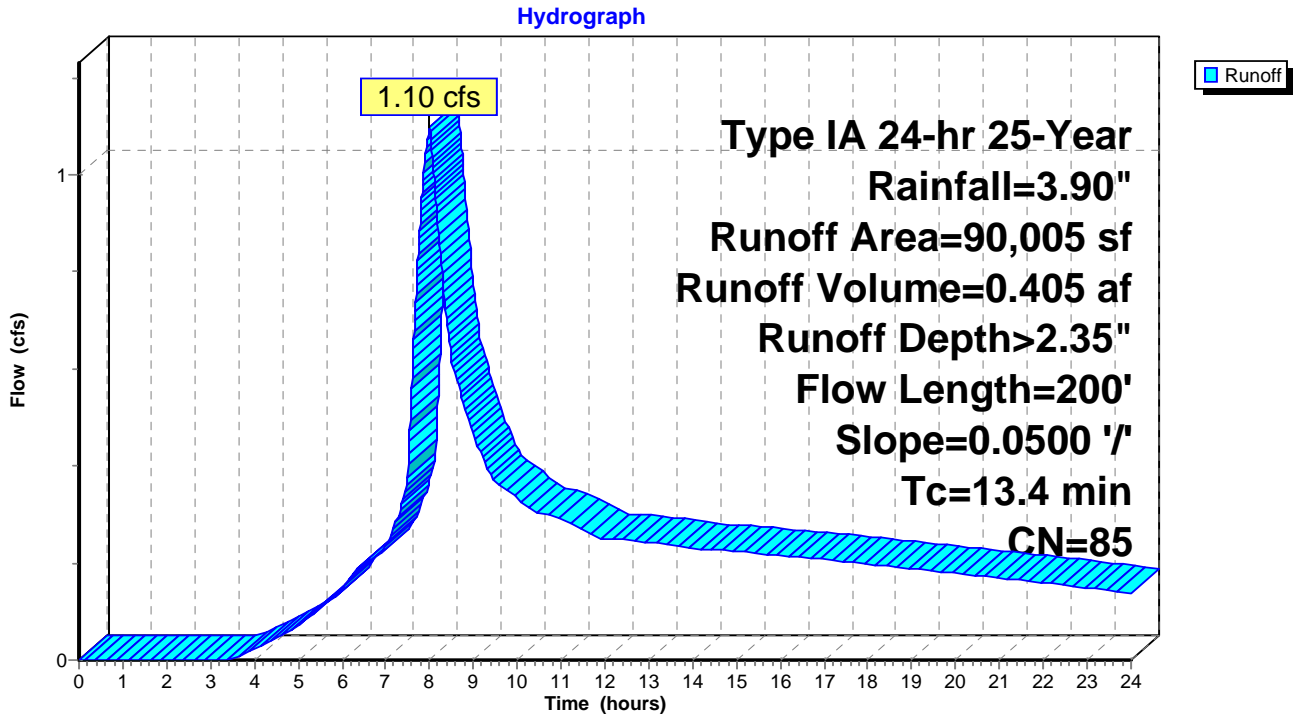
Runoff = 1.10 cfs @ 8.00 hrs, Volume= 0.405 af, Depth> 2.35"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

	Area (sf)	CN	Description
*	26,400	98	10 Lots at 2640 SF Impervious/Lot per CWS
	63,605	79	50-75% Grass cover, Fair, HSG C
	90,005	85	Weighted Average
	63,605		Pervious Area
	26,400		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	200	0.0500	0.25		Sheet Flow, LANDSCAPING SHEET FLOW Grass: Short n= 0.150 P2= 2.50"

Subcatchment 1300S3: LANDSCAPING AND HOUSES



Summary for Subcatchment 1900S1: POND SURFACE

Runoff = 7.99 cfs @ 7.87 hrs, Volume= 2.785 af, Depth> 3.89"

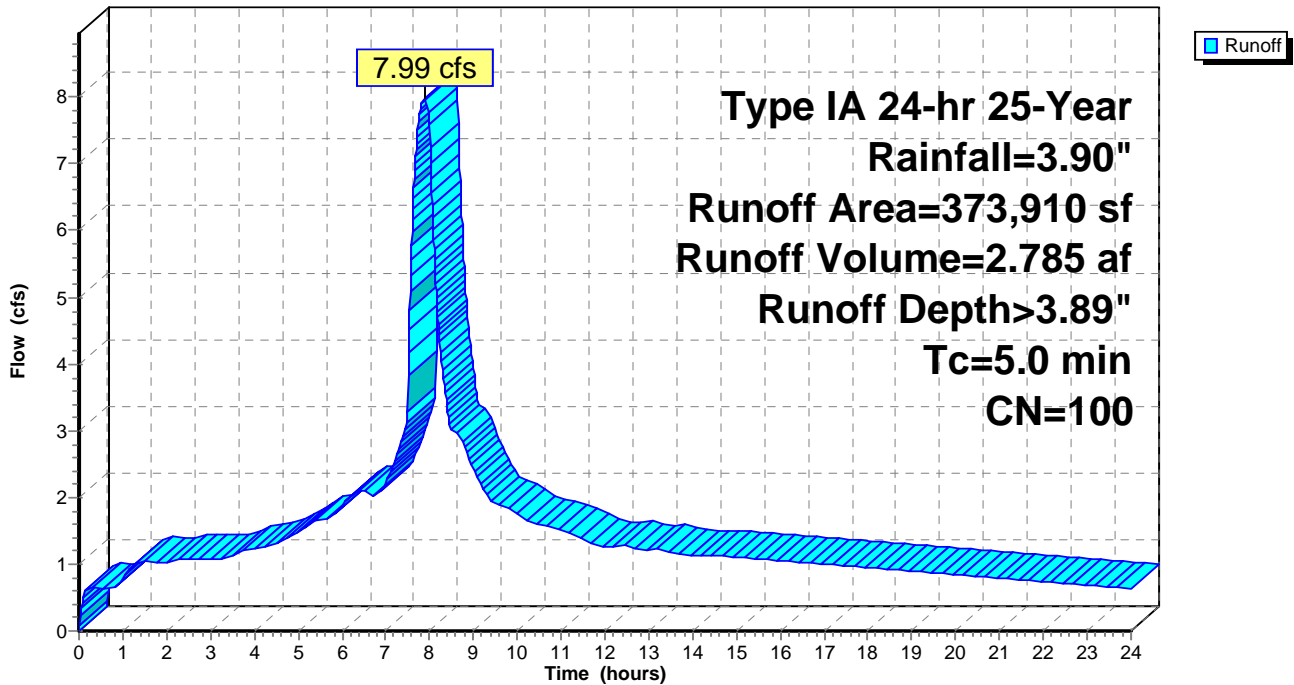
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
* 373,910	100	Water Surface
373,910		Impervious Area

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

Subcatchment 1900S1: POND SURFACE

Hydrograph



Summary for Subcatchment 1900S2: WOODED/ VEGETATED AREA

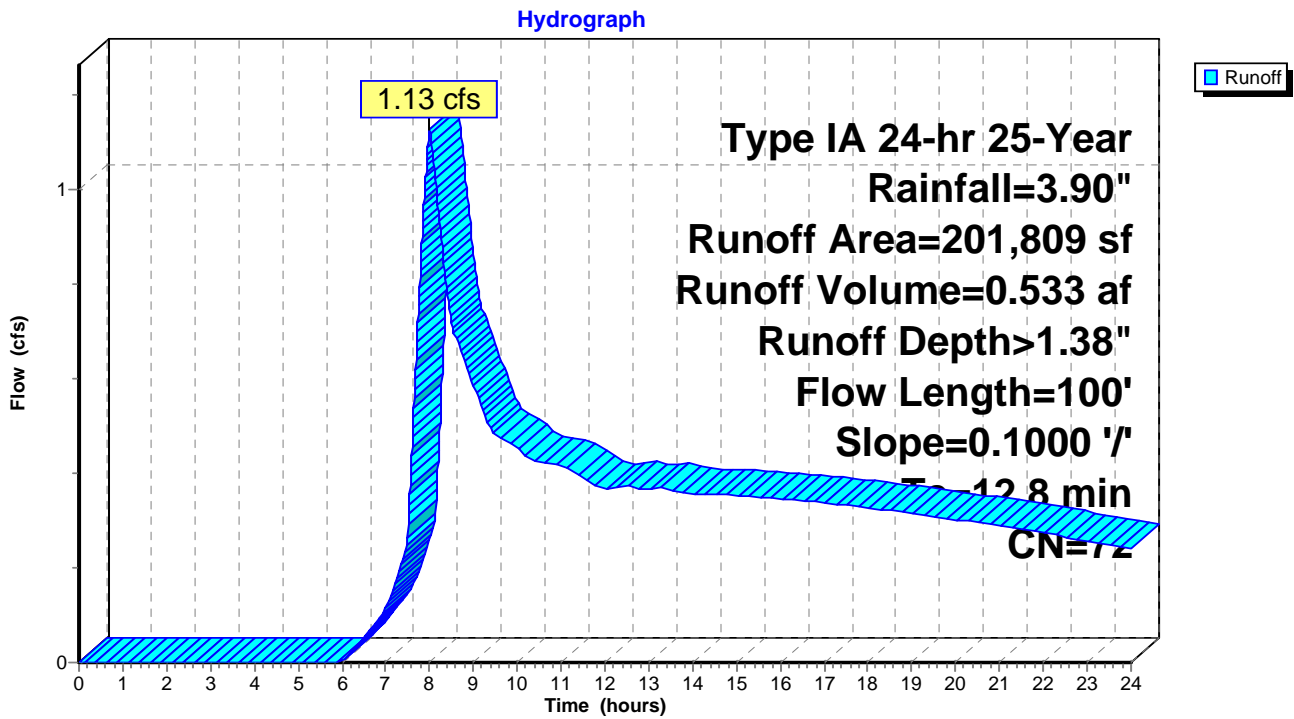
Runoff = 1.13 cfs @ 8.00 hrs, Volume= 0.533 af, Depth> 1.38"

Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
201,809	72	Woods/grass comb., Good, HSG C
201,809		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	100	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.50"

Subcatchment 1900S2: WOODED/ VEGETATED AREA



Summary for Subcatchment 1900S3: DEVELOPMENT

Runoff = 22.38 cfs @ 8.01 hrs, Volume= 9.850 af, Depth> 2.09"

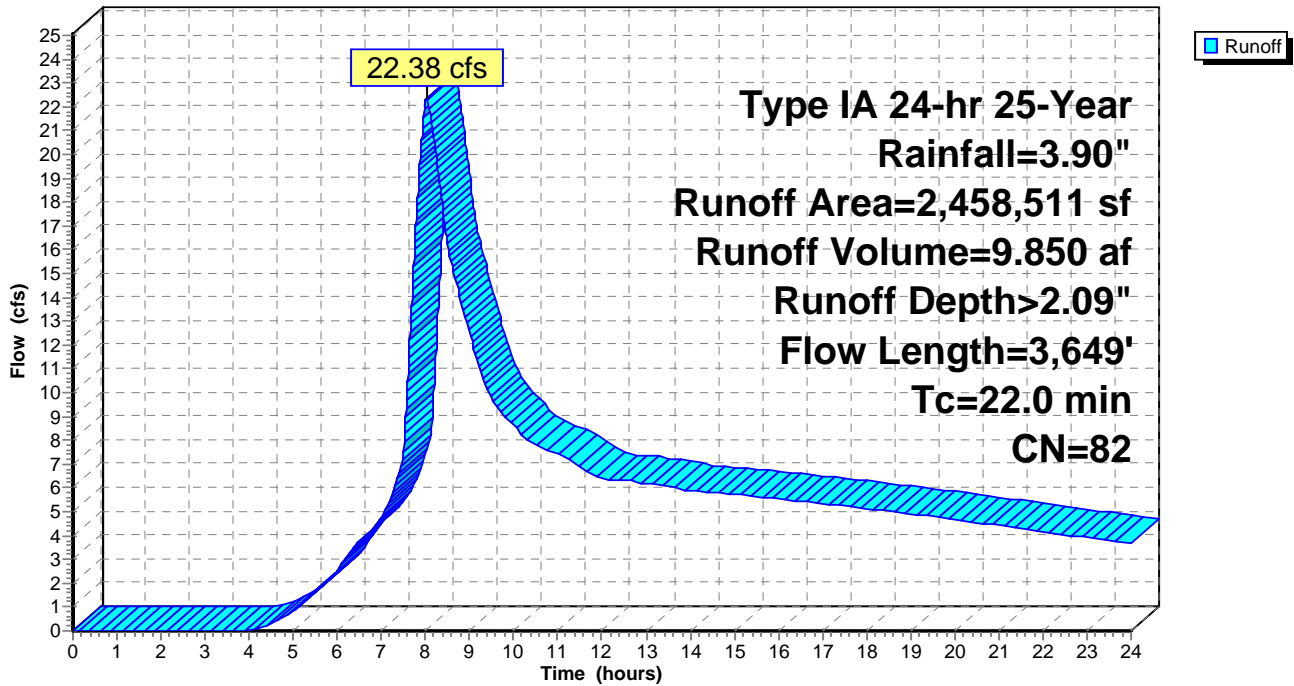
Runoff by SBUH method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
2,289,111	83	1/4 acre lots, 38% imp, HSG C
169,400	75	1/4 acre lots, 38% imp, HSG B
2,458,511	82	Weighted Average
1,524,277		Pervious Area
934,234		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	250	0.0500	0.26		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.50"
6.0	3,399	0.0435	9.46	7.43	Circular Channel (pipe), Conveyance Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
22.0	3,649	Total			

Subcatchment 1900S3: DEVELOPMENT

Hydrograph



Summary for Pond 1R: 12"

Inflow Area = 5.054 ac, 44.94% Impervious, Inflow Depth > 2.47" for 25-Year event
 Inflow = 1.76 cfs @ 8.30 hrs, Volume= 1.039 af
 Outflow = 1.76 cfs @ 8.30 hrs, Volume= 1.039 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.76 cfs @ 8.30 hrs, Volume= 1.039 af

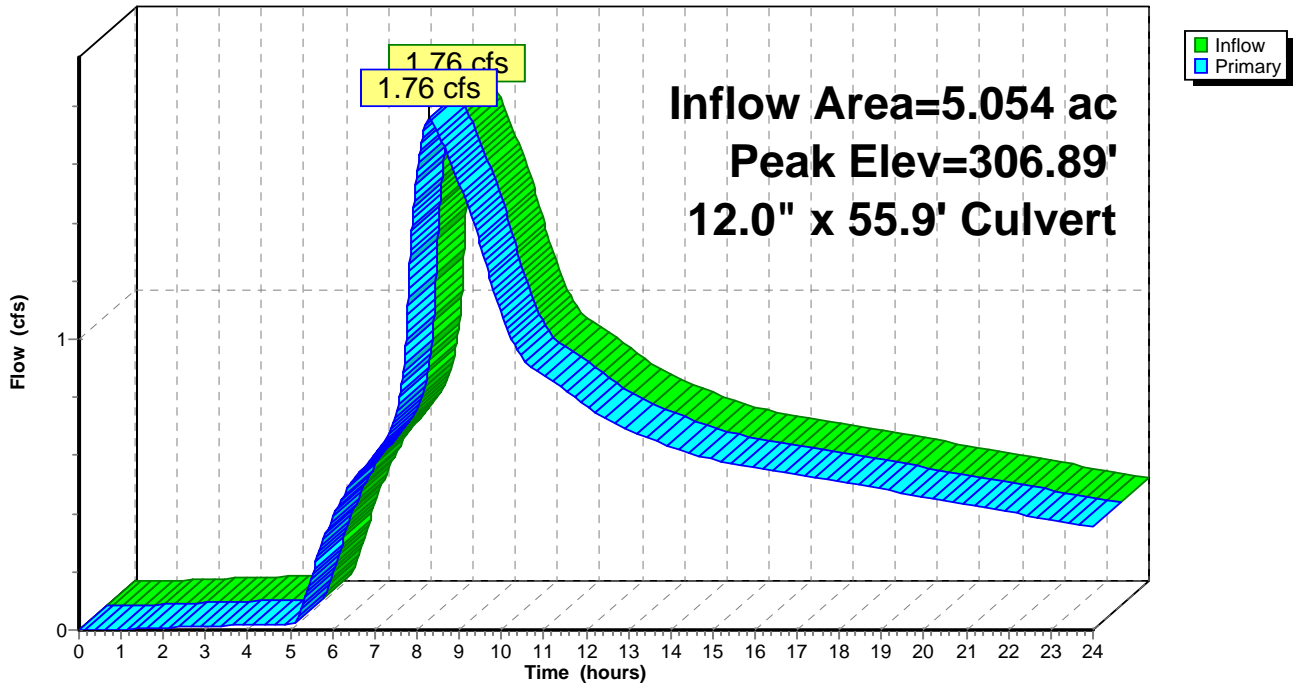
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.89' @ 8.30 hrs
 Flood Elev= 312.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	306.03'	12.0" x 55.9' long Culvert Ke= 0.500 Outlet Invert= 305.75' S= 0.0050 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.76 cfs @ 8.30 hrs HW=306.89' (Free Discharge)
 ←1=Culvert (Barrel Controls 1.76 cfs @ 3.28 fps)

Pond 1R: 12"

Hydrograph



Summary for Pond 2R: 12"

Inflow Area = 3.582 ac, 60.15% Impervious, Inflow Depth > 2.92" for 25-Year event
 Inflow = 2.61 cfs @ 7.91 hrs, Volume= 0.872 af
 Outflow = 2.61 cfs @ 7.91 hrs, Volume= 0.872 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.61 cfs @ 7.91 hrs, Volume= 0.872 af

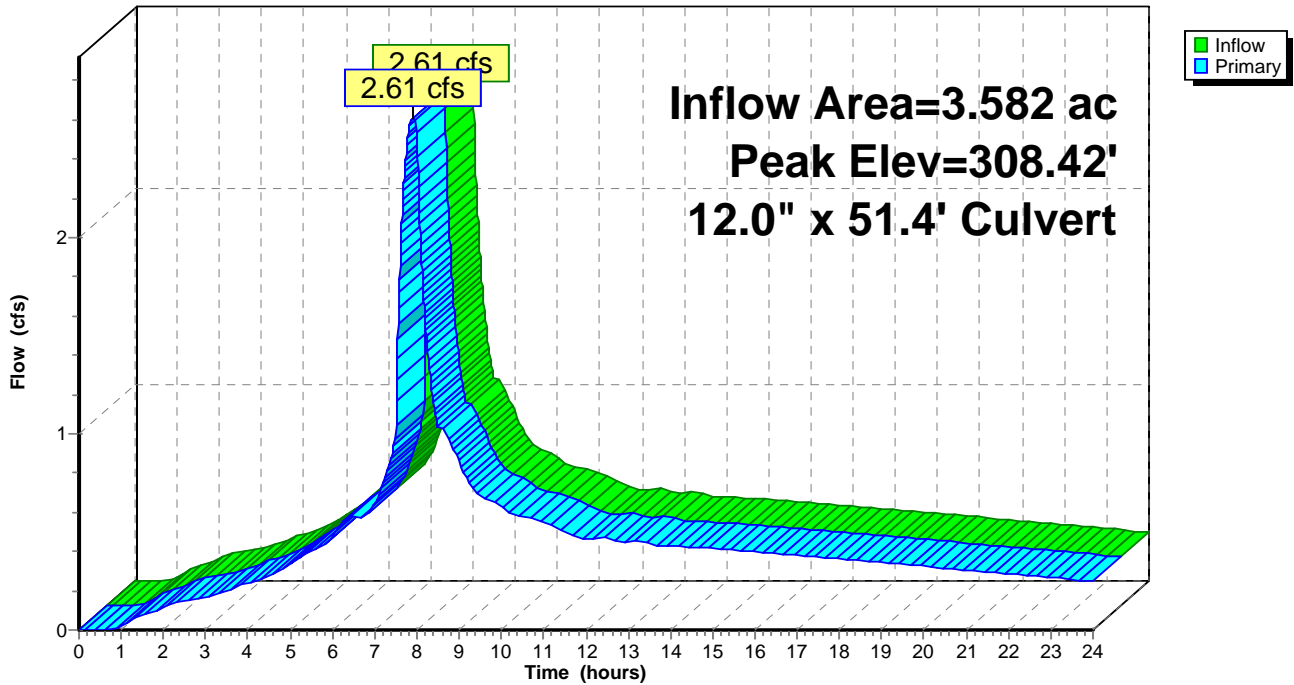
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.42' @ 7.91 hrs
 Flood Elev= 312.76'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.26'	12.0" x 51.4' long Culvert Ke= 0.500 Outlet Invert= 307.00' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.61 cfs @ 7.91 hrs HW=308.42' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.61 cfs @ 3.59 fps)

Pond 2R: 12"

Hydrograph



Summary for Pond 3R: 12"

Inflow Area = 0.818 ac, 58.69% Impervious, Inflow Depth > 2.88" for 25-Year event
 Inflow = 0.59 cfs @ 7.91 hrs, Volume= 0.196 af
 Outflow = 0.59 cfs @ 7.91 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.59 cfs @ 7.91 hrs, Volume= 0.196 af

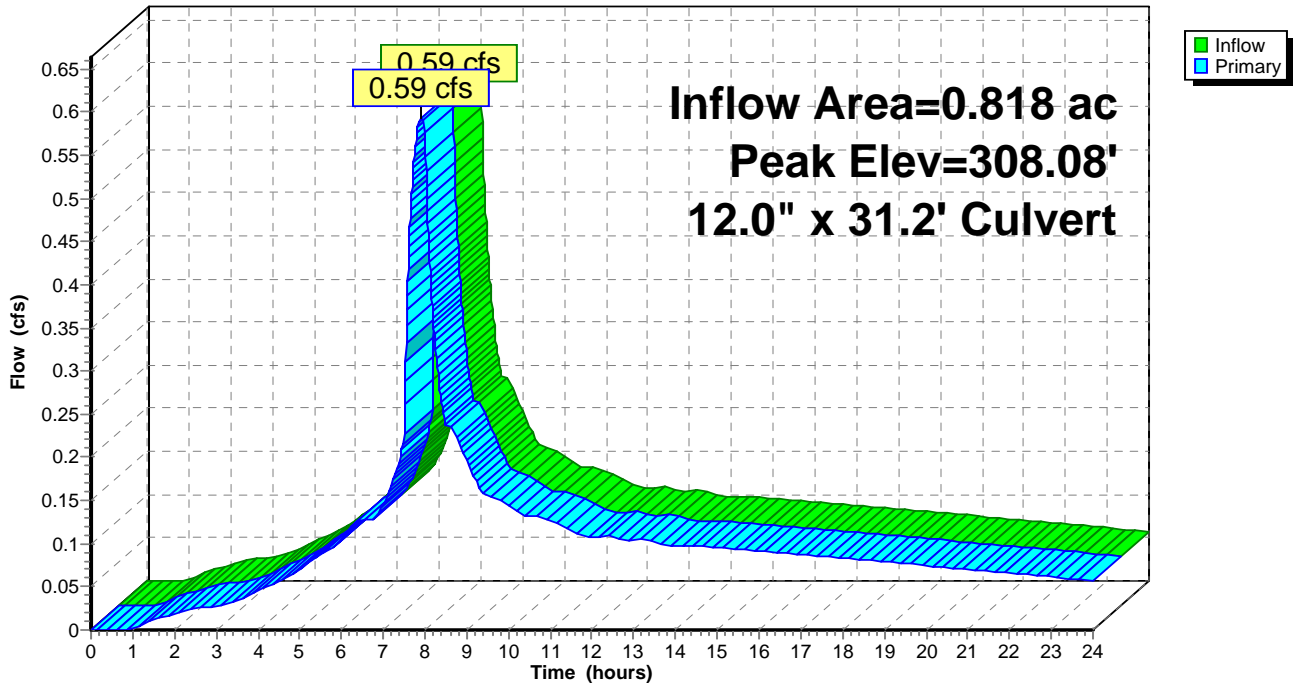
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 308.08' @ 7.91 hrs
 Flood Elev= 311.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	307.62'	12.0" x 31.2' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0051 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.59 cfs @ 7.91 hrs HW=308.08' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.59 cfs @ 2.47 fps)

Pond 3R: 12"

Hydrograph



Summary for Pond 4R: 12"

Inflow Area = 2.582 ac, 59.83% Impervious, Inflow Depth > 2.92" for 25-Year event
 Inflow = 1.87 cfs @ 7.90 hrs, Volume= 0.629 af
 Outflow = 1.87 cfs @ 7.90 hrs, Volume= 0.629 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.87 cfs @ 7.90 hrs, Volume= 0.629 af

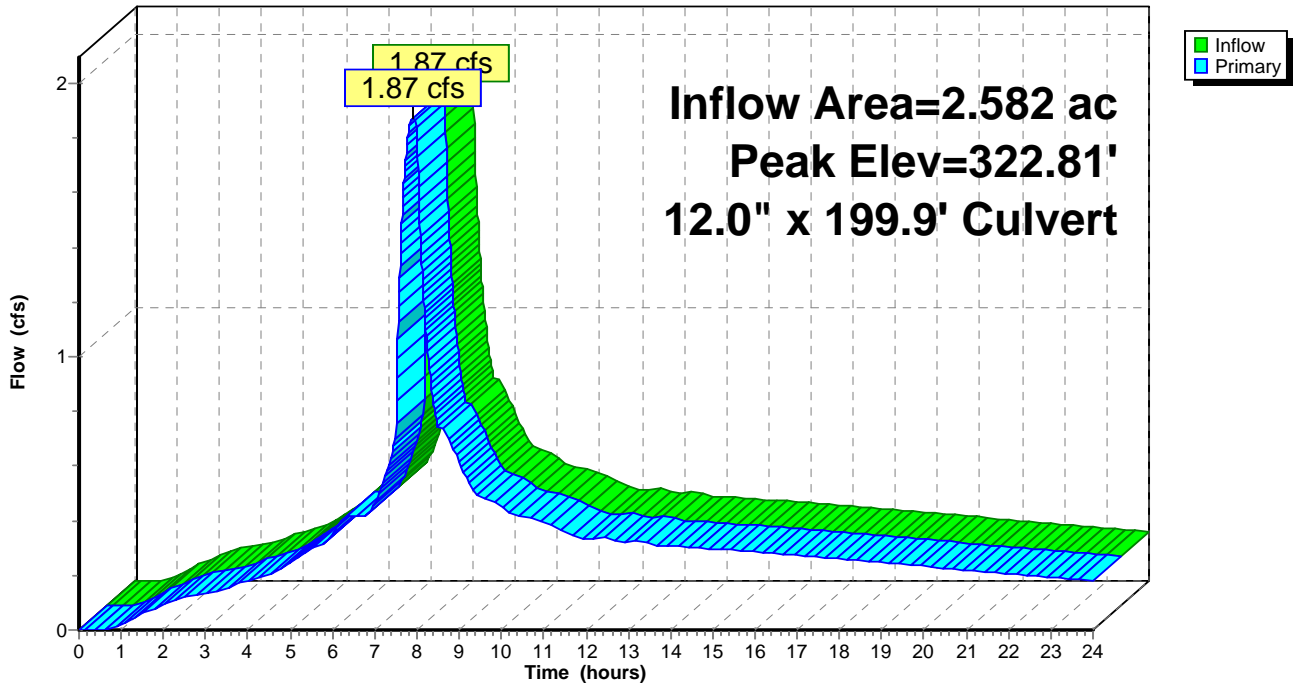
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 322.81' @ 7.90 hrs
 Flood Elev= 329.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	322.06'	12.0" x 199.9' long Culvert Ke= 0.500 Outlet Invert= 307.46' S= 0.0730 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=1.87 cfs @ 7.90 hrs HW=322.81' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.87 cfs @ 2.95 fps)

Pond 4R: 12"

Hydrograph



Summary for Pond 5R: 12"

Inflow Area = 2.015 ac, 56.71% Impervious, Inflow Depth > 2.88" for 25-Year event
 Inflow = 1.43 cfs @ 7.91 hrs, Volume= 0.484 af
 Outflow = 1.43 cfs @ 7.91 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.43 cfs @ 7.91 hrs, Volume= 0.484 af

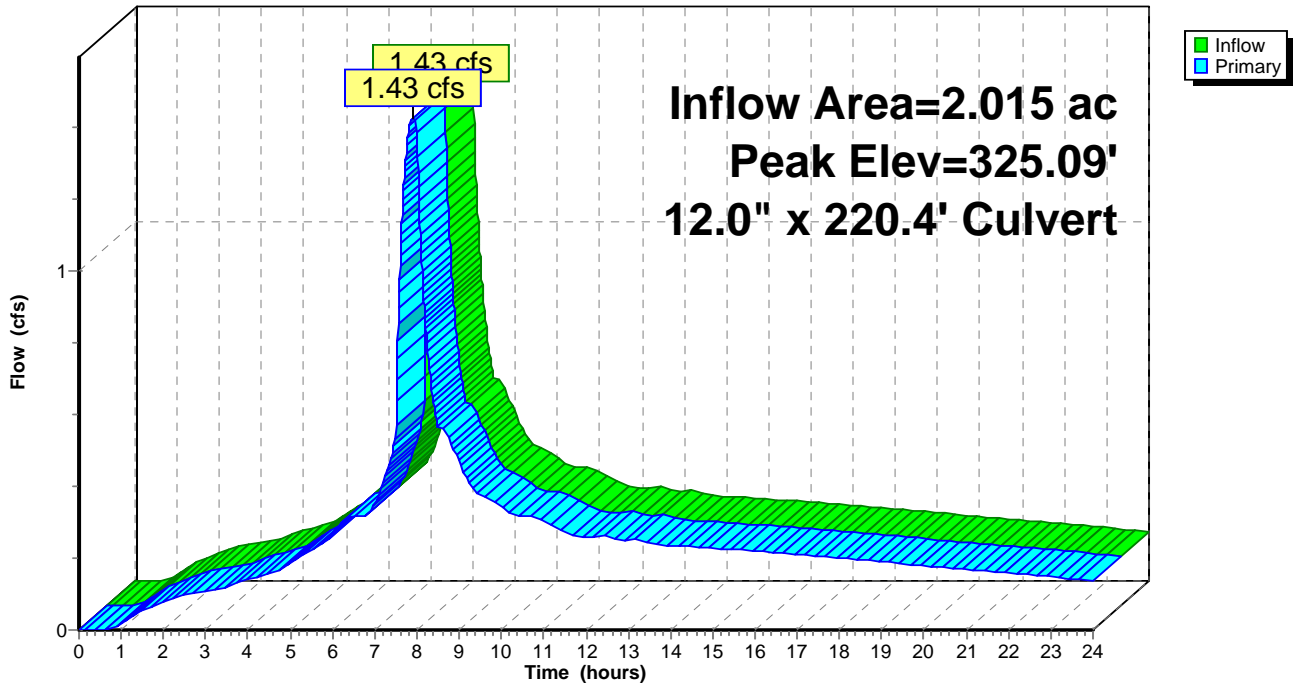
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 325.09' @ 7.91 hrs
 Flood Elev= 336.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	324.46'	12.0" x 220.4' long Culvert Ke= 0.500 Outlet Invert= 322.26' S= 0.0100 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.42 cfs @ 7.91 hrs HW=325.09' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.42 cfs @ 2.71 fps)

Pond 5R: 12"

Hydrograph



Summary for Pond 6R: 12"

Inflow Area = 1.603 ac, 54.26% Impervious, Inflow Depth > 2.84" for 25-Year event
 Inflow = 1.11 cfs @ 7.91 hrs, Volume= 0.380 af
 Outflow = 1.11 cfs @ 7.91 hrs, Volume= 0.380 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.11 cfs @ 7.91 hrs, Volume= 0.380 af

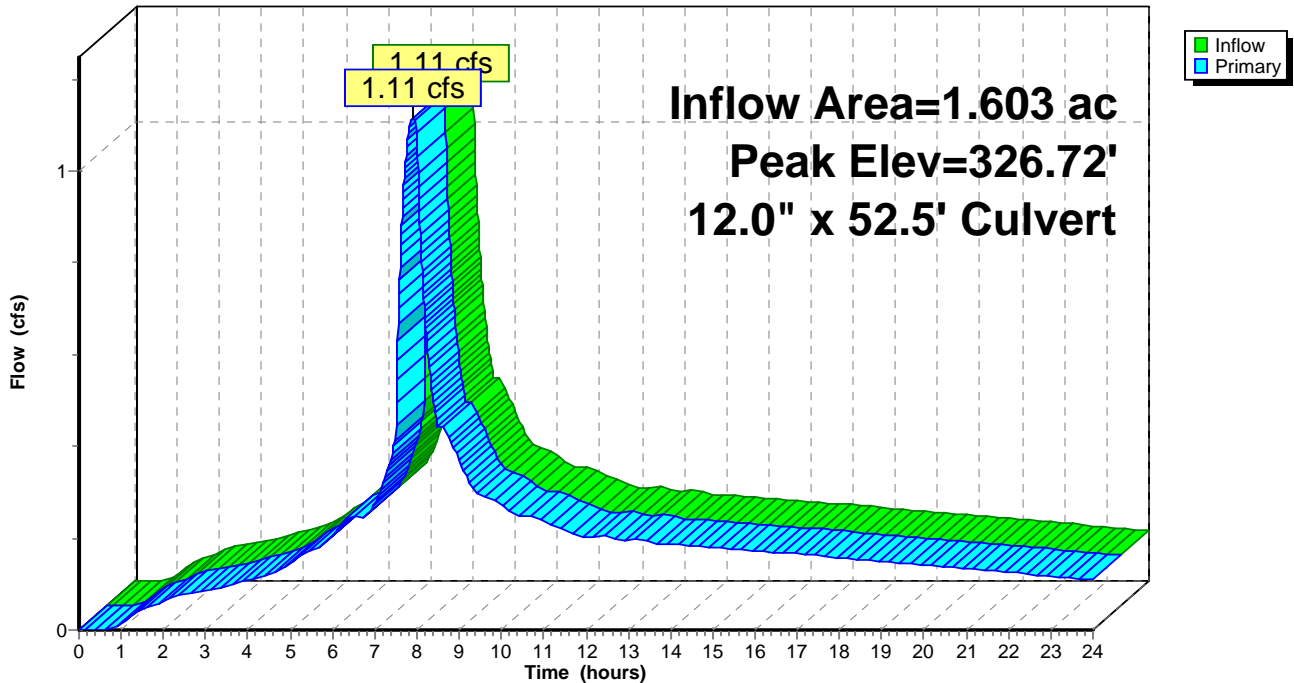
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.72' @ 7.91 hrs
 Flood Elev= 335.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.17'	12.0" x 52.5' long Culvert Ke= 0.500 Outlet Invert= 324.86' S= 0.0250 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=1.11 cfs @ 7.91 hrs HW=326.72' (Free Discharge)
 ←1=Culvert (Inlet Controls 1.11 cfs @ 2.52 fps)

Pond 6R: 12"

Hydrograph



Summary for Pond 7R: 12"

Inflow Area = 0.545 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.50 cfs @ 7.88 hrs, Volume= 0.166 af
 Outflow = 0.50 cfs @ 7.88 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.50 cfs @ 7.88 hrs, Volume= 0.166 af

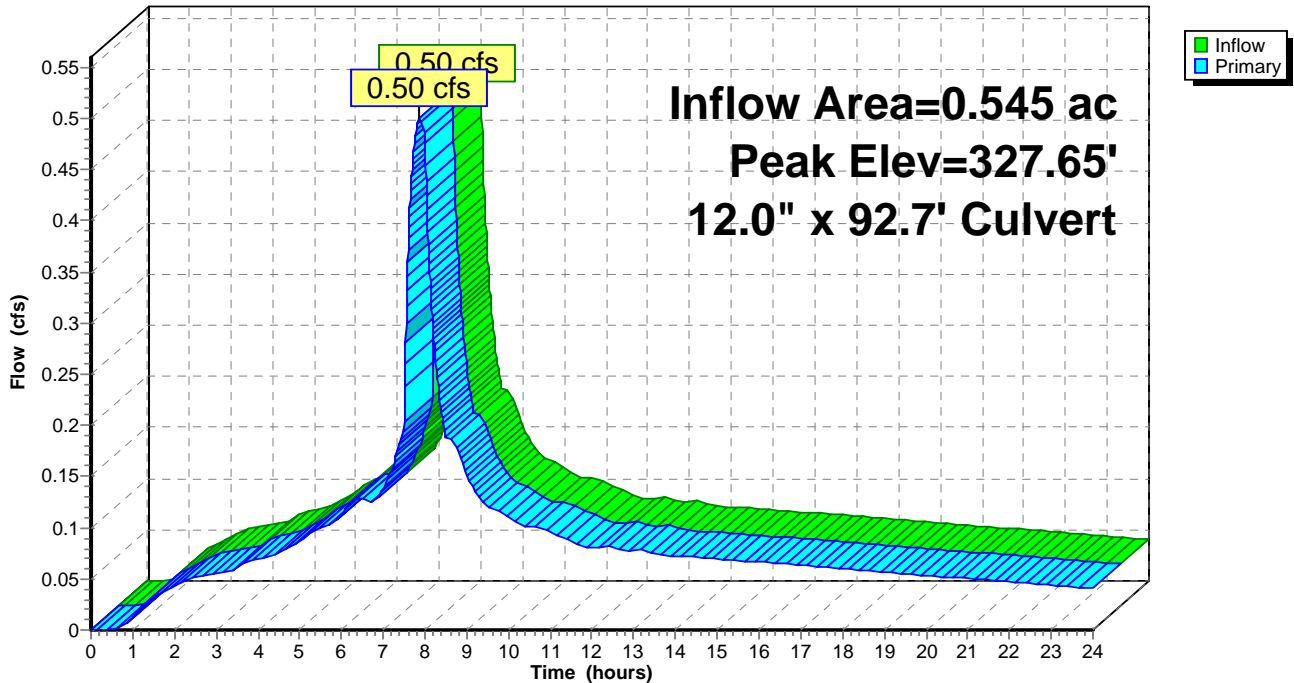
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 327.65' @ 7.88 hrs
 Flood Elev= 336.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	327.30'	12.0" x 92.7' long Culvert Ke= 0.500 Outlet Invert= 326.37' S= 0.0100 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.50 cfs @ 7.88 hrs HW=327.65' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.50 cfs @ 2.02 fps)

Pond 7R: 12"

Hydrograph



Summary for Pond 8R: 12"

Inflow Area = 0.242 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af
 Outflow = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.22 cfs @ 7.88 hrs, Volume= 0.074 af

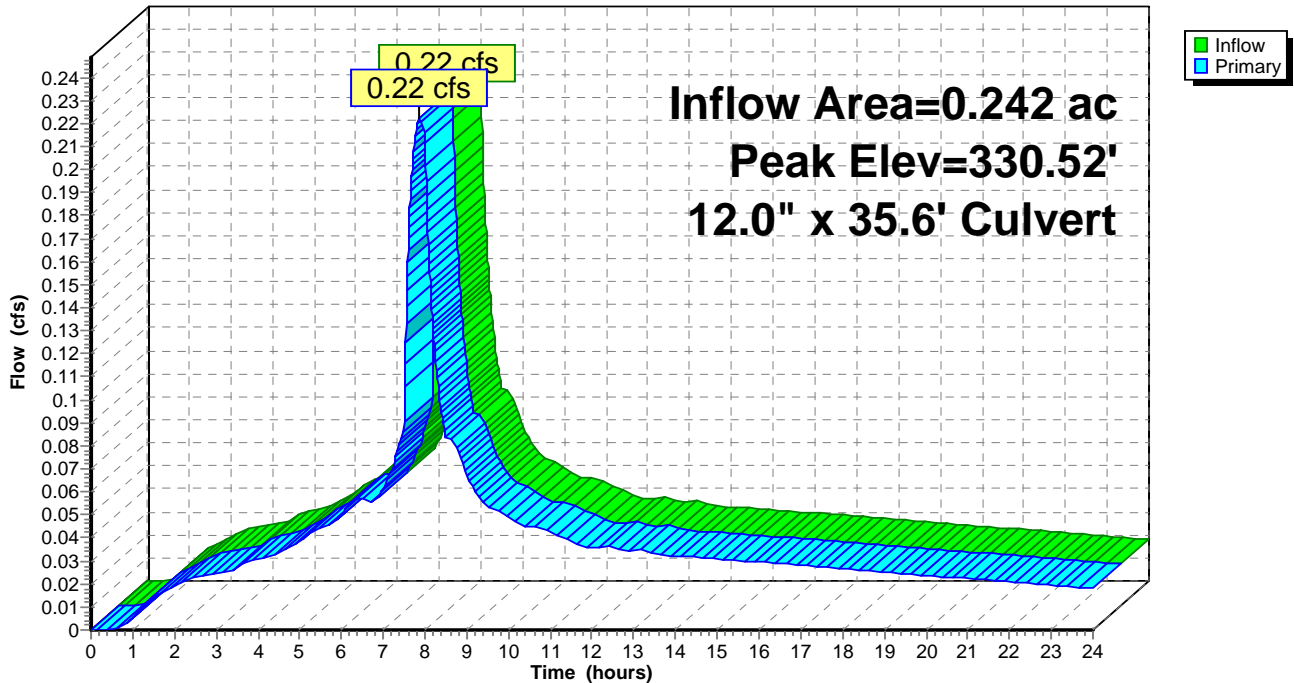
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 330.52' @ 7.88 hrs
 Flood Elev= 336.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.29'	12.0" x 35.6' long Culvert Ke= 0.500 Outlet Invert= 327.50' S= 0.0784 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.22 cfs @ 7.88 hrs HW=330.52' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.22 cfs @ 1.63 fps)

Pond 8R: 12"

Hydrograph



Summary for Pond 9R: 12"

Inflow Area = 0.291 ac, 52.20% Impervious, Inflow Depth > 2.76" for 25-Year event
 Inflow = 0.20 cfs @ 7.91 hrs, Volume= 0.067 af
 Outflow = 0.20 cfs @ 7.91 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.20 cfs @ 7.91 hrs, Volume= 0.067 af

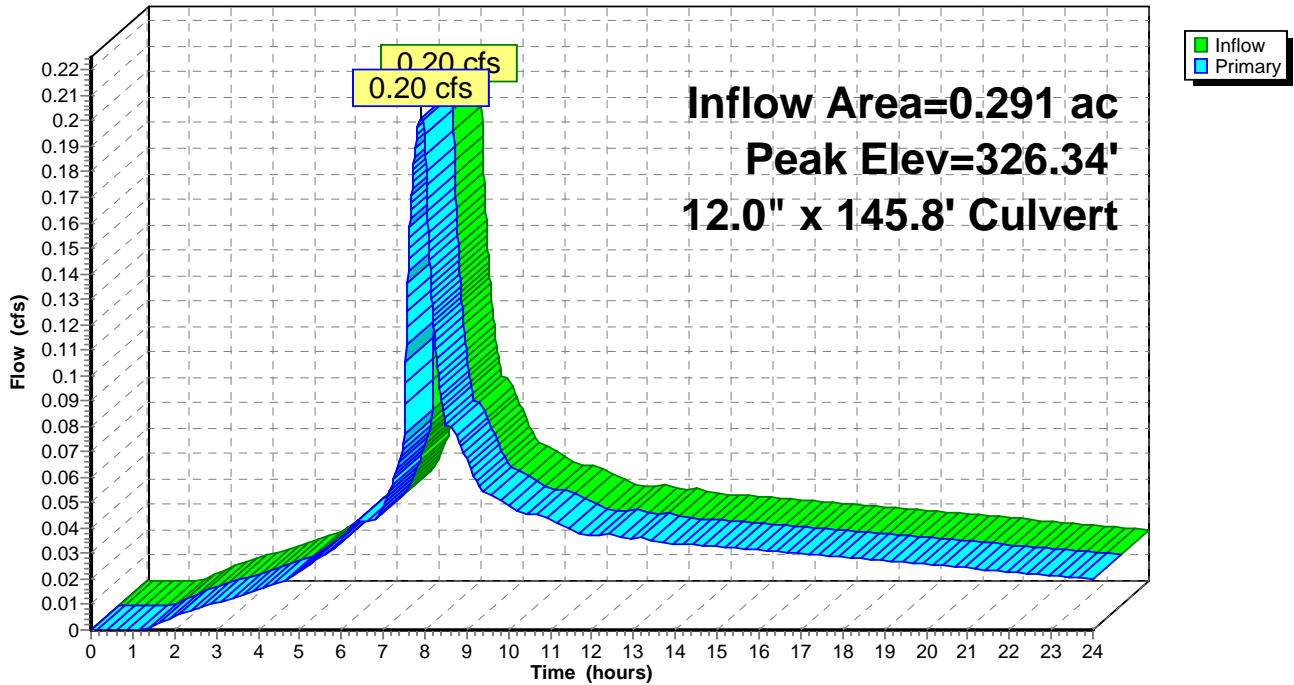
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.34' @ 7.91 hrs
 Flood Elev= 333.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	326.12'	12.0" x 145.8' long Culvert Ke= 0.500 Outlet Invert= 324.66' S= 0.0100 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.20 cfs @ 7.91 hrs HW=326.34' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.20 cfs @ 2.40 fps)

Pond 9R: 12"

Hydrograph



Summary for Pond 100R: 12"

Inflow Area = 0.034 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af
 Outflow = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.03 cfs @ 7.88 hrs, Volume= 0.010 af

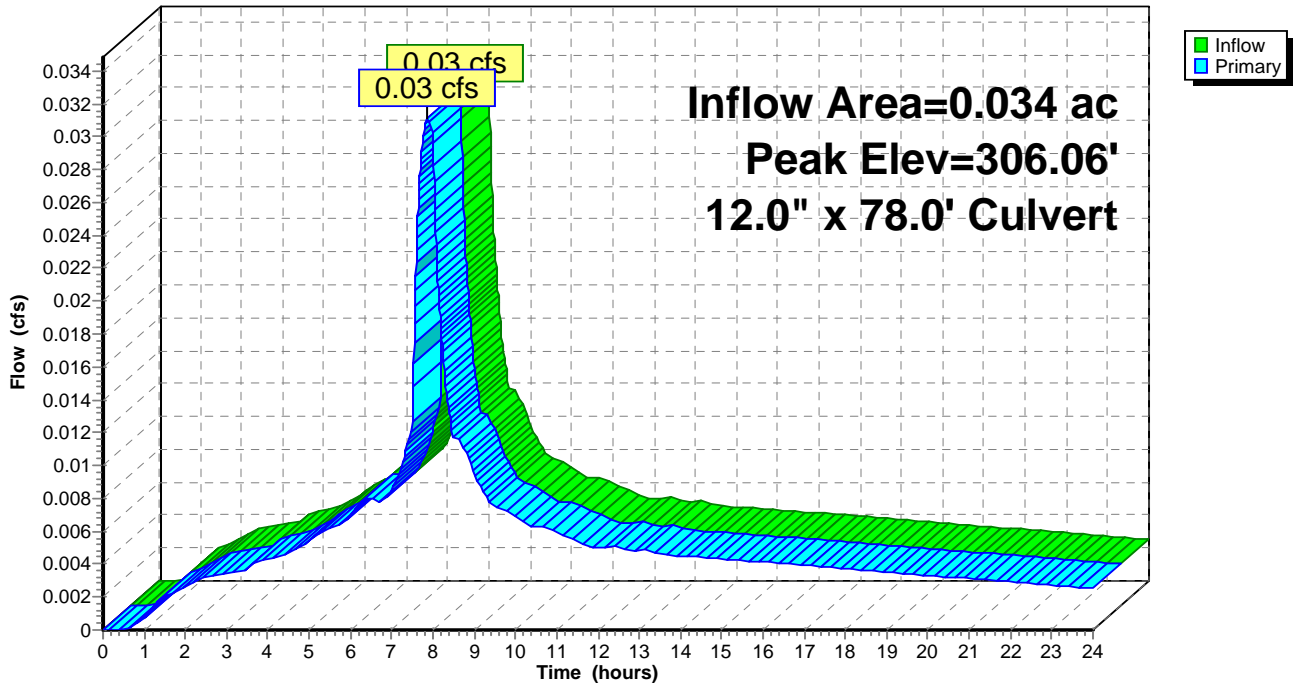
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.06' @ 7.88 hrs
 Flood Elev= 310.42'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.96'	12.0" x 78.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 305.57' S= 0.0050 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.03 cfs @ 7.88 hrs HW=306.06' (Free Discharge)
 ←1=Culvert (Barrel Controls 0.03 cfs @ 1.08 fps)

Pond 100R: 12"

Hydrograph



Summary for Pond 200R: 12"

Inflow Area = 5.547 ac, 49.62% Impervious, Inflow Depth > 2.57" for 25-Year event
 Inflow = 2.00 cfs @ 8.16 hrs, Volume= 1.188 af
 Outflow = 2.00 cfs @ 8.16 hrs, Volume= 1.188 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.00 cfs @ 8.16 hrs, Volume= 1.188 af

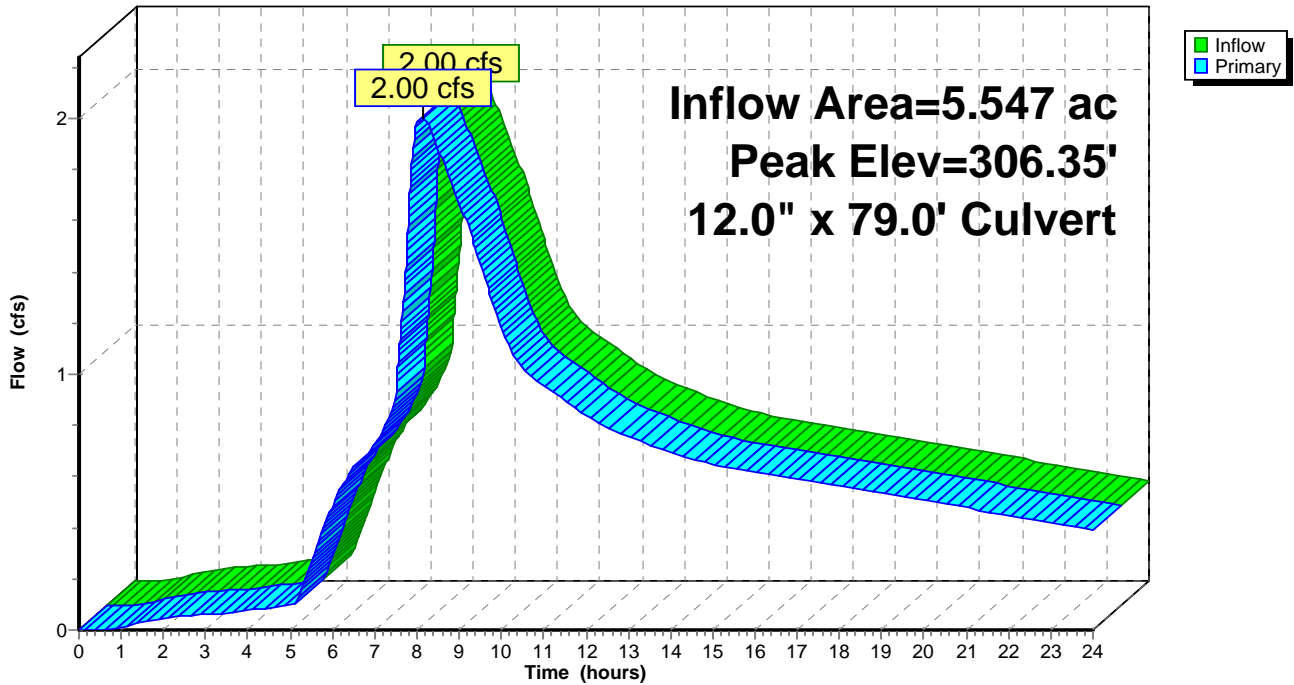
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 306.35' @ 8.16 hrs
 Flood Elev= 314.77'

Device	Routing	Invert	Outlet Devices
#1	Primary	305.47'	12.0" x 79.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 304.97' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.00 cfs @ 8.16 hrs HW=306.35' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.00 cfs @ 3.63 fps)

Pond 200R: 12"

Hydrograph



Summary for Pond 300R: 12"

Inflow Area = 5.613 ac, 50.12% Impervious, Inflow Depth > 2.58" for 25-Year event
 Inflow = 2.05 cfs @ 8.01 hrs, Volume= 1.208 af
 Outflow = 2.05 cfs @ 8.01 hrs, Volume= 1.208 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.05 cfs @ 8.01 hrs, Volume= 1.208 af

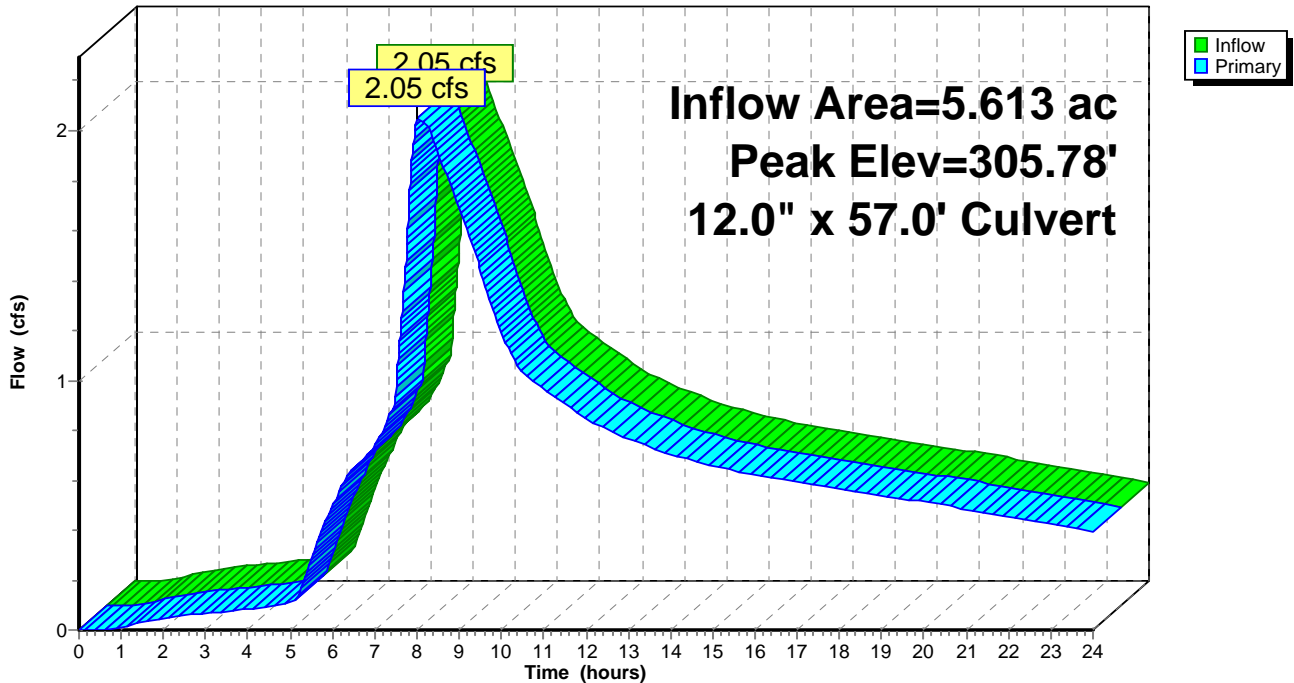
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 305.78' @ 8.01 hrs
 Flood Elev= 312.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	304.98'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.93' S= 0.0184 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=2.05 cfs @ 8.01 hrs HW=305.78' (Free Discharge)
 ←1=Culvert (Inlet Controls 2.05 cfs @ 3.05 fps)

Pond 300R: 12"

Hydrograph



Summary for Pond 400R: 12"

Inflow Area = 5.746 ac, 51.07% Impervious, Inflow Depth > 2.60" for 25-Year event
 Inflow = 2.16 cfs @ 8.01 hrs, Volume= 1.247 af
 Outflow = 2.16 cfs @ 8.01 hrs, Volume= 1.247 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.16 cfs @ 8.01 hrs, Volume= 1.247 af

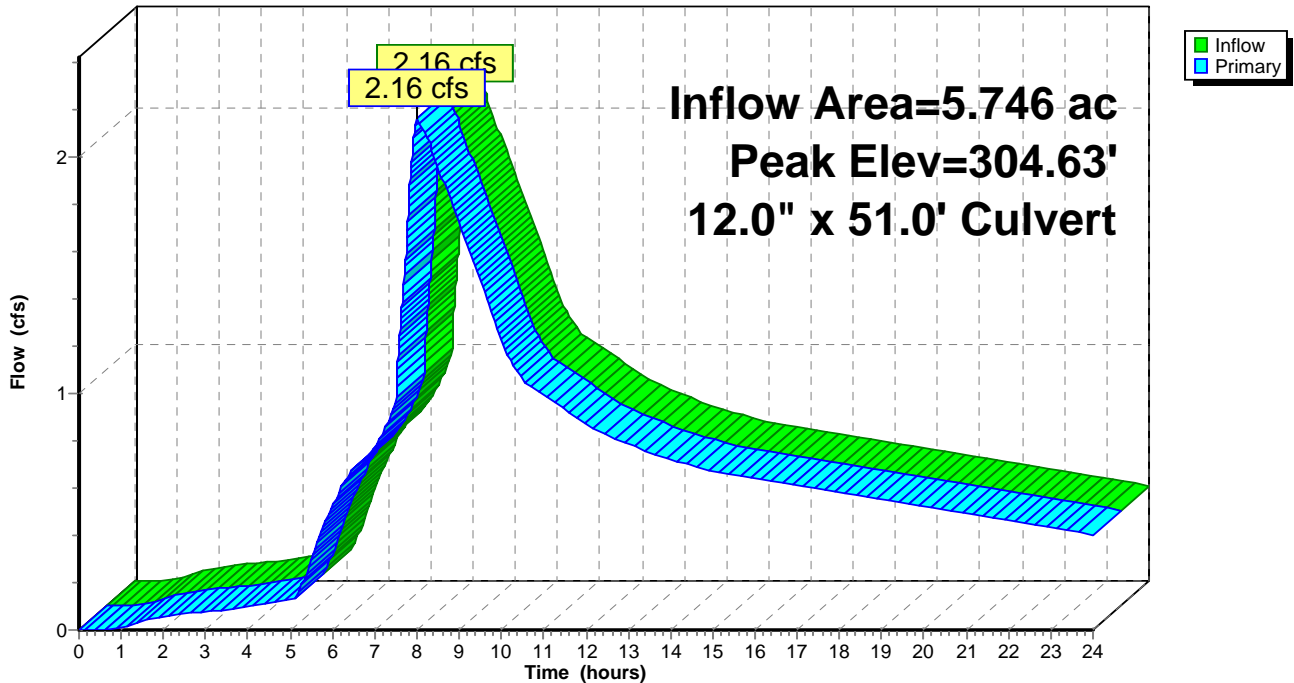
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 304.63' @ 8.01 hrs
 Flood Elev= 308.97'

Device	Routing	Invert	Outlet Devices
#1	Primary	303.80'	12.0" x 51.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 303.23' S= 0.0112 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.16 cfs @ 8.01 hrs HW=304.63' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.16 cfs @ 4.19 fps)

Pond 400R: 12"

Hydrograph



Summary for Pond 500R: 12"

Inflow Area = 5.812 ac, 51.53% Impervious, Inflow Depth > 2.61" for 25-Year event
 Inflow = 2.22 cfs @ 8.00 hrs, Volume= 1.266 af
 Outflow = 2.22 cfs @ 8.00 hrs, Volume= 1.266 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.22 cfs @ 8.00 hrs, Volume= 1.266 af

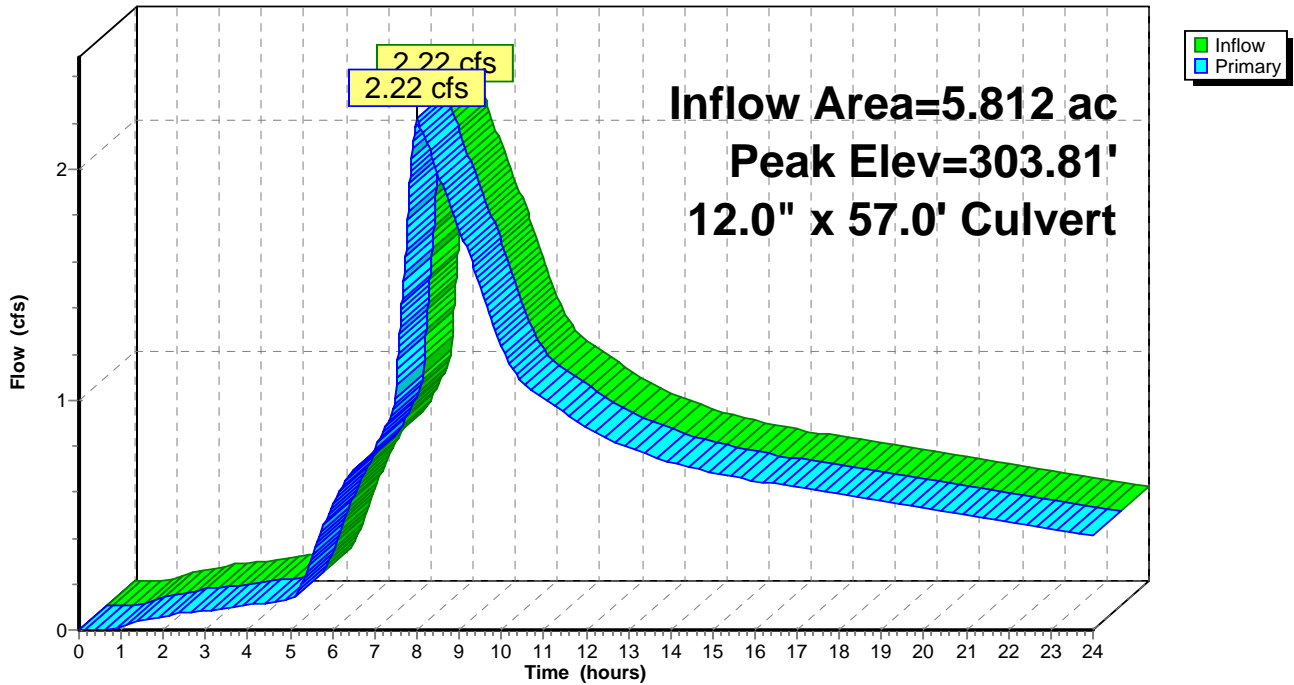
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.81' @ 8.00 hrs
 Flood Elev= 306.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.96'	12.0" x 57.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 302.26' S= 0.0123 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=2.22 cfs @ 8.00 hrs HW=303.81' (Free Discharge)
 ←1=Culvert (Inlet Controls 2.22 cfs @ 3.13 fps)

Pond 500R: 12"

Hydrograph



Summary for Pond 600R: 12"

Inflow Area = 5.945 ac, 52.42% Impervious, Inflow Depth > 2.64" for 25-Year event
 Inflow = 2.34 cfs @ 8.00 hrs, Volume= 1.306 af
 Outflow = 2.34 cfs @ 8.00 hrs, Volume= 1.306 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.34 cfs @ 8.00 hrs, Volume= 1.306 af

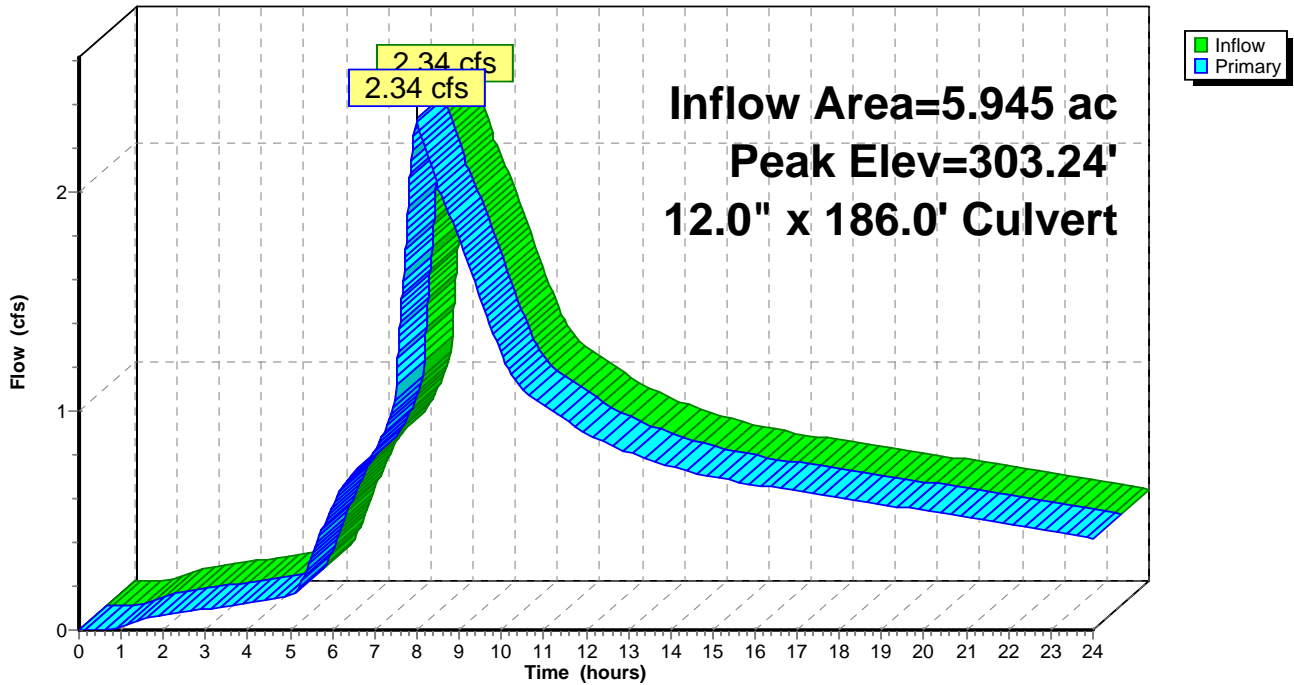
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 303.24' @ 8.00 hrs
 Flood Elev= 305.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	302.20'	12.0" x 186.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 301.28' S= 0.0049 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=2.34 cfs @ 8.00 hrs HW=303.24' (Free Discharge)
 ←1=Culvert (Barrel Controls 2.34 cfs @ 3.56 fps)

Pond 600R: 12"

Hydrograph



Summary for Pond 700R: 12"

Inflow Area = 7.999 ac, 54.95% Impervious, Inflow Depth > 2.77" for 25-Year event
 Inflow = 3.96 cfs @ 8.00 hrs, Volume= 1.843 af
 Outflow = 3.96 cfs @ 8.00 hrs, Volume= 1.843 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.96 cfs @ 8.00 hrs, Volume= 1.843 af

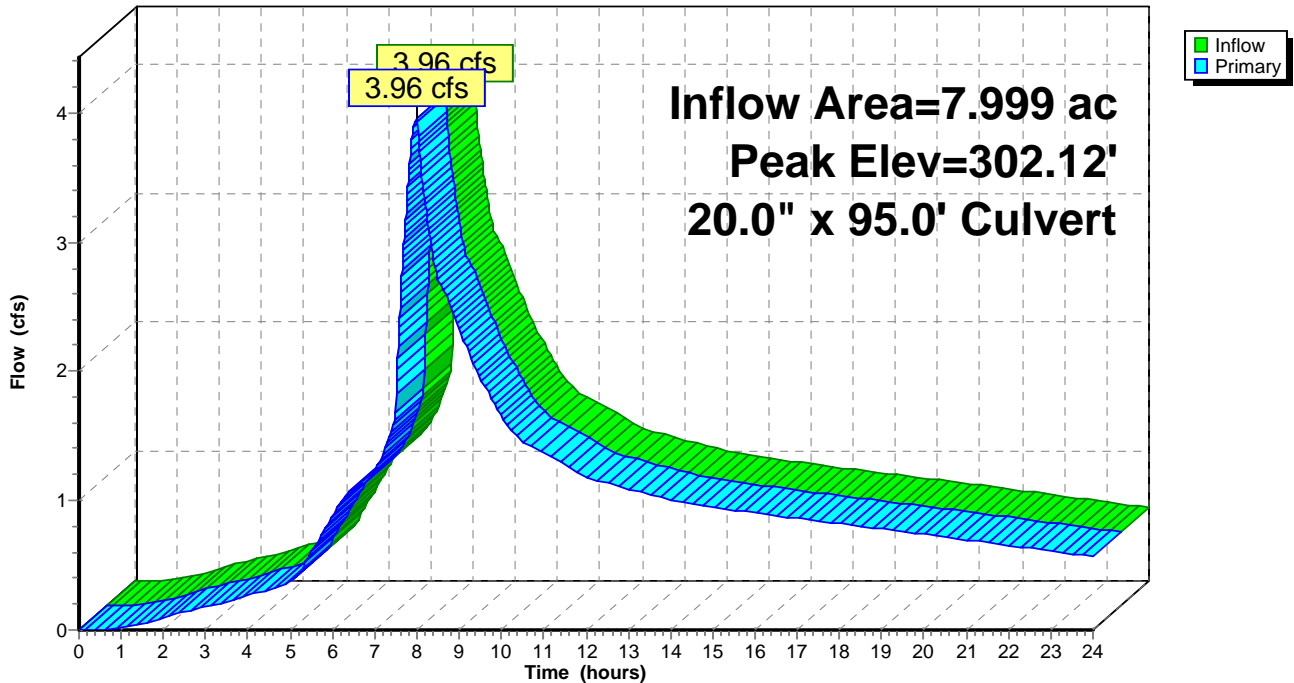
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 302.12' @ 8.00 hrs
 Flood Elev= 304.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	301.08'	20.0" x 95.0' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 300.60' S= 0.0051 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=3.95 cfs @ 8.00 hrs HW=302.12' (Free Discharge)
 ←1=Culvert (Barrel Controls 3.95 cfs @ 3.93 fps)

Pond 700R: 12"

Hydrograph



Summary for Pond 800R: 12"

Inflow Area = 8.132 ac, 55.55% Impervious, Inflow Depth > 2.78" for 25-Year event
 Inflow = 4.07 cfs @ 8.00 hrs, Volume= 1.883 af
 Outflow = 4.07 cfs @ 8.00 hrs, Volume= 1.883 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.07 cfs @ 8.00 hrs, Volume= 1.883 af

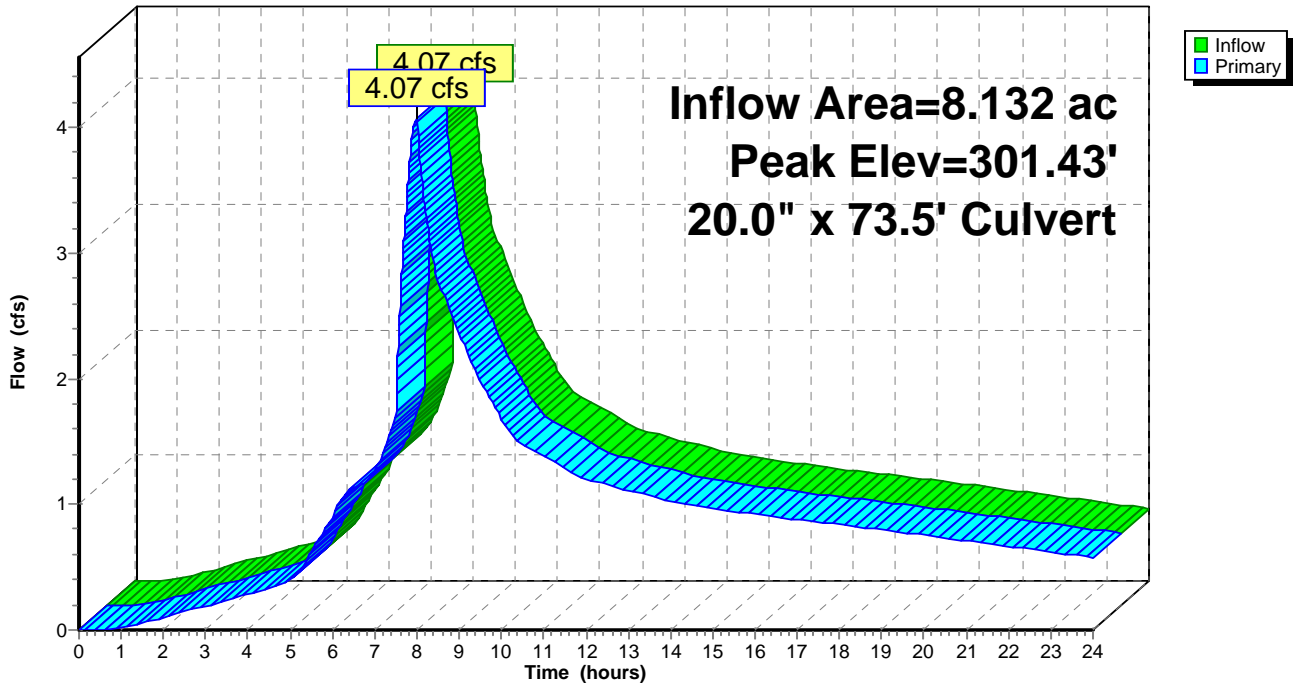
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.43' @ 8.00 hrs
 Flood Elev= 305.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.40'	20.0" x 73.5' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.94' S= 0.0063 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=4.07 cfs @ 8.00 hrs HW=301.43' (Free Discharge)
 ←1=Culvert (Barrel Controls 4.07 cfs @ 4.10 fps)

Pond 800R: 12"

Hydrograph



Summary for Pond 900R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 2.78" for 25-Year event
 Inflow = 4.13 cfs @ 8.00 hrs, Volume= 1.902 af
 Outflow = 4.13 cfs @ 8.00 hrs, Volume= 1.902 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.13 cfs @ 8.00 hrs, Volume= 1.902 af

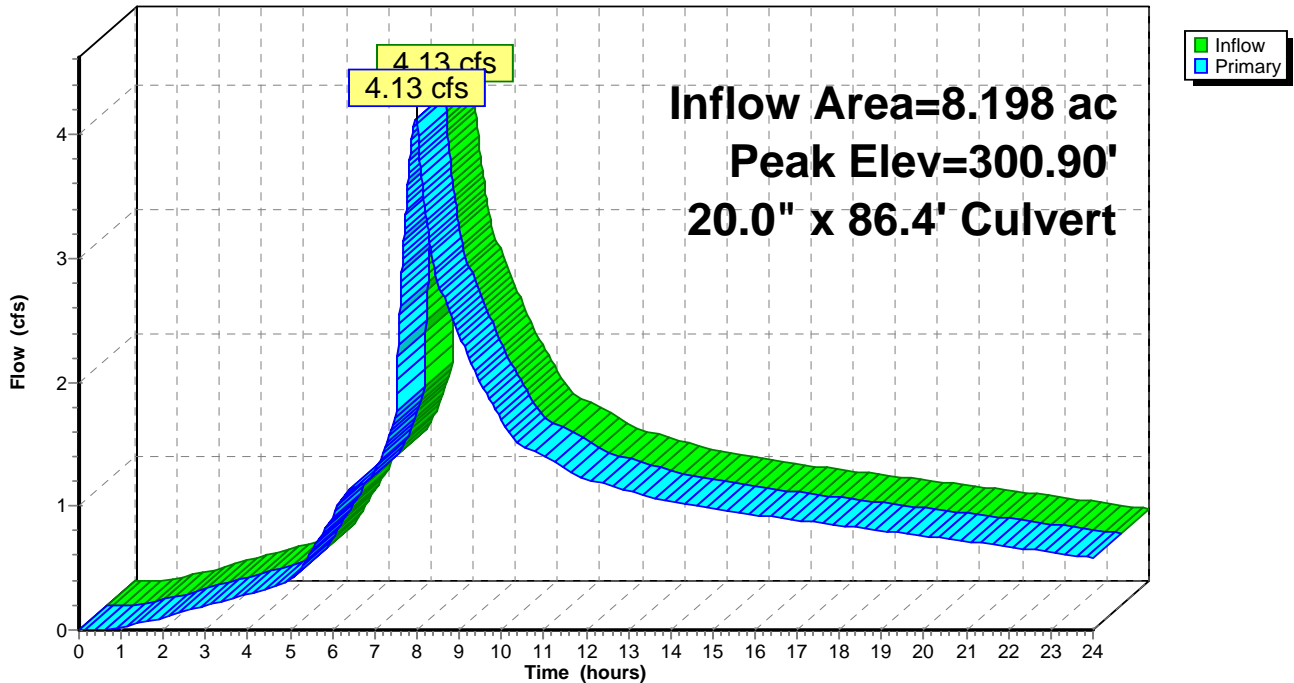
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.90' @ 8.00 hrs
 Flood Elev= 306.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.82'	20.0" x 86.4' long Culvert Square-edged headwall, Ke= 0.500 Outlet Invert= 299.40' S= 0.0049 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=4.13 cfs @ 8.00 hrs HW=300.90' (Free Discharge)
 ←1=Culvert (Barrel Controls 4.13 cfs @ 3.91 fps)

Pond 900R: 12"

Hydrograph



Summary for Pond 1000R: 12"

Inflow Area = 8.198 ac, 55.84% Impervious, Inflow Depth > 2.78" for 25-Year event
 Inflow = 4.13 cfs @ 8.00 hrs, Volume= 1.902 af
 Outflow = 4.13 cfs @ 8.00 hrs, Volume= 1.902 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.13 cfs @ 8.00 hrs, Volume= 1.902 af

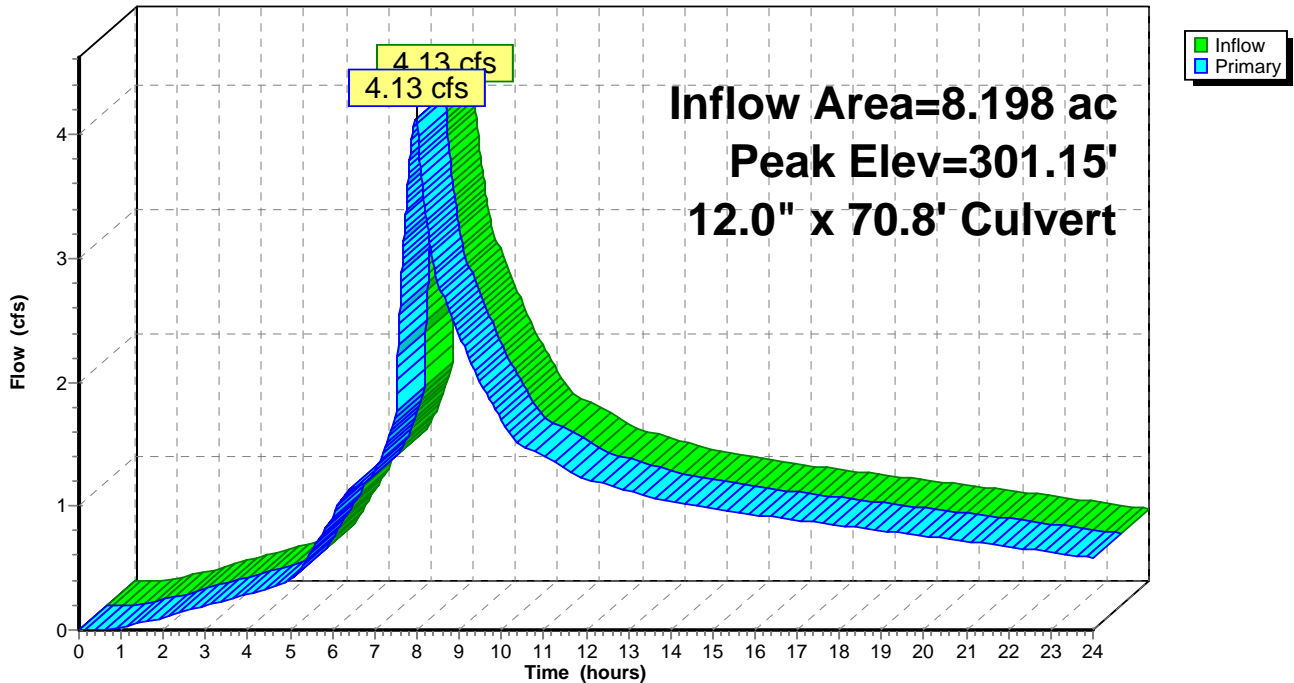
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.15' @ 8.00 hrs
 Flood Elev= 307.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	299.28'	12.0" x 70.8' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0103 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=4.13 cfs @ 8.00 hrs HW=301.15' (Free Discharge)
 ←1=Culvert (Barrel Controls 4.13 cfs @ 5.26 fps)

Pond 1000R: 12"

Hydrograph



Summary for Pond 1100R: 12"

Inflow Area = 0.303 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af
 Outflow = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.28 cfs @ 7.88 hrs, Volume= 0.092 af

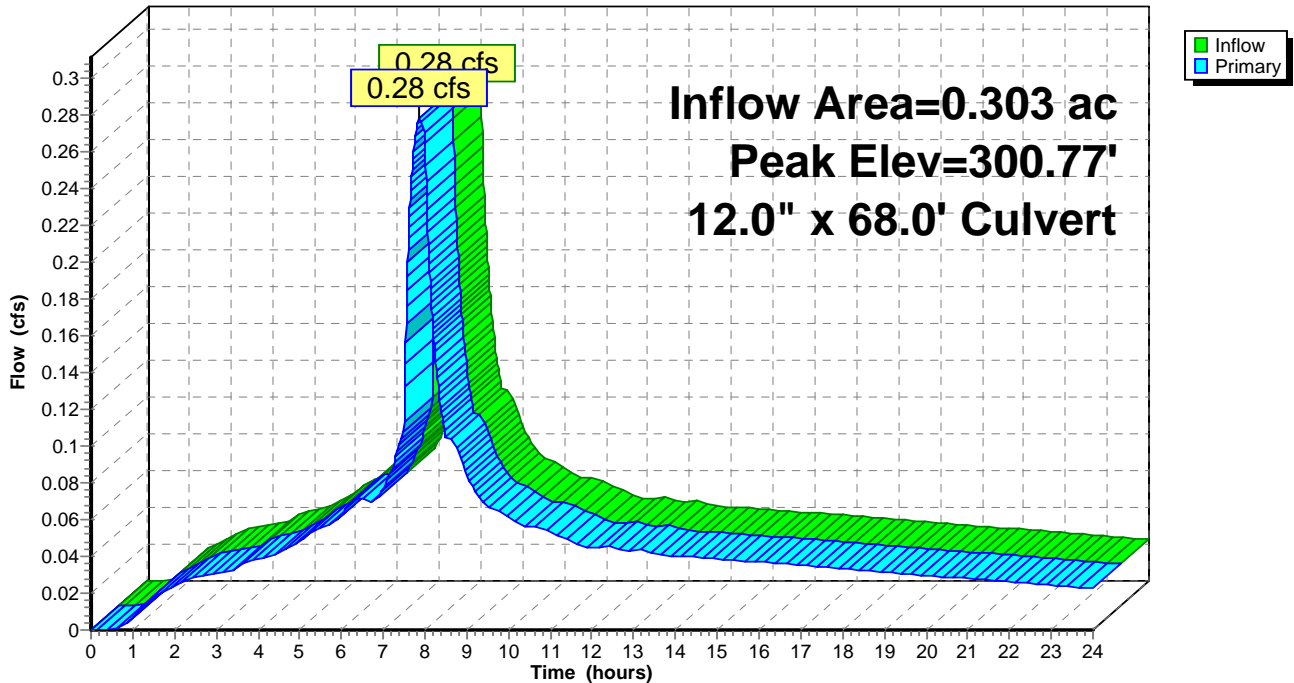
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 300.77' @ 7.88 hrs
 Flood Elev= 314.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	300.52'	12.0" x 68.0' long Culvert Ke= 0.500 Outlet Invert= 298.55' S= 0.0290 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=0.27 cfs @ 7.88 hrs HW=300.77' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.27 cfs @ 1.72 fps)

Pond 1100R: 12"

Hydrograph



Summary for Pond 1200R: 12"

Inflow Area = 0.182 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event
 Inflow = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af
 Outflow = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 7.88 hrs, Volume= 0.055 af

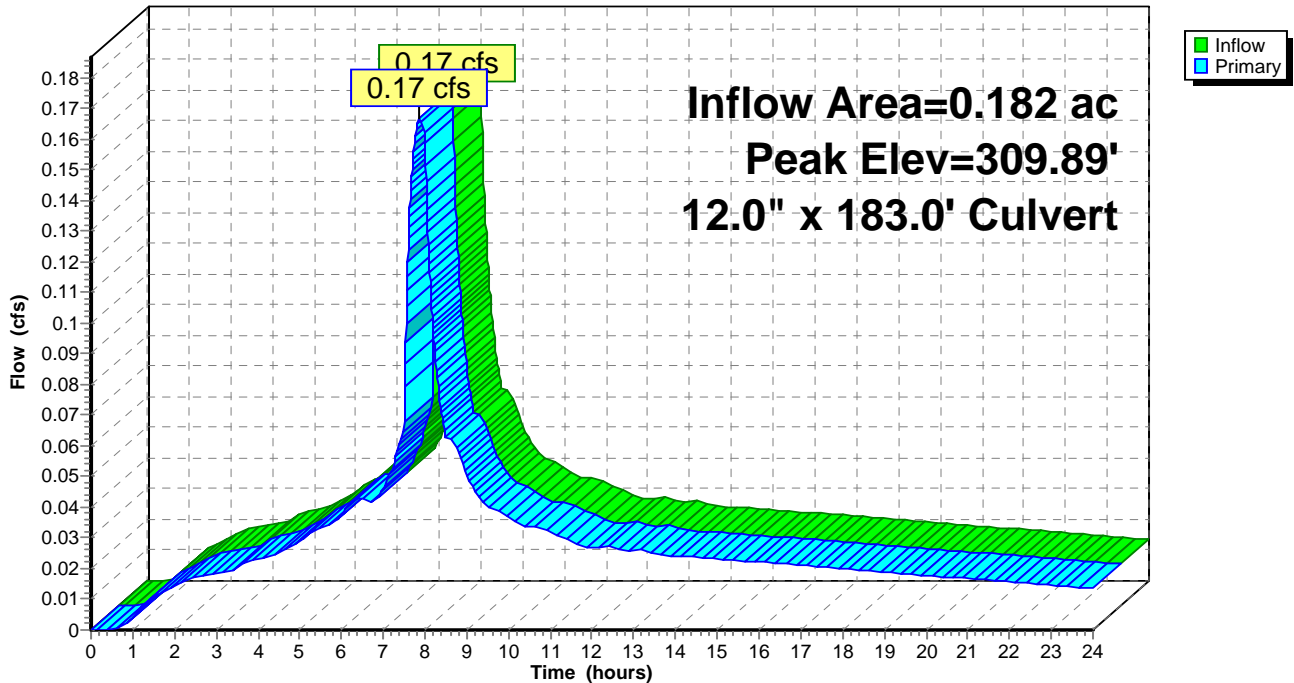
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 309.89' @ 7.88 hrs
 Flood Elev= 323.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	309.70'	12.0" x 183.0' long Culvert Ke= 0.500 Outlet Invert= 300.70' S= 0.0492 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=0.15 cfs @ 7.88 hrs HW=309.89' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.15 cfs @ 1.48 fps)

Pond 1200R: 12"

Hydrograph



Summary for Pond 1300R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.73" for 25-Year event
 Inflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af
 Outflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af

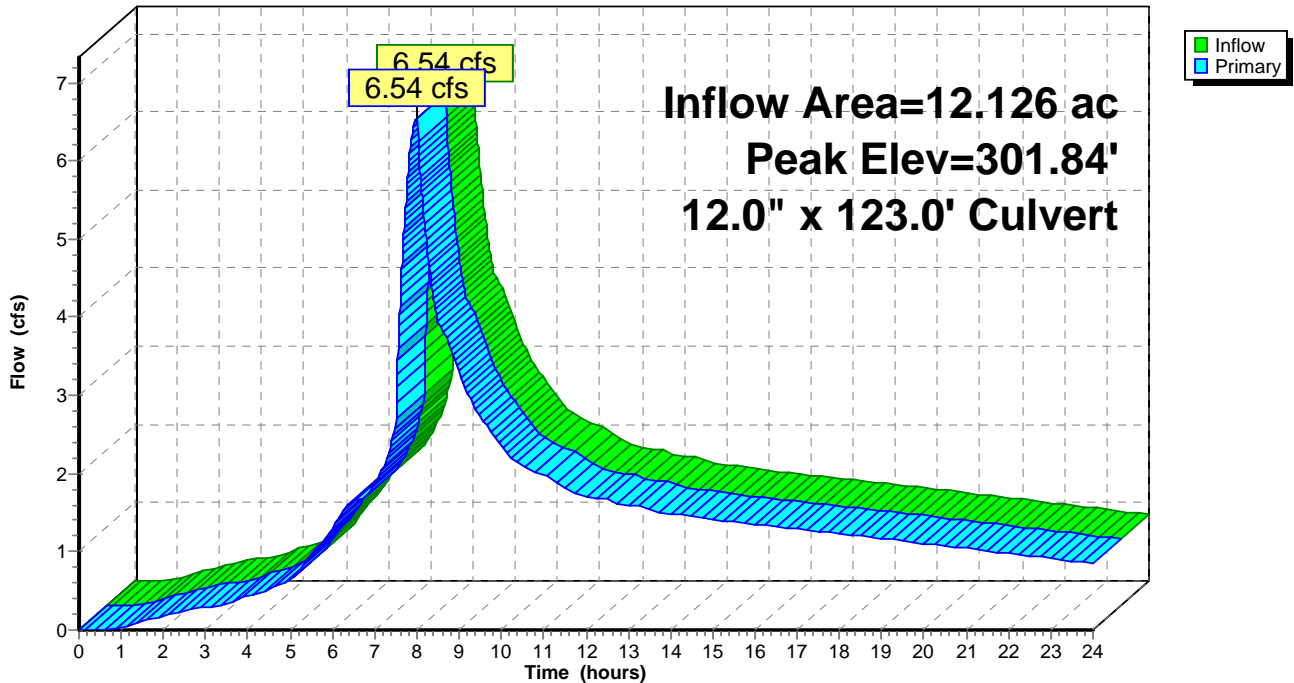
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 301.84' @ 8.00 hrs
 Flood Elev= 312.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.35'	12.0" x 123.0' long Culvert Ke= 0.500 Outlet Invert= 274.98' S= 0.1900 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.54 cfs @ 8.00 hrs HW=301.84' (Free Discharge)
 ↳ **1=Culvert** (Inlet Controls 6.54 cfs @ 8.33 fps)

Pond 1300R: 12"

Hydrograph



Summary for Pond 1400R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.73" for 25-Year event
 Inflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af
 Outflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af

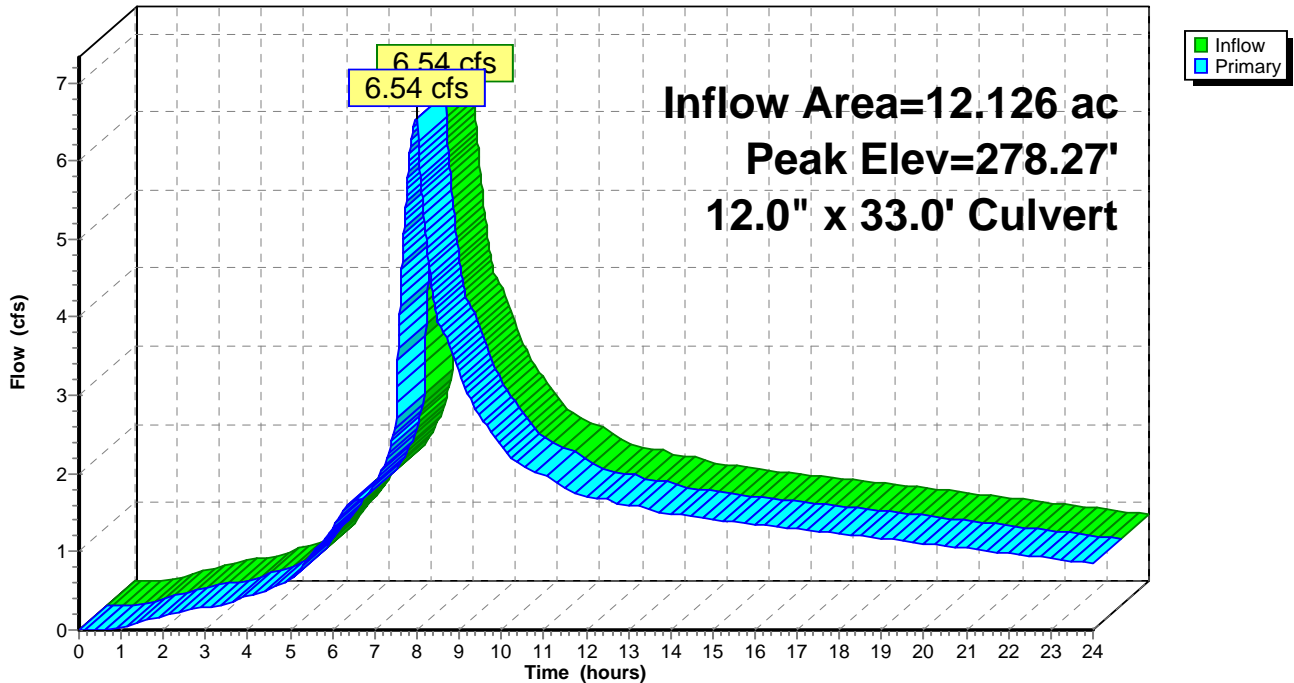
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 278.27' @ 8.00 hrs
 Flood Elev= 288.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.78'	12.0" x 33.0' long Culvert Ke= 0.500 Outlet Invert= 273.79' S= 0.0300 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.54 cfs @ 8.00 hrs HW=278.27' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.54 cfs @ 8.33 fps)

Pond 1400R: 12"

Hydrograph



Summary for Pond 1500R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.73" for 25-Year event
 Inflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af
 Outflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af

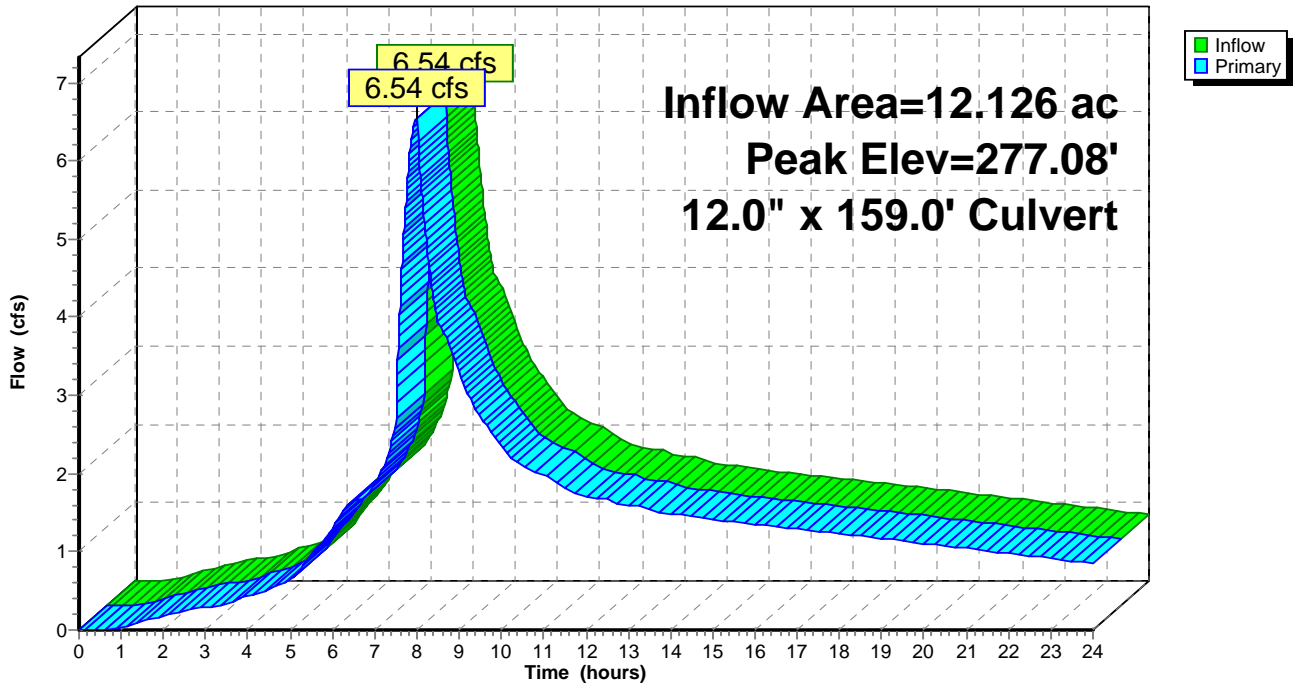
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 277.08' @ 8.00 hrs
 Flood Elev= 287.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.59'	12.0" x 159.0' long Culvert Ke= 0.500 Outlet Invert= 266.59' S= 0.0440 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.54 cfs @ 8.00 hrs HW=277.08' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.54 cfs @ 8.33 fps)

Pond 1500R: 12"

Hydrograph



Summary for Pond 1600R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.73" for 25-Year event
 Inflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af
 Outflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af

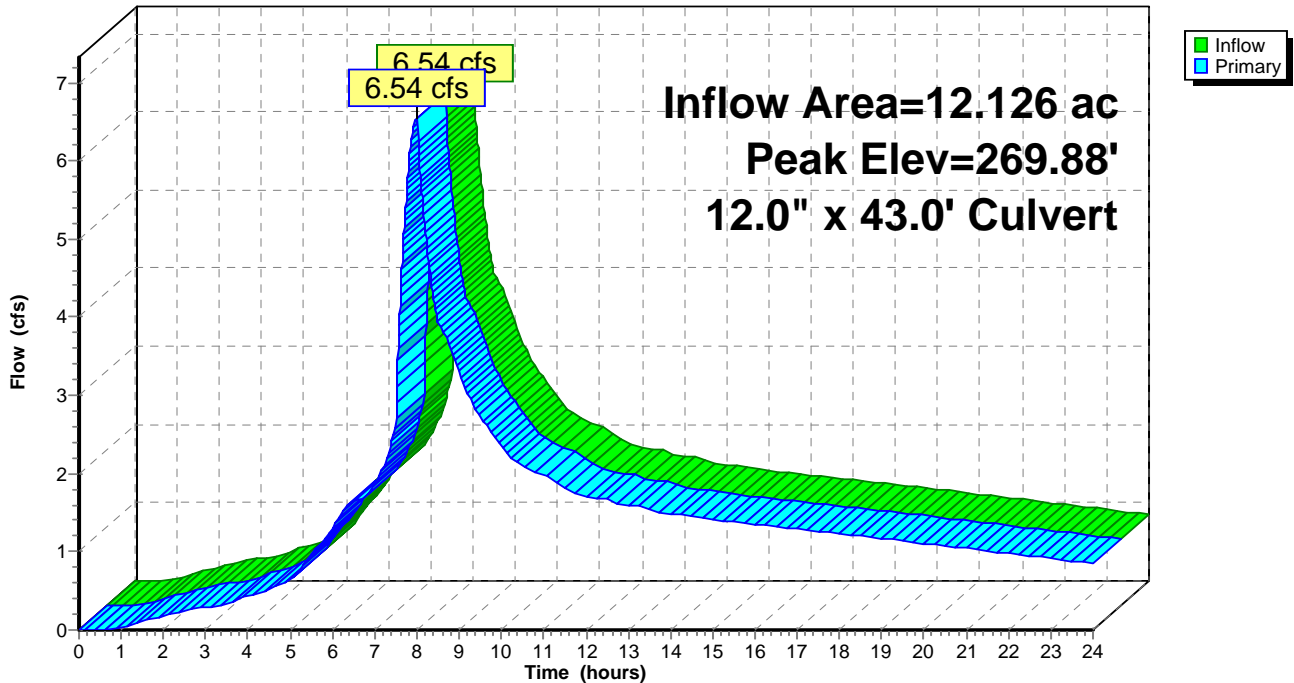
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 269.88' @ 8.00 hrs
 Flood Elev= 280.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	266.39'	12.0" x 43.0' long Culvert Ke= 0.500 Outlet Invert= 254.78' S= 0.2700 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.54 cfs @ 8.00 hrs HW=269.88' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.54 cfs @ 8.33 fps)

Pond 1600R: 12"

Hydrograph



Summary for Pond 1700R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.73" for 25-Year event
 Inflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af
 Outflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af

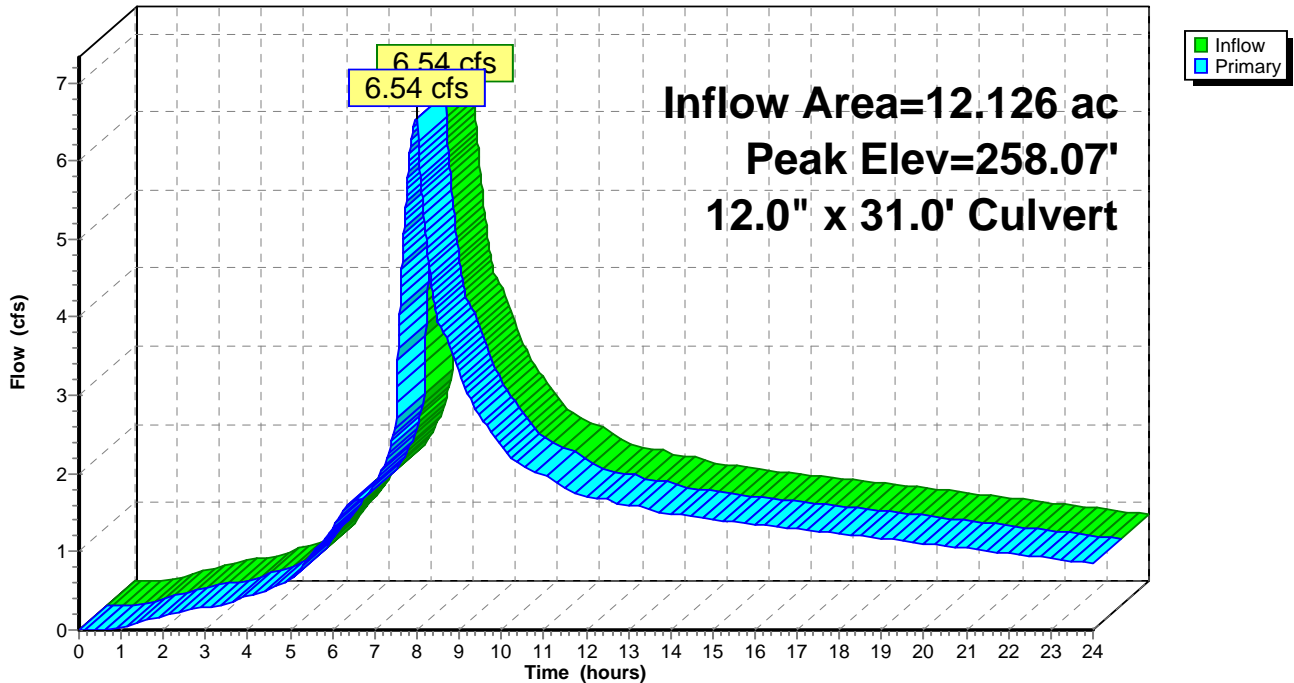
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 258.07' @ 8.00 hrs
 Flood Elev= 268.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	254.58'	12.0" x 31.0' long Culvert Ke= 0.500 Outlet Invert= 239.08' S= 0.5000 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.54 cfs @ 8.00 hrs HW=258.07' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.54 cfs @ 8.33 fps)

Pond 1700R: 12"

Hydrograph



Summary for Pond 1800R: 12"

Inflow Area = 12.126 ac, 51.90% Impervious, Inflow Depth > 2.73" for 25-Year event
 Inflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af
 Outflow = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.54 cfs @ 8.00 hrs, Volume= 2.761 af

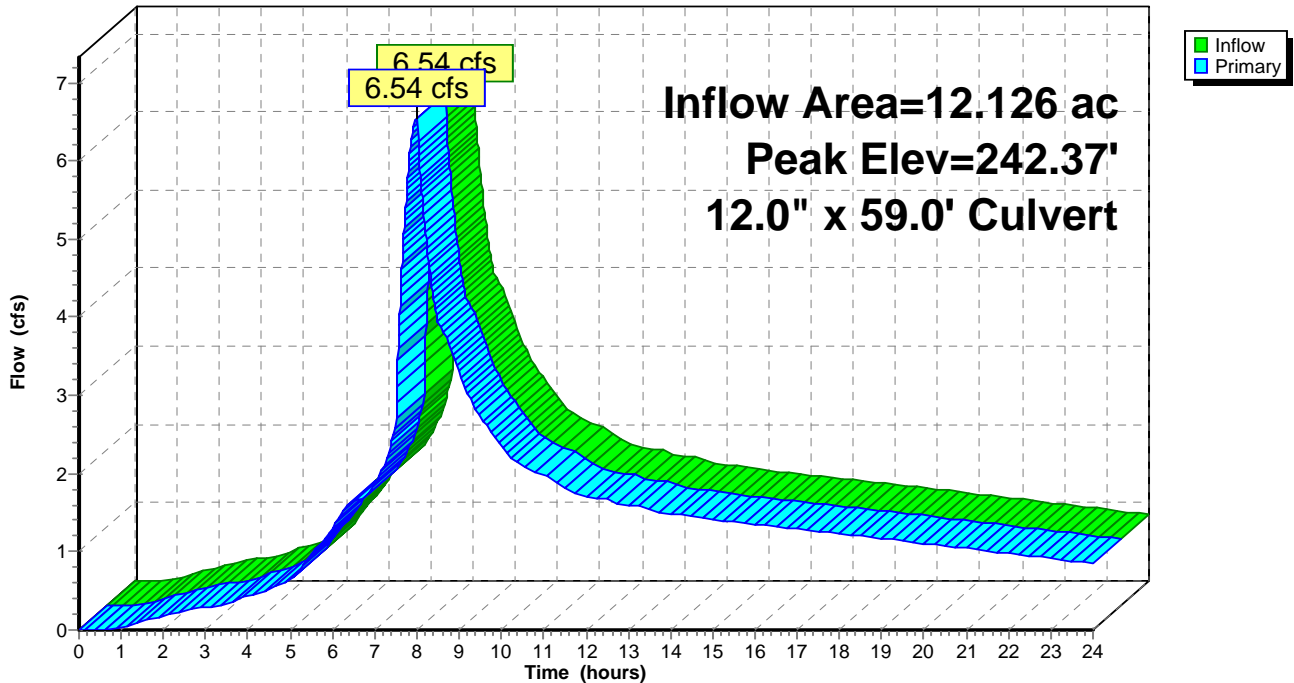
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 242.37' @ 8.00 hrs
 Flood Elev= 246.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	238.88'	12.0" x 59.0' long Culvert Ke= 0.500 Outlet Invert= 236.00' S= 0.0488 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=6.54 cfs @ 8.00 hrs HW=242.37' (Free Discharge)
 ←1=Culvert (Inlet Controls 6.54 cfs @ 8.33 fps)

Pond 1800R: 12"

Hydrograph



Summary for Pond A: POND

Inflow Area = 5.020 ac, 44.57% Impervious, Inflow Depth > 2.64" for 25-Year event
 Inflow = 3.09 cfs @ 7.94 hrs, Volume= 1.104 af
 Outflow = 1.74 cfs @ 8.31 hrs, Volume= 1.029 af, Atten= 44%, Lag= 21.9 min
 Primary = 1.74 cfs @ 8.31 hrs, Volume= 1.029 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 310.31' @ 8.31 hrs Surf.Area= 3,299 sf Storage= 7,729 cf

Plug-Flow detention time= 105.6 min calculated for 1.029 af (93% of inflow)
 Center-of-Mass det. time= 58.9 min (786.9 - 728.0)

Volume	Invert	Avail.Storage	Storage Description
#1	306.90'	10,088 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
306.90	1,318	0	0
307.00	1,364	134	134
308.00	1,865	1,615	1,749
309.00	2,436	2,151	3,899
310.00	3,078	2,757	6,656
311.00	3,785	3,432	10,088

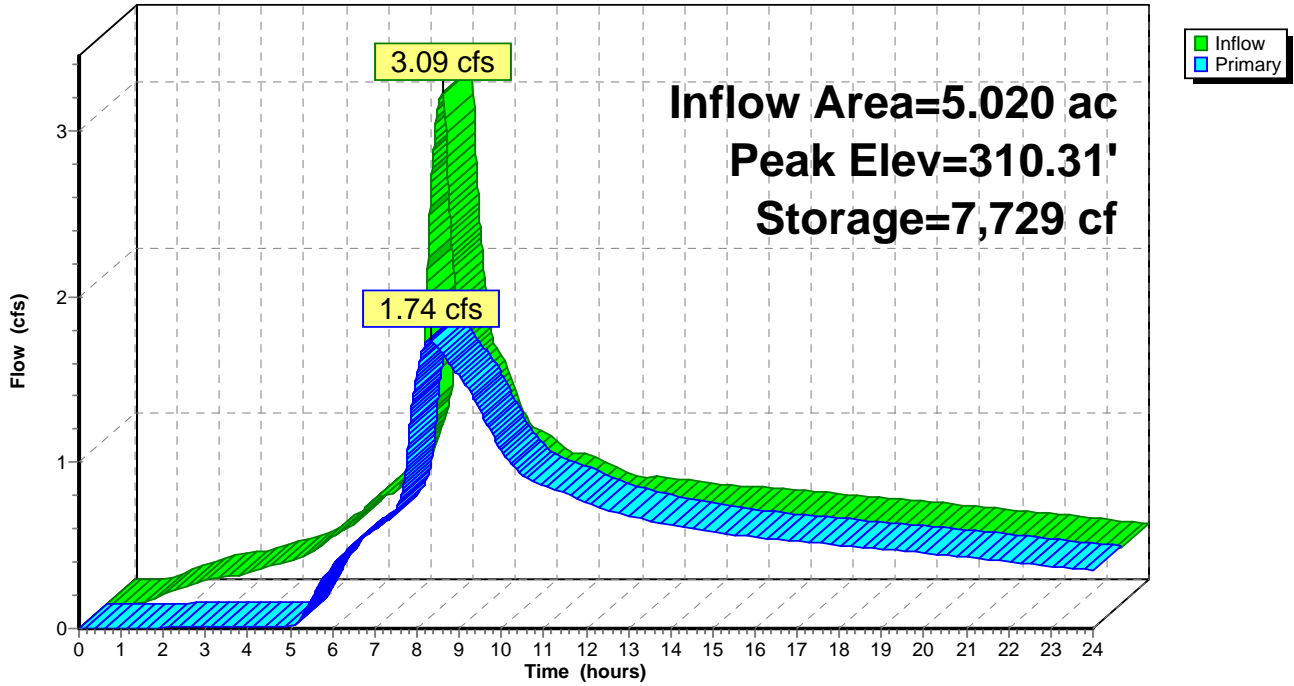
Device	Routing	Invert	Outlet Devices
#1	Primary	306.90'	0.7" Vert. Orifice/Grate C= 0.620
#2	Primary	308.34'	5.8" Vert. Orifice/Grate C= 0.620
#3	Primary	309.45'	4.4" Vert. Orifice/Grate C= 0.620
#4	Primary	310.10'	3.4" Vert. Orifice/Grate C= 0.620

Primary OutFlow Max=1.74 cfs @ 8.31 hrs HW=310.31' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.02 cfs @ 9.15 fps)
- 2=Orifice/Grate (Orifice Controls 1.20 cfs @ 6.55 fps)
- 3=Orifice/Grate (Orifice Controls 0.43 cfs @ 4.10 fps)
- 4=Orifice/Grate (Orifice Controls 0.08 cfs @ 1.62 fps)

Pond A: POND

Hydrograph

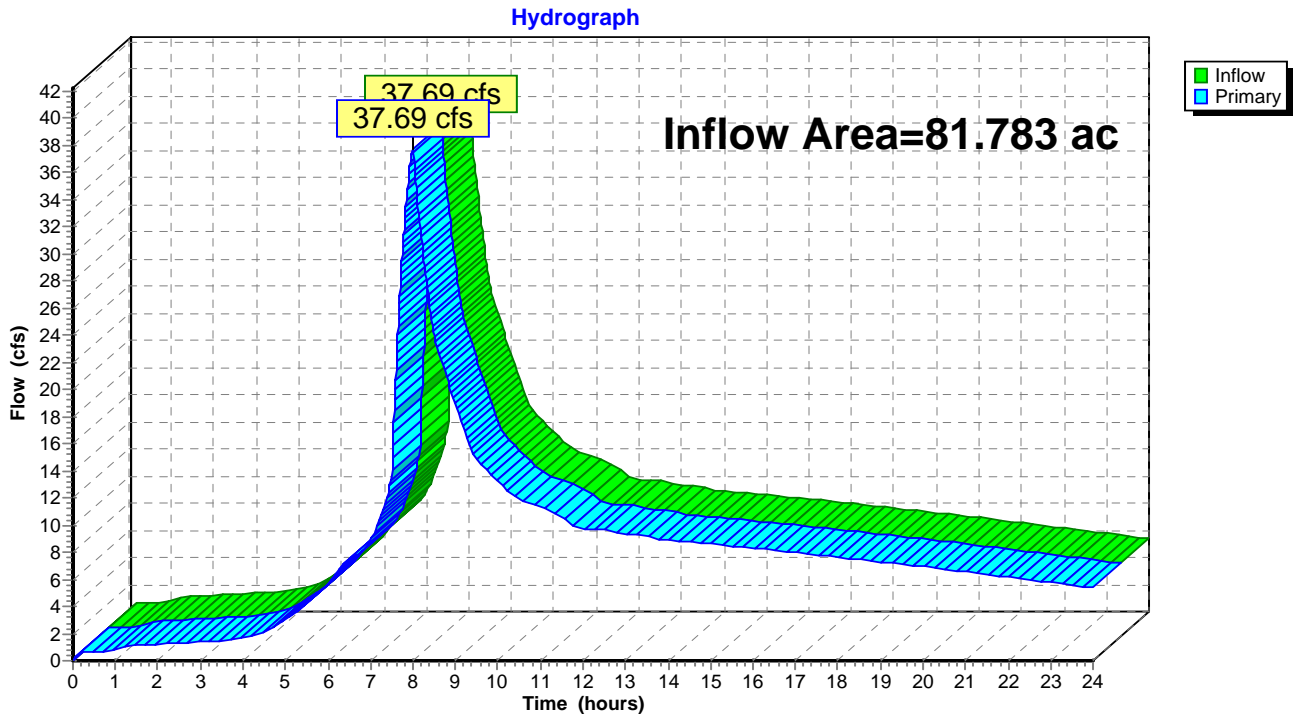


Summary for Link B: NATURAL POND 1900

Inflow Area = 81.783 ac, 44.42% Impervious, Inflow Depth > 2.34" for 25-Year event
Inflow = 37.69 cfs @ 8.00 hrs, Volume= 15.929 af
Primary = 37.69 cfs @ 8.00 hrs, Volume= 15.929 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link B: NATURAL POND 1900



APPENDIX 3.1

WATER QUALITY CALCULATIONS

Heather Ridge - Detention Pond

Job No. 3895
Date: 9/4/2014
Prepared by: SDL
Checked by:

Hydraulic Design Criteria (Per CWS 4.06.3 - R&O 07-20)

Design Flow: Water Quality Flow
Water Quality Drawdown Time: 48 hours
Maximum Water Design Depth: 4.0-ft
Minimum Freeboard: 1.0 foot (for facilities not protected from high flows)

Extended Dry Basin

Impervious Area used in Design (Per CWS 4.05.5d - R&O 07-20)

Total Impervious Area 86,109 SF

Water Quality Volume (Per CWS 4.05.6b - R&O 07-20)

Water Quality Storm Event = 0.36 in. falling in 24 hrs

Water Quality Volume (WQV) =

$$\frac{0.36 \text{ (in)} \times \text{Area (SF)}}{12 \text{ (in./ft.)}} = \underline{2,583 \text{ CF}}$$

$$\text{Water Quality Volume Pond Depth (ft)} = \underline{1.44 \text{ FT}}$$

Water Quality Flow (Per CWS 4.05.6c - R&O 07-20)

Water Quality Flow (Q) =

$$\frac{\text{WQV (cu.ft.)}}{172,800 \text{ seconds}} = \underline{0.01 \text{ CFS}}$$

Orifice Sizing:

Diameter of Orifice (D) =

$$24 \times \left[\frac{Q / (C [2gH]^{0.5})}{\pi} \right]^{0.5} = \underline{0.75 \text{ IN}}$$

where:

Q	C	g	H*
cfs		ft/s ²	ft
0.01	0.62	32.2	0.96





*H is 2/3 of the temporary detention height to centerline of orifice

25-Year Storm Event:

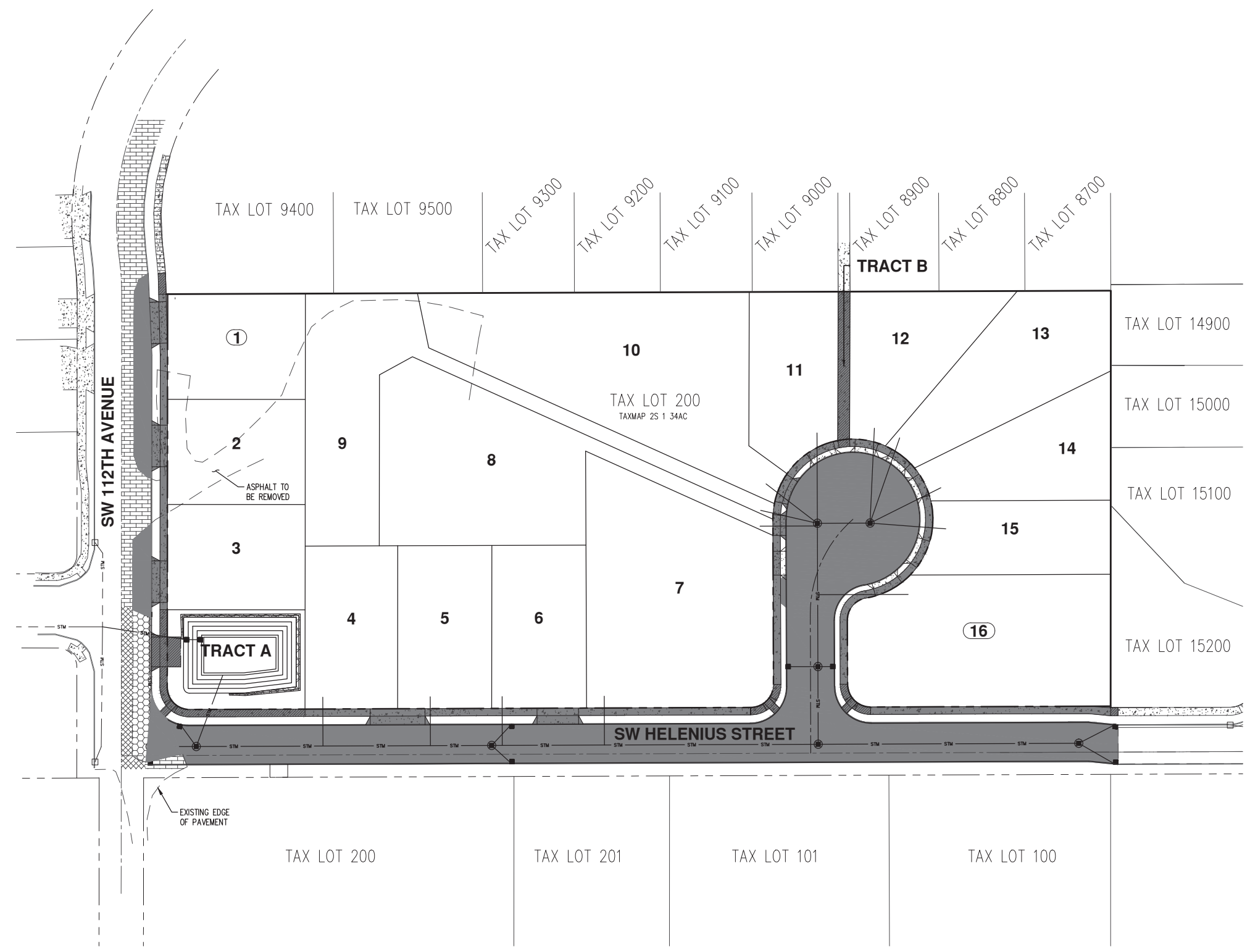
$$\text{Total Pond Depth (ft)} = \underline{5.10 \text{ FT}}$$

$$\text{25-year Storm Pond Depth (ft)} = \underline{3.22 \text{ FT}}$$

$$\text{Freeboard Depth (ft)} = \underline{1.88 \text{ FT}}$$

-  PROPOSED IMPERVIOUS AREA TO BE TREATED (2640 SF IMPERVIOUS AREA/LOT NOT SHOWN)
-  PROPOSED IMPERVIOUS AREA NOT TREATED
-  EXISTING IMPERVIOUS AREA TO BE TREATED
-  EXISTING IMPERVIOUS AREA WITHIN SITE BOUNDARY NOT TREATED

POST-DEVELOPED IMPERVIOUS AREA TABLE	
PROPOSED IMPERVIOUS AREA TO BE TREATED	81,243 SF
PROPOSED IMPERVIOUS AREA NOT TREATED	1,183 SF
EXISTING IMPERVIOUS AREA TO BE TREATED	4,866 SF
PROPOSED IMPERVIOUS AREA	82,426 SF
IMPERVIOUS AREA TO BE TREATED	86,109 SF
NET IMPERVIOUS AREA TREATED	+3,683 SF



APPENDIX 4.1
RELEVANT INFORMATION FROM CWS
DESIGN AND CONSTRUCTION STANDARDS
FOR SANITARY SEWER AND SURFACE
WATER MANAGEMENT (R&O 07-20)

24-HOUR RAINFALL DEPTHS

RECURRENCE INTERVAL (YEARS)	TOTAL PRECIPITATION DEPTH (INCHES)
2	2.50
5	3.10
10	3.45
25	3.90
50	4.20
100	4.50

24-HOUR RAINFALL DEPTHS

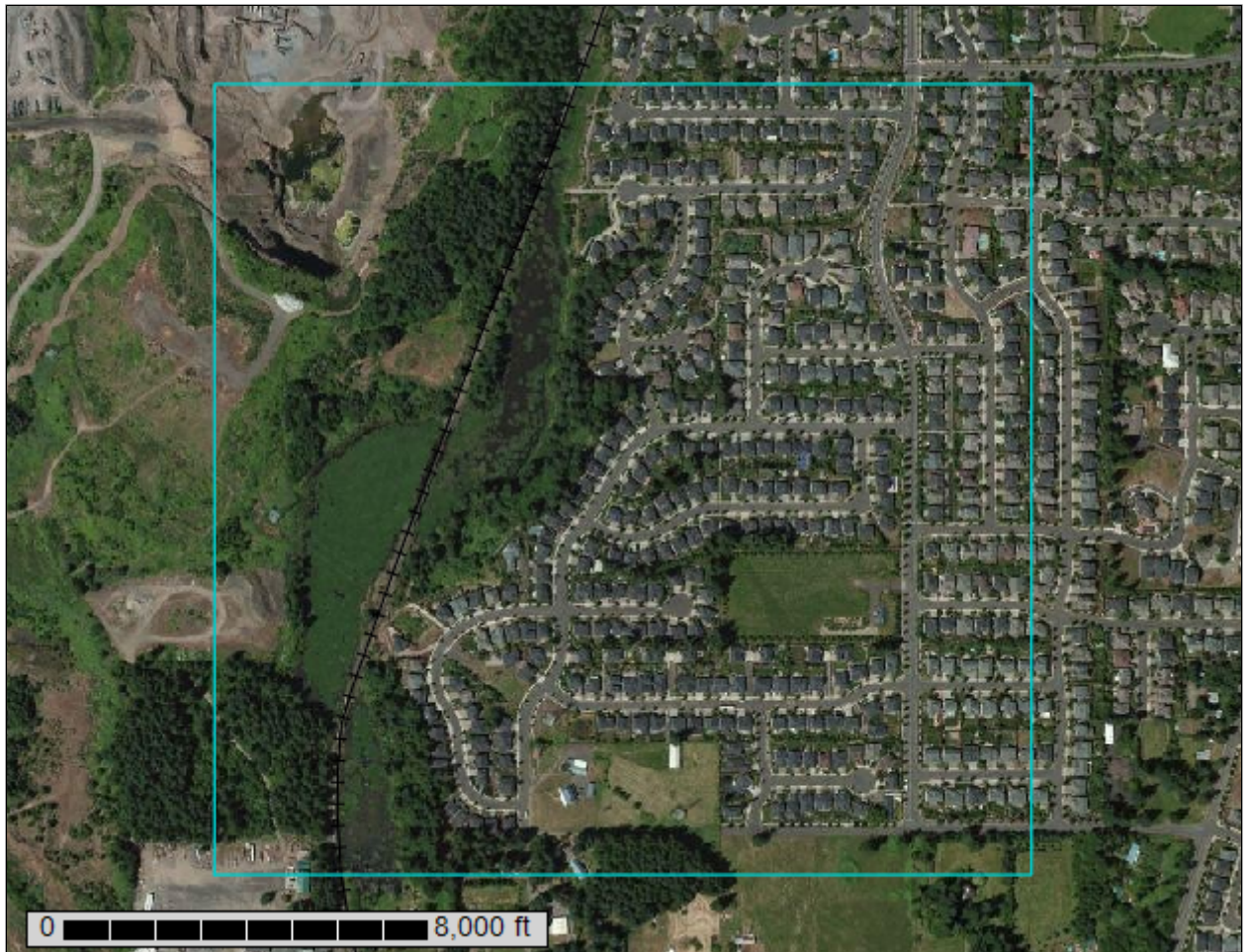
DRAWING NO. 1280

REVISED 12-06

 **CleanWater Services**
Our commitment is clear.

APPENDIX 5.1
SOILS IONFORMATION FROM
THE *USDA SOIL SURVEY OF*
WASHINGTON COUNTY

Custom Soil Resource Report for Washington County, Oregon



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 (<http://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

Custom Soil Resource Report

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.

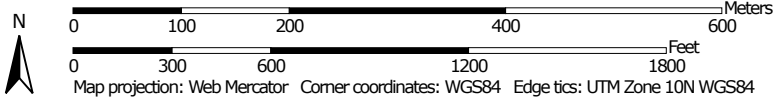
Soil Map

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: 1:6,990 if printed on A landscape (11" x 8.5") sheet.




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 1:20,000.

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: <http://websoilsurvey.nrcs.usda.gov>
 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: Washington County, Oregon
 Survey Area Data: Version 11, Dec 4, 2013

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

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

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

Washington County, Oregon (OR067)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5B	Briedwell stony silt loam, 0 to 7 percent slopes	3.5	2.0%
21A	Hillsboro loam, 0 to 3 percent slopes	8.8	5.0%
38B	Saum silt loam, 2 to 7 percent slopes	87.2	49.7%
38C	Saum silt loam, 7 to 12 percent slopes	34.1	19.5%
38D	Saum silt loam, 12 to 20 percent slopes	1.5	0.9%
38E	Saum silt loam, 20 to 30 percent slopes	10.3	5.9%
43	Wapato silty clay loam	4.0	2.3%
76	Pits	13.3	7.6%
W	Water	12.6	7.2%
Totals for Area of Interest		175.4	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

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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.

Washington County, Oregon

5B—Briedwell stony silt loam, 0 to 7 percent slopes

Map Unit Setting

National map unit symbol: 220h

Elevation: 200 to 320 feet

Mean annual precipitation: 40 to 60 inches

Mean annual air temperature: 50 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Briedwell and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Briedwell

Setting

Landform: Terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Silty over gravelly alluvium

Typical profile

H1 - 0 to 12 inches: stony silt loam

H2 - 12 to 26 inches: clay loam

H3 - 26 to 60 inches: extremely cobbly clay loam

Properties and qualities

Slope: 0 to 7 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

21A—Hillsboro loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 21y5

Elevation: 160 to 240 feet

Custom Soil Resource Report

Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hillsboro and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsboro

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and loamy old alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 48 inches: loam
H3 - 48 to 57 inches: fine sandy loam
H4 - 57 to 81 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B

38B—Saum silt loam, 2 to 7 percent slopes

Map Unit Setting

National map unit symbol: 21zq
Elevation: 250 to 1,200 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Saum and similar soils: 80 percent

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Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saum

Setting

Landform: Hills

Landform position (two-dimensional): Toeslope, summit

Landform position (three-dimensional): Interfluve, base slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed loess, old alluvium, and residuum weathered from basalt

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 23 inches: silty clay loam

H3 - 23 to 50 inches: stony silty clay loam

H4 - 50 to 54 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 7 percent

Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

38C—Saum silt loam, 7 to 12 percent slopes

Map Unit Setting

National map unit symbol: 21zr

Elevation: 250 to 1,200 feet

Mean annual precipitation: 40 to 50 inches

Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Saum and similar soils: 80 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saum

Setting

Landform: Hills

Landform position (two-dimensional): Shoulder

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Landform position (three-dimensional): Interfluve, base slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed loess, old alluvium, and residuum weathered from basalt

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 23 inches: silty clay loam

H3 - 23 to 50 inches: stony silty clay loam

H4 - 50 to 54 inches: unweathered bedrock

Properties and qualities

Slope: 7 to 12 percent

Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

38D—Saum silt loam, 12 to 20 percent slopes

Map Unit Setting

National map unit symbol: 21zs

Elevation: 250 to 1,200 feet

Mean annual precipitation: 40 to 50 inches

Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Saum and similar soils: 80 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saum

Setting

Landform: Hills

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Base slope, side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed loess, old alluvium, and residuum weathered from basalt

Typical profile

H1 - 0 to 8 inches: silt loam

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H2 - 8 to 23 inches: silty clay loam
H3 - 23 to 50 inches: stony silty clay loam
H4 - 50 to 54 inches: unweathered bedrock

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

38E—Saum silt loam, 20 to 30 percent slopes

Map Unit Setting

National map unit symbol: 21zt
Elevation: 250 to 1,200 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Saum and similar soils: 75 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saum

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed loess, old alluvium, and residuum weathered from basalt

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 23 inches: silty clay loam
H3 - 23 to 50 inches: stony silty clay loam
H4 - 50 to 54 inches: unweathered bedrock

Properties and qualities

Slope: 20 to 30 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Custom Soil Resource Report

Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

43—Wapato silty clay loam

Map Unit Setting

National map unit symbol: 2203
Elevation: 100 to 300 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Wapato and similar soils: 85 percent
Labish and similar soils: 3 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wapato

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent alluvium

Typical profile

H1 - 0 to 14 inches: silty clay loam
H2 - 14 to 42 inches: silty clay loam
H3 - 42 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent

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Frequency of ponding: Frequent

Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 3w

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Description of Labish

Setting

Landform: Flood plains, lakebeds (relict)

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and lacustrine deposits over organic material

Typical profile

H1 - 0 to 13 inches: mucky clay

H2 - 13 to 36 inches: clay

H3 - 36 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

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 12 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Available water storage in profile: Very high (about 18.7 inches)

Interpretive groups

Land capability classification (irrigated): 3w

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: C/D

Minor Components

Cove, silty clay loam surface

Percent of map unit: 4 percent

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

76—Pits

Map Unit Composition

Pits: 100 percent

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Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Properties and qualities

Slope: 0 to 90 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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 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.

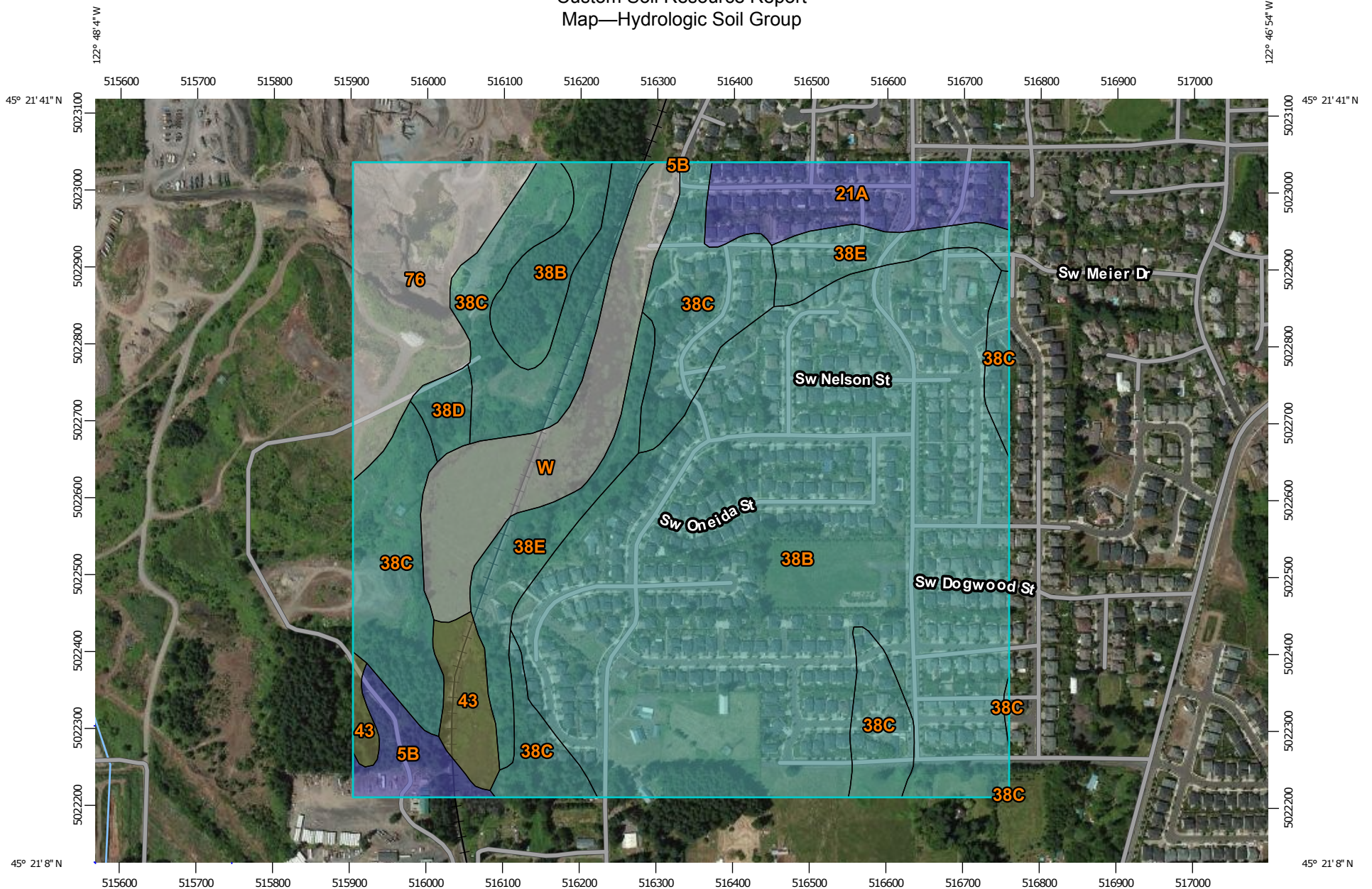
Custom Soil Resource Report

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.

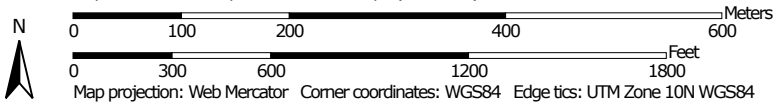
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over 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 Scale: 1:6,990 if printed on A landscape (11" x 8.5") sheet.











Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

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


Water Features

-  Streams and Canals





Transportation

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

Background

-  Aerial Photography

Other Legend Items:

-  C
-  C/D
-  D
-  Not rated or not available

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: <http://websoilsurvey.nrcs.usda.gov>
 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: Washington County, Oregon
 Survey Area Data: Version 11, Dec 4, 2013

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

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

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

Hydrologic Soil Group— Summary by Map Unit — Washington County, Oregon (OR067)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
5B	Briedwell stony silt loam, 0 to 7 percent slopes	B	3.5	2.0%
21A	Hillsboro loam, 0 to 3 percent slopes	B	8.8	5.0%
38B	Saum silt loam, 2 to 7 percent slopes	C	87.2	49.7%
38C	Saum silt loam, 7 to 12 percent slopes	C	34.1	19.5%
38D	Saum silt loam, 12 to 20 percent slopes	C	1.5	0.9%
38E	Saum silt loam, 20 to 30 percent slopes	C	10.3	5.9%
43	Wapato silty clay loam	C/D	4.0	2.3%
76	Pits		13.3	7.6%
W	Water		12.6	7.2%
Totals for Area of Interest			175.4	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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APPENDIX 6.1
RELEVANT INFORMATION
FROM TR-55

Table 2-2a Runoff curve numbers for urban areas ^{1/}

Cover description	Average percent impervious area ^{2/}	Curve numbers for hydrologic soil group			
		A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ^{4/}		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82

Developing urban areas

Newly graded areas
(pervious areas only, no vegetation) ^{5/}

	77	86	91	94
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Idle lands (CN's are determined using cover types
similar to those in table 2-2c).

¹ Average runoff condition, and $I_a = 0.2S$.

² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.