

Jon and Brenda Furlow
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jon.furlow@gmail.com 608.852.4506
bsfurlow71@gmail.com 608.692.0175

September 25, 2023

Re: [Legistar File #79099](#) - 3701 Council Crest Redesign Submission

Landmarks Commission:

Thank you for the opportunity to submit a redesign proposal for the new construction of our home at 3701 Council Crest.

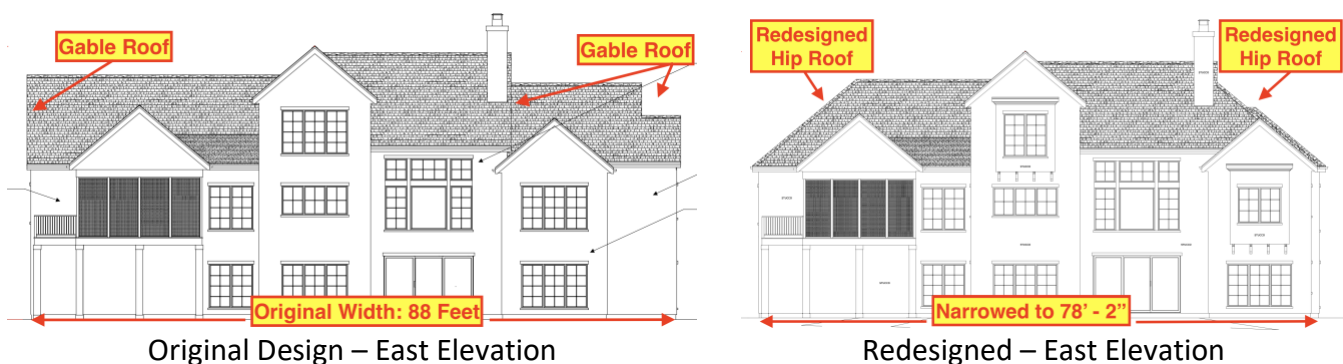
We have included the following items for your consideration:

1. Architectural drawings, including dimensioned site plans, elevations, and floor plan and a roof plan.
2. Perspective renderings.
3. Engineering plans for surface water management.

As suggested by the Commission, we have worked with Dr. Bailey and have proposed a redesign that follows the specific guidance that the Commission provided at the August 14, 2023 Landmarks Commission meeting, as reflected in the [Meeting Minutes](#) and the [Landmarks Commission Meeting Report](#).

I. The Redesign Narrows Our Home by Almost 10 Feet, and Reduces the Overall Scale By Changing the Roof Line.

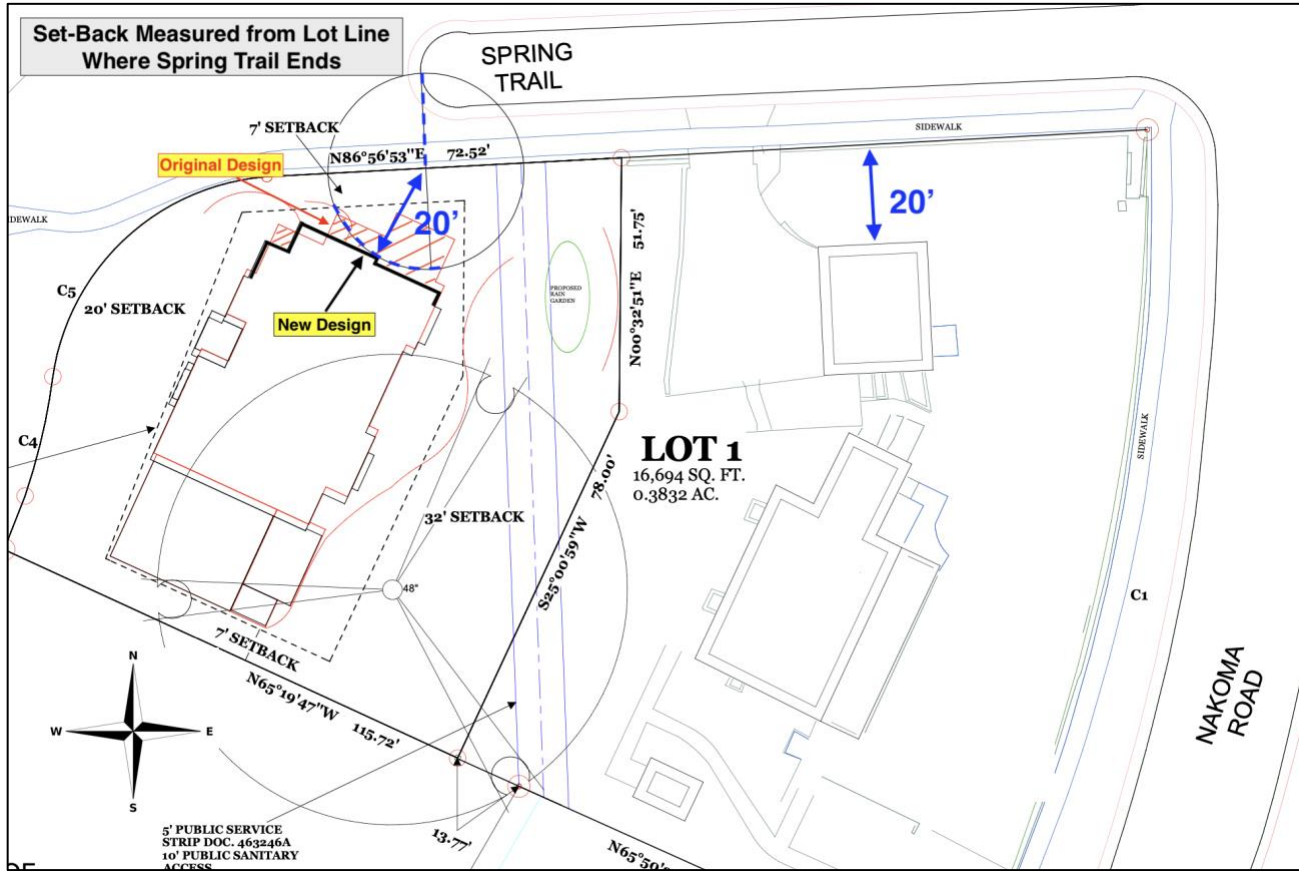
The Commission thought our proposed home was consistent with the neighborhood, but was too wide on the east elevation relative to the Tavern home. To address this, the Commission suggested we narrow our home by 8 to 10 feet. We agreed, and redesigned our home to narrow the overall width of the home almost 10 feet, from 88 feet to 78'- 2" feet. We further reduced the overall scale by modifying the roof line from a gable end in the original design, to a hip roof in the redesign.



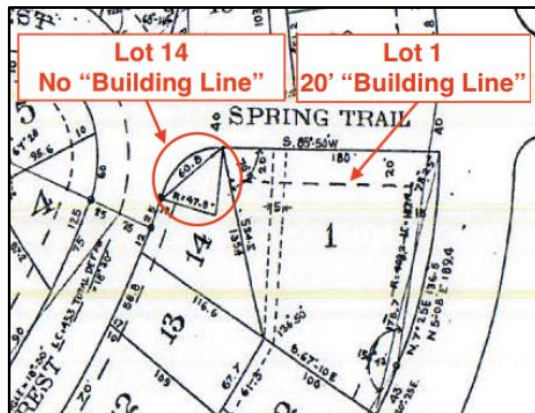
II. Our Redesign Increases the Setback To 20 Feet from the Lot Line At The End of Spring Trail.

The Commission requested that we redesign our home to meet a 20-foot set-back from the road, and clarified this to mean 20 feet from the lot line at the end of Spring Trail. We agreed and have increased the

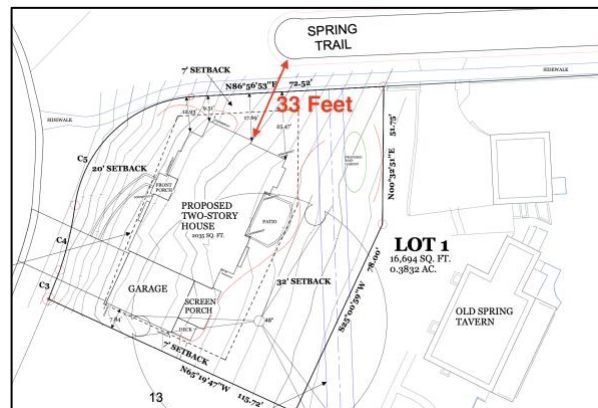
set-back on the Spring Trail side to 20 feet, which is consistent with the Tavern home set-back from Spring Trail.



Our redesign is also consistent with any historic “building line” referenced in the 1920 Nakoma Homes Company Agreement. These “building lines” were measured from the house “to the street”, and were shown as dotted lines on the original plat recorded on July 1, 1926.¹ The City, of course, does not enforce these “building lines.” And our lot, identified as Lot 14 on the original 1926 plat, was not subject to the 20 foot “building line” to Spring Trail. But even if the 20 foot “building line” were considered, the nearest part of our home is now over 33 feet from Spring Trail – well within any historic “building line” to the street.



1926 Nakoma Plat: Building Lines to Spring Trail



Site Plan: House Distance to Spring Trail

¹ Nakoma Homes Agreement is clear on the measurement: “The line of any building or any part thereof, erected on these premises, **shall not be nearer to the street** than the building line indicated on the recorded plat.” Nakoma Homes Agreement, Art. XIV, recorded December 18, 1920 as Doc. 397427 (emphasis supplied.)

III. We Recalculated the Surface Water Run-Off Based on the Redesign, and Our Construction Will Reduce The Run-Off Toward the Tavern Home Property.

Since our redesign has modified the footprint and rooflines of our home, we requested that the engineers remodel and recalculate the surface water run-off from our lot generally, and to the Tavern home property specifically.

Specific to the Tavern home property, our engineering shows that in every case from a 1-Yr, 24hr storm to a 500-Yr, 24hr storm, the run-off toward the Tavern home property **will be reduced** after we build our home and install the rain garden system. The results are summarized as follows:

A	B	C	D
Storm Event	Current Surface Water Run-Off Rate to Tavern Property from Vacant Lot (in CFS)	Surface Water Run-Off Rate to Tavern Property after Development (in CFS)	Reduction in Surface Water Run-Off Rate to Tavern Property after Development (in CFS)
1-Yr, 24hr	.32	.23	.09
2-Yr, 24hr	.42	.27	.15
5-Yr, 24hr	.60	.36	.24
10-Yr, 24hr	.81	.45	.36
25-Yr, 24hr	1.13	.59	.54
100-Yr, 24hr	1.74	.83	.91
200-Yr, 24hr	2.07	.96	1.11
500-Yr, 24hr	2.62	1.76	.86

Column A shows the Storm Event, from a 1-Yr, 24hr storm, to an extremely severe 500-Yr, 24hr storm. **Column B** shows the current run-off conditions toward the Tavern property, as they exist today from our vacant lot, measured in cubic feet per second (“CFS”). And **Column C** shows the run-off conditions toward the Tavern property after we build our home and install the rain garden.

Column D shows how our development will affect surface water run-off toward the Tavern home property, and demonstrates that in every storm event scenario, the amount of surface water run-off toward the Tavern property after we build our home **will be less than** the current run-off conditions as they exist today from the vacant lot.

Thank you again for considering our Application.

Jon and Brenda Furlow

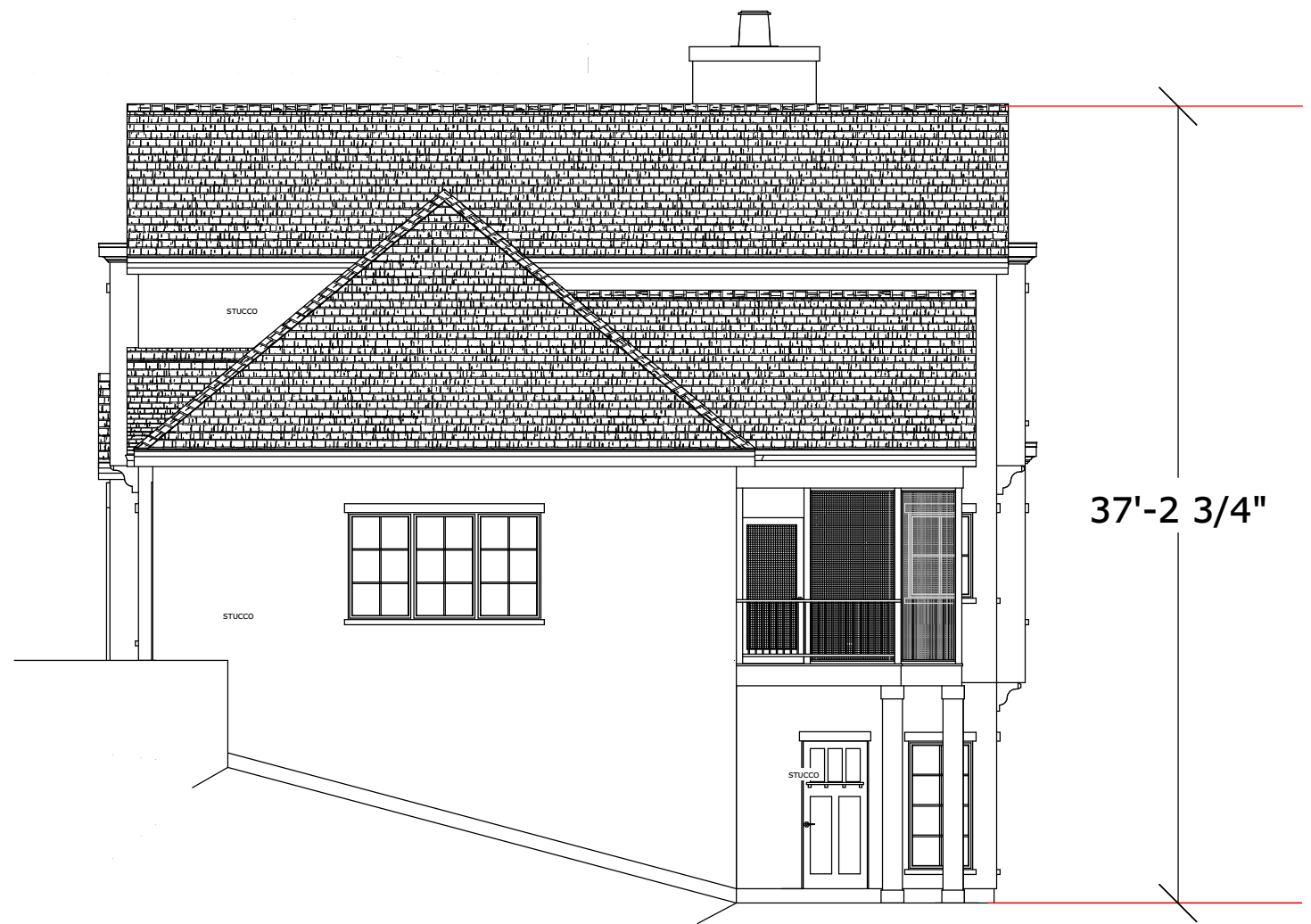


27'-8 3/4"

AVG HT. (4 SIDES): 34.855'

FRONT ELEVATION

1/8"=1'-0"



37'-2 3/4"

RIGHT ELEVATION

1/8"=1'-0"

NEW HOME FOR:
FURLOW RESIDENCE
 3701 Council Crest
 LOT 2
 MADISON, DANE COUNTY, WISCONSIN



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PRELIMINARY DRAWINGS ONLY
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ELEVATIONS	
DATE:	9/25/2023
SCALE:	SCALE: 1/8" = 1'-0"
REVISION:	SHEET
VER. 6	1

37'-2 3/4"



BACK ELEVATION

1/8" = 1'-0"

37'-2 3/4"



LEFT ELEVATION

1/8" = 1'-0"

NEW HOME FOR:

FURLOW RESIDENCE

3701 Council Crest
LOT 2
MADISON, DANE COUNTY, WISCONSIN



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ELEVATIONS

DATE:

9/25/2023

SCALE:

SCALE: 1/8" = 1'-0"

REVISION SHEET

VER. 6 2

NEW HOME FOR:

FURLOW RESIDENCE

3701 Council Crest
LOT 2

MADISON, DANE COUNTY, WISCONSIN



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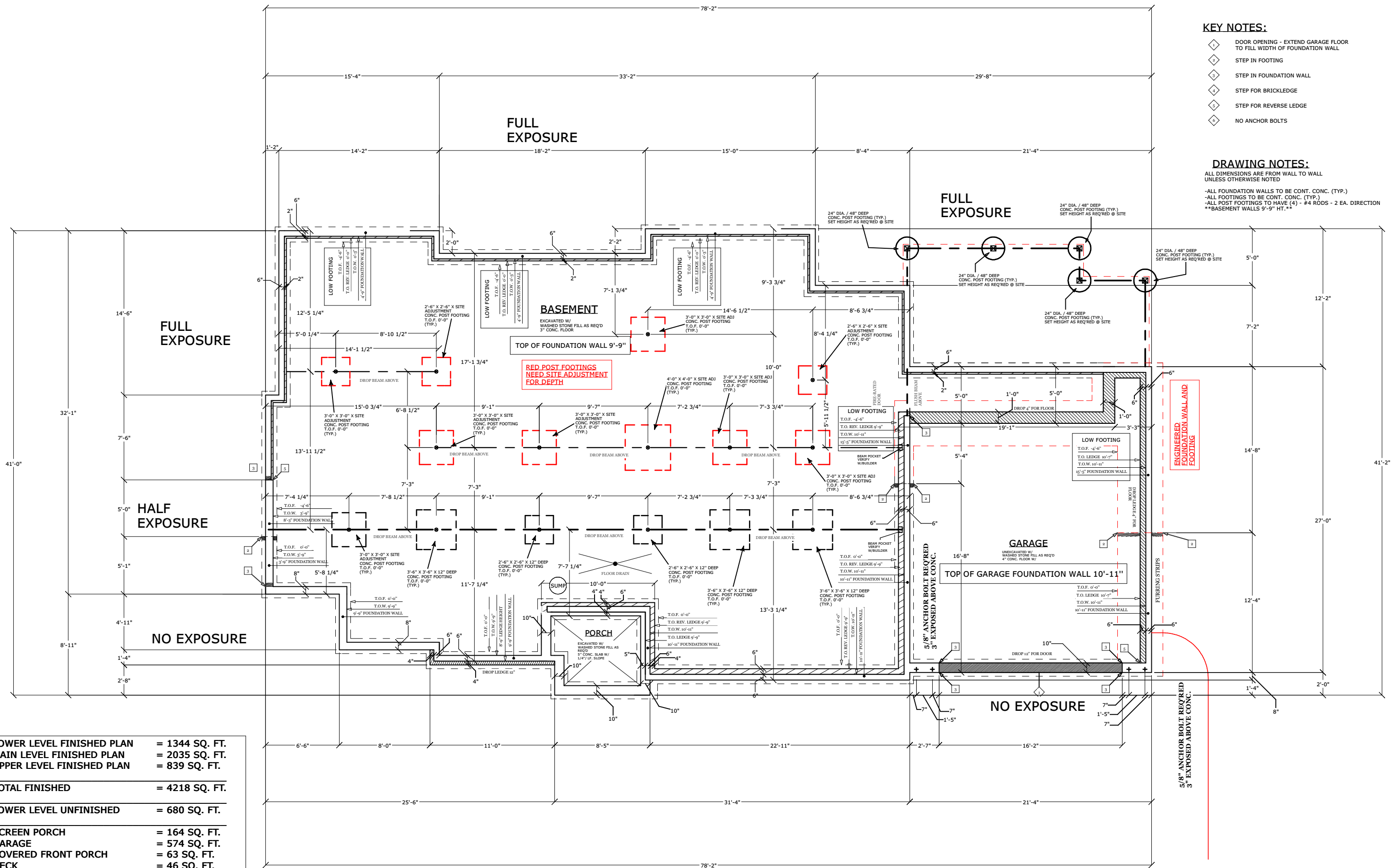
FOUNDATION	
DATE:	9/25/2023
SCALE:	SCALE: 1/8" = 1'-0"
REVISION:	SHEET
VER. 6	3

KEY NOTES:

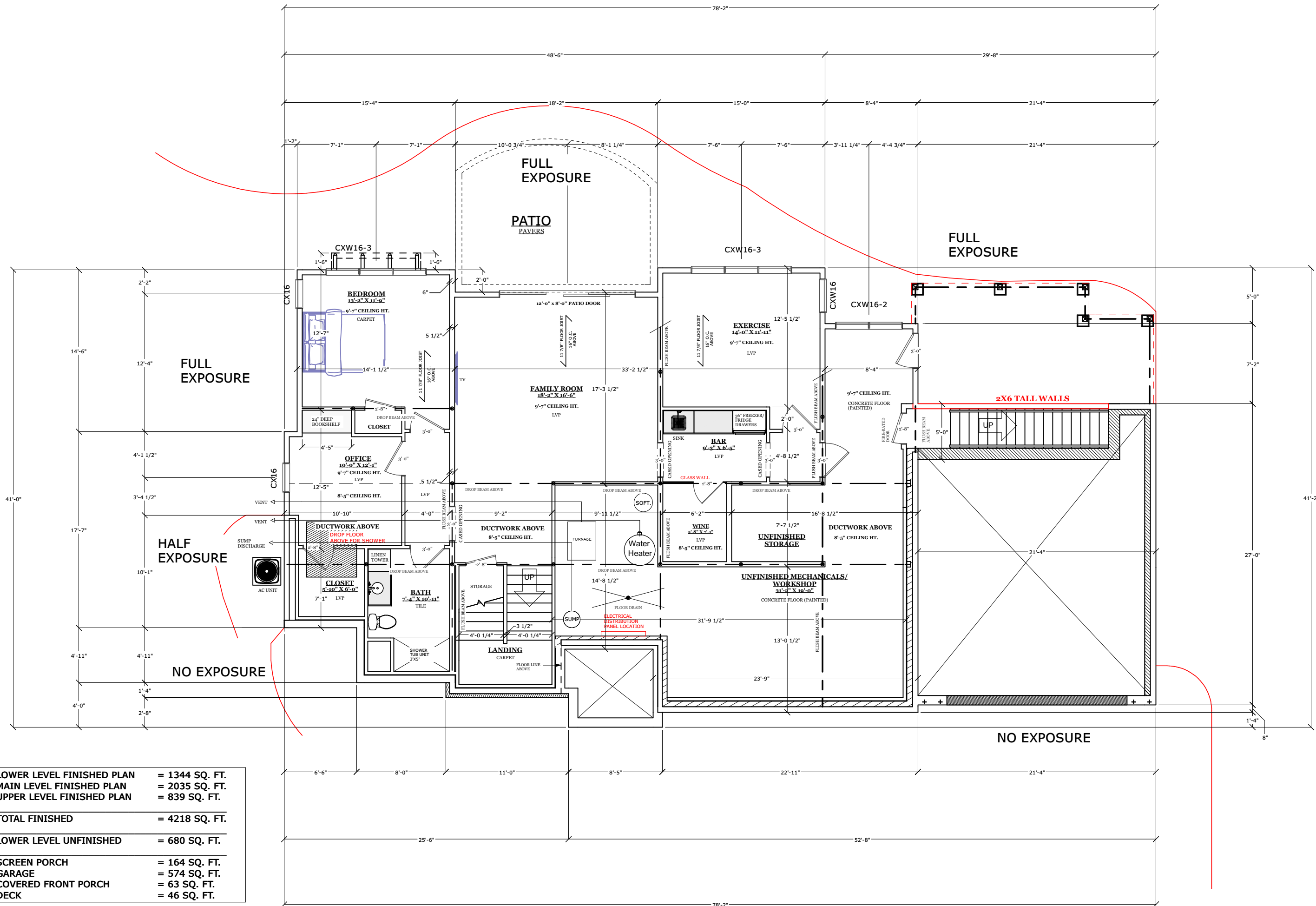
- 1 DOOR OPENING - EXTEND GARAGE FLOOR TO FILL WIDTH OF FOUNDATION WALL
- 2 STEP IN FOOTING
- 3 STEP IN FOUNDATION WALL
- 4 STEP FOR BRICKLEDGE
- 5 STEP FOR REVERSE LEDGE
- 6 NO ANCHOR BOLTS

DRAWING NOTES:

- ALL DIMENSIONS ARE FROM WALL TO WALL UNLESS OTHERWISE NOTED
- ALL FOUNDATION WALLS TO BE CONT. CONC. (TYP.)
- ALL FOOTINGS TO BE CONT. CONC. (TYP.)
- ALL POST FOOTINGS TO HAVE (4) - #4 RODS - 2 EA. DIRECTION
- **BASEMENT WALLS 9'-9" HT.**



LOWER LEVEL FINISHED PLAN	= 1344 SQ. FT.
MAIN LEVEL FINISHED PLAN	= 2035 SQ. FT.
UPPER LEVEL FINISHED PLAN	= 839 SQ. FT.
TOTAL FINISHED	= 4218 SQ. FT.
LOWER LEVEL UNFINISHED	= 680 SQ. FT.
SCREEN PORCH	= 164 SQ. FT.
GARAGE	= 574 SQ. FT.
COVERED FRONT PORCH	= 63 SQ. FT.
DECK	= 46 SQ. FT.



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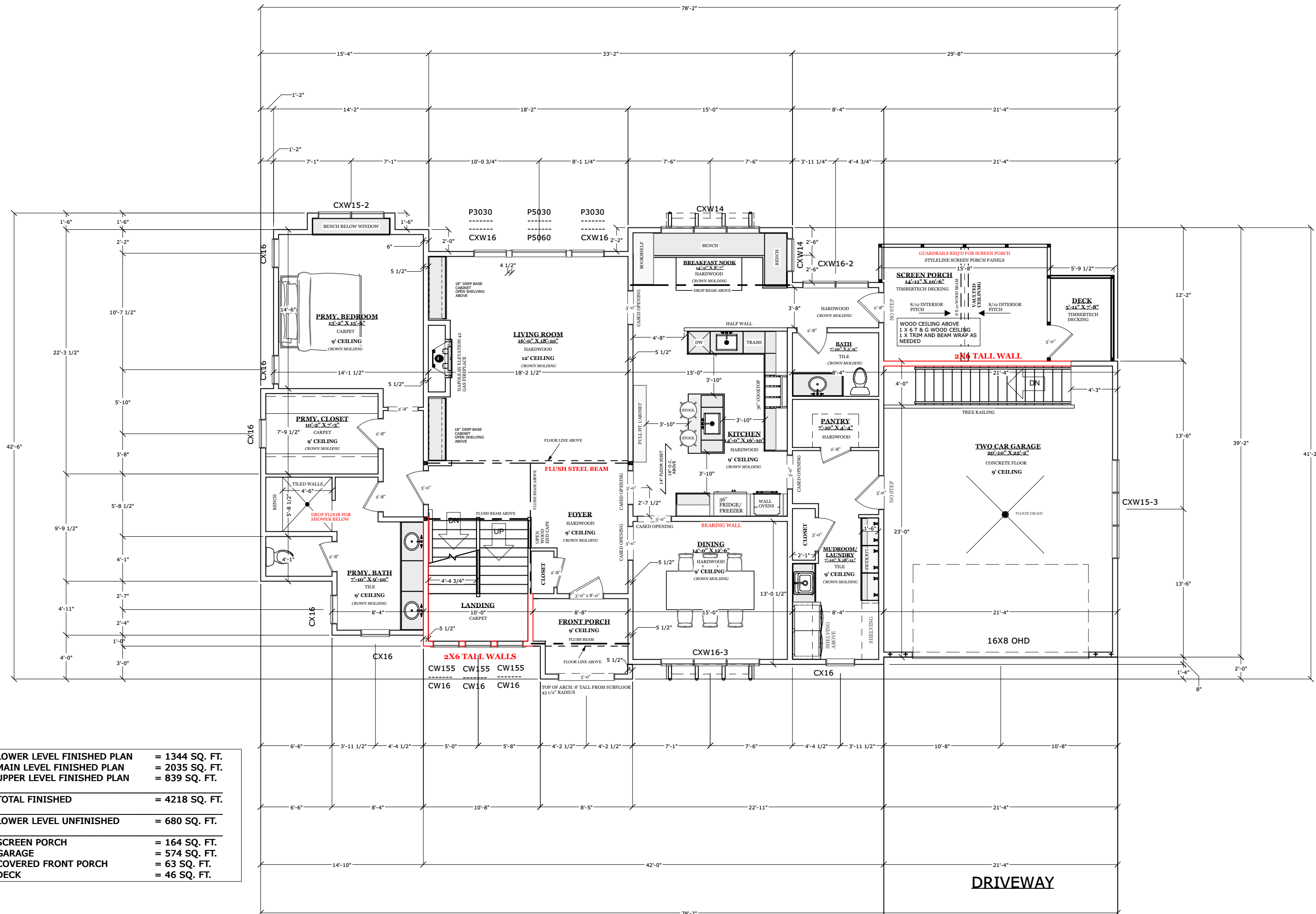
NEW HOME FOR:
FURLOW RESIDENCE
 3701 Council Crest
 LOT 2
 MADISON, DANE COUNTY, WISCONSIN



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LOWER LEVEL	
DATE:	9/25/2023
SCALE:	SCALE: 1/8" = 1'-0"
REVISION:	SHEET
VER. 6	4



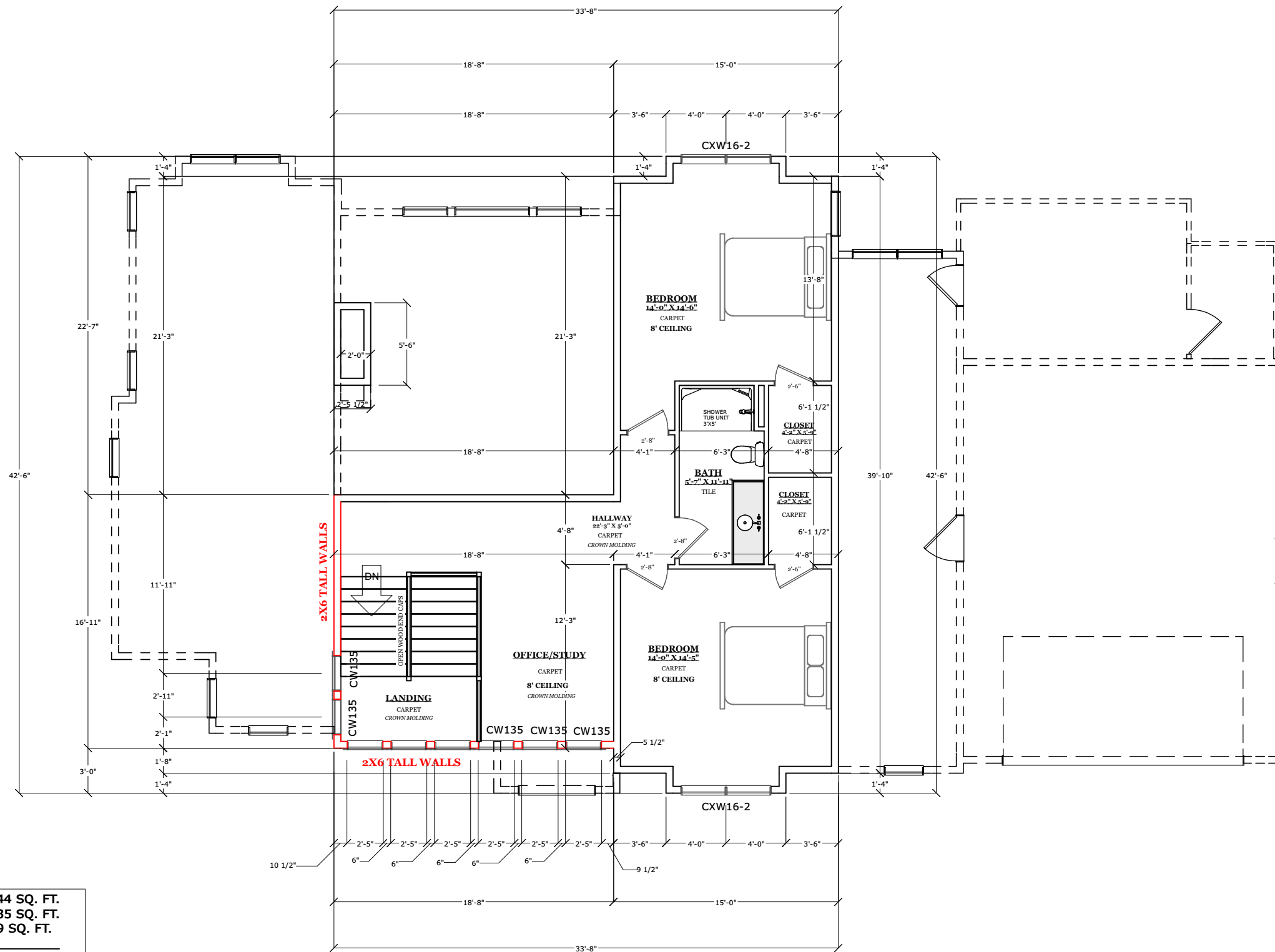
NEW HOME FOR:
FURLOW RESIDENCE
 3701 Council Crest
 LOT 2
 MADISON, DANE COUNTY, WISCONSIN



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MAIN LEVEL	
DATE:	9/25/2023
SCALE:	SCALE: 1/8" = 1'-0"
REVISION:	SHEET
VER. 6	5



LOWER LEVEL FINISHED PLAN	= 1344 SQ. FT.
MAIN LEVEL FINISHED PLAN	= 2035 SQ. FT.
UPPER LEVEL FINISHED PLAN	= 839 SQ. FT.
TOTAL FINISHED	= 4218 SQ. FT.
LOWER LEVEL UNFINISHED	= 680 SQ. FT.
SCREEN PORCH	= 164 SQ. FT.
GARAGE	= 574 SQ. FT.
COVERED FRONT PORCH	= 63 SQ. FT.
DECK	= 46 SQ. FT.

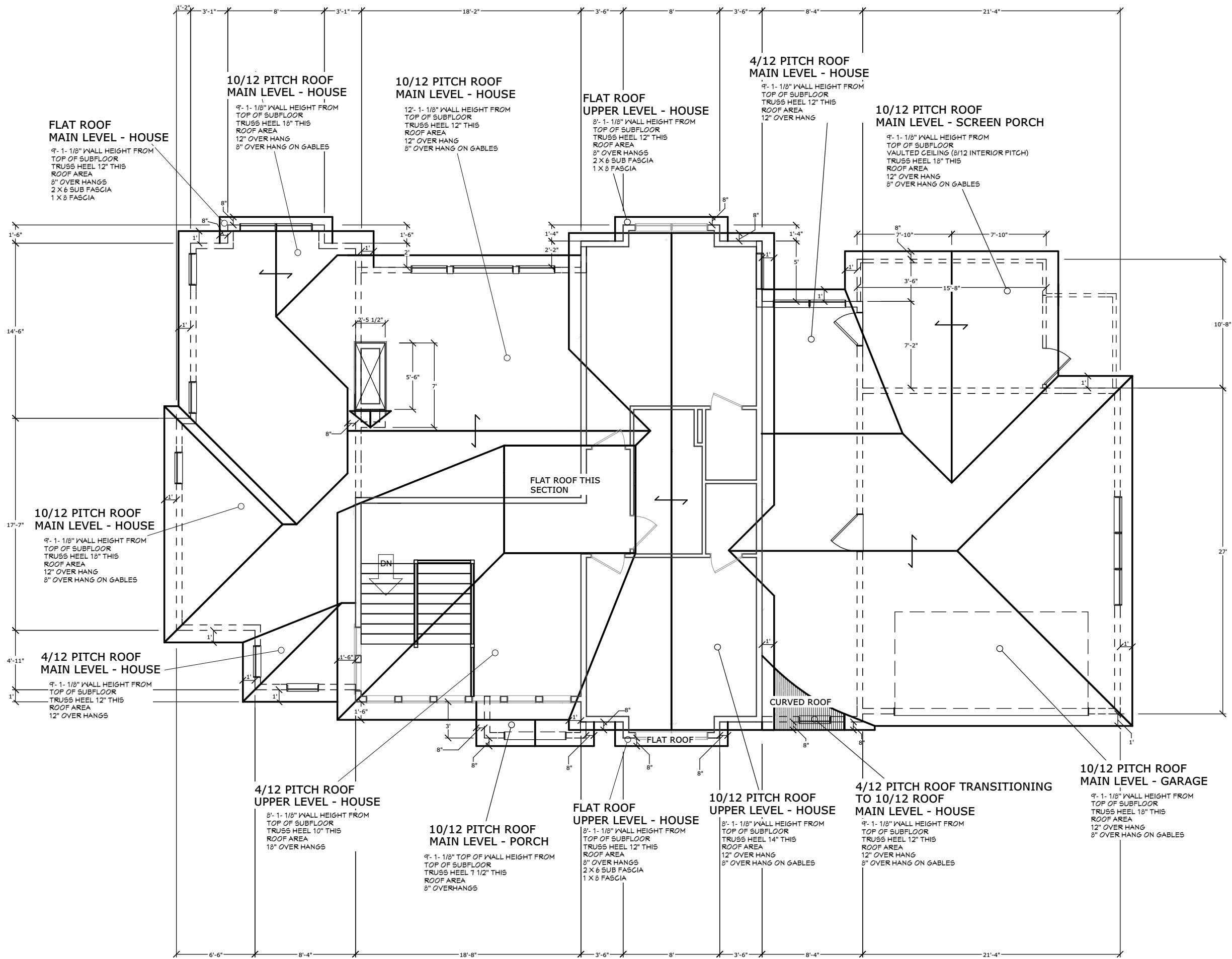
NEW HOME FOR:
FURLOW RESIDENCE
 3701 Council Crest
 LOT 2
 MADISON, DANE COUNTY, WISCONSIN



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UPPER LEVEL	
DATE:	9/25/2023
SCALE:	SCALE: 1/8" = 1'-0"
REVISION:	SHEET
VER. 6	6



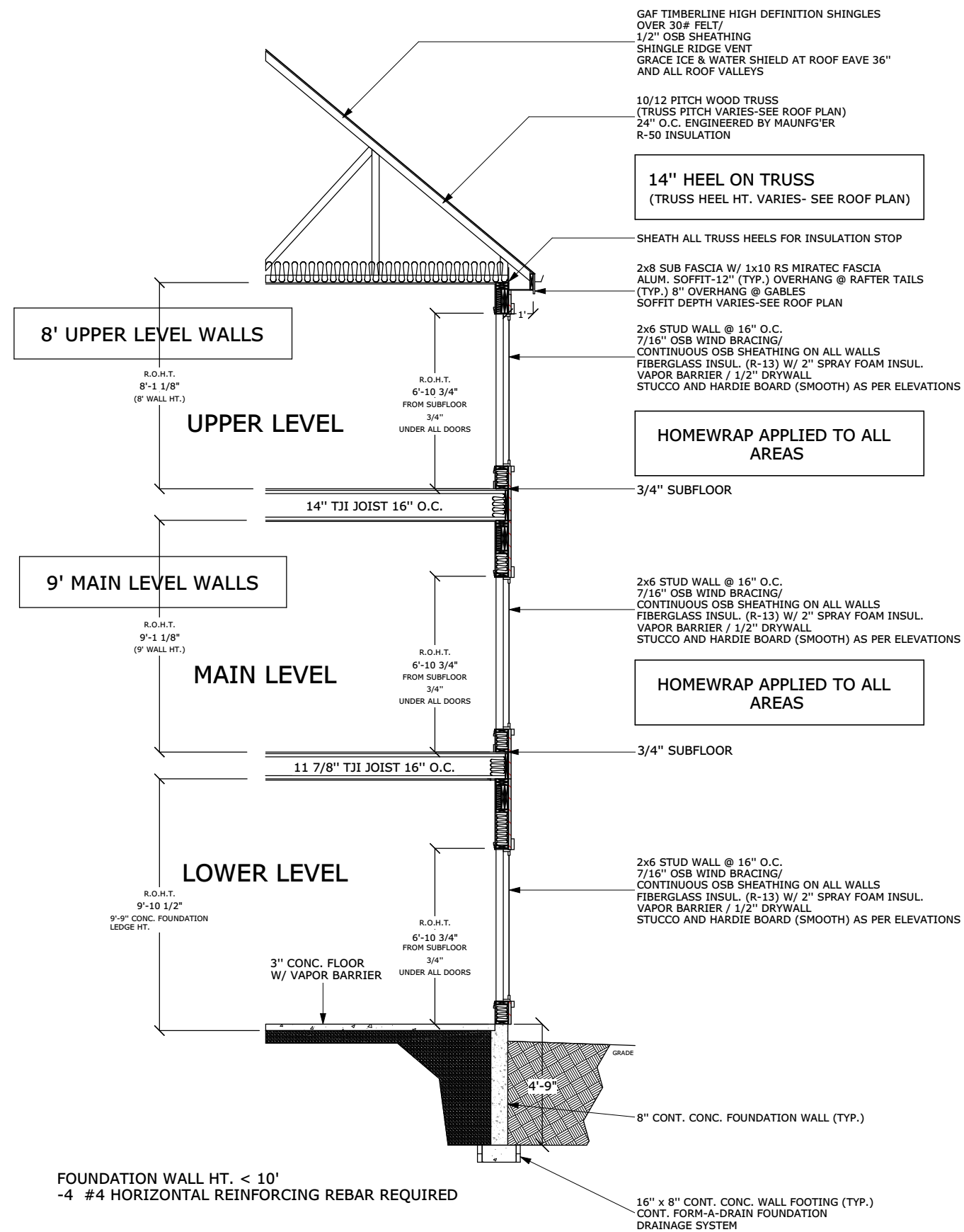
NEW HOME FOR:
FURLOW RESIDENCE
 3701 Council Crest
 LOT 2
 MADISON, DANE COUNTY, WISCONSIN



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ROOF PLAN	
DATE:	9/25/2023
SCALE:	SCALE: 1/8" = 1'-0"
REVISION:	SHEET:
VER. 6	7



FOUNDATION WALL HT. < 10'
 -4 #4 HORIZONTAL REINFORCING REBAR REQUIRED

NEW HOME FOR:

FURLOW RESIDENCE

3701 Council Crest
 LOT 2

MADISON, DANE COUNTY, WISCONSIN



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CROSS SECTION	
DATE:	9/25/2023
SCALE:	SCALE: 3/16" = 1'-0"
REVISION:	SHEET
VER. 6	8

SCALE: 1" = 25'

LOT 2

10,832 SQ. FT.
0.2487 AC.

REAR YARD SETBACK CALCULATION:
 DEPTH MEASUREMENT TO REAR YARD CORNER: 101.98'
 DEPTH MEASUREMENT MIDDLE OF LOT: 109.80'
 AVERAGE OF THE TWO: 105.89'
 105.89' X 30% OF AVERAGE: 31.77'
 ROUNDED UP TO 32' FOR REAR YARD SETBACK

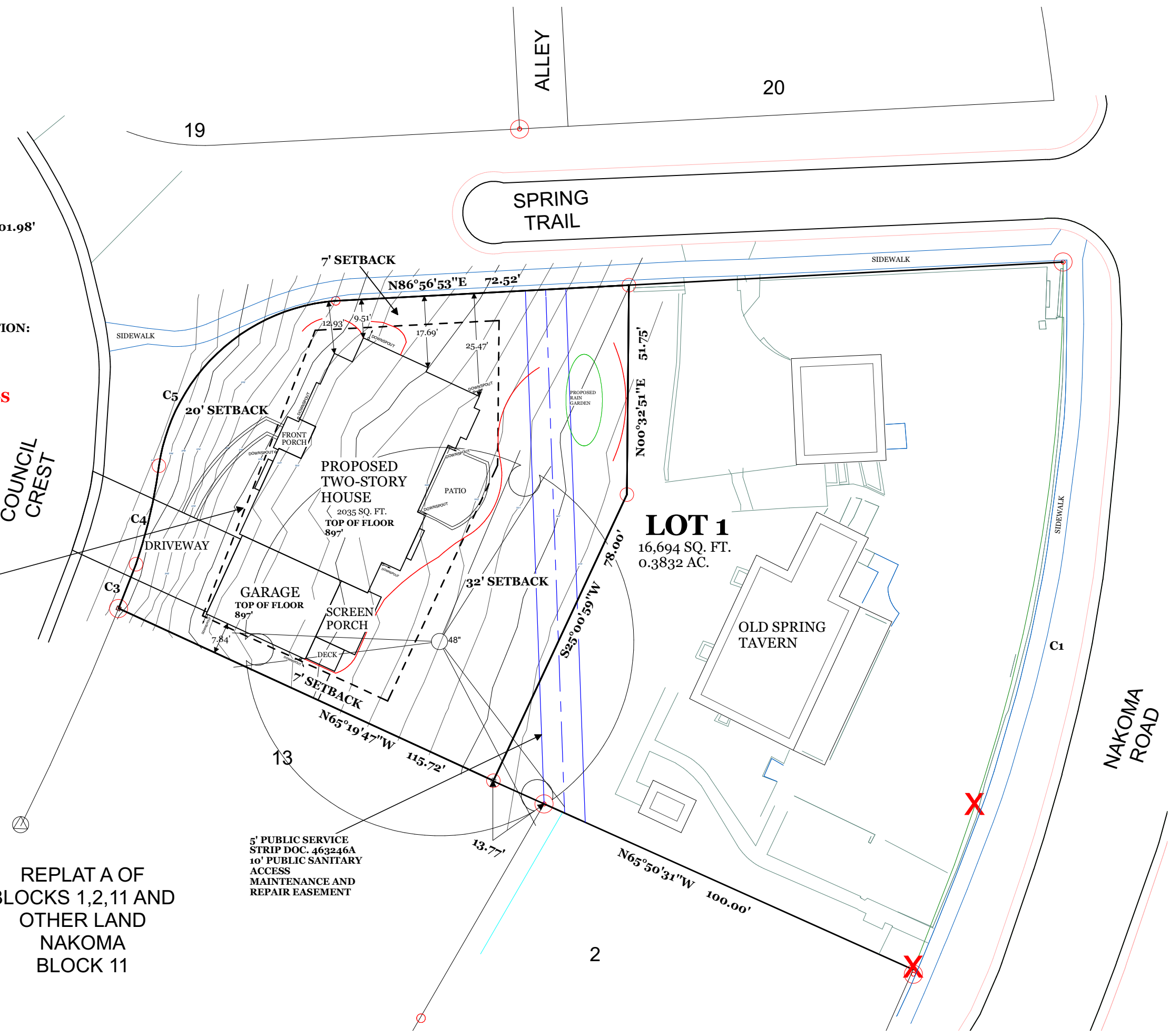
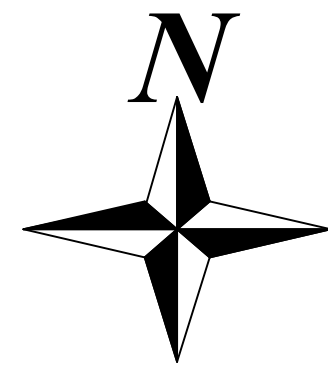
LOT COVERAGE/IMPERVIOUS SURFACE CALCULATION:
 TOTAL SURFACE: 3690.9 SQ. FT.
 TOTAL LOT AREA: 10832 SQ. FT.
 PERCENTAGE OF LOT COVERAGE: 34.1%

**PLEASE REFER TO BURSE ENGINEERING'S
 PLAN/REPORT FOR STORM WATER
 MITIGATION**

DERIVED 20' SETBACK
 FROM ARC CHORD OF
 C3 ARC. 20' SETBACK
 LINE IS USED FOR THE
 ENTIRE FRONT YARD
 SETBACK

REPLAT A OF
 BLOCKS 1,2,11 AND
 OTHER LAND
 NAKOMA
 BLOCK 11

5' PUBLIC SERVICE
 STRIP DOC. 463246A
 10' PUBLIC SANITARY
 ACCESS
 MAINTENANCE AND
 REPAIR EASEMENT



NEW HOME FOR:
FURLOW RESIDENCE
 3701 Council Crest
 LOT 2
 MADISON, DANE COUNTY, WISCONSIN



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SITE PLAN	
DATE:	9/25/2023
SCALE:	SCALE: 1" = 25'
REVISION:	SHEET
VER. 6	9

















EROSION CONTROL AND STORMWATER MANAGEMENT REPORT

**3701 COUNCIL CREST
MADISON, DANE COUNTY, WISCONSIN**

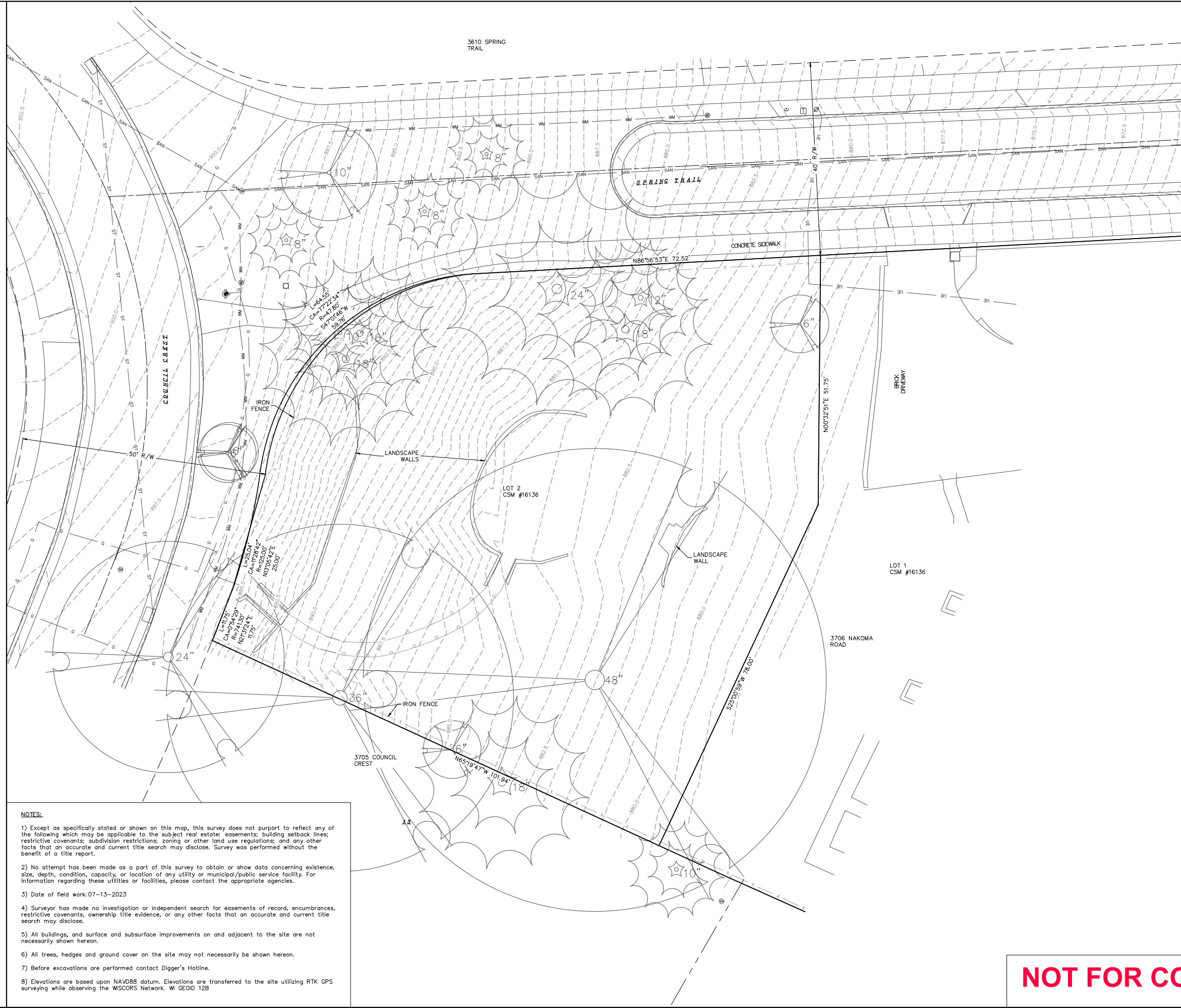
JULY 20, 2023
REVISED AUGUST 7, 2023
REVISED SEPTEMBER 21, 2023



PREPARED FOR:
HART DENOBLE BUILDERS, INC
7923 AIRPORT RD
MIDDLETON, WI 53562

PREPARED BY:
Burse Surveying and Engineering, Inc.
2801 International Lane, Suite 101
Madison, WI 53704
(608) 250-9263

BSEI FN: BSE2589



- LEGEND**
- MAG NAIL SET
 - 3/4" SOLID IRON ROD FOUND
 - 1" IRON PIPE FOUND UNLESS NOTED
 - ✕ FOUND CHISELED "X" IN CONCRETE
 - FOUND NAIL
 - 3/4" x 18" SOLID IRON RE-ROD SET, WT. 1.50 lbs./ft.
 - ⊕ 851.23 SPOT ELEVATION
 - OH OVERHEAD UTILITY WIRE
 - G BURIED GAS LINE
 - WM WATER MAIN
 - SAN SANITARY SEWER
 - ST STORM SEWER
 - UT BURIED TELEPHONE
 - UE BURIED ELECTRIC
 - UTV BURIED CABLE ACCESS TELEVISION LINE
 - FO BURIED FIBER OPTIC
 - WATER VALVE
 - GAS VALVE
 - ⊕ GAS METER
 - AC AIR CONDITIONER
 - TV PEDESTAL
 - ⊕ ELECTRIC PEDESTAL
 - ⊕ UTILITY POLE
 - ⊕ LIGHT POLE
 - ⊕ GROUND LIGHT
 - ⊕ TELEPHONE PEDESTAL
 - ⊕ FIRE HYDRANT
 - ⊕ SIGN
 - ⊕ GUY WIRE
 - ⊕ MAILBOX
 - BOLLARD
 - ⊕ STORM SEWER INLET
 - ⊕ ELECTRIC MANHOLE
 - ⊕ TELEPHONE MANHOLE
 - ⊕ STORM SEWER MANHOLE
 - ROUND CATCH BASIN
 - ⊕ STORM SEWER STRUCTURE
 - ⊕ SANITARY SEWER MANHOLE
 - MISC SYMBOL
 - ⊕ DECIDUOUS TREE (DBH IN INCHES)
 - ⊕ CONIFEROUS TREE (DBH IN INCHES)
 - () INDICATES RECORDED AS
- DISTANCES ARE MEASURED TO THE NEAREST HUNDREDTH OF A FOOT. BUILDINGS ARE MEASURED TO THE NEAREST TENTH OF A FOOT.

NOTES:

- 1) Except as specifically stated or shown on this map, this survey does not purport to reflect any of the following which may be applicable to the subject real estate: easements; building setback lines; restrictive covenants; subdivision restrictions; zoning or other land use regulations; and any other facts that an accurate and current title search may disclose. Survey was performed without the benefit of a title report.
- 2) No attempt has been made as a part of this survey to obtain or show data concerning existence, size, depth, condition, capacity, or location of any utility or municipal/public service facility. For information regarding these utilities or facilities, please contact the appropriate agencies.
- 3) Date of field work: 07-13-2023
- 4) Surveyor has made no investigation or independent search for easements of record, encumbrances, restrictive covenants, ownership title evidence, or any other facts that an accurate and current title search may disclose.
- 5) All buildings, and surface and subsurface improvements on and adjacent to the site are not necessarily shown hereon.
- 6) All trees, hedges and ground cover on the site may not necessarily be shown hereon.
- 7) Before excavations are performed contact Digger's Hotline.
- 8) Elevations are based upon NAVD88 datum. Elevations are transferred to the site utilizing RTK GPS surveying while observing the WSCORS Network. WI GEOID 12B

Burse
Surveying and Engineering, Inc.

2801 International Lane, Suite 101
Madison, WI 53704
Phone: 608-250-3263
Fax: 608-250-3266
e-mail: Murse@BSE-INC.net
www.bursesurveyeng.com

APPROVALS	MLB	DRH	DRH	PDF	MLB
PROJECT ENG.	REVIEWED BY:	DRAWN BY:	CHECKED BY:	DATE:	DATE:

FURLOW RESIDENCE
3701 COUNCIL CREST
MADISON, DANE COUNTY, WISCONSIN

HART DENOBLE BUILDERS, INC.
7923 AIRPORT RD
MIDDLETON, WI 53562

PROJECT #: BSE2589
PLOT DATE: 09/21/2023

REVISION DATES:

09/21/2023

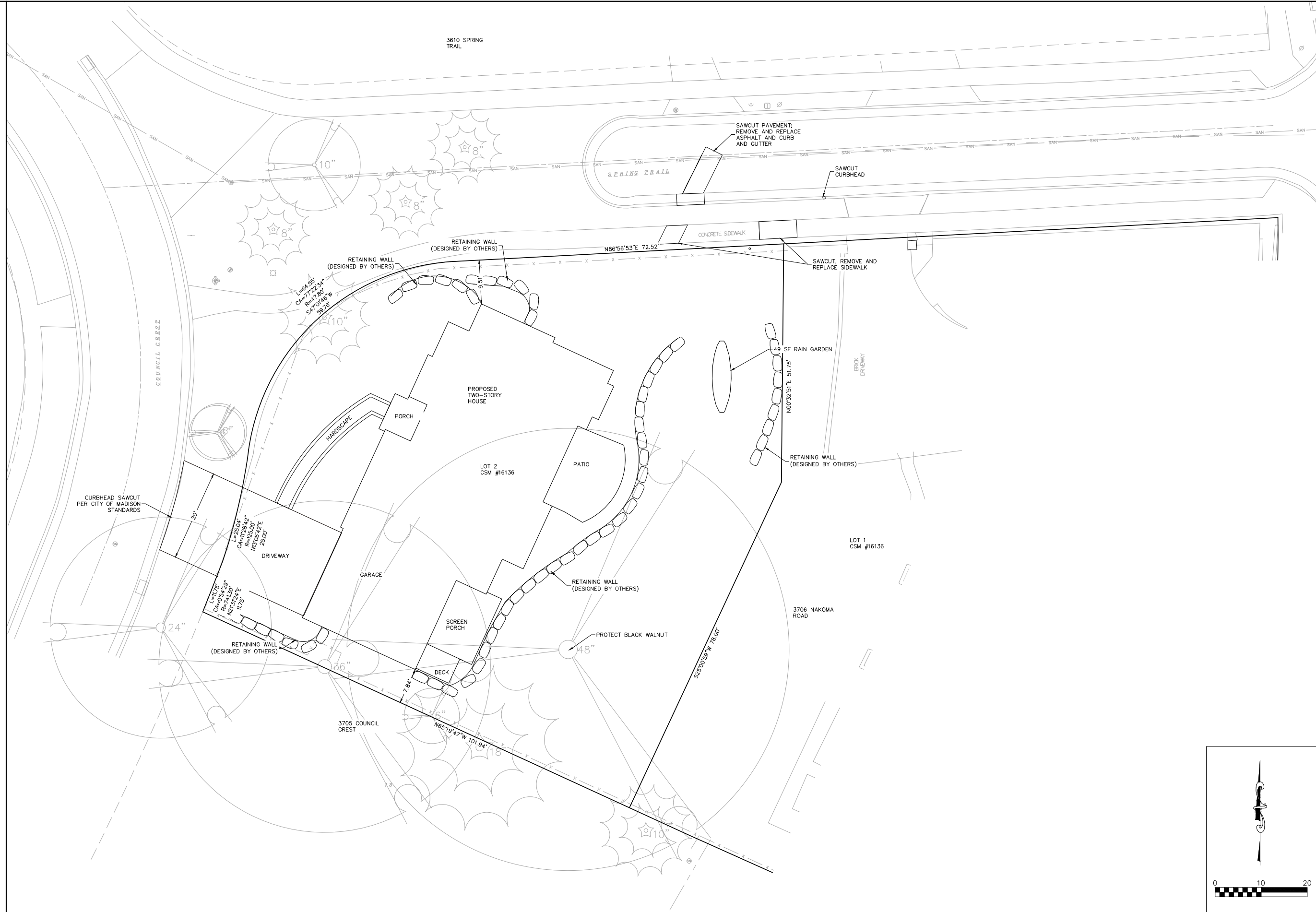
ISSUE DATES:

07/20/2023
09/21/2023

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C-100



Burse
Surveying and Engineering, Inc.
2801 International Lane, Suite 101
Madison, WI 53704
Phone: 608-250-9263
Fax: 608-250-3266
e-mail: Mburse@BSE-INC.net
www.bursesurveyeng.com

APPROVALS	MLB	DRH	DRH	MLB
PROJECT ENG.	MLB	DESIGNED BY	DRH	MLB
SCALE		DATE		

FURLOW RESIDENCE
3701 COUNCIL CREST
MADISON, DANE COUNTY, WISCONSIN
HART DENOBLE BUILDERS, INC.
7923 AIRPORT RD
MIDDLETON, WI 53562

PROJECT #: BSE2589
PLOT DATE: 09/21/2023

REVISION DATES:

09/21/2023

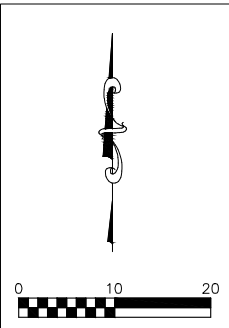
ISSUE DATES:

07/20/2023
09/21/2023

CIVIL SITE PLAN

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C-200



NOT FOR CONSTRUCTION



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Madison, WI 53704
Phone: 608-250-3263
Fax: 608-250-3266
e-mail: Mburse@BSE-INC.net
www.bursesurveyeng.com

APPROVALS	PROJECT ENG.	MLB
	DRAWN BY:	DRH
	CHECKED BY:	DRH
	INCHES BY:	PDF
	DATE:	APPROVED:
		MLB

FURLOW RESIDENCE
3701 COUNCIL CREST
MADISON, DANE COUNTY, WISCONSIN
HART DENOBLE BUILDERS, INC.
7923 AIRPORT RD
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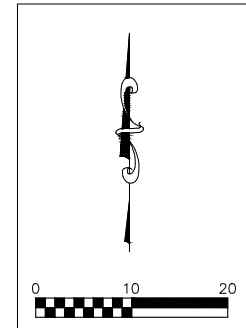
ISSUE DATES:
07/20/2023
09/21/2023

GRADING & UTILITY
PLAN

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C-300



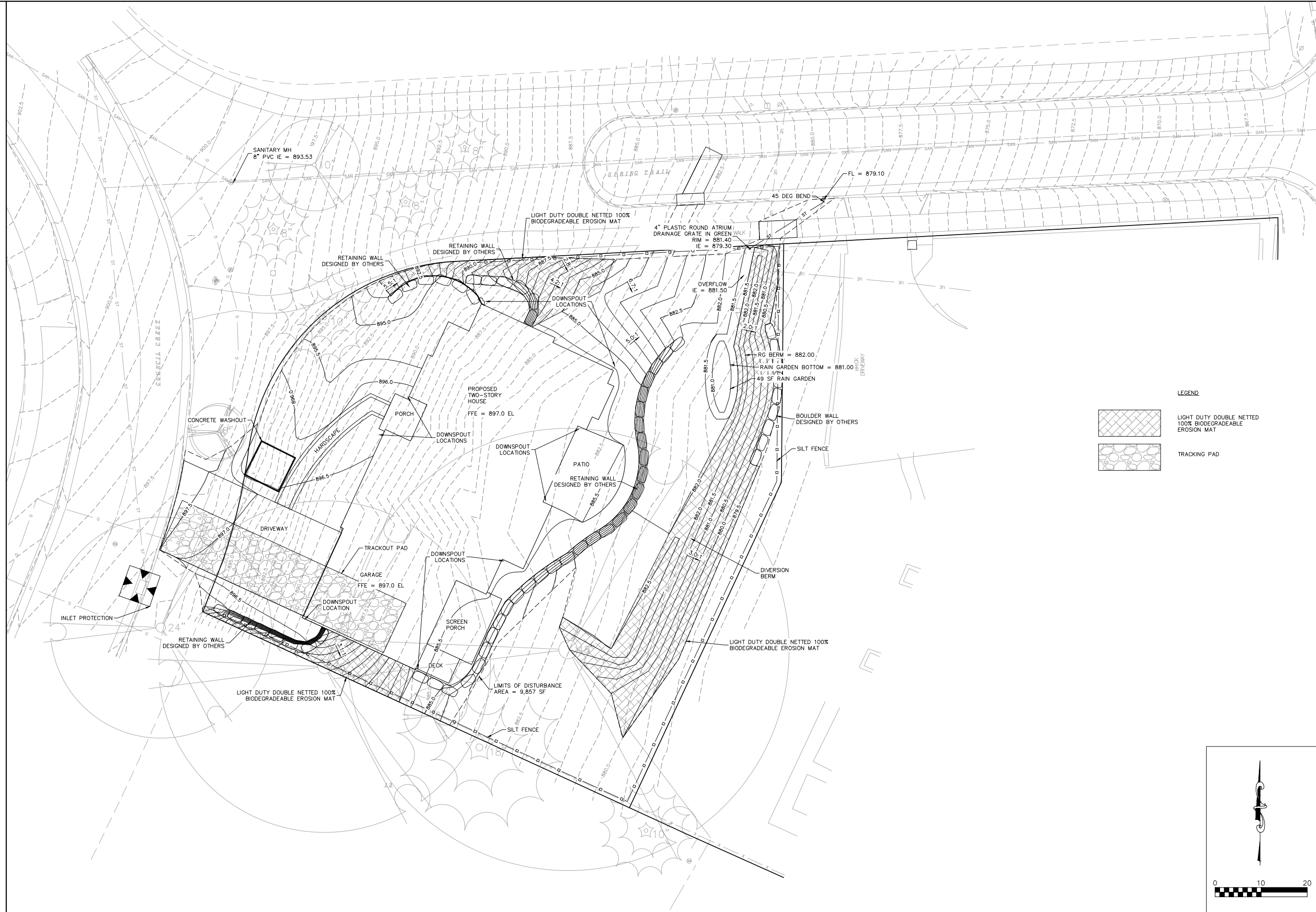
NOT FOR CONSTRUCTION

Furlow Residence


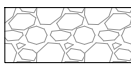
Stormwater Runoff Rate Summary

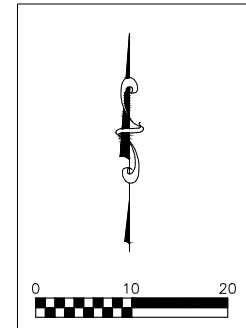
Project: BSE2589
Job Name: Furlow Residence
Task: Peak Flow Calcs
By: DRH
Date: 9/21/2023
Checked: PDF

A	B	C	D	E
Storm Event	Current Surface Water Runoff Rate to 3706 Nakoma Road	Runoff Rate from 3701 Council Crest onto 3706 Nakoma Road after Development	Reduction in surface water runoff to 3706 Nakoma Road from 3701 Council Crest	Percent reduction of Runoff
	(CFS)	(CFS)	(CFS)	(%)
1-Yr, 24hr	0.32	0.23	0.09	71.9%
2-Yr, 24hr	0.42	0.27	0.15	64.3%
5-Yr, 24hr	0.60	0.36	0.24	60.0%
10-Yr, 24hr	0.81	0.45	0.36	55.6%
25-Yr, 24hr	1.13	0.59	0.54	52.2%
100-Yr, 24hr	1.74	0.83	0.91	47.7%
200-Yr, 24hr	2.07	0.96	1.11	46.4%
500-Yr, 24hr	2.62	1.76	0.86	67.2%



LEGEND

	LIGHT DUTY DOUBLE NETTED 100% BIODEGRADABLE EROSION MAT
	TRACKING PAD



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Burse
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www.bursesurveyeng.com

APPROVALS	MLB	DRH	DRH	MLB
PROJECT ENG.	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED

FURLOW RESIDENCE
3701 COUNCIL CREST
MADISON, DANE COUNTY, WISCONSIN
HART DENOBLE BUILDERS, INC.
7923 AIRPORT RD
MIDDLETON, WI 53562

PROJECT #:	BSE2589
PLOT DATE:	09/21/2023
REVISION DATES:	09/21/2023
ISSUE DATES:	07/20/2023 09/21/2023

EROSION CONTROL PLAN

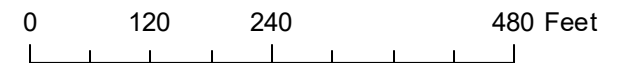
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DRAWING NUMBER
C-400



Dane County Map



July 17, 2023





 EXISTING IMPERVIOUS
 LANDSCAPE

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 Fax: 608-250-9265
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 www.bursesurveyengr.com

APPROVALS	MLB	DRH	DRH	MLB
PROJECT ENG.	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED

FURLOW RESIDENCE
 3701 COUNCIL CREST
 MADISON, DANE COUNTY, WISCONSIN
HART DENOBLE BUILDERS, INC.
 7923 AIRPORT RD
 MIDDLETON, WI 53562

PROJECT #: BSE2589
 PLOT DATE: 07/20/2023

REVISION DATES:

ISSUE DATES:

07/20/2023

PREDEVELOPED
 DRAINAGE AREA MAP
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EXHIBIT-1



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APPROVALS	MLB	DRH	DRH	MLB
PROJECT ENG.	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:

FURLOW RESIDENCE
3701 COUNCIL CREST
MADISON, DANE COUNTY, WISCONSIN

HART DENOBLE BUILDERS, INC.
7923 AIRPORT RD
MIDDLETON, WI 53562

PROJECT #: BSE2589
PLOT DATE: 07/20/2023

REVISION DATES:

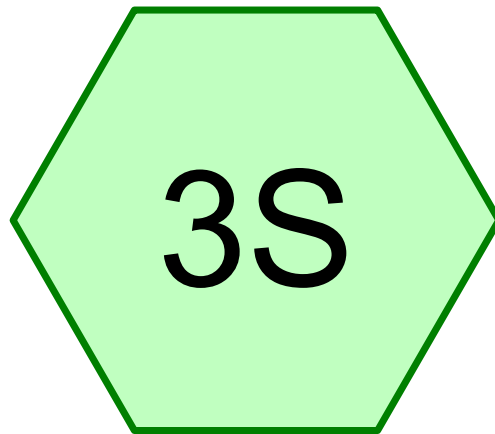
ISSUE DATES:
07/20/2023

POST DEVELOPED
DRAINAGE AREA MAP

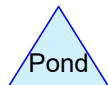
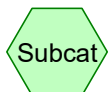
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Predeveloped



Routing Diagram for BSE2589 Stormwater Predeveloped Model
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BSE2589 Stormwater Predeveloped Model

Prepared by Burse Surveying and Engineering Inc.

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	MSE 24-hr	4	Default	24.00	1	2.49	2
2	2-yr	MSE 24-hr	4	Default	24.00	1	2.84	2
3	5-yr	MSE 24-hr	4	Default	24.00	1	3.45	2
4	10-yr	MSE 24-hr	4	Default	24.00	1	4.09	2
5	25-yr	MSE 24-hr	4	Default	24.00	1	5.02	2
6	100-yr	MSE 24-hr	4	Default	24.00	1	6.66	2
7	200-yr	MSE 24-hr	4	Default	24.00	1	7.53	2
8	500-yr	MSE 24-hr	4	Default	24.00	1	8.94	2

BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 1-yr Rainfall=2.49", Ia/S=0.10

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Page 3

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=0.70"

Flow Length=128' Tc=4.3 min CN=71 Runoff=0.32 cfs 0.016 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.016 af Average Runoff Depth = 0.70"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 1-yr Rainfall=2.49", la/S=0.10

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Page 4

Summary for Subcatchment 35: Predeveloped

Runoff = 0.32 cfs @ 12.12 hrs, Volume= 0.016 af, Depth= 0.70"

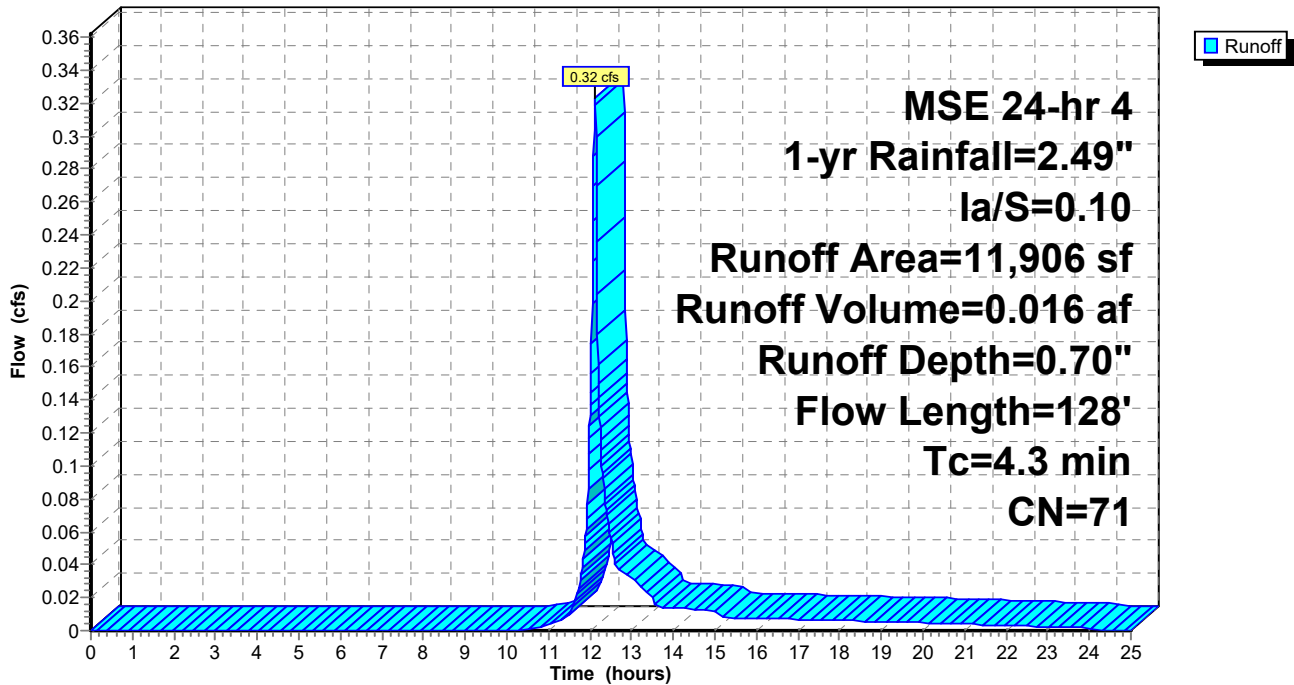
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 1-yr Rainfall=2.49", la/S=0.10

Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

Hydrograph



BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 2-yr Rainfall=2.84", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=0.91"

Flow Length=128' Tc=4.3 min CN=71 Runoff=0.42 cfs 0.021 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.021 af Average Runoff Depth = 0.91"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 2-yr Rainfall=2.84", la/S=0.10

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Summary for Subcatchment 35: Predeveloped

Runoff = 0.42 cfs @ 12.12 hrs, Volume= 0.021 af, Depth= 0.91"

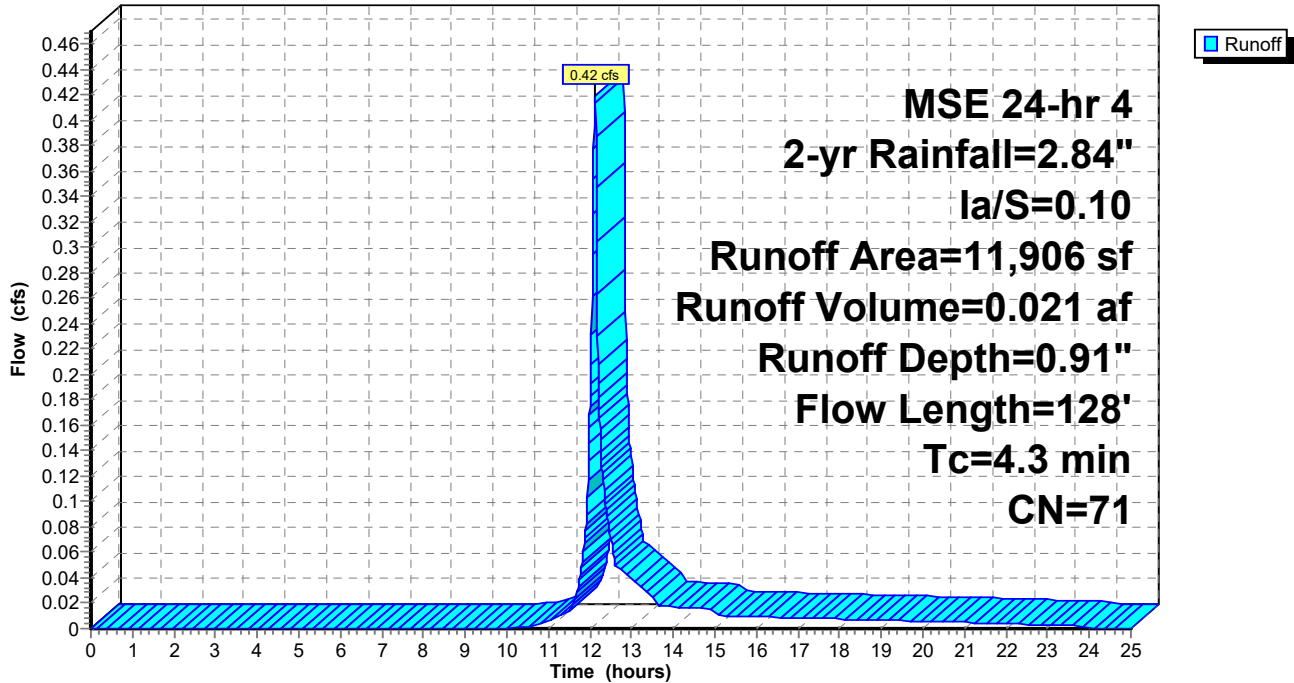
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 2-yr Rainfall=2.84", la/S=0.10

Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

Hydrograph



BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 5-yr Rainfall=3.45", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=1.30"

Flow Length=128' Tc=4.3 min CN=71 Runoff=0.60 cfs 0.030 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.030 af Average Runoff Depth = 1.30"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 5-yr Rainfall=3.45", la/S=0.10

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Summary for Subcatchment 35: Predeveloped

Runoff = 0.60 cfs @ 12.12 hrs, Volume= 0.030 af, Depth= 1.30"

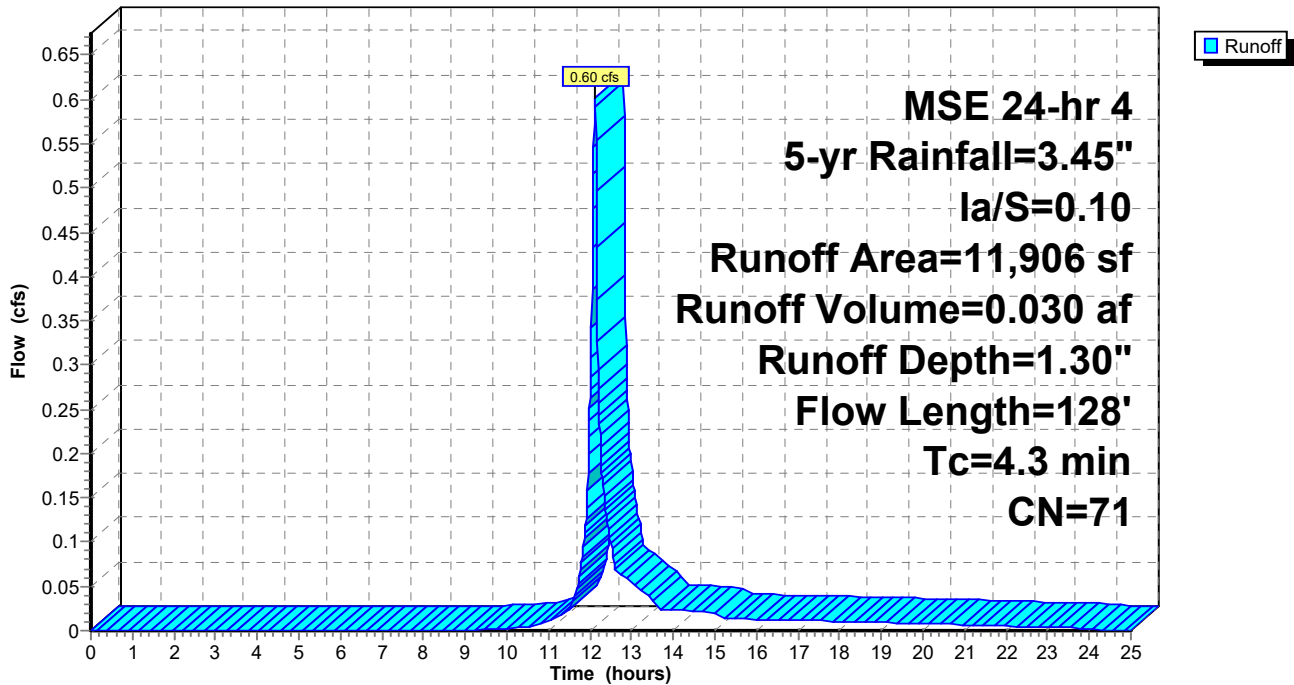
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 5-yr Rainfall=3.45", la/S=0.10

Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

Hydrograph



BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 10-yr Rainfall=4.09", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=1.75"

Flow Length=128' Tc=4.3 min CN=71 Runoff=0.81 cfs 0.040 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.040 af Average Runoff Depth = 1.75"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

Summary for Subcatchment 35: Predeveloped

Runoff = 0.81 cfs @ 12.12 hrs, Volume= 0.040 af, Depth= 1.75"

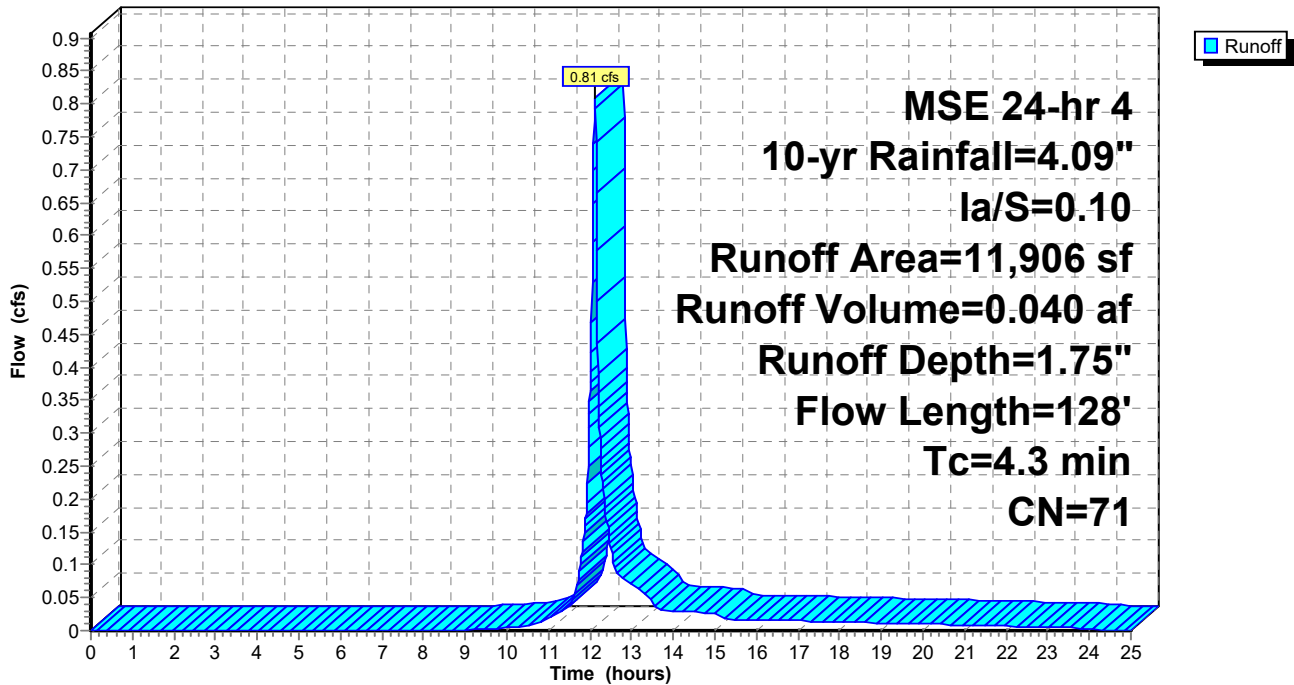
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 10-yr Rainfall=4.09", la/S=0.10

Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

Hydrograph



BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 25-yr Rainfall=5.02", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=2.45"

Flow Length=128' Tc=4.3 min CN=71 Runoff=1.13 cfs 0.056 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.056 af Average Runoff Depth = 2.45"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

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MSE 24-hr 4 25-yr Rainfall=5.02", la/S=0.10

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Summary for Subcatchment 35: Predeveloped

Runoff = 1.13 cfs @ 12.12 hrs, Volume= 0.056 af, Depth= 2.45"

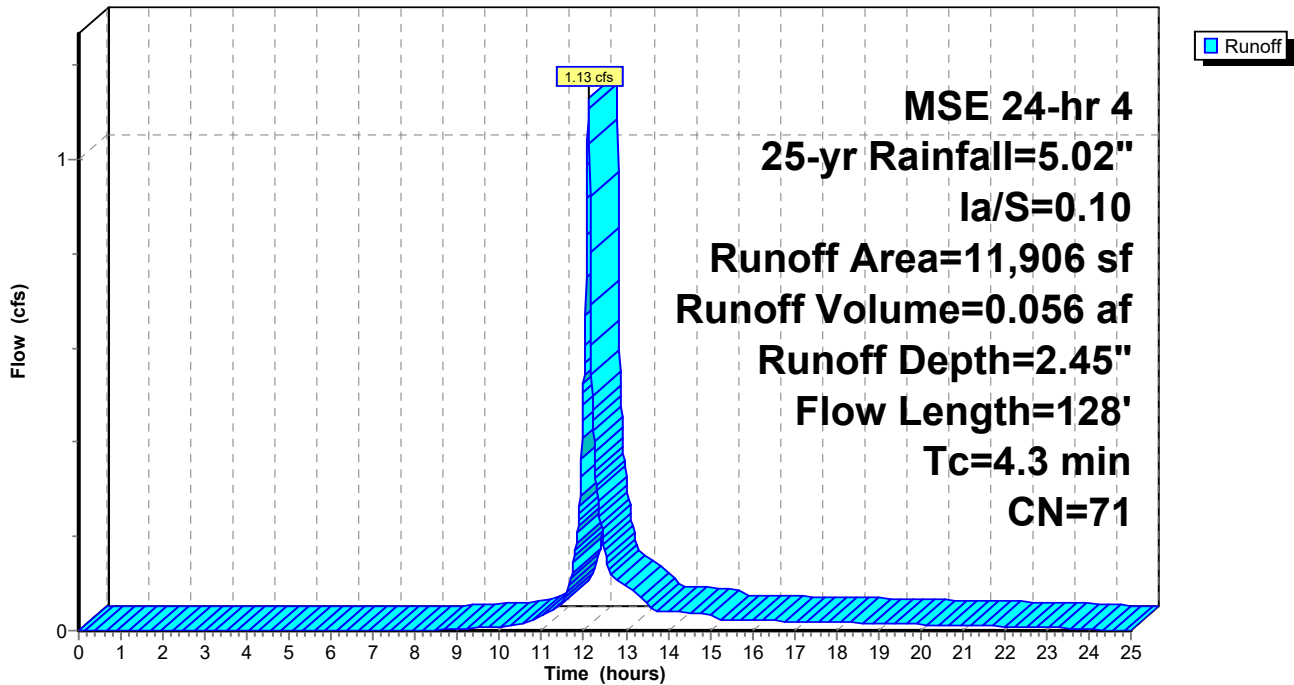
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 25-yr Rainfall=5.02", la/S=0.10

Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

Hydrograph



BSE2589 Stormwater Predeveloped Model

MSE 24-hr 4 100-yr Rainfall=6.66", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=3.78"

Flow Length=128' Tc=4.3 min CN=71 Runoff=1.74 cfs 0.086 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.086 af Average Runoff Depth = 3.78"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

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MSE 24-hr 4 100-yr Rainfall=6.66", la/S=0.10

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Summary for Subcatchment 35: Predeveloped

Runoff = 1.74 cfs @ 12.12 hrs, Volume= 0.086 af, Depth= 3.78"

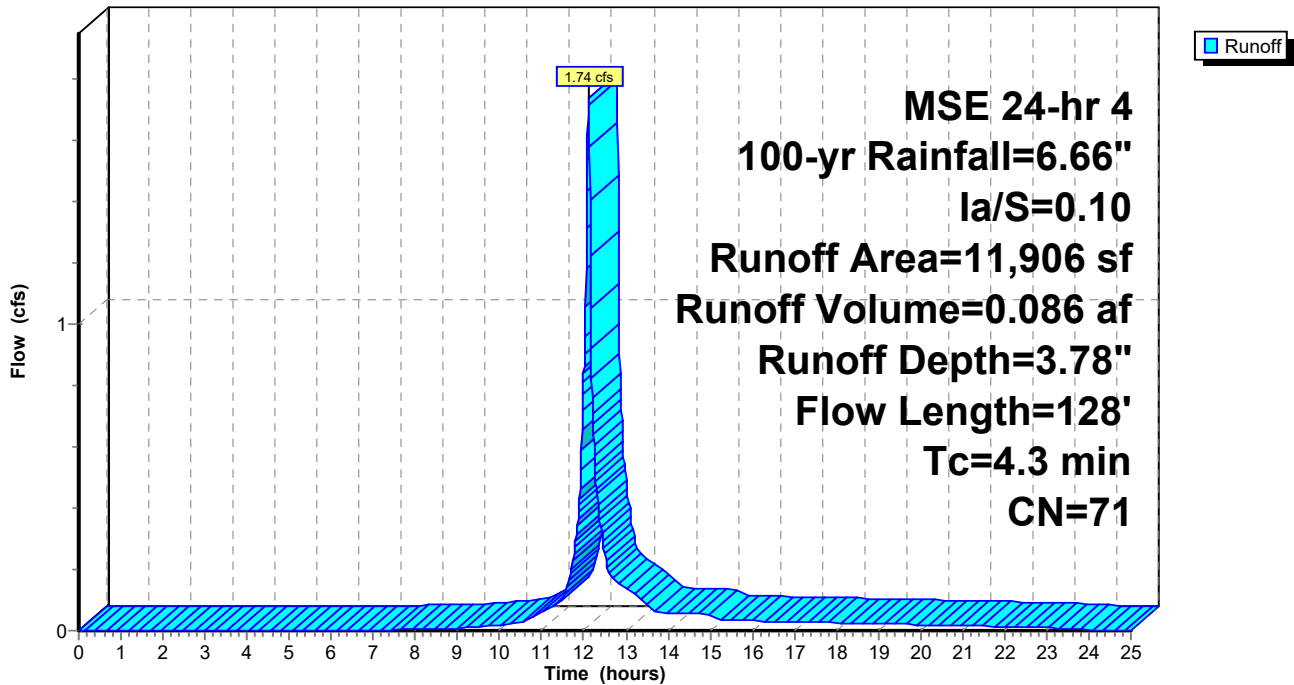
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 100-yr Rainfall=6.66", la/S=0.10

Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

Hydrograph



BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 200-yr Rainfall=7.53", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=4.53"

Flow Length=128' Tc=4.3 min CN=71 Runoff=2.07 cfs 0.103 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.103 af Average Runoff Depth = 4.53"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 200-yr Rainfall=7.53", la/S=0.10

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Summary for Subcatchment 35: Predeveloped

Runoff = 2.07 cfs @ 12.12 hrs, Volume= 0.103 af, Depth= 4.53"

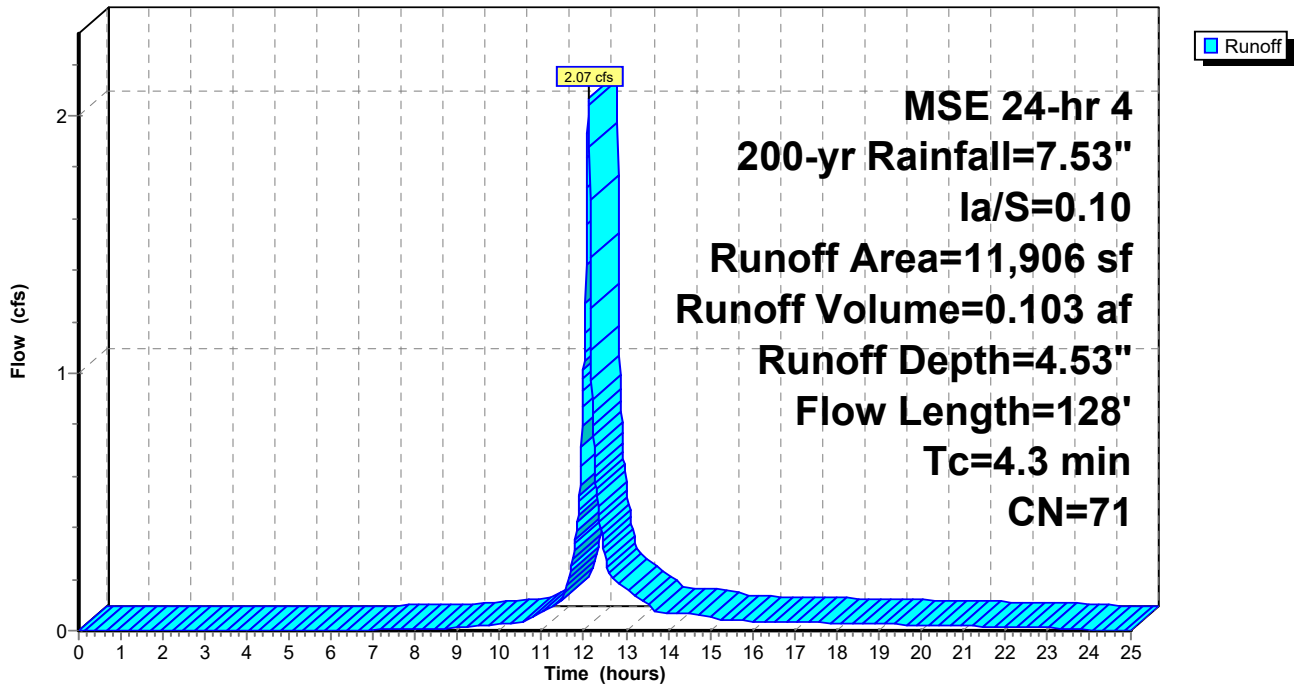
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 200-yr Rainfall=7.53", la/S=0.10

Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

Hydrograph



BSE2589 Stormwater Predeveloped Model

MSE 24-hr 4 500-yr Rainfall=8.94", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Predeveloped

Runoff Area=11,906 sf 1.84% Impervious Runoff Depth=5.77"

Flow Length=128' Tc=4.3 min CN=71 Runoff=2.62 cfs 0.131 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.131 af Average Runoff Depth = 5.77"

98.16% Pervious = 0.268 ac 1.84% Impervious = 0.005 ac

BSE2589 Stormwater Predeveloped Model

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MSE 24-hr 4 500-yr Rainfall=8.94", la/S=0.10

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Summary for Subcatchment 35: Predeveloped

Runoff = 2.62 cfs @ 12.12 hrs, Volume= 0.131 af, Depth= 5.77"

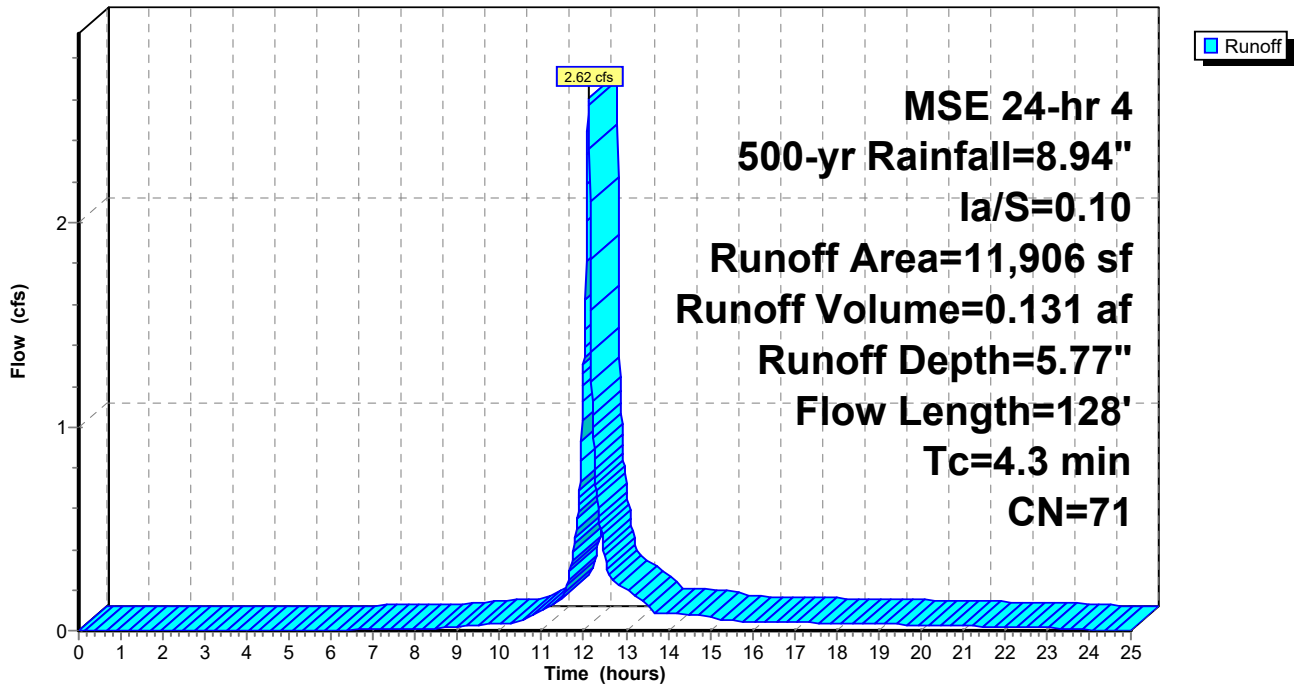
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 500-yr Rainfall=8.94", la/S=0.10

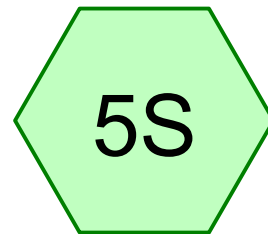
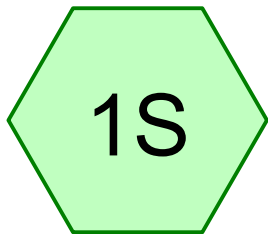
Area (sf)	CN	Description
* 11,687	71	LS (HSG C)
* 219	98	Impervious
11,906	71	Weighted Average
11,687	71	98.16% Pervious Area
219	98	1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	65	0.0880	4.45		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
4.1	63	0.2140	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 2.84"
4.3	128	Total			

Subcatchment 35: Predeveloped

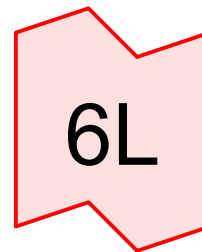
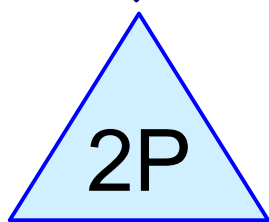
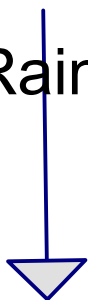
Hydrograph





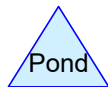
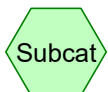
Area to Rain Garden

Undetained Area



Rain Garden

Summary



BSE2589 Stormwater Post Developed Model

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	MSE 24-hr	4	Default	24.00	1	2.49	2
2	2-yr	MSE 24-hr	4	Default	24.00	1	2.84	2
3	5-yr	MSE 24-hr	4	Default	24.00	1	3.45	2
4	10-yr	MSE 24-hr	4	Default	24.00	1	4.09	2
5	25-yr	MSE 24-hr	4	Default	24.00	1	5.02	2
6	100-yr	MSE 24-hr	4	Default	24.00	1	6.66	2
7	200-yr	MSE 24-hr	4	Default	24.00	1	7.53	2
8	500-yr	MSE 24-hr	4	Default	24.00	1	8.94	2

BSE2589 Stormwater Post Developed Model

MSE 24-hr 4 1-yr Rainfall=2.49", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=1.31"
Flow Length=146' Tc=2.7 min CN=85 Runoff=0.41 cfs 0.019 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=1.26"
Flow Length=52' Tc=0.7 min CN=84 Runoff=0.23 cfs 0.010 af

Pond 2P: Rain Garden

Peak Elev=881.66' Storage=189 cf Inflow=0.41 cfs 0.019 af
Discarded=0.02 cfs 0.010 af Primary=0.38 cfs 0.008 af Outflow=0.40 cfs 0.018 af

Link 6L: Summary

Inflow=0.59 cfs 0.018 af
Primary=0.59 cfs 0.018 af

**Total Runoff Area = 0.273 ac Runoff Volume = 0.029 af Average Runoff Depth = 1.29"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac**

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 0.41 cfs @ 12.11 hrs, Volume= 0.019 af, Depth= 1.31"
 Routed to Pond 2P : Rain Garden

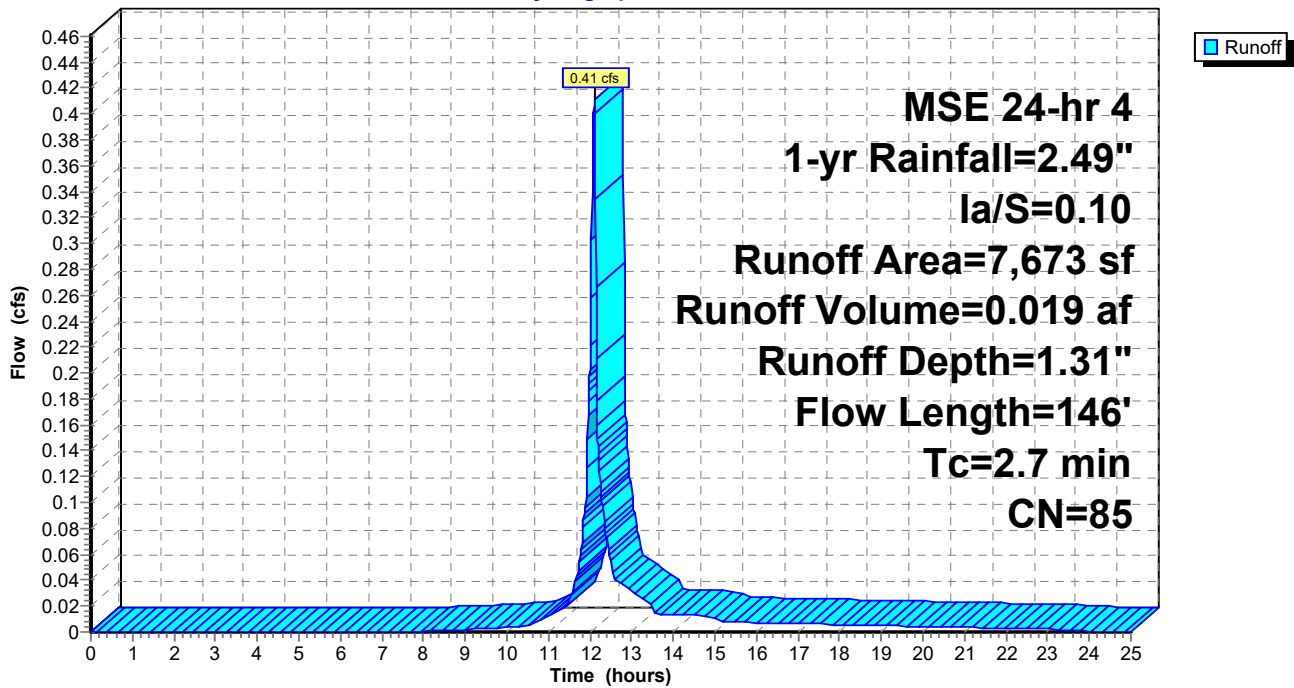
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 1-yr Rainfall=2.49", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



Summary for Subcatchment 5S: Undetained Area

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 1.26"
 Routed to Link 6L : Summary

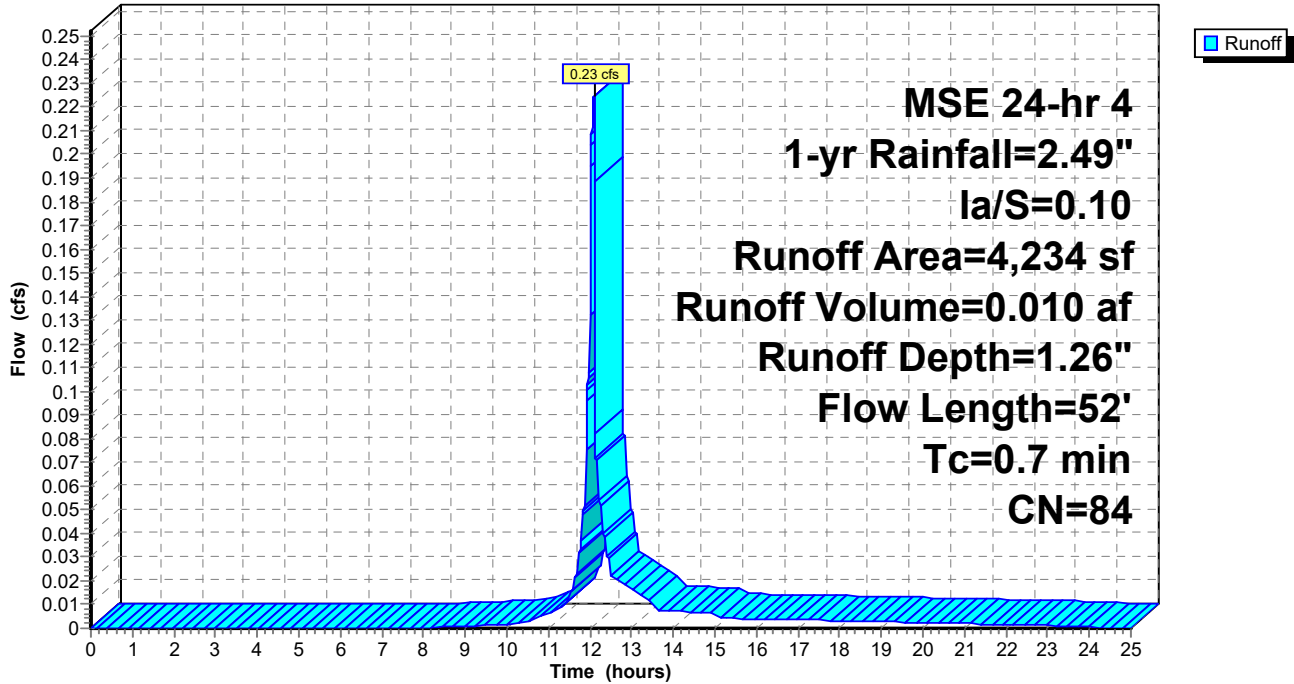
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 1-yr Rainfall=2.49", la/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 1.31" for 1-yr event
 Inflow = 0.41 cfs @ 12.11 hrs, Volume= 0.019 af
 Outflow = 0.40 cfs @ 12.12 hrs, Volume= 0.018 af, Atten= 3%, Lag= 0.6 min
 Discarded = 0.02 cfs @ 12.12 hrs, Volume= 0.010 af
 Primary = 0.38 cfs @ 12.12 hrs, Volume= 0.008 af

Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.66' @ 12.12 hrs Surf.Area= 227 sf Storage= 189 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 73.1 min (879.3 - 806.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

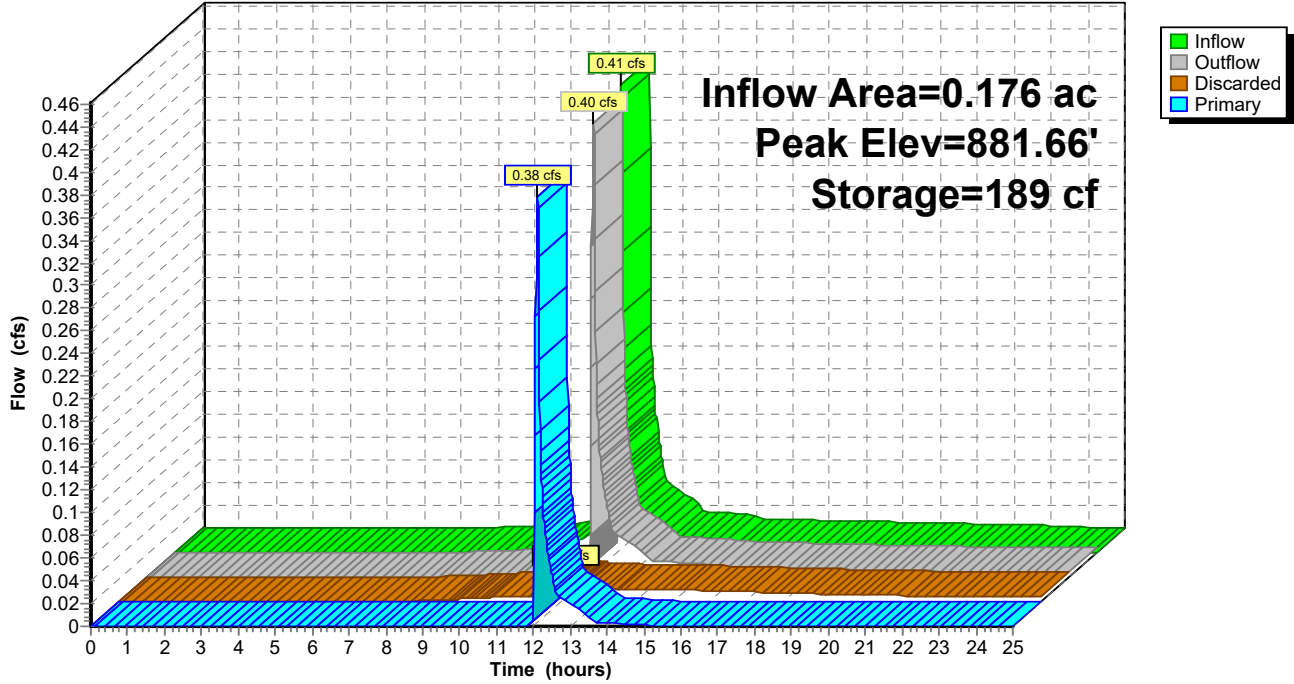
Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.02 cfs @ 12.12 hrs HW=881.66' (Free Discharge)
 ↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.38 cfs @ 12.12 hrs HW=881.66' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.38 cfs @ 1.07 fps)

Pond 2P: Rain Garden

Hydrograph



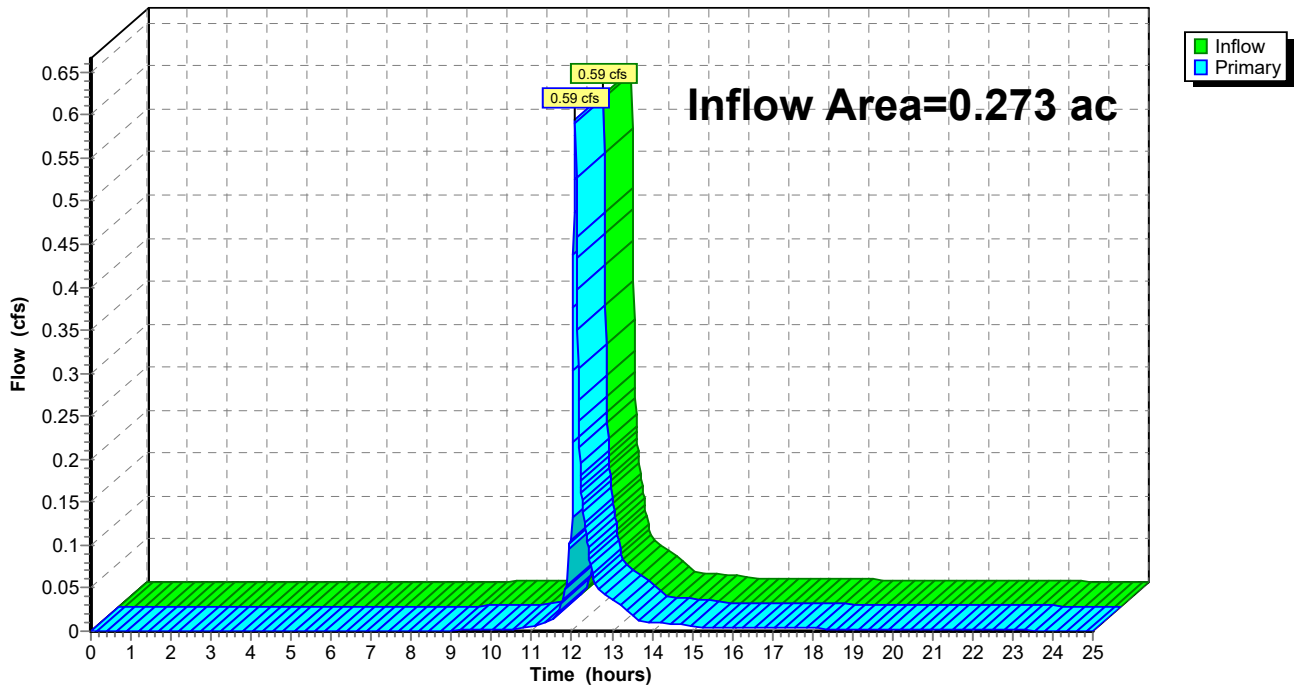
Summary for Link 6L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 0.79" for 1-yr event
Inflow = 0.59 cfs @ 12.10 hrs, Volume= 0.018 af
Primary = 0.59 cfs @ 12.10 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 6L: Summary

Hydrograph



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MSE 24-hr 4 2-yr Rainfall=2.84", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=1.60"
Flow Length=146' Tc=2.7 min CN=85 Runoff=0.50 cfs 0.024 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=1.54"
Flow Length=52' Tc=0.7 min CN=84 Runoff=0.27 cfs 0.012 af

Pond 2P: Rain Garden

Peak Elev=881.69' Storage=194 cf Inflow=0.50 cfs 0.024 af
Discarded=0.02 cfs 0.010 af Primary=0.46 cfs 0.011 af Outflow=0.49 cfs 0.022 af

Link 6L: Summary

Inflow=0.73 cfs 0.024 af
Primary=0.73 cfs 0.024 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.036 af Average Runoff Depth = 1.58"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 0.50 cfs @ 12.11 hrs, Volume= 0.024 af, Depth= 1.60"
 Routed to Pond 2P : Rain Garden

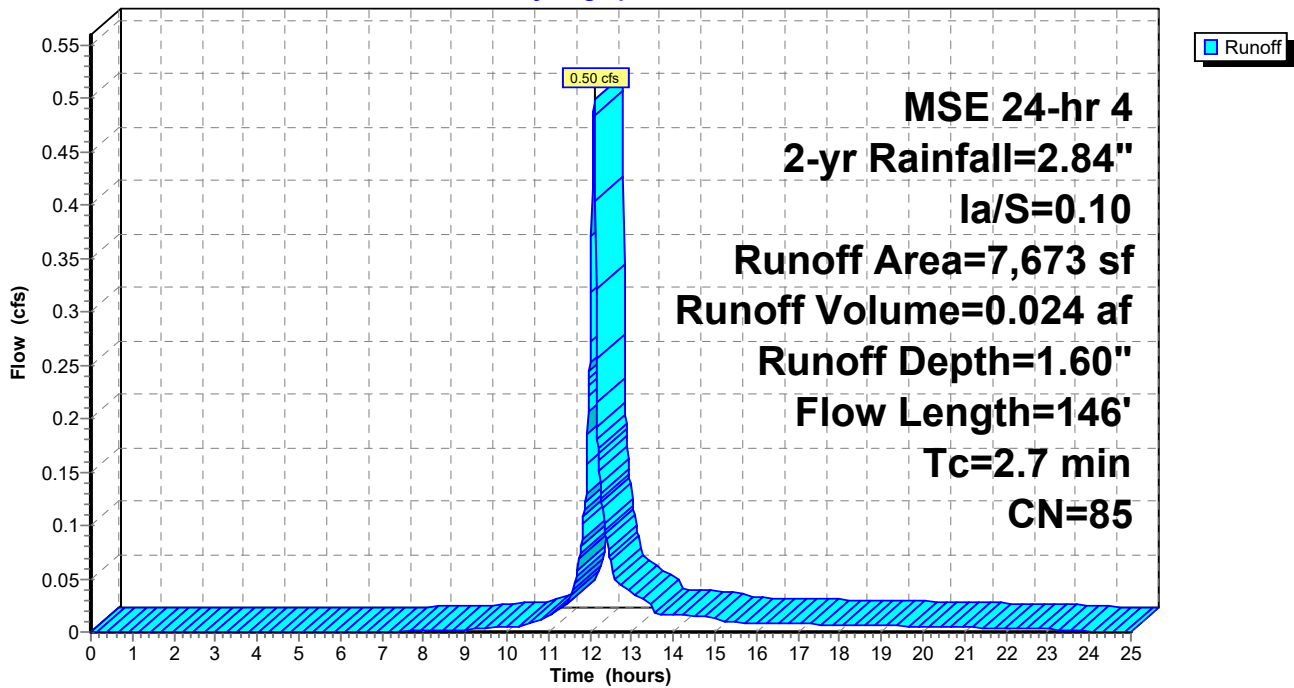
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 2-yr Rainfall=2.84", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



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MSE 24-hr 4 2-yr Rainfall=2.84", Ia/S=0.10

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Summary for Subcatchment 5S: Undetained Area

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.012 af, Depth= 1.54"
 Routed to Link 6L : Summary

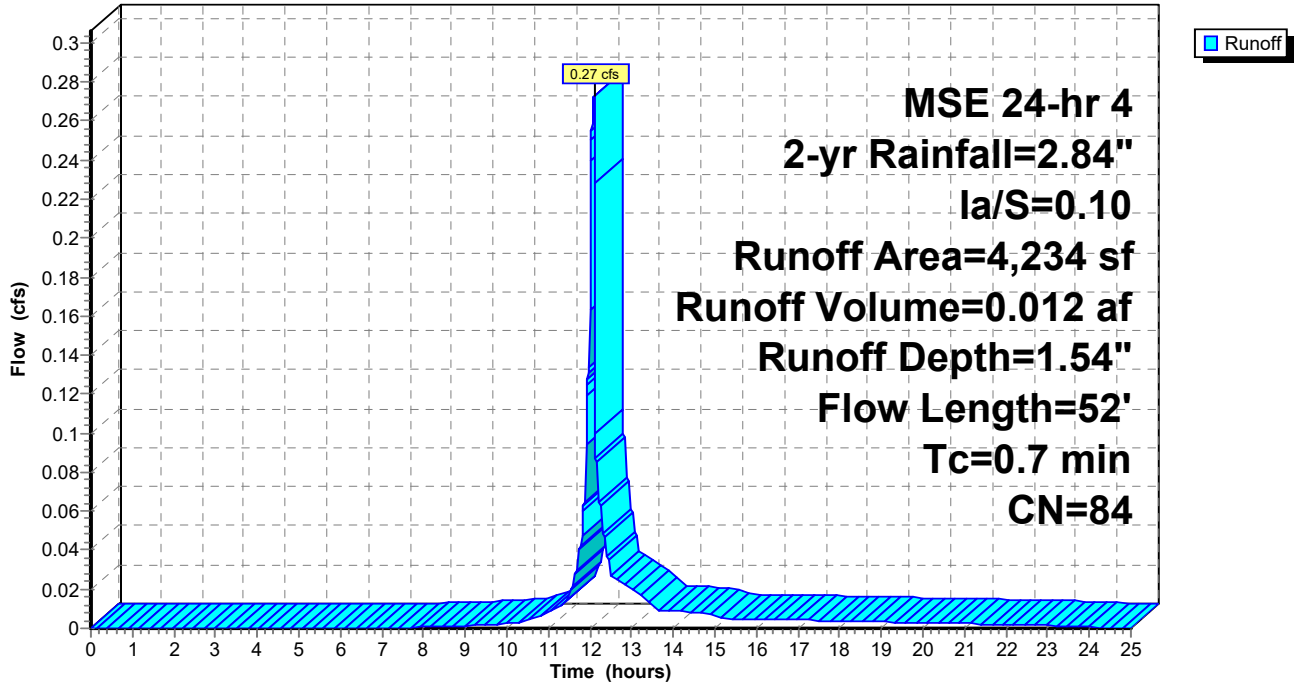
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 2-yr Rainfall=2.84", Ia/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 1.60" for 2-yr event
 Inflow = 0.50 cfs @ 12.11 hrs, Volume= 0.024 af
 Outflow = 0.49 cfs @ 12.12 hrs, Volume= 0.022 af, Atten= 3%, Lag= 0.6 min
 Discarded = 0.02 cfs @ 12.12 hrs, Volume= 0.010 af
 Primary = 0.46 cfs @ 12.12 hrs, Volume= 0.011 af
 Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.69' @ 12.12 hrs Surf.Area= 244 sf Storage= 194 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 58.4 min (860.5 - 802.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

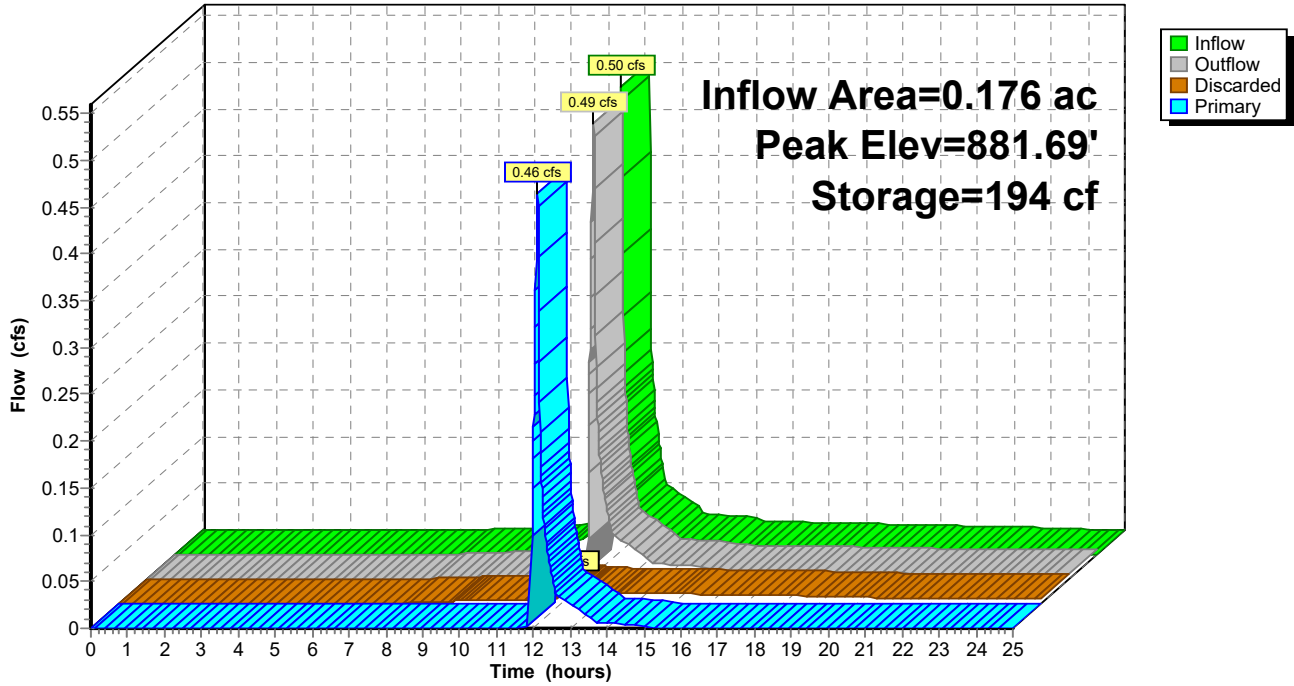
Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.02 cfs @ 12.12 hrs HW=881.69' (Free Discharge)
 ↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.46 cfs @ 12.12 hrs HW=881.69' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.46 cfs @ 1.14 fps)

Pond 2P: Rain Garden

Hydrograph



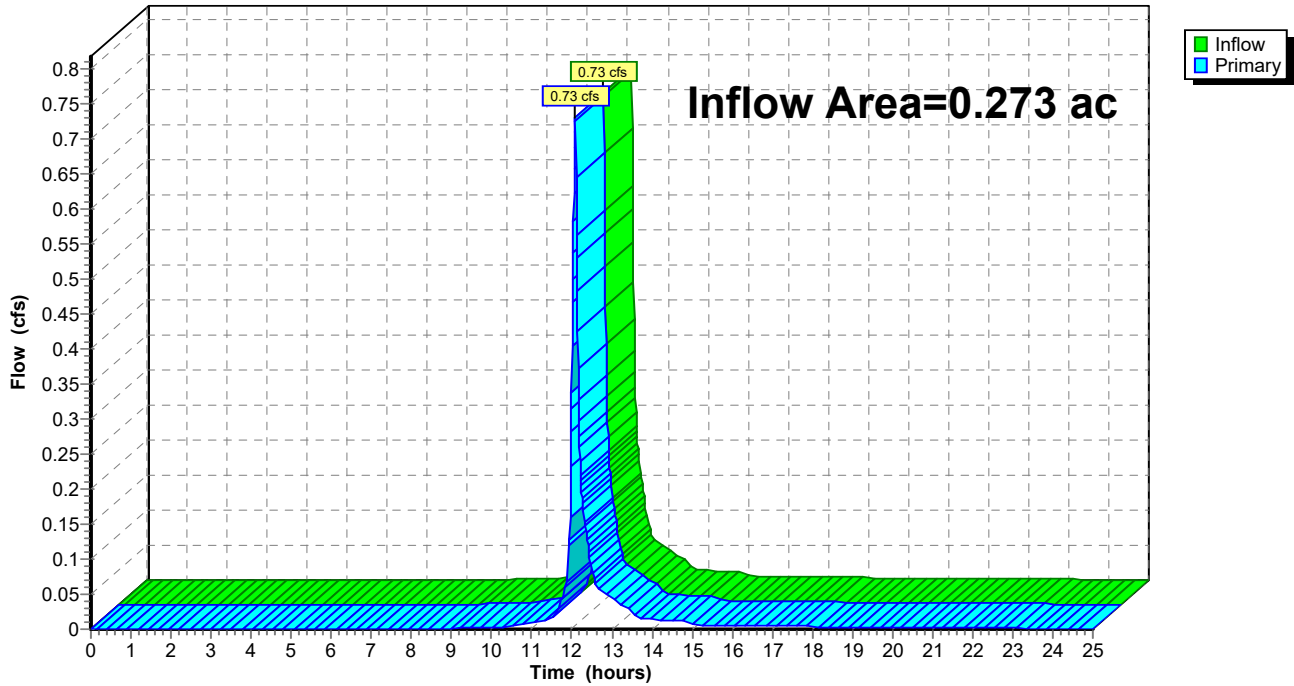
Summary for Link 6L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 1.04" for 2-yr event
Inflow = 0.73 cfs @ 12.10 hrs, Volume= 0.024 af
Primary = 0.73 cfs @ 12.10 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 6L: Summary

Hydrograph



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MSE 24-hr 4 5-yr Rainfall=3.45", Ia/S=0.10

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=2.13"
Flow Length=146' Tc=2.7 min CN=85 Runoff=0.66 cfs 0.031 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=2.06"
Flow Length=52' Tc=0.7 min CN=84 Runoff=0.36 cfs 0.017 af

Pond 2P: Rain Garden

Peak Elev=881.72' Storage=203 cf Inflow=0.66 cfs 0.031 af
Discarded=0.02 cfs 0.012 af Primary=0.61 cfs 0.017 af Outflow=0.64 cfs 0.029 af

Link 6L: Summary

Inflow=0.97 cfs 0.034 af
Primary=0.97 cfs 0.034 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.048 af Average Runoff Depth = 2.10"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 0.66 cfs @ 12.11 hrs, Volume= 0.031 af, Depth= 2.13"
 Routed to Pond 2P : Rain Garden

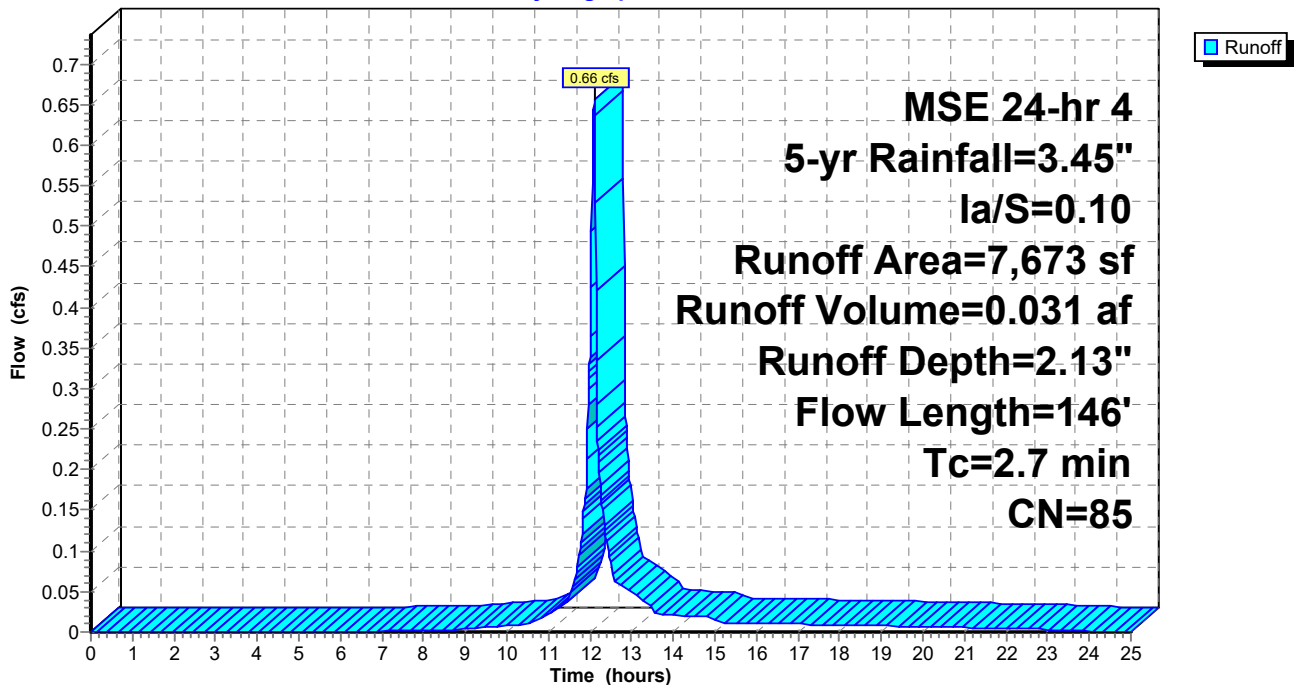
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 5-yr Rainfall=3.45", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



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MSE 24-hr 4 5-yr Rainfall=3.45", la/S=0.10

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Summary for Subcatchment 5S: Undetained Area

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.36 cfs @ 12.10 hrs, Volume= 0.017 af, Depth= 2.06"
 Routed to Link 6L : Summary

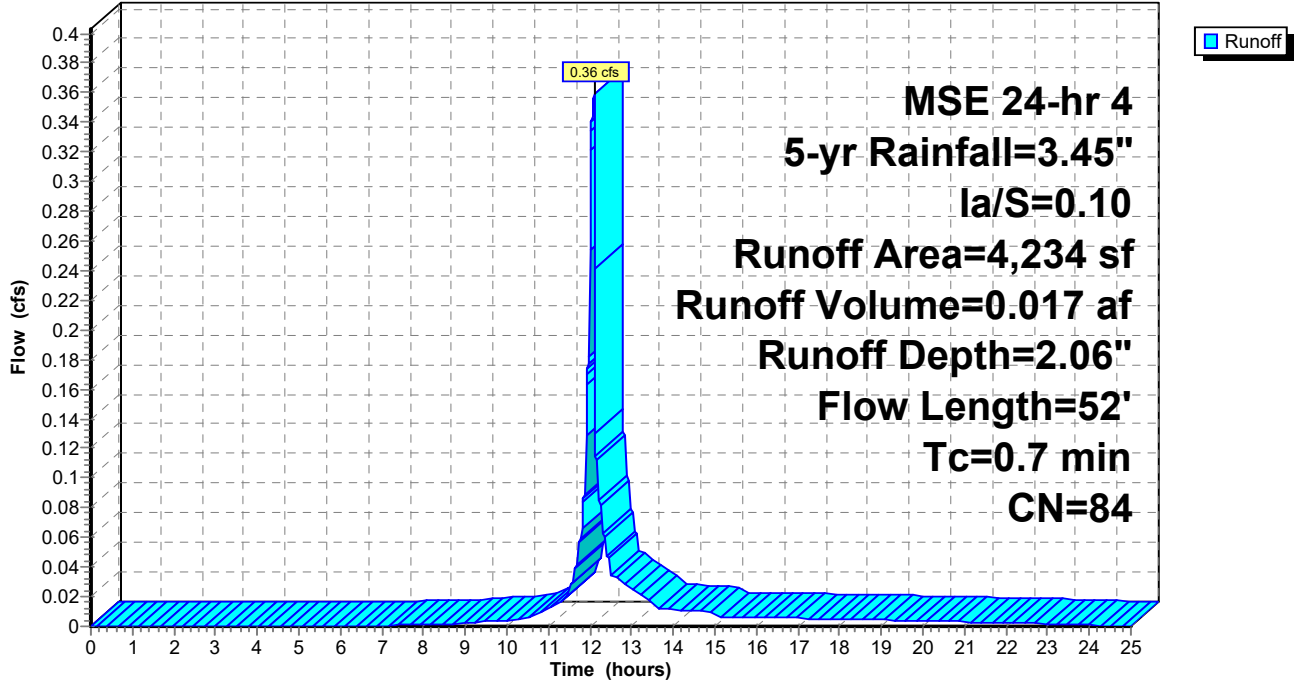
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, $dt= 0.01$ hrs
 MSE 24-hr 4 5-yr Rainfall=3.45", la/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 2.13" for 5-yr event
 Inflow = 0.66 cfs @ 12.11 hrs, Volume= 0.031 af
 Outflow = 0.64 cfs @ 12.11 hrs, Volume= 0.029 af, Atten= 3%, Lag= 0.5 min
 Discarded = 0.02 cfs @ 12.11 hrs, Volume= 0.012 af
 Primary = 0.61 cfs @ 12.11 hrs, Volume= 0.017 af

Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.72' @ 12.11 hrs Surf.Area= 271 sf Storage= 203 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 44.1 min (840.4 - 796.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

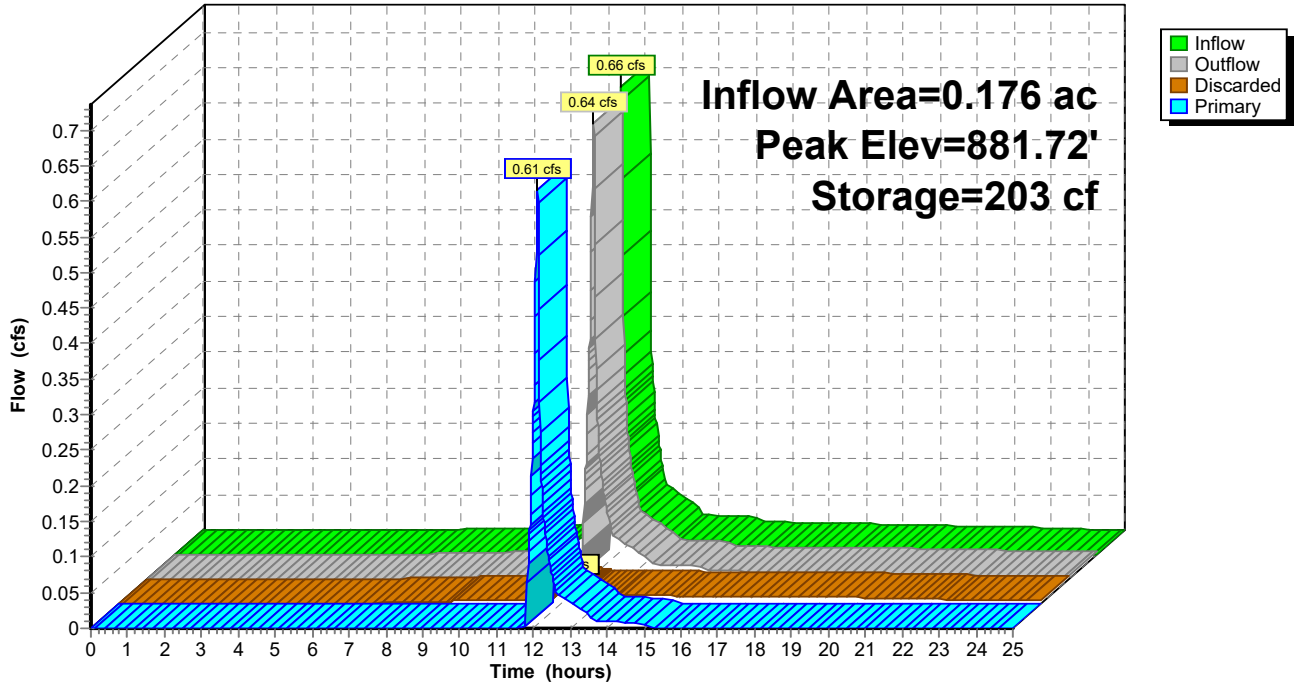
Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.02 cfs @ 12.11 hrs HW=881.72' (Free Discharge)
 ↑1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.61 cfs @ 12.11 hrs HW=881.72' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.61 cfs @ 1.24 fps)

Pond 2P: Rain Garden

Hydrograph



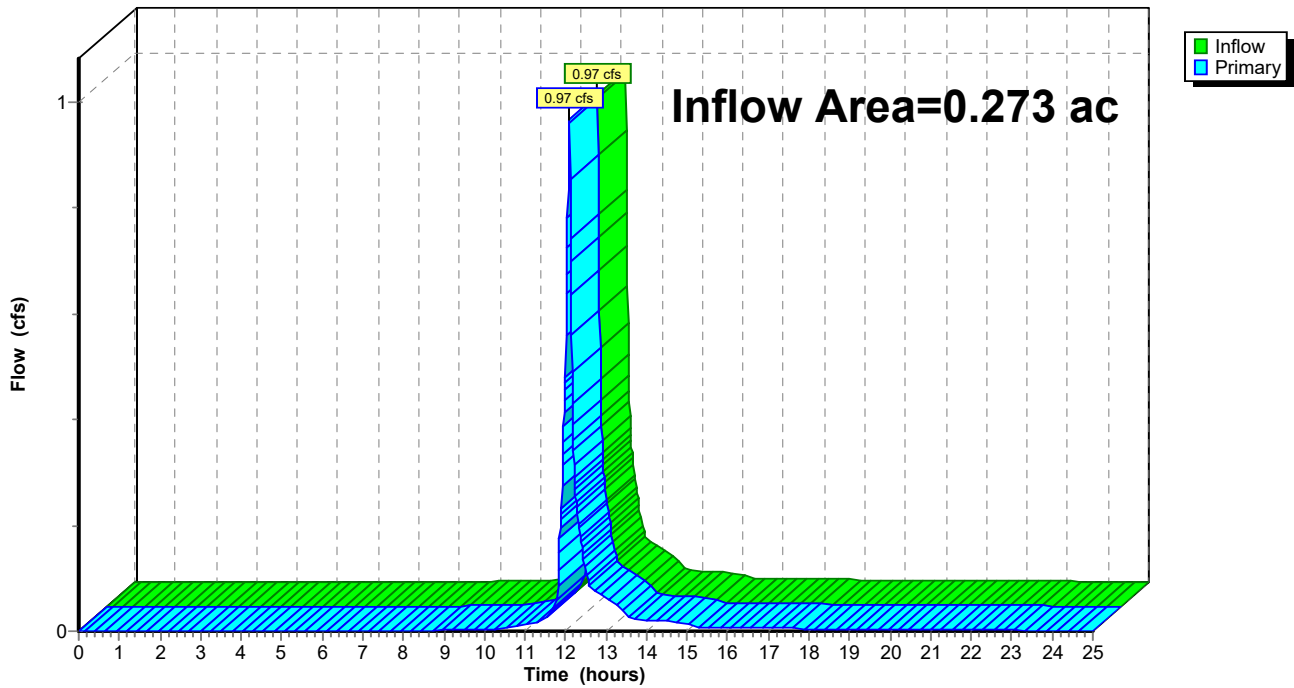
Summary for Link 6L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 1.49" for 5-yr event
Inflow = 0.97 cfs @ 12.10 hrs, Volume= 0.034 af
Primary = 0.97 cfs @ 12.10 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 6L: Summary

Hydrograph



Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=2.70"
Flow Length=146' Tc=2.7 min CN=85 Runoff=0.83 cfs 0.040 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=2.62"
Flow Length=52' Tc=0.7 min CN=84 Runoff=0.45 cfs 0.021 af

Pond 2P: Rain Garden

Peak Elev=881.76' Storage=213 cf Inflow=0.83 cfs 0.040 af
Discarded=0.03 cfs 0.013 af Primary=0.78 cfs 0.024 af Outflow=0.80 cfs 0.037 af

Link 6L: Summary

Inflow=1.22 cfs 0.046 af
Primary=1.22 cfs 0.046 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.061 af Average Runoff Depth = 2.67"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 0.83 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 2.70"
 Routed to Pond 2P : Rain Garden

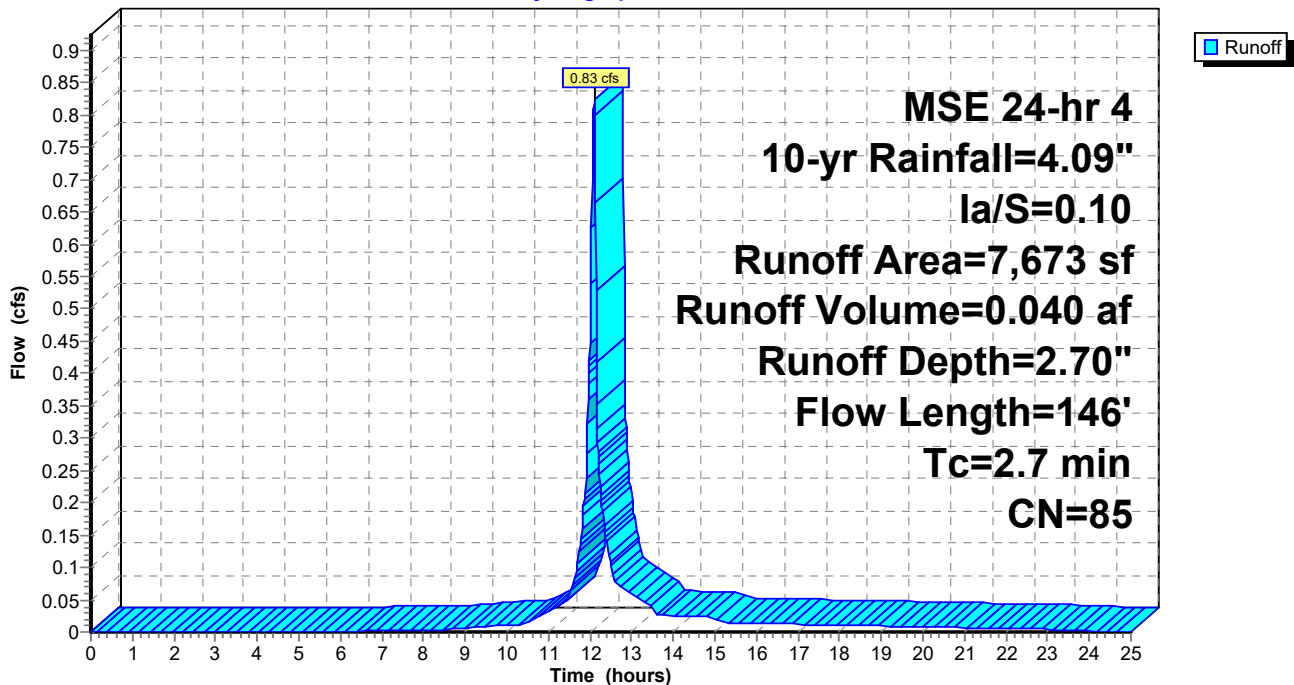
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 10-yr Rainfall=4.09", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



Summary for Subcatchment 5S: Undetained Area

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.45 cfs @ 12.10 hrs, Volume= 0.021 af, Depth= 2.62"

Routed to Link 6L : Summary

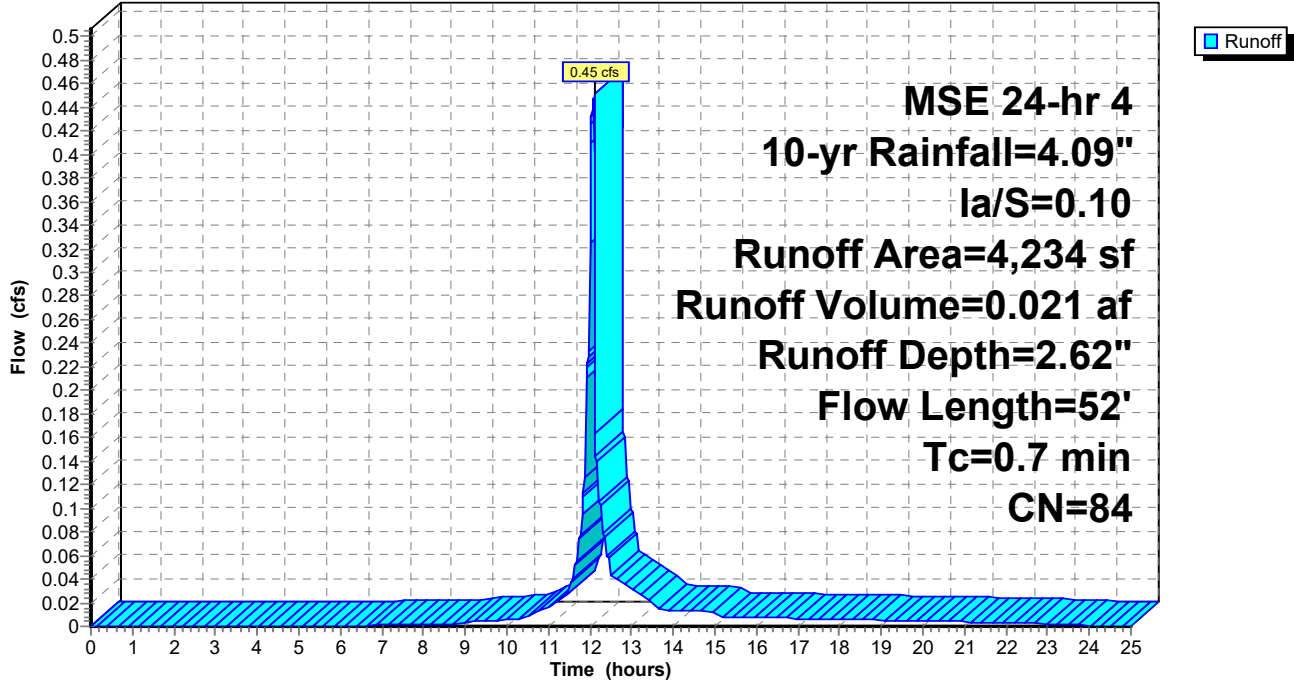
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 10-yr Rainfall=4.09", la/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 2.70" for 10-yr event
 Inflow = 0.83 cfs @ 12.11 hrs, Volume= 0.040 af
 Outflow = 0.80 cfs @ 12.11 hrs, Volume= 0.037 af, Atten= 3%, Lag= 0.5 min
 Discarded = 0.03 cfs @ 12.11 hrs, Volume= 0.013 af
 Primary = 0.78 cfs @ 12.11 hrs, Volume= 0.024 af

Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.76' @ 12.11 hrs Surf.Area= 297 sf Storage= 213 cf

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

Center-of-Mass det. time= 35.2 min (826.5 - 791.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.03 cfs @ 12.11 hrs HW=881.76' (Free Discharge)

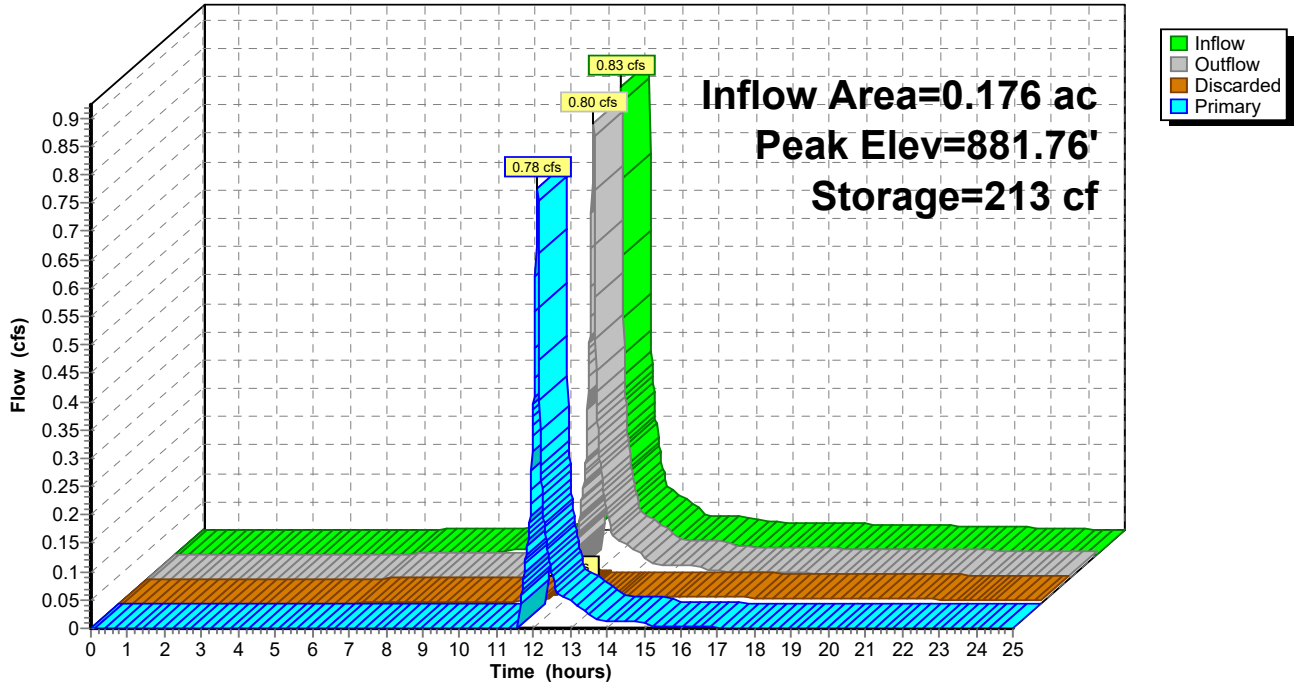
↑1=Exfiltration (Controls 0.03 cfs)

Primary OutFlow Max=0.77 cfs @ 12.11 hrs HW=881.76' TW=0.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.77 cfs @ 1.33 fps)

Pond 2P: Rain Garden

Hydrograph



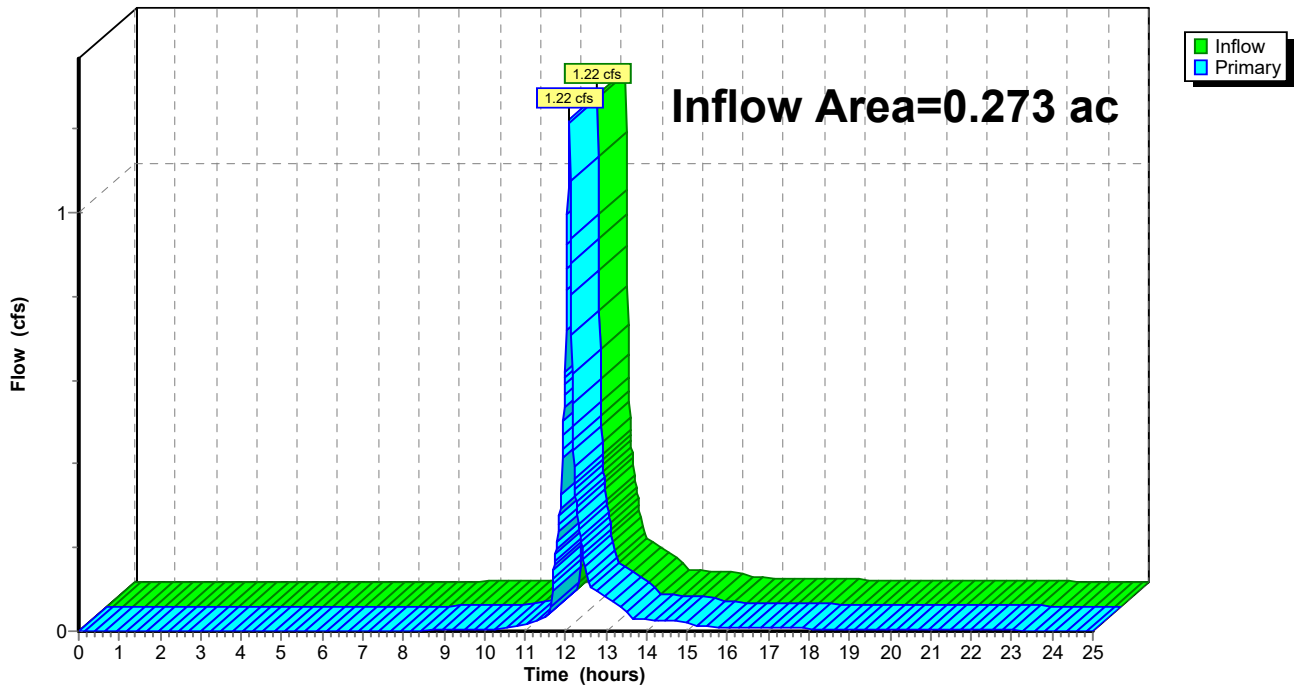
Summary for Link 6L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 2.00" for 10-yr event
Inflow = 1.22 cfs @ 12.10 hrs, Volume= 0.046 af
Primary = 1.22 cfs @ 12.10 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 6L: Summary

Hydrograph



Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=3.55"
Flow Length=146' Tc=2.7 min CN=85 Runoff=1.07 cfs 0.052 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=3.46"
Flow Length=52' Tc=0.7 min CN=84 Runoff=0.59 cfs 0.028 af

Pond 2P: Rain Garden

Peak Elev=881.80' Storage=228 cf Inflow=1.07 cfs 0.052 af
Discarded=0.03 cfs 0.014 af Primary=1.02 cfs 0.035 af Outflow=1.05 cfs 0.050 af

Link 6L: Summary

Inflow=1.60 cfs 0.063 af
Primary=1.60 cfs 0.063 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.080 af Average Runoff Depth = 3.52"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 1.07 cfs @ 12.10 hrs, Volume= 0.052 af, Depth= 3.55"
 Routed to Pond 2P : Rain Garden

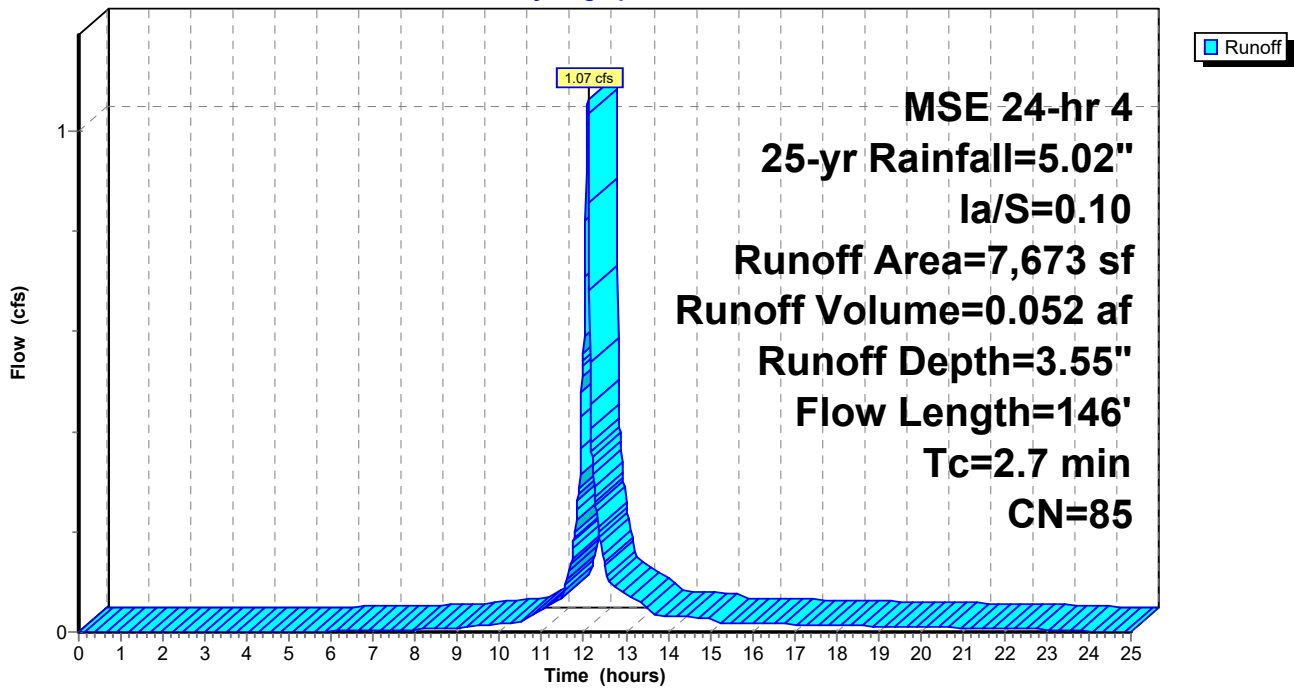
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 25-yr Rainfall=5.02", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



Summary for Subcatchment 5S: Undetained Area

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.028 af, Depth= 3.46"

Routed to Link 6L : Summary

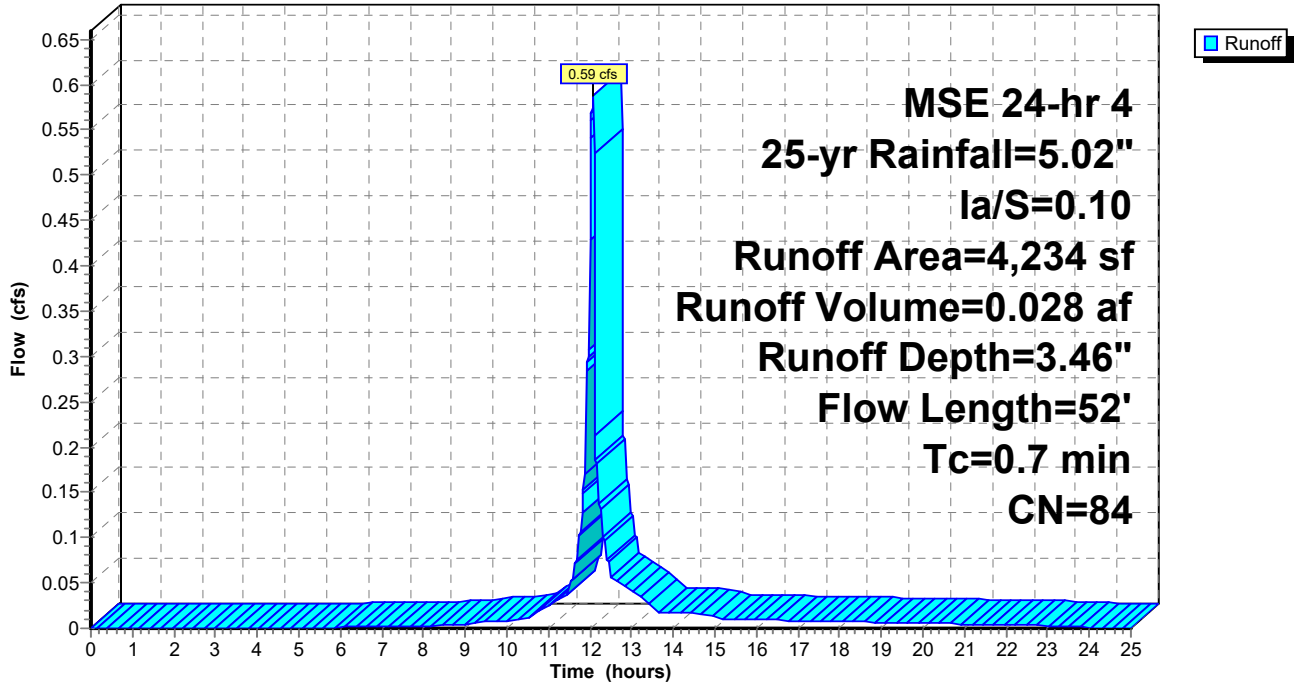
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 25-yr Rainfall=5.02", Ia/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 3.55" for 25-yr event
 Inflow = 1.07 cfs @ 12.10 hrs, Volume= 0.052 af
 Outflow = 1.05 cfs @ 12.11 hrs, Volume= 0.050 af, Atten= 2%, Lag= 0.5 min
 Discarded = 0.03 cfs @ 12.11 hrs, Volume= 0.014 af
 Primary = 1.02 cfs @ 12.11 hrs, Volume= 0.035 af

Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.80' @ 12.11 hrs Surf.Area= 331 sf Storage= 228 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 27.7 min (813.3 - 785.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

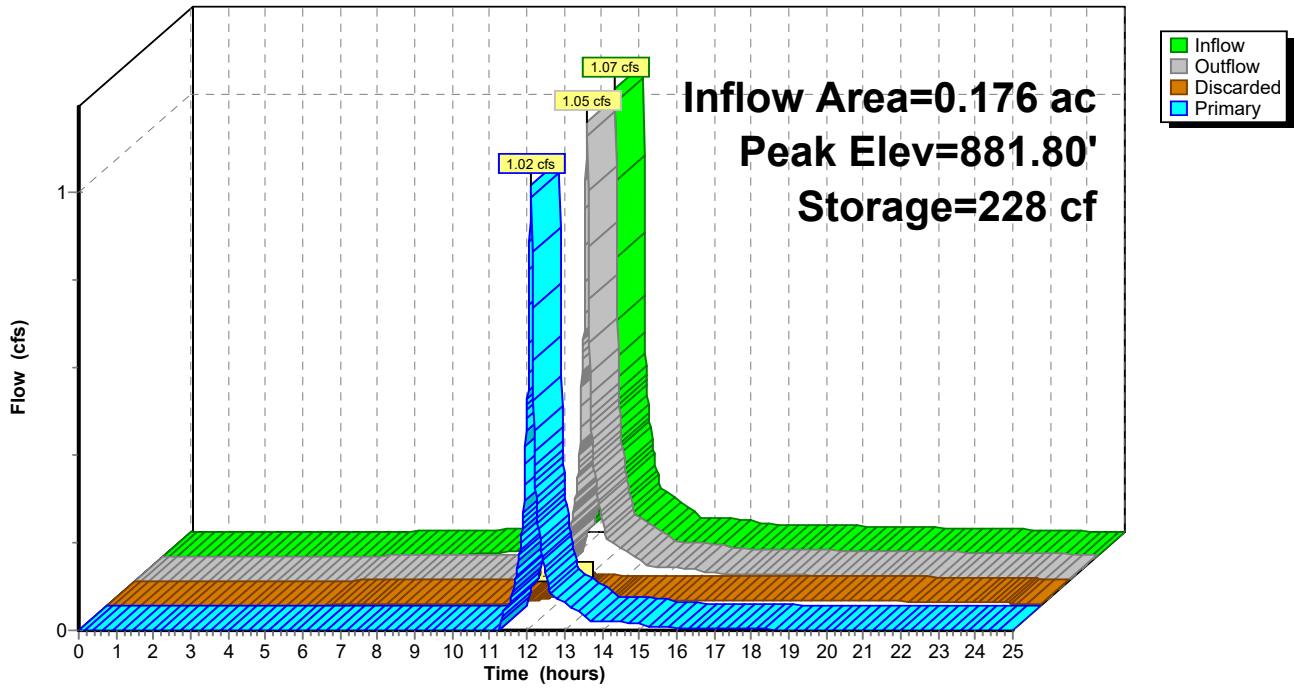
Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.03 cfs @ 12.11 hrs HW=881.80' (Free Discharge)
 ↑1=Exfiltration (Controls 0.03 cfs)

Primary OutFlow Max=1.01 cfs @ 12.11 hrs HW=881.80' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 1.01 cfs @ 1.44 fps)

Pond 2P: Rain Garden

Hydrograph



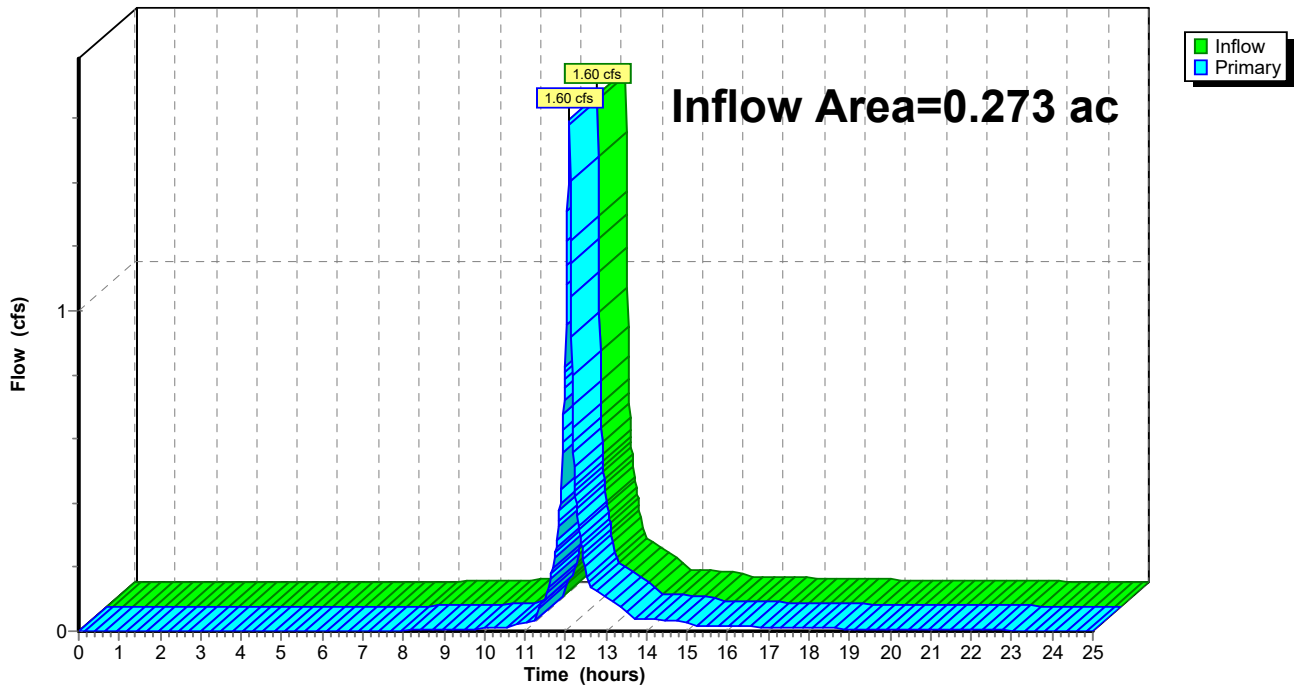
Summary for Link 6L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 1.60 cfs @ 12.10 hrs, Volume= 0.063 af
Primary = 1.60 cfs @ 12.10 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 6L: Summary

Hydrograph



BSE2589 Stormwater Post Developed Model

MSE 24-hr 4 100-yr Rainfall=6.66", Ia/S=0.10

Prepared by Burse Surveying & Engineering Inc

Printed 9/21/2023

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=5.10"
Flow Length=146' Tc=2.7 min CN=85 Runoff=1.50 cfs 0.075 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=5.00"
Flow Length=52' Tc=0.7 min CN=84 Runoff=0.83 cfs 0.040 af

Pond 2P: Rain Garden

Peak Elev=881.88' Storage=254 cf Inflow=1.50 cfs 0.075 af
Discarded=0.03 cfs 0.016 af Primary=1.44 cfs 0.056 af Outflow=1.47 cfs 0.072 af

Link 6L: Summary

Inflow=2.27 cfs 0.096 af
Primary=2.27 cfs 0.096 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.115 af Average Runoff Depth = 5.06"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 1.50 cfs @ 12.10 hrs, Volume= 0.075 af, Depth= 5.10"
 Routed to Pond 2P : Rain Garden

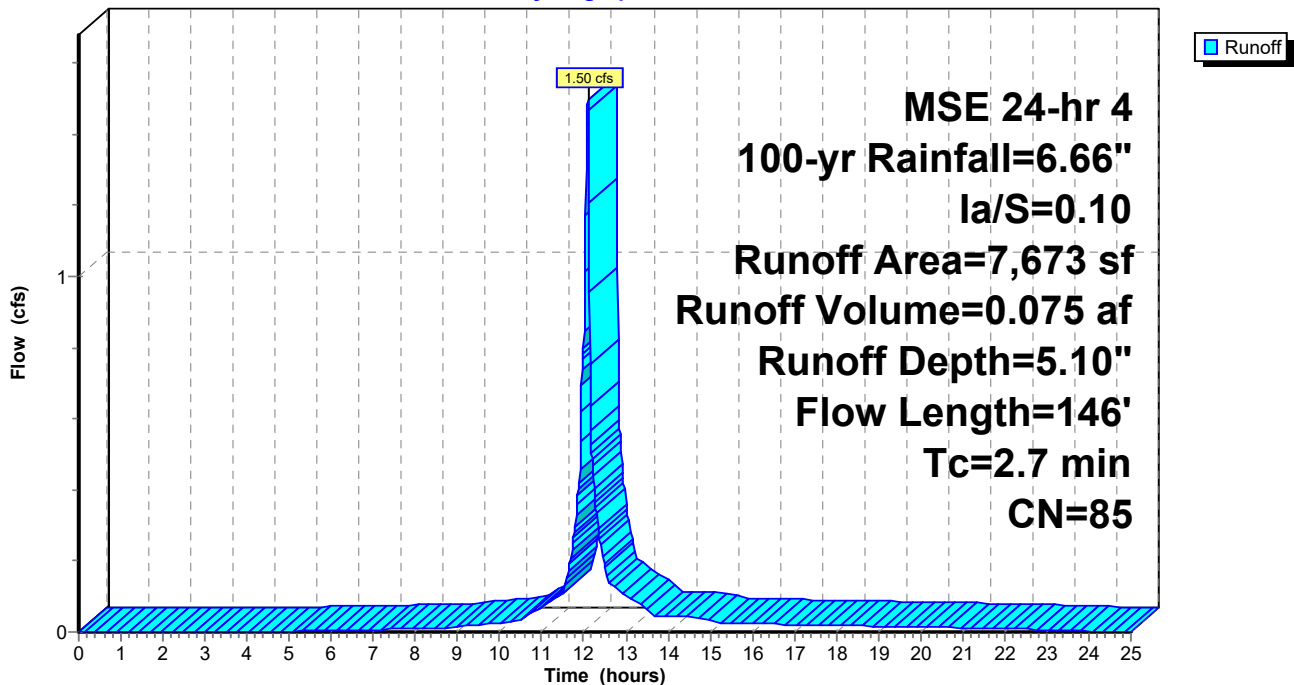
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 100-yr Rainfall=6.66", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



Summary for Subcatchment 5S: Undetained Area

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 5.00"

Routed to Link 6L : Summary

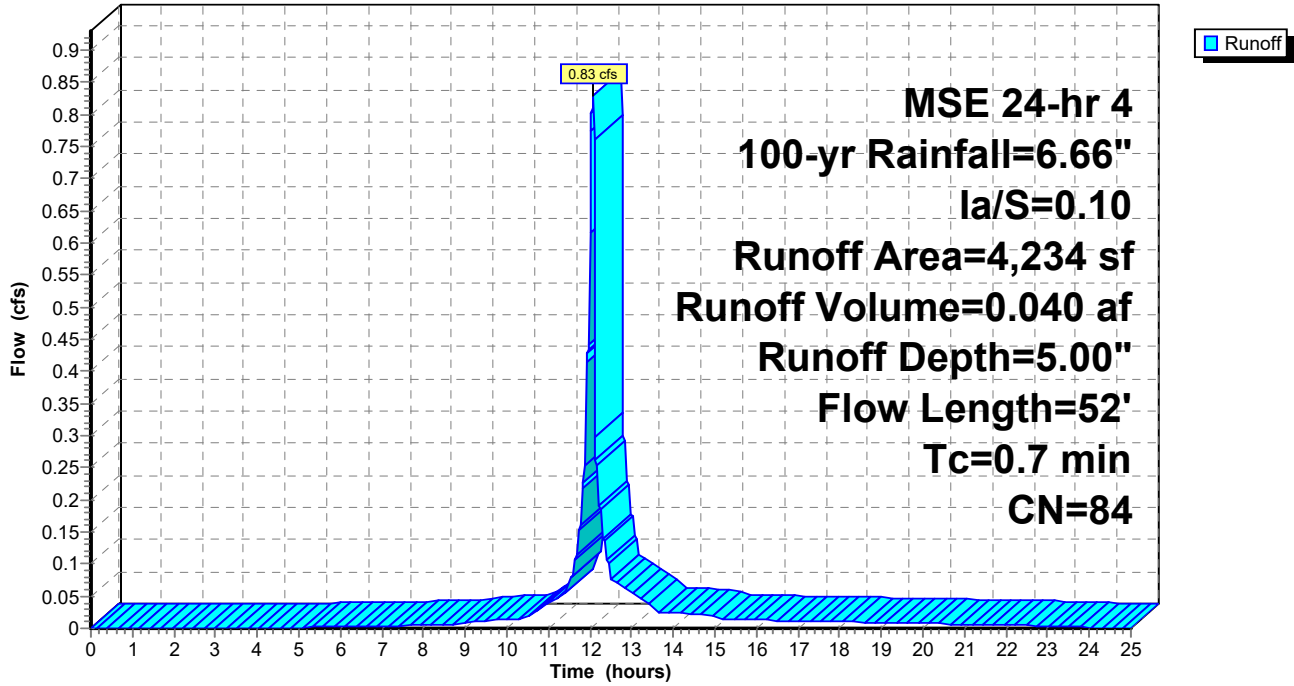
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 100-yr Rainfall=6.66", la/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 5.10" for 100-yr event
 Inflow = 1.50 cfs @ 12.10 hrs, Volume= 0.075 af
 Outflow = 1.47 cfs @ 12.11 hrs, Volume= 0.072 af, Atten= 2%, Lag= 0.5 min
 Discarded = 0.03 cfs @ 12.11 hrs, Volume= 0.016 af
 Primary = 1.44 cfs @ 12.11 hrs, Volume= 0.056 af

Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.88' @ 12.11 hrs Surf.Area= 385 sf Storage= 254 cf

Plug-Flow detention time= 41.0 min calculated for 0.072 af (96% of inflow)
 Center-of-Mass det. time= 21.0 min (799.1 - 778.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

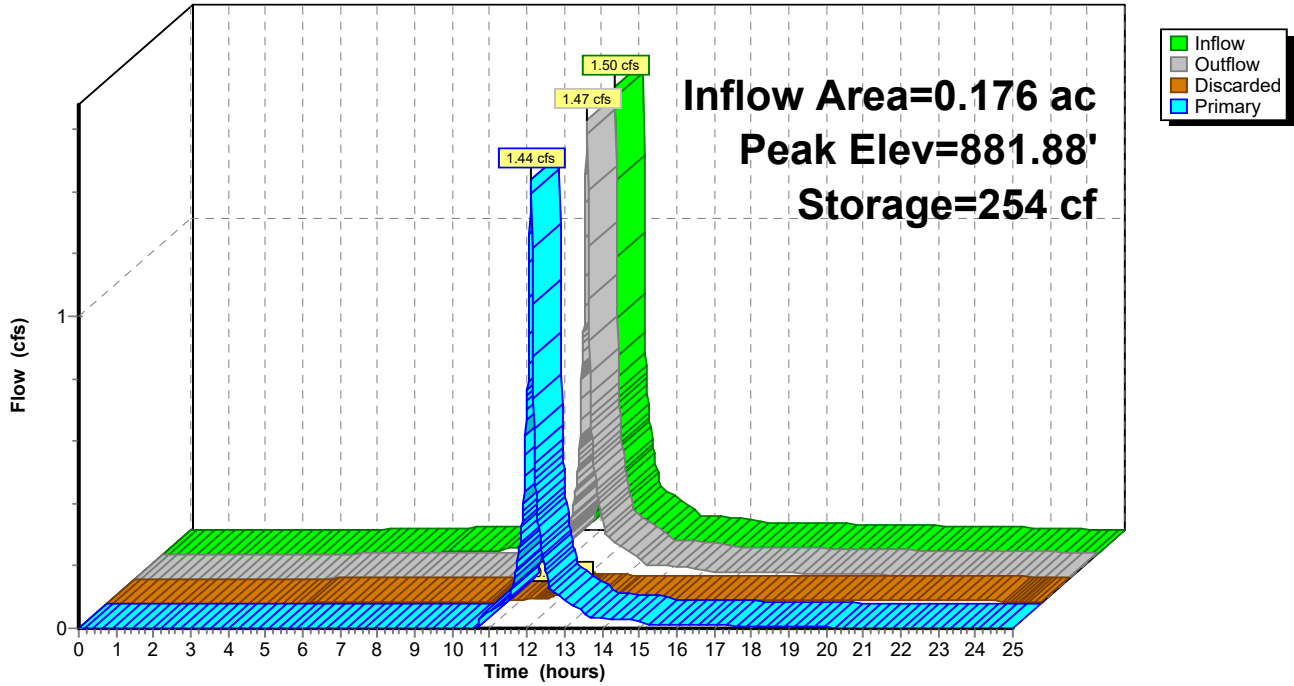
Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.03 cfs @ 12.11 hrs HW=881.88' (Free Discharge)
 ↑1=Exfiltration (Controls 0.03 cfs)

Primary OutFlow Max=1.44 cfs @ 12.11 hrs HW=881.88' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 1.44 cfs @ 1.60 fps)

Pond 2P: Rain Garden

Hydrograph



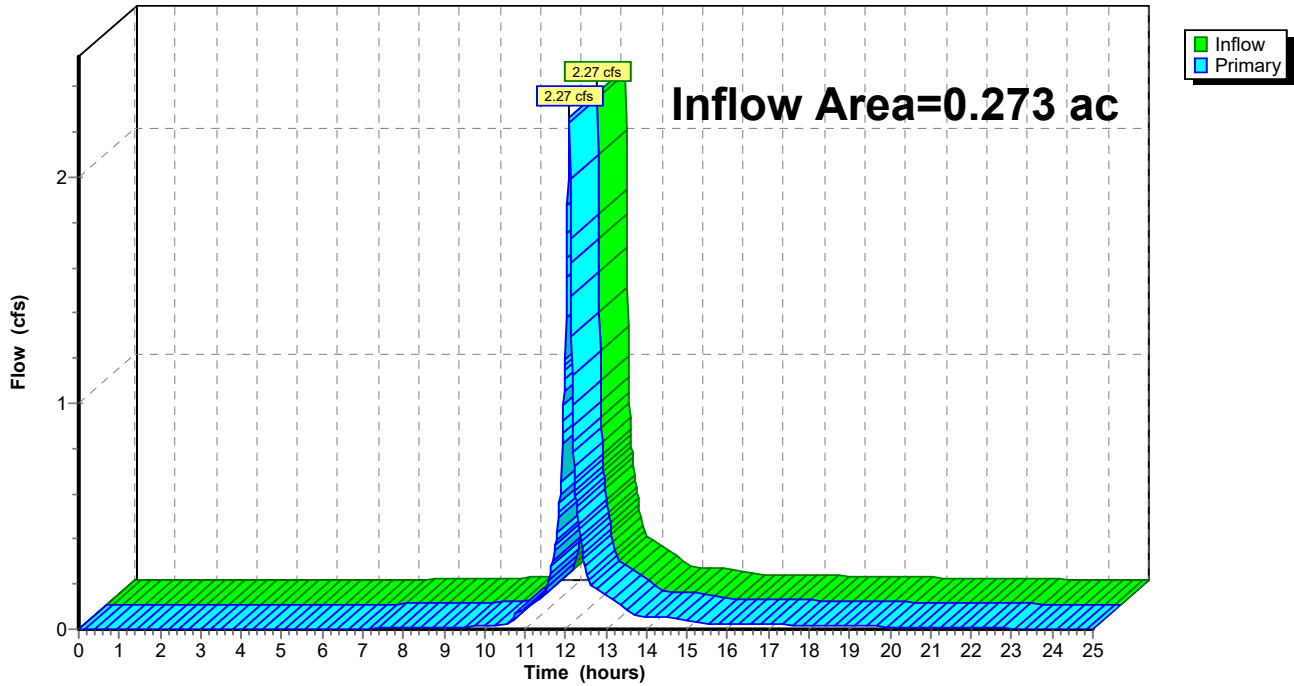
Summary for Link 6L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 4.23" for 100-yr event
Inflow = 2.27 cfs @ 12.10 hrs, Volume= 0.096 af
Primary = 2.27 cfs @ 12.10 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 6L: Summary

Hydrograph



BSE2589 Stormwater Post Developed Model

MSE 24-hr 4 200-yr Rainfall=7.53", Ia/S=0.10

Prepared by Burse Surveying & Engineering Inc

Printed 9/21/2023

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Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=5.93"
Flow Length=146' Tc=2.7 min CN=85 Runoff=1.73 cfs 0.087 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=5.83"
Flow Length=52' Tc=0.7 min CN=84 Runoff=0.96 cfs 0.047 af

Pond 2P: Rain Garden

Peak Elev=881.91' Storage=268 cf Inflow=1.73 cfs 0.087 af
Discarded=0.04 cfs 0.017 af Primary=1.66 cfs 0.067 af Outflow=1.70 cfs 0.084 af

Link 6L: Summary

Inflow=2.62 cfs 0.114 af
Primary=2.62 cfs 0.114 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.134 af Average Runoff Depth = 5.89"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 1.73 cfs @ 12.10 hrs, Volume= 0.087 af, Depth= 5.93"
 Routed to Pond 2P : Rain Garden

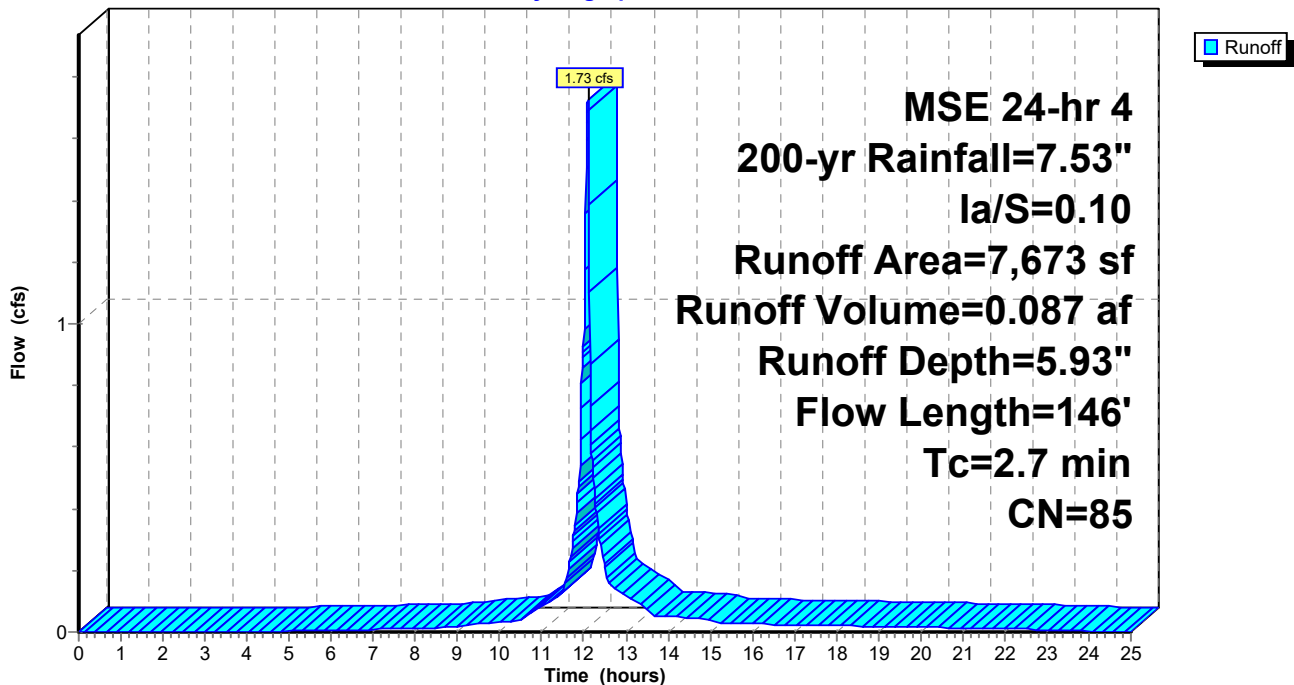
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 200-yr Rainfall=7.53", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



BSE2589 Stormwater Post Developed Model

MSE 24-hr 4 200-yr Rainfall=7.53", la/S=0.10

Prepared by Burse Surveying & Engineering Inc

Printed 9/21/2023

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Summary for Subcatchment 5S: Undetained Area

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 5.83"

Routed to Link 6L : Summary

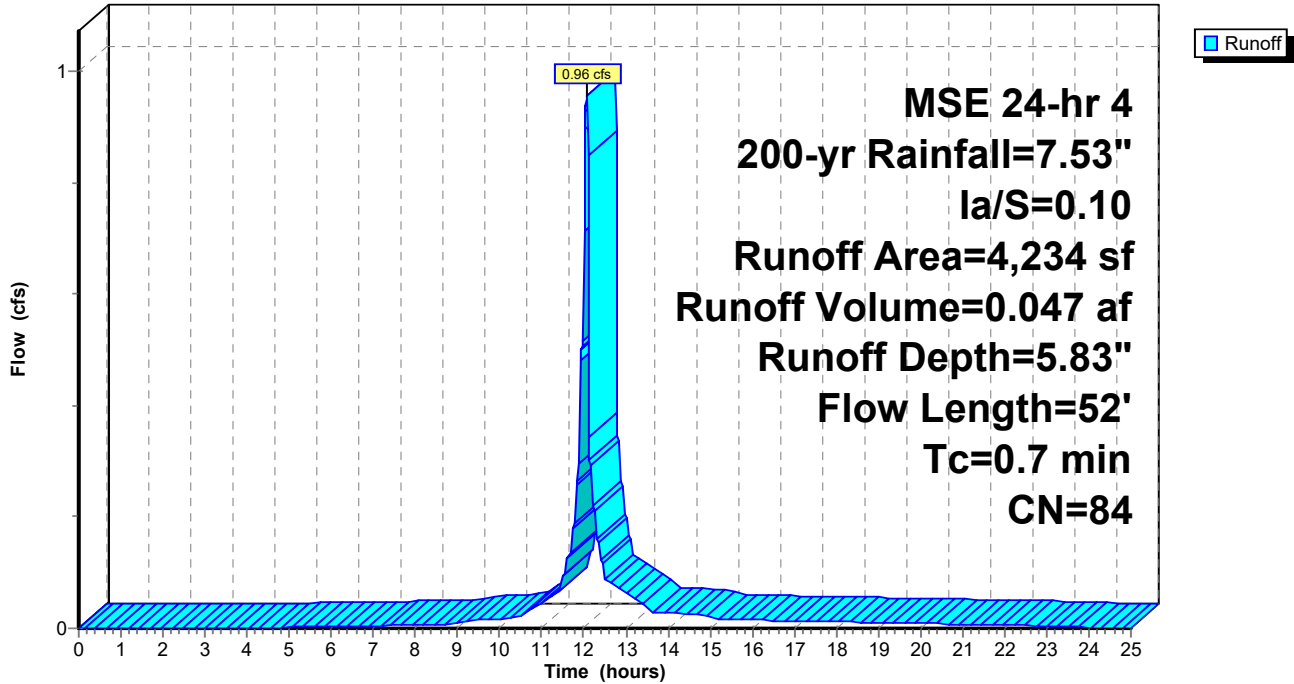
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 200-yr Rainfall=7.53", la/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 5.93" for 200-yr event
 Inflow = 1.73 cfs @ 12.10 hrs, Volume= 0.087 af
 Outflow = 1.70 cfs @ 12.11 hrs, Volume= 0.084 af, Atten= 2%, Lag= 0.6 min
 Discarded = 0.04 cfs @ 12.11 hrs, Volume= 0.017 af
 Primary = 1.66 cfs @ 12.11 hrs, Volume= 0.067 af

Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.91' @ 12.11 hrs Surf.Area= 411 sf Storage= 268 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 19.1 min (794.0 - 774.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

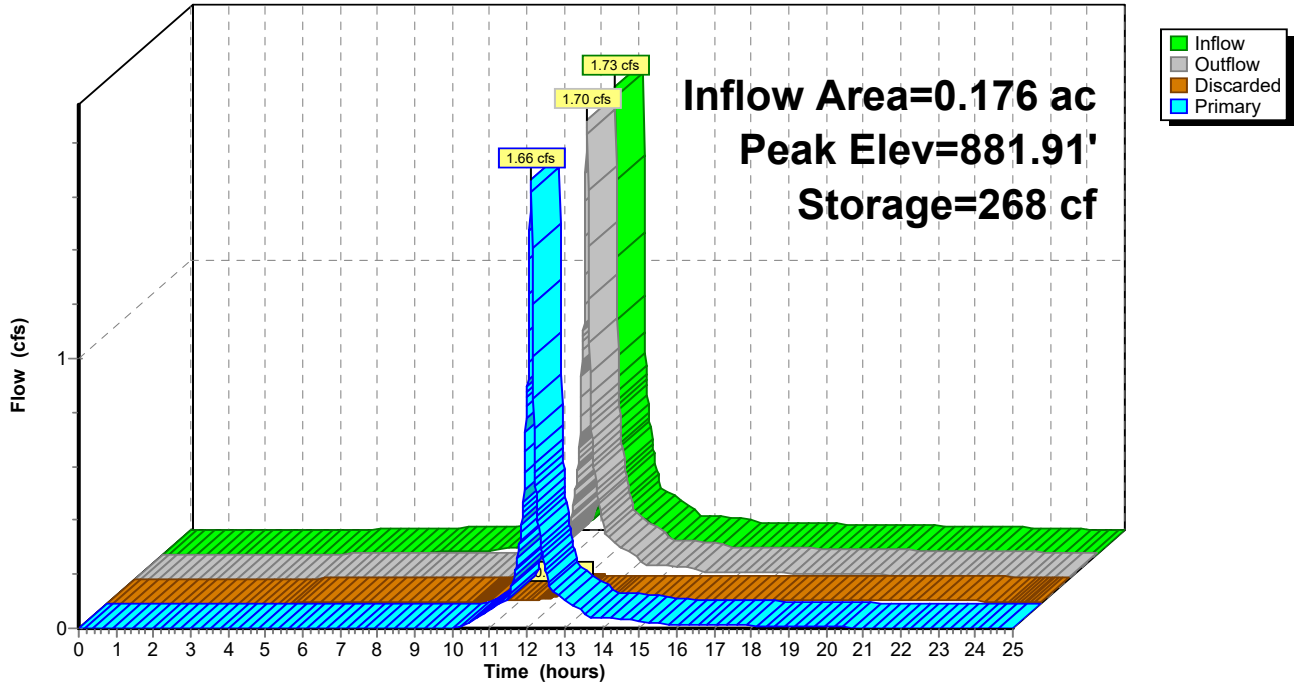
Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.04 cfs @ 12.11 hrs HW=881.91' (Free Discharge)
 ↑1=Exfiltration (Controls 0.04 cfs)

Primary OutFlow Max=1.66 cfs @ 12.11 hrs HW=881.91' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 1.66 cfs @ 1.67 fps)

Pond 2P: Rain Garden

Hydrograph



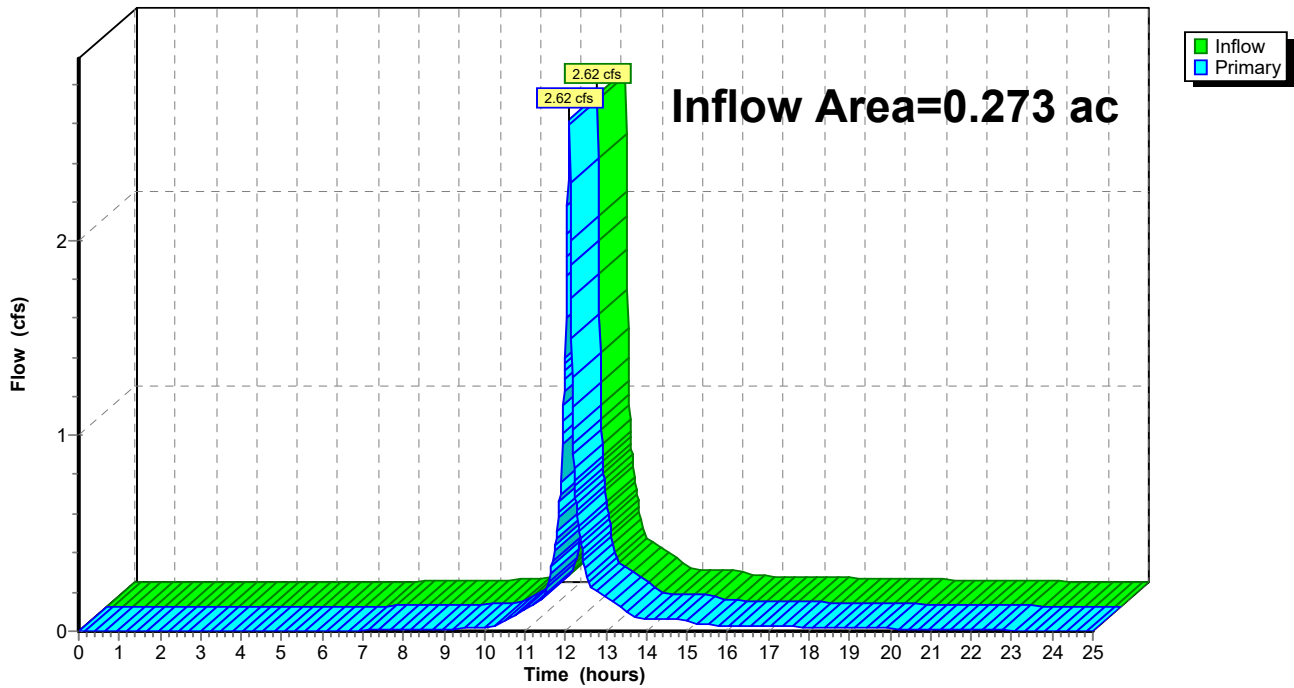
Summary for Link 0L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 5.02" for 200-yr event
Inflow = 2.62 cfs @ 12.10 hrs, Volume= 0.114 af
Primary = 2.62 cfs @ 12.10 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 0L: Summary

Hydrograph



Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Area to Rain Garden

Runoff Area=7,673 sf 35.28% Impervious Runoff Depth=7.29"
Flow Length=146' Tc=2.7 min CN=85 Runoff=2.10 cfs 0.107 af

Subcatchment 5S: Undetained Area

Runoff Area=4,234 sf 30.73% Impervious Runoff Depth=7.19"
Flow Length=52' Tc=0.7 min CN=84 Runoff=1.17 cfs 0.058 af

Pond 2P: Rain Garden

Peak Elev=881.96' Storage=290 cf Inflow=2.10 cfs 0.107 af
Discarded=0.04 cfs 0.018 af Primary=2.02 cfs 0.086 af Outflow=2.06 cfs 0.104 af

Link 6L: Summary

Inflow=3.19 cfs 0.144 af
Primary=3.19 cfs 0.144 af

Total Runoff Area = 0.273 ac Runoff Volume = 0.165 af Average Runoff Depth = 7.26"
66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

Summary for Subcatchment 1S: Area to Rain Garden

Runoff = 2.10 cfs @ 12.10 hrs, Volume= 0.107 af, Depth= 7.29"
 Routed to Pond 2P : Rain Garden

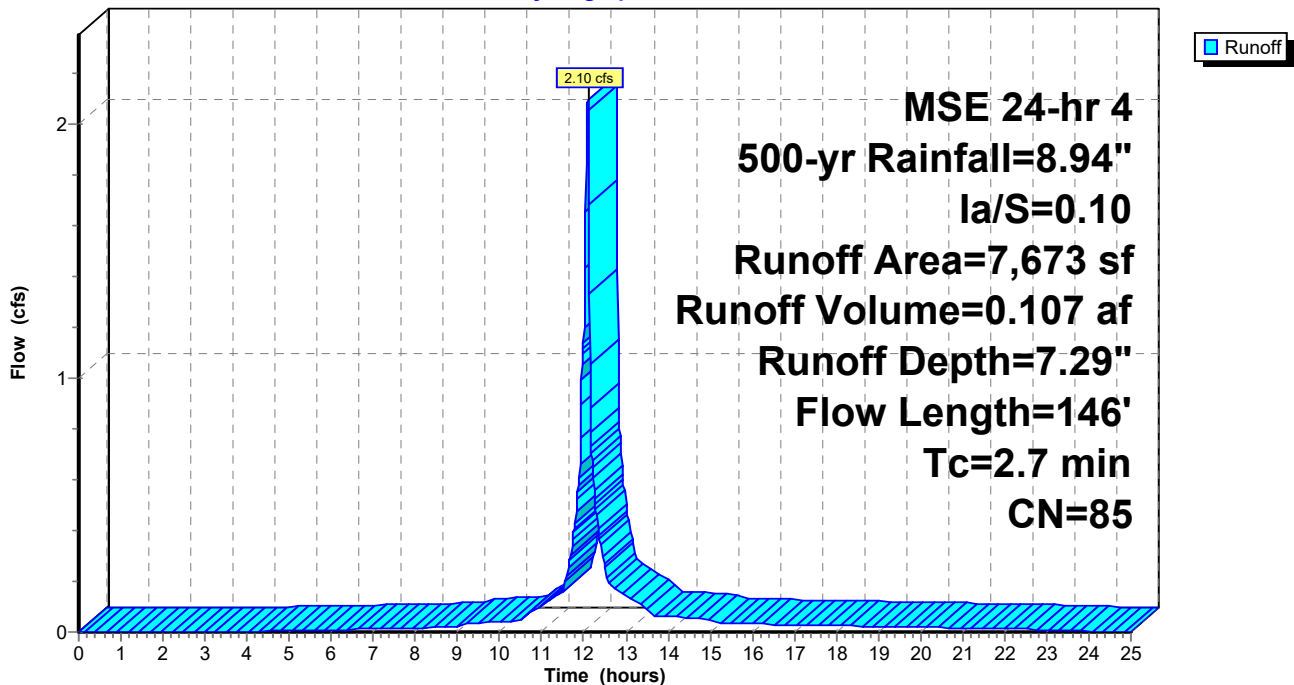
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 500-yr Rainfall=8.94", la/S=0.10

Area (sf)	CN	Description
* 4,966	78	LS (HSG D one higher than existing)
* 2,291	98	Roof
* 367	98	SW
* 49	100	Rain Garden
7,673	85	Weighted Average
4,966	78	64.72% Pervious Area
2,707	98	35.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	108	0.1370	5.55		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
2.3	24	0.0520	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 2.84"
2.7	146	Total			

Subcatchment 1S: Area to Rain Garden

Hydrograph



Summary for Subcatchment 5S: Undetained Area

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.17 cfs @ 12.09 hrs, Volume= 0.058 af, Depth= 7.19"

Routed to Link 6L : Summary

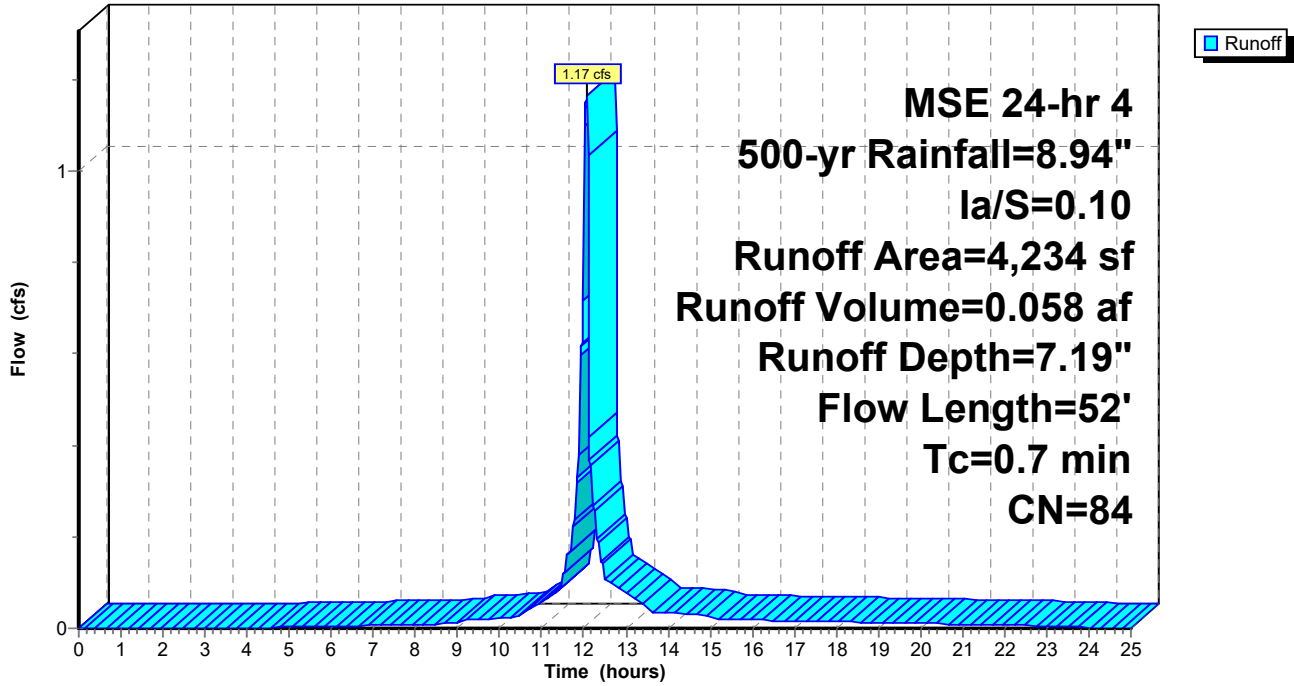
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 MSE 24-hr 4 500-yr Rainfall=8.94", la/S=0.10

Area (sf)	CN	Description
* 2,933	78	LS (HSG D one higher than existing)
* 546	98	Roof
* 710	98	Pavement
* 45	98	Deck
4,234	84	Weighted Average
2,933	78	69.27% Pervious Area
1,301	98	30.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	10	0.3150	8.42		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	14	1.0000	4.18		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.6	28	0.0130	0.85		Sheet Flow, Smooth surfaces n= 0.011 P2= 2.84"
0.7	52	Total			

Subcatchment 5S: Undetained Area

Hydrograph



Summary for Pond 2P: Rain Garden

Inflow Area = 0.176 ac, 35.28% Impervious, Inflow Depth = 7.29" for 500-yr event
 Inflow = 2.10 cfs @ 12.10 hrs, Volume= 0.107 af
 Outflow = 2.06 cfs @ 12.11 hrs, Volume= 0.104 af, Atten= 2%, Lag= 0.6 min
 Discarded = 0.04 cfs @ 12.11 hrs, Volume= 0.018 af
 Primary = 2.02 cfs @ 12.11 hrs, Volume= 0.086 af

Routed to Link 6L : Summary

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 881.96' @ 12.11 hrs Surf.Area= 449 sf Storage= 290 cf

Plug-Flow detention time= 32.1 min calculated for 0.104 af (97% of inflow)
 Center-of-Mass det. time= 16.8 min (787.5 - 770.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	878.49'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.49	49	0.0	0	0
878.50	49	27.0	0	0
881.00	49	100.0	123	123
881.50	106	100.0	39	161
882.00	476	100.0	146	307

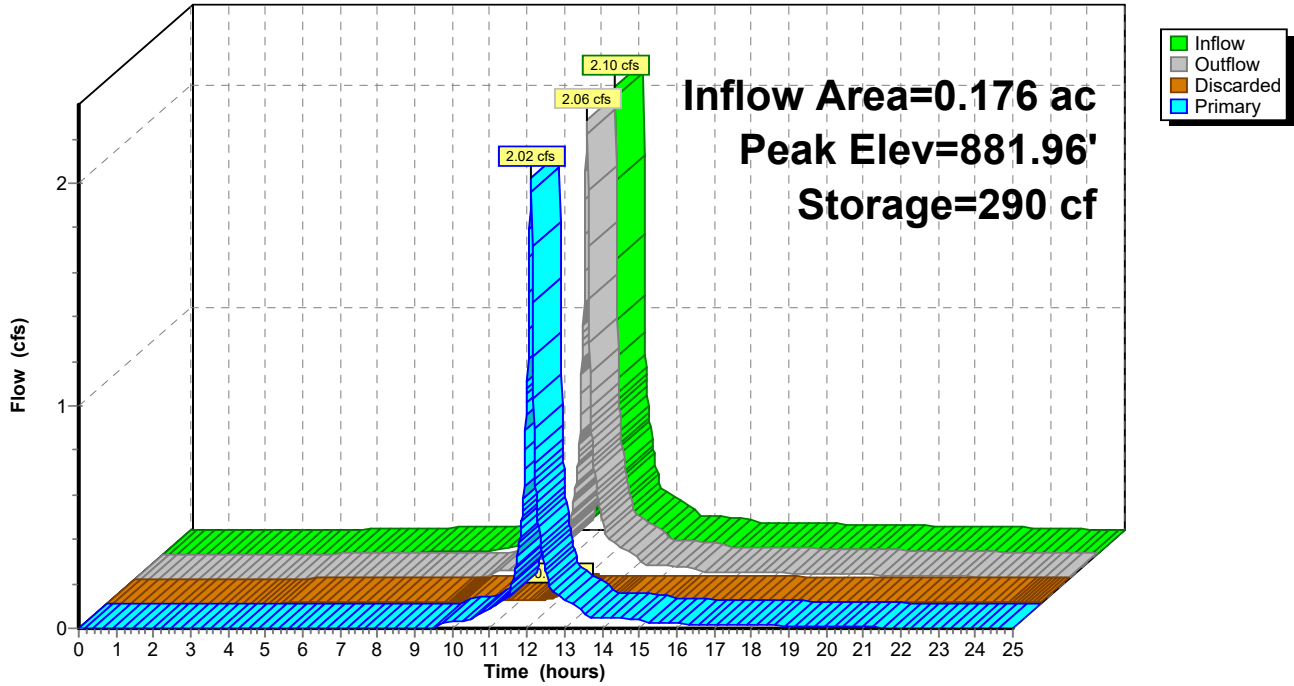
Device	Routing	Invert	Outlet Devices
#1	Discarded	878.49'	3.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 871.00'
#2	Primary	881.50'	2.0' long + 1.0 ' SideZ x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.04 cfs @ 12.11 hrs HW=881.96' (Free Discharge)
 ↑1=Exfiltration (Controls 0.04 cfs)

Primary OutFlow Max=2.02 cfs @ 12.11 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 2.02 cfs @ 1.77 fps)

Pond 2P: Rain Garden

Hydrograph



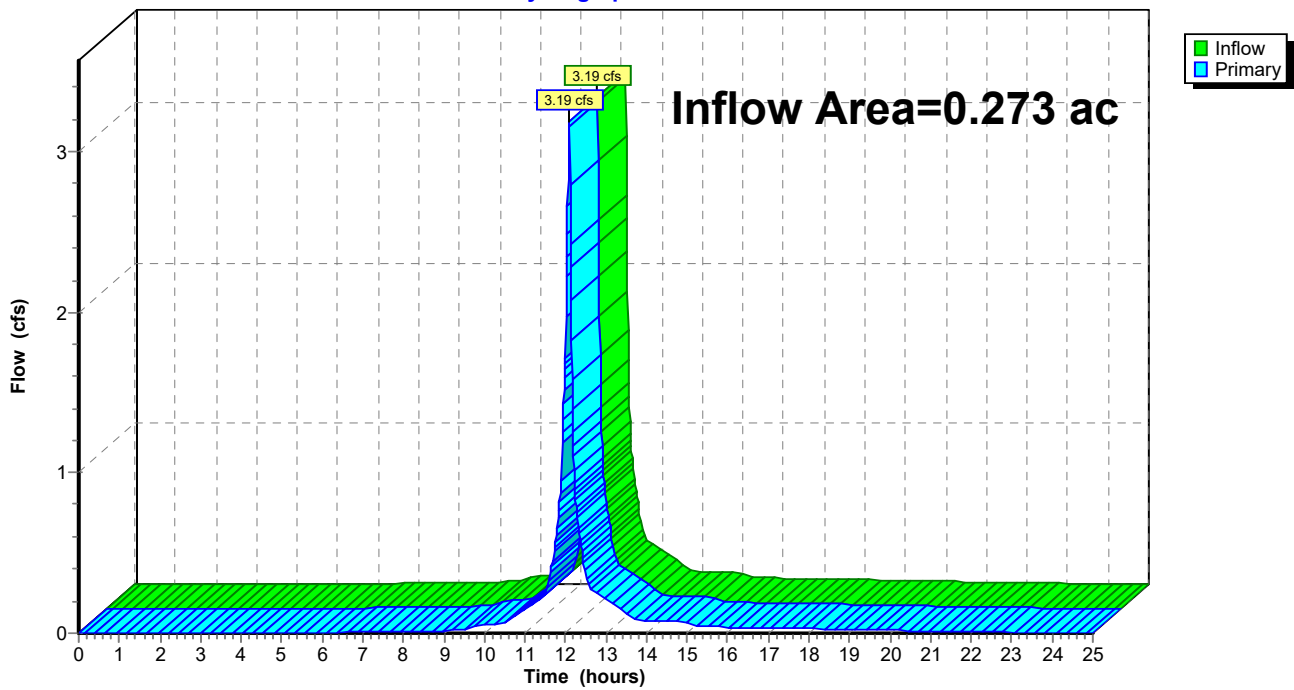
Summary for Link 6L: Summary

Inflow Area = 0.273 ac, 33.66% Impervious, Inflow Depth = 6.32" for 500-yr event
Inflow = 3.19 cfs @ 12.10 hrs, Volume= 0.144 af
Primary = 3.19 cfs @ 12.10 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link 6L: Summary

Hydrograph



Furlow Residence

Stormwater Runoff Rate Summary

Project: BSE2589
Job Name: Furlow Residence
Task: Peak Flow Calcs
By: DRH
Date: 9/21/2023
Checked: PDF

A	B	C	D	E
Storm Event	Current Surface Water Runoff Rate to 3706 Nakoma Road	Runoff Rate from 3701 Council Crest onto 3706 Nakoma Road after Development	Reduction in surface water runoff to 3706 Nakoma Road from 3701 Council Crest	Percent reduction of Runoff
	(CFS)	(CFS)	(CFS)	(%)
1-Yr, 24hr	0.32	0.23	0.09	28.1%
2-Yr, 24hr	0.42	0.27	0.15	35.7%
5-Yr, 24hr	0.60	0.36	0.24	40.0%
10-Yr, 24hr	0.81	0.45	0.36	44.4%
25-Yr, 24hr	1.13	0.59	0.54	47.8%
100-Yr, 24hr	1.74	0.83	0.91	52.3%
200-Yr, 24hr	2.07	0.96	1.11	53.6%
500-Yr, 24hr	2.62	1.76	0.86	32.8%