Jon and Brenda Furlow 2120 Girard Ave S, Minneapolis, MN 55405 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 <u>Meeting Minutes</u> and the <u>Landmarks Commission Meeting Report</u>.

# 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.<sup>1</sup> 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

<sup>&</sup>lt;sup>1</sup> 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:

Α	В	С	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 <b>after</b> 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



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



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



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## EROSION CONTROL AND STORMWATER MANAGEMENT REPORT

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

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

![](_page_20_Picture_3.jpeg)

## 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

![](_page_21_Figure_0.jpeg)

### EMERGENCY CONTACT

- 15. FOR THE FIRST SIX (6) WEEKS AFTER THE INITIAL STABILIZATION OF A DISTURBED AREA, WATERING SHALL BE PERFORMED WHENEVER MORE THAN SEVEN (7) DAYS OF DRY WEATHER ELAPSE.
- 14. ALL DISTURBED AREAS, EXCEPT PAVED AREAS, SHALL RECEIVE A MINIMUM OF FOUR (4) INCHES OF TOPSOIL, FERTILIZER, SEED, AND MULCH. SEED MIXTURES SHALL BE SELECTED APPORIATE TO THE INTENDED FUNCTION. A OUALPIED LANDSCAPING CONTRACTOR, LANDSCAPE ARCHITECT OR NURSERY CAN BE CONSULTED FOR RECOMMENDATIONS. SEEDING RATES SHALL BE SEASED ON POUNDS OR OUNCES OF PURE LUVE SEED PER ACRE AND SHALL BE PROVIDED BY THE SEED SUPPLIER. FERTILIZER CAN BE APPLIED TO HELP PROMOTE GROWTH, BUT A SOIL TEST IS RECOMMENDED TO DETERMINE THE TYPE AND AMOUNT OF FERTILIZER TO BE APPLIED. ALL SEEDING AND RESTORATION SHALL BE IN CONFORMANCE TO WONR TECHNICAL STANDARD TOSP FOUND AT HTTE: //ONR.M.GOV/TOP/C/STORMWATER/STANDARDS/CONST.STANDARDS.HTML. SEEDING AND SODDING MAY ONLY BE USED FROM MAY 1ST TO SEPTEMBER 151H OF ANY YEAR. TEMPORARY SEED SHALL BE USED AFTER STREMEER 15. IF TEMPORARY SEEDING IS USED, A PERMANENT COVER SHALL ALSO BE REQUIRED AS PART OF THE FINAL SITE STABILIZATION.
- 10. EROSION CONTROL DEVICES SHALL ADHERE TO THE TECHNICAL STANDARDS FOUND AT: HTTP://DNR.WI.GOV/RUNOFF/STORMWATER/TECHSTDS.HTM AND COMPLY WITH ALL CITY OF MADISON ORDINANCES. 11. ALL DEBRIS TRACKED ONTO PUBLIC STREETS SHALL BE BE SWEPT OR SCRAPED CLEAN BY THE END OF EACH WORKDAY ALL BUILDING AND WASTE MATERIAL SHALL BE HANDLED PROPERLY TO PREVENT RUNOFF OF THESE MATERIALS OFF OF THE SITE. 13. ALL DISTURBED AREAS SHALL BE SEEDED IMMEDIATELY AFTER GRADING ACTIVITIES HAVE BEEN COMPLETED.
- NO SOLID MATERIAL SHALL BE DISCHARGED OR DEPOSITED INTO WATERS OF THE STATE IN VIOLATION OF CH. 30 OR 31 OF THE WISCONSIN STATE STATUTES OR 33 USC 1344 PERMITS.

- BUILDING AND WASTE MATERIALS SHALL BE PREVENTED FROM RUNNING-OFF THE SITE AND ENTERING WATERS OF THE STATE IN CONFORMANCE WITH NR151.12(6M).

- 7. STORM SEWER INLETS PROVIDE WDOT TYPE D "CATCHALL" INLET PROTECTION OR EQUIVALENT. REFER TO WDOT PRODUCT ACCEPTABILITY LIST AT: HTTP://WWW.DOT.WSCONSIN.GOV/BUSINESS/ENGRSERV/PALLTM. INLET PROTECTION SHALL BE INSTALLED PRIOR TO THE STORM SEWER SYSTEM RECEIVING SITE RUNOFF. OTHER THAN FOR PERFORMING MAINTENANCE, THESE DEVICES SHALL NOT BE REMOVED UNTIL PLAT-LEVEL STABILIZATION IS COMPLETE.

- COMPLET WITH WORK TECHNICAL STANDARD TOOL FOUND AT: HTTP://DNR.WI.GOV/TOPIC/STORMWATER/STANDARDS/CONST\_STANDARDS.HTML THIS WATER SHALL BE DISCHARGED IN A MANNER THAT DOES NOT INDUCE EROSION OF THE SITE OR ADJACENT PROPERTY.

EROSION CONTROL NOTES/SPECIFICATIONS: 1. EROSION CONTROL DEVICES AND/OR STRUCTURES SHALL BE INSTALLED PRIOR TO CLEARING AND GRUBBING OPERATIONS. THESE SHALL BE PROPERLY MAINTAINED FOR MAXIMUM EFFECTIVENESS UNTIL VEGETATION IS RE-ESTABLISHED.

2. EROSION CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ACCEPTANCE OF THIS PROJECT. EROSION CONTROL MEASURES AS SHOWN SHALL BE THE MINIMUM PRECAUTIONS THAT MILL BE ALLOWED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORNIZING AND CORRECTING ALL EROSION CONTROL MOBILEMS THAT ARE THE RESULT OF CONSTRUCTION ACTIVITES, ADDITIONAL EROSION CONTROL MEASURES, AS REQUESTED IN WRITING BY THE STATE OR LOCAL

3. ALL EROSION CONTROL MEASURES AND STRUCTURES SERVING THE SITE MUST BE INSPECTED AT LEAST WEEKLY OR WIT 24 HOURS OF THE TIME O.S INCHES OF RAIN IS PRODUCED. ALL MAINTENANCE WILL FOLLOW AN INSPECTION WITHIN 24 HOURS. INSPECTION SCHEDULE AND RECORD REEPING SHALL COMPLY WITH NR 216.46(9), WIS. ADM. CODE.

INSPECTORS, OR THE DEVELOPER'S ENGINEER, SHALL BE INSTALLED WITHIN 24 HOURS.

- PUMP SIZE (MAX GPM) TYPE I BAG SIZE (SQ-FT)
- DEWATERING WATER PUMPED FROM THE SITE SHALL BE TREATED BY USING A TEMPORARY SEDIMENTATION BASIN, PORTABLE DEWATERING BASIN, GEOTEXTILE BAG, OR AN EQUIVALENT DEVICE. SHOW ON THE PLAN THE ANTICIPATED LOCATIONS OF DEWATERING ACTIVITY, AND PROVDE AN ENGINEERING DETAIL OF THE DEWATERING SYSTEM. DEVISES SHALL COMPLY WITH WONR TECHNICAL STANDARD 1061 FOUND AT:

- 5. SOIL STOCKPILES A ROW OF SILT FENCE PLACED DOWNSLOPE AND AT LEAST 10 FEET AWAY FROM THE STOCKPILE SHALL PROTECT ALL STOCKPILES. SOIL STOCKPILES THAT ARE INACTIVE FOR MORE THAN 14 CONSECUTIVE DAYS SHALL BE STABILIZED WITH SEED & MULCH, EROSION MAT, POLYMER, OR COVERED WITH TARPS OR SIMILAR MATERIAL. NO STOCKPILE SHALL BE PLACED WITHIN 20 FEET OF A DRAINAGE WAY.

- 4. CONSTRUCTION ENTRANCES PROVIDE A STONE TRACKING PAD AT EACH POINT OF ACCESS. INSTALL ACCORDING TO WDNR STANDARD 1057. REFER TO WONR'S STORWWATER WEB PAGE OF TECHNICAL STANDARDS AT: HTTP://DNR.WI.GOV/TOPIC/STORWWATER/STANDARDS/CONST\_STANDARDS.HTML\_THE TRACKING PAD MUST BE MAINTAINED IN A CONDITION THAT PREVENTS THE TRACKING OF MATERIAL ONTO THE PUBLIC STREET.

- SITE PLAN NOTES:
  - 1. PAVEMENT DESIGN SHALL BE PER THE RECOMMENDATION OF THE SOILS CONSULTANT.

GRADING PLAN NOTES:

UTILITY PLAN NOTES:

AND CHARGES.

ANY DISCREPANCIES.

1. ALL GRADES ARE FINISH ELEVATION UNLESS NOTED OTHERWISE.

5. CONTRACTOR SHALL INSTALL TREE PROTECTION FENCING IN THE AREA BETWEEN THE CURB AND SIDEWALK AND EXTEND IT AT LEAST 5 FEET FROM BOTH SIDES OF THE TREE ALONG THE LENGTH OF THE TERRACE. NO EXCAVATION IS PERMITTED WITHIN 5 FEET OF THE OUTSIDE EDGE OF A TREE TRUNK. IF EXCAVATION WITHIN 5 FEET OF ANY TREE IS NECESSARY, CONTRACTOR SHALL CONTACT CITY FORESTRY (266-4416) PRIOR TO EXCAVATION TO ASSESS THE IMPACT TO THE TREE AND ROOT SYSTEM. TREE PRUNING SHALL BE COORDINATED WITH CITY FORESTRY PRIOT TO EXCENT OF CONSTRUCTION. TREE PROTECTION SPECIFICATIONS CAN BE FOUND IN SECTION 107.13 OF CITY OF MADISON STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION http://www.cityofmadison.com/business/pw/documents/stdspecs/2018/part1.pdf. ANY TREE REMOVALS THAT ARE REQUIRED FOR CONSTRUCTION AFTER THE DEVELOPMENT PLAN IS APPROVED WILL REQUIRE AT LEAST A 72 HOUR WAIT PERIOD BEFORE A TREE REMOVAL PERMIT CAN BE ISSUED BY FORESTRY, TO NOTIFY THE ALDER OF THE CHANGE IN THE TREE PLAN.

THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION, REMOVAL, AND DISPOSING IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES, OF ALL STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING DRIVES, DRAINAGE, STRUCTURES, UTLITIES, ETC., SUCH THAT THE IMPROVEMENTS SHOWN ON TREMAINING PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE SPECIFICATIONS.

3. THE CONTRACTOR SHALL COORDINATE WITH THE RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY FORCING ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE DEVELOPER IS RESPONSIBLE FOR PAYING ALL FEES

4. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ONSITE LOCATIONS OF EXISTING UTILITIES. NOTIFY THE ENGINEER OF

5.ALL EXISTING SEWERS, PIPING, AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES BEFORE PROCEEDING WITH THE WORK. UTILITIES DETERMINED TO BE ABANDONED AND LEFT IN PLACE SHALL BE GROUTED IF UNDER BUILDINGS.

6.ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC CABLE, AND/OR GAS LINES NEEDING TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. 7.CONTRACTOR SHALL PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, COVERED WALKWAYS, ETC. CONTRACTOR SHALL SUBMIT THEIR STREET OCCUPANCY PLAN TO TRAFFIC ENGINEERING FOR APPROVAL

4. THE RIGHT-OF-WAY IS THE SOLE JURISDICTION OF THE CITY OF MADISON AND IS SUBJECT TO CHANGE AT ANY TIME PER THE RECOMMENDATION/PLAN OF THE CITY

1. ALL WORK WITHIN THE CITY RIGHT OF WAY AND EASEMENTS SHALL BE COMPLIANT WITH THE CITY OF MADISON STANDARD SPECIFICATIONS CURRENT AT THE TIME OF CONSTRUCTION.

2. UTILITY INSTALLATION SHALL BE COORDINATED WITH ENGINEER AT LEAST 4 WEEKS PRIOR TO INSTALLATION TO ENSURE BUILDING INSPECTION APPROVAL IS OBTAINED.

2.TRAFFIC CONTROL SIGNAGE SHALL BE IN ACCORDANCE WITH FEDERAL, STATE, COUNTY, CITY, AND LOCAL CODE, WHICHEVER HAS JURISDICTION.

2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL

8.PRIOR TO DEMOLITION OCCURRING, ALL APPLICABLE EROSION CONTROL DEVICES ARE TO BE INSTALLED.

10. DAMAGE TO ALL EXISTING CONDITIONS TO REMAIN WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE

3.NEW APRONS SHALL BE CONSTRUCTED AND PLACED IN CONFORMANCE WITH THE CITY OF MADISON STANDARD DETAIL 3.02 FOR COMMERCIAL OPENINGS.

3.ANY SIDEWALK, CURB, OR OTHER PUBLIC PROPERTY DAMAGED AS PART OF THE CONSTRUCTION OF THE UTILITIES AND BUILDING SHALL BE REPLACED IN-KIND PER THE CITY OF MADISON STANDARD SPECIFICATIONS

2. CONTRACTOR SHALL VERIFY THE SIZE, TYPE, SLOPE, AND INVERTS OF ALL EXISTING STORM AND SANITARY LATERALS CALLED OUT TO BE CONNECTED TO. CONTRACTOR SHALL SUBMIT THE INFORMATION ON THE PIPES TO THE CITY INSPECTOR AND PROJECT CIVIL ENGINEER.

GENERAL NOTES: 1.1T IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF UNDERGROUND UTILITIES. UTILITIES WERE LOCATED BY OBSERVED EVIDENCE, MARKINGS PROVIDED BY DIGGER'S HOTLINE, AND RECORD DRAWINGS FROM THE CITY OF MADISON.

![](_page_21_Figure_54.jpeg)

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	ACCESSIBLE ROUTE
	EXISTING EASEMENT
	PROPERTY BOUNDARY
	PARKING STALL COUNT
	LANDSCAPED AREA
	BITUMINOUS PAVEMENT
	CONCRETE PAVEMENT
	SPOT GRADE
	FINISH GRADE
	EXISTING GRADE
	SIDEWALK
	EDGE OF PAVEMENT
	FLOW LINE
	LOW POINT
	HIGH POINT
	TOP OF CURB
	TOP OF WALL
	BOTTOM OF WALL
	BACK OF WALK
	FRONT OF WALK
	EXPOSURE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LATERAL
	UTILITY LINE DEMOLITION
	TREE REMOVAL
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	PROPOSED MAJOR CONTOUR
	PROPOSED RIDGE LINE
	PROPOSED SWALE/DITCH
	ACCESSIBLE PARKING SIGN
	VISION TRIANGLE (NO VISUAL OBSTRUCTIONS BETWEEN HEIGHTS OF 30" AND 10')
	RIPRAP
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	DISTURBANCE LIMITS
	SILT FENCE
	CHECK DAM

State						
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ISSUE DATES: 07/20/2023 09/21 09/21/2023 09/21/2023 09/21/2023 09/21/2023 09/21/2023 09/						

9. THE CONTRACTOR MAY LIMIT SAWCUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS, BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR IN KIND.

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LEGEND/ ABBREVIA

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> L.S. BIT.

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![](_page_22_Figure_0.jpeg)

		LEGEND					
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_	۲	1" IRON PIPE FOUND UNLESS NOTED		-		J <b>TSE</b> and Engineering, Inc.	
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	0	3/4" X 18" SOLID IRON RE-ROD SET, WT. 1.50 lbs./ft.			Madison Phone: 608 Fax: 608	WI 53704 3-250-9263 250-9266	
	<del>ф</del> -851.23	SPOT ELEVATION			e-mail: Mburs www.burses	e@BSE-INC.net .irveyengr.com	
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				re	nor the informati produced, distribut either in whole or	on herein is to be ed, used or disclosed, in part, excent as	23\dv
				sp	ecifically authorize and Engin	d by Burse Surveying eering, Inc.	9/20
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KUU	<b>N</b> S	NUCTION	ŀ				•

![](_page_23_Figure_0.jpeg)

Ø	Burses Surveying and Engineering. Inc. 2001 International Lane, Saite 101 Madison, WI 5370-1 Phone: 608-250-9263 Fare 608-250-9266 e-mail: Maarse@BSE-8ACnet www.barsesurveyengr.com
	APPROVALS FROM THE FROM THE FR
	FURLOW RESIDENCE 3701 COUNCIL CREST MADISON, DANE COUNTY, WISCONSIN HART DENOBLE BUILDERS, INC. 7923 AIRPORT RD MIDDLETON, WI 53562 MIDDLETON, WI 53562
	PROJECT #: BSE2589       PLOT DATE:     09/21/2023       09/21/2023       09/21/2023       1       09/21/2023       1       1       1       1       1       09/21/2023       1
	O7/20/2023 O9/21/2023 O/202 O
OR CONSTRUCTION	

![](_page_24_Figure_0.jpeg)

## **Furlow Residence**

Stormwater Runoff Rate Summary

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

Α	В	С	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%

![](_page_26_Figure_0.jpeg)

![](_page_26_Figure_1.jpeg)

## Dane County Map

![](_page_27_Picture_1.jpeg)

![](_page_28_Figure_0.jpeg)

![](_page_29_Figure_0.jpeg)

![](_page_30_Picture_0.jpeg)

**BSE2589 Stormwater Predeveloped Model** Prepared by Burse Surveying and Engineering Inc. HydroCAD® 10.10-7a s/n 08315 @ 2021 HydroCAD Software Solutions LLC

Printed 7/18/2023 Page 2

### Rainfall Events Listing

Event#	Event	Storm Type	Curve	Mode	Duration	B/B	Depth	АМС
	Name				(hours)		(inches)	
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

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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 35: Predeveloped

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

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### Summary for Subcatchment 3S: Predeveloped

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

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

	P	\rea (sf)	CN	Descriptic	n	
*		11,687	71	LS (HSG	C)	
*		219	98	Impervious	ð	
		11,906	71	Weighted	Average	
		11,687	71	98.16% Pa	ervious Area	
		219	98	1.84% Imp	ervious Area	
	Tc	Length	Sla	pe Velocit	y Capacity	Description
	(min)	(feet)	(ft/	ft) (ft/sea	c) (cfs)	
	0.2	65	0.088	30 4.4	5	Shallow Concentrated Flow,
						Grassed Waterway Kv= 15.0 fps
	4.1	63	0.21	40 0.2	6	Sheet Flow,
						Grass: Dense n= 0.240 P2= 2.84"
	4.3	128	Tota			

128 Total

### Subcatchment 3S: Predeveloped

![](_page_33_Figure_9.jpeg)

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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 35: Predeveloped

 $\label{eq:Runoff} $$ Runoff Area=11,906 $$ sf $1.84\%$ Impervious $$ Runoff Depth=0.91"$ Flow Length=128' $$ Tc=4.3 $$ min $$ CN=71 $$ Runoff=0.42 $$ cfs $0.021 $$ af $$ cfs $$ cfs $0.021 $$ af $$ cfs $$ 

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

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### Summary for Subcatchment 3S: Predeveloped

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

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

	P	\rea (sf)	CN	Descriptio	n	
*		11,687	71	LS (HSG	C)	
*		219	98	Impervious	ð	
		11,906	71	Weighted	Average	
		11,687	71	98.16% Pa	ervious Area	
		219	98	1.84% Imp	ervious Area	
	Tc	Length	Sla	pe Velocit	y Capacity	Description
	(min)	(feet)	(ft/	ft) (ft/sea	c) (cfs)	
	0.2	65	0.088	30 4.4	5	Shallow Concentrated Flow,
						Grassed Waterway Kv= 15.0 fps
	4.1	63	0.21	40 0.2	6	Sheet Flow,
						Grass: Dense n= 0.240 P2= 2.84"
	4.3	128	Tota			

128 Total

### Subcatchment 3S: Predeveloped

![](_page_35_Figure_9.jpeg)
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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 35: Predeveloped

 $\label{eq:Kunoff} $$ Runoff Area=11,906 $$ sf $$ 1.84\%$ Impervious $$ Runoff Depth=1.30"$ Flow Length=128' $$ Tc=4.3$ min $$ CN=71 $$ Runoff=0.60$ cfs $$ 0.030$ af $$ 1.84\%$ and $$ 1$ 

Total Runoff Area = 0.273 acRunoff Volume = 0.030 afAverage Runoff Depth = 1.30"98.16% Pervious = 0.268 ac1.84% Impervious = 0.005 ac

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#### Summary for Subcatchment 3S: Predeveloped

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

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

	P	\rea (sf)	CN	Description		
*		11,687	71	LS (HSG C)		
*		219	98	Impervious		
		11,906	71	Weighted Av	erage	
		11,687	71	98.16% Perv	ious Area	
	219 98 1.84% Impervious Area				vious Area	
	Тс	Length	Sla	pe Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft) (ft/sec)	(cfs)	
	0.2	65	0.088	30 4.45		Shallow Concentrated Flow,
						Grassed Waterway Kv= 15.0 fps
	4.1	63	0.21	40 0.26		Sheet Flow,
						Grass: Dense n= 0.240 P2= 2.84"
	4.3	128	Tota			

128 Total

#### Subcatchment 3S: Predeveloped



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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 35: Predeveloped

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

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#### Summary for Subcatchment 3S: Predeveloped

С

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

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

	P	\rea (sf)	CN	Description		
*		11,687	71	LS (HSG C)		
*		219	98	Impervious		
		11,906	71	Weighted Av	erage	
		11,687	71	98.16% Perv	ious Area	
	219 98 1.84% Impervious Area				vious Area	
	Тс	Length	Sla	pe Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft) (ft/sec)	(cfs)	
	0.2	65	0.088	30 4.45		Shallow Concentrated Flow,
						Grassed Waterway Kv= 15.0 fps
	4.1	63	0.21	40 0.26		Sheet Flow,
						Grass: Dense n= 0.240 P2= 2.84"
	4.3	128	Tota			

128 Total

#### Subcatchment 3S: Predeveloped



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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 35: Predeveloped

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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#### Summary for Subcatchment 3S: Predeveloped

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

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

	P	\rea (sf)	CN	Desci	ription		
*		11,687	71	LS (H	15G C)		
*		219	98	Imper	rvious		
		11,906	71 Weighted Ave			erage	
	11,687 71 98.16% Pervious Area 219 98 1.84% Impervious Area				3% Pervi	ous Area	
					6 Imperv	ious Area	
	Тс	Length	Sla	ipe Va	elocity	Capacity	Description
	(min)	(feet)	(ft/	ft) (f	t/sec)	(cfs)	
	0.2	65	0.088	30	4.45		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	4.1	63	0.21	40	0.26		Sheet Flow,
							Grass: Dense n= 0.240 P2= 2.84"
	4.3	128	Tota				

Total 128

#### Subcatchment 3S: Predeveloped



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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 35: Predeveloped

Total Runoff Area = 0.273 acRunoff Volume = 0.086 afAverage Runoff Depth = 3.78"98.16% Pervious = 0.268 ac1.84% Impervious = 0.005 ac

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#### Summary for Subcatchment 3S: 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", Ia/S=0.10

	P	\rea (sf)	CN	Descript	cion		
*		11,687	71	LS (HSC	ЭC)		
*		219	98	Impervio	us		
		11,906	71	Weighte	Veighted Average		
		11,687	7 71 98.16% Pervious Area				
	219 98 1.84% Impervious Area				1perv	ious Area	
	Tc	Length	Sla	pe Veloo	city	Capacity	Description
	(min)	(feet)	(ft/	ft) (ft/s	ec)	(cfs)	
	0.2	65	0.088	30 4	.45		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	4.1	63	0.214	40 O	.26		Sheet Flow,
							Grass: Dense n= 0.240 P2= 2.84"
	4.3	128	Tota				

#### Subcatchment 3S: Predeveloped



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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 35: Predeveloped

Total Runoff Area = 0.273 acRunoff Volume = 0.103 afAverage Runoff Depth = 4.53"98.16% Pervious = 0.268 ac1.84% Impervious = 0.005 ac

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#### Summary for Subcatchment 3S: 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

	P	\rea (sf)	CN	Description		
*		11,687	71	LS (HSG C)		
*		219	98	Impervious		
		11,906	71	Weighted Av	verage	
		11,687	71	98.16% Perv	vious Area	
		219	98	1.84% Imper	vious Area	
	Тс	Length	Sla	pe Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft) (ft/sec)	(cfs)	
	0.2	65	0.088	30 4.45		Shallow Concentrated Flow,
						Grassed Waterway Kv= 15.0 fps
	4.1	63	0.21	40 0.26		Sheet Flow,
						Grass: Dense n= 0.240 P2= 2.84"
	13	100	Toto	1		

128 Total

#### Subcatchment 3S: Predeveloped



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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 35: Predeveloped

 $\label{eq:Runoff} $$ Runoff Area=11,906 $$ sf $$ 1.84\%$ Impervious $$ Runoff Depth=5.77"$ Flow Length=128' $$ Tc=4.3$ min $$ CN=71$ $$ Runoff=2.62$ cfs $$ 0.131$ af $$ 1.84\%$$ 

Total Runoff Area = 0.273 acRunoff Volume = 0.131 afAverage Runoff Depth = 5.77"98.16% Pervious = 0.268 ac1.84% Impervious = 0.005 ac

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#### Summary for Subcatchment 3S: Predeveloped

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

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

	P	\rea (sf)	CN	Desci	ription		
*		11,687	71	LS (H	15G C)		
*		219	98	Imper	rvious		
		11,906	71 Weighted Ave			erage	
	11,687 71 98.16% Pervious Area 219 98 1.84% Impervious Area				3% Pervi	ous Area	
					6 Imperv	ious Area	
	Тс	Length	Sla	ipe Va	elocity	Capacity	Description
	(min)	(feet)	(ft/	ft) (f	t/sec)	(cfs)	
	0.2	65	0.088	30	4.45		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	4.1	63	0.21	40	0.26		Sheet Flow,
							Grass: Dense n= 0.240 P2= 2.84"
	4.3	128	Tota				

Total 128

#### Subcatchment 3S: Predeveloped





**BSE2589 Stormwater Post Developed Model** Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC

Printed 9/21/2023 Page 2

# Rainfall Events Listing

Event#	Event	Storm Type	Curve	Mode	Duration	B/B	Depth	АМС
	Name				(hours)		(inches)	
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

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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 15: 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 55: 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

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

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#### 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 2	2P : Rain Garde	n				

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", Ia/S=0.10

	P	\rea (sf)	CN	De	scription		
*		4,966	78	LS	(HSG D o	ne higher th	nan existing)
*		2,291	98	Ro	of	-	
*		367	98	SW	/		
*		49	100	Ra	in Garden		
		7,673	85	We	ighted Ave	erage	
		4,966	78	64	.72% Pervi	ous Area	
		2,707	98	35	.28% Impe	rvious Area	
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	2.3	24	0.05	20	0.18		Sheet Flow,
							Grass: Short n= 0.150 P2= 2.84"
	2.7	146	Tota	I			

## Subcatchment 15: Area to Rain Garden



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# Summary for Subcatchment 5S: Undetained Area

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

Runoff	=	0.23 cfs @	12.10 hrs,	Volume=	0.010 af, Depth=	1.26"
Route	d to Lii	nk 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

	P	\rea (sf)	CN	De	escription								
*		2,933	78	LS	6 (HSG D a	ne higher th	nan existing)						
*		546	98	Rc	oof	F							
*		710	98	Pa	avement								
*		45	98	De	eck								
		4,234	84	We	eighted Ave	erage							
		2,933	78	69	9.27% Pervi	ous Area							
		1,301	98	30	D.73% Impe	rvious Area							
	Тс	Length	Sla	pe	Velocity	Capacity	Description						
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)							
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,						
							Grassed Waterway Kv= 15.0 fps						
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,						
							Smooth surfaces n= 0.011 P2= 2.84"						
	0.6	28	0.01	30	0.85		Sheet Flow,						
							Smooth surfaces n= 0.011 P2= 2.84"						
	0.7	52	Tota	1									

Hydrograph 0.25 0.24 Runoff 0.23-0.22-0.23 cfs MSE 24-hr 4 0.21 1-yr Rainfall=2.49" 0.2 0.19la/S=0.10 0.18 0.17-Runoff Area=4,234 sf 0.16 0.15 0.14 0.13 (cfs) Runoff Volume=0.010 af Flow 0.12 0.11 Runoff Depth=1.26" 0.1-Flow Length=52' 0.09 0.08 Tc=0.7 min 0.07 0.06 CN=84 0.05 0.04-0.03-0.02 0.01 0 1 12 13 14 21 22 23 24 25 Ò ż Ż 8 ģ 10 11 15 16 17 18 19 20 3 4 5 6

Time (hours)

#### Subcatchment 55: Undetained Area

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## Summary for Pond 2P: Rain Garden

Inflow Area	a =	0.176 ac, 35	.28% Impervious, Inflow Dept	≎h = 1.31"	for 1-yr ev	vent
Inflow	=	0.41 cfs @	12.11 hrs, Volume=	0.019 af		
Outflow	=	0.40 cfs @	12.12 hrs, Volume=	0.018 af, A	tten= 3%,	Lag= 0.6 min
Discarded	=	0.02 cfs @	12.12 hrs, Volume=	0.010 af		
Primary	=	0.38 cfs @	12.12 hrs, Volume=	<i>0.008 a</i> f		
Routed	to Link 6	L : 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	Inver	t Ava	ail.Storage	Storage Descripti	on				
#1	878.49	9'	307 cf	Custom Stage Da	Custom Stage Data (Prismatic) Listed below (Recalc)				
Elevat (fe	cion eet)	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	Inve	ert Outle	t Devices					
#1 #2	Discarded Primary	878.49' <b>3.600</b> Conduc 881.50' <b>2 0' Ion</b>		<b>D in/hr Exfiltration ov</b> activity to Groundwa ong + 1.0 '/' SideZ x 2	in/hr Exfiltration over Surface area stivity to Groundwater Elevation = 871.00' na. + 10.'' Side7 x 20.0' breadth Broad-Created Rectangular Weir				
Head (feet Coef. (Engl		(feet) 0.20 0.40 ( (English) 2.68 2.70	0.60 0.80 1.00 2.70 2.64 2.63	1.20 1.40 1.60 3 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) Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC





# Summary for Link 6L: Summary

Inflow Area	a =	0.273 ac, 33	.66% Impervious, Inflow Dept	h= 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, A	tten= 0%, Lag= 0.0 min

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



#### Link 6L: Summary

Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC

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 15: Area to Rain GardenRunoff 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 afSubcatchment 55: Undetained AreaRunoff 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

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

Pond 2P: Rain Garden

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

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#### Summary for Subcatchment 1S: Area to Rain Garden

0.024 af, Depth= 1.60" Runoff 0.50 cfs @ 12.11 hrs, Volume= = 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

	P	\rea (sf)	CN	Dee	scription		
*		4,966	78	LS	(HSG D o	ne higher th	nan existing)
*		2,291	98	Roc	of	·	
*		367	98	SW	,		
*		49	100	Rai	n Garden		
		7,673	85	Wei	ghted Ave	erage	
		4,966	78	64	72% Pervi	ous Area	
		2,707	98	35.	.28% Impe	rvious Area	
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	2.3	24	0.05	20	0.18		Sheet Flow,
							Grass: Short n= 0.150 P2= 2.84"
	2.7	146	Tota	I			

# 146 Total

#### Subcatchment 1S: Area to Rain Garden



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# Summary for Subcatchment 5S: Undetained Area

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

Runoff	=	0.27 cfs @	12.10 hrs,	Volume=	0.0	212 af,	Depth=	1.54"
Route	d to Lii	nk 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

	P	\rea (sf)	CN	De	escription									
*		2,933	78	LS	6 (HSG D o	ne higher th	nan existing)							
*		546	98	Rc	of									
*		710	98	Pa	ivement									
*		45	98	De	eck									
		4,234	84	We	eighted Ave	erage								
		2,933	78	69	9.27% Pervi	ous Area								
		1,301	98	30	).73% Impe	rvious Area								
	Tc	Length	Sla	pe	Velocity	Capacity	Description							
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)								
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,							
							Grassed Waterway Kv= 15.0 fps							
	<i>O</i> .1	14	1.000	00	4.18		Sheet Flow,							
							Smooth surfaces n= 0.011 P2= 2.84"							
	0.6	28	0.01	30	0.85		Sheet Flow,							
							Smooth surfaces n= 0.011 P2= 2.84"							
	0.7	52	Tota											



# Subcatchment 5S: Undetained Area

# Summary for Pond 2P: Rain Garden

Inflow Area	1 =	0.176 ac, 35	.28% Impervious, Inflow Dept	$h = 1.60^{\circ}$	for 2-yr <i>e</i> v	/ent
Inflow	=	0.50 cfs @	12.11 hrs, Volume=	0.024 af		
Outflow	=	0.49 cfs @	12.12 hrs, Volume=	0.022 af, A	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		
10 - H I	For Line C					

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	Inver	t Ava	ail.Storage	Storage Description	on			
#1	878.49	9'	307 cf	Custom Stage Da	<b>ta (Prismatic)</b> Lis <sup>.</sup>	ced below (Recalc)		
Elevat	tion	Surf.Area	Voids	Inc.Store	Cum.Store			
(†e	et)	(sq-tt)	(%)	(cubic-feet)	(cubic-teet)			
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	Inve	rt Outlet	Devices				
#1	Discarded	878.4	-9' <b>3.60(</b> Condu	<b>) in/hr Exfiltration ov</b> activity to Groundwa <sup>s</sup>	<b>er Surface area</b> ter Elevation = 871.	.00'		
#2 Primary		881.50' <b>2.0' l</b> e Head Coef.		<b>ng + 1.0 '/ SideZ x 20.0' breadth Broad-Crested Rectangular Weir</b> (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 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) Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC



Pond 2P: Rain Garden

# Summary for Link 6L: Summary

Inflow Ar	ea =	0.273 ac, 33	5.66% Impervious,	Inflow Depth = $1.0$	4" for 2-yr <i>e</i> vent
Inflow	=	0.73 cfs @	12.10 hrs, Volume	= 0.024 af	2
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

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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 15: 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 55: 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

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 =  $2.10^{\circ}$ 66.34% Pervious = 0.181 ac 33.66% Impervious = 0.092 ac

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#### Summary for Subcatchment 1S: Area to Rain Garden

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

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

	P	Area (sf)	CN	De	scription		
*		4,966	78	LS	(HSG D o	ne higher th	nan existing)
*		2,291	98	Ro	of	-	
*		367	98	SW	/		
*		49	100	Ra	in Garden		
		7,673	85	We	ighted Ave	erage	
		4,966	78	64	.72% Pervi	ous Area	
		2,707	98	35	.28% Impe	rvious Area	
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	2.3	24	0.05	20	0.18		Sheet Flow,
							Grass: Short n= 0.150 P2= 2.84"
	2.7	146	Tota	I			

# 146 Total

# Subcatchment 15: Area to Rain Garden



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# Summary for Subcatchment 5S: Undetained Area

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

Runoff	=	0.36 cfs @	12.10 hrs,	Volume=	0.017 af, Depth=	2.06"
Route	d to Lir	1k 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

	P	\rea (sf)	CN	De	escription		
*		2,933	78	LS	6 (HSG D a	ne higher th	nan existing)
*		546	98	Rc	oof	-	
*		710	98	Pa	avement		
*		45	98	De	eck		
		4,234	84	We	eighted Ave	erage	
		2,933	78	69	9.27% Pervi	ous Area	
		1,301	98	30	0.73% Impe	rvious Area	
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	00	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	0.6	28	0.01	30	0.85		Sheet Flow,
_							Smooth surfaces n= 0.011 P2= 2.84"
	0.7	52	Tota				

# **BSE2589 Stormwater Post Developed Model** Prepared by Burse Surveying & Enginering Inc

HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC



#### Subcatchment 5S: Undetained Area

# Summary for Pond 2P: Rain Garden

Inflow Area	a =	0.176 ac, 35.	28% Impervious, Inflow Dept	zh = 2.13"	for 5-yre	vent
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 6	L : 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	Inver	t Ava	ail.Storage	Storage Description	วท			
#1 878.45		)' 307 cf		Custom Stage Da	ted below (Recalc)			
Elevation		Surf.Area Voids		Inc.Store	Cum.Store			
(†e	et)	(sq-tt)	(%)	(cubic-feet)	(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	Inve	rt Outlet	t Devices				
#1	Discarded 878.49'		-9' <b>3.60(</b> Condu	<b>3.600 in/hr Exfiltration over Surface area</b> Conductivity to Groundwater Elevation = 871.00'				
#2 Primary		881.50' <b>2.0'  </b> Heac Coef.		ong +1.0'1' SideZ x 20.0' breadth Broad-Crested Rectangular Weir 1 (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 . (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) Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC



Pond 2P: Rain Garden

# Summary for Link 6L: Summary

Inflow Area	1 =	0.273 ac, 33	.66% Impervious, Inflow Dept	≎h = 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, A	Atten= 0%, Lag= 0.0 min

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



Link 6L: Summary

Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 © 2023 HydroCAD Software Solutions LLC MSE 24-hr 4 10-yr Rainfall=4.09", la/S=0.10 Printed 9/21/2023 Page 24

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 15: Area to Rain GardenRunoff Area=7,673 of 35.28% Impervious Runoff Depth=2.70"<br/>Flow Length=146' Tc=2.7 min CN=85 Runoff=0.83 cfs 0.040 afSubcatchment 55: Undetained AreaRunoff Area=4,234 of 30.73% Impervious Runoff Depth=2.62"<br/>Flow Length=52' Tc=0.7 min CN=84 Runoff=0.45 cfs 0.021 afPond 2P: Rain GardenPeak Elev=881.76' Storage=213 cf Inflow=0.83 cfs 0.040 af<br/>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 acRunoff Volume = 0.061 afAverage Runoff Depth = 2.67"66.34% Pervious = 0.181 ac33.66% Impervious = 0.092 ac
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## 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", Ia/S=0.10

	P	\rea (sf)	CN	De	scription		
*		4,966	78	LS	(HSG D o	ne higher th	nan existing)
*		2,291	98	Ro	of	·	•
*		367	98	SV	V		
*		49	100	Ra	in Garden		
		7,673	85	We	ighted Ave	erage	
		4,966	78	64	.72% Pervi	ous Area	
		2,707	98	35	.28% Impe	rvious Area	
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	2.3	24	0.05	20	0.18		Sheet Flow,
							Grass: Short n= 0.150 P2= 2.84"
	2.7	146	Tota	I			

#### Subcatchment 15: Area to Rain Garden



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## 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"
Route	d to Lii	nk 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", Ia/S=0.10

	P	\rea (sf)	CN	De	escription							
*		2,933	78	LS	6 (HSG D o	HSG D one higher than existing)						
*		546	98	Rc	of	-						
*		710	98	Pa	ivement							
*		45	98	De	eck							
		4,234	84	We	eighted Ave	erage						
		2,933	78	69	9.27% Pervi	ous Area						
		1,301	98	30	).73% Impe	rvious Area						
	Tc	Length	Sla	pe	Velocity	Capacity	Description					
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)						
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,					
							Grassed Waterway Kv= 15.0 fps					
	<i>O</i> .1	14	1.00	00	4.18		Sheet Flow,					
							Smooth surfaces n= 0.011 P2= 2.84"					
	0.6	28	0.01	30	0.85		Sheet Flow,					
							Smooth surfaces n= 0.011 P2= 2.84"					
	0.7	52	Tota									

Subcatchment 55: Undetained Area



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## Summary for Pond 2P: Rain Garden

Inflow Area	a =	0.176 ac, 35.	28% Impervious, Inflow Dept	th = 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 6	L : 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	Inver	t Ava	ail.Storage	Storage Descripti	on			
#1	878.49	9'	307 cf	Custom Stage Da	Custom Stage Data (Prismatic) Listed below (Recalc)			
Elevat	tion	Surf.Area	Voids	Inc.Store	Cum.Store	3		
(fe	et)	(sq-ft)	(%)	(cubic-feet)	(cubic-feet)	<u> </u>		
878	.49	49	0.0	0	С	)		
878	.50	49	27.0	0	С	)		
881	.00	49	100.0	123	123	)		
881	.50	106	100.0	39	161	I		
882	.00	476	100.0	146	307	,		
Device	Routing	Inve	ert Outlet	Devices				
#1	Discarded	ed 878.49'		<b>3.600 in/hr Exfiltration over Surface area</b>				
#2 Primary		881.50' <b>2.0' lo</b> Head Coef.		<b>ng + 1.0 '/ SideZ x 20.0' breadth Broad-Crested Rectangular Weir</b> (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 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) Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC

Pond 2P: Rain Garden



## Summary for Link 6L: Summary

Inflow Area	a =	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, A	tten= 0%, Lag= 0.0 min

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



Link 6L: Summary

Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC

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 15: 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 59: 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

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## Summary for Subcatchment 1S: Area to Rain Garden

0.052 af, Depth= 3.55" Runoff 1.07 cfs @ 12.10 hrs, Volume= = 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

	P	\rea (sf)	CN	De	scription						
*		4,966	78	LS	(HSG D o	ne higher th	nan existing)				
*		2,291	98	Ro	of						
*		367	98	SW	/						
*		49	100	Ra	in Garden						
		7,673	85	We	ighted Ave	erage					
		4,966	78	64	.72% Pervi	ous Area					
		2,707	98	35	.28% Impe	rvious Area					
	Tc	Length	Sla	pe	Velocity	Capacity	Description				
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)					
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,				
							Grassed Waterway Kv= 15.0 fps				
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,				
							Smooth surfaces n= 0.011 P2= 2.84"				
	2.3	24	0.05	20	0.18		Sheet Flow,				
							Grass: Short n= 0.150 P2= 2.84"				
	2.7	146	Tota	I							

#### 146 Total

#### Subcatchment 1S: Area to Rain Garden



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## Summary for Subcatchment 5S: Undetained Area

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

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

	P	\rea (sf)	CN	De	escription							
*		2,933	78	LS	6 (HSG D o	HSG D one higher than existing)						
*		546	98	Rc	of	-						
*		710	98	Pa	ivement							
*		45	98	De	eck							
		4,234	84	We	eighted Ave	erage						
		2,933	78	69	9.27% Pervi	ous Area						
		1,301	98	30	0.73% Impe	rvious Area						
	Tc	Length	Sla	pe	Velocity	Capacity	Description					
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)						
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,					
							Grassed Waterway Kv= 15.0 fps					
	<i>O</i> .1	14	1.00	00	4.18		Sheet Flow,					
							Smooth surfaces n= 0.011 P2= 2.84"					
	0.6	28	0.01	30	0.85		Sheet Flow,					
							Smooth surfaces n= 0.011 P2= 2.84"					
	0.7	52	Tota									

Hydrograph 0.65 Runoff 0.59 cfs 0.6 MSE 24-hr 4 0.55 25-yr Rainfall=5.02" 0.5 la/S=0.10 0.45 Runoff Area=4,234 sf 0.4 **Elow** (cts) 0.35 Runoff Volume=0.028 af Runoff Depth=3.46" Flow Length=52' 0.25 0.2 Tc=0.7 min 0.15 **CN=84** 0.1 0.05 0-1 2 12 13 14 15 16 17 18 19 20 21 22 23 24 25 ò ż 5 6 Ż 8 ģ 10 11 4 Time (hours)

## Subcatchment 55: Undetained Area

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## Summary for Pond 2P: Rain Garden

Inflow Area	a =	0.176 ac, 3	5.28% 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=	<i>0.050 a</i> f, At	ten= 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 G	L : 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	Inver	rt Ava	ail.Storage	Storage Descripti	on			
#1	878.4	9'	307 cf	Custom Stage Data (Prismatic) Listed below (Recalc)				
Eleva	tion	Surf.Area	Voids	Inc.Store	Cum.Store			
(†a	eet)	(sq-tt)	(%)	(cubic-teet)	(cubic-teet)			
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	Inve	ert Outlet	Devices				
#1	Discarded	d 878.49' <b>3</b>		<b>3.600 in/hr Exfiltration over Surface area</b>				
#2	Primary	881.50' <b>2.</b> Ha Ca		<b>2.0' long + 1.0'/' SideZ x 20.0' breadth Broad-Crested Rectangular Weir</b> 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)

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Pond 2P: Rain Garden

## Summary for Link 6L: Summary

Inflow Area	1 =	0.273 ac, 33	.66% Impervious, Inflow De	pth = 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, A	tten= 0%, Lag= 0.0 min

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



## Link 6L: Summary

Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 © 2023 HydroCAD Software Solutions LLC MSE 24-hr 4 100-yr Rainfall=6.66", la/S=0.10 Printed 9/21/2023 Page 38

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 15: 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 55: 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

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

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## 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", Ia/S=0.10

	P	\rea (sf)	CN	Des	scription		
*		4,966	78	LS	(HSG D a	ne higher tl	nan existing)
*		2,291	98	Roo	of		
*		367	98	SW	/		
*		49	100	Rai	in Garden		
		7,673	85	We	ighted Ave	erage	
		4,966	78	64	.72% Pervi	ous Area	
		2,707	98	35	.28% Impe	rvious Ar <i>ea</i>	a de la constante de
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	2.3	24	0.05	20	0.18		Sheet Flow,
							Grass: Short n= 0.150 P2= 2.84"

2.7 146 Total

## Subcatchment 15: Area to Rain Garden



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## Summary for Subcatchment 5S: Undetained Area

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

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

	P	\rea (sf)	CN	De	escription		
*		2,933	78	LS	6 (HSG D o	ne higher th	nan existing)
*		546	98	Rc	of	·	•
*		710	98	Pa	vement		
*		45	98	De	eck		
		4,234	84	We	eighted Ave	erage	
		2,933	78	69	9.27% Pervi	ous Area	
		1,301	98	30	0.73% Impe	rvious Area	
	Тс	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	00	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	0.6	28	0.01	30	0.85		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	0.7	52	Tota				

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## Subcatchment 5S: Undetained Area

## Summary for Pond 2P: Rain Garden

Inflow Area	a =	0.176 ac, 35	5.28% Impervious, Inflow De	pth = 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, 1	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 G	L : 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	Inver	rt Ava	ail.Storage	Storage Descripti	on				
#1	878.4	9'	307 cf	Custom Stage Da	Custom Stage Data (Prismatic) Listed below (Recalc)				
Eleva	tion	Surf.Area	Voids	Inc.Store	Cum.Store				
(fa	eet)	(sq-ft)	(%)	(cubic-feet)	(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	Inve	rt Outlet	c Devices					
#1	Discarded	d 878.49' <b>3</b> . Ci		<b>3.600 in/hr Exfiltration over Surface area</b> Conductivity to Groundwater Elevation = 871.00'					
#2	Primary	881.5	0' <b>2.0' lo</b> Head Coef.	n <b>g + 1.0 '/ SideZ x</b> (feet) 0.20 0.40 ( (English) 2.68 2.70	<b>20.0' breadth Bro</b> 0.60 0.80 1.00 <sup>-</sup> 0 2.70 2.64 2.63	<b>ad-Crested Rectangular Weir</b> 1.20 1.40 1.60 3 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) Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC



Pond 2P: Rain Garden

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## Summary for Link 6L: Summary

Inflow A	rea =	0.273 ac, 33	.66% Impervious,	Inflow Depth =	4.23'	' for 100-y	r event
Inflow	=	2.27 cfs @	12.10 hrs, Volume	= 0.090	3 af		
Primary	=	2.27 cfs @	12.10 hrs, Volume	= 0.096	5 af,	Atten=0%,	Lag= 0.0 min

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



Link 6L: Summary

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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 15: 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 55: 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

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

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## Summary for Subcatchment 1S: Area to Rain Garden

0.087 af, Depth= 5.93" Runoff 1.73 cfs @ 12.10 hrs, Volume= = 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

	P	\rea (sf)	CN	Dee	scription		
*		4,966	78	LS	(HSG D o	ne higher th	nan existing)
*		2,291	98	Roc	of	·	
*		367	98	SW	,		
*		49	100	Rai	n Garden		
		7,673	85	Wei	ghted Ave	erage	
		4,966	78	64	72% Pervi	ous Area	
		2,707	98	35.	.28% Impe	rvious Area	
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	2.3	24	0.05	20	0.18		Sheet Flow,
							Grass: Short n= 0.150 P2= 2.84"
	2.7	146	Tota	I			

## 146 Total

#### Subcatchment 1S: Area to Rain Garden



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## Summary for Subcatchment 5S: Undetained Area

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

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

	P	\rea (sf)	CN	De	escription		
*		2,933	78	LS	6 (HSG D o	ne higher th	nan existing)
*		546	98	Rc	of	-	
*		710	98	Pa	ivement		
*		45	98	De	eck		
		4,234	84	We	eighted Ave	erage	
		2,933	78	69	9.27% Pervi	ous Area	
		1,301	98	30	0.73% Impe	rvious Area	
	Tc	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.00	00	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	0.6	28	0.01	30	0.85		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	0.7	52	Tota				

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Subcatchment 5S: Undetained Area

## Summary for Pond 2P: Rain Garden

Inflow Area	=	0.176 ac, 35	.28% Impervious, Inflow Dept	th = 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 mir
Discarded	=	0.04 cfs @	12.11 hrs, Volume=	0.017 af
Primary	=	1.66 cfs @	12.11 hrs, Volume=	0.067 af
10 - L I				

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	Inve	rt Ava	ail.Storage	Storage Descripti	on				
#1 878.4		9' 307 cf		Custom Stage Da	ta (Prismatic)	Listed below (Recalc)			
Eleva (fe	tion eet)	Surf.Area (sa-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	)			
878	5.49	49	0.0	0	(00010 1000)	<u>-</u> )			
878	.50	49	27.0	0	C				
881	.00	49	100.0	123	123	5			
881	.50	106	100.0	39	161	1			
882	00	476	100.0	146	307	7			
Device	Routing	Inve	ert Outlet	t Devices					
#1	Discarded	'iscarded 878.49'		<b>3.600 in/hr Exfiltration over Surface area</b>					
#2	Primary	881.5	50' <b>2.0' lo</b> Head Coef.	o <b>ng + 1.0 '/' SideZ x</b> : (feet) 0.20 0.40 ( (English) 2.68 2.70	<b>20.0' breadth B</b> 0.60 0.80 1.00 0 2.70 2.64 2.6	<b>road-Crested Rectangular Weir</b> ) 1.20 1.40 1.60 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) Prepared by Burse Surveying & Enginering Inc HydroCAD® 10.20-3f s/n 08315 @ 2023 HydroCAD Software Solutions LLC



Pond 2P: Rain Garden

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## Summary for Link 6L: Summary

Inflow A	rea =	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





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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 15: 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 55: 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

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

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## 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", Ia/S=0.10

	P	\rea (sf)	CN	Dee	scription					
*		4,966	78	LS	δ (HSG D one higher than existing)					
*		2,291	98	Roc	vof					
*		367	98	SW	,					
*		49	100	Rai	n Garden					
		7,673	85	Wei	ghted Ave	erage				
		4,966	78	64.	72% Pervi	ous Area				
		2,707	98	35.	.28% Impe	rvious Area				
	Tc	Length	Sla	pe	Velocity	Capacity	Description			
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)				
	0.3	108	0.13	70	5.55		Shallow Concentrated Flow,			
							Grassed Waterway Kv= 15.0 fps			
	<i>O</i> .1	14	1.000	20	4.18		Sheet Flow,			
							Smooth surfaces n= 0.011 P2= 2.84"			
	2.3	24	0.05	20	0.18		Sheet Flow,			
							Grass: Short n= 0.150 P2= 2.84"			
	2.7	146	Tota	I						



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## Summary for Subcatchment 5S: Undetained Area

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

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", Ia/S=0.10

	P	\rea (sf)	CN	De	escription		
*		2,933	78	LS	6 (HSG D o	ne higher th	nan existing)
*		546	98	Rc	of	·	•
*		710	98	Pa	vement		
*		45	98	De	eck		
		4,234	84	We	eighted Ave	erage	
		2,933	78	69	9.27% Pervi	ious Area	
		1,301	98	30	0.73% Impe	rvious Area	
	Тс	Length	Sla	pe	Velocity	Capacity	Description
	(min)	(feet)	(ft/	ft)	(ft/sec)	(cfs)	
	0.0	10	0.31	50	8.42		Shallow Concentrated Flow,
							Grassed Waterway Kv= 15.0 fps
	<i>O</i> .1	14	1.000	00	4.18		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	0.6	28	0.01	30	0.85		Sheet Flow,
							Smooth surfaces n= 0.011 P2= 2.84"
	0.7	52	Tota				

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Subcatchment 5S: Undetained Area

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## Summary for Pond 2P: Rain Garden

Inflow Area	a =	0.176 ac, 35	.28% Impervious, Inflow Dept	ch = 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 6	L : 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	Inver	t Ava	ail.Storage	Storage Descripti	on		
#1	878.49	9'	307 cf	Custom Stage Da	ta (Prismatic) 🛛	listed below (Recalc)	
Eleva	tion	Surf.Area	Voids	Inc.Store	Cum.Store		
(16	eet)	(SQ-TI)	(%)	(CUDIC-TEET)	(CUDIC-TEET)		
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	Inve	rt Outlet	: Devices			
#1	Discarded	878.4	-9' <b>3.600</b> Condu	) in/hr Exfiltration ov ctivity to Groundwa	<b>er Surface area</b> ter Elevation = 8	371.00'	
#2 Primary		881.50' <b>2.0' lor</b> Head ( Coef. (1		<b>g + 1.0'?' SideZ x 20.0' breadth Broad-Crested Rectangular Weir</b> feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 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)

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Pond 2P: Rain Garden

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## Summary for Link 6L: Summary

Inflow Ar	ea =	0.273 ac, 33	5.66% Impervious,	Inflow Depth =	6.32'	' for 500-	yr event
Inflow	=	3.19 cfs @	12.10 hrs, Volume	0.14	4 af		
Primary	=	3.19 cfs @	12.10 hrs, Volume	e= 0.14-	4 af,	Atten=0%,	Lag= 0.0 min

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



Link 6L: Summary

# **Furlow Residence**

Stormwater Runoff Rate Summary

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

Α	В	С	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%