A STORMWATER DETENTION ANALYSIS

OF THE PROPOSED DEVELOPMENT OF

GRANT WAREHOUSE & STORAGE LOT 4

IN

CITY OF O'FALLON, MISSOURI

FOR

MJSM, L.L.C.
2209 DROSTE ROAD
SAINT CHARLES, MO 63301

BAX PROJECT NO. 01-11691F

September 13, 2019

Prepared by:
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9-13-19

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INTRODUCTION:

The currently undeveloped site is located in the City of O'Fallon, Missouri and is comprised of 6.92 acres of land. In this report, the site shall be analyzed for the construction of the proposed Grant Warehouse and Storage Lot 4 which is an industrial site. On this site, an existing Dry Detention Basin as well as the Existing Outfall Structure shall be utilized to provide the Stormwater Attenuation required by the City of O'Fallon Design Standards for the development. The storage volume and outflow rates shall be proportioned so that the peak rate of runoff leaving the tract under Postdeveloped Conditions is less than or equal to the peak rate of runoff under Predeveloped Conditions for the 2, 15, 25, and 100 Year 20 Minute Design Storms. The safe passage of the 100 Year 20 Minute Design Storm will also be analyzed assuming the low flow slot is blocked.

GENERAL SITE DATA AND RUNOFF CALCULATIONS

The Predeveloped Runoff Factors used for the analysis are:

Land Use	Percent Impervious	PI Factors (cfs/ac)			
		2 year	15 year	25 year	100 year
Greenspace	0-5%	1.15	1.70	2.00	2.29

The Postdeveloped Runoff Factors used for the analysis are:

Land Use	Percent Impervious	PI Factors (cfs/ac)			
		2 year	15 year	25 year	100 year
Greenspace	0-5%	1.15	1.70	2.00	2.29
Pavement	100%	2.39	3.54	4.16	4.77
Building	100%	2.39	3.54	4.16	4.77
Basin	100%	2.39	3.54	4.16	4.77

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DETENTION BASIN CALCULATIONS

PREDEVELOPED CONDITIONS:

The Predeveloped site has two separate discharge points to be analyzed for the total runoff from the watershed using the rational method to determine the Predeveloped Runoff rates leaving the site. For this analysis, the Predeveloped Runoff for the 2, 15, 25, and 100 year 20 minute design storms will be calculated for comparison to the Postdeveloped Runoff to determine the quantity of detention that will be required.

Discharge Point 1

2 Year				
Onsite Greenspace	1.76 ac	x 1.15 cfs/ac	=	2.02 cfs
Offsite Greenspace	1.95 ac	x 1.15 cfs/ac	=	2.24 cfs
		Total	=	4.26 cfs
15 Year				
Onsite Greenspace	1.76 ac	x 1.70 cfs/ac	=	2.99 cfs
Offsite Greenspace	1.95 ac	x 1.70 cfs/ac	=	3.32 cfs
		Total	=	6.31 cfs
25 Year				
Onsite Greenspace	1.76 ac	x 2.00 cfs/ac	=	3.52 cfs
Offsite Greenspace	1.95 ac	x 2.00 cfs/ac	=	3.90 cfs
		Total	=	7.42 cfs
100 Year				
Onsite Greenspace	1.76 ac	x 2.29 cfs/ac	=	4.03 cfs
Offsite Greenspace	1.95 ac	x 2.29 cfs/ac	=	4.47 cfs
		Total	=	8.50 cfs

2 year-20 minute storm:	4.26 cfs
15 year-20 minute storm:	6.31 cfs
25 year-20 minute storm:	7.42 cfs
100 year-20 minute storm:	8.50 cfs

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Discharge Point 2

2 Year				
Onsite Greenspace	5.16 ac	x 1.15 cfs/ac	=	5.93 cfs
Offsite Greenspace	0.95 ac	x 1.15 cfs/ac	=	1.09 cfs
		Total	=	7.02 cfs
15 Year				
Onsite Greenspace	5.16 ac	x 1.70 cfs/ac	=	8.77 cfs
Offsite Greenspace	0.95 ac	x 1.70 cfs/ac	=	1.62 cfs
		Total	=	10.39 cfs
25 Year				
Onsite Greenspace	5.16 ac	x 2.00 cfs/ac	=	10.32 cfs
Offsite Greenspace	0.95 ac	x 2.00 cfs/ac	=	1.90 cfs
		Total	=	12.22 cfs
100 Year				
Onsite Greenspace	5.16 ac	x 2.29 cfs/ac	=	11.82 cfs
Offsite Greenspace	0.95 ac	x 2.29 cfs/ac	=	2.18 cfs
		Total	=	14.00 cfs

2 year-20 minute storm:	7.02 cfs
15 year-20 minute storm:	10.39 cfs
25 year-20 minute storm:	12.22 cfs
100 year-20 minute storm:	14.00 cfs

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POSTDEVELOPED CONDITIONS:

The Postdeveloped site maintains the same two distinct watersheds. Using the Rational Method, the Postdeveloped Runoff for the 2, 15, 25, and 100 year 20 Minute Design Storms will be calculated for comparison to the previously calculated Predeveloped Runoff to determine the quantity of detention that will be required.

Discharge Point 1

2 Year

Onsite Greenspace	0.50 ac	x	1.15 cfs/ac	=	0.58 cfs
Onsite Pavement	0.66 ac	x	2.39 cfs/ac	=	1.58 cfs
Onsite Building	0.20 ac	x	2.39 cfs/ac	=	0.48 cfs
Onsite Basin	0.07 ac	x	2.39 cfs/ac	=	0.17 cfs
Offsite Greenspace	0.07 ac	x	1.15 cfs/ac	=	0.08 cfs
			Total	=	2.89 cfs

15 Year

Onsite Greenspace	0.50 ac	x	1.70 cfs/ac	=	0.85 cfs
Onsite Pavement	0.66 ac	x	3.54 cfs/ac	=	2.34 cfs
Onsite Building	0.20 ac	x	3.54 cfs/ac	=	0.71 cfs
Onsite Basin	0.07 ac	x	3.54 cfs/ac	=	0.25 cfs
Offsite Greenspace	0.07 ac	x	1.70 cfs/ac	=	0.12 cfs
			Total	=	4.27 cfs

25 Year

Onsite Greenspace	0.50 ac	x	2.00 cfs/ac	=	1.00 cfs
Onsite Pavement	0.66 ac	x	4.16 cfs/ac	=	2.75 cfs
Onsite Building	0.20 ac	x	4.16 cfs/ac	=	0.83 cfs
Onsite Basin	0.07 ac	x	4.16 cfs/ac	=	0.29 cfs
Offsite Greenspace	0.07 ac	x	2.00 cfs/ac	=	0.14 cfs
			Total	=	5.01 cfs

100 Year

Onsite Greenspace	0.50 ac	x	2.29 cfs/ac	=	1.15 cfs
Onsite Pavement	0.66 ac	x	4.77 cfs/ac	=	3.15 cfs
Onsite Building	0.20 ac	x	4.77 cfs/ac	=	0.95 cfs
Onsite Basin	0.07 ac	x	4.77 cfs/ac	=	0.33 cfs
Offsite Greenspace	0.07 ac	x	2.29 cfs/ac	=	0.16 cfs
			Total	=	5.74 cfs

2 year-20 minute storm:	2.89 cfs
15 year-20 minute storm:	4.27 cfs
25 year-20 minute storm:	5.01 cfs
100 year-20 minute storm:	5.74 cfs

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Discharge Point 2

2 Year

Onsite Greenspace	3.31 ac x	1.15 cfs/ac	=	3.81 cfs
Onsite Pavement	1.11 ac x	2.39 cfs/ac	=	2.65 cfs
Onsite Building	0.69 ac x	2.39 cfs/ac	=	1.65 cfs
Onsite Basin	0.38 ac x	2.39 cfs/ac	=	0.91 cfs
Offsite Greenspace	1.31 ac x	1.15 cfs/ac	=	1.51 cfs
Offsite Pavement	0.87 ac x	2.39 cfs/ac	=	2.08 cfs
Offsite Building	0.65 ac x	2.39 cfs/ac	=	1.55 cfs
		Total	=	14.16 cfs

15 Year

Onsite Greenspace	3.31 ac x	1.70 cfs/ac	=	5.63 cfs
Onsite Pavement	1.11 ac x	3.54 cfs/ac	=	3.93 cfs
Onsite Building	0.69 ac x	3.54 cfs/ac	=	2.44 cfs
Onsite Basin	0.38 ac x	3.54 cfs/ac	=	1.35 cfs
Offsite Greenspace	1.31 ac x	1.70 cfs/ac	=	2.23 cfs
Offsite Pavement	0.87 ac x	3.54 cfs/ac	=	3.08 cfs
Offsite Building	0.65 ac x	3.54 cfs/ac	=	2.30 cfs
		Total	=	20.96 cfs

25 Year

Onsite Greenspace	3.31 ac x	2.00 cfs/ac	=	6.62 cfs
Onsite Pavement	1.11 ac x	4.16 cfs/ac	=	4.62 cfs
Onsite Building	0.69 ac x	4.16 cfs/ac	=	2.87 cfs
Onsite Basin	0.38 ac x	4.16 cfs/ac	=	1.58 cfs
Offsite Greenspace	1.31 ac x	2.00 cfs/ac	=	2.62 cfs
Offsite Pavement	0.87 ac x	4.16 cfs/ac	=	3.62 cfs
Offsite Building	0.65 ac x	4.16 cfs/ac	=	2.70 cfs
		Total	=	24.63 cfs

100 Year

Onsite Greenspace	3.31 ac x	2.29 cfs/ac	=	7.58 cfs
Onsite Pavement	1.11 ac x	4.77 cfs/ac	=	5.29 cfs
Onsite Building	0.69 ac x	4.77 cfs/ac	=	3.29 cfs
Onsite Basin	0.38 ac x	4.77 cfs/ac	=	1.81 cfs
Offsite Greenspace	1.31 ac x	2.29 cfs/ac	=	3.00 cfs
Offsite Pavement	0.87 ac x	4.77 cfs/ac	=	4.15 cfs
Offsite Building	0.65 ac x	4.77 cfs/ac	=	3.10 cfs
		Total	=	28.22 cfs

2 year-20 minute storm:	14.16 cfs
15 year-20 minute storm:	20.96 cfs
25 year-20 minute storm:	24.63 cfs
100 year-20 minute storm:	28.22 cfs

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DIFFERENTIAL RUNOFF

To determine if detention is required for the development, the 15 Year 20 Minute Differential Runoff is calculated by subtracting the Predeveloped Runoff rate from the Postdeveloped Runoff rate.

Discharge Point 1

Design Storm	Postdeveloped Runoff	Predeveloped Runoff	Differential Runoff
2 yr	2.89 cfs	4.26 cfs	-1.37 cfs
15 yr	4.27 cfs	6.31 cfs	-2.04 cfs
25 yr	5.01 cfs	7.42 cfs	-2.41 cfs
100 yr	5.74 cfs	8.50 cfs	-2.76 cfs

Discharge Point 2

Design Storm	Postdeveloped Runoff	Predeveloped Runoff	Differential Runoff
2 yr	14.16 cfs	7.02 cfs	7.14 cfs
15 yr	20.96 cfs	10.39 cfs	10.57 cfs
25 yr	24.63 cfs	12.22 cfs	12.41 cfs
100 yr	28.22 cfs	14.00 cfs	14.22 cfs

** Detention required for Discharge Point #2.

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DETENTION ANALYSIS

TIME OF CONCENTRATION:

Time of Concentration is defined as the time needed for stormwater to flow from the most remote point in a watershed to the existing Detention Facility. With that said, the most remote point of flow on this site tributary to the Detention Facility lies on the Western portion of the site near the existing parking lot. Flows will travel approximately 117 ft across Grant Industrial drive into a swale where the flow travels approximately 248 ft into an existing culvert which passes the flow under the pavement. The flow will then travel approximately 125 ft overland to the culvert where the runoff is carried approximately 104 ft to the existing Dry Detention Facility. Time of Concentration is estimated as follows:

T(overland): L = 116.64 feet
Elevation difference = 0.96 feet
Surface Coefficient = 0.40(Pavement)

T(overland) = 0.40*1.80 = 0.72 minutes:
See figure 1 in Appendix A

T(overland): L = 247.83 feet
Elevation difference = 2.74 feet
Surface Coefficient = 1.0(greenspace)

T(overland) = 1.00*3.10 = 3.10 minutes:
See figure 1 in Appendix A

T(overland): L = 124.55 feet
Elevation difference = 2.13 feet
Surface Coefficient = 1.00(Pavement)

T(overland) = 1.00*1.50 = 1.50 minutes:
See figure 1 in Appendix A

T(storm system): L = 202.97 feet
Average Velocity = 7 ft/s

T(storm system) = 202.97(ft) / 7(ft/s) / 60 (s/min) = 0.48 min

Total time = 0.72 + 3.10 + 1.40 + 0.48 = 5.70 min => **use 5 minutes**

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Basin Peak Inflow

2 Year

Onsite Greenspace	0.29 ac x	1.15 cfs/ac	=	0.33 cfs
Onsite Pavement	0.92 ac x	2.39 cfs/ac	=	2.20 cfs
Onsite Building	0.69 ac x	2.39 cfs/ac	=	1.65 cfs
Onsite Basin	0.38 ac x	2.39 cfs/ac	=	0.91 cfs
Offsite Greenspace	1.31 ac x	1.15 cfs/ac	=	1.51 cfs
Offsite Pavement	0.87 ac x	2.39 cfs/ac	=	2.08 cfs
Offsite Building	0.65 ac x	2.39 cfs/ac	=	1.55 cfs
		Total	=	10.23 cfs

15 Year

Onsite Greenspace	0.29 ac x	1.70 cfs/ac	=	0.49 cfs
Onsite Pavement	0.92 ac x	3.54 cfs/ac	=	3.26 cfs
Onsite Building	0.69 ac x	3.54 cfs/ac	=	2.44 cfs
Onsite Basin	0.38 ac x	3.54 cfs/ac	=	1.35 cfs
Offsite Greenspace	1.31 ac x	1.70 cfs/ac	=	2.23 cfs
Offsite Pavement	0.87 ac x	3.54 cfs/ac	=	3.08 cfs
Offsite Building	0.65 ac x	3.54 cfs/ac	=	2.30 cfs
		Total	=	15.15 cfs

25 Year

Onsite Greenspace	0.29 ac x	2.00 cfs/ac	=	0.58 cfs
Onsite Pavement	0.92 ac x	4.16 cfs/ac	=	3.83 cfs
Onsite Building	0.69 ac x	4.16 cfs/ac	=	2.87 cfs
Onsite Basin	0.38 ac x	4.16 cfs/ac	=	1.58 cfs
Offsite Greenspace	1.31 ac x	2.00 cfs/ac	=	2.62 cfs
Offsite Pavement	0.87 ac x	4.16 cfs/ac	=	3.62 cfs
Offsite Building	0.65 ac x	4.16 cfs/ac	=	2.70 cfs
		Total	=	17.80 cfs

100 Year

Onsite Greenspace	0.29 ac x	2.29 cfs/ac	=	0.66 cfs
Onsite Pavement	0.92 ac x	4.77 cfs/ac	=	4.39 cfs
Onsite Building	0.69 ac x	4.77 cfs/ac	=	3.29 cfs
Onsite Basin	0.38 ac x	4.77 cfs/ac	=	1.81 cfs
Offsite Greenspace	1.31 ac x	2.29 cfs/ac	=	3.00 cfs
Offsite Pavement	0.87 ac x	4.77 cfs/ac	=	4.15 cfs
Offsite Building	0.65 ac x	4.77 cfs/ac	=	3.10 cfs
		Total	=	20.40 cfs

2 year-20 minute storm:	10.23 cfs
15 year-20 minute storm:	15.15 cfs
25 year-20 minute storm:	17.80 cfs
100 year-20 minute storm:	20.40 cfs

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ALLOWABLE RELEASE RATE

Allowable Release Rate is defined as the maximum amount of stormwater that can be released from the proposed basin in any given storm duration. This calculation can be done by taking the Basin Inflow and subtracting it by the Differential Runoff Rate for each design storm. The following table is the representation of the Allowable Release Rate for this site:

BASIN 1

STORM	BASIN INFLOW	-	DIFFERENTIAL RUNOFF RATE	=	ALLOWABLE RELEASE RATE
2 yr	10.23 cfs	-	7.14 cfs	=	3.09 cfs
15 yr	15.15 cfs	-	10.57 cfs	=	4.58 cfs
25 yr	17.80 cfs	-	12.41 cfs	=	5.39 cfs
100 yr	20.40 cfs	-	14.22 cfs	=	6.18 cfs

STORM ROUTING CALCULATIONS AND RESULTS

The computer program PONDPACK was used in routing the 2, 15, 25 and 100 year storms through the Existing Dry Detention Basin required for this site. The routing calculations can be found in Appendix B for the 2, 15, 25 and 100 year storms for the watershed and also the calculations for safe passage of the 100 year storms with the low flow blocked (LFB) and the basin ponded full to the top of the outfall structure. As found in the routing calculations, the results are as follows:

Basin 1

STORM (20 MIN)	PEAK INFLOW	ALLOWABLE RELEASE RATE	CALCULATED RELEASE	PEAK ELEVATION
2 yr	10.23 cfs	3.09 cfs	1.55 cfs	569.68 ft
15 yr	15.15 cfs	4.58 cfs	2.72 cfs	570.60 ft
25 yr	17.80 cfs	5.39 cfs	3.05 cfs	571.03 ft
100 yr	20.40 cfs	6.18 cfs	3.31 cfs	571.43 ft
100 yr LFB	20.40 cfs	N/A	20.31 cfs	572.65 ft

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SEDIMENT STORAGE CALCULATIONS

The City of O'Fallon Design Standards require that all detention basins are designed to accommodate two years of sediment storage. This is accomplished by routing the design storms through the outfall structure and determining the 100 year, 20 minute high-water elevation. Using the annual sediment storage nomograph included in the Appendix of this report, we calculate the volume of sediment delivered to the proposed Detention Basin over a two year period. By adding the volume of sediment to the storage volume required for the 100 year, 20 minute storm, we can calculate the crest elevation of the standpipe which must be above the volume required for the 100 year, 20 minute storm and the volume required sediment storage when added together. Pond pack has been used to calculate this elevation and the results are as follows:

Basin 1

100 Year, 20 Minute Storage	= 21,684.00 ft^3
Volume Achieved at Elevation	= 571.43 ft
2 Year Sediment Storage Volume	= 1,636 ft^3
Required Storage Volume	= 23,320.00 ft^3
Volume Achieved at Elevation	= 571.62 ft
Crest of Outfall Structure and Sill	= 572.08 ft

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SUMMARY:

Dry Detention Basin	Flow Rate	High Water
2 Year	1.55 cfs	569.68 ft
15 Year	2.72 cfs	570.60 ft
25 Year	3.05 cfs	571.03 ft
100 Year	3.31 cfs	571.43 ft
100 Year –LOW FLOW BLOCKED	20.31 cfs	572.65 ft

EXISTING LOWER FLOW SLOT	5.4” W x 4.2” H
ELEVATION	566.05 ft
EXISTING UPPER FLOW SLOT	6.0” W x 6.0” H
ELEVATION	569.50 ft
EXISTING STRUCTURE TYPE	60” Precast Concrete Standpipe
CREST ELEVATION	572.08 ft
EXISTING TOP OF BASIN BERM	574.83 ft
FREEBOARD	2.18 ft

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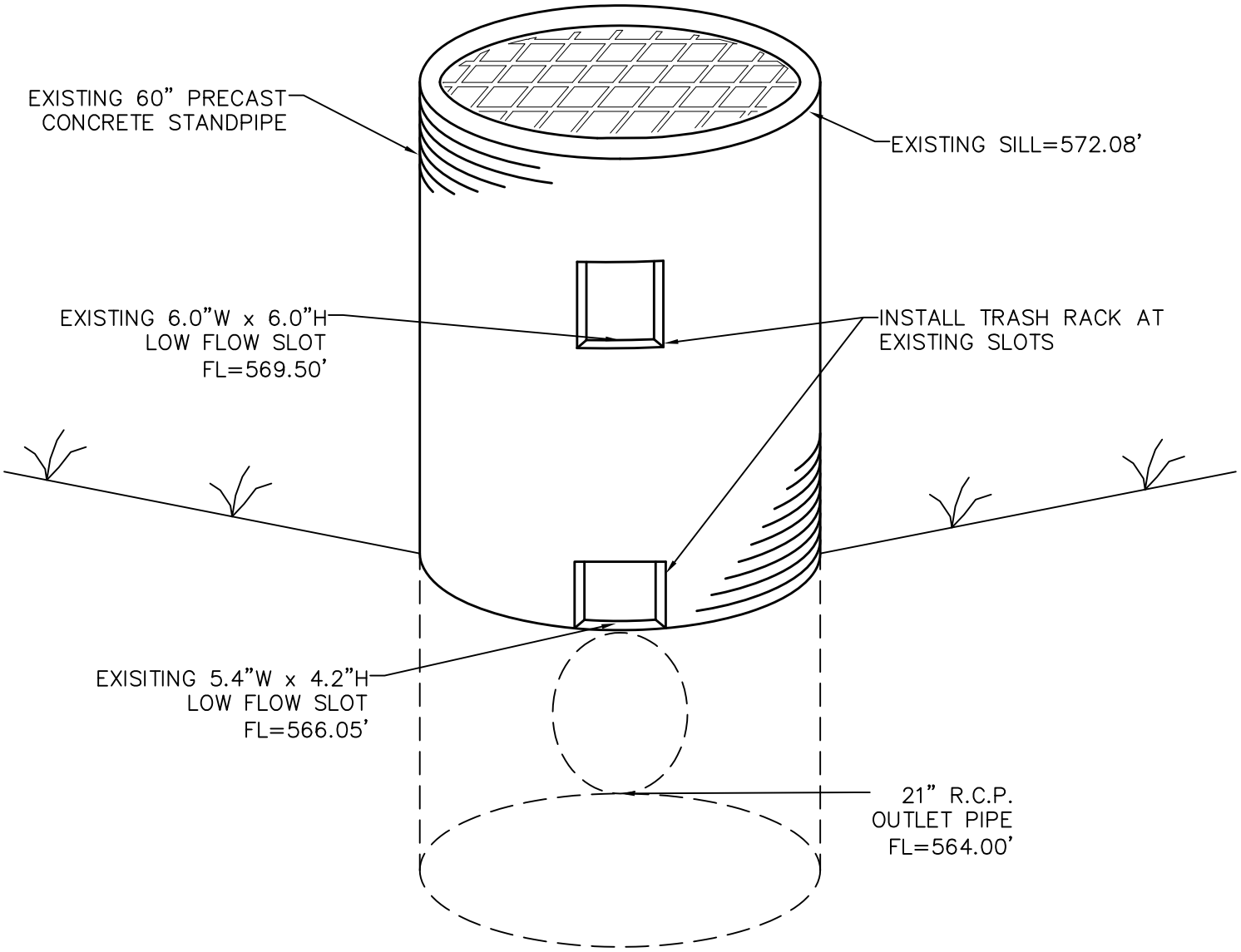
Appendix A

-Structure Details

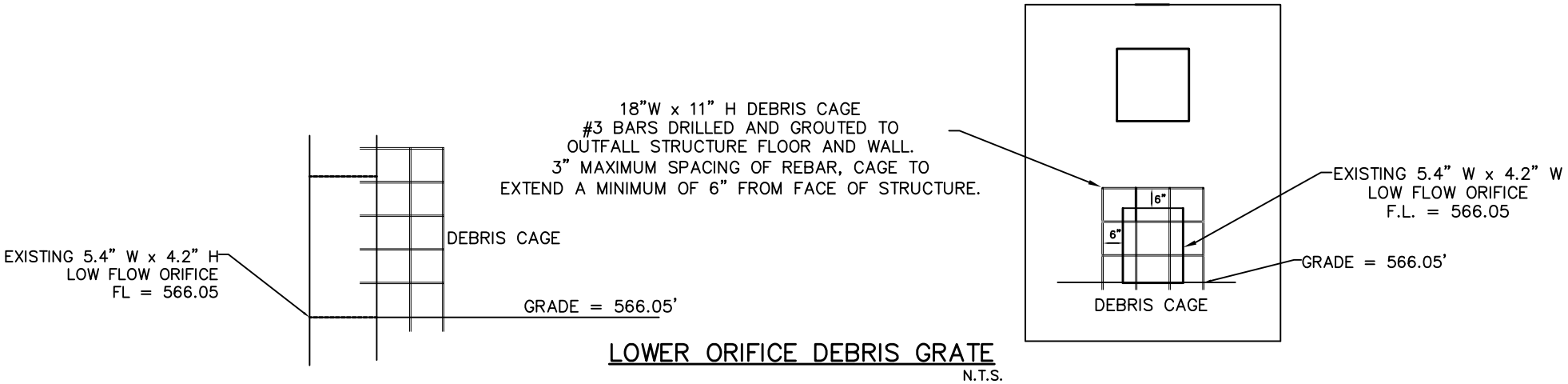
-Misc Figures



EXISTING OVERFLOW STRUCTURE DETAIL

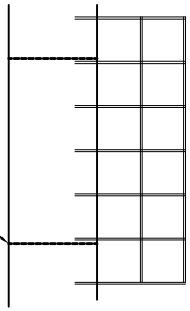
NOT TO SCALE

2 YEAR, 20 MIN HIGHWATER = 569.68'
15 YEAR, 20 MIN HIGHWATER = 570.60'
50 YEAR, 20 MIN HIGHWATER = 571.03'
100 YEAR, 20 MIN HIGHWATER = 571.43'
100 YEAR, 20 MIN (LFB) HIGHWATER = 572.65'



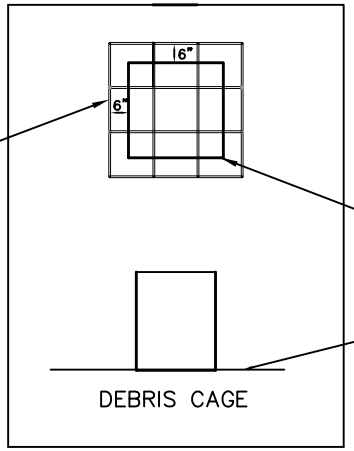
LOWER ORIFICE DEBRIS GRATE

N.T.S.



EXISTING 6" W x 6" H
UPPER FLOW ORIFICE
FL = 569.50

18"W x 18" H DEBRIS CAGE
#3 BARS DRILLED AND GROUTED TO
OUTFALL STRUCTURE FLOOR AND WALL.
3" MAXIMUM SPACING OF REBAR, CAGE TO
EXTEND A MINIMUM OF 6" FROM FACE OF STRUCTURE.



EXISTING 6" W x 6" W
UPPER FLOW ORIFICE
F.L. = 569.50

GRADE = 566.05'

UPPER ORIFICE DEBRIS GRATE

N.T.S.

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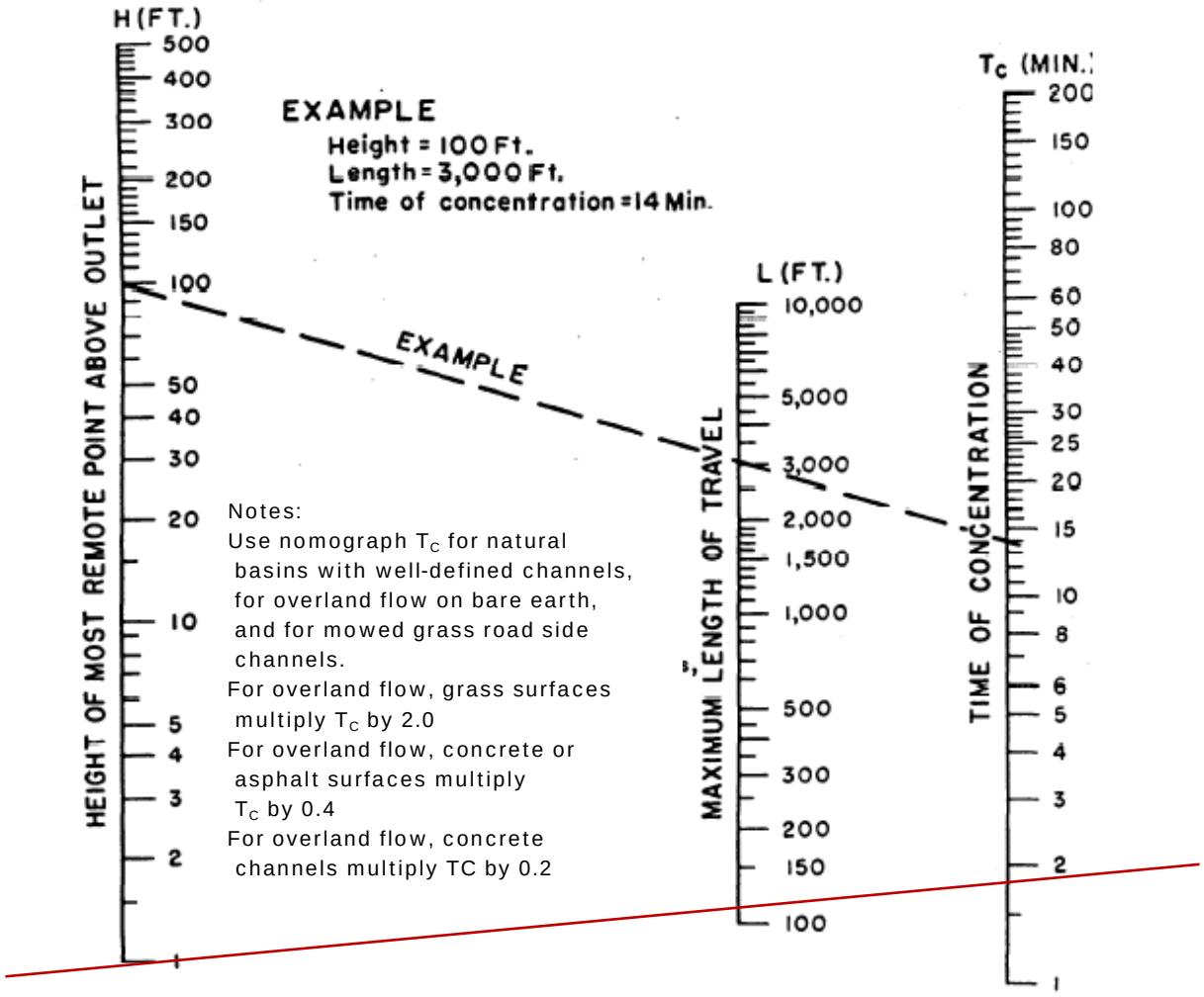
Date: 6-22-2017 Project No: 01-11691F
Designer: TMM Checked: TMM

TIME OF CONCENTRATION FOR SMALL DRAINAGE BASINS



OVERLAND FLOW-PART 3

Δ Height = 0.96 ft

Length = 116.64 ft

$T_{Overland}$ = 0.40*1.80 min = 0.72 min

STORM SEWER TRAVEL TIME

T_{storm}=Pipe Length (L) * Assumed Velocity (V)

L = 0 ft

V = 0 ft/s

T_{storm} = 0 ft / 7 ft/s / 60 sec/min =0.00 min

Total Time of Concentration = $T_{Overland}$ + T_{storm} = 0.72 + 0.00 = 3.10 →USE 0.72 min.

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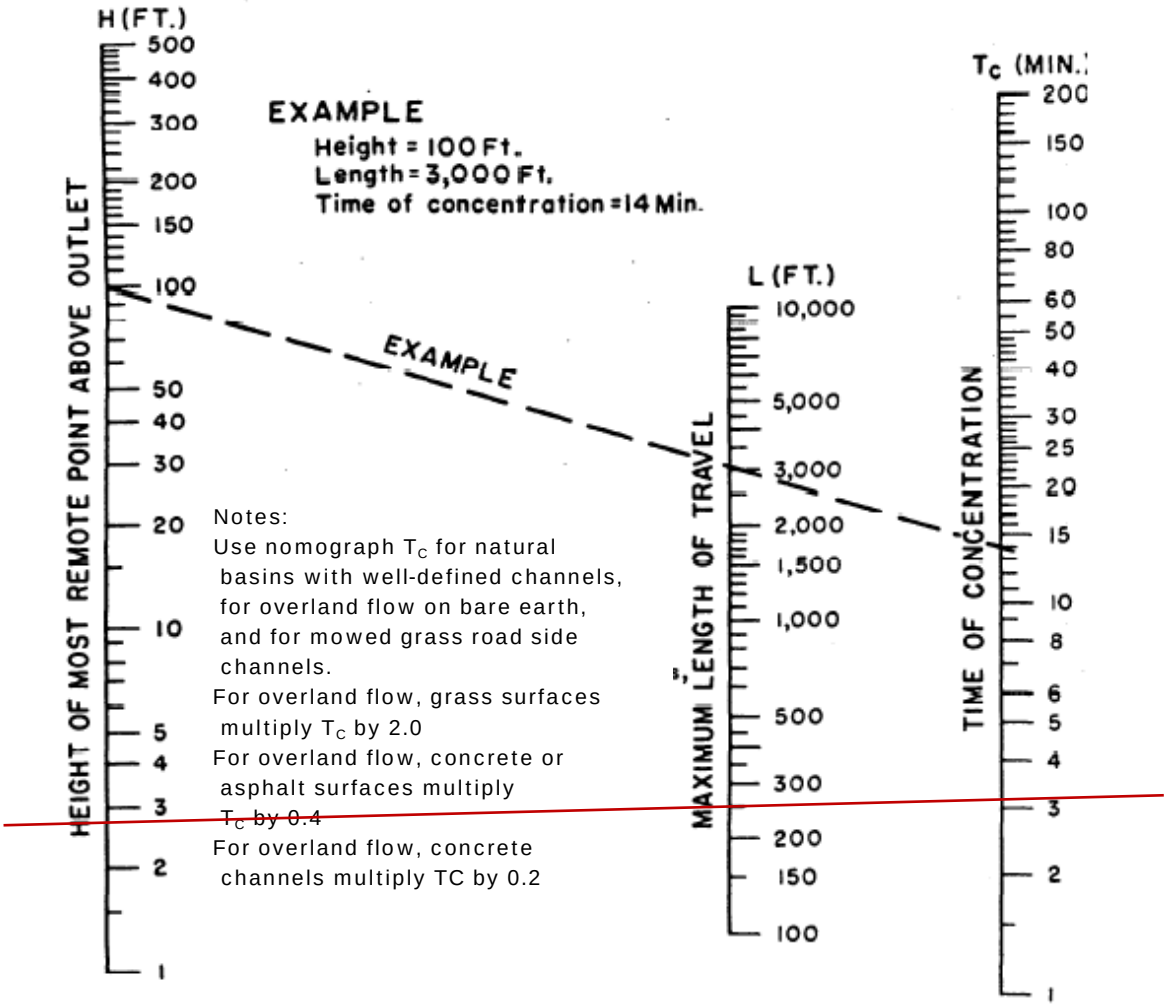
TIME OF CONCENTRATION FOR SMALL DRAINAGE BASINS



OVERLAND FLOW-PART 3

Δ Height = 2.74 ft

Length = 247.83 ft

$T_{Overland}$ = 3.10 min

STORM SEWER TRAVEL TIME

T_{storm}=Pipe Length (L) * Assumed Velocity (V)

L = 0 ft

V = 0 ft/s

T_{storm} = 0 ft / 7 ft/s / 60 sec/min =0.00 min

Total Time of Concentration = $T_{Overland}$ + T_{storm} = 3.10 + 0.00 = 3.10 → USE 3.10 min.

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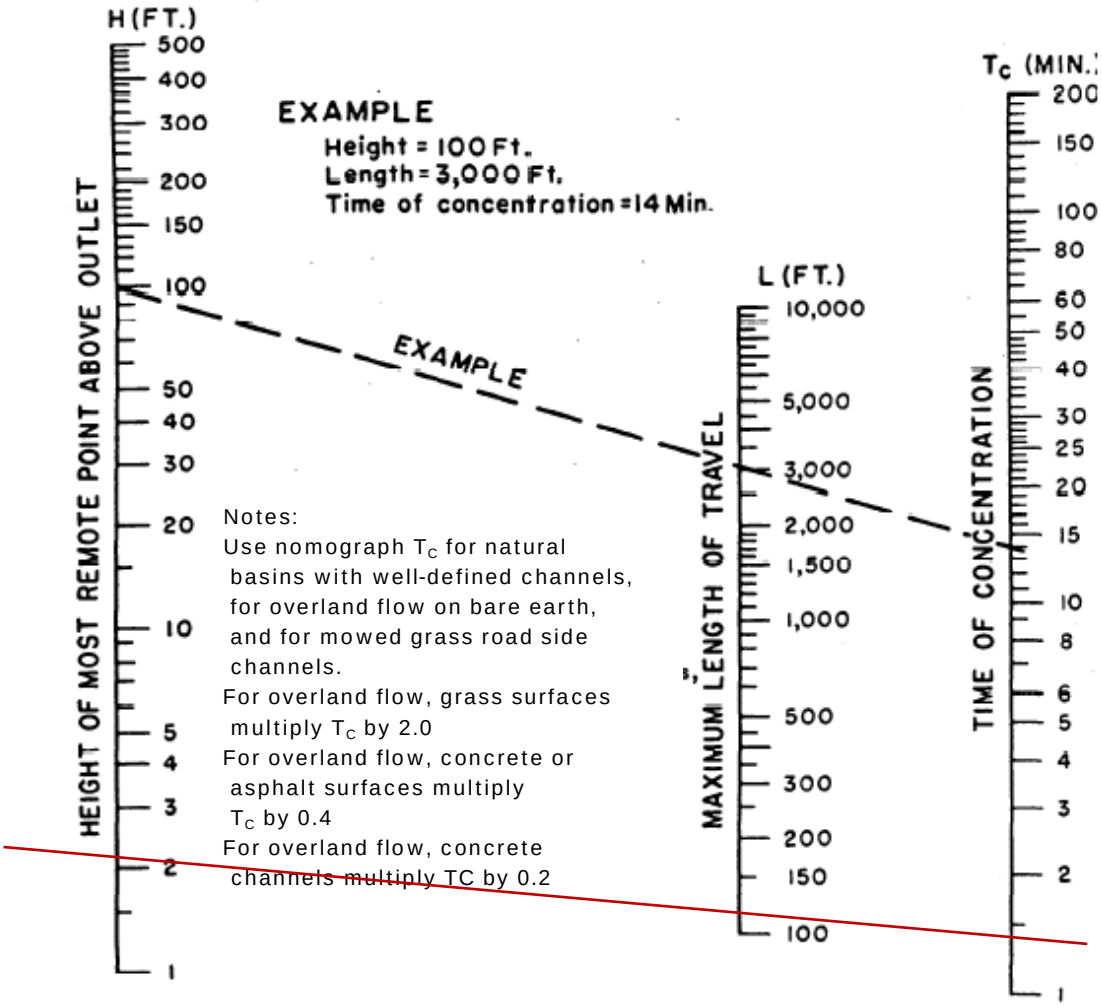
Project: Grant Warehouse and Storage Lot 4
Date: 6-22-2017 Project No: 01-11691F
Designer: TMM Checked: TMM

TIME OF CONCENTRATION FOR SMALL DRAINAGE BASINS



OVERLAND FLOW-PART 3

Δ Height = 2.13 ft

Length = 124.55 ft

$T_{Overland}$ = 1.40 min

STORM SEWER TRAVEL TIME

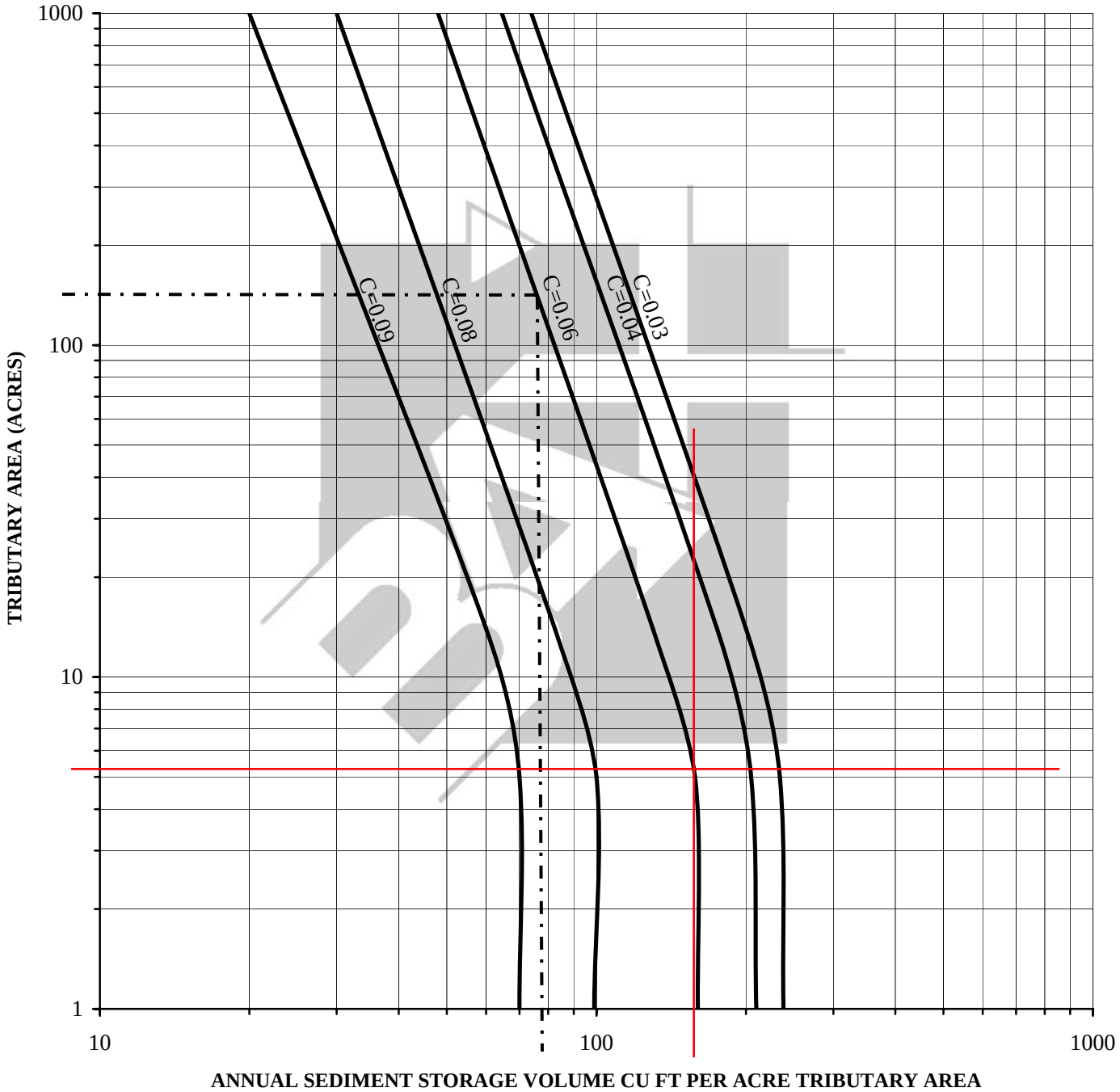
T_{storm}=Pipe Length (L) * Assumed Velocity (V)
L = 202.97 ft
V = 7 ft/s
T_{storm} = 202.97 ft / 7 ft/s / 60 sec/min =0.48 min

Total Time of Concentration = $T_{Overland}$ + T_{storm} = 1.40 + 0.48 = 1.88 → USE 1.88 min.

BAX ENGINEERING
Engineering – Planning – Surveying
221 Point West Blvd.
St. Charles, MO 63301
636 928-5552 FAX 636 928-1718

Project: GRANT WAREHOUSE
Date: 9/4/2019 Project: 01-11691F
Designer: TMM Checked: TCF

ANNUAL SEDIMENT STORAGE



Storage Required = Years of Storage * Annual Sediment * Drainage Area

RUNOFF C VALUE = 0.6
DRAINAGE AREA = 5.11 acres
ANNUAL SEDIMENT = 160 CU FT per acre

YEARS OF STORAGE = 2 years
STORAGE REQUIRED = 2*160*5.11=3,060 CU FT

Appendix B
- Basin Routing
-Basin Inflow
-2 year Detention Routing
-15 year Detention Routing
-25 year Detention Routing
-100 year Detention Routing

Table of Contents

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Site Runoff 1	100 Yr LFB	0	24,480.000	5	20.40
Site Runoff 1	2 Year 20 Min	0	12,276.000	5	10.23
Site Runoff 1	15 Year 20 Min	0	18,180.000	5	15.15
Site Runoff 1	25 Year 20 Min	0	21,360.000	5	17.80
Site Runoff 1	100 Year 20 Min	0	24,480.000	5	20.40

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Outflow 1	100 Yr LFB	0	24,480.000	20	20.31
Outflow 1	2 Year 20 Min	0	10,823.000	24	1.55
Outflow 1	15 Year 20 Min	0	14,545.000	24	2.72
Outflow 1	25 Year 20 Min	0	16,667.000	24	3.05
Outflow 1	100 Year 20 Min	0	18,764.000	24	3.31

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
Basin 1 (IN)	100 Yr LFB	0	24,480.000	5	20.40	(N/A)	(N/A)
Basin 1 (OUT)	100 Yr LFB	0	24,480.000	20	20.31	572.65	31,790.000
Basin 1 (IN)	2 Year 20 Min	0	12,276.000	5	10.23	(N/A)	(N/A)
Basin 1 (OUT)	2 Year 20 Min	0	10,823.000	24	1.55	569.68	10,722.000
Basin 1 (IN)	15 Year 20 Min	0	18,180.000	5	15.15	(N/A)	(N/A)
Basin 1 (OUT)	15 Year 20 Min	0	14,545.000	24	2.72	570.60	15,988.000
Basin 1 (IN)	25 Year 20 Min	0	21,360.000	5	17.80	(N/A)	(N/A)
Basin 1 (OUT)	25 Year 20 Min	0	16,667.000	24	3.05	571.03	18,847.000
Basin 1 (IN)	100 Year 20 Min	0	24,480.000	5	20.40	(N/A)	(N/A)
Basin 1 (OUT)	100 Year 20 Min	0	18,764.000	24	3.31	571.43	21,684.000

Peak Discharge	10.23 ft³/s
Time to Peak	11 min
Hydrograph Volume	12,276.000 ft³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 1 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0	0.00	2.05	4.09	6.14	8.18
5	10.23	10.23	10.23	10.23	10.23
10	10.23	10.23	10.23	10.23	10.23
15	10.23	10.23	10.23	10.23	10.23
20	10.23	8.18	6.14	4.09	2.05
25	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00
90	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Peak Discharge	15.15 ft³/s
Time to Peak	11 min
Hydrograph Volume	18,180.000 ft³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 1 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0	0.00	3.03	6.06	9.09	12.12
5	15.15	15.15	15.15	15.15	15.15
10	15.15	15.15	15.15	15.15	15.15
15	15.15	15.15	15.15	15.15	15.15
20	15.15	12.12	9.09	6.06	3.03
25	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00
90	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Peak Discharge	17.80 ft³/s
Time to Peak	11 min
Hydrograph Volume	21,360.000 ft³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 1 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0	0.00	3.56	7.12	10.68	14.24
5	17.80	17.80	17.80	17.80	17.80
10	17.80	17.80	17.80	17.80	17.80
15	17.80	17.80	17.80	17.80	17.80
20	17.80	14.24	10.68	7.12	3.56
25	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00
90	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Peak Discharge	20.40 ft³/s
Time to Peak	11 min
Hydrograph Volume	24,480.000 ft³

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 1 min
Time on left represents time for first value in each row.

Time (min)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0	0.00	4.08	8.16	12.24	16.32
5	20.40	20.40	20.40	20.40	20.40
10	20.40	20.40	20.40	20.40	20.40
15	20.40	20.40	20.40	20.40	20.40
20	20.40	16.32	12.24	8.16	4.08
25	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00
70	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00
90	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Elevation-Area Volume Curve
Label: Basin 1

Return Event: 2 years
Storm Event:

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr(A1*A2) (ft²)	Volume (ft³)	Volume (Total) (ft³)
566.05	0.00	461.41	0.00	0.000	0.000
567.00	0.00	1,948.68	3,358.32	1,063.000	1,063.000
568.00	0.00	3,288.03	7,767.98	2,589.000	3,653.000
569.00	0.00	4,381.28	11,464.80	3,822.000	7,474.000
570.00	0.00	5,571.56	14,893.54	4,965.000	12,439.000
571.00	0.00	6,846.40	18,594.13	6,198.000	18,637.000
572.00	0.00	8,202.89	22,543.31	7,514.000	26,151.000
573.00	0.00	9,665.81	26,773.06	8,924.000	35,076.000
574.00	0.00	11,317.80	31,442.85	10,481.000	45,557.000

Pond Volume Equations
* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2 - El1) * (Area1 + Area2 + sqr(Area1 * Area2))

where:	EL1, EL2	Lower and upper elevations of the increment
	Area1, Area2	Areas computed for EL1, EL2, respectively
	Volume	Incremental volume between EL1 and EL2

Subsection: Elevation-Area Volume Curve
Label: Basin 1

Return Event: 101 years
Storm Event:

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr(A1*A2) (ft²)	Volume (ft³)	Volume (Total) (ft³)
566.05	0.00	461.41	0.00	0.000	0.000
567.00	0.00	1,948.68	3,358.32	1,063.000	1,063.000
568.00	0.00	3,288.03	7,767.98	2,589.000	3,653.000
569.00	0.00	4,381.28	11,464.80	3,822.000	7,474.000
570.00	0.00	5,571.56	14,893.54	4,965.000	12,439.000
571.00	0.00	6,846.40	18,594.13	6,198.000	18,637.000
572.00	0.00	8,202.89	22,543.31	7,514.000	26,151.000
573.00	0.00	9,665.81	26,773.06	8,924.000	35,076.000
574.00	0.00	11,317.80	31,442.85	10,481.000	45,557.000

Pond Volume Equations
*** Incremental volume computed by the Conic Method for Reservoir Volumes.**

Volume = (1/3) * (EL2 - El1) * (Area1 + Area2 + sqr(Area1 * Area2))

where:	EL1, EL2	Lower and upper elevations of the increment
	Area1, Area2	Areas computed for EL1, EL2, respectively
	Volume	Incremental volume between EL1 and EL2

Requested Pond Water Surface Elevations	
Minimum (Headwater)	557.98 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	564.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Stand Pipe	Riser - 1	Forward	Culvert - 1	572.08	574.00
Culvert-Circular	Culvert - 1	Forward	TW	564.00	574.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	21.0 in
Length	84.49 ft
Length (Computed Barrel)	84.50 ft
Slope (Computed)	0.014 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.015
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.089
T2 ratio (HW/D)	1.190
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	565.90 ft	T1 Flow	11.14 ft³/s
T2 Elevation	566.08 ft	T2 Flow	12.73 ft³/s

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	572.08 ft
Diameter	60.0 in
Orifice Area	19.63 ft²
Orifice Coefficient	0.600
Weir Length	15.71 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Composite Rating Curve
Label: LFB 1

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
566.05	0.00	(N/A)	0.00
566.15	0.00	(N/A)	0.00
566.25	0.00	(N/A)	0.00
566.35	0.00	(N/A)	0.00
566.45	0.00	(N/A)	0.00
566.55	0.00	(N/A)	0.00
566.65	0.00	(N/A)	0.00
566.75	0.00	(N/A)	0.00
566.85	0.00	(N/A)	0.00
566.95	0.00	(N/A)	0.00
567.05	0.00	(N/A)	0.00
567.15	0.00	(N/A)	0.00
567.25	0.00	(N/A)	0.00
567.35	0.00	(N/A)	0.00
567.45	0.00	(N/A)	0.00
567.55	0.00	(N/A)	0.00
567.65	0.00	(N/A)	0.00
567.75	0.00	(N/A)	0.00
567.85	0.00	(N/A)	0.00
567.95	0.00	(N/A)	0.00
568.05	0.00	(N/A)	0.00
568.15	0.00	(N/A)	0.00
568.25	0.00	(N/A)	0.00
568.35	0.00	(N/A)	0.00
568.45	0.00	(N/A)	0.00
568.55	0.00	(N/A)	0.00
568.65	0.00	(N/A)	0.00
568.75	0.00	(N/A)	0.00
568.85	0.00	(N/A)	0.00
568.95	0.00	(N/A)	0.00
569.05	0.00	(N/A)	0.00
569.15	0.00	(N/A)	0.00
569.25	0.00	(N/A)	0.00
569.35	0.00	(N/A)	0.00
569.45	0.00	(N/A)	0.00
569.55	0.00	(N/A)	0.00
569.65	0.00	(N/A)	0.00
569.75	0.00	(N/A)	0.00
569.85	0.00	(N/A)	0.00
569.95	0.00	(N/A)	0.00
570.05	0.00	(N/A)	0.00
570.15	0.00	(N/A)	0.00
570.25	0.00	(N/A)	0.00
570.35	0.00	(N/A)	0.00

Subsection: Composite Rating Curve
Label: LFB 1

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
570.45	0.00	(N/A)	0.00
570.55	0.00	(N/A)	0.00
570.65	0.00	(N/A)	0.00
570.75	0.00	(N/A)	0.00
570.85	0.00	(N/A)	0.00
570.95	0.00	(N/A)	0.00
571.05	0.00	(N/A)	0.00
571.15	0.00	(N/A)	0.00
571.25	0.00	(N/A)	0.00
571.35	0.00	(N/A)	0.00
571.45	0.00	(N/A)	0.00
571.55	0.00	(N/A)	0.00
571.65	0.00	(N/A)	0.00
571.75	0.00	(N/A)	0.00
571.85	0.00	(N/A)	0.00
571.95	0.00	(N/A)	0.00
572.05	0.00	(N/A)	0.00
572.08	0.00	(N/A)	0.00
572.15	0.87	(N/A)	0.00
572.25	3.30	(N/A)	0.00
572.35	6.61	(N/A)	0.00
572.45	10.60	(N/A)	0.00
572.55	15.19	(N/A)	0.00
572.65	20.28	(N/A)	0.00
572.75	25.84	(N/A)	0.00
572.85	31.84	(N/A)	0.00
572.95	35.61	(N/A)	0.00
573.05	35.82	(N/A)	0.00
573.15	36.03	(N/A)	0.00
573.25	36.24	(N/A)	0.00
573.35	36.45	(N/A)	0.00
573.45	36.66	(N/A)	0.00
573.55	36.87	(N/A)	0.00
573.65	37.07	(N/A)	0.00
573.75	37.27	(N/A)	0.00
573.85	37.48	(N/A)	0.00
573.95	37.68	(N/A)	0.00
574.00	37.78	(N/A)	0.00

Contributing Structures
(no Q: Riser - 1,Culvert - 1)
(no Q: Riser - 1,Culvert - 1)
(no Q: Riser - 1,Culvert - 1)
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Composite Outflow Summary

Contributing Structures
(no Q: Riser - 1,Culvert - 1)
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(no Q: Riser - 1,Culvert - 1)

Composite Outflow Summary

Contributing Structures
(no Q: Riser - 1,Culvert - 1)
(no Q: Riser - 1,Culvert - 1)
(no Q: Riser - 1,Culvert - 1)
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Riser - 1,Culvert - 1
Riser - 1,Culvert - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	566.05 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	574.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Rectangular Weir	Weir - 1	Forward	Culvert - 1	566.05	566.40
Orifice-Area	Orifice - 2	Forward	Culvert - 1	570.00	574.00
Rectangular Weir	Weir - 2	Forward	Culvert - 1	569.50	570.00
Stand Pipe	Riser - 1	Forward	Culvert - 1	572.08	574.00
Orifice-Area	Orifice - 1	Forward	Culvert - 1	566.40	574.00
Culvert-Circular	Culvert - 1	Forward	TW	564.00	574.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	566.05 ft
Weir Length	0.45 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Orifice - 1 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	566.05 ft
Orifice Area	0.16 ft²
Top Elevation	566.40 ft
Datum Elevation	566.23 ft
Orifice Coefficient	0.600

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	21.0 in
Length	84.49 ft
Length (Computed Barrel)	84.50 ft
Slope (Computed)	0.014 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.015
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.089
T2 ratio (HW/D)	1.190
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	565.90 ft	T1 Flow	11.14 ft³/s
T2 Elevation	566.08 ft	T2 Flow	12.73 ft³/s

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	572.08 ft
Diameter	60.0 in
Orifice Area	19.63 ft²
Orifice Coefficient	0.600
Weir Length	15.71 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Weir - 2 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	569.50 ft
Weir Length	0.50 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Orifice - 2 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	569.50 ft
Orifice Area	0.25 ft²
Top Elevation	570.00 ft
Datum Elevation	569.75 ft
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Composite Rating Curve
Label: OS 101

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
566.05	0.00	(N/A)	0.00
566.15	0.04	(N/A)	0.00
566.25	0.12	(N/A)	0.00
566.35	0.22	(N/A)	0.00
566.45	0.36	(N/A)	0.00
566.55	0.44	(N/A)	0.00
566.65	0.50	(N/A)	0.00
566.75	0.56	(N/A)	0.00
566.85	0.61	(N/A)	0.00
566.95	0.65	(N/A)	0.00
567.05	0.70	(N/A)	0.00
567.15	0.74	(N/A)	0.00
567.25	0.78	(N/A)	0.00
567.35	0.81	(N/A)	0.00
567.45	0.85	(N/A)	0.00
567.55	0.88	(N/A)	0.00
567.65	0.92	(N/A)	0.00
567.75	0.95	(N/A)	0.00
567.85	0.98	(N/A)	0.00
567.95	1.01	(N/A)	0.00
568.05	1.04	(N/A)	0.00
568.15	1.07	(N/A)	0.00
568.25	1.10	(N/A)	0.00
568.35	1.12	(N/A)	0.00
568.45	1.15	(N/A)	0.00
568.55	1.17	(N/A)	0.00
568.65	1.20	(N/A)	0.00
568.75	1.22	(N/A)	0.00
568.85	1.25	(N/A)	0.00
568.95	1.27	(N/A)	0.00
569.05	1.29	(N/A)	0.00
569.15	1.31	(N/A)	0.00
569.25	1.34	(N/A)	0.00
569.35	1.36	(N/A)	0.00
569.45	1.38	(N/A)	0.00
569.50	1.39	(N/A)	0.00
569.55	1.42	(N/A)	0.00
569.65	1.51	(N/A)	0.00
569.75	1.63	(N/A)	0.00
569.85	1.78	(N/A)	0.00
569.95	1.94	(N/A)	0.00
570.05	2.16	(N/A)	0.00
570.15	2.28	(N/A)	0.00
570.25	2.39	(N/A)	0.00

Subsection: Composite Rating Curve
Label: OS 101

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
570.35	2.50	(N/A)	0.00
570.45	2.59	(N/A)	0.00
570.55	2.68	(N/A)	0.00
570.65	2.76	(N/A)	0.00
570.75	2.84	(N/A)	0.00
570.85	2.92	(N/A)	0.00
570.95	2.99	(N/A)	0.00
571.05	3.06	(N/A)	0.00
571.15	3.13	(N/A)	0.00
571.25	3.19	(N/A)	0.00
571.35	3.26	(N/A)	0.00
571.45	3.33	(N/A)	0.00
571.55	3.39	(N/A)	0.00
571.65	3.45	(N/A)	0.00
571.75	3.51	(N/A)	0.00
571.85	3.57	(N/A)	0.00
571.95	3.62	(N/A)	0.00
572.05	3.68	(N/A)	0.00
572.08	3.70	(N/A)	0.00
572.15	4.61	(N/A)	0.00
572.25	7.10	(N/A)	0.00
572.35	10.46	(N/A)	0.00
572.45	14.47	(N/A)	0.00
572.55	18.97	(N/A)	0.00
572.65	23.91	(N/A)	0.00
572.75	29.02	(N/A)	0.00
572.85	33.64	(N/A)	0.00
572.95	35.61	(N/A)	0.00
573.05	35.82	(N/A)	0.00
573.15	36.03	(N/A)	0.00
573.25	36.24	(N/A)	0.00
573.35	36.45	(N/A)	0.00
573.45	36.66	(N/A)	0.00
573.55	36.87	(N/A)	0.00
573.65	37.07	(N/A)	0.00
573.75	37.27	(N/A)	0.00
573.85	37.48	(N/A)	0.00
573.95	37.68	(N/A)	0.00
574.00	37.78	(N/A)	0.00

Contributing Structures

(no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1,Orifice - 1,Culvert - 1)
Weir - 1,Culvert - 1 (no Q: Orifice - 2,Weir - 2,Riser - 1,Orifice - 1)

Composite Outflow Summary

Contributing Structures
Weir - 1,Culvert - 1 (no Q: Orifice - 2,Weir - 2,Riser - 1,Orifice - 1)
Weir - 1,Culvert - 1 (no Q: Orifice - 2,Weir - 2,Riser - 1,Orifice - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)

Composite Outflow Summary

Contributing Structures
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Riser - 1)
Weir - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Riser - 1)
Weir - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Riser - 1)
Weir - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Riser - 1)
Weir - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Riser - 1)
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Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)

Composite Outflow Summary

Contributing Structures
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2,Riser - 1)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Orifice - 2,Riser - 1,Orifice - 1,Culvert - 1 (no Q: Weir - 1,Weir - 2)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)

Composite Outflow Summary

Contributing Structures
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)
Riser - 1,Culvert - 1 (no Q: Weir - 1,Orifice - 2,Weir - 2,Orifice - 1)

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Basin 1

Return Event: 2 years
Storm Event:

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
566.05	0.00	0.000	461.41	0.00	0.00	0.00
566.15	0.04	51.455	569.59	0.00	0.04	1.76
566.25	0.12	114.297	689.15	0.00	0.12	3.93
566.35	0.22	189.665	820.10	0.00	0.22	6.54
566.45	0.36	278.696	962.42	0.00	0.36	9.65
566.55	0.44	382.529	1,116.13	0.00	0.44	13.19
566.65	0.50	502.302	1,281.22	0.00	0.50	17.24
566.75	0.56	639.153	1,457.70	0.00	0.56	21.86
566.85	0.61	794.221	1,645.55	0.00	0.61	27.08
566.95	0.65	968.643	1,844.79	0.00	0.65	32.94
567.05	0.70	1,162.366	2,007.37	0.00	0.70	39.44
567.15	0.74	1,369.074	2,127.38	0.00	0.74	46.37
567.25	0.78	1,587.957	2,250.86	0.00	0.78	53.71
567.35	0.81	1,819.362	2,377.83	0.00	0.81	61.46
567.45	0.85	2,063.639	2,508.28	0.00	0.85	69.64
567.55	0.88	2,321.134	2,642.21	0.00	0.88	78.26
567.65	0.92	2,592.198	2,779.63	0.00	0.92	87.32
567.75	0.95	2,877.177	2,920.53	0.00	0.95	96.86
567.85	0.98	3,176.421	3,064.92	0.00	0.98	106.86
567.95	1.01	3,490.277	3,212.79	0.00	1.01	117.35
568.05	1.04	3,818.468	3,338.97	0.00	1.04	128.32
568.15	1.07	4,157.505	3,442.03	0.00	1.07	139.65
568.25	1.10	4,506.926	3,546.66	0.00	1.10	151.33
568.35	1.12	4,866.888	3,652.85	0.00	1.12	163.35
568.45	1.15	5,237.548	3,760.61	0.00	1.15	175.73
568.55	1.17	5,619.062	3,869.93	0.00	1.17	188.48
568.65	1.20	6,011.587	3,980.82	0.00	1.20	201.58
568.75	1.22	6,415.279	4,093.28	0.00	1.22	215.06
568.85	1.25	6,830.296	4,207.31	0.00	1.25	228.92
568.95	1.27	7,256.793	4,322.90	0.00	1.27	243.16
569.05	1.29	7,694.861	4,437.40	0.00	1.29	257.79

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
569.15	1.31	8,144.255	4,550.71	0.00	1.31	272.79
569.25	1.34	8,605.052	4,665.46	0.00	1.34	288.17
569.35	1.36	9,077.394	4,781.63	0.00	1.36	303.94
569.45	1.38	9,561.425	4,899.23	0.00	1.38	320.10
569.50	1.39	9,807.868	4,958.56	0.00	1.39	328.32
569.55	1.42	10,057.287	5,018.25	0.00	1.42	336.66
569.65	1.51	10,565.124	5,138.71	0.00	1.51	353.68
569.75	1.63	11,085.077	5,260.60	0.00	1.63	371.13
569.85	1.78	11,617.290	5,383.91	0.00	1.78	389.02
569.95	1.94	12,161.907	5,508.65	0.00	1.94	407.33
570.05	2.16	12,719.003	5,632.19	0.00	2.16	426.13
570.15	2.28	13,288.322	5,754.42	0.00	2.28	445.23
570.25	2.39	13,869.931	5,877.97	0.00	2.39	464.72
570.35	2.50	14,463.960	6,002.83	0.00	2.50	484.63
570.45	2.59	15,070.540	6,129.00	0.00	2.59	504.94
570.55	2.68	15,689.803	6,256.48	0.00	2.68	525.67
570.65	2.76	16,321.880	6,385.28	0.00	2.76	546.82
570.75	2.84	16,966.903	6,515.39	0.00	2.84	568.40
570.85	2.92	17,625.002	6,646.81	0.00	2.92	590.42
570.95	2.99	18,296.308	6,779.54	0.00	2.99	612.87
571.05	3.06	18,980.897	6,911.31	0.00	3.06	635.76
571.15	3.13	19,678.556	7,042.06	0.00	3.13	659.08
571.25	3.19	20,389.350	7,174.04	0.00	3.19	682.84
571.35	3.26	21,113.404	7,307.24	0.00	3.26	707.04
571.45	3.33	21,850.838	7,441.66	0.00	3.33	731.69
571.55	3.39	22,601.776	7,577.31	0.00	3.39	756.78
571.65	3.45	23,366.341	7,714.18	0.00	3.45	782.33
571.75	3.51	24,144.654	7,852.28	0.00	3.51	808.33
571.85	3.57	24,936.838	7,991.61	0.00	3.57	834.79
571.95	3.62	25,743.016	8,132.16	0.00	3.62	861.72
572.05	3.68	26,563.291	8,273.19	0.00	3.68	889.13
572.08	3.70	26,812.121	8,315.51	0.00	3.70	897.44
572.15	4.61	27,397.674	8,414.68	0.00	4.61	917.87
572.25	7.10	28,246.267	8,557.37	0.00	7.10	948.64
572.35	10.46	29,109.189	8,701.27	0.00	10.46	980.77
572.45	14.47	29,986.560	8,846.36	0.00	14.47	1,014.02
572.55	18.97	30,878.500	8,992.65	0.00	18.97	1,048.25
572.65	23.91	31,785.130	9,140.14	0.00	23.91	1,083.41
572.75	29.02	32,706.569	9,288.83	0.00	29.02	1,119.24
572.85	33.64	33,642.937	9,438.72	0.00	33.64	1,155.07
572.95	35.61	34,594.353	9,589.81	0.00	35.61	1,188.76
573.05	35.82	35,561.020	9,745.32	0.00	35.82	1,221.19
573.15	36.03	36,543.540	9,905.30	0.00	36.03	1,254.15
573.25	36.24	37,542.124	10,066.60	0.00	36.24	1,287.65
573.35	36.45	38,556.902	10,229.19	0.00	36.45	1,321.68

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 2 years
Label: Basin 1 Storm Event:

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
573.45	36.66	39,588.005	10,393.09	0.00	36.66	1,356.26
573.55	36.87	40,635.563	10,558.28	0.00	36.87	1,391.39
573.65	37.07	41,699.706	10,724.79	0.00	37.07	1,427.06
573.75	37.27	42,780.564	10,892.59	0.00	37.27	1,463.29
573.85	37.48	43,878.267	11,061.70	0.00	37.48	1,500.09
573.95	37.68	44,992.947	11,232.11	0.00	37.68	1,537.44
574.00	37.78	45,556.693	11,317.80	0.00	37.78	1,556.34

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
566.05	0.00	0.000	461.41	0.00	0.00	0.00
566.15	0.04	51.455	569.59	0.00	0.04	1.76
566.25	0.12	114.297	689.15	0.00	0.12	3.93
566.35	0.22	189.665	820.10	0.00	0.22	6.54
566.45	0.36	278.696	962.42	0.00	0.36	9.65
566.55	0.44	382.529	1,116.13	0.00	0.44	13.19
566.65	0.50	502.302	1,281.22	0.00	0.50	17.24
566.75	0.56	639.153	1,457.70	0.00	0.56	21.86
566.85	0.61	794.221	1,645.55	0.00	0.61	27.08
566.95	0.65	968.643	1,844.79	0.00	0.65	32.94
567.05	0.70	1,162.366	2,007.37	0.00	0.70	39.44
567.15	0.74	1,369.074	2,127.38	0.00	0.74	46.37
567.25	0.78	1,587.957	2,250.86	0.00	0.78	53.71
567.35	0.81	1,819.362	2,377.83	0.00	0.81	61.46
567.45	0.85	2,063.639	2,508.28	0.00	0.85	69.64
567.55	0.88	2,321.134	2,642.21	0.00	0.88	78.26
567.65	0.92	2,592.198	2,779.63	0.00	0.92	87.32
567.75	0.95	2,877.177	2,920.53	0.00	0.95	96.86
567.85	0.98	3,176.421	3,064.92	0.00	0.98	106.86
567.95	1.01	3,490.277	3,212.79	0.00	1.01	117.35
568.05	1.04	3,818.468	3,338.97	0.00	1.04	128.32
568.15	1.07	4,157.505	3,442.03	0.00	1.07	139.65
568.25	1.10	4,506.926	3,546.66	0.00	1.10	151.33
568.35	1.12	4,866.888	3,652.85	0.00	1.12	163.35
568.45	1.15	5,237.548	3,760.61	0.00	1.15	175.73
568.55	1.17	5,619.062	3,869.93	0.00	1.17	188.48
568.65	1.20	6,011.587	3,980.82	0.00	1.20	201.58
568.75	1.22	6,415.279	4,093.28	0.00	1.22	215.06
568.85	1.25	6,830.296	4,207.31	0.00	1.25	228.92
568.95	1.27	7,256.793	4,322.90	0.00	1.27	243.16
569.05	1.29	7,694.861	4,437.40	0.00	1.29	257.79

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
569.15	1.31	8,144.255	4,550.71	0.00	1.31	272.79
569.25	1.34	8,605.052	4,665.46	0.00	1.34	288.17
569.35	1.36	9,077.394	4,781.63	0.00	1.36	303.94
569.45	1.38	9,561.425	4,899.23	0.00	1.38	320.10
569.50	1.39	9,807.868	4,958.56	0.00	1.39	328.32
569.55	1.42	10,057.287	5,018.25	0.00	1.42	336.66
569.65	1.51	10,565.124	5,138.71	0.00	1.51	353.68
569.75	1.63	11,085.077	5,260.60	0.00	1.63	371.13
569.85	1.78	11,617.290	5,383.91	0.00	1.78	389.02
569.95	1.94	12,161.907	5,508.65	0.00	1.94	407.33
570.05	2.16	12,719.003	5,632.19	0.00	2.16	426.13
570.15	2.28	13,288.322	5,754.42	0.00	2.28	445.23
570.25	2.39	13,869.931	5,877.97	0.00	2.39	464.72
570.35	2.50	14,463.960	6,002.83	0.00	2.50	484.63
570.45	2.59	15,070.540	6,129.00	0.00	2.59	504.94
570.55	2.68	15,689.803	6,256.48	0.00	2.68	525.67
570.65	2.76	16,321.880	6,385.28	0.00	2.76	546.82
570.75	2.84	16,966.903	6,515.39	0.00	2.84	568.40
570.85	2.92	17,625.002	6,646.81	0.00	2.92	590.42
570.95	2.99	18,296.308	6,779.54	0.00	2.99	612.87
571.05	3.06	18,980.897	6,911.31	0.00	3.06	635.76
571.15	3.13	19,678.556	7,042.06	0.00	3.13	659.08
571.25	3.19	20,389.350	7,174.04	0.00	3.19	682.84
571.35	3.26	21,113.404	7,307.24	0.00	3.26	707.04
571.45	3.33	21,850.838	7,441.66	0.00	3.33	731.69
571.55	3.39	22,601.776	7,577.31	0.00	3.39	756.78
571.65	3.45	23,366.341	7,714.18	0.00	3.45	782.33
571.75	3.51	24,144.654	7,852.28	0.00	3.51	808.33
571.85	3.57	24,936.838	7,991.61	0.00	3.57	834.79
571.95	3.62	25,743.016	8,132.16	0.00	3.62	861.72
572.05	3.68	26,563.291	8,273.19	0.00	3.68	889.13
572.08	3.70	26,812.121	8,315.51	0.00	3.70	897.44
572.15	4.61	27,397.674	8,414.68	0.00	4.61	917.87
572.25	7.10	28,246.267	8,557.37	0.00	7.10	948.64
572.35	10.46	29,109.189	8,701.27	0.00	10.46	980.76
572.45	14.47	29,986.560	8,846.36	0.00	14.47	1,014.02
572.55	18.97	30,878.500	8,992.65	0.00	18.97	1,048.25
572.65	23.91	31,785.130	9,140.14	0.00	23.91	1,083.41
572.75	29.02	32,706.569	9,288.83	0.00	29.02	1,119.24
572.85	33.64	33,642.937	9,438.72	0.00	33.64	1,155.07
572.95	35.61	34,594.353	9,589.81	0.00	35.61	1,188.76
573.05	35.82	35,561.020	9,745.32	0.00	35.82	1,221.19
573.15	36.03	36,543.540	9,905.30	0.00	36.03	1,254.15
573.25	36.24	37,542.124	10,066.60	0.00	36.24	1,287.65
573.35	36.45	38,556.902	10,229.19	0.00	36.45	1,321.68

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 15 years
Label: Basin 1 Storm Event:

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
573.45	36.66	39,588.005	10,393.09	0.00	36.66	1,356.26
573.55	36.87	40,635.563	10,558.28	0.00	36.87	1,391.39
573.65	37.07	41,699.706	10,724.79	0.00	37.07	1,427.06
573.75	37.27	42,780.564	10,892.59	0.00	37.27	1,463.29
573.85	37.48	43,878.267	11,061.70	0.00	37.48	1,500.09
573.95	37.68	44,992.947	11,232.11	0.00	37.68	1,537.44
574.00	37.78	45,556.693	11,317.80	0.00	37.78	1,556.34

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
566.05	0.00	0.000	461.41	0.00	0.00	0.00
566.15	0.04	51.455	569.59	0.00	0.04	1.76
566.25	0.12	114.297	689.15	0.00	0.12	3.93
566.35	0.22	189.665	820.10	0.00	0.22	6.54
566.45	0.36	278.696	962.42	0.00	0.36	9.65
566.55	0.44	382.529	1,116.13	0.00	0.44	13.19
566.65	0.50	502.302	1,281.22	0.00	0.50	17.24
566.75	0.56	639.153	1,457.70	0.00	0.56	21.86
566.85	0.61	794.221	1,645.55	0.00	0.61	27.08
566.95	0.65	968.643	1,844.79	0.00	0.65	32.94
567.05	0.70	1,162.366	2,007.37	0.00	0.70	39.44
567.15	0.74	1,369.074	2,127.38	0.00	0.74	46.37
567.25	0.78	1,587.957	2,250.86	0.00	0.78	53.71
567.35	0.81	1,819.362	2,377.83	0.00	0.81	61.46
567.45	0.85	2,063.639	2,508.28	0.00	0.85	69.64
567.55	0.88	2,321.134	2,642.21	0.00	0.88	78.26
567.65	0.92	2,592.198	2,779.63	0.00	0.92	87.32
567.75	0.95	2,877.177	2,920.53	0.00	0.95	96.86
567.85	0.98	3,176.421	3,064.92	0.00	0.98	106.86
567.95	1.01	3,490.277	3,212.79	0.00	1.01	117.35
568.05	1.04	3,818.468	3,338.97	0.00	1.04	128.32
568.15	1.07	4,157.505	3,442.03	0.00	1.07	139.65
568.25	1.10	4,506.926	3,546.66	0.00	1.10	151.33
568.35	1.12	4,866.888	3,652.85	0.00	1.12	163.35
568.45	1.15	5,237.548	3,760.61	0.00	1.15	175.73
568.55	1.17	5,619.062	3,869.93	0.00	1.17	188.48
568.65	1.20	6,011.587	3,980.82	0.00	1.20	201.58
568.75	1.22	6,415.279	4,093.28	0.00	1.22	215.06
568.85	1.25	6,830.296	4,207.31	0.00	1.25	228.92
568.95	1.27	7,256.793	4,322.90	0.00	1.27	243.16
569.05	1.29	7,694.861	4,437.40	0.00	1.29	257.79

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
569.15	1.31	8,144.255	4,550.71	0.00	1.31	272.79
569.25	1.34	8,605.052	4,665.46	0.00	1.34	288.17
569.35	1.36	9,077.394	4,781.63	0.00	1.36	303.94
569.45	1.38	9,561.425	4,899.23	0.00	1.38	320.10
569.50	1.39	9,807.868	4,958.56	0.00	1.39	328.32
569.55	1.42	10,057.287	5,018.25	0.00	1.42	336.66
569.65	1.51	10,565.124	5,138.71	0.00	1.51	353.68
569.75	1.63	11,085.077	5,260.60	0.00	1.63	371.13
569.85	1.78	11,617.290	5,383.91	0.00	1.78	389.02
569.95	1.94	12,161.907	5,508.65	0.00	1.94	407.33
570.05	2.16	12,719.003	5,632.19	0.00	2.16	426.13
570.15	2.28	13,288.322	5,754.42	0.00	2.28	445.23
570.25	2.39	13,869.931	5,877.97	0.00	2.39	464.72
570.35	2.50	14,463.960	6,002.83	0.00	2.50	484.63
570.45	2.59	15,070.540	6,129.00	0.00	2.59	504.94
570.55	2.68	15,689.803	6,256.48	0.00	2.68	525.67
570.65	2.76	16,321.880	6,385.28	0.00	2.76	546.82
570.75	2.84	16,966.903	6,515.39	0.00	2.84	568.40
570.85	2.92	17,625.002	6,646.81	0.00	2.92	590.42
570.95	2.99	18,296.308	6,779.54	0.00	2.99	612.87
571.05	3.06	18,980.897	6,911.31	0.00	3.06	635.76
571.15	3.13	19,678.556	7,042.06	0.00	3.13	659.08
571.25	3.19	20,389.350	7,174.04	0.00	3.19	682.84
571.35	3.26	21,113.404	7,307.24	0.00	3.26	707.04
571.45	3.33	21,850.838	7,441.66	0.00	3.33	731.69
571.55	3.39	22,601.776	7,577.31	0.00	3.39	756.78
571.65	3.45	23,366.341	7,714.18	0.00	3.45	782.33
571.75	3.51	24,144.654	7,852.28	0.00	3.51	808.33
571.85	3.57	24,936.838	7,991.61	0.00	3.57	834.79
571.95	3.62	25,743.016	8,132.16	0.00	3.62	861.72
572.05	3.68	26,563.291	8,273.19	0.00	3.68	889.13
572.08	3.70	26,812.121	8,315.51	0.00	3.70	897.44
572.15	4.61	27,397.674	8,414.68	0.00	4.61	917.87
572.25	7.10	28,246.267	8,557.37	0.00	7.10	948.64
572.35	10.46	29,109.189	8,701.27	0.00	10.46	980.76
572.45	14.47	29,986.560	8,846.36	0.00	14.47	1,014.02
572.55	18.97	30,878.500	8,992.65	0.00	18.97	1,048.25
572.65	23.91	31,785.130	9,140.14	0.00	23.91	1,083.41
572.75	29.02	32,706.569	9,288.83	0.00	29.02	1,119.24
572.85	33.64	33,642.937	9,438.72	0.00	33.64	1,155.07
572.95	35.61	34,594.353	9,589.81	0.00	35.61	1,188.76
573.05	35.82	35,561.020	9,745.32	0.00	35.82	1,221.19
573.15	36.03	36,543.540	9,905.30	0.00	36.03	1,254.15
573.25	36.24	37,542.124	10,066.60	0.00	36.24	1,287.65
573.35	36.45	38,556.902	10,229.19	0.00	36.45	1,321.68

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 25 years
Label: Basin 1 Storm Event:

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
573.45	36.66	39,588.005	10,393.09	0.00	36.66	1,356.26
573.55	36.87	40,635.563	10,558.28	0.00	36.87	1,391.39
573.65	37.07	41,699.706	10,724.79	0.00	37.07	1,427.06
573.75	37.27	42,780.564	10,892.59	0.00	37.27	1,463.29
573.85	37.48	43,878.267	11,061.70	0.00	37.48	1,500.09
573.95	37.68	44,992.947	11,232.11	0.00	37.68	1,537.44
574.00	37.78	45,556.693	11,317.80	0.00	37.78	1,556.34

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
566.05	0.00	0.000	461.41	0.00	0.00	0.00
566.15	0.04	51.455	569.59	0.00	0.04	1.76
566.25	0.12	114.297	689.15	0.00	0.12	3.93
566.35	0.22	189.665	820.10	0.00	0.22	6.54
566.45	0.36	278.696	962.42	0.00	0.36	9.65
566.55	0.44	382.529	1,116.13	0.00	0.44	13.19
566.65	0.50	502.302	1,281.22	0.00	0.50	17.24
566.75	0.56	639.153	1,457.70	0.00	0.56	21.86
566.85	0.61	794.221	1,645.55	0.00	0.61	27.08
566.95	0.65	968.643	1,844.79	0.00	0.65	32.94
567.05	0.70	1,162.366	2,007.37	0.00	0.70	39.44
567.15	0.74	1,369.074	2,127.38	0.00	0.74	46.37
567.25	0.78	1,587.957	2,250.86	0.00	0.78	53.71
567.35	0.81	1,819.362	2,377.83	0.00	0.81	61.46
567.45	0.85	2,063.639	2,508.28	0.00	0.85	69.64
567.55	0.88	2,321.134	2,642.21	0.00	0.88	78.26
567.65	0.92	2,592.198	2,779.63	0.00	0.92	87.32
567.75	0.95	2,877.177	2,920.53	0.00	0.95	96.86
567.85	0.98	3,176.421	3,064.92	0.00	0.98	106.86
567.95	1.01	3,490.277	3,212.79	0.00	1.01	117.35
568.05	1.04	3,818.468	3,338.97	0.00	1.04	128.32
568.15	1.07	4,157.505	3,442.03	0.00	1.07	139.65
568.25	1.10	4,506.926	3,546.66	0.00	1.10	151.33
568.35	1.12	4,866.888	3,652.85	0.00	1.12	163.35
568.45	1.15	5,237.548	3,760.61	0.00	1.15	175.73
568.55	1.17	5,619.062	3,869.93	0.00	1.17	188.48
568.65	1.20	6,011.587	3,980.82	0.00	1.20	201.58
568.75	1.22	6,415.279	4,093.28	0.00	1.22	215.06
568.85	1.25	6,830.296	4,207.31	0.00	1.25	228.92
568.95	1.27	7,256.793	4,322.90	0.00	1.27	243.16
569.05	1.29	7,694.861	4,437.40	0.00	1.29	257.79

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
569.15	1.31	8,144.255	4,550.71	0.00	1.31	272.79
569.25	1.34	8,605.052	4,665.46	0.00	1.34	288.17
569.35	1.36	9,077.394	4,781.63	0.00	1.36	303.94
569.45	1.38	9,561.425	4,899.23	0.00	1.38	320.10
569.50	1.39	9,807.868	4,958.56	0.00	1.39	328.32
569.55	1.42	10,057.287	5,018.25	0.00	1.42	336.66
569.65	1.51	10,565.124	5,138.71	0.00	1.51	353.68
569.75	1.63	11,085.077	5,260.60	0.00	1.63	371.13
569.85	1.78	11,617.290	5,383.91	0.00	1.78	389.02
569.95	1.94	12,161.907	5,508.65	0.00	1.94	407.33
570.05	2.16	12,719.003	5,632.19	0.00	2.16	426.13
570.15	2.28	13,288.322	5,754.42	0.00	2.28	445.23
570.25	2.39	13,869.931	5,877.97	0.00	2.39	464.72
570.35	2.50	14,463.960	6,002.83	0.00	2.50	484.63
570.45	2.59	15,070.540	6,129.00	0.00	2.59	504.94
570.55	2.68	15,689.803	6,256.48	0.00	2.68	525.67
570.65	2.76	16,321.880	6,385.28	0.00	2.76	546.82
570.75	2.84	16,966.903	6,515.39	0.00	2.84	568.40
570.85	2.92	17,625.002	6,646.81	0.00	2.92	590.42
570.95	2.99	18,296.308	6,779.54	0.00	2.99	612.87
571.05	3.06	18,980.897	6,911.31	0.00	3.06	635.76
571.15	3.13	19,678.556	7,042.06	0.00	3.13	659.08
571.25	3.19	20,389.350	7,174.04	0.00	3.19	682.84
571.35	3.26	21,113.404	7,307.24	0.00	3.26	707.04
571.45	3.33	21,850.838	7,441.66	0.00	3.33	731.69
571.55	3.39	22,601.776	7,577.31	0.00	3.39	756.78
571.65	3.45	23,366.341	7,714.18	0.00	3.45	782.33
571.75	3.51	24,144.654	7,852.28	0.00	3.51	808.33
571.85	3.57	24,936.838	7,991.61	0.00	3.57	834.79
571.95	3.62	25,743.016	8,132.16	0.00	3.62	861.72
572.05	3.68	26,563.291	8,273.19	0.00	3.68	889.13
572.08	3.70	26,812.121	8,315.51	0.00	3.70	897.44
572.15	4.61	27,397.674	8,414.68	0.00	4.61	917.87
572.25	7.10	28,246.267	8,557.37	0.00	7.10	948.64
572.35	10.46	29,109.189	8,701.27	0.00	10.46	980.76
572.45	14.47	29,986.560	8,846.36	0.00	14.47	1,014.02
572.55	18.97	30,878.500	8,992.65	0.00	18.97	1,048.25
572.65	23.91	31,785.130	9,140.14	0.00	23.91	1,083.41
572.75	29.02	32,706.569	9,288.83	0.00	29.02	1,119.24
572.85	33.64	33,642.937	9,438.72	0.00	33.64	1,155.07
572.95	35.61	34,594.353	9,589.81	0.00	35.61	1,188.76
573.05	35.82	35,561.020	9,745.32	0.00	35.82	1,221.19
573.15	36.03	36,543.540	9,905.30	0.00	36.03	1,254.15
573.25	36.24	37,542.124	10,066.60	0.00	36.24	1,287.65
573.35	36.45	38,556.902	10,229.19	0.00	36.45	1,321.68

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 100 years
Label: Basin 1 Storm Event:

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
573.45	36.66	39,588.005	10,393.09	0.00	36.66	1,356.26
573.55	36.87	40,635.563	10,558.28	0.00	36.87	1,391.39
573.65	37.07	41,699.706	10,724.79	0.00	37.07	1,427.06
573.75	37.27	42,780.564	10,892.59	0.00	37.27	1,463.29
573.85	37.48	43,878.267	11,061.70	0.00	37.48	1,500.09
573.95	37.68	44,992.947	11,232.11	0.00	37.68	1,537.44
574.00	37.78	45,556.693	11,317.80	0.00	37.78	1,556.34

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	572.08 ft
Volume (Initial)	26,812.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
566.05	0.00	0.000	461.41	0.00	0.00	0.00
566.15	0.00	51.455	569.59	0.00	0.00	1.72
566.25	0.00	114.297	689.15	0.00	0.00	3.81
566.35	0.00	189.665	820.10	0.00	0.00	6.32
566.45	0.00	278.696	962.42	0.00	0.00	9.29
566.55	0.00	382.529	1,116.13	0.00	0.00	12.75
566.65	0.00	502.302	1,281.22	0.00	0.00	16.74
566.75	0.00	639.153	1,457.70	0.00	0.00	21.31
566.85	0.00	794.221	1,645.55	0.00	0.00	26.47
566.95	0.00	968.643	1,844.79	0.00	0.00	32.29
567.05	0.00	1,162.366	2,007.37	0.00	0.00	38.75
567.15	0.00	1,369.074	2,127.38	0.00	0.00	45.64
567.25	0.00	1,587.957	2,250.86	0.00	0.00	52.93
567.35	0.00	1,819.362	2,377.83	0.00	0.00	60.65
567.45	0.00	2,063.639	2,508.28	0.00	0.00	68.79
567.55	0.00	2,321.134	2,642.21	0.00	0.00	77.37
567.65	0.00	2,592.198	2,779.63	0.00	0.00	86.41
567.75	0.00	2,877.177	2,920.53	0.00	0.00	95.91
567.85	0.00	3,176.421	3,064.92	0.00	0.00	105.88
567.95	0.00	3,490.277	3,212.79	0.00	0.00	116.34
568.05	0.00	3,818.468	3,338.97	0.00	0.00	127.28
568.15	0.00	4,157.505	3,442.03	0.00	0.00	138.58
568.25	0.00	4,506.926	3,546.66	0.00	0.00	150.23
568.35	0.00	4,866.888	3,652.85	0.00	0.00	162.23
568.45	0.00	5,237.548	3,760.61	0.00	0.00	174.58
568.55	0.00	5,619.062	3,869.93	0.00	0.00	187.30
568.65	0.00	6,011.587	3,980.82	0.00	0.00	200.39
568.75	0.00	6,415.279	4,093.28	0.00	0.00	213.84
568.85	0.00	6,830.296	4,207.31	0.00	0.00	227.68
568.95	0.00	7,256.793	4,322.90	0.00	0.00	241.89
569.05	0.00	7,694.861	4,437.40	0.00	0.00	256.50

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
569.15	0.00	8,144.255	4,550.71	0.00	0.00	271.48
569.25	0.00	8,605.052	4,665.46	0.00	0.00	286.84
569.35	0.00	9,077.394	4,781.63	0.00	0.00	302.58
569.45	0.00	9,561.425	4,899.23	0.00	0.00	318.71
569.55	0.00	10,057.287	5,018.25	0.00	0.00	335.24
569.65	0.00	10,565.124	5,138.71	0.00	0.00	352.17
569.75	0.00	11,085.077	5,260.60	0.00	0.00	369.50
569.85	0.00	11,617.290	5,383.91	0.00	0.00	387.24
569.95	0.00	12,161.907	5,508.65	0.00	0.00	405.40
570.05	0.00	12,719.003	5,632.19	0.00	0.00	423.97
570.15	0.00	13,288.322	5,754.42	0.00	0.00	442.94
570.25	0.00	13,869.931	5,877.97	0.00	0.00	462.33
570.35	0.00	14,463.960	6,002.83	0.00	0.00	482.13
570.45	0.00	15,070.540	6,129.00	0.00	0.00	502.35
570.55	0.00	15,689.803	6,256.48	0.00	0.00	522.99
570.65	0.00	16,321.880	6,385.28	0.00	0.00	544.06
570.75	0.00	16,966.903	6,515.39	0.00	0.00	565.56
570.85	0.00	17,625.002	6,646.81	0.00	0.00	587.50
570.95	0.00	18,296.308	6,779.54	0.00	0.00	609.88
571.05	0.00	18,980.897	6,911.31	0.00	0.00	632.70
571.15	0.00	19,678.556	7,042.06	0.00	0.00	655.95
571.25	0.00	20,389.350	7,174.04	0.00	0.00	679.65
571.35	0.00	21,113.404	7,307.24	0.00	0.00	703.78
571.45	0.00	21,850.838	7,441.66	0.00	0.00	728.36
571.55	0.00	22,601.776	7,577.31	0.00	0.00	753.39
571.65	0.00	23,366.341	7,714.18	0.00	0.00	778.88
571.75	0.00	24,144.654	7,852.28	0.00	0.00	804.82
571.85	0.00	24,936.838	7,991.61	0.00	0.00	831.23
571.95	0.00	25,743.016	8,132.16	0.00	0.00	858.10
572.05	0.00	26,563.291	8,273.19	0.00	0.00	885.44
572.08	0.00	26,812.121	8,315.51	0.00	0.00	893.74
572.15	0.87	27,397.674	8,414.68	0.00	0.87	914.13
572.25	3.30	28,246.267	8,557.37	0.00	3.30	944.85
572.35	6.61	29,109.189	8,701.27	0.00	6.61	976.92
572.45	10.60	29,986.560	8,846.36	0.00	10.60	1,010.15
572.55	15.19	30,878.500	8,992.65	0.00	15.19	1,044.47
572.65	20.28	31,785.130	9,140.14	0.00	20.28	1,079.78
572.75	25.84	32,706.569	9,288.83	0.00	25.84	1,116.06
572.85	31.84	33,642.937	9,438.72	0.00	31.84	1,153.27
572.95	35.61	34,594.353	9,589.81	0.00	35.61	1,188.75
573.05	35.82	35,561.020	9,745.32	0.00	35.82	1,221.19
573.15	36.03	36,543.540	9,905.30	0.00	36.03	1,254.15
573.25	36.24	37,542.124	10,066.60	0.00	36.24	1,287.65
573.35	36.45	38,556.902	10,229.19	0.00	36.45	1,321.68
573.45	36.66	39,588.005	10,393.09	0.00	36.66	1,356.26

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 101 years
Label: Basin 1 Storm Event:

Elevation (ft)	Outflow (ft^3/s)	Storage (ft^3)	Area (ft^2)	Infiltration (ft^3/s)	Flow (Total) (ft^3/s)	2S/t + O (ft^3/s)
573.55	36.87	40,635.563	10,558.28	0.00	36.87	1,391.39
573.65	37.07	41,699.706	10,724.79	0.00	37.07	1,427.06
573.75	37.27	42,780.564	10,892.59	0.00	37.27	1,463.29
573.85	37.48	43,878.267	11,061.70	0.00	37.48	1,500.09
573.95	37.68	44,992.947	11,232.11	0.00	37.68	1,537.44
574.00	37.78	45,556.693	11,317.80	0.00	37.78	1,556.34

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	10.23 ft³/s	Time to Peak (Flow, In)	5 min
Flow (Peak Outlet)	1.55 ft³/s	Time to Peak (Flow, Outlet)	24 min

Elevation (Water Surface, Peak)	569.68 ft
Volume (Peak)	10,722.313 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	12,276.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	10,823.000 ft³
Volume (Retained)	1,407.000 ft³
Volume (Unrouted)	-46.000 ft³
Error (Mass Balance)	0.4 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	15.15 ft³/s	Time to Peak (Flow, In)	5 min
Flow (Peak Outlet)	2.72 ft³/s	Time to Peak (Flow, Outlet)	24 min

Elevation (Water Surface, Peak)	570.60 ft
Volume (Peak)	15,988.190 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	18,180.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	14,545.000 ft³
Volume (Retained)	3,573.000 ft³
Volume (Unrouted)	-62.000 ft³
Error (Mass Balance)	0.3 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	17.80 ft³/s	Time to Peak (Flow, In)	5 min
Flow (Peak Outlet)	3.05 ft³/s	Time to Peak (Flow, Outlet)	24 min

Elevation (Water Surface, Peak)	571.03 ft
Volume (Peak)	18,847.191 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	21,360.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	16,667.000 ft³
Volume (Retained)	4,625.000 ft³
Volume (Unrouted)	-68.000 ft³
Error (Mass Balance)	0.3 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	566.05 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	20.40 ft³/s	Time to Peak (Flow, In)	5 min
Flow (Peak Outlet)	3.31 ft³/s	Time to Peak (Flow, Outlet)	24 min

Elevation (Water Surface, Peak)	571.43 ft
Volume (Peak)	21,683.769 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	24,480.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	18,764.000 ft³
Volume (Retained)	5,645.000 ft³
Volume (Unrouted)	-71.000 ft³
Error (Mass Balance)	0.3 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	572.08 ft
Volume (Initial)	26,812.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	1 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	20.40 ft³/s	Time to Peak (Flow, In)	5 min
Flow (Peak Outlet)	20.31 ft³/s	Time to Peak (Flow, Outlet)	20 min

Elevation (Water Surface, Peak)	572.65 ft
Volume (Peak)	31,790.494 ft³

Mass Balance (ft³)	
Volume (Initial)	26,812.000 ft³
Volume (Total Inflow)	24,480.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	24,480.000 ft³
Volume (Retained)	26,812.000 ft³
Volume (Unrouted)	0.000 ft³
Error (Mass Balance)	0.0 %

Summary for Hydrograph Addition at 'Basin 1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Site Runoff 1

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Site Runoff 1	12,276.000	5	10.23
Flow (In)	Basin 1	12,276.000	5	10.23

Summary for Hydrograph Addition at 'Basin 1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Site Runoff 1

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Site Runoff 1	18,180.000	5	15.15
Flow (In)	Basin 1	18,180.000	5	15.15

Summary for Hydrograph Addition at 'Basin 1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Site Runoff 1

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Site Runoff 1	21,360.000	5	17.80
Flow (In)	Basin 1	21,360.000	5	17.80

Summary for Hydrograph Addition at 'Basin 1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Site Runoff 1

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Site Runoff 1	24,480.000	5	20.40
Flow (In)	Basin 1	24,480.000	5	20.40

Summary for Hydrograph Addition at 'Basin 1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Site Runoff 1

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Site Runoff 1	24,480.000	5	20.40
Flow (In)	Basin 1	24,480.000	5	20.40

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Appendix C

-Drainage Area Maps

Exhibit A
Predeveloped Drainage Area Map
Grant Warehouse and Storage Lot 4
01-11691F

GRAPHIC SCALE
50 0 25 50
(IN FEET)
1 inch = 50 ft.

ENGINEERING
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221 Point West Blvd.
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PROPERTY N/F
JEAN E. BEAN
645/565
CITY OF ST. PAUL
ZONED RESIDENTIAL

EAST WEST CENTERLINE OF SECTION 24

PROPERTY N/F
HENRY J. AND KAREN E. HOFF
1217/850
CITY OF ST. PAUL
ZONED AG

PROPERTY N/F
WALTER AND NORMA JEAN HOFF
888/1450
CITY OF ST. PAUL
RESIDENTIAL

CITY OF ST. PAUL
RESIDENTIAL

DEDICATION AREA (TYP.)

PROPERTY N/F
MARKET FIBERS COMPANY, INC.
5592/2039

HOFF ROAD 40' WIDE

HOFF ROAD

40' WIDE

PROPERTY N/F
MARKET FIBERS
COMPANY, INC.
5592/2039

PROPERTY N/F
CITY OF O'FALLON, MISSOURI
1442/1170
PARCEL 2

N55°59'24"E 192.40'

S82°30'36"E 118.01'

N00°32'14"W 132.19'

N89°27'46"E 330.48'

PREDEVELOPED WATERSHED A

LAND USE	ACRE	PI
ONSITE GREENSPACE	1.76	1.70
OFFSITE GREENSPACE	1.95	1.70

PROPERTY N/F
LAYNE G. AND SHIRLEY A. KONNEMAN
1217/850
ST. CHARLES CO.
ZONED A

PROPERTY N/F
MJSM, L.L.C.
4817/1509

EXISTING PHOENIX METALS

PROPERTY N/F
RONALD AMD CAROL SATTELE
864/522
ST. CHARLES CO.
ZONED A

S00°11'48"E 13.59'

S89°48'12"W 185.61'

N01°36'18"E 247.55'

MANDERLY PLACE DRIVE (PRIVATE)

PROPERTY N/F
GLENNON G. AND ANNE HIBBLER
REVOCABLE TRUST
2188/21
ST. CHARLES CO.
ZONED A

PROPERTY N/F
MJSM, L.L.C.
4817/1509

MANDERLY PLACE
PLAT BOOK 34 PAGE 278
CITY OF O'FALLON
ZONED R1-A

PREDEVELOPED WATERSHED B

LAND USE	ACRE	PI
ONSITE GREENSPACE	5.16	1.70
OFFSITE GREENSPACE	0.95	1.70

GRANT INDUSTRIAL DRIVE

LOT 2

PROPERTY N/F
MARKET FIBERS COMPANY, INC.
5592/2039
ZONED: I-1

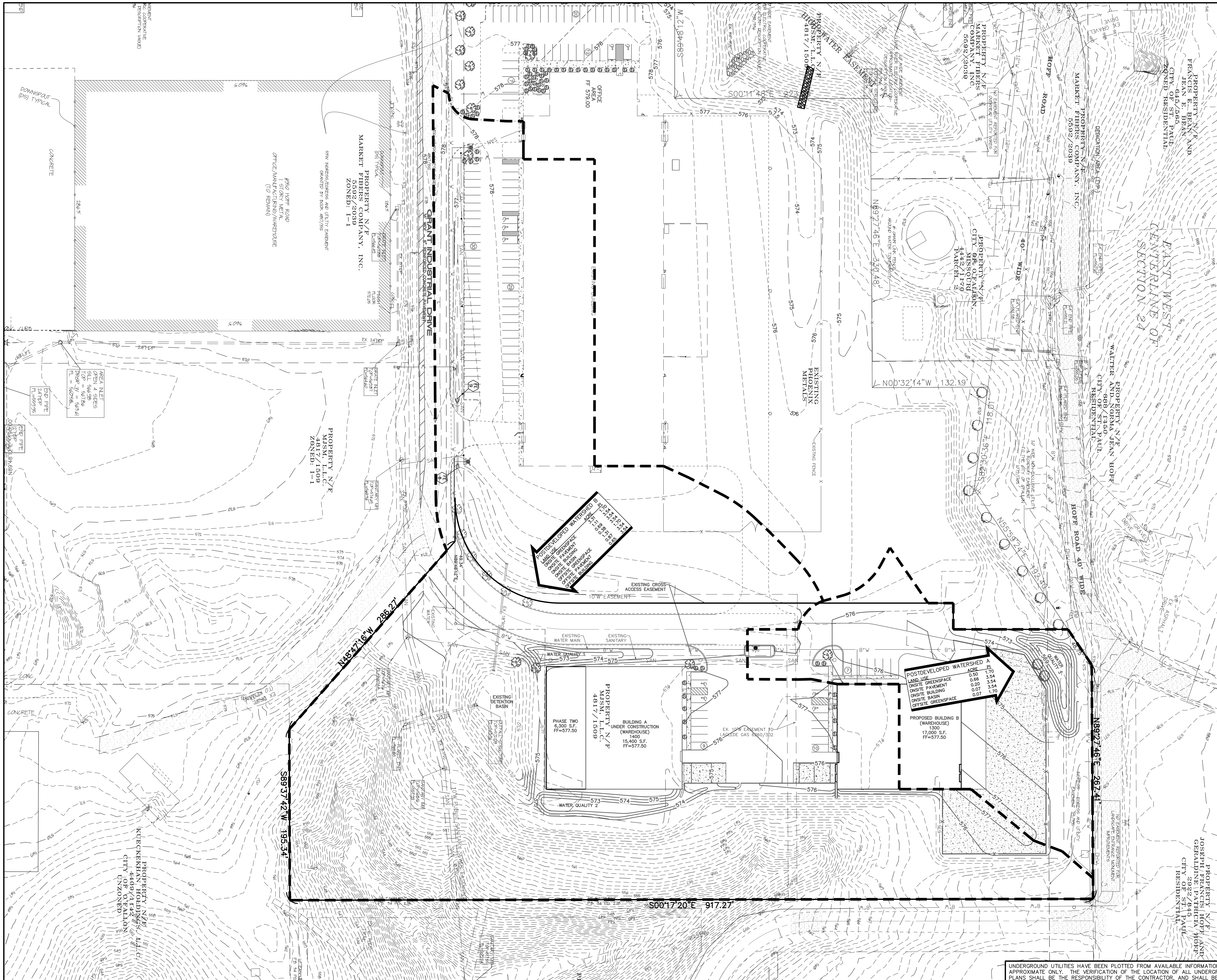
#350 HOFF ROAD
1 STORY METAL
OFFICE/MANUFACTURING/WAREHOUSE
(TO REMAIN)

PROPERTY N/F
MJSM, L.L.C.
4817/1509
ZONED: I-1

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE THEIR LOCATIONS SHALL BE CONSIDERED APPROXIMATE ONLY. THE VERIFICATION OF THE LOCATION OF ALL UNDERGROUND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE LOCATED PRIOR TO ANY GRADING OR CONSTRUCTION OF THE IMPROVEMENTS.

Todd C. Flaugus
Engineer
Engineers License #2005000982

Exhibit B
Postdeveloped Drainage Area Map
Grant Warehouse and Storage Lot 4
01-11691F



ENGINEERING
PLANNING
SURVEYING

221 Point West Blvd.
St. Charles, MO 63301
636-928-5552
FAX 928-1718

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE THEIR LOCATIONS SHALL BE CONSIDERED APPROXIMATE ONLY. THE VERIFICATION OF THE LOCATION OF ALL UNDERGROUND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE LOCATED PRIOR TO ANY GRADING OR CONSTRUCTION OF THE IMPROVEMENTS.

Todd C. Flauaus
Engineer
Engineers License #2005000982

Exhibit C
Basin Inflow Drainage Area Map
Grant Warehouse and Storage Lot 4
01-11691F

ENGINEERING PLANNING SURVEYING

221 Point West Blvd.
St. Charles, MO 63301
636-928-5552
FAX 928-1718

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Todd C. Flauaus
Engineer
Engineers License #2005000982

Engineering Authority No. 000655
Surveying Authority No. 000144

Exhibit A
Predeveloped Drainage Area Map
Grant Warehouse and Storage Lot 4
01-11691F

GRAPHIC SCALE
50 0 25 50
(IN FEET)
1 inch = 50 ft.

ENGINEERING
PLANNING
SURVEYING
221 Point West Blvd.
St. Charles, MO 63301
636-928-5552
FAX 928-1718

10-24-19 CITY REVIEW

DISCHARGE POINT 1

DISCHARGE POINT 2

PREDEVELOPED WATERSHED 1
LAND USE	ACRE	PI
ONSITE GREENSPACE	1.76	1.70
OFFSITE GREENSPACE	1.95	1.70

PREDEVELOPED WATERSHED 2
LAND USE	ACRE	PI
ONSITE GREENSPACE	5.16	1.70
OFFSITE GREENSPACE	0.95	1.70

PROPERTY N/F
JEAN E. BEAN
645/565
CITY OF ST. PAUL
ZONED RESIDENTIAL

PROPERTY N/F
HENRY J. AND
KAREN E. HOFF
1217/850
CITY OF ST. PAUL
ZONED AG

PROPERTY N/F
WALTER AND NORMA JEAN HOFF
880/1450
CITY OF ST. PAUL
RESIDENTIAL

CITY OF ST. PAUL
RESIDENTIAL

PROPERTY N/F
MARKET FIBERS COMPANY, INC.
5592/2039

PROPERTY N/F
CITY OF O'FALLON,
MISSOURI
1443/1170
PARCEL 2

PROPERTY N/F
MARKET FIBERS
COMPANY, INC.
5592/2039

PROPERTY N/F
LAYNE G. KONNEMAN
SHIRLEY A. KONNEMAN
REVOCABLE TRUST
2168/41
ST. CHARLES CO.
ZONED A

PROPERTY N/F
MJSM, L.L.C.
4817/1509

PROPERTY N/F
RONALD AND
CAROL SATTERLY
864/522
ST. CHARLES CO.
ZONED A

PROPERTY N/F
GLENNON G. AND JANE HIBBLER
REVOCABLE TRUST
2168/41
ST. CHARLES CO.
ZONED A

PROPERTY N/F
MARKET FIBERS COMPANY, INC.
5592/2039
ZONED: I-1

PROPERTY N/F
MJSM, L.L.C.
4817/1509
ZONED: I-1

#350 HOFF ROAD
1 STORY METAL
OFFICE/MANUFACTURING/WAREHOUSE
(TO REMAIN)

EXISTING
PHOENIX
METALS

HOFF ROAD 40' WIDE

HOFF ROAD 40' WIDE

DEDICATION AREA (TYP.)

MANDERLY PLACE DRIVE
(PRIVATE)

MANDERLY PLACE
PLAT BOOK 34 PAGE 278
CITY OF O'FALLON
ZONED R1-S

LOT 2

GRANT INDUSTRIAL DRIVE

S82°30'36"E 118.01'

N55°59'24"E 192.40'

N00°32'14"W 132.19'

N89°27'46"E 330.48'

S00°11'48"E 13.59'

S89°48'12"W 185.61'

N01°30'18"E 247.55'

25' X 50'
CONSTRUCTION
ENTRANCE

SAWCUT LIMIT

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE THEIR LOCATIONS SHALL BE CONSIDERED APPROXIMATE ONLY. THE VERIFICATION OF THE LOCATION OF ALL UNDERGROUND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE LOCATED PRIOR TO ANY GRADING OR CONSTRUCTION OF THE IMPROVEMENTS.

Todd C. Flauus
Engineer
Engineers License #2005000982

Exhibit B
Postdeveloped Drainage Area Map
Grant Warehouse and Storage Lot 4
01-11691F

GRAPHIC SCALE

50 0 25 50

(IN FEET)
1 inch = 50 ft.

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PLANNING
SURVEYING

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St. Charles, MO 63301
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FAX 928-1718

10-24-19 CITY REVIEW

HIGH WATER EASEMENT "A"

10'W EASEMENT

#850 HOFF ROAD
1 STORY METAL
OFFICE/MANUFACTURING/WAREHOUSE
(TO REMAIN)

60%

24"DIP

SAN

EAST WEST CENTERLINE OF SECTION 24

POSTDEVELOPED WATERSHED 1

LAND USE	ACRE	PI
ONSITE GREENSPACE	0.50	1.70
ONSITE PAVEMENT	0.69	3.54
ONSITE BUILDING	0.20	3.54
ONSITE BASIN	0.07	3.54
OFFSITE GREENSPACE	0.07	1.70

POSTDEVELOPED WATERSHED 2

LAND USE	ACRE	PI
ONSITE GREENSPACE	2.33	1.70
ONSITE PAVEMENT	0.00	3.54
ONSITE BUILDING	0.00	3.54
ONSITE BASIN	0.00	3.54
OFFSITE GREENSPACE	0.00	1.70
OFFSITE PAVEMENT	0.00	3.54
OFFSITE BUILDING	0.00	3.54

N89°48'12"E 49.34'

R=120.00' L=188.50'

N00°11'48"W 448.87'

S89°48'12"W 30.00'

N55°39'41"E 48.73'

S00°11'48"E 130.94'

N48°47'16"W 286.27'

N89°27'46"E 267.41'

DISCHARGE POINT 1

DISCHARGE POINT 2

S89°37'42"W 195.34'

S0°17'20"E 917.27'

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