A STORMWATER ANALYSIS

OF THE PROPOSED DEVELOPMENT OF

FORT ZUMWALT PROFESSIONAL DEVELOPMENT CENTER

IN

CITY OF O'FALLON, MISSOURI

FOR

FORT ZUMWALT SCHOOL DISTRICT
555 EAST TERRA LANE
O'FALLON, MO 63366

BAX PROJECT NO. 19-17514

January 21, 2020

Prepared by:
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INTRODUCTION:

The undeveloped site is located in the City of O'Fallon, Missouri and is comprised of 6.43 acres of land. Located near Tom Ginnever Avenue and N. Cool Springs Road, this site shall be analyzed for the construction of the proposed Fort Zumwalt Professional Development Center which disturbs approximately 5.56 acres of land. Stormwater Detention for this site was originally provided with the Offsite Commercial Dry Detention Basin which was implemented during the Villas at Crystal Ridge Development. As part of the analysis, the Offsite Commercial Dry Detention Basin as well as the 2 Detention Basins in the Villas at Crystal Ridge which are located within the same watershed are analyzed to determine if the Stormwater Attenuation required by the City of O'Fallon's Design Standards is provided for the development. The storage volume and outflow rates shall be proportioned so that the peak rate of runoff leaving the tract under the Postdeveloped Condition is less than the peak rate of runoff leaving the Predeveloped Condition for the 2, 15, 25, and 100 Year 20 Minute Design Storms. The safe passage of the 100 Year 20 Minute Design Storm is also analyzed assuming the low flow slot is blocked.

The two Dry Detention Basins located in the Villas at Crystal Ridge are routed with the assumption that the Basins were constructed to plan based on the approved design completed by Pickett, Ray, & Silver Inc. on September 22, 2003.

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/Building	100%	2.39	3.54	4.16	4.77
Basin	100%	2.39	3.54	4.16	4.77
Multifamily Residential	60%	2.06	3.06	3.59	4.12

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DETENTION BASIN CALCULATIONS

PREDEVELOPED CONDITIONS:

The Predeveloped watershed is modeled to analyze the peak runoff contributed by the site under the existing conditions for the discharge point. The total runoff for the watershed is calculated using the Rational Method to determine the Predeveloped Runoff Rates leaving the site. The Predeveloped Runoff Rates for the 2, 15, 25, and 100 Year 20 Minute Design Storms are calculated for comparison to the Postdeveloped Runoff rates to determine the Required Attenuation for the development. Drainage Areas are shown on the accompanying Predeveloped Drainage Area Map.

Discharge Point 1

2 Year					
Onsite Greenspace	6.43 ac	x	1.15 cfs/ac	=	7.39 cfs
Offsite Greenspace	27.31 ac	x	1.15 cfs/ac	=	31.41 cfs
			Total	=	38.80 cfs
15 Year					
Onsite Greenspace	6.43 ac	x	1.70 cfs/ac	=	10.93 cfs
Offsite Greenspace	27.31 ac	x	1.70 cfs/ac	=	46.43 cfs
			Total	=	57.36 cfs
25 Year					
Onsite Greenspace	6.43 ac	x	2.00 cfs/ac	=	12.86 cfs
Offsite Greenspace	27.31 ac	x	2.00 cfs/ac	=	54.62 cfs
			Total	=	67.48 cfs
100 Year					
Onsite Greenspace	6.43 ac	x	2.29 cfs/ac	=	14.72 cfs
Offsite Greenspace	27.31 ac	x	2.29 cfs/ac	=	62.54 cfs
			Total	=	77.26 cfs

2 year-20 minute storm:	38.80 cfs
15 year-20 minute storm:	57.36 cfs
25 year-20 minute storm:	67.48 cfs
100 year-20 minute storm:	77.26 cfs

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POSTDEVELOPED CONDITIONS:

The Postdeveloped site maintains the same distinct watershed and discharge point as analyzed under Predeveloped Conditions. The total runoff from the watershed will be calculated using the Rational Method to determine the Postdeveloped Runoff Rates leaving the site. The Postdeveloped Runoff Rates for the 2, 15, 25, and 100 Year 20 Minute Design Storms are calculated for comparison to the previously calculated Predeveloped Runoff to determine the Required Attenuation for the development. Drainage Areas are shown on the accompanying Postdeveloped Drainage Area Map.

Discharge Point 1

2 Year

Onsite Greenspace	2.05 ac	x	1.15 cfs/ac	=	2.36 cfs
Onsite Pavement/ Building	4.38 ac	x	2.39 cfs/ac	=	10.47 cfs
Offsite Greenspace	3.58 ac	x	1.15 cfs/ac	=	4.12 cfs
Offsite Multifamily Residential	22.79 ac	x	2.06 cfs/ac	=	46.95 cfs
Offsite Pavement/ Building	0.62 ac	x	2.39 cfs/ac	=	1.48 cfs
Offsite Basin	0.32 ac	x	2.39 cfs/ac	=	0.76 cfs
			Total	=	66.14 cfs

15 Year

Onsite Greenspace	2.05 ac	x	1.70 cfs/ac	=	3.49 cfs
Onsite Pavement/ Building	4.38 ac	x	3.54 cfs/ac	=	15.51 cfs
Offsite Greenspace	3.58 ac	x	1.70 cfs/ac	=	6.09 cfs
Offsite Multifamily Residential	22.79 ac	x	3.06 cfs/ac	=	69.74 cfs
Offsite Pavement/ Building	0.62 ac	x	3.54 cfs/ac	=	2.19 cfs
Offsite Basin	0.32 ac	x	3.54 cfs/ac	=	1.13 cfs
			Total	=	98.15 cfs

25 Year

Onsite Greenspace	2.05 ac	x	2.00 cfs/ac	=	4.10 cfs
Onsite Pavement/ Building	4.38 ac	x	4.16 cfs/ac	=	18.22 cfs
Offsite Greenspace	3.58 ac	x	2.00 cfs/ac	=	7.16 cfs
Offsite Multifamily Residential	22.79 ac	x	3.59 cfs/ac	=	81.82 cfs
Offsite Pavement/ Building	0.62 ac	x	4.16 cfs/ac	=	2.58 cfs
Offsite Basin	0.32 ac	x	4.16 cfs/ac	=	1.33 cfs
			Total	=	115.21 cfs

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100 Year

Onsite Greenspace	2.05 ac	x	2.29 cfs/ac	=	4.69 cfs
Onsite Pavement/ Building	4.38 ac	x	4.77 cfs/ac	=	20.89 cfs
Offsite Greenspace	3.58 ac	x	2.29 cfs/ac	=	8.20 cfs
Offsite Multifamily Residential	22.79 ac	x	4.12 cfs/ac	=	93.89 cfs
Offsite Pavement/ Building	0.62 ac	x	4.77 cfs/ac	=	2.96 cfs
Offsite Basin	0.32 ac	x	4.77 cfs/ac	=	1.53 cfs
			Total	=	132.16 cfs

2 year-20 minute storm:	66.14 cfs
15 year-20 minute storm:	98.15 cfs
25 year-20 minute storm:	115.21 cfs
100 year-20 minute storm:	132.16 cfs

DIFFERENTIAL RUNOFF

To determine if detention is required for the development, the 25 Year 20 Minute Differential Runoff is calculated. This is determined by subtracting the Predeveloped Runoff rate from the Postdeveloped Runoff rate.

Discharge Point 1

Design Storm	Postdeveloped Runoff	Predeveloped Runoff	Differential Runoff
2 yr	66.14 cfs	38.80 cfs	27.34 cfs
15 yr	98.15 cfs	57.36 cfs	40.79 cfs
25 yr	115.21 cfs	67.48 cfs	47.73 cfs
100 yr	132.16 cfs	77.26 cfs	54.90 cfs

After analysis of the calculations, it was determined that detention is required for the 2, 15, 25, and 100 Year 20 Minute Design Storm.

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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 an Existing Detention Facility. With that said, there are 3 Time of Concentrations that are calculated and shown below.

Commercial Dry Detention Basin #1
The most remote point of flow indicative of this site tributary to the Detention Facility lies on the northwestern quadrant near the existing concrete road. Flows will travel approximately 281 ft overland to the Existing AI 34. Flows will enter the structure which will be piped approximately 645 ft to the Commercial Dry Detention Basin. Time of Concentration is estimated as follows:

Discharge Point 1

T(overland):	L = 281 feet
	Elevation difference = 8.60 feet
	Surface Coefficient = 1.0(Swale)
	T(overland) = 1.0*2.30 = 2.30 minutes:
	See figure 1 in Appendix A
T(storm system):	L = 645 feet
	Average Velocity = 7 ft/s
	T(storm system)= 645(ft)/7(ft/s) / 60 (s/min) = 1.54 min

Total time = 2.30 + 1.54 = 3.84 min => **use 4 minutes**

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Upper Villas at Crystal Ridge Dry Detention Basin #2
The most remote point of flow tributary to the Detention Facility lies on the northwestern quadrant near Lot 22A. Flows will travel approximately 190 ft overland to the Existing AI 46. Flows will enter the structure which will be piped approximately 805 ft to Upper Villas at Crystal Ridge Dry Detention Basin #2. Time of Concentration is estimated as follows:

Discharge Point 2

T(overland): L = 190 feet
Elevation difference = 10.85 feet
Surface Coefficient = 1.0(Swale)

T(overland) = 1.0*1.40 = 1.40 minutes:
See figure 1 in Appendix A

T(storm system): L = 805 feet
Average Velocity = 7 ft/s
T(storm system)= 805(ft)/7(ft/s) / 60 (s/min) = 1.92 min

Total time = 1.40 + 1.92 = 3.32 min => **use 3 minutes**

Lower Villas at Crystal Ridge Dry Detention Basin #3
The most remote point of flow indicative of this site tributary to the Detention Facility lies on the northeastern quadrant near Lot 46A. Flows will travel approximately 260 ft overland to the Existing AI 23. Flows will enter the structure which will be piped approximately 235 ft to Lower Villas at Crystal Ridge Dry Detention Basin #3. Time of Concentration is estimated as follows:

Discharge Point 3

T(overland): L = 260 feet
Elevation difference = 10.45 feet
Surface Coefficient = 1.0(Swale)

T(overland) = 1.0*2.00 = 2.00 minutes:
See figure 1 in Appendix A

T(storm system): L = 235 feet
Average Velocity = 7 ft/s
T(storm system)= 235(ft)/7(ft/s) / 60 (s/min) = 0.56 min

Total time = 2.00 + 0.56 = 2.56 min => **use 2 minutes**

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BASIN PEAK INFLOW

Existing Dry Detention Basin – Commercial Basin #1

2 Year

Onsite Greenspace	1.50 ac	x	1.15 cfs/ac	=	1.73 cfs
Onsite Pavement/ Building	4.07 ac	x	2.39 cfs/ac	=	9.73 cfs
Offsite Greenspace	1.84 ac	x	1.15 cfs/ac	=	2.12 cfs
Offsite Multifamily Residential	2.04 ac	x	2.06 cfs/ac	=	4.20 cfs
Offsite Pavement/ Building	0.62 ac	x	2.39 cfs/ac	=	1.48 cfs
Offsite Basin	0.32 ac	x	2.39 cfs/ac	=	0.76 cfs
			Total	=	20.02 cfs

15 Year

Onsite Greenspace	1.50 ac	x	1.70 cfs/ac	=	2.55 cfs
Onsite Pavement/ Building	4.07 ac	x	3.54 cfs/ac	=	14.41 cfs
Offsite Greenspace	1.84 ac	x	1.70 cfs/ac	=	3.13 cfs
Offsite Multifamily Residential	2.04 ac	x	3.06 cfs/ac	=	6.24 cfs
Offsite Pavement/ Building	0.62 ac	x	3.54 cfs/ac	=	2.19 cfs
Offsite Basin	0.32 ac	x	3.54 cfs/ac	=	1.13 cfs
			Total	=	29.65 cfs

25 Year

Onsite Greenspace	1.50 ac	x	2.00 cfs/ac	=	3.00 cfs
Onsite Pavement/ Building	4.07 ac	x	4.16 cfs/ac	=	16.93 cfs
Offsite Greenspace	1.84 ac	x	2.00 cfs/ac	=	3.68 cfs
Offsite Multifamily Residential	2.04 ac	x	3.59 cfs/ac	=	7.32 cfs
Offsite Pavement/ Building	0.62 ac	x	4.16 cfs/ac	=	2.58 cfs
Offsite Basin	0.32 ac	x	4.16 cfs/ac	=	1.33 cfs
			Total	=	34.84 cfs

100 Year

Onsite Greenspace	1.50 ac	x	2.29 cfs/ac	=	3.44 cfs
Onsite Pavement/ Building	4.07 ac	x	4.77 cfs/ac	=	19.41 cfs
Offsite Greenspace	1.84 ac	x	2.29 cfs/ac	=	4.21 cfs
Offsite Multifamily Residential	2.04 ac	x	4.12 cfs/ac	=	8.40 cfs
Offsite Pavement/ Building	0.62 ac	x	4.77 cfs/ac	=	2.96 cfs
Offsite Basin	0.32 ac	x	4.77 cfs/ac	=	1.53 cfs
			Total	=	39.95 cfs

2 year-20 minute storm:	20.02 cfs
15 year-20 minute storm:	29.65 cfs
25 year-20 minute storm:	34.84 cfs
100 year-20 minute storm:	39.95 cfs

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Existing Dry Detention Basin – Upper Villas at Crystal Ridge Basin #2

2 Year

Offsite Multifamily Residential	8.41 ac x	2.06 cfs/ac	=	17.32 cfs
		Total	=	17.32 cfs

15 Year

Offsite Multifamily Residential	8.41 ac x	3.06 cfs/ac	=	25.73 cfs
		Total	=	25.73 cfs

25 Year

Offsite Multifamily Residential	8.41 ac x	3.59 cfs/ac	=	30.19 cfs
		Total	=	30.19 cfs

100 Year

Offsite Multifamily Residential	8.41 ac x	4.12 cfs/ac	=	34.65 cfs
		Total	=	34.65 cfs

2 year-20 minute storm:	17.32 cfs
15 year-20 minute storm:	25.73 cfs
25 year-20 minute storm:	30.19 cfs
100 year-20 minute storm:	34.65 cfs

Existing Dry Detention Basin – Lower Villas at Crystal Ridge Basin #3

2 Year

Offsite Multifamily Residential	5.00 ac x	2.06 cfs/ac	=	10.30 cfs
		Total	=	10.30 cfs

15 Year

Offsite Multifamily Residential	5.00 ac x	3.06 cfs/ac	=	15.30 cfs
		Total	=	15.30 cfs

25 Year

Offsite Multifamily Residential	5.00 ac x	3.59 cfs/ac	=	17.95 cfs
		Total	=	17.95 cfs

100 Year

Offsite Multifamily Residential	5.00 ac x	4.12 cfs/ac	=	20.60 cfs
		Total	=	20.60 cfs

2 year-20 minute storm:	10.30 cfs
15 year-20 minute storm:	15.30 cfs
25 year-20 minute storm:	17.95 cfs
100 year-20 minute storm:	20.60 cfs

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ALLOWABLE RELEASE RATE

The Allowable Release Rate for the development is determined by subtracting the Differential Runoff from the Inflow for each Design Storm. The following table shows the Allowable Release Rate for this site:

TOTAL BASIN INFLOW FOR WATERSHED

STORM	Commercial Basin #1		Upper Villas at Crystal Ridge Basin #2		Lower Villas at Crystal Ridge Basin #3		Total
2 yr	20.02 cfs	+	17.32 cfs	+	10.30 cfs	=	47.64 cfs
15 yr	29.65 cfs	+	25.73 cfs	+	15.30 cfs	=	70.68 cfs
25 yr	34.84 cfs	+	30.19 cfs	+	17.95 cfs	=	82.98 cfs
100 yr	39.95 cfs	+	34.65 cfs	+	20.60 cfs	=	95.20 cfs

ALLOWABLE RELEASE RATE FOR WATERSHED

STORM	BASIN INFLOW	-	DIFFERENTIAL RUNOFF RATE	=	ALLOWABLE RELEASE RATE
2 yr	47.64 cfs	-	27.34 cfs	=	20.30 cfs
15 yr	70.68 cfs	-	40.79 cfs	=	29.89 cfs
25 yr	82.98 cfs	-	47.73 cfs	=	35.25 cfs
100 yr	95.20 cfs	-	54.90 cfs	=	40.30 cfs

STORM ROUTING CALCULATIONS AND RESULTS

The computer program PONDPACK was used in routing the 2, 15, 25 and 100 year storms through the Dry Detention Basins within the site. The routing calculations can be found in Appendix B for the 2, 15, 25 and 100 Year 20 Minute Design Storms for the watershed as well as the calculations for safe passage of the 100 Year Storm assuming the low flow slot is blocked (LFB). As found in the routing calculations, the results are as follows:

Commercial Dry Detention Basin #1

STORM (20 MIN)	PEAK INFLOW	CALCULATED RELEASE	PEAK ELEVATION
2 yr	20.02 cfs	9.79 cfs	466.88 ft
15 yr	29.65 cfs	11.42 cfs	467.85 ft
25 yr	34.84 cfs	12.20 cfs	468.35 ft
100 yr	39.95 cfs	12.91 cfs	468.83 ft
100 yr LFB	39.95 cfs	39.72 cfs	470.04 ft

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Upper Villas at Crystal Ridge Dry Detention Basin #2

STORM (20 MIN)	PEAK INFLOW	CALCULATED RELEASE	PEAK ELEVATION
2 yr	17.32 cfs	16.67 cfs	461.95 ft
15 yr	25.73 cfs	23.87 cfs	462.64 ft
25 yr	30.19 cfs	27.53 cfs	463.11 ft
100 yr	34.65 cfs	31.42 cfs	463.60 ft
100 yr LFB	34.65 cfs	28.92 cfs	465.47 ft

Lower Villas at Crystal Ridge Dry Detention Basin #3

STORM (20 MIN)	INFLOW FROM BASIN #2	INFLOW TRIBUTARY TO BASIN #3	CALCULATED RELEASE	PEAK ELEVATION
2 yr	16.67 cfs	10.30 cfs	8.97 cfs	461.61 ft
15 yr	23.87 cfs	15.30 cfs	10.93 cfs	462.58 ft
25 yr	27.53 cfs	17.95 cfs	11.76 cfs	463.05 ft
100 yr	31.42 cfs	20.60 cfs	12.56 cfs	463.51 ft
100 yr LFB	28.92 cfs	20.60 cfs	43.20 cfs	465.09 ft

To determine if the Allowable Release Rate has been achieved, the outflow rates of the Commercial Dry Detention Basin #1 and Lower Villas at Crystal Ridge Dry Detention Basin #3 are combined. The Upper Villas at Crystal Ridge Dry Detention Basin #2 Outfall is not included in the Total Discharge as it discharges into Lower Villas at Crystal Ridge Dry Detention Basin #3. The results are shown below.

ALLOWABLE RELEASE RATE CHECK

STORM	Commercial Basin #1		Lower Villas at Crystal Ridge Basin #3		Total		Allowable Release Rate	
2 yr	9.79 cfs	+	8.97 cfs	=	18.76 cfs	<	20.30 cfs	√
15 yr	11.42 cfs	+	10.93 cfs	=	22.35 cfs	<	29.89 cfs	√
25 yr	12.20 cfs	+	11.76 cfs	=	23.96 cfs	<	35.25 cfs	√
100 yr	12.91 cfs	+	12.56 cfs	=	25.47 cfs	<	40.30 cfs	√

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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 Dry 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 outfall structure which must be above the volume required for the 100 year, 20 minute storm and the volume required sediment storage when added together. Pondpack has been used to calculate this elevation and the results are as follows:

Existing Commercial Dry Detention Basin #1

100 Year, 20 Minute Storage Volume	= 34,237.00 ft^3
Volume Achieved at Elevation	= 468.83 ft
2 Year Sediment Storage Volume	= 2,910 ft^3
Total Required Storage Volume	= 37,147.00 ft^3
Volume Achieved at Elevation	= 469.08 ft
Crest of Outfall Structure and Sill	= 469.15 ft

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SUMMARY FOR WATERSHED A

Commercial Dry Detention Basin #1	Flow Rate	High Water
2 Year	9.79 cfs	466.88 ft
15 Year	11.42 cfs	467.85 ft
25 Year	12.20 cfs	468.35 ft
100 Year	12.91 cfs	468.83 ft
100 Year –LOW FLOW BLOCKED	39.72 cfs	470.04 ft

LOW FLOW SLOT	1.80’ W x 0.75’ H
ELEVATION	462.99 ft
STRUCTURE TYPE	60” Diameter Standpipe
CREST ELEVATION	469.15 ft
CULVERT	27” R.C.P.
FLOWLINE	463.03 ft
TOP OF BASIN BERM	471.38 ft
FREEBOARD	1.96 ft

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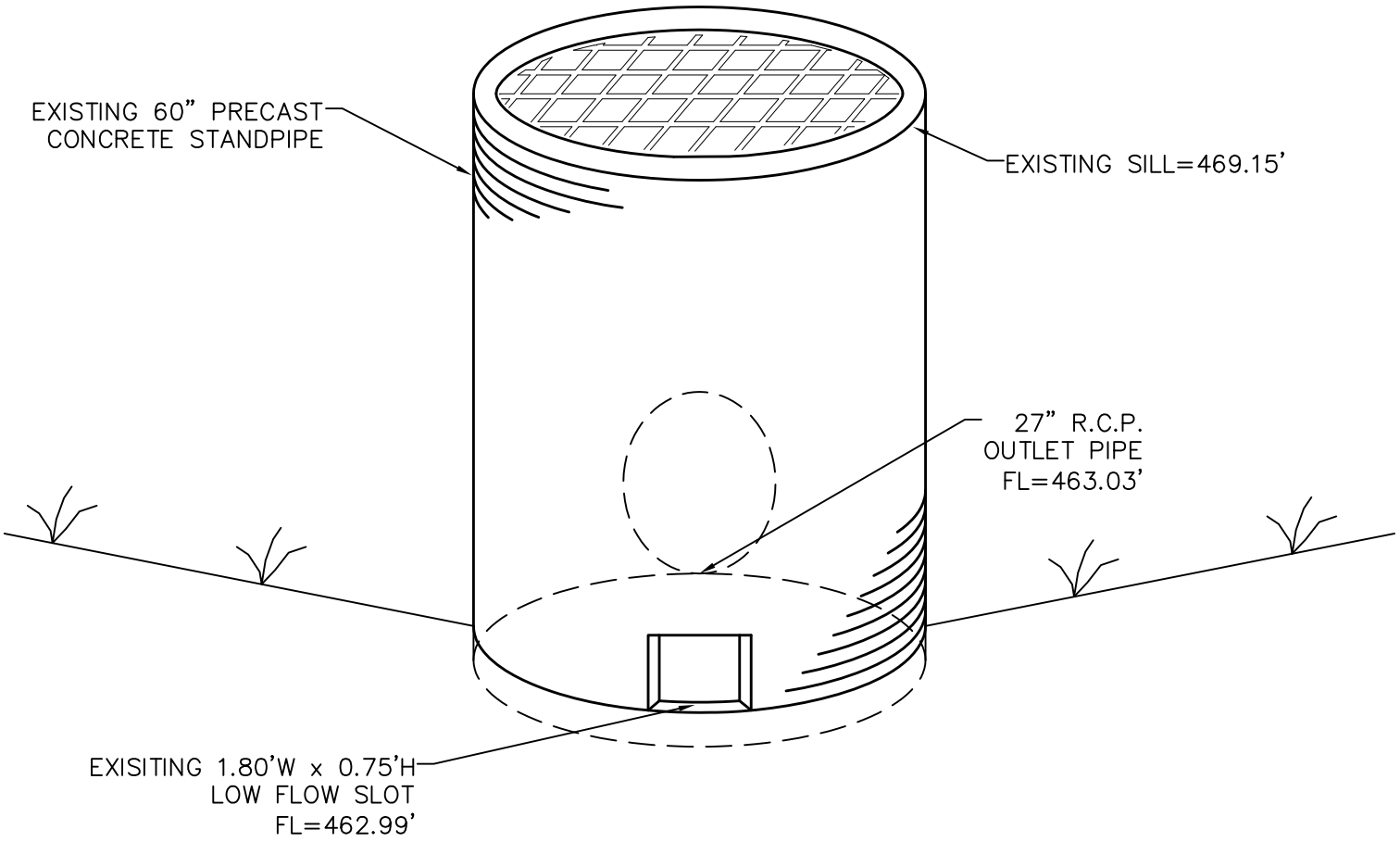
Appendix A

-Structure Details
-Misc Figures



EXISTING OVERFLOW STRUCTURE DETAIL

NOT TO SCALE

2 YEAR, 20 MIN HIGHWATER = 466.88'
15 YEAR, 20 MIN HIGHWATER = 467.85'
25 YEAR, 20 MIN HIGHWATER = 468.35'
100 YEAR, 20 MIN HIGHWATER = 468.83'
100 YEAR, 20 MIN (LFB) HIGHWATER = 470.04'

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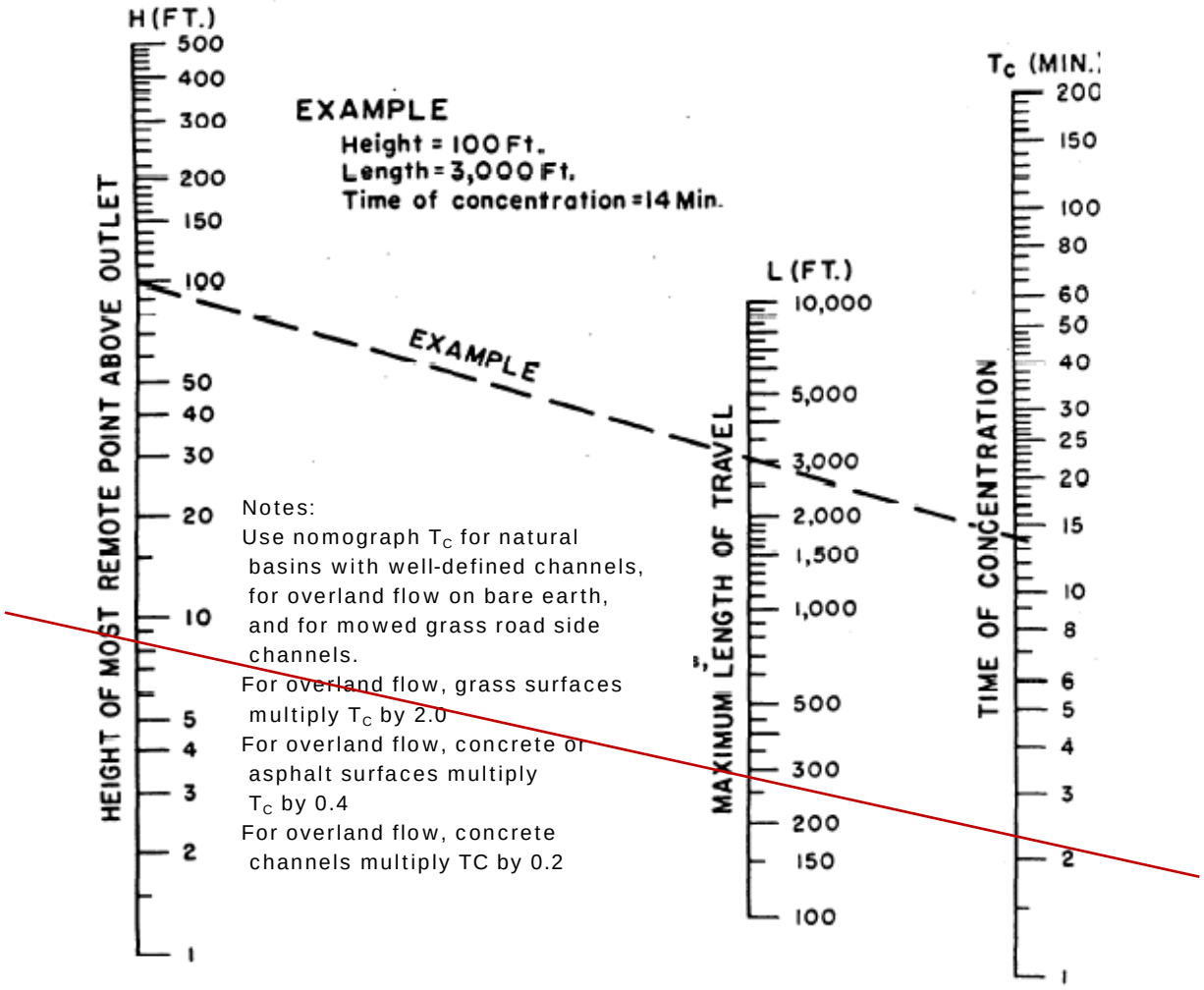
Project: Fort Zumwalt Development Center
Date: 01-13-20 Project No: 19-17514
Designer: TMM Checked: TCF

TIME OF CONCENTRATION FOR SMALL DRAINAGE BASINS



OVERLAND FLOW

Δ Height = 8.60 ft

Length = 281 ft

$T_{Overland}$ = 2.3 min

STORM SEWER TRAVEL TIME

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

L = 645 ft

V = 7 ft/s

T_{storm} = 645 ft / 7 ft/s / 60 sec/min =1.54 min

Total Time of Concentration = $T_{Overland}$ + T_{storm} = 2.30 + 1.54 = 3.84 → USE 4 min.

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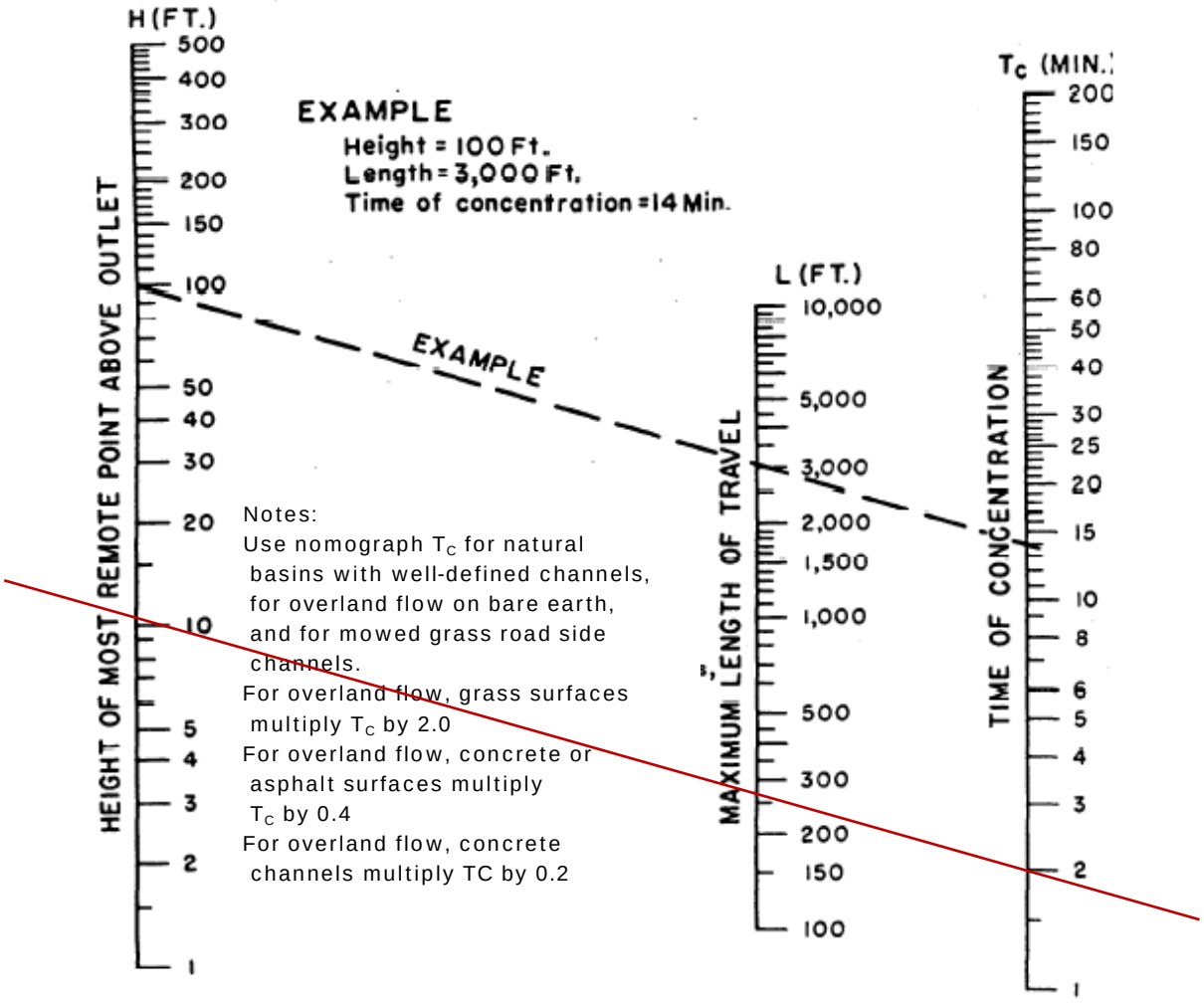
Project: Lower Villas at Crystal Ridge BMP #3
Date: 01-13-20 Project No: 19-17514
Designer: TMM Checked: TCF

TIME OF CONCENTRATION FOR SMALL DRAINAGE BASINS



OVERLAND FLOW

Δ Height = 10.45 ft

Length = 260 ft

$T_{Overland}$ = 2.00 min

STORM SEWER TRAVEL TIME

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

L = 235 ft

V = 7 ft/s

T_{storm} = 235 ft / 7 ft/s / 60 sec/min =0.56 min

Total Time of Concentration = $T_{Overland}$ + T_{storm} = 2.00 + 0.56 = 2.56 → USE 2 min.

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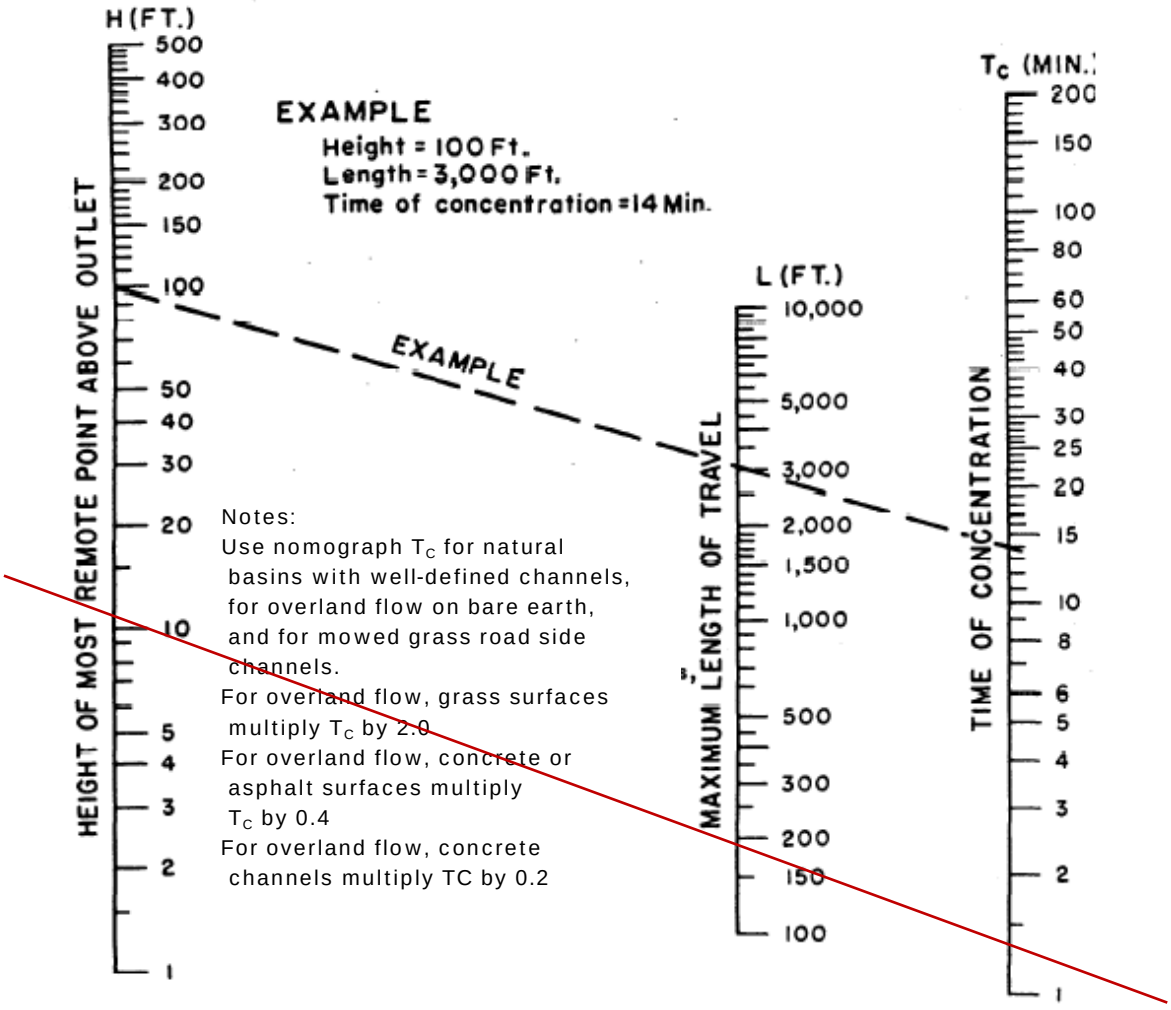
Project: Upper Villas at Crystal Ridge BMP #2
Date: 01-13-20 Project No: 19-17514
Designer: TMM Checked: TCF

TIME OF CONCENTRATION FOR SMALL DRAINAGE BASINS



OVERLAND FLOW

Δ Height = 10.85 ft

Length = 190 ft

$T_{Overland}$ = 1.40 min

STORM SEWER TRAVEL TIME

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

L = 805 ft

V = 7 ft/s

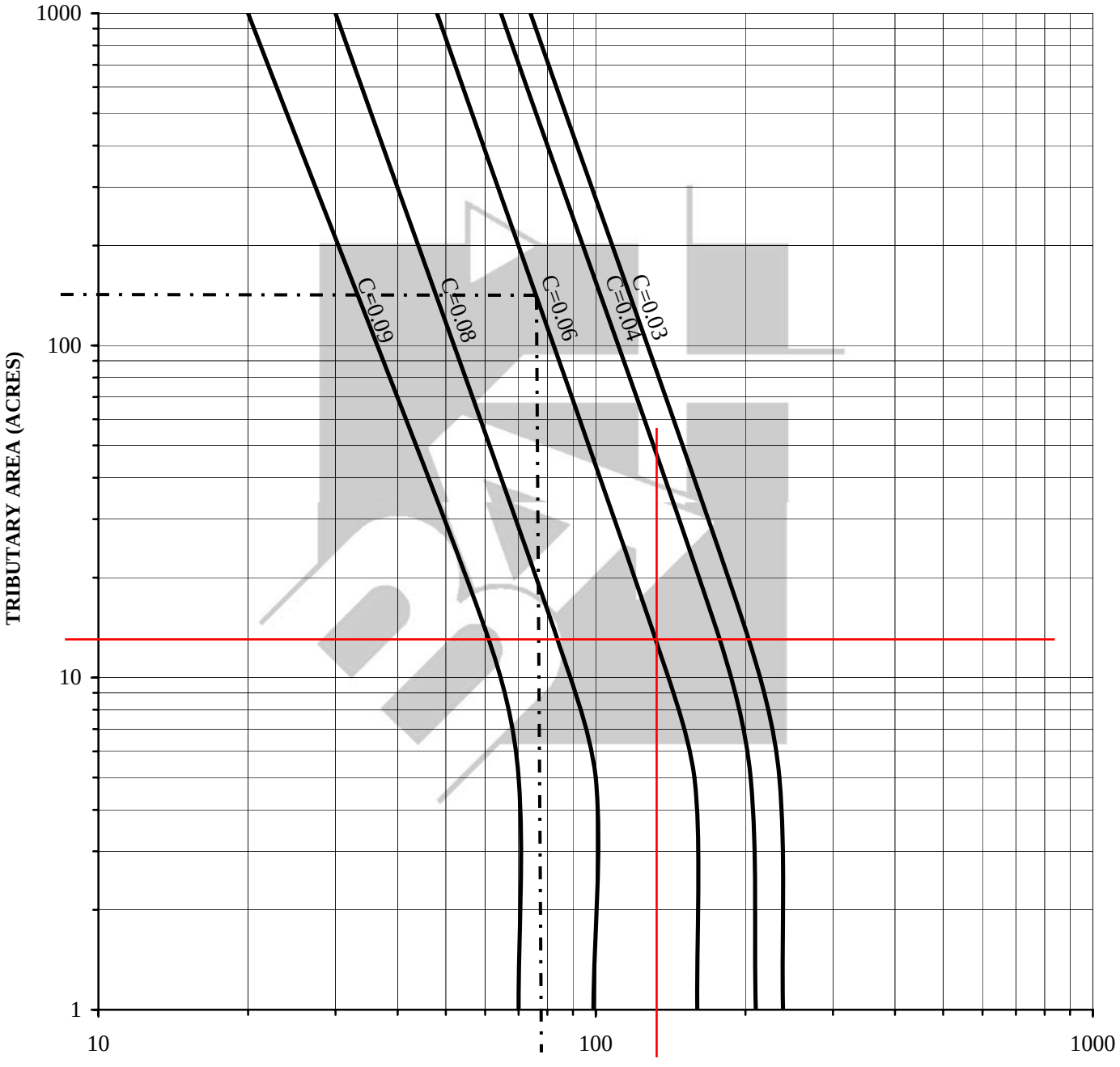
T_{storm} = 805 ft / 7 ft/s / 60 sec/min =1.92 min

Total Time of Concentration = $T_{Overland}$ + T_{storm} = 1.40 + 1.92 = 3.32 → USE 3 min.

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

Project: Fort Zumwalt Development Center
Date: 01/13/2020 Project: 19-17514
Designer: TMM Checked: TCF

ANNUAL SEDIMENT STORAGE



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

RUNOFF C VALUE = 0.6
DRAINAGE AREA = 10.39 acres
ANNUAL SEDIMENT = 140 CU FT per acre

YEARS OF STORAGE = 2 years
STORAGE REQUIRED = 2*140*10.39=2,910 CU FT

Appendix B

- Dry Detention Basin Routing

-2 Year Detention Routing
-15 Year Detention Routing
-25 Year Detention Routing
- 100 Year Detention Routing
- 100 Year LFB Routing

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Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Commercial Basin #1 Inflow	25 Year 20 Min	0	41,808.000	4	34.84
Commercial Basin #1 Inflow	2 Year 20 Min	0	24,024.000	4	20.02
Commercial Basin #1 Inflow	15 Year 20 Min	0	35,580.000	4	29.65
Commercial Basin #1 Inflow	100 Year 20 Min	0	47,940.000	4	39.95
Commercial Basin #1 Inflow	100 Yr LFB	0	47,940.000	4	39.95
Upper Villas Basin #2 Inflow	25 Year 20 Min	0	36,192.000	3	30.19
Upper Villas Basin #2 Inflow	2 Year 20 Min	0	20,763.000	3	17.32
Upper Villas Basin #2 Inflow	15 Year 20 Min	0	30,845.000	3	25.73
Upper Villas Basin #2 Inflow	100 Year 20 Min	0	41,538.000	3	34.65
Upper Villas Basin #2 Inflow	100 Yr LFB	0	41,538.000	3	34.65
Lower Villas Basin #3 Inflow	25 Year 20 Min	0	21,540.000	2	17.95
Lower Villas Basin #3 Inflow	2 Year 20 Min	0	12,360.000	2	10.30
Lower Villas Basin #3 Inflow	15 Year 20 Min	0	18,360.000	2	15.30
Lower Villas Basin #3 Inflow	100 Year 20 Min	0	24,720.000	2	20.60
Lower Villas Basin #3 Inflow	100 Yr LFB	0	24,720.000	2	20.60

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
Outflow 1	25 Year 20 Min	0	99,056.000	22	23.95
Outflow 1	2 Year 20 Min	0	57,037.000	22	18.73
Outflow 1	15 Year 20 Min	0	84,468.000	22	22.35
Outflow 1	100 Year 20 Min	0	113,459.000	23	25.45
Outflow 1	100 Yr LFB	0	95,863.000	20	82.79

Pond Summary

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)
Commercial Basin #1 (IN)	25 Year 20 Min	0	41,808.000	4	34.84	(N/A)	(N/A)
Commercial Basin #1 (OUT)	25 Year 20 Min	0	41,725.000	23	12.20	468.35	28,783.000
Commercial Basin #1 (IN)	2 Year 20 Min	0	24,024.000	4	20.02	(N/A)	(N/A)
Commercial Basin #1 (OUT)	2 Year 20 Min	0	23,941.000	22	9.79	466.88	13,513.000
Commercial Basin #1 (IN)	15 Year 20 Min	0	35,580.000	4	29.65	(N/A)	(N/A)
Commercial Basin #1 (OUT)	15 Year 20 Min	0	35,497.000	22	11.42	467.85	23,320.000
Commercial Basin #1 (IN)	100 Year 20 Min	0	47,940.000	4	39.95	(N/A)	(N/A)
Commercial Basin #1 (OUT)	100 Year 20 Min	0	47,857.000	23	12.91	468.83	34,237.000
Commercial Basin #1 (IN)	100 Yr LFB	0	47,940.000	4	39.95	(N/A)	(N/A)
Commercial Basin #1 (OUT)	100 Yr LFB	0	47,940.000	20	39.72	470.04	48,763.000
Upper Villas Basin #2 (IN)	25 Year 20 Min	0	36,192.000	3	30.19	(N/A)	(N/A)
Upper Villas Basin #2 (OUT)	25 Year 20 Min	0	36,296.000	15	27.53	463.11	11,117.000
Upper Villas Basin #2 (IN)	2 Year 20 Min	0	20,763.000	3	17.32	(N/A)	(N/A)
Upper Villas Basin #2 (OUT)	2 Year 20 Min	0	20,763.000	20	16.67	461.95	5,363.000
Upper Villas Basin #2 (IN)	15 Year 20 Min	0	30,845.000	3	25.73	(N/A)	(N/A)

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)
Upper Villas Basin #2 (OUT)	15 Year 20 Min	0	30,871.000	15	23.87	462.64	8,784.000
Upper Villas Basin #2 (IN)	100 Year 20 Min	0	41,538.000	3	34.65	(N/A)	(N/A)
Upper Villas Basin #2 (OUT)	100 Year 20 Min	0	41,775.000	14	31.42	463.60	13,565.000
Upper Villas Basin #2 (IN)	100 Yr LFB	0	41,538.000	3	34.65	(N/A)	(N/A)
Upper Villas Basin #2 (OUT)	100 Yr LFB	0	32,629.000	20	28.92	465.47	24,296.000
Upper Villas Basin #2 (Reverse)	100 Yr LFB	0	-9,426.000	2	-47.19	(N/A)	(N/A)
Lower Villas Basin #3 (IN)	25 Year 20 Min	0	57,836.000	15	45.48	(N/A)	(N/A)
Lower Villas Basin #3 (OUT)	25 Year 20 Min	0	57,331.000	22	11.76	463.05	36,134.000
Lower Villas Basin #3 (IN)	2 Year 20 Min	0	33,123.000	20	26.97	(N/A)	(N/A)
Lower Villas Basin #3 (OUT)	2 Year 20 Min	0	33,096.000	23	8.97	461.61	20,766.000
Lower Villas Basin #3 (IN)	15 Year 20 Min	0	49,231.000	15	39.17	(N/A)	(N/A)
Lower Villas Basin #3 (OUT)	15 Year 20 Min	0	48,971.000	22	10.93	462.58	30,914.000
Lower Villas Basin #3 (IN)	100 Year 20 Min	0	66,495.000	14	52.02	(N/A)	(N/A)
Lower Villas Basin #3 (OUT)	100 Year 20 Min	0	65,601.000	22	12.56	463.51	41,362.000
Lower Villas Basin #3 (IN)	100 Yr LFB	0	54,063.000	20	49.52	(N/A)	(N/A)

Subsection: Master Network Summary

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)
Lower Villas Basin #3 (Reverse)	100 Yr LFB	0	-6,140.000	0	-51.81	(N/A)	(N/A)
Lower Villas Basin #3 (OUT)	100 Yr LFB	0	47,923.000	21	43.20	465.09	61,496.000

Peak Discharge	20.02 ft³/s
Time to Peak	12 min
Hydrograph Volume	24,024.000 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	5.01	10.01	15.02	20.02
5	20.02	20.02	20.02	20.02	20.02
10	20.02	20.02	20.02	20.02	20.02
15	20.02	20.02	20.02	20.02	20.02
20	20.02	15.02	10.01	5.01	0.00
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	29.65 ft³/s
Time to Peak	12 min
Hydrograph Volume	35,580.000 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	7.41	14.83	22.24	29.65
5	29.65	29.65	29.65	29.65	29.65
10	29.65	29.65	29.65	29.65	29.65
15	29.65	29.65	29.65	29.65	29.65
20	29.65	22.24	14.83	7.41	0.00
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	34.84 ft³/s
Time to Peak	12 min
Hydrograph Volume	41,808.000 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	8.71	17.42	26.13	34.84
5	34.84	34.84	34.84	34.84	34.84
10	34.84	34.84	34.84	34.84	34.84
15	34.84	34.84	34.84	34.84	34.84
20	34.84	26.13	17.42	8.71	0.00
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	39.95 ft³/s
Time to Peak	12 min
Hydrograph Volume	47,940.000 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	9.99	19.98	29.96	39.95
5	39.95	39.95	39.95	39.95	39.95
10	39.95	39.95	39.95	39.95	39.95
15	39.95	39.95	39.95	39.95	39.95
20	39.95	29.96	19.98	9.99	0.00
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	10.30 ft³/s
Time to Peak	13 min
Hydrograph Volume	12,360.000 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	5.15	10.30	10.30	10.30
5	10.30	10.30	10.30	10.30	10.30
10	10.30	10.30	10.30	10.30	10.30
15	10.30	10.30	10.30	10.30	10.30
20	10.30	5.15	0.00	0.00	0.00
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	15.30 ft³/s
Time to Peak	13 min
Hydrograph Volume	18,360.000 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	7.65	15.30	15.30	15.30
5	15.30	15.30	15.30	15.30	15.30
10	15.30	15.30	15.30	15.30	15.30
15	15.30	15.30	15.30	15.30	15.30
20	15.30	7.65	0.00	0.00	0.00
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	17.95 ft³/s
Time to Peak	13 min
Hydrograph Volume	21,540.000 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	8.98	17.95	17.95	17.95
5	17.95	17.95	17.95	17.95	17.95
10	17.95	17.95	17.95	17.95	17.95
15	17.95	17.95	17.95	17.95	17.95
20	17.95	8.98	0.00	0.00	0.00
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	20.60 ft³/s
Time to Peak	13 min
Hydrograph Volume	24,720.000 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	10.30	20.60	20.60	20.60
5	20.60	20.60	20.60	20.60	20.60
10	20.60	20.60	20.60	20.60	20.60
15	20.60	20.60	20.60	20.60	20.60
20	20.60	10.30	0.00	0.00	0.00
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	17.32 ft³/s
Time to Peak	13 min
Hydrograph Volume	20,763.216 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	5.72	11.43	17.32	17.32
5	17.32	17.32	17.32	17.32	17.32
10	17.32	17.32	17.32	17.32	17.32
15	17.32	17.32	17.32	17.32	17.32
20	17.32	11.43	5.72	0.00	0.00
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	25.73 ft³/s
Time to Peak	13 min
Hydrograph Volume	30,845.124 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	8.49	16.98	25.73	25.73
5	25.73	25.73	25.73	25.73	25.73
10	25.73	25.73	25.73	25.73	25.73
15	25.73	25.73	25.73	25.73	25.73
20	25.73	16.98	8.49	0.00	0.00
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	30.19 ft³/s
Time to Peak	13 min
Hydrograph Volume	36,191.772 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	9.96	19.93	30.19	30.19
5	30.19	30.19	30.19	30.19	30.19
10	30.19	30.19	30.19	30.19	30.19
15	30.19	30.19	30.19	30.19	30.19
20	30.19	19.93	9.96	0.00	0.00
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	34.65 ft³/s
Time to Peak	13 min
Hydrograph Volume	41,538.420 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	11.43	22.87	34.65	34.65
5	34.65	34.65	34.65	34.65	34.65
10	34.65	34.65	34.65	34.65	34.65
15	34.65	34.65	34.65	34.65	34.65
20	34.65	22.87	11.43	0.00	0.00
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: Commercial 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)
462.99	0.00	0.00	0.00	0.000	0.000
463.00	0.00	5.92	5.92	0.000	0.000
464.00	0.00	402.96	457.72	153.000	153.000
465.00	0.00	2,645.10	4,080.47	1,360.000	1,513.000
466.00	0.00	7,170.19	14,170.27	4,723.000	6,236.000
467.00	0.00	9,760.38	25,296.20	8,432.000	14,668.000
468.00	0.00	10,845.73	30,894.86	10,298.000	24,967.000
469.00	0.00	11,638.04	33,718.67	11,240.000	36,206.000
470.00	0.00	12,445.30	36,118.24	12,039.000	48,246.000
471.00	0.00	13,267.88	38,563.19	12,854.000	61,100.000
472.00	0.00	15,591.54	43,242.28	14,414.000	75,514.000

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: Lower Villas Basin #3

Return Event: 2 years
Storm Event:

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr(A1*A2) (ft²)	Volume (ft³)	Volume (Total) (ft³)
458.00	0.00	5.00	0.00	0.000	0.000
460.00	0.00	8,392.00	8,601.84	5,735.000	5,735.000
462.00	0.00	10,262.00	27,934.02	18,623.000	24,357.000
464.00	0.00	12,291.00	33,783.77	22,523.000	46,880.000
466.00	0.00	14,468.00	40,094.15	26,729.000	73,609.000

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: Upper Villas Basin #2

Return Event: 2 years
Storm Event:

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr(A1*A2) (ft²)	Volume (ft³)	Volume (Total) (ft³)
460.15	0.00	5.00	0.00	0.000	0.000
461.00	0.00	4,149.00	4,298.03	1,218.000	1,218.000
462.00	0.00	4,562.00	13,061.60	4,354.000	5,572.000
464.00	0.00	5,446.00	14,992.44	9,995.000	15,567.000
466.00	0.00	6,408.00	17,761.45	11,841.000	27,408.000

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)	460.15 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	466.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	Culvert - 1	Forward + Reverse	TW	460.15	466.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	42.0 in
Length	202.00 ft
Length (Computed Barrel)	202.00 ft
Slope (Computed)	0.004 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.006
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)	1.093
T2 ratio (HW/D)	1.195
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	463.98 ft	T1 Flow	63.00 ft³/s
T2 Elevation	464.33 ft	T2 Flow	72.00 ft³/s

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	458.00	0.00
460.50	0.71	458.00	0.00
460.65	1.43	458.00	0.00
461.00	4.04	458.00	0.00
461.15	5.51	458.00	0.00
461.50	9.77	458.00	0.00
461.65	11.91	458.00	0.00
462.00	17.62	458.00	0.00
462.15	20.33	458.00	0.00
462.50	27.30	458.00	0.00
462.65	30.53	458.00	0.00
463.00	38.38	458.00	0.00
463.15	41.89	458.00	0.00
463.50	50.17	458.00	0.00
463.65	53.72	458.00	0.00
464.00	61.71	458.00	0.00
464.15	64.96	458.00	0.00
464.50	71.91	458.00	0.00
464.65	74.57	458.00	0.00
465.00	79.44	458.00	0.00
465.15	81.28	458.00	0.00
465.50	85.59	458.00	0.00
465.65	87.42	458.00	0.00
466.00	91.66	458.00	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	458.50	0.00
460.50	0.71	458.50	0.00
460.65	1.43	458.50	0.00
461.00	4.04	458.50	0.00
461.15	5.51	458.50	0.00
461.50	9.77	458.50	0.00
461.65	11.91	458.50	0.00
462.00	17.62	458.50	0.00
462.15	20.33	458.50	0.00
462.50	27.30	458.50	0.00
462.65	30.53	458.50	0.00
463.00	38.38	458.50	0.00
463.15	41.89	458.50	0.00
463.50	50.17	458.50	0.00
463.65	53.72	458.50	0.00
464.00	61.71	458.50	0.00
464.15	64.96	458.50	0.00
464.50	71.91	458.50	0.00
464.65	74.57	458.50	0.00
465.00	79.44	458.50	0.00
465.15	81.28	458.50	0.00
465.50	85.59	458.50	0.00
465.65	87.42	458.50	0.00
466.00	91.66	458.50	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	459.00	0.00
460.50	0.71	459.00	0.00
460.65	1.43	459.00	0.00
461.00	4.04	459.00	0.00
461.15	5.51	459.00	0.00
461.50	9.77	459.00	0.00
461.65	11.91	459.00	0.00
462.00	17.62	459.00	0.00
462.15	20.33	459.00	0.00
462.50	27.30	459.00	0.00
462.65	30.53	459.00	0.00
463.00	38.38	459.00	0.00
463.15	41.89	459.00	0.00
463.50	50.17	459.00	0.00
463.65	53.72	459.00	0.00
464.00	61.71	459.00	0.00
464.15	64.96	459.00	0.00
464.50	71.91	459.00	0.00
464.65	74.57	459.00	0.00
465.00	79.44	459.00	0.00
465.15	81.28	459.00	0.00
465.50	85.59	459.00	0.00
465.65	87.42	459.00	0.00
466.00	91.66	459.00	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	459.40	0.00
460.50	0.71	459.40	0.00
460.65	1.43	459.40	0.00
461.00	4.04	459.40	0.00
461.15	5.51	459.40	0.00
461.50	9.77	459.40	0.00
461.65	11.91	459.40	0.00
462.00	17.62	459.40	0.00
462.15	20.33	459.40	0.00
462.50	27.30	459.40	0.00
462.65	30.53	459.40	0.00
463.00	38.38	459.40	0.00
463.15	41.89	459.40	0.00
463.50	50.17	459.40	0.00
463.65	53.72	459.40	0.00
464.00	61.71	459.40	0.00
464.15	64.96	459.40	0.00
464.50	71.91	459.40	0.00
464.65	74.57	459.40	0.00
465.00	79.44	459.40	0.00
465.15	81.28	459.40	0.00
465.50	85.59	459.40	0.00
465.65	87.42	459.40	0.00
466.00	91.66	459.40	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	459.50	0.00
460.50	0.71	459.50	0.00
460.65	1.43	459.50	0.00
461.00	4.04	459.50	0.00
461.15	5.51	459.50	0.00
461.50	9.77	459.50	0.00
461.65	11.91	459.50	0.00
462.00	17.62	459.50	0.00
462.15	20.33	459.50	0.00
462.50	27.30	459.50	0.00
462.65	30.53	459.50	0.00
463.00	38.38	459.50	0.00
463.15	41.89	459.50	0.00
463.50	50.17	459.50	0.00
463.65	53.72	459.50	0.00
464.00	61.71	459.50	0.00
464.15	64.96	459.50	0.00
464.50	71.91	459.50	0.00
464.65	74.57	459.50	0.00
465.00	79.44	459.50	0.00
465.15	81.28	459.50	0.00
465.50	85.59	459.50	0.00
465.65	87.42	459.50	0.00
466.00	91.66	459.50	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	460.00	0.00
460.50	0.71	460.00	0.00
460.65	1.43	460.00	0.00
461.00	4.04	460.00	0.00
461.15	5.51	460.00	0.00
461.50	9.77	460.00	0.00
461.65	11.91	460.00	0.00
462.00	17.62	460.00	0.00
462.15	20.33	460.00	0.00
462.50	27.30	460.00	0.00
462.65	30.53	460.00	0.00
463.00	38.38	460.00	0.00
463.15	41.89	460.00	0.00
463.50	50.17	460.00	0.00
463.65	53.72	460.00	0.00
464.00	61.71	460.00	0.00
464.15	64.96	460.00	0.00
464.50	71.91	460.00	0.00
464.65	74.57	460.00	0.00
465.00	79.44	460.00	0.00
465.15	81.28	460.00	0.00
465.50	85.59	460.00	0.00
465.65	87.42	460.00	0.00
466.00	91.66	460.00	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	460.15	0.00
460.50	0.71	460.15	0.00
460.65	1.43	460.15	0.00
461.00	4.03	460.15	0.00
461.15	5.51	460.15	0.00
461.50	9.77	460.15	0.00
461.65	11.91	460.15	0.00
462.00	17.62	460.15	0.00
462.15	20.33	460.15	0.00
462.50	27.30	460.15	0.00
462.65	30.53	460.15	0.00
463.00	38.38	460.15	0.00
463.15	41.89	460.15	0.00
463.50	50.17	460.15	0.00
463.65	53.72	460.15	0.00
464.00	61.71	460.15	0.00
464.15	64.96	460.15	0.00
464.50	71.91	460.15	0.00
464.65	74.57	460.15	0.00
465.00	79.44	460.15	0.00
465.15	81.28	460.15	0.00
465.50	85.59	460.15	0.00
465.65	87.42	460.15	0.00
466.00	91.66	460.15	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-0.61	460.50	0.00
460.50	0.00	460.50	0.00
460.65	1.43	460.50	0.00
461.00	4.03	460.50	0.00
461.15	5.51	460.50	0.00
461.50	9.77	460.50	0.00
461.65	11.91	460.50	0.00
462.00	17.62	460.50	0.00
462.15	20.33	460.50	0.00
462.50	27.30	460.50	0.00
462.65	30.53	460.50	0.00
463.00	38.38	460.50	0.00
463.15	41.89	460.50	0.00
463.50	50.17	460.50	0.00
463.65	53.72	460.50	0.00
464.00	61.71	460.50	0.00
464.15	64.96	460.50	0.00
464.50	71.91	460.50	0.00
464.65	74.57	460.50	0.00
465.00	79.44	460.50	0.00
465.15	81.28	460.50	0.00
465.50	85.59	460.50	0.00
465.65	87.42	460.50	0.00
466.00	91.66	460.50	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-3.60	461.00	0.00
460.50	-3.60	461.00	0.00
460.65	-3.60	461.00	0.00
461.00	0.00	461.00	0.00
461.15	5.12	461.00	0.00
461.50	9.77	461.00	0.00
461.65	11.91	461.00	0.00
462.00	17.62	461.00	0.00
462.15	20.37	461.00	0.00
462.50	27.30	461.00	0.00
462.65	30.53	461.00	0.00
463.00	38.38	461.00	0.00
463.15	41.89	461.00	0.00
463.50	50.17	461.00	0.00
463.65	53.72	461.00	0.00
464.00	61.71	461.00	0.00
464.15	64.96	461.00	0.00
464.50	71.91	461.00	0.00
464.65	74.57	461.00	0.00
465.00	79.44	461.00	0.00
465.15	81.28	461.00	0.00
465.50	85.59	461.00	0.00
465.65	87.42	461.00	0.00
466.00	91.66	461.00	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-8.89	461.50	0.00
460.50	-8.89	461.50	0.00
460.65	-8.89	461.50	0.00
461.00	-8.89	461.50	0.00
461.15	-8.75	461.50	0.00
461.50	0.00	461.50	0.00
461.65	9.58	461.50	0.00
462.00	17.69	461.50	0.00
462.15	20.42	461.50	0.00
462.50	27.30	461.50	0.00
462.65	30.53	461.50	0.00
463.00	38.38	461.50	0.00
463.15	41.89	461.50	0.00
463.50	50.17	461.50	0.00
463.65	53.72	461.50	0.00
464.00	61.71	461.50	0.00
464.15	64.96	461.50	0.00
464.50	71.91	461.50	0.00
464.65	74.57	461.50	0.00
465.00	79.44	461.50	0.00
465.15	81.28	461.50	0.00
465.50	85.59	461.50	0.00
465.65	87.42	461.50	0.00
466.00	91.66	461.50	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-16.07	462.00	0.00
460.50	-16.07	462.00	0.00
460.65	-16.07	462.00	0.00
461.00	-16.07	462.00	0.00
461.15	-16.07	462.00	0.00
461.50	-15.83	462.00	0.00
461.65	-14.73	462.00	0.00
462.00	0.00	462.00	0.00
462.15	13.96	462.00	0.00
462.50	25.91	462.00	0.00
462.65	29.83	462.00	0.00
463.00	38.26	462.00	0.00
463.15	41.76	462.00	0.00
463.50	50.07	462.00	0.00
463.65	53.64	462.00	0.00
464.00	61.68	462.00	0.00
464.15	64.93	462.00	0.00
464.50	71.91	462.00	0.00
464.65	74.57	462.00	0.00
465.00	79.44	462.00	0.00
465.15	81.28	462.00	0.00
465.50	85.59	462.00	0.00
465.65	87.42	462.00	0.00
466.00	91.66	462.00	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-24.65	462.50	0.00
460.50	-24.65	462.50	0.00
460.65	-24.65	462.50	0.00
461.00	-24.65	462.50	0.00
461.15	-24.65	462.50	0.00
461.50	-24.65	462.50	0.00
461.65	-24.65	462.50	0.00
462.00	-23.08	462.50	0.00
462.15	-20.79	462.50	0.00
462.50	0.00	462.50	0.00
462.65	17.61	462.50	0.00
463.00	32.72	462.50	0.00
463.15	37.62	462.50	0.00
463.50	47.59	462.50	0.00
463.65	51.48	462.50	0.00
464.00	60.01	462.50	0.00
464.15	63.41	462.50	0.00
464.50	70.66	462.50	0.00
464.65	73.36	462.50	0.00
465.00	78.39	462.50	0.00
465.15	80.39	462.50	0.00
465.50	85.07	462.50	0.00
465.65	87.03	462.50	0.00
466.00	91.47	462.50	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-34.05	463.00	0.00
460.50	-34.05	463.00	0.00
460.65	-34.05	463.00	0.00
461.00	-34.05	463.00	0.00
461.15	-34.05	463.00	0.00
461.50	-34.05	463.00	0.00
461.65	-34.05	463.00	0.00
462.00	-34.05	463.00	0.00
462.15	-33.62	463.00	0.00
462.50	-29.56	463.00	0.00
462.65	-25.94	463.00	0.00
463.00	0.00	463.00	0.00
463.15	19.54	463.00	0.00
463.50	35.85	463.00	0.00
463.65	40.94	463.00	0.00
464.00	50.60	463.00	0.00
464.15	53.94	463.00	0.00
464.50	61.18	463.00	0.00
464.65	64.15	463.00	0.00
465.00	70.63	463.00	0.00
465.15	73.22	463.00	0.00
465.50	78.96	463.00	0.00
465.65	81.28	463.00	0.00
466.00	86.50	463.00	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-43.20	463.50	0.00
460.50	-43.20	463.50	0.00
460.65	-43.20	463.50	0.00
461.00	-43.20	463.50	0.00
461.15	-43.20	463.50	0.00
461.50	-43.20	463.50	0.00
461.65	-43.20	463.50	0.00
462.00	-43.20	463.50	0.00
462.15	-43.20	463.50	0.00
462.50	-42.10	463.50	0.00
462.65	-40.53	463.50	0.00
463.00	-33.62	463.50	0.00
463.15	-28.75	463.50	0.00
463.50	0.00	463.50	0.00
463.65	19.34	463.50	0.00
464.00	35.33	463.50	0.00
464.15	40.26	463.50	0.00
464.50	49.93	463.50	0.00
464.65	53.54	463.50	0.00
465.00	61.15	463.50	0.00
465.15	64.13	463.50	0.00
465.50	70.61	463.50	0.00
465.65	73.21	463.50	0.00
466.00	78.96	463.50	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-51.81	464.00	0.00
460.50	-51.81	464.00	0.00
460.65	-51.81	464.00	0.00
461.00	-51.81	464.00	0.00
461.15	-51.81	464.00	0.00
461.50	-51.81	464.00	0.00
461.65	-51.81	464.00	0.00
462.00	-51.81	464.00	0.00
462.15	-51.81	464.00	0.00
462.50	-51.71	464.00	0.00
462.65	-51.12	464.00	0.00
463.00	-47.40	464.00	0.00
463.15	-44.68	464.00	0.00
463.50	-35.19	464.00	0.00
463.65	-29.56	464.00	0.00
464.00	0.00	464.00	0.00
464.15	19.34	464.00	0.00
464.50	35.29	464.00	0.00
464.65	40.26	464.00	0.00
465.00	49.93	464.00	0.00
465.15	53.55	464.00	0.00
465.50	61.16	464.00	0.00
465.65	64.16	464.00	0.00
466.00	70.61	464.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-59.89	464.50	0.00
460.50	-59.89	464.50	0.00
460.65	-59.89	464.50	0.00
461.00	-59.89	464.50	0.00
461.15	-59.89	464.50	0.00
461.50	-59.89	464.50	0.00
461.65	-59.89	464.50	0.00
462.00	-59.89	464.50	0.00
462.15	-59.89	464.50	0.00
462.50	-59.89	464.50	0.00
462.65	-59.84	464.50	0.00
463.00	-57.91	464.50	0.00
463.15	-56.12	464.50	0.00
463.50	-49.73	464.50	0.00
463.65	-46.06	464.50	0.00
464.00	-35.29	464.50	0.00
464.15	-29.56	464.50	0.00
464.50	0.00	464.50	0.00
464.65	19.39	464.50	0.00
465.00	35.30	464.50	0.00
465.15	40.26	464.50	0.00
465.50	49.96	464.50	0.00
465.65	53.54	464.50	0.00
466.00	61.14	464.50	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-67.52	465.00	0.00
460.50	-67.52	465.00	0.00
460.65	-67.52	465.00	0.00
461.00	-67.52	465.00	0.00
461.15	-67.52	465.00	0.00
461.50	-67.52	465.00	0.00
461.65	-67.52	465.00	0.00
462.00	-67.52	465.00	0.00
462.15	-67.52	465.00	0.00
462.50	-67.52	465.00	0.00
462.65	-67.52	465.00	0.00
463.00	-66.76	465.00	0.00
463.15	-65.61	465.00	0.00
463.50	-60.89	465.00	0.00
463.65	-58.03	465.00	0.00
464.00	-49.92	465.00	0.00
464.15	-46.06	465.00	0.00
464.50	-35.29	465.00	0.00
464.65	-29.56	465.00	0.00
465.00	0.00	465.00	0.00
465.15	19.37	465.00	0.00
465.50	35.30	465.00	0.00
465.65	40.27	465.00	0.00
466.00	49.93	465.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-74.72	465.50	0.00
460.50	-74.72	465.50	0.00
460.65	-74.72	465.50	0.00
461.00	-74.72	465.50	0.00
461.15	-74.72	465.50	0.00
461.50	-74.72	465.50	0.00
461.65	-74.72	465.50	0.00
462.00	-74.72	465.50	0.00
462.15	-74.72	465.50	0.00
462.50	-74.72	465.50	0.00
462.65	-74.72	465.50	0.00
463.00	-74.53	465.50	0.00
463.15	-73.84	465.50	0.00
463.50	-70.29	465.50	0.00
463.65	-67.90	465.50	0.00
464.00	-61.15	465.50	0.00
464.15	-58.03	465.50	0.00
464.50	-49.92	465.50	0.00
464.65	-46.06	465.50	0.00
465.00	-35.29	465.50	0.00
465.15	-29.56	465.50	0.00
465.50	0.00	465.50	0.00
465.65	19.30	465.50	0.00
466.00	35.34	465.50	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-81.54	466.00	0.00
460.50	-81.54	466.00	0.00
460.65	-81.54	466.00	0.00
461.00	-81.54	466.00	0.00
461.15	-81.54	466.00	0.00
461.50	-81.54	466.00	0.00
461.65	-81.54	466.00	0.00
462.00	-81.54	466.00	0.00
462.15	-81.54	466.00	0.00
462.50	-81.54	466.00	0.00
462.65	-81.54	466.00	0.00
463.00	-81.54	466.00	0.00
463.15	-81.23	466.00	0.00
463.50	-78.56	466.00	0.00
463.65	-76.56	466.00	0.00
464.00	-70.62	466.00	0.00
464.15	-67.90	466.00	0.00
464.50	-61.15	466.00	0.00
464.65	-58.03	466.00	0.00
465.00	-49.92	466.00	0.00
465.15	-46.06	466.00	0.00
465.50	-35.29	466.00	0.00
465.65	-29.56	466.00	0.00
466.00	0.00	466.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	460.15 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	466.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	Culvert - 1	Forward + Reverse	TW	460.15	466.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	42.0 in
Length	202.00 ft
Length (Computed Barrel)	202.00 ft
Slope (Computed)	0.004 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.006
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)	1.093
T2 ratio (HW/D)	1.195
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	463.98 ft	T1 Flow	63.00 ft³/s
T2 Elevation	464.33 ft	T2 Flow	72.00 ft³/s

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	458.00	0.00
460.50	0.71	458.00	0.00
460.65	1.43	458.00	0.00
461.00	4.04	458.00	0.00
461.15	5.51	458.00	0.00
461.50	9.77	458.00	0.00
461.65	11.91	458.00	0.00
462.00	17.62	458.00	0.00
462.15	20.33	458.00	0.00
462.50	27.30	458.00	0.00
462.65	30.53	458.00	0.00
463.00	38.38	458.00	0.00
463.15	41.89	458.00	0.00
463.50	50.17	458.00	0.00
463.65	53.72	458.00	0.00
464.00	61.71	458.00	0.00
464.15	64.96	458.00	0.00
464.50	71.91	458.00	0.00
464.65	74.57	458.00	0.00
465.00	79.44	458.00	0.00
465.15	81.28	458.00	0.00
465.50	85.59	458.00	0.00
465.65	87.42	458.00	0.00
466.00	91.66	458.00	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	458.50	0.00
460.50	0.71	458.50	0.00
460.65	1.43	458.50	0.00
461.00	4.04	458.50	0.00
461.15	5.51	458.50	0.00
461.50	9.77	458.50	0.00
461.65	11.91	458.50	0.00
462.00	17.62	458.50	0.00
462.15	20.33	458.50	0.00
462.50	27.30	458.50	0.00
462.65	30.53	458.50	0.00
463.00	38.38	458.50	0.00
463.15	41.89	458.50	0.00
463.50	50.17	458.50	0.00
463.65	53.72	458.50	0.00
464.00	61.71	458.50	0.00
464.15	64.96	458.50	0.00
464.50	71.91	458.50	0.00
464.65	74.57	458.50	0.00
465.00	79.44	458.50	0.00
465.15	81.28	458.50	0.00
465.50	85.59	458.50	0.00
465.65	87.42	458.50	0.00
466.00	91.66	458.50	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	459.00	0.00
460.50	0.71	459.00	0.00
460.65	1.43	459.00	0.00
461.00	4.04	459.00	0.00
461.15	5.51	459.00	0.00
461.50	9.77	459.00	0.00
461.65	11.91	459.00	0.00
462.00	17.62	459.00	0.00
462.15	20.33	459.00	0.00
462.50	27.30	459.00	0.00
462.65	30.53	459.00	0.00
463.00	38.38	459.00	0.00
463.15	41.89	459.00	0.00
463.50	50.17	459.00	0.00
463.65	53.72	459.00	0.00
464.00	61.71	459.00	0.00
464.15	64.96	459.00	0.00
464.50	71.91	459.00	0.00
464.65	74.57	459.00	0.00
465.00	79.44	459.00	0.00
465.15	81.28	459.00	0.00
465.50	85.59	459.00	0.00
465.65	87.42	459.00	0.00
466.00	91.66	459.00	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	459.40	0.00
460.50	0.71	459.40	0.00
460.65	1.43	459.40	0.00
461.00	4.04	459.40	0.00
461.15	5.51	459.40	0.00
461.50	9.77	459.40	0.00
461.65	11.91	459.40	0.00
462.00	17.62	459.40	0.00
462.15	20.33	459.40	0.00
462.50	27.30	459.40	0.00
462.65	30.53	459.40	0.00
463.00	38.38	459.40	0.00
463.15	41.89	459.40	0.00
463.50	50.17	459.40	0.00
463.65	53.72	459.40	0.00
464.00	61.71	459.40	0.00
464.15	64.96	459.40	0.00
464.50	71.91	459.40	0.00
464.65	74.57	459.40	0.00
465.00	79.44	459.40	0.00
465.15	81.28	459.40	0.00
465.50	85.59	459.40	0.00
465.65	87.42	459.40	0.00
466.00	91.66	459.40	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	459.50	0.00
460.50	0.71	459.50	0.00
460.65	1.43	459.50	0.00
461.00	4.04	459.50	0.00
461.15	5.51	459.50	0.00
461.50	9.77	459.50	0.00
461.65	11.91	459.50	0.00
462.00	17.62	459.50	0.00
462.15	20.33	459.50	0.00
462.50	27.30	459.50	0.00
462.65	30.53	459.50	0.00
463.00	38.38	459.50	0.00
463.15	41.89	459.50	0.00
463.50	50.17	459.50	0.00
463.65	53.72	459.50	0.00
464.00	61.71	459.50	0.00
464.15	64.96	459.50	0.00
464.50	71.91	459.50	0.00
464.65	74.57	459.50	0.00
465.00	79.44	459.50	0.00
465.15	81.28	459.50	0.00
465.50	85.59	459.50	0.00
465.65	87.42	459.50	0.00
466.00	91.66	459.50	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	460.00	0.00
460.50	0.71	460.00	0.00
460.65	1.43	460.00	0.00
461.00	4.04	460.00	0.00
461.15	5.51	460.00	0.00
461.50	9.77	460.00	0.00
461.65	11.91	460.00	0.00
462.00	17.62	460.00	0.00
462.15	20.33	460.00	0.00
462.50	27.30	460.00	0.00
462.65	30.53	460.00	0.00
463.00	38.38	460.00	0.00
463.15	41.89	460.00	0.00
463.50	50.17	460.00	0.00
463.65	53.72	460.00	0.00
464.00	61.71	460.00	0.00
464.15	64.96	460.00	0.00
464.50	71.91	460.00	0.00
464.65	74.57	460.00	0.00
465.00	79.44	460.00	0.00
465.15	81.28	460.00	0.00
465.50	85.59	460.00	0.00
465.65	87.42	460.00	0.00
466.00	91.66	460.00	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	0.00	460.15	0.00
460.50	0.71	460.15	0.00
460.65	1.43	460.15	0.00
461.00	4.03	460.15	0.00
461.15	5.51	460.15	0.00
461.50	9.77	460.15	0.00
461.65	11.91	460.15	0.00
462.00	17.62	460.15	0.00
462.15	20.33	460.15	0.00
462.50	27.30	460.15	0.00
462.65	30.53	460.15	0.00
463.00	38.38	460.15	0.00
463.15	41.89	460.15	0.00
463.50	50.17	460.15	0.00
463.65	53.72	460.15	0.00
464.00	61.71	460.15	0.00
464.15	64.96	460.15	0.00
464.50	71.91	460.15	0.00
464.65	74.57	460.15	0.00
465.00	79.44	460.15	0.00
465.15	81.28	460.15	0.00
465.50	85.59	460.15	0.00
465.65	87.42	460.15	0.00
466.00	91.66	460.15	0.00

Contributing Structures
None Contributing
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-0.61	460.50	0.00
460.50	0.00	460.50	0.00
460.65	1.43	460.50	0.00
461.00	4.03	460.50	0.00
461.15	5.51	460.50	0.00
461.50	9.77	460.50	0.00
461.65	11.91	460.50	0.00
462.00	17.62	460.50	0.00
462.15	20.33	460.50	0.00
462.50	27.30	460.50	0.00
462.65	30.53	460.50	0.00
463.00	38.38	460.50	0.00
463.15	41.89	460.50	0.00
463.50	50.17	460.50	0.00
463.65	53.72	460.50	0.00
464.00	61.71	460.50	0.00
464.15	64.96	460.50	0.00
464.50	71.91	460.50	0.00
464.65	74.57	460.50	0.00
465.00	79.44	460.50	0.00
465.15	81.28	460.50	0.00
465.50	85.59	460.50	0.00
465.65	87.42	460.50	0.00
466.00	91.66	460.50	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-3.60	461.00	0.00
460.50	-3.60	461.00	0.00
460.65	-3.60	461.00	0.00
461.00	0.00	461.00	0.00
461.15	5.12	461.00	0.00
461.50	9.77	461.00	0.00
461.65	11.91	461.00	0.00
462.00	17.62	461.00	0.00
462.15	20.37	461.00	0.00
462.50	27.30	461.00	0.00
462.65	30.53	461.00	0.00
463.00	38.38	461.00	0.00
463.15	41.89	461.00	0.00
463.50	50.17	461.00	0.00
463.65	53.72	461.00	0.00
464.00	61.71	461.00	0.00
464.15	64.96	461.00	0.00
464.50	71.91	461.00	0.00
464.65	74.57	461.00	0.00
465.00	79.44	461.00	0.00
465.15	81.28	461.00	0.00
465.50	85.59	461.00	0.00
465.65	87.42	461.00	0.00
466.00	91.66	461.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-8.89	461.50	0.00
460.50	-8.89	461.50	0.00
460.65	-8.89	461.50	0.00
461.00	-8.89	461.50	0.00
461.15	-8.75	461.50	0.00
461.50	0.00	461.50	0.00
461.65	9.58	461.50	0.00
462.00	17.69	461.50	0.00
462.15	20.42	461.50	0.00
462.50	27.30	461.50	0.00
462.65	30.53	461.50	0.00
463.00	38.38	461.50	0.00
463.15	41.89	461.50	0.00
463.50	50.17	461.50	0.00
463.65	53.72	461.50	0.00
464.00	61.71	461.50	0.00
464.15	64.96	461.50	0.00
464.50	71.91	461.50	0.00
464.65	74.57	461.50	0.00
465.00	79.44	461.50	0.00
465.15	81.28	461.50	0.00
465.50	85.59	461.50	0.00
465.65	87.42	461.50	0.00
466.00	91.66	461.50	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-16.07	462.00	0.00
460.50	-16.07	462.00	0.00
460.65	-16.07	462.00	0.00
461.00	-16.07	462.00	0.00
461.15	-16.07	462.00	0.00
461.50	-15.83	462.00	0.00
461.65	-14.73	462.00	0.00
462.00	0.00	462.00	0.00
462.15	13.96	462.00	0.00
462.50	25.91	462.00	0.00
462.65	29.83	462.00	0.00
463.00	38.26	462.00	0.00
463.15	41.76	462.00	0.00
463.50	50.07	462.00	0.00
463.65	53.64	462.00	0.00
464.00	61.68	462.00	0.00
464.15	64.93	462.00	0.00
464.50	71.91	462.00	0.00
464.65	74.57	462.00	0.00
465.00	79.44	462.00	0.00
465.15	81.28	462.00	0.00
465.50	85.59	462.00	0.00
465.65	87.42	462.00	0.00
466.00	91.66	462.00	0.00

Contributing Structures
Culvert - 1
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Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-24.65	462.50	0.00
460.50	-24.65	462.50	0.00
460.65	-24.65	462.50	0.00
461.00	-24.65	462.50	0.00
461.15	-24.65	462.50	0.00
461.50	-24.65	462.50	0.00
461.65	-24.65	462.50	0.00
462.00	-23.08	462.50	0.00
462.15	-20.79	462.50	0.00
462.50	0.00	462.50	0.00
462.65	17.61	462.50	0.00
463.00	32.72	462.50	0.00
463.15	37.62	462.50	0.00
463.50	47.59	462.50	0.00
463.65	51.48	462.50	0.00
464.00	60.01	462.50	0.00
464.15	63.41	462.50	0.00
464.50	70.66	462.50	0.00
464.65	73.36	462.50	0.00
465.00	78.39	462.50	0.00
465.15	80.39	462.50	0.00
465.50	85.07	462.50	0.00
465.65	87.03	462.50	0.00
466.00	91.47	462.50	0.00

Contributing Structures
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-34.05	463.00	0.00
460.50	-34.05	463.00	0.00
460.65	-34.05	463.00	0.00
461.00	-34.05	463.00	0.00
461.15	-34.05	463.00	0.00
461.50	-34.05	463.00	0.00
461.65	-34.05	463.00	0.00
462.00	-34.05	463.00	0.00
462.15	-33.62	463.00	0.00
462.50	-29.56	463.00	0.00
462.65	-25.94	463.00	0.00
463.00	0.00	463.00	0.00
463.15	19.54	463.00	0.00
463.50	35.85	463.00	0.00
463.65	40.94	463.00	0.00
464.00	50.60	463.00	0.00
464.15	53.94	463.00	0.00
464.50	61.18	463.00	0.00
464.65	64.15	463.00	0.00
465.00	70.63	463.00	0.00
465.15	73.22	463.00	0.00
465.50	78.96	463.00	0.00
465.65	81.28	463.00	0.00
466.00	86.50	463.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-43.20	463.50	0.00
460.50	-43.20	463.50	0.00
460.65	-43.20	463.50	0.00
461.00	-43.20	463.50	0.00
461.15	-43.20	463.50	0.00
461.50	-43.20	463.50	0.00
461.65	-43.20	463.50	0.00
462.00	-43.20	463.50	0.00
462.15	-43.20	463.50	0.00
462.50	-42.10	463.50	0.00
462.65	-40.53	463.50	0.00
463.00	-33.62	463.50	0.00
463.15	-28.75	463.50	0.00
463.50	0.00	463.50	0.00
463.65	19.34	463.50	0.00
464.00	35.33	463.50	0.00
464.15	40.26	463.50	0.00
464.50	49.93	463.50	0.00
464.65	53.54	463.50	0.00
465.00	61.15	463.50	0.00
465.15	64.13	463.50	0.00
465.50	70.61	463.50	0.00
465.65	73.21	463.50	0.00
466.00	78.96	463.50	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-51.81	464.00	0.00
460.50	-51.81	464.00	0.00
460.65	-51.81	464.00	0.00
461.00	-51.81	464.00	0.00
461.15	-51.81	464.00	0.00
461.50	-51.81	464.00	0.00
461.65	-51.81	464.00	0.00
462.00	-51.81	464.00	0.00
462.15	-51.81	464.00	0.00
462.50	-51.71	464.00	0.00
462.65	-51.12	464.00	0.00
463.00	-47.40	464.00	0.00
463.15	-44.68	464.00	0.00
463.50	-35.19	464.00	0.00
463.65	-29.56	464.00	0.00
464.00	0.00	464.00	0.00
464.15	19.34	464.00	0.00
464.50	35.29	464.00	0.00
464.65	40.26	464.00	0.00
465.00	49.93	464.00	0.00
465.15	53.55	464.00	0.00
465.50	61.16	464.00	0.00
465.65	64.16	464.00	0.00
466.00	70.61	464.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-59.89	464.50	0.00
460.50	-59.89	464.50	0.00
460.65	-59.89	464.50	0.00
461.00	-59.89	464.50	0.00
461.15	-59.89	464.50	0.00
461.50	-59.89	464.50	0.00
461.65	-59.89	464.50	0.00
462.00	-59.89	464.50	0.00
462.15	-59.89	464.50	0.00
462.50	-59.89	464.50	0.00
462.65	-59.84	464.50	0.00
463.00	-57.91	464.50	0.00
463.15	-56.12	464.50	0.00
463.50	-49.73	464.50	0.00
463.65	-46.06	464.50	0.00
464.00	-35.29	464.50	0.00
464.15	-29.56	464.50	0.00
464.50	0.00	464.50	0.00
464.65	19.39	464.50	0.00
465.00	35.30	464.50	0.00
465.15	40.26	464.50	0.00
465.50	49.96	464.50	0.00
465.65	53.54	464.50	0.00
466.00	61.14	464.50	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Composite Outflow Summary

Contributing Structures
Culvert - 1
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Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-67.52	465.00	0.00
460.50	-67.52	465.00	0.00
460.65	-67.52	465.00	0.00
461.00	-67.52	465.00	0.00
461.15	-67.52	465.00	0.00
461.50	-67.52	465.00	0.00
461.65	-67.52	465.00	0.00
462.00	-67.52	465.00	0.00
462.15	-67.52	465.00	0.00
462.50	-67.52	465.00	0.00
462.65	-67.52	465.00	0.00
463.00	-66.76	465.00	0.00
463.15	-65.61	465.00	0.00
463.50	-60.89	465.00	0.00
463.65	-58.03	465.00	0.00
464.00	-49.92	465.00	0.00
464.15	-46.06	465.00	0.00
464.50	-35.29	465.00	0.00
464.65	-29.56	465.00	0.00
465.00	0.00	465.00	0.00
465.15	19.37	465.00	0.00
465.50	35.30	465.00	0.00
465.65	40.27	465.00	0.00
466.00	49.93	465.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-74.72	465.50	0.00
460.50	-74.72	465.50	0.00
460.65	-74.72	465.50	0.00
461.00	-74.72	465.50	0.00
461.15	-74.72	465.50	0.00
461.50	-74.72	465.50	0.00
461.65	-74.72	465.50	0.00
462.00	-74.72	465.50	0.00
462.15	-74.72	465.50	0.00
462.50	-74.72	465.50	0.00
462.65	-74.72	465.50	0.00
463.00	-74.53	465.50	0.00
463.15	-73.84	465.50	0.00
463.50	-70.29	465.50	0.00
463.65	-67.90	465.50	0.00
464.00	-61.15	465.50	0.00
464.15	-58.03	465.50	0.00
464.50	-49.92	465.50	0.00
464.65	-46.06	465.50	0.00
465.00	-35.29	465.50	0.00
465.15	-29.56	465.50	0.00
465.50	0.00	465.50	0.00
465.65	19.30	465.50	0.00
466.00	35.34	465.50	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
460.15	-81.54	466.00	0.00
460.50	-81.54	466.00	0.00
460.65	-81.54	466.00	0.00
461.00	-81.54	466.00	0.00
461.15	-81.54	466.00	0.00
461.50	-81.54	466.00	0.00
461.65	-81.54	466.00	0.00
462.00	-81.54	466.00	0.00
462.15	-81.54	466.00	0.00
462.50	-81.54	466.00	0.00
462.65	-81.54	466.00	0.00
463.00	-81.54	466.00	0.00
463.15	-81.23	466.00	0.00
463.50	-78.56	466.00	0.00
463.65	-76.56	466.00	0.00
464.00	-70.62	466.00	0.00
464.15	-67.90	466.00	0.00
464.50	-61.15	466.00	0.00
464.65	-58.03	466.00	0.00
465.00	-49.92	466.00	0.00
465.15	-46.06	466.00	0.00
465.50	-35.29	466.00	0.00
465.65	-29.56	466.00	0.00
466.00	0.00	466.00	0.00

Contributing Structures
Culvert - 1
Culvert - 1
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Subsection: Composite Rating Curve
Label: EP 4 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	462.99 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	472.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Rectangular Weir	Weir - 1	Forward + Reverse	Culvert - 1	462.99	463.74
Stand Pipe	Riser - 1	Forward + Reverse	Culvert - 1	469.15	472.00
Orifice-Area	Orifice - 1	Forward + Reverse	Culvert - 1	463.74	472.00
Culvert-Circular	Culvert - 1	Forward	TW	463.03	472.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	462.99 ft
Weir Length	1.80 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Orifice - 1 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	462.99 ft
Orifice Area	1.35 ft²
Top Elevation	463.74 ft
Datum Elevation	463.36 ft
Orifice Coefficient	0.600

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	27.0 in
Length	48.06 ft
Length (Computed Barrel)	48.07 ft
Slope (Computed)	0.018 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.011
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)	1.086
T2 ratio (HW/D)	1.188
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	465.47 ft	T1 Flow	20.87 ft³/s
T2 Elevation	465.70 ft	T2 Flow	23.86 ft³/s

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	469.15 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

Subsection: Composite Rating Curve
Label: OS 18

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
462.99	0.00	463.87	0.00
463.03	0.00	463.87	0.00
463.09	0.00	463.87	0.00
463.19	0.00	463.87	0.00
463.29	0.00	463.87	0.00
463.39	0.00	463.87	0.00
463.49	0.00	463.87	0.00
463.59	0.00	463.87	0.00
463.69	0.00	463.87	0.00
463.79	0.00	463.87	0.00
463.89	0.83	463.87	0.00
463.99	2.04	463.87	0.00
464.09	2.74	463.87	0.00
464.19	3.29	463.87	0.00
464.29	3.72	463.87	0.00
464.39	4.03	463.87	0.00
464.49	4.34	463.87	0.00
464.59	4.64	463.87	0.00
464.69	4.93	463.87	0.00
464.79	5.20	463.87	0.00
464.89	5.48	463.87	0.00
464.99	5.74	463.87	0.00
465.09	6.00	463.87	0.00
465.19	6.25	463.87	0.00
465.29	6.50	463.87	0.00
465.39	6.73	463.87	0.00
465.49	6.96	463.87	0.00
465.59	7.20	463.87	0.00
465.69	7.42	463.87	0.00
465.79	7.64	463.87	0.00
465.89	7.86	463.87	0.00
465.99	8.06	463.87	0.00
466.09	8.27	463.87	0.00
466.19	8.48	463.87	0.00
466.29	8.67	463.87	0.00
466.39	8.87	463.87	0.00
466.49	9.06	463.87	0.00
466.59	9.26	463.87	0.00
466.69	9.43	463.87	0.00
466.79	9.63	463.87	0.00
466.89	9.80	463.87	0.00
466.99	9.98	463.87	0.00
467.09	10.15	463.87	0.00
467.19	10.33	463.87	0.00

Subsection: Composite Rating Curve
Label: OS 18

Return Event: 2 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
467.29	10.51	463.87	0.00
467.39	10.67	463.87	0.00
467.49	10.84	463.87	0.00
467.59	11.00	463.87	0.00
467.69	11.17	463.87	0.00
467.79	11.33	463.87	0.00
467.89	11.48	463.87	0.00
467.99	11.64	463.87	0.00
468.09	11.79	463.87	0.00
468.19	11.95	463.87	0.00
468.29	12.11	463.87	0.00
468.39	12.26	463.87	0.00
468.49	12.40	463.87	0.00
468.59	12.56	463.87	0.00
468.69	12.71	463.87	0.00
468.79	12.85	463.87	0.00
468.89	12.99	463.87	0.00
468.99	13.13	463.87	0.00
469.09	13.28	463.87	0.00
469.15	13.35	463.87	0.00
469.19	13.74	463.87	0.00
469.29	15.74	463.87	0.00
469.39	18.60	463.87	0.00
469.49	22.13	463.87	0.00
469.59	26.15	463.87	0.00
469.69	30.43	463.87	0.00
469.79	34.94	463.87	0.00
469.89	39.58	463.87	0.00
469.99	44.23	463.87	0.00
470.09	48.70	463.87	0.00
470.19	52.33	463.87	0.00
470.29	53.44	463.87	0.00
470.39	53.91	463.87	0.00
470.49	54.37	463.87	0.00
470.59	54.82	463.87	0.00
470.69	55.28	463.87	0.00
470.79	55.73	463.87	0.00
470.89	56.17	463.87	0.00
470.99	56.62	463.87	0.00
471.09	57.05	463.87	0.00
471.19	57.49	463.87	0.00
471.29	57.92	463.87	0.00
471.39	58.35	463.87	0.00
471.49	58.78	463.87	0.00

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
471.59	59.20	463.87	0.00
471.69	59.62	463.87	0.00
471.79	60.03	463.87	0.00
471.89	60.45	463.87	0.00
471.99	60.86	463.87	0.00
472.00	60.90	463.87	0.00

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

Composite Outflow Summary

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

Composite Outflow Summary

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

Subsection: Composite Rating Curve
Label: OS 18

Return Event: 2 years
Storm Event:

Composite Outflow Summary

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

Subsection: Composite Rating Curve
Label: OS 18

Return Event: 2 years
Storm Event:

Composite Outflow Summary

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

Requested Pond Water Surface Elevations	
Minimum (Headwater)	462.99 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	472.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Stand Pipe	Riser - 1	Forward + Reverse	Culvert - 1	469.15	472.00
Culvert-Circular	Culvert - 1	Forward	TW	463.03	472.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	27.0 in
Length	48.06 ft
Length (Computed Barrel)	48.07 ft
Slope (Computed)	0.018 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.011
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)	1.086
T2 ratio (HW/D)	1.188
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	465.47 ft	T1 Flow	20.87 ft³/s
T2 Elevation	465.70 ft	T2 Flow	23.86 ft³/s

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	469.15 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

Subsection: Composite Rating Curve
Label: OS 18 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
462.99	0.00	463.87	0.00
463.03	0.00	463.87	0.00
463.09	0.00	463.87	0.00
463.19	0.00	463.87	0.00
463.29	0.00	463.87	0.00
463.39	0.00	463.87	0.00
463.49	0.00	463.87	0.00
463.59	0.00	463.87	0.00
463.69	0.00	463.87	0.00
463.79	0.00	463.87	0.00
463.89	0.00	463.87	0.00
463.99	0.00	463.87	0.00
464.09	0.00	463.87	0.00
464.19	0.00	463.87	0.00
464.29	0.00	463.87	0.00
464.39	0.00	463.87	0.00
464.49	0.00	463.87	0.00
464.59	0.00	463.87	0.00
464.69	0.00	463.87	0.00
464.79	0.00	463.87	0.00
464.89	0.00	463.87	0.00
464.99	0.00	463.87	0.00
465.09	0.00	463.87	0.00
465.19	0.00	463.87	0.00
465.29	0.00	463.87	0.00
465.39	0.00	463.87	0.00
465.49	0.00	463.87	0.00
465.59	0.00	463.87	0.00
465.69	0.00	463.87	0.00
465.79	0.00	463.87	0.00
465.89	0.00	463.87	0.00
465.99	0.00	463.87	0.00
466.09	0.00	463.87	0.00
466.19	0.00	463.87	0.00
466.29	0.00	463.87	0.00
466.39	0.00	463.87	0.00
466.49	0.00	463.87	0.00
466.59	0.00	463.87	0.00
466.69	0.00	463.87	0.00
466.79	0.00	463.87	0.00
466.89	0.00	463.87	0.00
466.99	0.00	463.87	0.00
467.09	0.00	463.87	0.00
467.19	0.00	463.87	0.00

Subsection: Composite Rating Curve
Label: OS 18 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
467.29	0.00	463.87	0.00
467.39	0.00	463.87	0.00
467.49	0.00	463.87	0.00
467.59	0.00	463.87	0.00
467.69	0.00	463.87	0.00
467.79	0.00	463.87	0.00
467.89	0.00	463.87	0.00
467.99	0.00	463.87	0.00
468.09	0.00	463.87	0.00
468.19	0.00	463.87	0.00
468.29	0.00	463.87	0.00
468.39	0.00	463.87	0.00
468.49	0.00	463.87	0.00
468.59	0.00	463.87	0.00
468.69	0.00	463.87	0.00
468.79	0.00	463.87	0.00
468.89	0.00	463.87	0.00
468.99	0.00	463.87	0.00
469.09	0.00	463.87	0.00
469.15	0.00	463.87	0.00
469.19	0.38	463.87	0.00
469.29	2.47	463.87	0.00
469.39	5.54	463.87	0.00
469.49	9.35	463.87	0.00
469.59	13.76	463.87	0.00
469.69	18.70	463.87	0.00
469.79	24.13	463.87	0.00
469.89	29.99	463.87	0.00
469.99	36.28	463.87	0.00
470.09	42.95	463.87	0.00
470.19	49.98	463.87	0.00
470.29	53.44	463.87	0.00
470.39	53.91	463.87	0.00
470.49	54.37	463.87	0.00
470.59	54.82	463.87	0.00
470.69	55.28	463.87	0.00
470.79	55.73	463.87	0.00
470.89	56.17	463.87	0.00
470.99	56.62	463.87	0.00
471.09	57.05	463.87	0.00
471.19	57.49	463.87	0.00
471.29	57.92	463.87	0.00
471.39	58.35	463.87	0.00
471.49	58.78	463.87	0.00

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
471.59	59.20	463.87	0.00
471.69	59.62	463.87	0.00
471.79	60.03	463.87	0.00
471.89	60.45	463.87	0.00
471.99	60.86	463.87	0.00
472.00	60.90	463.87	0.00

Contributing Structures
(no Q: Riser - 1,Culvert - 1)
(no Q: Riser - 1,Culvert - 1)
(no Q: Riser - 1,Culvert - 1)
(no Q: Riser - 1,Culvert - 1)
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Subsection: Composite Rating Curve
Label: OS 18 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

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

Subsection: Composite Rating Curve
Label: OS 18 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Contributing Structures
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1
Riser - 1,Culvert - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	458.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	466.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	Orifice - 1	Forward	Culvert - 1	458.50	466.00
Orifice-Area	Orifice - 2	Forward	Culvert - 1	460.50	466.00
Rectangular Weir	Weir - 2	Forward	Culvert - 1	460.00	460.50
Stand Pipe	Riser - 1	Forward	Culvert - 1	464.00	466.00
Rectangular Weir	Weir - 1	Forward	Culvert - 1	458.00	458.50
Culvert-Circular	Culvert - 1	Forward	TW	457.88	466.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	0.00 ft
Weir Length	1.50 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Orifice - 1 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	458.00 ft
Orifice Area	0.75 ft²
Top Elevation	458.50 ft
Datum Elevation	458.25 ft
Orifice Coefficient	0.600

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	464.00 ft
Diameter	48.0 in
Orifice Area	12.57 ft²
Orifice Coefficient	0.600
Weir Length	12.57 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: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	30.0 in
Length	60.22 ft
Length (Computed Barrel)	60.23 ft
Slope (Computed)	0.020 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.009
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)	1.085
T2 ratio (HW/D)	1.187
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	460.59 ft	T1 Flow	27.16 ft³/s
T2 Elevation	460.85 ft	T2 Flow	31.05 ft³/s

Structure ID: Weir - 2 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	460.00 ft
Weir Length	1.25 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Orifice - 2 Structure Type: Orifice-Area	
Number of Openings	1
Elevation	460.00 ft
Orifice Area	0.63 ft²
Top Elevation	460.50 ft
Datum Elevation	460.25 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
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
458.00	0.07	(N/A)	0.00
458.50	1.22	(N/A)	0.00
459.00	2.32	(N/A)	0.00
459.50	3.20	(N/A)	0.00
460.00	3.93	(N/A)	0.00
460.50	5.88	(N/A)	0.00
461.00	7.47	(N/A)	0.00
461.50	8.72	(N/A)	0.00
462.00	9.81	(N/A)	0.00
462.50	10.78	(N/A)	0.00
463.00	11.68	(N/A)	0.00
463.50	12.54	(N/A)	0.00
464.00	13.31	(N/A)	0.00
464.50	26.39	(N/A)	0.00
465.00	47.92	(N/A)	0.00
465.50	67.08	(N/A)	0.00
466.00	69.86	(N/A)	0.00

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

Subsection: Composite Rating Curve
Label: OS 2

Return Event: 2 years
Storm Event:

Composite Outflow Summary

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

Requested Pond Water Surface Elevations	
Minimum (Headwater)	458.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	466.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Stand Pipe	Riser - 1	Forward	Culvert - 1	464.00	466.00
Culvert-Circular	Culvert - 1	Forward	TW	457.88	466.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	464.00 ft
Diameter	48.0 in
Orifice Area	12.57 ft²
Orifice Coefficient	0.600
Weir Length	12.57 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: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	30.0 in
Length	60.22 ft
Length (Computed Barrel)	60.23 ft
Slope (Computed)	0.020 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.009
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)	1.085
T2 ratio (HW/D)	1.187
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	460.59 ft	T1 Flow	27.16 ft³/s
T2 Elevation	460.85 ft	T2 Flow	31.05 ft³/s

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: OS 2 LFB

Return Event: 101 years
Storm Event:

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
458.00	0.00	(N/A)	0.00
458.50	0.00	(N/A)	0.00
459.00	0.00	(N/A)	0.00
459.50	0.00	(N/A)	0.00
460.00	0.00	(N/A)	0.00
460.50	0.00	(N/A)	0.00
461.00	0.00	(N/A)	0.00
461.50	0.00	(N/A)	0.00
462.00	0.00	(N/A)	0.00
462.50	0.00	(N/A)	0.00
463.00	0.00	(N/A)	0.00
463.50	0.00	(N/A)	0.00
464.00	0.00	(N/A)	0.00
464.50	13.34	(N/A)	0.00
465.00	37.69	(N/A)	0.00
465.50	67.08	(N/A)	0.00
466.00	69.86	(N/A)	0.00

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

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)
462.99	0.00	0.000	0.00	0.00	0.00	0.00
463.03	0.00	0.239	8.78	0.00	0.00	0.01
463.09	0.00	0.976	16.17	0.00	0.00	0.03
463.19	0.00	3.406	33.46	0.00	0.00	0.11
463.29	0.00	7.876	56.99	0.00	0.00	0.26
463.39	0.00	15.010	86.73	0.00	0.00	0.50
463.49	0.00	25.430	122.70	0.00	0.00	0.85
463.59	0.00	39.758	164.90	0.00	0.00	1.33
463.69	0.00	58.617	213.31	0.00	0.00	1.95
463.79	0.00	82.628	267.95	0.00	0.00	2.75
463.89	0.83	112.415	328.82	0.00	0.83	4.58
463.99	2.04	148.599	395.91	0.00	2.04	6.99
464.09	2.74	194.198	524.23	0.00	2.74	9.21
464.19	3.29	254.127	677.65	0.00	3.29	11.76
464.29	3.72	330.382	850.73	0.00	3.72	14.74
464.39	4.03	424.929	1,043.48	0.00	4.03	18.19
464.49	4.34	539.734	1,255.90	0.00	4.34	22.33
464.59	4.64	676.764	1,487.98	0.00	4.64	27.20
464.69	4.93	837.985	1,739.72	0.00	4.93	32.86
464.79	5.20	1,025.364	2,011.13	0.00	5.20	39.38
464.89	5.48	1,240.867	2,302.21	0.00	5.48	46.84
464.99	5.74	1,486.460	2,612.94	0.00	5.74	55.29
465.09	6.00	1,764.928	2,961.83	0.00	6.00	64.83
465.19	6.25	2,079.573	3,334.76	0.00	6.25	75.57
465.29	6.50	2,432.616	3,729.79	0.00	6.50	87.58
465.39	6.73	2,826.268	4,146.93	0.00	6.73	100.94
465.49	6.96	3,262.739	4,586.17	0.00	6.96	115.72
465.59	7.20	3,744.239	5,047.52	0.00	7.20	132.00
465.69	7.42	4,272.981	5,530.98	0.00	7.42	149.85
465.79	7.64	4,851.173	6,036.55	0.00	7.64	169.35
465.89	7.86	5,481.027	6,564.22	0.00	7.86	190.56

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
465.99	8.06	6,164.753	7,114.00	0.00	8.06	213.55
466.09	8.27	6,891.223	7,386.98	0.00	8.27	237.98
466.19	8.48	7,642.121	7,631.65	0.00	8.48	263.21
466.29	8.67	8,417.686	7,880.31	0.00	8.67	289.26
466.39	8.87	9,218.316	8,132.95	0.00	8.87	316.14
466.49	9.06	10,044.409	8,389.58	0.00	9.06	343.88
466.59	9.26	10,896.364	8,650.19	0.00	9.26	372.47
466.69	9.43	11,774.580	8,914.79	0.00	9.43	401.92
466.79	9.63	12,679.455	9,183.37	0.00	9.63	432.28
466.89	9.80	13,611.387	9,455.95	0.00	9.80	463.52
466.99	9.98	14,570.777	9,732.50	0.00	9.98	495.67
467.09	10.15	15,550.962	9,855.72	0.00	10.15	528.52
467.19	10.33	16,541.853	9,962.19	0.00	10.33	561.73
467.29	10.51	17,543.420	10,069.24	0.00	10.51	595.29
467.39	10.67	18,555.721	10,176.86	0.00	10.67	629.19
467.49	10.84	19,578.812	10,285.05	0.00	10.84	663.46
467.59	11.00	20,612.750	10,393.82	0.00	11.00	698.09
467.69	11.17	21,657.594	10,503.15	0.00	11.17	733.09
467.79	11.33	22,713.400	10,613.06	0.00	11.33	768.44
467.89	11.48	23,780.225	10,723.54	0.00	11.48	804.16
467.99	11.64	24,858.127	10,834.59	0.00	11.64	840.24
468.09	11.79	25,945.800	10,915.89	0.00	11.79	876.65
468.19	11.95	27,041.299	10,994.12	0.00	11.95	913.33
468.29	12.11	28,144.634	11,072.62	0.00	12.11	950.26
468.39	12.26	29,255.833	11,151.41	0.00	12.26	987.46
468.49	12.40	30,374.925	11,230.47	0.00	12.40	1,024.90
468.59	12.56	31,501.937	11,309.81	0.00	12.56	1,062.62
468.69	12.71	32,636.897	11,389.44	0.00	12.71	1,100.61
468.79	12.85	33,779.833	11,469.34	0.00	12.85	1,138.85
468.89	12.99	34,930.774	11,549.52	0.00	12.99	1,177.35
468.99	13.13	36,089.746	11,629.98	0.00	13.13	1,216.12
469.09	13.28	37,256.728	11,709.59	0.00	13.28	1,255.17
469.15	13.35	37,960.737	11,757.40	0.00	13.35	1,278.71
469.19	13.74	38,431.672	11,789.34	0.00	13.74	1,294.80
469.29	15.74	39,614.604	11,869.36	0.00	15.74	1,336.23
469.39	18.60	40,805.553	11,949.65	0.00	18.60	1,378.78
469.49	22.13	42,004.544	12,030.22	0.00	22.13	1,422.29
469.59	26.15	43,211.605	12,111.05	0.00	26.15	1,466.54
469.69	30.43	44,426.763	12,192.15	0.00	30.43	1,511.33
469.79	34.94	45,650.045	12,273.53	0.00	34.94	1,556.61
469.89	39.58	46,881.478	12,355.18	0.00	39.58	1,602.29
469.99	44.23	48,121.089	12,437.09	0.00	44.23	1,648.26
470.09	48.70	49,368.859	12,518.25	0.00	48.70	1,694.33
470.19	52.33	50,624.748	12,599.56	0.00	52.33	1,739.82
470.29	53.44	51,888.781	12,681.14	0.00	53.44	1,783.07

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
470.39	53.91	53,160.985	12,762.98	0.00	53.91	1,825.94
470.49	54.37	54,441.385	12,845.08	0.00	54.37	1,869.08
470.59	54.82	55,730.008	12,927.44	0.00	54.82	1,912.49
470.69	55.28	57,026.881	13,010.07	0.00	55.28	1,956.17
470.79	55.73	58,332.030	13,092.95	0.00	55.73	2,000.13
470.89	56.17	59,645.481	13,176.11	0.00	56.17	2,044.35
470.99	56.62	60,967.261	13,259.52	0.00	56.62	2,088.86
471.09	57.05	62,303.061	13,469.34	0.00	57.05	2,133.82
471.19	57.49	63,661.260	13,694.96	0.00	57.49	2,179.54
471.29	57.92	65,042.114	13,922.45	0.00	57.92	2,225.99
471.39	58.35	66,445.812	14,151.82	0.00	58.35	2,273.21
471.49	58.78	67,872.540	14,383.06	0.00	58.78	2,321.20
471.59	59.20	69,322.486	14,616.17	0.00	59.20	2,369.95
471.69	59.62	70,795.837	14,851.16	0.00	59.62	2,419.48
471.79	60.03	72,292.781	15,088.03	0.00	60.03	2,469.79
471.89	60.45	73,813.505	15,326.76	0.00	60.45	2,520.90
471.99	60.86	75,358.197	15,567.38	0.00	60.86	2,572.80
472.00	60.90	75,513.991	15,591.54	0.00	60.90	2,578.04

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)
462.99	0.00	0.000	0.00	0.00	0.00	0.00
463.03	0.00	0.239	8.78	0.00	0.00	0.01
463.09	0.00	0.976	16.17	0.00	0.00	0.03
463.19	0.00	3.406	33.46	0.00	0.00	0.11
463.29	0.00	7.876	56.99	0.00	0.00	0.26
463.39	0.00	15.010	86.73	0.00	0.00	0.50
463.49	0.00	25.430	122.70	0.00	0.00	0.85
463.59	0.00	39.758	164.90	0.00	0.00	1.33
463.69	0.00	58.617	213.31	0.00	0.00	1.95
463.79	0.00	82.628	267.95	0.00	0.00	2.75
463.89	0.83	112.415	328.82	0.00	0.83	4.58
463.99	2.04	148.599	395.91	0.00	2.04	6.99
464.09	2.74	194.198	524.23	0.00	2.74	9.21
464.19	3.29	254.127	677.65	0.00	3.29	11.76
464.29	3.72	330.382	850.73	0.00	3.72	14.74
464.39	4.03	424.929	1,043.48	0.00	4.03	18.19
464.49	4.34	539.734	1,255.90	0.00	4.34	22.33
464.59	4.64	676.764	1,487.98	0.00	4.64	27.20
464.69	4.93	837.985	1,739.72	0.00	4.93	32.86
464.79	5.20	1,025.364	2,011.13	0.00	5.20	39.38
464.89	5.48	1,240.867	2,302.21	0.00	5.48	46.84
464.99	5.74	1,486.460	2,612.94	0.00	5.74	55.29
465.09	6.00	1,764.928	2,961.83	0.00	6.00	64.83
465.19	6.25	2,079.573	3,334.76	0.00	6.25	75.57
465.29	6.50	2,432.616	3,729.79	0.00	6.50	87.58
465.39	6.73	2,826.268	4,146.93	0.00	6.73	100.94
465.49	6.96	3,262.739	4,586.17	0.00	6.96	115.72
465.59	7.20	3,744.239	5,047.52	0.00	7.20	132.00
465.69	7.42	4,272.981	5,530.98	0.00	7.42	149.85
465.79	7.64	4,851.173	6,036.55	0.00	7.64	169.35
465.89	7.86	5,481.027	6,564.22	0.00	7.86	190.56

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 15 years
Label: Commercial 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)
465.99	8.06	6,164.753	7,114.00	0.00	8.06	213.55
466.09	8.27	6,891.223	7,386.98	0.00	8.27	237.98
466.19	8.48	7,642.121	7,631.65	0.00	8.48	263.21
466.29	8.67	8,417.686	7,880.31	0.00	8.67	289.26
466.39	8.87	9,218.316	8,132.95	0.00	8.87	316.14
466.49	9.06	10,044.409	8,389.58	0.00	9.06	343.88
466.59	9.26	10,896.364	8,650.19	0.00	9.26	372.47
466.69	9.43	11,774.580	8,914.79	0.00	9.43	401.92
466.79	9.63	12,679.455	9,183.37	0.00	9.63	432.28
466.89	9.80	13,611.387	9,455.95	0.00	9.80	463.52
466.99	9.98	14,570.777	9,732.50	0.00	9.98	495.67
467.09	10.15	15,550.962	9,855.72	0.00	10.15	528.52
467.19	10.33	16,541.853	9,962.19	0.00	10.33	561.73
467.29	10.51	17,543.420	10,069.24	0.00	10.51	595.29
467.39	10.67	18,555.721	10,176.86	0.00	10.67	629.19
467.49	10.84	19,578.812	10,285.05	0.00	10.84	663.46
467.59	11.00	20,612.750	10,393.82	0.00	11.00	698.09
467.69	11.17	21,657.594	10,503.15	0.00	11.17	733.09
467.79	11.33	22,713.400	10,613.06	0.00	11.33	768.44
467.89	11.48	23,780.225	10,723.54	0.00	11.48	804.16
467.99	11.64	24,858.127	10,834.59	0.00	11.64	840.24
468.09	11.79	25,945.800	10,915.89	0.00	11.79	876.65
468.19	11.95	27,041.299	10,994.12	0.00	11.95	913.33
468.29	12.11	28,144.634	11,072.62	0.00	12.11	950.26
468.39	12.26	29,255.833	11,151.41	0.00	12.26	987.46
468.49	12.40	30,374.925	11,230.47	0.00	12.40	1,024.90
468.59	12.56	31,501.937	11,309.81	0.00	12.56	1,062.62
468.69	12.71	32,636.897	11,389.44	0.00	12.71	1,100.61
468.79	12.85	33,779.833	11,469.34	0.00	12.85	1,138.85
468.89	12.99	34,930.774	11,549.52	0.00	12.99	1,177.35
468.99	13.13	36,089.746	11,629.98	0.00	13.13	1,216.12
469.09	13.28	37,256.728	11,709.59	0.00	13.28	1,255.17
469.15	13.35	37,960.737	11,757.40	0.00	13.35	1,278.71
469.19	13.74	38,431.672	11,789.34	0.00	13.74	1,294.80
469.29	15.74	39,614.604	11,869.36	0.00	15.74	1,336.23
469.39	18.61	40,805.553	11,949.65	0.00	18.61	1,378.80
469.49	22.11	42,004.544	12,030.22	0.00	22.11	1,422.26
469.59	26.15	43,211.605	12,111.05	0.00	26.15	1,466.54
469.69	30.43	44,426.763	12,192.15	0.00	30.43	1,511.33
469.79	34.94	45,650.045	12,273.53	0.00	34.94	1,556.61
469.89	39.58	46,881.478	12,355.18	0.00	39.58	1,602.29
469.99	44.23	48,121.089	12,437.09	0.00	44.23	1,648.26
470.09	48.70	49,368.859	12,518.25	0.00	48.70	1,694.33
470.19	52.33	50,624.748	12,599.56	0.00	52.33	1,739.82
470.29	53.44	51,888.781	12,681.14	0.00	53.44	1,783.07

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
470.39	53.91	53,160.985	12,762.98	0.00	53.91	1,825.94
470.49	54.37	54,441.385	12,845.08	0.00	54.37	1,869.08
470.59	54.82	55,730.008	12,927.44	0.00	54.82	1,912.49
470.69	55.28	57,026.881	13,010.07	0.00	55.28	1,956.17
470.79	55.73	58,332.030	13,092.95	0.00	55.73	2,000.13
470.89	56.17	59,645.481	13,176.11	0.00	56.17	2,044.35
470.99	56.62	60,967.261	13,259.52	0.00	56.62	2,088.86
471.09	57.05	62,303.061	13,469.34	0.00	57.05	2,133.82
471.19	57.49	63,661.260	13,694.96	0.00	57.49	2,179.54
471.29	57.92	65,042.114	13,922.45	0.00	57.92	2,225.99
471.39	58.35	66,445.812	14,151.82	0.00	58.35	2,273.21
471.49	58.78	67,872.540	14,383.06	0.00	58.78	2,321.20
471.59	59.20	69,322.486	14,616.17	0.00	59.20	2,369.95
471.69	59.62	70,795.837	14,851.16	0.00	59.62	2,419.48
471.79	60.03	72,292.781	15,088.03	0.00	60.03	2,469.79
471.89	60.45	73,813.505	15,326.76	0.00	60.45	2,520.90
471.99	60.86	75,358.197	15,567.38	0.00	60.86	2,572.80
472.00	60.90	75,513.991	15,591.54	0.00	60.90	2,578.04

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)
462.99	0.00	0.000	0.00	0.00	0.00	0.00
463.03	0.00	0.239	8.78	0.00	0.00	0.01
463.09	0.00	0.976	16.17	0.00	0.00	0.03
463.19	0.00	3.406	33.46	0.00	0.00	0.11
463.29	0.00	7.876	56.99	0.00	0.00	0.26
463.39	0.00	15.010	86.73	0.00	0.00	0.50
463.49	0.00	25.430	122.70	0.00	0.00	0.85
463.59	0.00	39.758	164.90	0.00	0.00	1.33
463.69	0.00	58.617	213.31	0.00	0.00	1.95
463.79	0.00	82.628	267.95	0.00	0.00	2.75
463.89	0.83	112.415	328.82	0.00	0.83	4.58
463.99	2.04	148.599	395.91	0.00	2.04	6.99
464.09	2.74	194.198	524.23	0.00	2.74	9.21
464.19	3.29	254.127	677.65	0.00	3.29	11.76
464.29	3.72	330.382	850.73	0.00	3.72	14.74
464.39	4.03	424.929	1,043.48	0.00	4.03	18.19
464.49	4.34	539.734	1,255.90	0.00	4.34	22.33
464.59	4.64	676.764	1,487.98	0.00	4.64	27.20
464.69	4.93	837.985	1,739.72	0.00	4.93	32.86
464.79	5.20	1,025.364	2,011.13	0.00	5.20	39.38
464.89	5.48	1,240.867	2,302.21	0.00	5.48	46.84
464.99	5.74	1,486.460	2,612.94	0.00	5.74	55.29
465.09	6.00	1,764.928	2,961.83	0.00	6.00	64.83
465.19	6.25	2,079.573	3,334.76	0.00	6.25	75.57
465.29	6.50	2,432.616	3,729.79	0.00	6.50	87.58
465.39	6.73	2,826.268	4,146.93	0.00	6.73	100.94
465.49	6.96	3,262.739	4,586.17	0.00	6.96	115.72
465.59	7.20	3,744.239	5,047.52	0.00	7.20	132.00
465.69	7.42	4,272.981	5,530.98	0.00	7.42	149.85
465.79	7.64	4,851.173	6,036.55	0.00	7.64	169.35
465.89	7.86	5,481.027	6,564.22	0.00	7.86	190.56

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
465.99	8.06	6,164.753	7,114.00	0.00	8.06	213.55
466.09	8.27	6,891.223	7,386.98	0.00	8.27	237.98
466.19	8.48	7,642.121	7,631.65	0.00	8.48	263.21
466.29	8.67	8,417.686	7,880.31	0.00	8.67	289.26
466.39	8.87	9,218.316	8,132.95	0.00	8.87	316.14
466.49	9.06	10,044.409	8,389.58	0.00	9.06	343.88
466.59	9.26	10,896.364	8,650.19	0.00	9.26	372.47
466.69	9.43	11,774.580	8,914.79	0.00	9.43	401.92
466.79	9.63	12,679.455	9,183.37	0.00	9.63	432.28
466.89	9.80	13,611.387	9,455.95	0.00	9.80	463.52
466.99	9.98	14,570.777	9,732.50	0.00	9.98	495.67
467.09	10.15	15,550.962	9,855.72	0.00	10.15	528.52
467.19	10.33	16,541.853	9,962.19	0.00	10.33	561.73
467.29	10.51	17,543.420	10,069.24	0.00	10.51	595.29
467.39	10.67	18,555.721	10,176.86	0.00	10.67	629.19
467.49	10.84	19,578.812	10,285.05	0.00	10.84	663.46
467.59	11.00	20,612.750	10,393.82	0.00	11.00	698.09
467.69	11.17	21,657.594	10,503.15	0.00	11.17	733.09
467.79	11.33	22,713.400	10,613.06	0.00	11.33	768.44
467.89	11.48	23,780.225	10,723.54	0.00	11.48	804.16
467.99	11.64	24,858.127	10,834.59	0.00	11.64	840.24
468.09	11.79	25,945.800	10,915.89	0.00	11.79	876.65
468.19	11.95	27,041.299	10,994.12	0.00	11.95	913.33
468.29	12.11	28,144.634	11,072.62	0.00	12.11	950.26
468.39	12.26	29,255.833	11,151.41	0.00	12.26	987.46
468.49	12.40	30,374.925	11,230.47	0.00	12.40	1,024.90
468.59	12.56	31,501.937	11,309.81	0.00	12.56	1,062.62
468.69	12.71	32,636.897	11,389.44	0.00	12.71	1,100.61
468.79	12.85	33,779.833	11,469.34	0.00	12.85	1,138.85
468.89	12.99	34,930.774	11,549.52	0.00	12.99	1,177.35
468.99	13.13	36,089.746	11,629.98	0.00	13.13	1,216.12
469.09	13.28	37,256.728	11,709.59	0.00	13.28	1,255.17
469.15	13.35	37,960.737	11,757.40	0.00	13.35	1,278.71
469.19	13.74	38,431.672	11,789.34	0.00	13.74	1,294.80
469.29	15.74	39,614.604	11,869.36	0.00	15.74	1,336.23
469.39	18.61	40,805.553	11,949.65	0.00	18.61	1,378.80
469.49	22.11	42,004.544	12,030.22	0.00	22.11	1,422.26
469.59	26.15	43,211.605	12,111.05	0.00	26.15	1,466.54
469.69	30.43	44,426.763	12,192.15	0.00	30.43	1,511.33
469.79	34.94	45,650.045	12,273.53	0.00	34.94	1,556.61
469.89	39.58	46,881.478	12,355.18	0.00	39.58	1,602.29
469.99	44.23	48,121.089	12,437.09	0.00	44.23	1,648.26
470.09	48.70	49,368.859	12,518.25	0.00	48.70	1,694.33
470.19	52.33	50,624.748	12,599.56	0.00	52.33	1,739.82
470.29	53.44	51,888.781	12,681.14	0.00	53.44	1,783.07

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)
470.39	53.91	53,160.985	12,762.98	0.00	53.91	1,825.94
470.49	54.37	54,441.385	12,845.08	0.00	54.37	1,869.08
470.59	54.82	55,730.008	12,927.44	0.00	54.82	1,912.49
470.69	55.28	57,026.881	13,010.07	0.00	55.28	1,956.17
470.79	55.73	58,332.030	13,092.95	0.00	55.73	2,000.13
470.89	56.17	59,645.481	13,176.11	0.00	56.17	2,044.35
470.99	56.62	60,967.261	13,259.52	0.00	56.62	2,088.86
471.09	57.05	62,303.061	13,469.34	0.00	57.05	2,133.82
471.19	57.49	63,661.260	13,694.96	0.00	57.49	2,179.54
471.29	57.92	65,042.114	13,922.45	0.00	57.92	2,225.99
471.39	58.35	66,445.812	14,151.82	0.00	58.35	2,273.21
471.49	58.78	67,872.540	14,383.06	0.00	58.78	2,321.20
471.59	59.20	69,322.486	14,616.17	0.00	59.20	2,369.95
471.69	59.62	70,795.837	14,851.16	0.00	59.62	2,419.48
471.79	60.03	72,292.781	15,088.03	0.00	60.03	2,469.79
471.89	60.45	73,813.505	15,326.76	0.00	60.45	2,520.90
471.99	60.86	75,358.197	15,567.38	0.00	60.86	2,572.80
472.00	60.90	75,513.991	15,591.54	0.00	60.90	2,578.04

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)
462.99	0.00	0.000	0.00	0.00	0.00	0.00
463.03	0.00	0.239	8.78	0.00	0.00	0.01
463.09	0.00	0.976	16.17	0.00	0.00	0.03
463.19	0.00	3.406	33.46	0.00	0.00	0.11
463.29	0.00	7.876	56.99	0.00	0.00	0.26
463.39	0.00	15.010	86.73	0.00	0.00	0.50
463.49	0.00	25.430	122.70	0.00	0.00	0.85
463.59	0.00	39.758	164.90	0.00	0.00	1.33
463.69	0.00	58.617	213.31	0.00	0.00	1.95
463.79	0.00	82.628	267.95	0.00	0.00	2.75
463.89	0.83	112.415	328.82	0.00	0.83	4.58
463.99	2.04	148.599	395.91	0.00	2.04	6.99
464.09	2.74	194.198	524.23	0.00	2.74	9.21
464.19	3.29	254.127	677.65	0.00	3.29	11.76
464.29	3.72	330.382	850.73	0.00	3.72	14.74
464.39	4.03	424.929	1,043.48	0.00	4.03	18.19
464.49	4.34	539.734	1,255.90	0.00	4.34	22.33
464.59	4.64	676.764	1,487.98	0.00	4.64	27.20
464.69	4.93	837.985	1,739.72	0.00	4.93	32.86
464.79	5.20	1,025.364	2,011.13	0.00	5.20	39.38
464.89	5.48	1,240.867	2,302.21	0.00	5.48	46.84
464.99	5.74	1,486.460	2,612.94	0.00	5.74	55.29
465.09	6.00	1,764.928	2,961.83	0.00	6.00	64.83
465.19	6.25	2,079.573	3,334.76	0.00	6.25	75.57
465.29	6.50	2,432.616	3,729.79	0.00	6.50	87.58
465.39	6.73	2,826.268	4,146.93	0.00	6.73	100.94
465.49	6.96	3,262.739	4,586.17	0.00	6.96	115.72
465.59	7.20	3,744.239	5,047.52	0.00	7.20	132.00
465.69	7.42	4,272.981	5,530.98	0.00	7.42	149.85
465.79	7.64	4,851.173	6,036.55	0.00	7.64	169.35
465.89	7.86	5,481.027	6,564.22	0.00	7.86	190.56

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 100 years
Label: Commercial 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)
465.99	8.06	6,164.753	7,114.00	0.00	8.06	213.55
466.09	8.27	6,891.223	7,386.98	0.00	8.27	237.98
466.19	8.48	7,642.121	7,631.65	0.00	8.48	263.21
466.29	8.67	8,417.686	7,880.31	0.00	8.67	289.26
466.39	8.87	9,218.316	8,132.95	0.00	8.87	316.14
466.49	9.06	10,044.409	8,389.58	0.00	9.06	343.88
466.59	9.26	10,896.364	8,650.19	0.00	9.26	372.47
466.69	9.43	11,774.580	8,914.79	0.00	9.43	401.92
466.79	9.63	12,679.455	9,183.37	0.00	9.63	432.28
466.89	9.80	13,611.387	9,455.95	0.00	9.80	463.52
466.99	9.98	14,570.777	9,732.50	0.00	9.98	495.67
467.09	10.15	15,550.962	9,855.72	0.00	10.15	528.52
467.19	10.33	16,541.853	9,962.19	0.00	10.33	561.73
467.29	10.51	17,543.420	10,069.24	0.00	10.51	595.29
467.39	10.67	18,555.721	10,176.86	0.00	10.67	629.19
467.49	10.84	19,578.812	10,285.05	0.00	10.84	663.46
467.59	11.00	20,612.750	10,393.82	0.00	11.00	698.09
467.69	11.17	21,657.594	10,503.15	0.00	11.17	733.09
467.79	11.33	22,713.400	10,613.06	0.00	11.33	768.44
467.89	11.48	23,780.225	10,723.54	0.00	11.48	804.16
467.99	11.64	24,858.127	10,834.59	0.00	11.64	840.24
468.09	11.79	25,945.800	10,915.89	0.00	11.79	876.65
468.19	11.95	27,041.299	10,994.12	0.00	11.95	913.33
468.29	12.11	28,144.634	11,072.62	0.00	12.11	950.26
468.39	12.26	29,255.833	11,151.41	0.00	12.26	987.46
468.49	12.40	30,374.925	11,230.47	0.00	12.40	1,024.90
468.59	12.56	31,501.937	11,309.81	0.00	12.56	1,062.62
468.69	12.71	32,636.897	11,389.44	0.00	12.71	1,100.61
468.79	12.85	33,779.833	11,469.34	0.00	12.85	1,138.85
468.89	12.99	34,930.774	11,549.52	0.00	12.99	1,177.35
468.99	13.13	36,089.746	11,629.98	0.00	13.13	1,216.12
469.09	13.28	37,256.728	11,709.59	0.00	13.28	1,255.17
469.15	13.35	37,960.737	11,757.40	0.00	13.35	1,278.71
469.19	13.74	38,431.672	11,789.34	0.00	13.74	1,294.80
469.29	15.74	39,614.604	11,869.36	0.00	15.74	1,336.23
469.39	18.61	40,805.553	11,949.65	0.00	18.61	1,378.80
469.49	22.11	42,004.544	12,030.22	0.00	22.11	1,422.26
469.59	26.15	43,211.605	12,111.05	0.00	26.15	1,466.54
469.69	30.43	44,426.763	12,192.15	0.00	30.43	1,511.33
469.79	34.94	45,650.045	12,273.53	0.00	34.94	1,556.61
469.89	39.58	46,881.478	12,355.18	0.00	39.58	1,602.29
469.99	44.23	48,121.089	12,437.09	0.00	44.23	1,648.26
470.09	48.70	49,368.859	12,518.25	0.00	48.70	1,694.33
470.19	52.33	50,624.748	12,599.56	0.00	52.33	1,739.82
470.29	53.44	51,888.781	12,681.14	0.00	53.44	1,783.07

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
470.39	53.91	53,160.985	12,762.98	0.00	53.91	1,825.94
470.49	54.37	54,441.385	12,845.08	0.00	54.37	1,869.08
470.59	54.82	55,730.008	12,927.44	0.00	54.82	1,912.49
470.69	55.28	57,026.881	13,010.07	0.00	55.28	1,956.17
470.79	55.73	58,332.030	13,092.95	0.00	55.73	2,000.13
470.89	56.17	59,645.481	13,176.11	0.00	56.17	2,044.35
470.99	56.62	60,967.261	13,259.52	0.00	56.62	2,088.86
471.09	57.05	62,303.061	13,469.34	0.00	57.05	2,133.82
471.19	57.49	63,661.260	13,694.96	0.00	57.49	2,179.54
471.29	57.92	65,042.114	13,922.45	0.00	57.92	2,225.99
471.39	58.35	66,445.812	14,151.82	0.00	58.35	2,273.21
471.49	58.78	67,872.540	14,383.06	0.00	58.78	2,321.20
471.59	59.20	69,322.486	14,616.17	0.00	59.20	2,369.95
471.69	59.62	70,795.837	14,851.16	0.00	59.62	2,419.48
471.79	60.03	72,292.781	15,088.03	0.00	60.03	2,469.79
471.89	60.45	73,813.505	15,326.76	0.00	60.45	2,520.90
471.99	60.86	75,358.197	15,567.38	0.00	60.86	2,572.80
472.00	60.90	75,513.991	15,591.54	0.00	60.90	2,578.04

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	469.15 ft
Volume (Initial)	37,961.000 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)
462.99	0.00	0.000	0.00	0.00	0.00	0.00
463.03	0.00	0.239	8.78	0.00	0.00	0.01
463.09	0.00	0.976	16.17	0.00	0.00	0.03
463.19	0.00	3.406	33.46	0.00	0.00	0.11
463.29	0.00	7.876	56.99	0.00	0.00	0.26
463.39	0.00	15.010	86.73	0.00	0.00	0.50
463.49	0.00	25.430	122.70	0.00	0.00	0.85
463.59	0.00	39.758	164.90	0.00	0.00	1.33
463.69	0.00	58.617	213.31	0.00	0.00	1.95
463.79	0.00	82.628	267.95	0.00	0.00	2.75
463.89	0.00	112.415	328.82	0.00	0.00	3.75
463.99	0.00	148.599	395.91	0.00	0.00	4.95
464.09	0.00	194.198	524.23	0.00	0.00	6.47
464.19	0.00	254.127	677.65	0.00	0.00	8.47
464.29	0.00	330.382	850.73	0.00	0.00	11.01
464.39	0.00	424.929	1,043.48	0.00	0.00	14.16
464.49	0.00	539.734	1,255.90	0.00	0.00	17.99
464.59	0.00	676.764	1,487.98	0.00	0.00	22.56
464.69	0.00	837.985	1,739.72	0.00	0.00	27.93
464.79	0.00	1,025.364	2,011.13	0.00	0.00	34.18
464.89	0.00	1,240.867	2,302.21	0.00	0.00	41.36
464.99	0.00	1,486.460	2,612.94	0.00	0.00	49.55
465.09	0.00	1,764.928	2,961.83	0.00	0.00	58.83
465.19	0.00	2,079.573	3,334.76	0.00	0.00	69.32
465.29	0.00	2,432.616	3,729.79	0.00	0.00	81.09
465.39	0.00	2,826.268	4,146.93	0.00	0.00	94.21
465.49	0.00	3,262.739	4,586.17	0.00	0.00	108.76
465.59	0.00	3,744.239	5,047.52	0.00	0.00	124.81
465.69	0.00	4,272.981	5,530.98	0.00	0.00	142.43
465.79	0.00	4,851.173	6,036.55	0.00	0.00	161.71
465.89	0.00	5,481.027	6,564.22	0.00	0.00	182.70

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 101 years
Label: Commercial 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)
465.99	0.00	6,164.753	7,114.00	0.00	0.00	205.49
466.09	0.00	6,891.223	7,386.98	0.00	0.00	229.71
466.19	0.00	7,642.121	7,631.65	0.00	0.00	254.74
466.29	0.00	8,417.686	7,880.31	0.00	0.00	280.59
466.39	0.00	9,218.316	8,132.95	0.00	0.00	307.28
466.49	0.00	10,044.409	8,389.58	0.00	0.00	334.81
466.59	0.00	10,896.364	8,650.19	0.00	0.00	363.21
466.69	0.00	11,774.580	8,914.79	0.00	0.00	392.49
466.79	0.00	12,679.455	9,183.37	0.00	0.00	422.65
466.89	0.00	13,611.387	9,455.95	0.00	0.00	453.71
466.99	0.00	14,570.777	9,732.50	0.00	0.00	485.69
467.09	0.00	15,550.962	9,855.72	0.00	0.00	518.37
467.19	0.00	16,541.853	9,962.19	0.00	0.00	551.40
467.29	0.00	17,543.420	10,069.24	0.00	0.00	584.78
467.39	0.00	18,555.721	10,176.86	0.00	0.00	618.52
467.49	0.00	19,578.812	10,285.05	0.00	0.00	652.63
467.59	0.00	20,612.750	10,393.82	0.00	0.00	687.09
467.69	0.00	21,657.594	10,503.15	0.00	0.00	721.92
467.79	0.00	22,713.400	10,613.06	0.00	0.00	757.11
467.89	0.00	23,780.225	10,723.54	0.00	0.00	792.67
467.99	0.00	24,858.127	10,834.59	0.00	0.00	828.60
468.09	0.00	25,945.800	10,915.89	0.00	0.00	864.86
468.19	0.00	27,041.299	10,994.12	0.00	0.00	901.38
468.29	0.00	28,144.634	11,072.62	0.00	0.00	938.15
468.39	0.00	29,255.833	11,151.41	0.00	0.00	975.19
468.49	0.00	30,374.925	11,230.47	0.00	0.00	1,012.50
468.59	0.00	31,501.937	11,309.81	0.00	0.00	1,050.06
468.69	0.00	32,636.897	11,389.44	0.00	0.00	1,087.90
468.79	0.00	33,779.833	11,469.34	0.00	0.00	1,125.99
468.89	0.00	34,930.774	11,549.52	0.00	0.00	1,164.36
468.99	0.00	36,089.746	11,629.98	0.00	0.00	1,202.99
469.09	0.00	37,256.728	11,709.59	0.00	0.00	1,241.89
469.15	0.00	37,960.737	11,757.40	0.00	0.00	1,265.36
469.19	0.38	38,431.672	11,789.34	0.00	0.38	1,281.43
469.29	2.47	39,614.604	11,869.36	0.00	2.47	1,322.96
469.39	5.54	40,805.553	11,949.65	0.00	5.54	1,365.73
469.49	9.35	42,004.544	12,030.22	0.00	9.35	1,409.50
469.59	13.76	43,211.605	12,111.05	0.00	13.76	1,454.15
469.69	18.70	44,426.763	12,192.15	0.00	18.70	1,499.59
469.79	24.13	45,650.045	12,273.53	0.00	24.13	1,545.79
469.89	29.99	46,881.478	12,355.18	0.00	29.99	1,592.71
469.99	36.28	48,121.089	12,437.09	0.00	36.28	1,640.31
470.09	42.95	49,368.859	12,518.25	0.00	42.95	1,688.58
470.19	49.98	50,624.748	12,599.56	0.00	49.98	1,737.47
470.29	53.44	51,888.781	12,681.14	0.00	53.44	1,783.07

Subsection: Elevation-Volume-Flow Table (Pond) Return Event: 101 years
Label: Commercial 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)
470.39	53.91	53,160.985	12,762.98	0.00	53.91	1,825.94
470.49	54.37	54,441.385	12,845.08	0.00	54.37	1,869.08
470.59	54.82	55,730.008	12,927.44	0.00	54.82	1,912.49
470.69	55.28	57,026.881	13,010.07	0.00	55.28	1,956.17
470.79	55.73	58,332.030	13,092.95	0.00	55.73	2,000.13
470.89	56.17	59,645.481	13,176.11	0.00	56.17	2,044.35
470.99	56.62	60,967.261	13,259.52	0.00	56.62	2,088.86
471.09	57.05	62,303.061	13,469.34	0.00	57.05	2,133.82
471.19	57.49	63,661.260	13,694.96	0.00	57.49	2,179.54
471.29	57.92	65,042.114	13,922.45	0.00	57.92	2,225.99
471.39	58.35	66,445.812	14,151.82	0.00	58.35	2,273.21
471.49	58.78	67,872.540	14,383.06	0.00	58.78	2,321.20
471.59	59.20	69,322.486	14,616.17	0.00	59.20	2,369.95
471.69	59.62	70,795.837	14,851.16	0.00	59.62	2,419.48
471.79	60.03	72,292.781	15,088.03	0.00	60.03	2,469.79
471.89	60.45	73,813.505	15,326.76	0.00	60.45	2,520.90
471.99	60.86	75,358.197	15,567.38	0.00	60.86	2,572.80
472.00	60.90	75,513.991	15,591.54	0.00	60.90	2,578.04

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)	20.02 ft³/s	Time to Peak (Flow, In)	4 min
Flow (Peak Outlet)	9.79 ft³/s	Time to Peak (Flow, Outlet)	22 min

Elevation (Water Surface, Peak)	466.88 ft
Volume (Peak)	13,513.398 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	24,024.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	23,941.000 ft³
Volume (Retained)	83.000 ft³
Volume (Unrouted)	0.000 ft³
Error (Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)	29.65 ft³/s	Time to Peak (Flow, In)	4 min
Flow (Peak Outlet)	11.42 ft³/s	Time to Peak (Flow, Outlet)	22 min

Elevation (Water Surface, Peak)	467.85 ft
Volume (Peak)	23,320.314 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	35,580.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	35,497.000 ft³
Volume (Retained)	83.000 ft³
Volume (Unrouted)	0.000 ft³
Error (Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)	34.84 ft³/s	Time to Peak (Flow, In)	4 min
Flow (Peak Outlet)	12.20 ft³/s	Time to Peak (Flow, Outlet)	23 min

Elevation (Water Surface, Peak)	468.35 ft
Volume (Peak)	28,782.923 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	41,808.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	41,725.000 ft³
Volume (Retained)	83.000 ft³
Volume (Unrouted)	0.000 ft³
Error (Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.99 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)	39.95 ft³/s	Time to Peak (Flow, In)	4 min
Flow (Peak Outlet)	12.91 ft³/s	Time to Peak (Flow, Outlet)	23 min

Elevation (Water Surface, Peak)	468.83 ft
Volume (Peak)	34,236.644 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	47,940.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	47,857.000 ft³
Volume (Retained)	83.000 ft³
Volume (Unrouted)	0.000 ft³
Error (Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	469.15 ft
Volume (Initial)	37,961.000 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)	39.95 ft³/s	Time to Peak (Flow, In)	4 min
Flow (Peak Outlet)	39.72 ft³/s	Time to Peak (Flow, Outlet)	20 min

Elevation (Water Surface, Peak)	470.04 ft
Volume (Peak)	48,763.240 ft³

Mass Balance (ft³)	
Volume (Initial)	37,961.000 ft³
Volume (Total Inflow)	47,940.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	47,940.000 ft³
Volume (Retained)	37,961.000 ft³
Volume (Unrouted)	0.000 ft³
Error (Mass Balance)	0.0 %

Summary for Hydrograph Addition at 'Commercial Basin #1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Commercial Basin #1 Inflow

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Commercial Basin #1 Inflow	24,024.000	4	20.02
Flow (In)	Commercial Basin #1	24,024.000	4	20.02

Summary for Hydrograph Addition at 'Commercial Basin #1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Commercial Basin #1 Inflow

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Commercial Basin #1 Inflow	35,580.000	4	29.65
Flow (In)	Commercial Basin #1	35,580.000	4	29.65

Summary for Hydrograph Addition at 'Commercial Basin #1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Commercial Basin #1 Inflow

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Commercial Basin #1 Inflow	41,808.000	4	34.84
Flow (In)	Commercial Basin #1	41,808.000	4	34.84

Summary for Hydrograph Addition at 'Commercial Basin #1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Commercial Basin #1 Inflow

Node Inflows

Inflow Type	Element	Volume (ft^3)	Time to Peak (min)	Flow (Peak) (ft^3/s)
Flow (From)	Commercial Basin #1 Inflow	47,940.000	4	39.95
Flow (In)	Commercial Basin #1	47,940.000	4	39.95

Summary for Hydrograph Addition at 'Commercial Basin #1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Commercial Basin #1 Inflow

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	Commercial Basin #1 Inflow	47,940.000	4	39.95
Flow (In)	Commercial Basin #1	47,940.000	4	39.95

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	458.00	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.07	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	23	461.61	20,766.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	17.32	0	0.00
Pond Outflow...	20	16.67	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	20,763.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	20,763.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	33,123.000 ft³
Volume (Total Out ICPM)	33,096.000 ft³
Volume (Ending)	26.000 ft³
Elevation (Ending)	458.01 ft
Difference	1.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	458.00	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.07	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	22	462.58	30,914.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	25.73	0	0.00
Pond Outflow...	15	23.87	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	30,845.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	30,871.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	49,231.000 ft³
Volume (Total Out ICPM)	48,971.000 ft³
Volume (Ending)	254.000 ft³
Elevation (Ending)	458.09 ft
Difference	6.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	458.00	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.07	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	22	463.05	36,134.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	30.19	0	0.00
Pond Outflow...	15	27.53	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	36,192.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	36,296.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	57,836.000 ft³
Volume (Total Out ICPM)	57,331.000 ft³
Volume (Ending)	494.000 ft³
Elevation (Ending)	458.17 ft
Difference	12.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	458.00	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.07	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	22	463.51	41,362.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	34.65	0	0.00
Pond Outflow...	14	31.42	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	41,538.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	41,775.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	66,495.000 ft³
Volume (Total Out ICPM)	65,601.000 ft³
Volume (Ending)	872.000 ft³
Elevation (Ending)	458.30 ft
Difference	21.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	464.00	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	46,880.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.00	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	21	465.09	61,496.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	34.65	0	0.00
Pond Outflow...	20	28.92	2	-47.19

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	41,538.000	Forward	0.000	Reverse
Pond Outflow...	9,426.000	Reverse	32,629.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	46,880.000 ft³
Volume (Total In ICPM)	54,063.000 ft³
Volume (Total Out ICPM)	54,063.000 ft³
Volume (Ending)	46,880.000 ft³
Elevation (Ending)	464.00 ft
Difference	0.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	460.15	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.00	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	20	461.95	5,363.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	17.32	0	0.00
Pond Outflow...	20	16.67	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	20,763.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	20,763.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	20,763.000 ft³
Volume (Total Out ICPM)	20,763.000 ft³
Volume (Ending)	0.000 ft³
Elevation (Ending)	460.15 ft
Difference	0.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.0 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	460.15	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.00	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	21	462.64	8,784.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	25.73	0	0.00
Pond Outflow...	15	23.87	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	30,845.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	30,871.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	30,845.000 ft³
Volume (Total Out ICPM)	30,871.000 ft³
Volume (Ending)	1.000 ft³
Elevation (Ending)	460.15 ft
Difference	-27.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.1 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	460.15	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.00	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	22	463.11	11,117.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	30.19	0	0.00
Pond Outflow...	15	27.53	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	36,192.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	36,296.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	36,192.000 ft³
Volume (Total Out ICPM)	36,296.000 ft³
Volume (Ending)	3.000 ft³
Elevation (Ending)	460.15 ft
Difference	-108.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.3 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	460.15	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	0.00	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	22	463.60	13,565.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	34.65	0	0.00
Pond Outflow...	14	31.42	0	0.00

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	41,538.000	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	41,775.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	41,538.000 ft³
Volume (Total Out ICPM)	41,775.000 ft³
Volume (Ending)	8.000 ft³
Elevation (Ending)	460.16 ft
Difference	-244.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.6 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	460.15	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	0.000	ft³	Maximum Iterations	35	
Outflow (Starting)	-51.81	ft³/s	ICPM Time Step	3	min

	Maximum Storage		
	Time to Peak (min)	Elevation (ft)	Volume (ft³)
	21	465.47	24,296.000

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (min)	Flow (Peak) (ft³/s)	Time to Peak (min)	Flow (Peak) (ft³/s)
Pond Inflow....	3	34.65	0	0.00
Pond Outflow...	20	28.92	2	-47.19

	Total Volume In		Total Volume Out	
	Volume (ft³)	Direction	Volume (ft³)	Direction
Pond Inflow....	41,538.000	Forward	0.000	Reverse
Pond Outflow...	9,426.000	Reverse	32,629.000	Forward

Mass Balance (ft³)	
Volume (Initial ICPM)	0.000 ft³
Volume (Total In ICPM)	50,964.000 ft³
Volume (Total Out ICPM)	32,629.000 ft³
Volume (Ending)	15,567.000 ft³
Elevation (Ending)	464.00 ft
Difference	2,769.000 ft³
Percent of Inflow Volume (Interconnected Pond Mass Balance)	5.4 %

Index

Appendix C

-Drainage Area Maps

Exhibit A
Predeveloped Drainage Area Map
Fort Zumwalt Professional Development Center
19-17514

GRAPHIC SCALE
60 0 30 60
(IN FEET)
1 inch = 60 ft.

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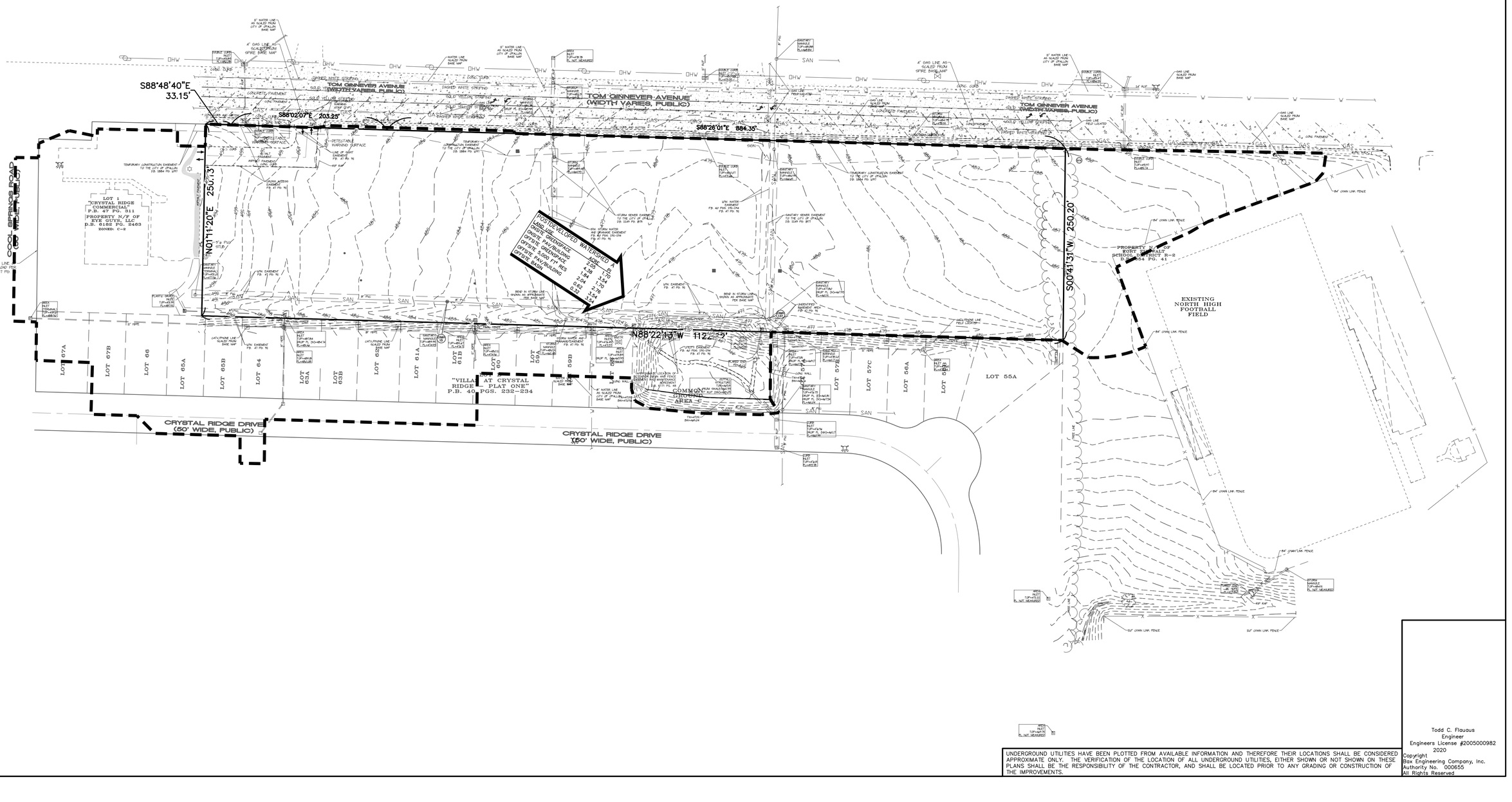
S88°48'40"E
33.15'
S88°02'07"E 203.25'
S88°26'01"E 884.35'
N01°11'20"E 250.13'
S00°41'31"W 250.20'
N88°22'13"W 112.25'
TOM GINNEVER AVENUE
(WIDTH VARIES, PUBLIC)
COOL SPRINGS ROAD
(60' WIDE, PUBLIC)
CRYSTAL RIDGE DRIVE
(50' WIDE, PUBLIC)
POST-DEVELOPED WATERSHED
LAND USE
ONSITE GREENSPACE
ONSITE PAVE/BUILDING
OFFSITE GREENSPACE
OFFSITE SLOPES/FLAT RES.
OFFSITE PAVE/BUILDING
OFFSITE BASIN
LOT 1
"CRYSTAL RIDGE COMMERCIAL"
P.B. 47 PG. 311
PROPERTY N/F OF
EYE GUYS, LLC
D.B. 6182 PG. 2463
ZONED: C-2
"VILLAGE AT CRYSTAL RIDGE PLAT ONE"
P.B. 40 PGS. 232-234
COMMON GROUND AREA C
PROPERTY N/F OF
JOINT SCHOOL DISTRICT R-2
D.B. 864 PG. 41
EXISTING NORTH HIGH FOOTBALL FIELD
LOT 67A
LOT 67B
LOT 66
LOT 65A
LOT 65B
LOT 64
LOT 63A
LOT 63B
LOT 62
LOT 61A
LOT 61B
LOT 60
LOT 59A
LOT 59B
LOT 58
LOT 57B
LOT 57C
LOT 56A
LOT 55A
EAST RIGHT OF WAY LINE
COOL SPRINGS ROAD PER
P.B. 47 PG. 76
TEMPORARY CONSTRUCTION EASEMENT
TO THE CITY OF O'FALLON
D.B. 3884 PG. 697
STORM WATER INLET
TOP=457.04
INV=447.54
SANITARY MANHOLE
TOP=457.60
INV=447.30
FLARED END
TOP=456.00
INV=447.00
6' CHAIN LINK FENCE
GAS LINE
SCALED FROM
BASE MAP
GAS LINE
FIELD LOCATED
OHW
SAN
GAS
W
8" WATER LINE
AS SCALED FROM
CITY OF O'FALLON
BASE MAP
4" GAS LINE AS
SCALED FROM
SPIRE BASE MAP
CONCRETE PAVEMENT
DASHED WHITE STRIPING
SOLID YELLOW STRIPING
CONCRETE CURB
CURB INLET
TOP=457.04
INV=447.54
AREA INLET
TOP=457.04
INV=447.54
FLARED END
TOP=456.00
INV=447.00
SANITARY MANHOLE
TOP=457.60
INV=447.30
UTILITY EASEMENT
PB. 47 PG. 76
STORM WATER
DRAINAGE EASEMENT
PB. 47 PG. 76
SIGN
LIGHT POLE
TRAFFIC SIGNAL
POLE
TRAFFIC SIGNAL
CONTROL BOX
TRAFFIC SIGNAL
JUNCTION BOX
TRAFFIC SIGNAL
PULL BOX
TRAFFIC SIGNAL
CONDUIT
TRAFFIC SIGNAL
CABLE
TRAFFIC SIGNAL
CONTROLLER
TRAFFIC SIGNAL
CONTROLLER
CABINET
TRAFFIC SIGNAL
CONTROLLER
CABINET
TRAFFIC SIGNAL
CONTROLLER
CABINET

Exhibit B
Postdeveloped Drainage Area Map
Fort Zumwalt Professional Development Center
19-17514

GRAPHIC SCALE
60 0 30 60
(IN FEET)
1 inch = 60 ft.

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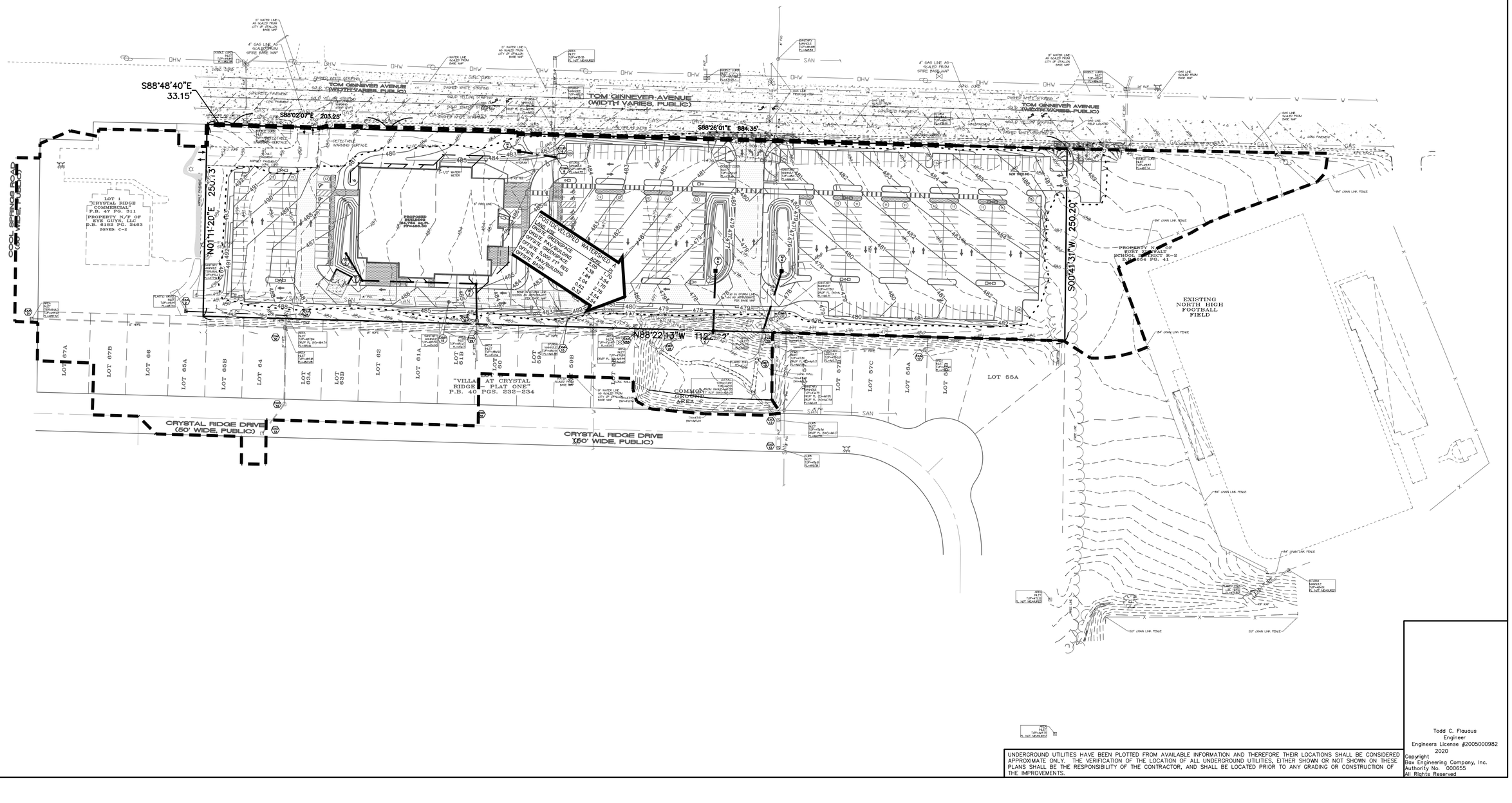

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE THEIR LOCATIONS SHALL BE CONSIDERED APPROXIMATE ONLY. THE VERIFICATION OF THE LOCATION OF ALL UNDERGROUND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE LOCATED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

Todd C. Flaugus
Engineer
Engineers License #2005000982
2020

Exhibit C
Basin Inflow Drainage Area Map
Fort Zumwalt Professional Development Center
19-17514

GRAPHIC SCALE
60 0 30 60
(IN FEET)
1 inch = 60 ft.

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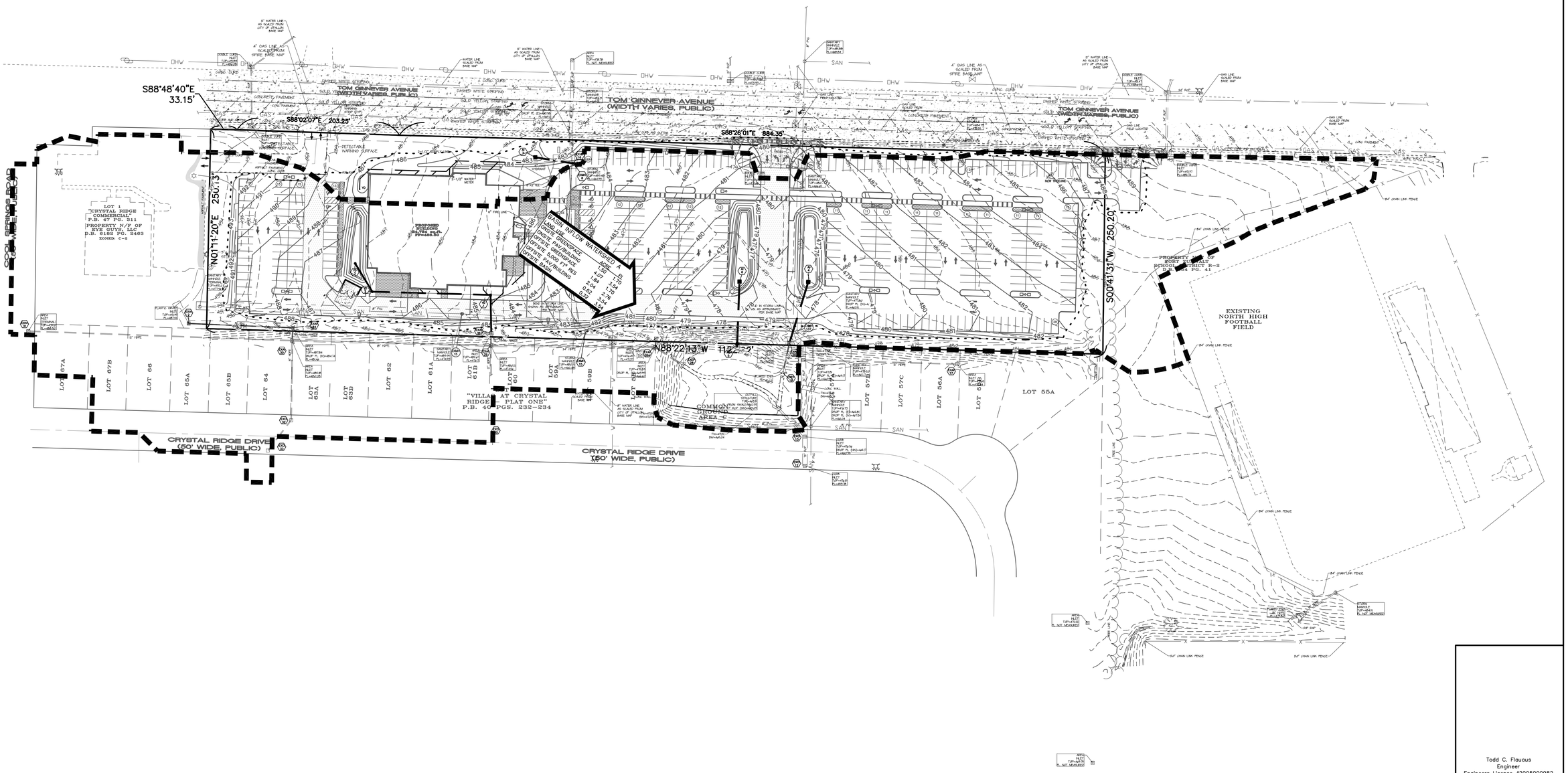

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Todd C. Flaugus
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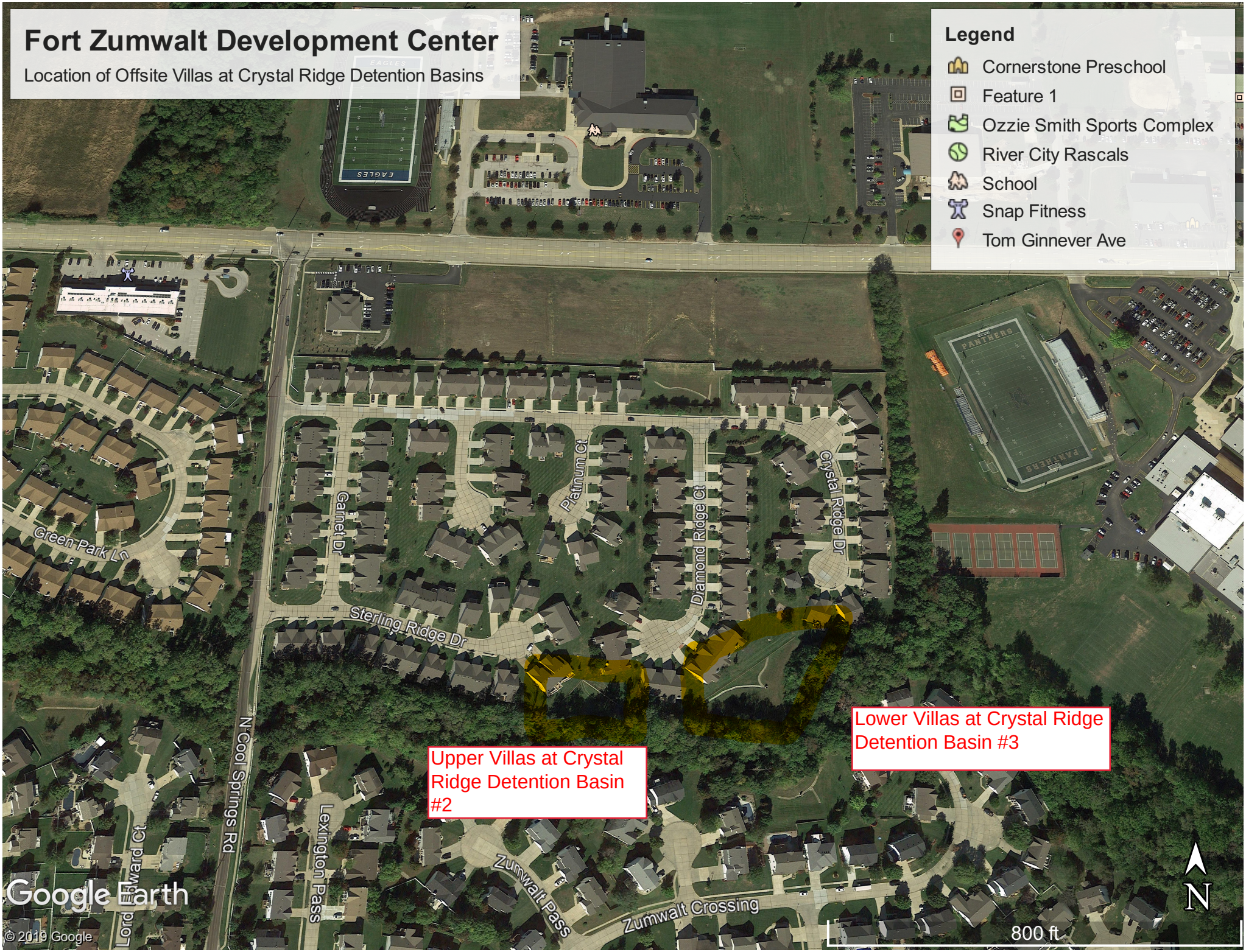
2020


Fort Zumwalt Development Center
Location of Offsite Villas at Crystal Ridge Detention Basins
Legend
Cornerstone Preschool
Feature 1
Ozzie Smith Sports Complex
River City Rascals
School
Snap Fitness
Tom Ginnever Ave
Green Park Ln
Garnet Dr
Platinum Ct
Diamond Ridge Ct
Crystal Ridge Dr
Sterling Ridge Dr
N Cool Springs Rd
Lexington Pass
Zumwalt Pass
Zumwalt Crossing
Lord Edward Ct
Upper Villas at Crystal Ridge Detention Basin #2
Lower Villas at Crystal Ridge Detention Basin #3
Google Earth
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N
800 ft