



MESA ENGINEERING & SURVEYING CO., INC

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Crossroads II

**DRAINAGE
REPORT**

Revised September 20, 2022



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The Crossroads II development plan is located within the City of Montrose, Montrose County, Colorado. The subject property is located within the N/W1/4S/W1/4 Section 23, T.49 N., R. 9 W and was formally known as Lot 1 of the Endrich Minor Subdivision. The planned subdivision is located on the northeast intersection corner of Locust and 6600 Roads.

The subject property slopes from east to west at $\pm 2.0\%$ and contains approximately 1.688 acres. The predominant ground cover is silty clay loam topsoil over Mancos shale strata and is classified as a soil type Class C Soil Group with some weeds and bare ground. The site was previously irrigated east to west with the waste flow going to the southwest corner of the property. Roadside drainage adjacent to the property from 6600 Road and Locust Road also travels to this corner where a 12" ADS pipe releases to the west from which flows continue through existing drainage paths to Cedar Creek. The proposed planned project for the site is 13 buildings with 26 total units.

The original ground cover on this site was bare soil with intermittent weeds. The site has inclination of $\pm 2.0\%$ from east to west. Drainage from the site was evaluated using the Rational Method. The following table shows historic and developed flows for the site besides taking into consideration the water quality capture volume.

Pre-Development			
5 Year	1.688 Acres	T = 25.11 Min.	0.63 CFS
25 Year	1.688 Acres	T = 25.11 Min.	2.14 CFS

Post Development			
5 Year	1.688 Acres	T = 13.86 Min.	1.19 CFS
25 Year	1.688 Acres	T = 13.86 Min.	2.32 CFS

Using the UDFCD calculation for water quality capture volume, the volume of capture required to release slowly from the site is $\pm 1,481$ cubic feet, the 5-year storm volume is $\pm 1,655$ cubic feet, and the 25-year storm volume is $\pm 3,006$ cubic feet. An orifice plate will control the release of the WQCV and the 5-year detention level of the pond while a weir at the top of the plate controls the release of the 25-year event. Side slopes for the pond will be 3:1 with sod while the bottom will have a wetland grass bottom. The release time for the basin will meet the required 72-hour time period for the 5-year storm.

The site is not influenced by drainage from neighboring properties and the adjoining road drainage is limited to the length of the property with high points at property lines or just past the property as shown on the map. The culverts at Taylor and Trysten Drives are the minimum size per City of Montrose standards and can handle the anticipated flows below 1 cfs.

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APPENDIX A

WQCV calculations and drawings

Calculation of Peak Runoff using Rational Method	
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$$Q(cfs) = CIA$$
[illegible]

Calculation of Peak Runoff using Rational Method	
Area (A)	1000000
Runoff Coefficient (C)	0.5
Intensity (I)	100
Time of Concentration (Tc)	10
Peak Runoff (Qp)	1000000

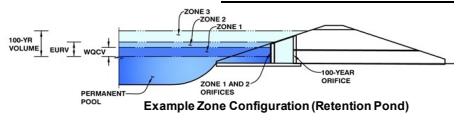
$$Q(cfs) = CIA$$
[illegible]

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: **Crossroads II**

Basin ID:



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	1.69	acres
Watershed Length =	395	ft
Watershed Length to Centroid =	200	ft
Watershed Slope =	0.012	ft/ft
Watershed Imperviousness =	62.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Water Quality Capture Volume (WQCV) =	0.034	acre-feet
Excess Urban Runoff Volume (EURV) =	0.101	acre-feet
2-yr Runoff Volume (P1 = 0.41 in.) =	0.027	acre-feet
5-yr Runoff Volume (P1 = 0.55 in.) =	0.038	acre-feet
10-yr Runoff Volume (P1 = 0.68 in.) =	0.049	acre-feet
25-yr Runoff Volume (P1 = 0.87 in.) =	0.069	acre-feet
50-yr Runoff Volume (P1 = 1.04 in.) =	0.090	acre-feet
100-yr Runoff Volume (P1 = 1.22 in.) =	0.116	acre-feet
500-yr Runoff Volume (P1 = 1.69 in.) =	0.180	acre-feet
Approximate 2-yr Detention Volume =	0.031	acre-feet
Approximate 5-yr Detention Volume =	0.047	acre-feet
Approximate 10-yr Detention Volume =	0.057	acre-feet
Approximate 25-yr Detention Volume =	0.068	acre-feet
Approximate 50-yr Detention Volume =	0.075	acre-feet
Approximate 100-yr Detention Volume =	0.086	acre-feet

Optional User Overrides

		acre-feet
		acre-feet
0.41		inches
0.55		inches
0.68		inches
0.87		inches
1.04		inches
1.22		inches
1.69		inches

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.034	acre-feet
Zone 2 Volume (25-year - Zone 1) =	0.034	acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	0.068	acre-feet
Initial Surcharge Volume (ISV) =	4	ft ³
Initial Surcharge Depth (ISD) =	0.00	ft
Total Available Detention Depth (H _{total}) =	3.00	ft
Depth of Trickle Channel (H _{TC}) =	0.50	ft
Slope of Trickle Channel (S _{TC}) =	0.005	ft/ft
Slopes of Main Basin Sides (S _{main}) =	3	H:V
Basin Length-to-Width Ratio (R _{L/W}) =	2	
Initial Surcharge Area (A _{ISV}) =	0	ft ²
Surcharge Volume Length (L _{SV}) =	0.0	ft
Surcharge Volume Width (W _{SV}) =	0.0	ft
Depth of Basin Floor (H _{FLOOR}) =	0.20	ft
Length of Basin Floor (L _{FLOOR}) =	40.6	ft
Width of Basin Floor (W _{FLOOR}) =	20.0	ft
Area of Basin Floor (A _{FLOOR}) =	812	ft ²
Volume of Basin Floor (V _{FLOOR}) =	54	ft ³
Depth of Main Basin (H _{MAIN}) =	2.30	ft
Length of Main Basin (L _{MAIN}) =	54.4	ft
Width of Main Basin (W _{MAIN}) =	33.8	ft
Area of Main Basin (A _{MAIN}) =	1,839	ft ²
Volume of Main Basin (V _{MAIN}) =	2,969	ft ³
Calculated Total Basin Volume (V _{total}) =	0.069	acre-feet

Total detention volume is less than 100-year volume.

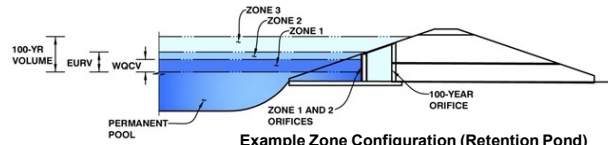
Depth Increment =	0.25								
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft ²)	Optional Override Area (ft ²)	Area (acre)	Volume (ft ³)	Volume (ac-ft)
Top of Micropool	0.00		0.0	0.0	0		0.000		
ISV	0.00		0.0	0.0	0		0.000	0	0.000
	0.25		0.0	0.0	0		0.000	0	0.000
	0.50		0.0	0.0	0		0.000	0	0.000
	0.70		40.6	20.0	812		0.019	54	0.001
	0.75		40.9	20.3	830		0.019	95	0.002
Floor	1.00		42.4	21.8	924		0.021	314	0.007
	1.25		43.9	23.3	1,023		0.023	558	0.013
	1.50		45.4	24.8	1,126		0.026	826	0.019
	1.75		46.9	26.3	1,233		0.028	1,121	0.026
	2.00		48.4	27.8	1,346		0.031	1,443	0.033
	2.04		48.6	28.0	1,364		0.031	1,498	0.034
	2.25		49.9	29.3	1,462		0.034	1,794	0.041
	2.50		51.4	30.8	1,583		0.036	2,175	0.050
	2.75		52.9	32.3	1,709		0.039	2,586	0.059
	2.97		54.2	33.6	1,823		0.042	2,975	0.068
Zone 1 (WQCV)	3.00		54.4	33.8	1,839		0.042	3,029	0.070
	3.25		55.9	35.3	1,973		0.045	3,506	0.080
	3.50		57.4	36.8	2,112		0.048	4,016	0.092
	3.75		58.9	38.3	2,256		0.052	4,562	0.105
	4.00		60.4	39.8	2,404		0.055	5,145	0.118
	4.25		61.9	41.3	2,556		0.059	5,765	0.132
	4.50		63.4	42.8	2,714		0.062	6,423	0.147
	4.75		64.9	44.3	2,875		0.066	7,122	0.163
	5.00		66.4	45.8	3,041		0.070	7,861	0.180
	5.25		67.9	47.3	3,212		0.074	8,643	0.198
	5.50		69.4	48.8	3,387		0.078	9,468	0.217
	5.75		70.9	50.3	3,566		0.082	10,337	0.237
	6.00		72.4	51.8	3,750		0.086	11,251	0.258
	6.25		73.9	53.3	3,939		0.090	12,212	0.280
	6.50		75.4	54.8	4,132		0.095	13,221	0.304
	6.75		76.9	56.3	4,329		0.099	14,278	0.328
	7.00		78.4	57.8	4,532		0.104	15,386	0.353
	7.25		79.9	59.3	4,738		0.109	16,545	0.380
	7.50		81.4	60.8	4,949		0.114	17,755	0.408
	7.75		82.9	62.3	5,165		0.119	19,019	0.437
	8.00		84.4	63.8	5,385		0.124	20,338	0.467
	8.25		85.9	65.3	5,609		0.129	21,712	0.498
	8.50		87.4	66.8	5,838		0.134	23,143	0.531
	8.75		88.9	68.3	6,072		0.139	24,632	0.565
	9.00		90.4	69.8	6,310		0.145	26,179	0.601
	9.25		91.9	71.3	6,552		0.150	27,787	0.638
	9.50		93.4	72.8	6,800		0.156	29,456	0.676
	9.75		94.9	74.3	7,051		0.162	31,187	0.716
	10.00		96.4	75.8	7,307		0.168	32,982	0.757
	10.25		97.9	77.3	7,568		0.174	34,841	0.800
	10.50		99.4	78.8	7,833		0.180	36,766	0.844
	10.75		100.9	80.3	8,102		0.186	38,758	0.890
	11.00		102.4	81.8	8,376		0.192	40,818	0.937
	11.25		103.9	83.3	8,655		0.199	42,946	0.986
	11.50		105.4	84.8	8,938		0.205	45,145	1.036
	11.75		106.9	86.3	9,225		0.212	47,416	1.089
	12.00		108.4	87.8	9,518		0.218	49,759	1.142
	12.25		109.9	89.3	9,814		0.225	52,175	1.198
	12.50		111.4	90.8	10,115		0.232	54,666	1.255
	12.75		112.9	92.3	10,421		0.239	57,233	1.314
	13.00		114.4	93.8	10,731		0.246	59,877	1.375
	13.25		115.9	95.3	11,045		0.254	62,599	1.437
	13.50		117.4	96.8	11,364		0.261	65,400	1.501
	13.75		118.9	98.3	11,688		0.268	68,281	1.568
	14.00		120.4	99.8	12,016		0.276	71,244	1.636
	14.25		121.9	101.3	12,348		0.283	74,289	1.705
	14.50		123.4	102.8	12,686		0.291	77,419	1.777
	14.75		124.9	104.3	13,027		0.299	80,633	1.851
	15.00		126.4	105.8	13,373		0.307	83,932	1.927
	15.25		127.9	107.3	13,724		0.315	87,320	2.005
	15.50		129.4	108.8	14,079		0.323	90,795	2.084
	15.75		130.9	110.3	14,438		0.331	94,359	2.166
	16.00		132.4	111.8	14,802		0.340	98,014	2.250
	16.25		133.9	113.3	15,171		0.348	101,761	2.336
	16.50		135.4	114.8	15,544		0.357	105,600	2.424
	16.75		136.9	116.3	15,921		0.366	109,533	2.515
	17.00		138.4	117.8	16,304		0.374	113,561	2.607
	17.25		139.9	119.3	16,690		0.383	117,685	2.702
	17.50		141.4	120.8	17,081		0.392	121,907	2.799
	17.75		142.9	122.3	17,477		0.401	126,226	2.898
	18.00		144.4	123.8	17,877		0.410	130,645	2.999
	18.25		145.9	125.3	18,281		0.420	135,165	3.103
	18.50		147.4	126.8	18,690		0.429	139,786	3.209
	18.75		148.9	128.3	19,104		0.439	144,510	3.318
	19.00		150.4	129.8	19,522		0.448	149,339	3.428
	19.25		151.9	131.3	19,944		0.458	154,272	3.542
	19.50		153.4	132.8	20,372		0.468	159,311	3.657
	19.75		154.9	134.3	20,803		0.478	164,458	3.775
	20.00		156.4	135.8	21,239		0.488	169,713	3.896
	20.25		157.9	137.3	21,680		0.498	175,078	4.019
	20.50		159.4	138.8	22,125		0.508	180,553	4.145
	20.75		160.9	140.3	22,574		0.518	186,141	4.273
	21.00		162.4	141.8	23,028		0.529	191,841	4.404
	21.25		163.9	143.3	23,487		0.539	197,655	4.538
	21.50		165.4	144.8	23,950		0.550	203,585	4.674
	21.75		166.9	146.3	24,417		0.561	209,630	4.812
	22.00		168.4	147.8	24,890		0.571	215,794	4.954
	22.25		169.9	149.3	25,366		0.582	222,076	5.098
	22.50		171.4	150.8	25,847		0.593	228,477	5.245
	22.75		172.9	152.3	26,333		0.605	235,000	5.395
Zone 2	23.00		174.4	153.8	26,823		0.616	241,644	5.547
	23.25		175.9	155.3	27,317		0.627	248,411	5.703
	23.50		177.4	156.8	27,816		0.639	255,303	5.861

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: **Crossroads II**

Basin ID: _____



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.04	0.034	Orifice Plate
Zone 2 (25-year)	2.97	0.034	Weir&Pipe (Circular)
Zone 3			
Total (all zones)		0.068	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth = ft (distance below the filtration media surface)
Underdrain Orifice Diameter = inches

Calculated Parameters for Underdrain
Underdrain Orifice Area = ft²
Underdrain Orifice Centroid = feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Centroid of Lowest Orifice = 0.00 ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate = 3.00 ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing = N/A inches
Orifice Plate: Orifice Area per Row = 0.18 sq. inches (diameter = 1/2 inch)

Calculated Parameters for Plate
WQ Orifice Area per Row = 1.250E-03 ft²
Elliptical Half-Width = N/A feet
Elliptical Slot Centroid = N/A feet
Elliptical Slot Area = N/A ft²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.88	1.76					
Orifice Area (sq. inches)	0.18	0.18	0.18					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice = Not Selected Not Selected ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice = ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter = inches

Calculated Parameters for Vertical Orifice
Vertical Orifice Area = Not Selected Not Selected ft²
Vertical Orifice Centroid = feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

Overflow Weir Front Edge Height, H_o = Zone 2 Weir Not Selected ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length = 0.75 feet
Overflow Weir Grate Slope = 0.00 H:V
Horiz. Length of Weir Sides = 3.67 feet
Overflow Grate Type = Close Mesh Grate
Debris Clogging % = 30% %

Calculated Parameters for Overflow Weir
Height of Grate Upper Edge, H_u = Zone 2 Weir Not Selected feet
Overflow Weir Slope Length = 3.67 feet
Grate Open Area / 100-yr Orifice Area =
Overflow Grate Open Area w/o Debris = 2.18 ft²
Overflow Grate Open Area w/ Debris = 1.52 ft²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

Depth to Invert of Outlet Pipe = Zone 2 Circular Not Selected ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter = inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate
Outlet Orifice Area = Zone 2 Circular Not Selected ft²
Outlet Orifice Centroid = feet
Half-Central Angle of Restrictor Plate on Pipe = N/A N/A radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage = ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length = feet
Spillway End Slopes = H:V
Freeboard above Max Water Surface = feet

Calculated Parameters for Spillway
Spillway Design Flow Depth = feet
Stage at Top of Freeboard = feet
Basin Area at Top of Freeboard = acres
Basin Volume at Top of Freeboard = acre-ft

Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	0.41	0.55	0.68	0.87	1.04	1.22	1.69
One-Hour Rainfall Depth (in) =	0.034	0.101	0.027	0.038	0.049	0.069	0.090	0.116	0.180
CUHP Runoff Volume (acre-ft) =	N/A	N/A	0.027	0.038	0.049	0.069	0.090	0.116	0.180
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.0	0.0	0.0	0.0	0.2	0.5	1.1
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.3	0.6	1.1	2.1	2.9	3.8	6.0
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A							

Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.20	0.37	0.65	1.27	1.71	2.27	3.56
Peak Inflow Q (cfs) =	N/A	N/A	0.4	0.5	0.7	1.0	1.4	1.9	2.9
Peak Outflow Q (cfs) =	0.0	2.0	0.0	0.0	0.0	0.0	0.1	0.7	2.0
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.0	0.0	0.0	0.0	0.2	0.3
Structure Controlling Flow =	Plate	Overflow Weir 1	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir
Max Velocity through Grate 1 (fps) =	N/A	-0.01	N/A	N/A	N/A	N/A	0.0	0.0	0.0
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	39	61	35	42	48	56	64	62	58
Time to Drain 99% of Inflow Volume (hours) =	41	66	36	44	50	60	68	67	66
Maximum Ponding Depth (ft) =	2.03	3.68	1.71	2.07	2.38	2.89	3.34	3.43	3.54
Area at Maximum Ponding Depth (acres) =	0.03	0.05	0.03	0.03	0.03	0.04	0.05	0.05	0.05
Maximum Volume Stored (acre-ft) =	0.034	0.101	0.024	0.035	0.046	0.065	0.085	0.088	0.094

Weir Report

<Name>

Rectangular Weir

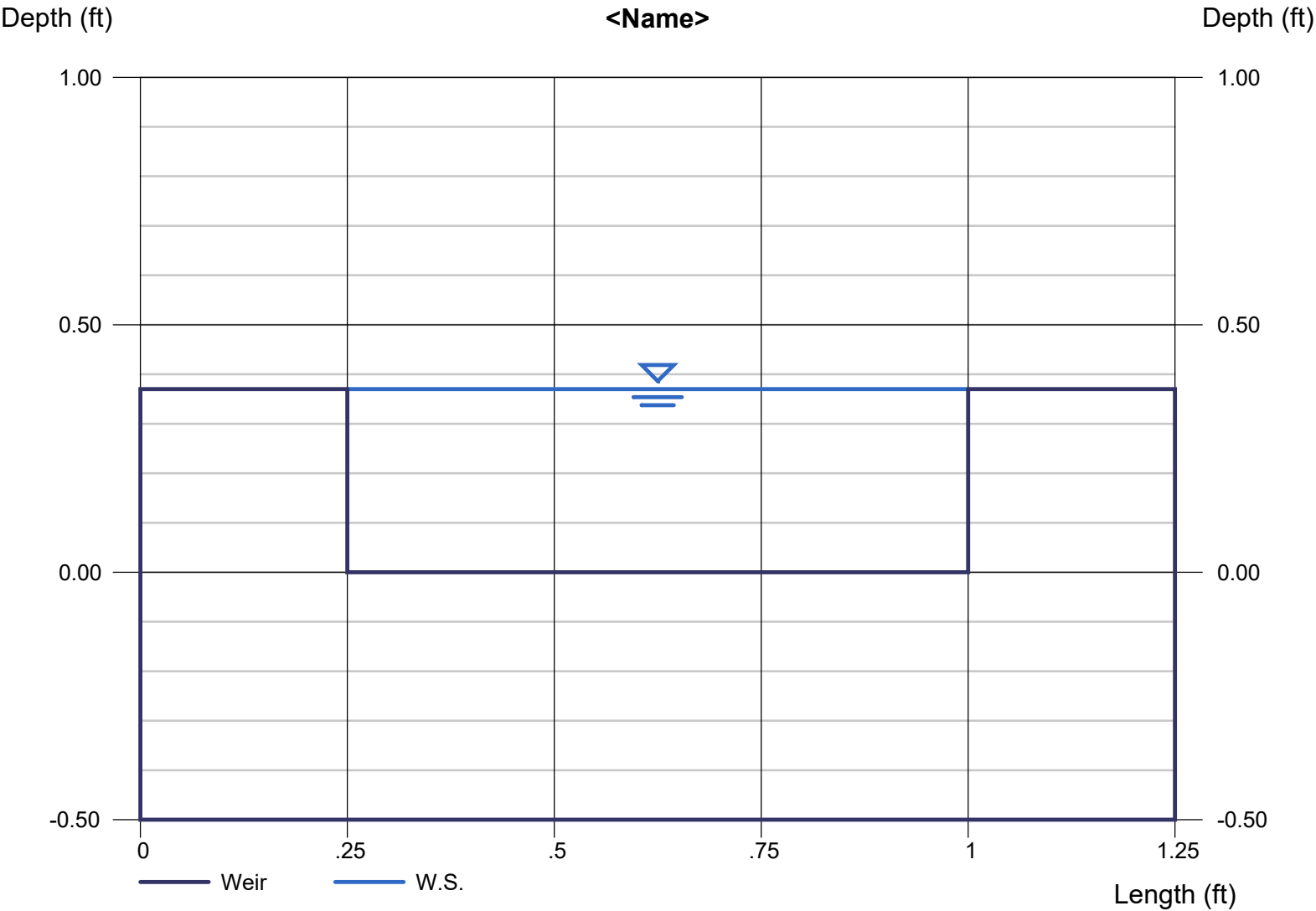
Crest = Sharp
Bottom Length (ft) = 0.75
Total Depth (ft) = 0.37

Highlighted

Depth (ft) = 0.37
Q (cfs) = 0.562
Area (sqft) = 0.28
Velocity (ft/s) = 2.03
Top Width (ft) = 0.75

Calculations

Weir Coeff. Cw = 3.33
Compute by: Q vs Depth
No. Increments = 10



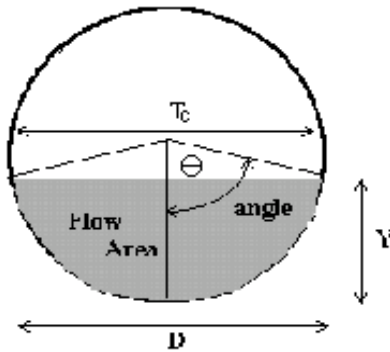
Depth	Q	Area
(ft)	(cfs)	(sqft)
0.04	0.018	0.03
0.07	0.050	0.06
0.11	0.092	0.08
0.15	0.142	0.11
0.19	0.199	0.14
0.22	0.261	0.17
0.26	0.329	0.19
0.30	0.402	0.22
0.33	0.480	0.25
0.37	0.562	0.28

Veloc	TopWidth	Energy
(ft/s)	(ft)	(ft)
0.64	0.75	0.04
0.91	0.75	0.09
1.11	0.75	0.13
1.28	0.75	0.17
1.43	0.75	0.22
1.57	0.75	0.26
1.69	0.75	0.30
1.81	0.75	0.35
1.92	0.75	0.39
2.03	0.75	0.43

CIRCULAR CONDUIT FLOW (Normal & Critical Depth Computation)

Project: Crossroads II

Pipe ID: 6600 Road Release



Design Information (Input)

Pipe Invert Slope	So =	0.0100	ft/ft
Pipe Manning's n-value	n =	0.0150	
Pipe Diameter	D =	12.00	inches
Design discharge	Q =	2.14	cfs

Full-flow Capacity (Calculated)

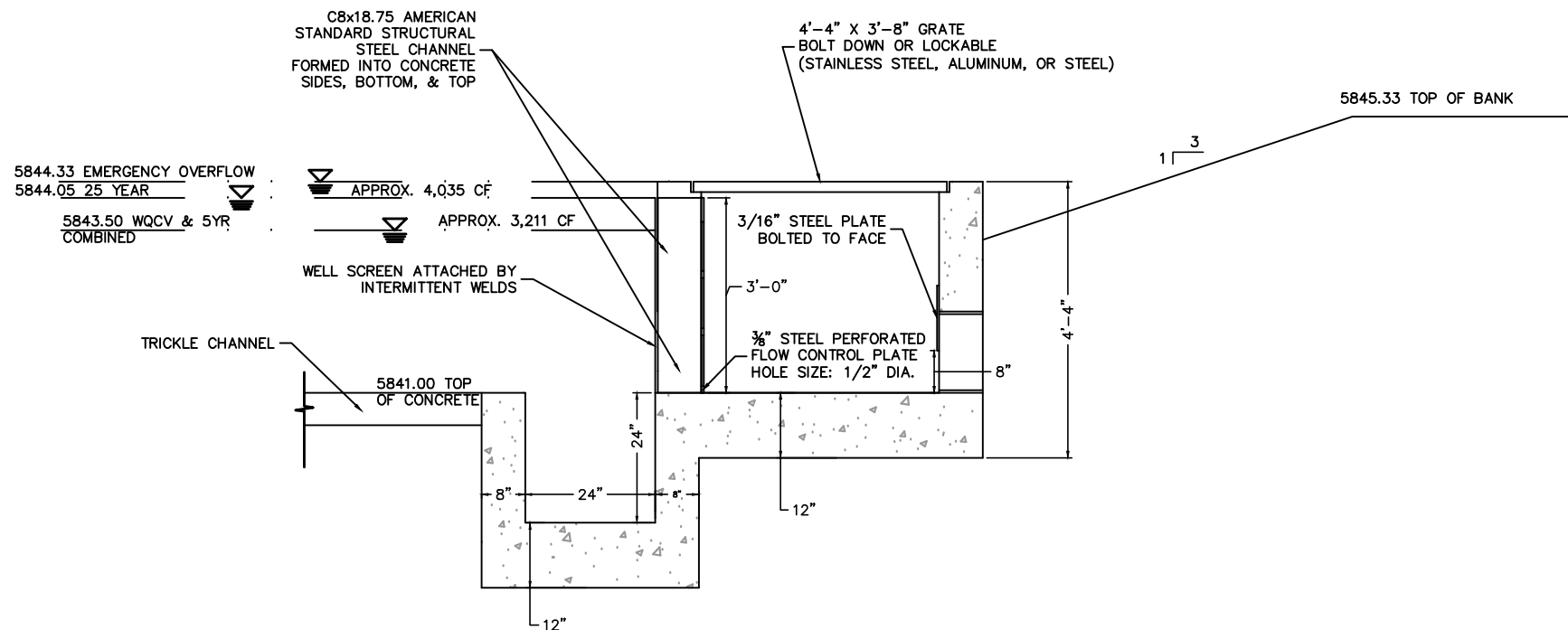
Full-flow area	Af =	0.79	sq ft
Full-flow wetted perimeter	Pf =	3.14	ft
Half Central Angle	Theta =	3.14	radians
Full-flow capacity	Qf =	3.10	cfs

Calculation of Normal Flow Condition

Half Central Angle ($0 < \theta < 3.14$)	Theta =	1.80	radians
Flow area	An =	0.50	sq ft
Top width	Tn =	0.97	ft
Wetted perimeter	Pn =	1.80	ft
Flow depth	Yn =	0.61	ft
Flow velocity	Vn =	4.25	fps
Discharge	Qn =	2.14	cfs
Percent Full Flow	Flow =	69.0%	of full flow
Normal Depth Froude Number	Fr _n =	1.04	supercritical

Calculation of Critical Flow Condition

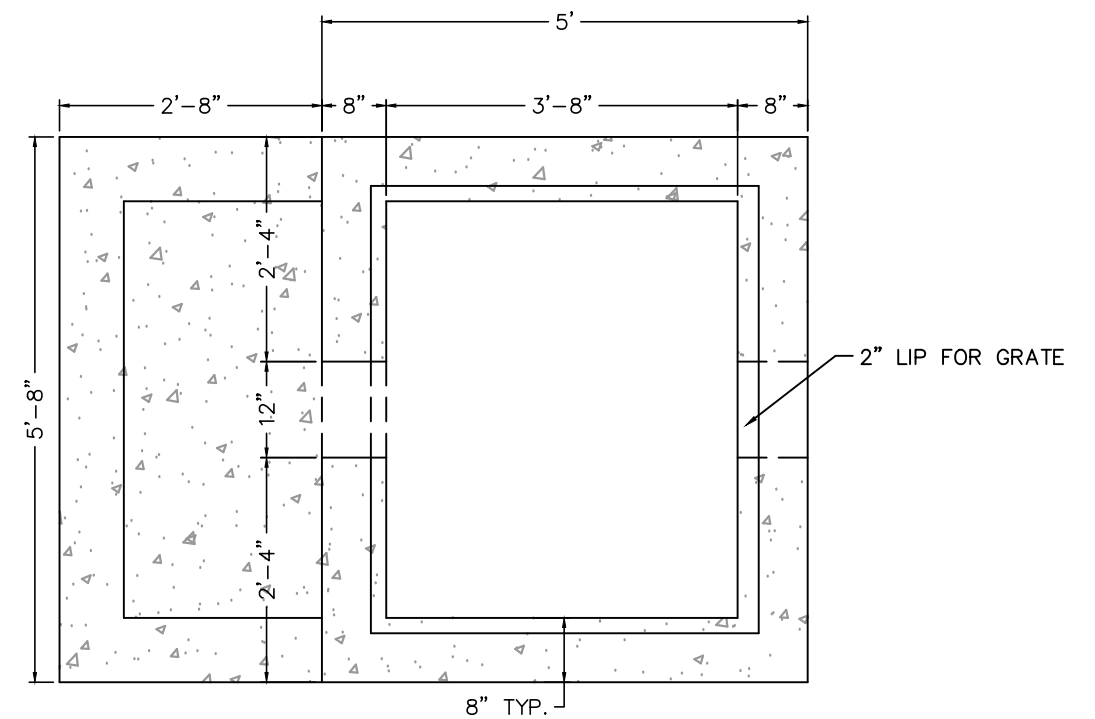
Half Central Angle ($0 < \theta_c < 3.14$)	Theta-c =	1.82	radians
Critical flow area	Ac =	0.52	sq ft
Critical top width	Tc =	0.97	ft
Critical flow depth	Yc =	0.63	ft
Critical flow velocity	Vc =	4.14	fps
Critical Depth Froude Number	Fr _c =	1.00	



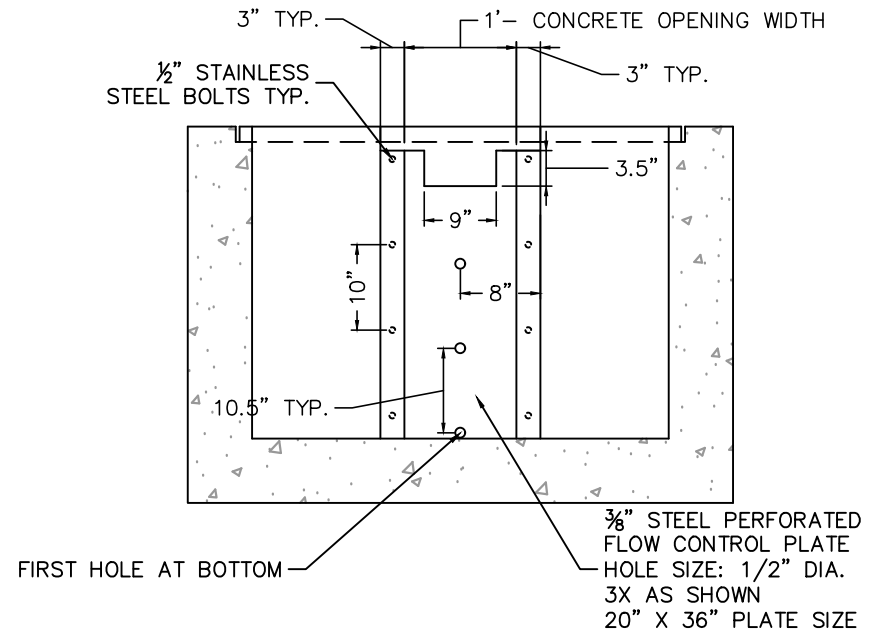
NOTES:

1. WELL SCREEN TRASH RACKS SHALL BE STAINLESS STEEL AND BOLTED OR WELDED TO OUTLET STRUCTURE.
2. U.S. FILTER (OR APPROVED EQUAL) WITH #93 VEE WIRE.
3. WELL SCREEN SHALL HAVE 0.139" OPENINGS BETWEEN WIRES AND TE 0.074 X 0.75" SUPPORT RODS AT 1" O.C.

POND OUTLET STRUCTURE PROFILE
 $\frac{3}{8}" = 1'$



POND OUTLET STRUCTURE PLAN
 $\frac{1}{2}" = 1'$



WEIR PLATE PROFILE
 $1/2" = 1'$