

# Kimley»Horn

October 31, 2022

Gilbert LaForce, PE  
El Paso County  
2880 International Circle, Suite 110  
Colorado Springs, CO 8010

Re: ***Winsome Filing No. 2 Certification Letter  
El Paso County, Colorado***

Dear Mr. LaForce:

This letter serves as the certification for Winsome Filing No. 2, El Paso County, CO consistent with El Paso County Engineering Manual (“ECM”) Section 5.10.B, which states, *“Engineering Record Drawings shall be accompanied by a certification letter from the Engineer of Record which shall state that the site and adjacent properties (as affected by work performed under the County permit) are stable with respect to settlement and subsidence, sloughing of cut and fill slopes, revegetation or other ground cover, and that the improvements (public improvements, common development improvements, site grading and paving) meet or exceed the minimum design requirements. For sites including detention and/or water quality facilities, the certification letter shall include a statement that the facilities provide the required storage volume and will meet the required release rates, as documented by an attached UDFCD design form submitted with the original application, the stage areas, elevations and outlet dimensions.”*

Based upon this information and information gathered during periodic site visits to the site during significant/key phases of the infrastructure installation, *Kimley-Horn & Associates, Inc.* is of the opinion that the work performed under the County Permit, per Section 5.10.B of the ECM, have been constructed in general compliance with the approved Construction Plans as filed with the County dated November 16, 2021.

#### **Statement Of Engineer In Responsible Charge:**

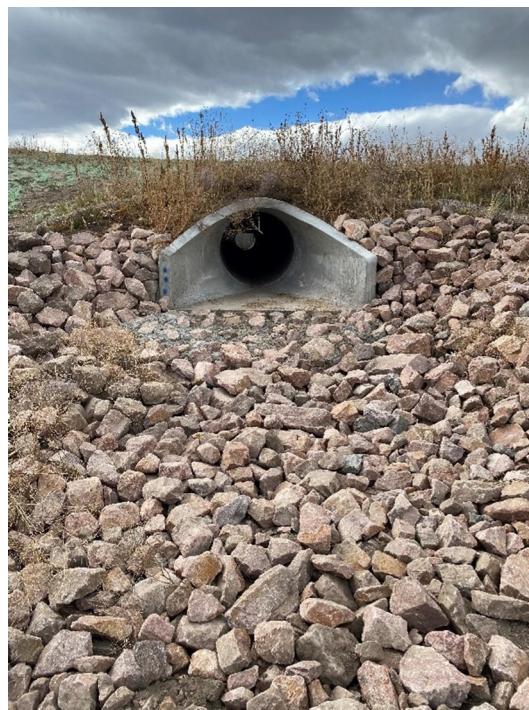
I, Kevin R. Kofford, a registered Professional Engineer in the State of Colorado, in accordance with Sections 5.2 and 5.3 of the Bylaws and Rules of the State Board of Registration for Professional Engineers and Professional Land Surveyors, do hereby certify that I or a person under my responsible charge periodically observed the construction of the above-mentioned project. Based on the on-site field observations and review of pertinent documentation, it is my professional opinion that the required infrastructure improvements have been installed and are in general compliance with the approved Construction Plans as filed with El Paso County. For BMPs with a Water Quality Capture Volume (WQCV), I have attached the post-construction As-Built drawings. The As-Built drawings accurately depict the final installation of the stormwater BMPs and verify the WQCV.

Kevin R. Kofford, P.E.  
Colorado No. 57234



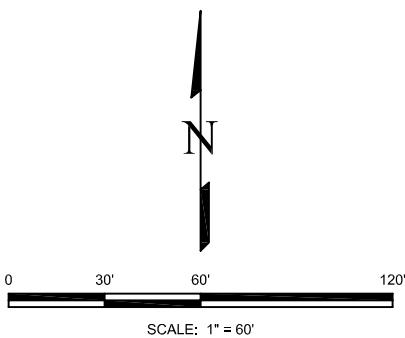




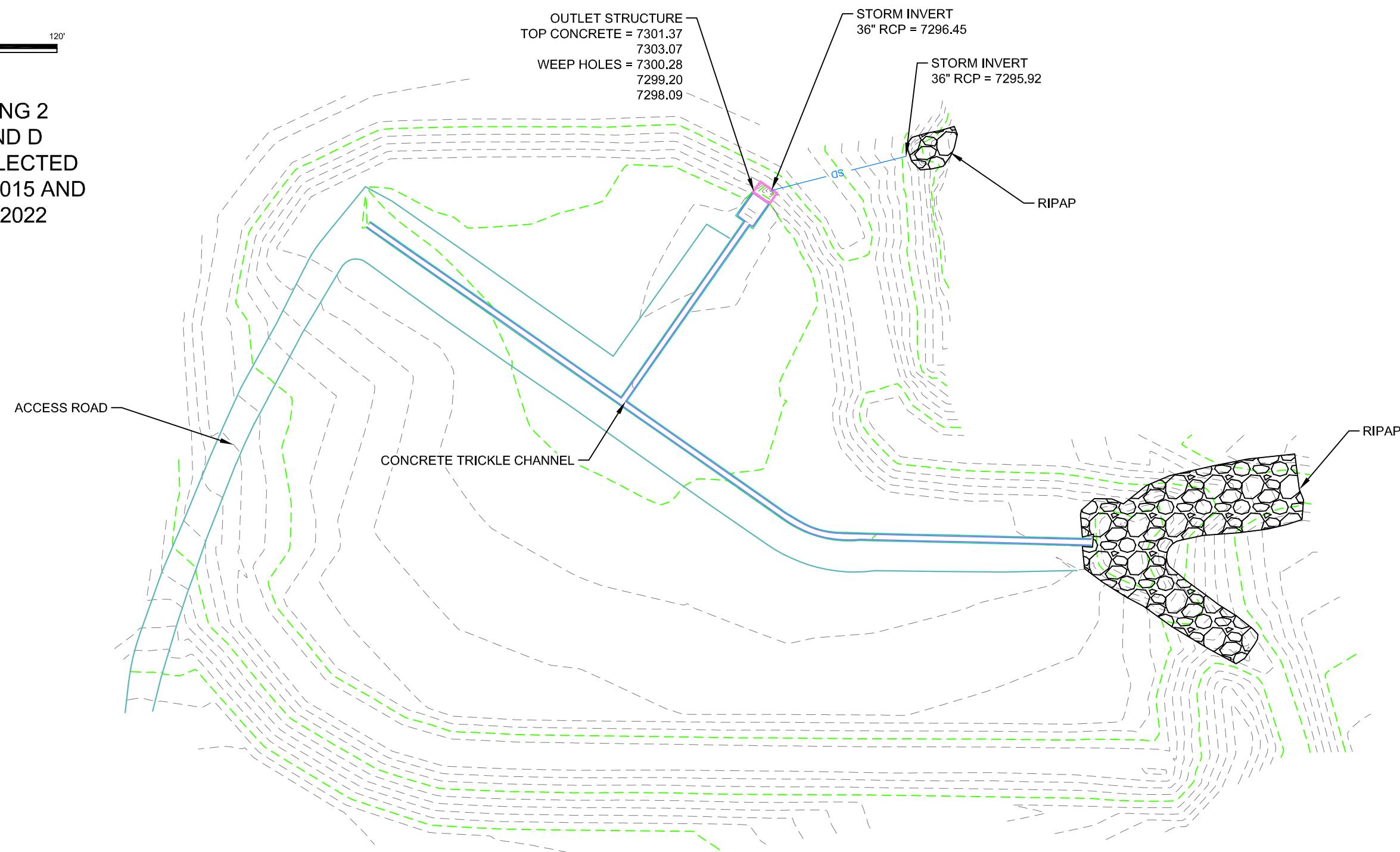


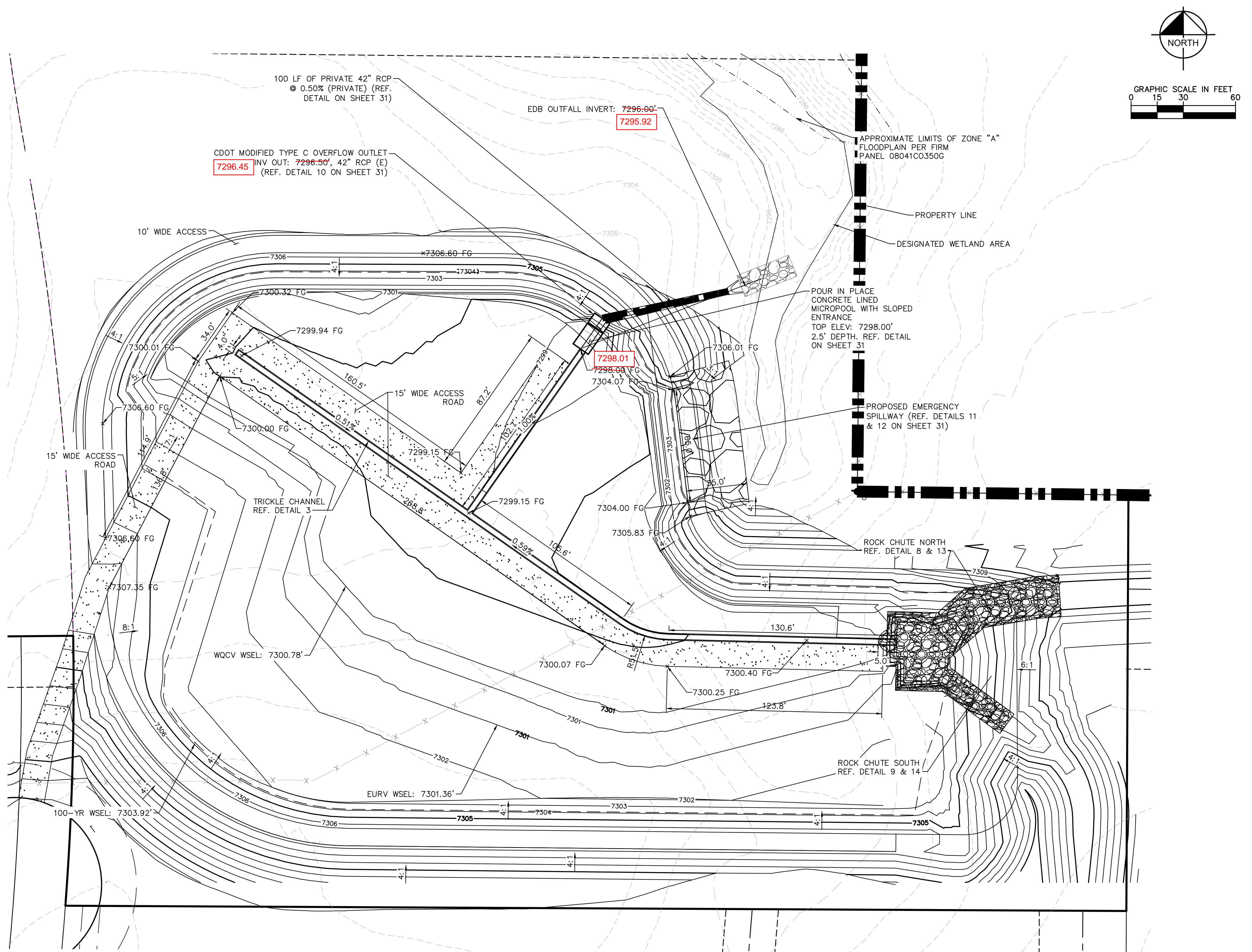






**WINSOME FILING 2**  
**AS-BUILT POND D**  
**FIELD DATA COLLECTED**  
**SEPTEMBER 15, 2015 AND**  
**OCTOBER 27, 2022**





LEGEND	
FG	FINISH GRADE
FBT	TOP OF FOREBAY AT FINISHED GRADE
FBB	BOTTOM OF FOREBAY AT FINISHED GRADE
TCT	TOP OF TRICKLE CHANNEL AT FINISHED GRADE
TCB	BOTTOM OF TRICKLE CHANNEL AT FINISHED GRADE
MPT	TOP OF MICROPOND AT FINISHED GRADE
MPB	BOTTOM OF MICROPOND AT FINISHED GRADE
GRATE	OUTLET STRUCTURE GRATE ELEVATION
ME	MATCH EXISTING
PT	TOP OF STEEL PLATE AT FINISHED GRADE
PB	BOTTOM OF STEEL PLATE AT FINISHED GRADE
■	PROPERTY LINE
—	TOP OF POND
—	PROPOSED STORM SEWER

**Kimley»Horn**

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PHONE: 719-453-0180  
WWW.KIMLEY-HORN.COM

## POND 5 OVERVIEW

**WINSOME FILING NO. 2**

PREPARED FOR  
**WINSOME LLC**

CO  
EL PASO COUNTY  
SHEET NUMBER  
30



EPC 11/16/2021

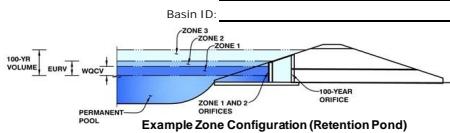
No.	Date	By
4	10/29/21 KRK	COUNTY SUBMITTAL #4
3	9/15/21 KRK	COUNTY SUBMITTAL #3
2	8/25/21 KRK	COUNTY SUBMITTAL #2
		REVISIONS



## DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

**Project:**



#### **Example Zone Configuration (Retention Pond)**

## Watershed Information

Selected BMP Type	EDB
Watershed Area	151.30 acres
Watershed Length	6,210 ft
Watershed Length to Centroid	2,295 ft
Watershed Slope	0.026 ft/ft
Watershed Imperviousness	32.90 percent
Percentage Hydrologic Soil Group A	0.0%
Percentage Hydrologic Soil Group B	98.1%
Percentage Hydrologic Soil Groups C/D	1.9%
Target WOCV Drain Time	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.

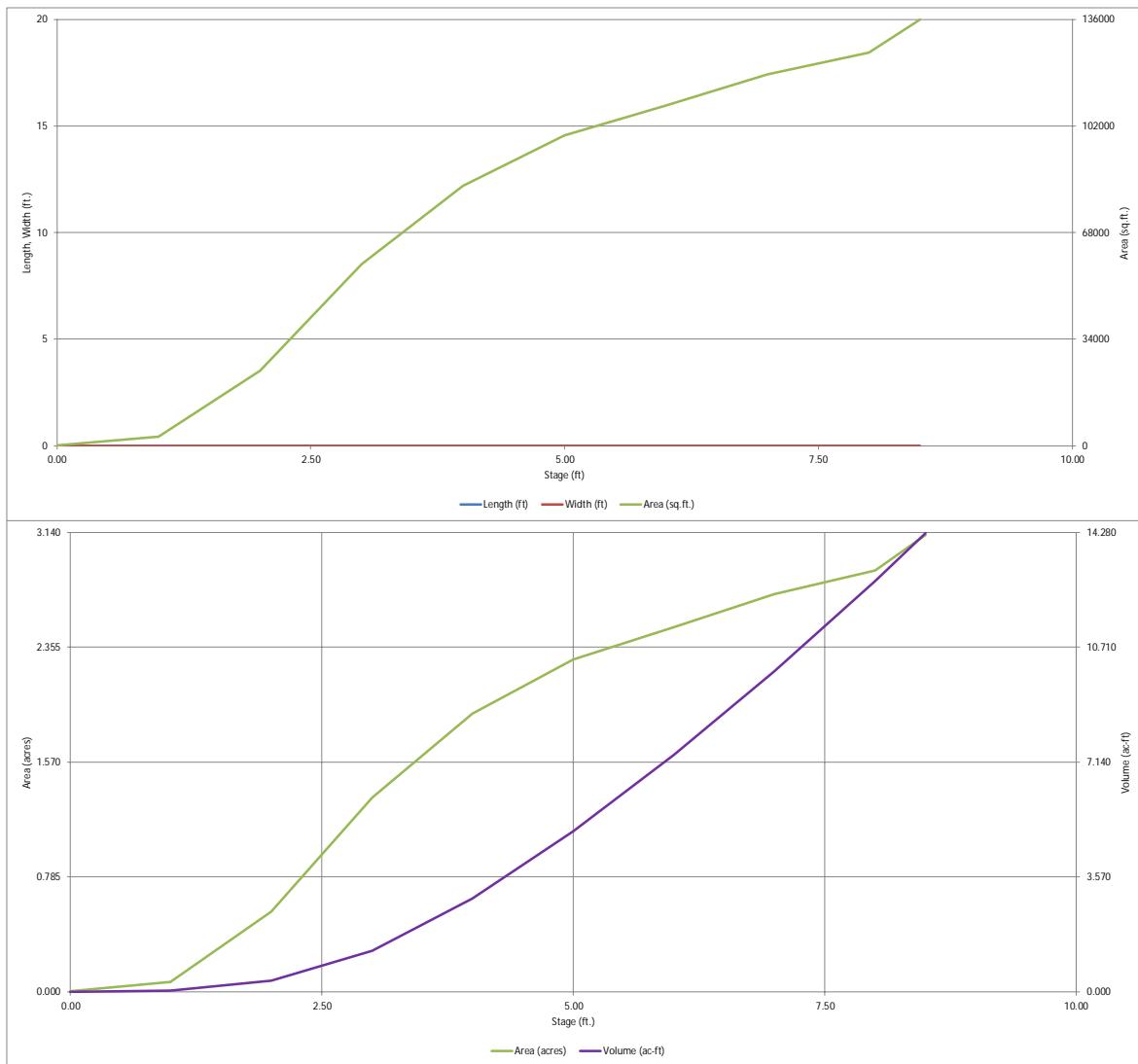
The embedded Colorado Urban Hydrograph Procedure	
Water Quality Capture Volume (WQCV) =	<b>1,033</b> acre-feet
Excess Urban Runoff Volume (EURV) =	<b>1,825</b> acre-feet
2-yr Runoff Volume ( $P_1 = 1.19 \text{ in.}$ ) =	<b>2,329</b> acre-feet
5-yr Runoff Volume ( $P_1 = 1.5 \text{ in.}$ ) =	<b>4,848</b> acre-feet
10-yr Runoff Volume ( $P_1 = 1.75 \text{ in.}$ ) =	<b>7,343</b> acre-feet
25-yr Runoff Volume ( $P_1 = 2 \text{ in.}$ ) =	<b>11,651</b> acre-feet
50-yr Runoff Volume ( $P_1 = 2.25 \text{ in.}$ ) =	<b>14,636</b> acre-feet
100-yr Runoff Volume ( $P_1 = 2.52 \text{ in.}$ ) =	<b>18,889</b> acre-feet
500-yr Runoff Volume ( $P_1 = 3.14 \text{ in.}$ ) =	<b>26,699</b> acre-feet
Approximate 2-yr Detention Volume =	<b>1,162</b> acre-feet
Approximate 5-yr Detention Volume =	<b>1,809</b> acre-feet
Approximate 10-yr Detention Volume =	<b>3,412</b> acre-feet
Approximate 25-yr Detention Volume =	<b>4,591</b> acre-feet
Approximate 50-yr Detention Volume =	<b>4,825</b> acre-feet
Approximate 100-yr Detention Volume =	<b>6,164</b> acre-feet

### Define Zones and Basin Geometry

Zone 1 Volume (WOCV) =	1.033	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.792	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	4.399	acre-feet
Initial Detention Basin Volume =	6.164	acre-feet
Initial Surge Volume (ISV) =	user	ft <sup>3</sup>
Initial Surge Depth (ISD) =	user	ft
Total Available Detention Depth (H <sub>TOTAL</sub> ) =	user	ft
Depth of Trickle Channel (H <sub>TC</sub> ) =	user	ft
Slope of Trickle Channel (S <sub>TC</sub> ) =	user	ft/ft
Slopes of Main Basin Sides (S <sub>MAIN</sub> ) =	user	ft/V
Basin Length-to-Width Ratio (R <sub>LW</sub> ) =	user	
Initial Surge Area (A <sub>ISV</sub> ) =	user	ft <sup>2</sup>
Surcharge Volume Length (L <sub>SVL</sub> ) =	user	ft
Surcharge Volume Width (W <sub>SVL</sub> ) =	user	ft
Depth of Basin Floor (H <sub>FLOOR</sub> ) =	user	ft
Length of Basin Floor (L <sub>FLOOR</sub> ) =	user	ft
Width of Basin Floor (W <sub>FLOOR</sub> ) =	user	ft
Area of Basin Floor (A <sub>FLOOR</sub> ) =	user	ft <sup>2</sup>
Volume of Basin Floor (V <sub>FLOOR</sub> ) =	user	ft <sup>3</sup>
Depth of Main Basin (H <sub>MAIN</sub> ) =	user	ft
Length of Main Basin (L <sub>MAIN</sub> ) =	user	ft
Width of Main Basin (W <sub>MAIN</sub> ) =	user	ft
Area of Main Basin (A <sub>MAIN</sub> ) =	user	ft <sup>2</sup>
Volume of Main Basin (V <sub>MAIN</sub> ) =	user	ft <sup>3</sup>
Calculated Total Basin Volume (V <sub>TOTAL</sub> ) =	user	acre-feet

## DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

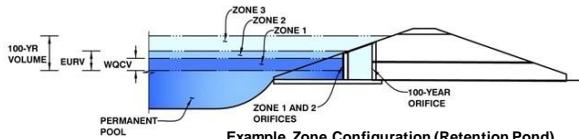


# DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project:

Basin ID:



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.81	1.033	Orifice Plate
Zone 2 (EURV)	3.39	0.792	Orifice Plate
Zone 3 (100-year)	5.51	4.339	Weir&Pipe (Restrict)
Total (all zones)		6.164	

User Input: Orifice at Underdrain Outlet (typically used to drain WOCV 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 =  ft<sup>2</sup>  
Underdrain Orifice Centroid =  feet

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

Centroid of Lowest Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Orifice Plate =  ft (relative to basin bottom at Stage = 0 ft)  
Orifice Plate: Orifice Vertical Spacing =  inches  
Orifice Plate: Orifice Area per Row =  sq. inches

Calculated Parameters for Plate  
WQ Orifice Area per Row =  ft<sup>2</sup>  
Elliptical Half-Width =  feet  
Elliptical Slot Centroid =  feet  
Elliptical Slot Area =  ft<sup>2</sup>

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	1.11	2.19					
Orifice Area (sq. inches)	3.14	3.14	10.00					
	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 =  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 =  ft<sup>2</sup>  
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<sub>o</sub> =  ft (relative to basin bottom at Stage = 0 ft)  
Overflow Weir Front Edge Length =  feet  
Overflow Weir Grate Slope =  H:V  
Horiz. Length of Weir Sides =  feet  
Overflow Grate Type =   
Debris Clogging % =  %

Calculated Parameters for Overflow Weir  
Height of Grate Upper Edge, H<sub>t</sub> =  feet  
Overflow Weir Slope Length =  feet  
Grate Open Area / 100-yr Orifice Area =  ft<sup>2</sup>  
Overflow Grate Open Area w/o Debris =  ft<sup>2</sup>  
Overflow Grate Open Area w/ Debris =  ft<sup>2</sup>

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

Depth to Invert of Outlet Pipe =  ft (distance below basin bottom at Stage = 0 ft)  
Outlet Pipe Diameter =  inches  
Restrictor Plate Height Above Pipe Invert =  inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate  
Outlet Orifice Area =  ft<sup>2</sup>  
Outlet Orifice Centroid =  feet  
Half-Central Angle of Restrictor Plate on Pipe =  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

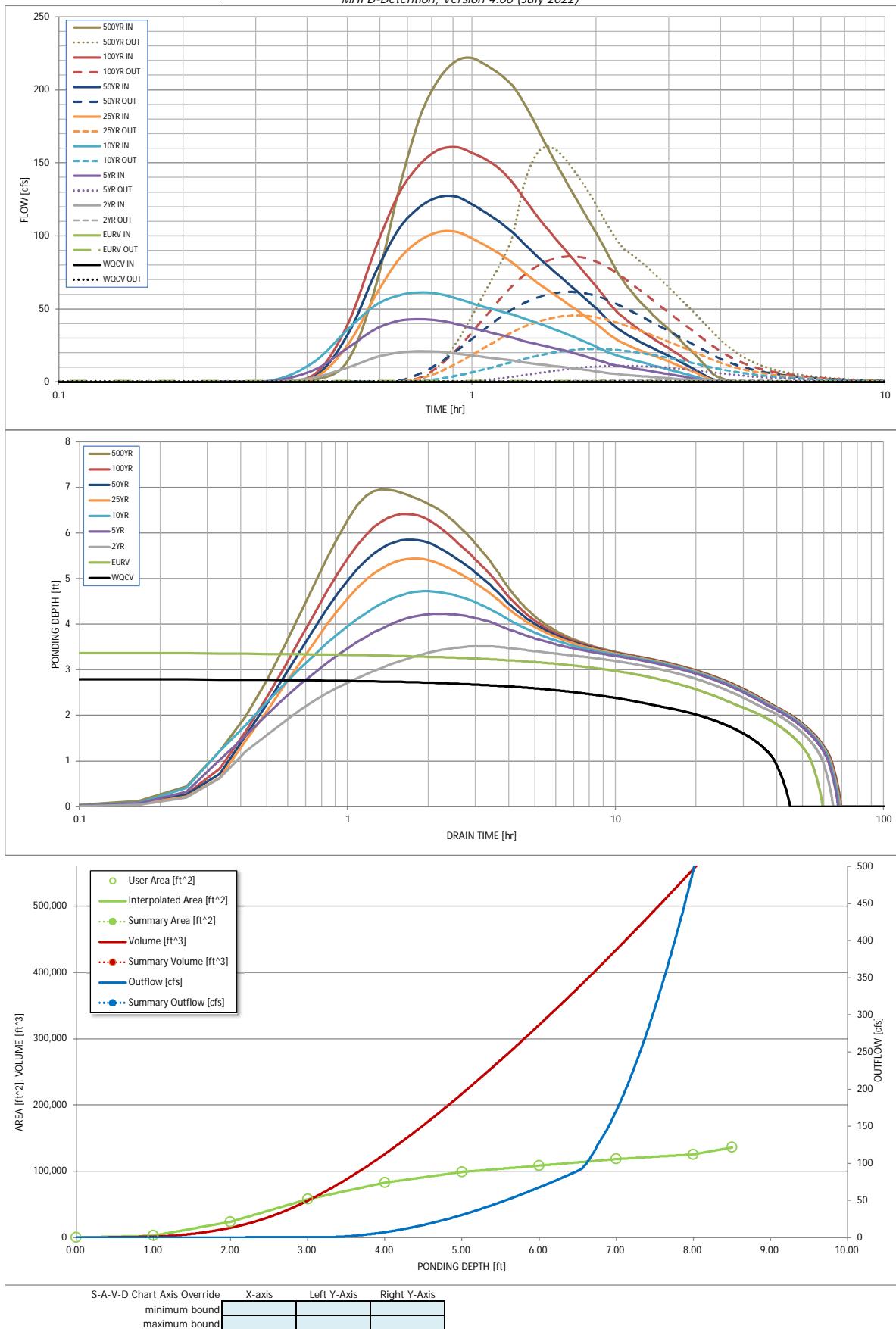
## Routed Hydrograph Results

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

	WOCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =									
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	1.033	1.825	2.329	4.848	7.343	11.651	14.636	18.889	26.699
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	2.329	4.848	7.343	11.651	14.636	18.889	26.699
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	11.5	32.3	50.1	92.4	116.2	149.4	209.6
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.08	0.21	0.33	0.61	0.77	0.99	1.39
Peak Inflow Q (cfs) =	N/A	N/A	21.2	43.2	61.4	102.9	127.0	161.0	221.9
Peak Outflow Q (cfs) =	0.6	1.0	1.8	11.2	22.8	45.6	61.8	86.1	160.9
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.3	0.5	0.5	0.5	0.6	0.8
Structure Controlling Flow =	Plate	Overflow Weir 1	Spillway						
Max Velocity through Grate 1 (fps) =	N/A	0.01	0.03	0.2	0.5	1.0	1.4	2.0	2.4
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) =	40	52	56	54	50	44	40	36	30
Time to Drain 99% of Inflow Volume (hours) =	43	56	61	61	59	57	55	53	49
Maximum Ponding Depth (ft) =	2.81	3.39	3.52	4.23	4.73	5.44	5.86	6.42	6.96
Area at Maximum Ponding Depth (acres) =	1.18	1.55	1.63	1.99	2.17	2.37	2.46	2.59	2.71
Maximum Volume Stored (acre-ft) =	1.040	1.840	2.046	3.341	4.359	6.001	6.991	8.428	9.831

# DETENTION BASIN OUTLET STRUCTURE DESIGN

*MHFD-Detention, Version 4.06 (July 2022)*



## DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename: \_\_\_\_\_

### Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
TIME	WOCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
Time Interval									
5.00 min									
0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04
0:15:00	0.00	0.00	0.10	0.16	0.20	0.14	0.19	0.17	0.29
0:20:00	0.00	0.00	0.49	1.13	1.74	0.53	0.64	0.79	1.76
0:25:00	0.00	0.00	3.30	8.51	14.40	3.22	4.09	5.67	14.18
0:30:00	0.00	0.00	10.04	23.37	35.96	25.12	32.23	39.26	64.00
0:35:00	0.00	0.00	16.78	36.26	52.47	58.75	74.25	90.66	132.23
0:40:00	0.00	0.00	20.29	42.06	59.52	84.32	105.06	129.25	181.76
0:45:00	0.00	0.00	21.16	43.19	61.45	97.12	120.12	149.38	207.63
0:50:00	0.00	0.00	20.76	42.27	60.50	102.76	126.81	159.08	219.90
0:55:00	0.00	0.00	19.63	39.92	57.34	102.91	127.02	160.98	221.91
1:00:00	0.00	0.00	18.25	37.09	53.90	98.48	121.80	157.02	216.82
1:05:00	0.00	0.00	17.06	34.66	51.15	93.16	115.74	152.34	211.03
1:10:00	0.00	0.00	15.98	32.56	48.72	87.83	109.65	146.11	203.21
1:15:00	0.00	0.00	14.83	30.44	46.35	81.93	102.77	137.02	191.74
1:20:00	0.00	0.00	13.66	28.27	43.78	75.67	95.25	126.53	178.07
1:25:00	0.00	0.00	12.63	26.39	41.26	69.62	87.81	116.13	164.17
1:30:00	0.00	0.00	11.81	24.85	38.76	64.54	81.51	107.17	151.79
1:35:00	0.00	0.00	11.05	23.37	36.26	59.89	75.69	99.10	140.50
1:40:00	0.00	0.00	10.32	21.85	33.79	55.57	70.26	91.74	130.10
1:45:00	0.00	0.00	9.61	20.25	31.37	51.44	65.06	84.82	120.28
1:50:00	0.00	0.00	8.90	18.63	29.00	47.45	60.06	78.14	110.85
1:55:00	0.00	0.00	8.17	17.00	26.65	43.53	55.15	71.64	101.68
2:00:00	0.00	0.00	7.43	15.39	24.24	39.67	50.32	65.30	92.75
2:05:00	0.00	0.00	6.68	13.79	21.79	35.81	45.48	59.04	83.91
2:10:00	0.00	0.00	6.00	12.42	19.75	31.98	40.66	52.86	75.38
2:15:00	0.00	0.00	5.48	11.42	18.20	28.92	36.84	47.88	68.50
2:20:00	0.00	0.00	5.09	10.62	16.89	26.56	33.87	43.95	62.93
2:25:00	0.00	0.00	4.75	9.89	15.69	24.58	31.33	40.57	58.07
2:30:00	0.00	0.00	4.42	9.20	14.55	22.81	29.05	37.54	53.69
2:35:00	0.00	0.00	4.11	8.55	13.47	21.20	26.97	34.77	49.67
2:40:00	0.00	0.00	3.81	7.91	12.43	19.68	25.01	32.18	45.91
2:45:00	0.00	0.00	3.51	7.29	11.43	18.22	23.13	29.76	42.40
2:50:00	0.00	0.00	3.23	6.68	10.46	16.82	21.34	27.51	39.13
2:55:00	0.00	0.00	2.95	6.09	9.54	15.45	19.59	25.31	35.96
3:00:00	0.00	0.00	2.68	5.51	8.65	14.10	17.88	23.14	32.85
3:05:00	0.00	0.00	2.41	4.94	7.77	12.76	16.19	20.98	29.76
3:10:00	0.00	0.00	2.13	4.37	6.91	11.42	14.50	18.82	26.69
3:15:00	0.00	0.00	1.87	3.82	6.06	10.10	12.82	16.66	23.62
3:20:00	0.00	0.00	1.60	3.26	5.21	8.77	11.15	14.51	20.56
3:25:00	0.00	0.00	1.33	2.72	4.36	7.45	9.48	12.37	17.51
3:30:00	0.00	0.00	1.07	2.17	3.53	6.13	7.82	10.23	14.47
3:35:00	0.00	0.00	0.81	1.63	2.70	4.82	6.17	8.10	11.44
3:40:00	0.00	0.00	0.56	1.10	1.91	3.52	4.53	5.98	8.46
3:45:00	0.00	0.00	0.35	0.71	1.36	2.28	2.97	3.97	5.76
3:50:00	0.00	0.00	0.23	0.51	1.05	1.46	1.98	2.66	4.01
3:55:00	0.00	0.00	0.18	0.40	0.84	0.98	1.38	1.83	2.86
4:00:00	0.00	0.00	0.14	0.32	0.68	0.68	0.98	1.25	2.03
4:05:00	0.00	0.00	0.12	0.26	0.55	0.46	0.69	0.84	1.41
4:10:00	0.00	0.00	0.09	0.21	0.43	0.33	0.50	0.54	0.95
4:15:00	0.00	0.00	0.07	0.16	0.33	0.23	0.36	0.33	0.62
4:20:00	0.00	0.00	0.06	0.12	0.25	0.16	0.25	0.20	0.39
4:25:00	0.00	0.00	0.05	0.09	0.18	0.12	0.19	0.15	0.29
4:30:00	0.00	0.00	0.04	0.07	0.13	0.09	0.14	0.11	0.22
4:35:00	0.00	0.00	0.03	0.05	0.10	0.07	0.11	0.09	0.17
4:40:00	0.00	0.00	0.02	0.04	0.08	0.05	0.08	0.07	0.13
4:45:00	0.00	0.00	0.02	0.02	0.05	0.04	0.06	0.05	0.10
4:50:00	0.00	0.00	0.01	0.02	0.04	0.03	0.04	0.04	0.07
4:55:00	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.05
5:00:00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03
5:05:00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02
5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00