

October 9<sup>th</sup>, 2024

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

This section was intended to describe the ECM requirements. Statement of Engineer of record is provided below. This section updated to provide additional statement as engineer of record.

Re: **La Foret Certification Letter  
El Paso County, Colorado**

Please don't just quote the ECM but provide that statement as the engineer of record.

Dear Mr. LaForce:

This letter serves as the certification for La Foret, 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 15, 2023.

**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



72 LF OF 8" HDPE @ 0.60%

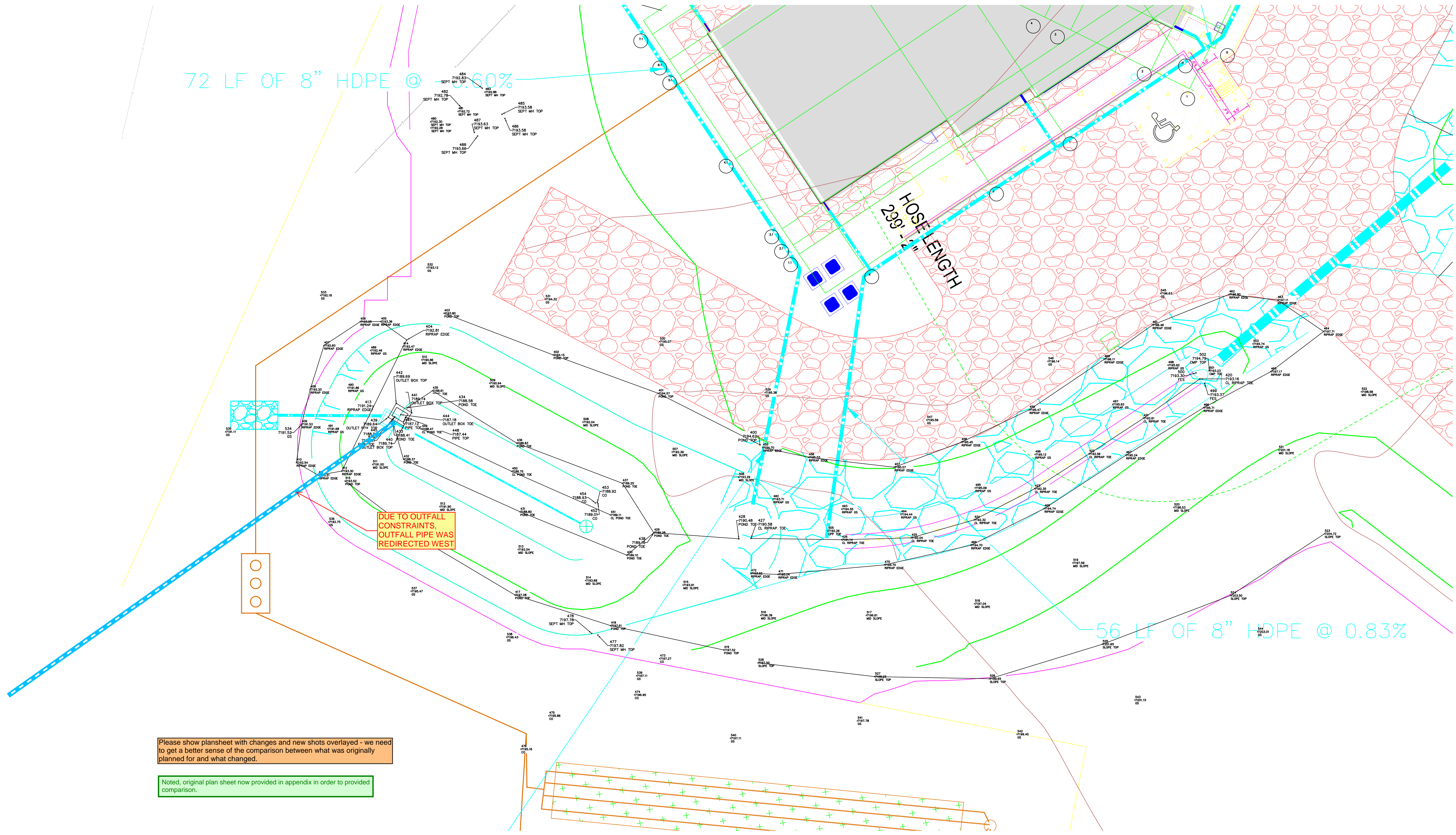
HOSE LENGTH  
299' - 11"

56 LF OF 8" HDPE @ 0.83%

DUE TO OUTFALL CONSTRAINTS,  
OUTFALL PIPE WAS  
REDIRECTED WEST

Please show plansheet with changes and new shots overlaid - we need to get a better sense of the comparison between what was originally planned for and what changed.

Noted, original plan sheet now provided in appendix in order to provided comparison.

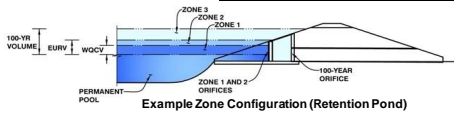




DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: \_\_\_\_\_  
 Basin ID: \_\_\_\_\_



**Watershed Information**

Selected BMP Type =	RG	
Watershed Area =	2.89	acres
Watershed Length =	500	ft
Watershed Length to Centroid =	250	ft
Watershed Slope =	0.050	ft/ft
Watershed Imperviousness =	26.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQC Drain Time =	12.0	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) =	0.027	acre-feet
Excess Urban Runoff Volume (EURV) =	0.076	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.077	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.130	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.179	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	0.255	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	0.312	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	0.389	acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	0.535	acre-feet
Approximate 2-yr Detention Volume =	0.054	acre-feet
Approximate 5-yr Detention Volume =	0.078	acre-feet
Approximate 10-yr Detention Volume =	0.117	acre-feet
Approximate 25-yr Detention Volume =	0.139	acre-feet
Approximate 50-yr Detention Volume =	0.147	acre-feet
Approximate 100-yr Detention Volume =	0.176	acre-feet

**Optional User Overrides**

		acre-feet
		acre-feet
	1.19	inches
	1.50	inches
	1.75	inches
	2.00	inches
	2.25	inches
	2.52	inches
		inches

**Define Zones and Basin Geometry**

Zone 1 Volume (WQCV) =	0.027	acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	0.027	acre-feet
Initial Surcharge Volume (ISV) =	N/A	ft <sup>3</sup>
Initial Surcharge Depth (ISD) =	N/A	ft
Total Available Detention Depth (H <sub>total</sub> ) =	user	ft
Depth of Trickle Channel (H <sub>TC</sub> ) =	N/A	ft
Slope of Trickle Channel (S <sub>TC</sub> ) =	N/A	ft/ft
Slopes of Main Basin Sides (S <sub>main</sub> ) =	user	H:V
Basin Length-to-Width Ratio (R <sub>L/W</sub> ) =	user	
Initial Surcharge Area (A <sub>ISV</sub> ) =	user	ft <sup>2</sup>
Surcharge Volume Length (L <sub>ISV</sub> ) =	user	ft
Surcharge Volume Width (W <sub>ISV</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

Total detention volume is less than 100-year volume.

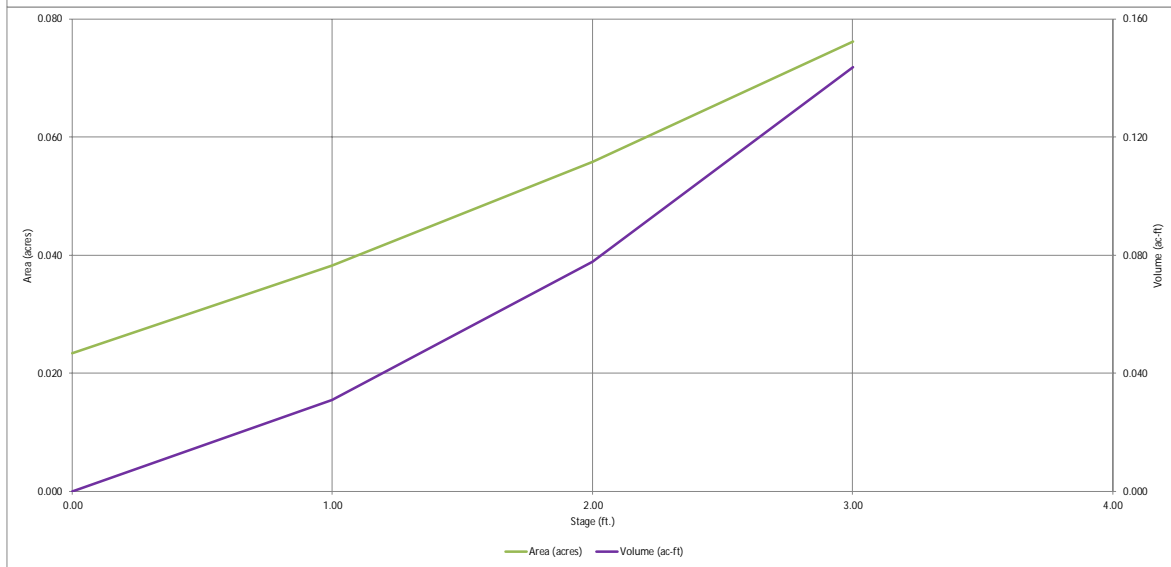
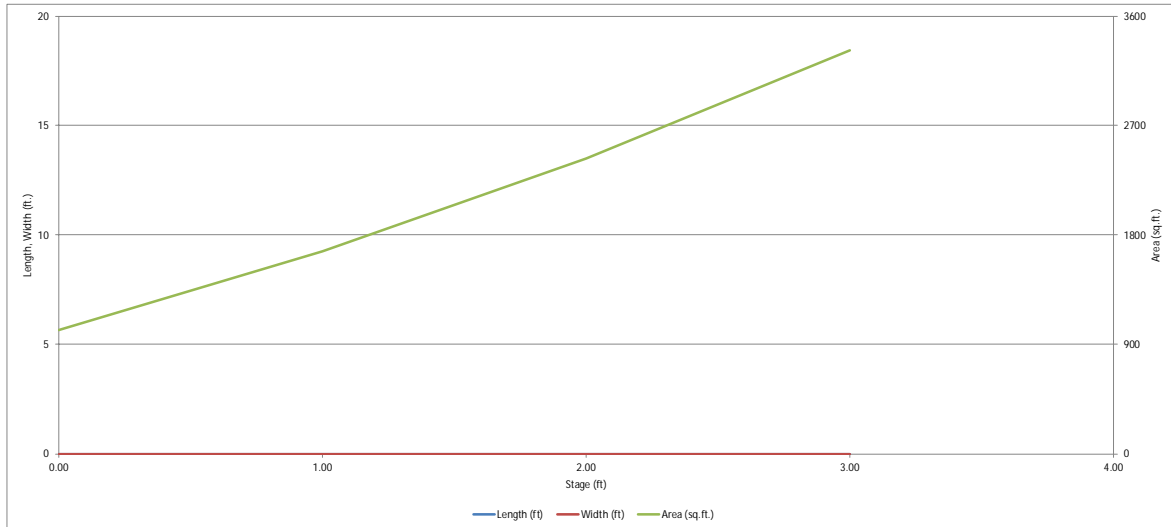
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft <sup>2</sup> )	Optional Override Area (ft <sup>2</sup> )	Area (acre)	Volume (ft <sup>3</sup> )	Volume (ac-ft)
Media Surface	--	0.00	--	--	--	1,019	0.023		
	--	1.00	--	--	--	1,665	0.038	1,342	0.031
	--	2.00	--	--	--	2,430	0.056	3,389	0.078
	--	3.00	--	--	--	3,319	0.076	6,264	0.144

This spreadsheet is the revised UD Detention spreadsheet with updated as-built information. The revised spreadsheet confirms the drain times and that the rg is functioning as intended. The Original spreadsheet, as found in the approved FDR, has been provided in the appendix as well for comparison.

Please include the full MHFD-Detention Spreadsheet so drain times can be confirmed. Please update the MHFD-Detention Spreadsheet with the updated as-built information (pond elevations, spillway length, orifice hole elevations, etc.) to confirm that the pond is functioning as intended. The updated Spreadsheet should be attached to the Pond Certification Letter. If some items haven't change keep that as-is from the design calcs.

# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

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

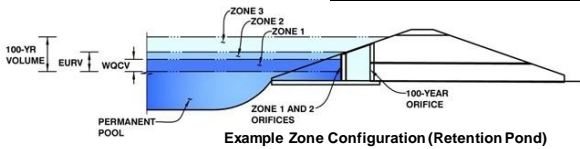


# DETENTION BASIN OUTLET STRUCTURE DESIGN

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

Project: \_\_\_\_\_

Basin ID: \_\_\_\_\_



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.89	0.027	Filtration Media
Zone 2			
Zone 3			
Total (all zones)		0.027	

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 =  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 WQCV 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  
 WO 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 (optional)	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)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Orifice Area (sq. inches)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

	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)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Orifice Area (sq. inches)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

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 Gate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

Overflow Weir Front Edge Height, Ho =   ft (relative to basin bottom at Stage = 0 ft)  
 Overflow Weir Front Edge Length =  feet  
 Overflow Weir Gate Slope =  H:V  
 Horiz. Length of Weir Sides =  feet  
 Overflow Gate Type =   
 Debris Clogging % =  %

Calculated Parameters for Overflow Weir  
 Height of Gate Upper Edge, Hi =  feet  
 Overflow Weir Slope Length =  feet  
 Gate Open Area / 100-yr Orifice Area =   
 Overflow Gate Open Area w/o Debris =  ft<sup>2</sup>  
 Overflow Gate 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)  
 Circular Orifice Diameter =  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

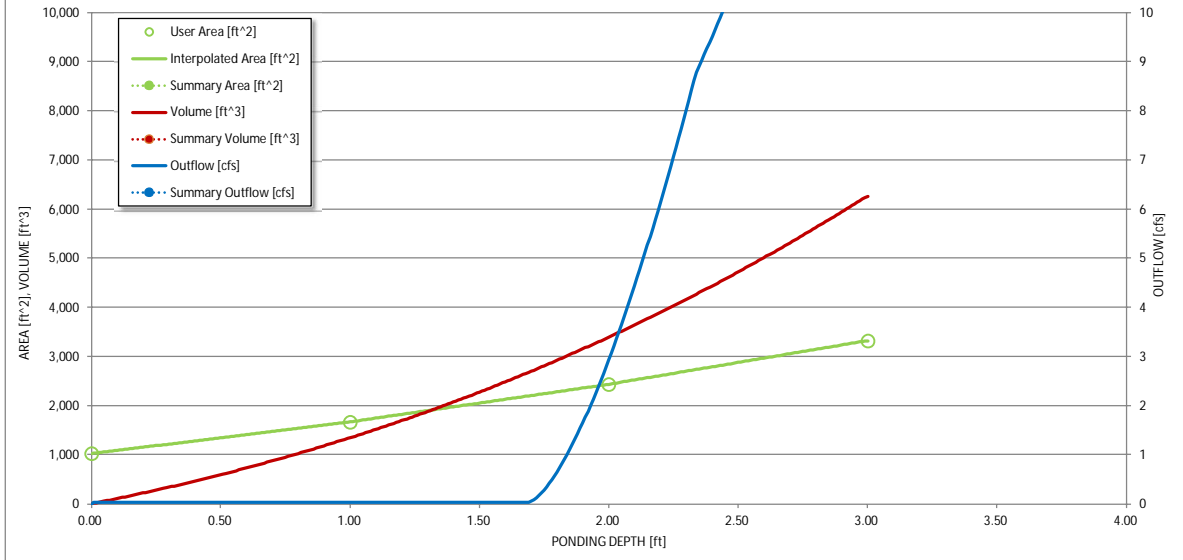
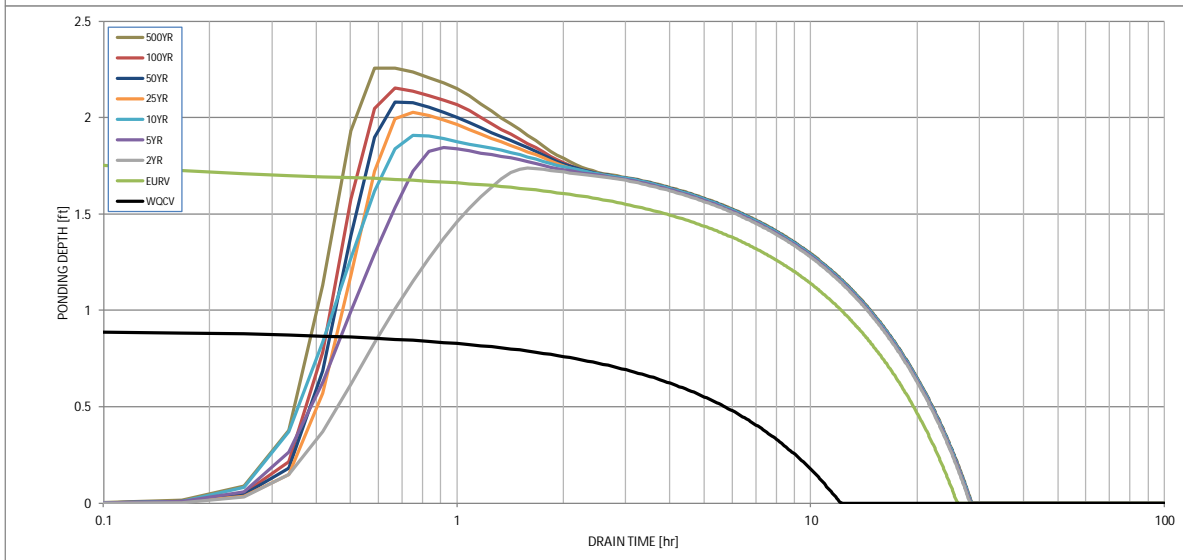
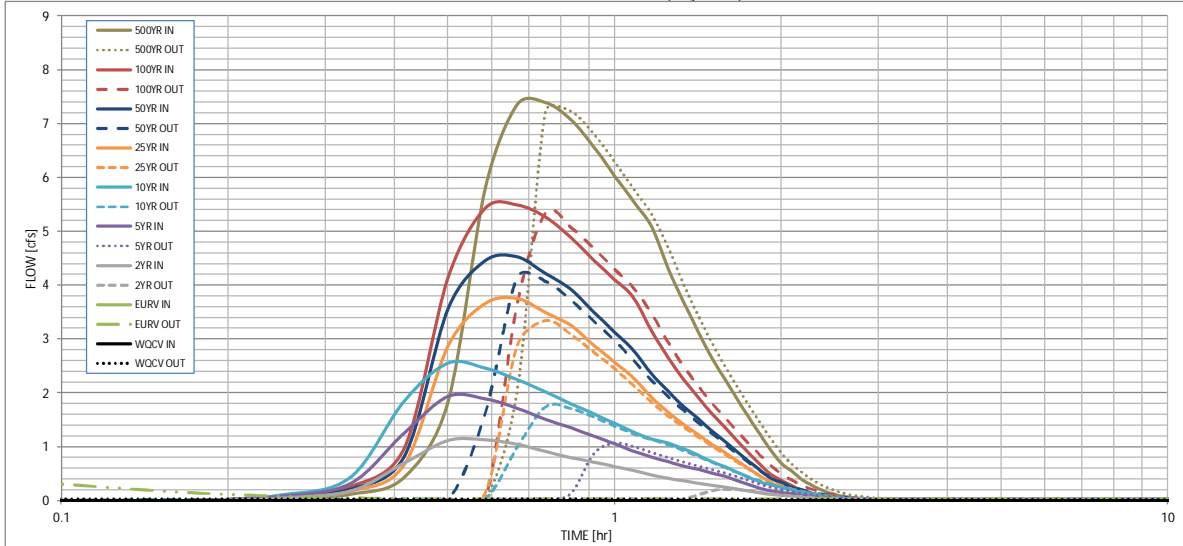
## Routed Hydrograph Results

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

	WQCV	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)	0.027	0.076	0.077	0.130	0.179	0.255	0.312	0.389	0.535
Inflow Hydrograph Volume (acre-ft)	N/A	N/A	0.077	0.130	0.179	0.255	0.312	0.389	0.535
CUHP Predevelopment Peak Q (cfs)	N/A	N/A	0.4	1.1	1.6	2.9	3.6	4.5	6.2
OPTIONAL Override Predevelopment Peak Q (cfs)	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre)	N/A	N/A	0.14	0.38	0.56	0.99	1.24	1.55	2.16
Peak Inflow Q (cfs)	N/A	N/A	1.1	1.9	2.6	3.8	4.5	5.5	7.4
Peak Outflow Q (cfs)	0.03	1.4	0.2	1.1	1.7	3.3	4.1	5.3	7.2
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	1.0	1.1	1.2	1.2	1.2	1.2
Structure Controlling Flow	Filtration Media	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1
Max Velocity through Gate 1 (fps)	N/A	-0.01	-0.01	0.0	0.0	0.0	0.0	0.0	0.0
Max Velocity through Gate 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)	12	25	27	26	26	25	24	23	21
Time to Drain 99% of Inflow Volume (hours)	12	26	28	28	28	27	27	27	26
Maximum Ponding Depth (ft)	0.90	1.97	1.74	1.85	1.91	2.03	2.08	2.15	2.26
Area at Maximum Ponding Depth (acres)	0.04	0.06	0.05	0.05	0.05	0.06	0.06	0.06	0.06
Maximum Volume Stored (acre-ft)	0.027	0.076	0.063	0.069	0.072	0.079	0.082	0.086	0.092

# DETENTION BASIN OUTLET STRUCTURE DESIGN

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



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

# 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.

Time Interval	SOURCE	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
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	0.02
	0:15:00	0.00	0.00	0.05	0.08	0.10	0.07	0.09	0.09	0.12
	0:20:00	0.00	0.00	0.18	0.33	0.44	0.18	0.22	0.26	0.44
	0:25:00	0.00	0.00	0.70	1.27	1.86	0.68	0.83	0.99	1.85
	0:30:00	0.00	0.00	1.12	1.94	2.55	2.88	3.57	4.15	5.80
	0:35:00	0.00	0.00	1.13	1.89	2.46	3.66	4.45	5.43	7.35
	0:40:00	0.00	0.00	1.04	1.72	2.25	3.75	4.53	5.49	7.39
	0:45:00	0.00	0.00	0.91	1.51	2.03	3.50	4.22	5.27	7.08
	0:50:00	0.00	0.00	0.80	1.35	1.80	3.26	3.92	4.89	6.58
	0:55:00	0.00	0.00	0.72	1.20	1.61	2.90	3.51	4.47	6.03
	1:00:00	0.00	0.00	0.64	1.05	1.44	2.57	3.13	4.11	5.55
	1:05:00	0.00	0.00	0.56	0.92	1.27	2.28	2.78	3.76	5.09
	1:10:00	0.00	0.00	0.48	0.81	1.15	1.92	2.35	3.15	4.31
	1:15:00	0.00	0.00	0.42	0.72	1.07	1.64	2.03	2.66	3.69
	1:20:00	0.00	0.00	0.37	0.65	0.96	1.42	1.75	2.25	3.13
	1:25:00	0.00	0.00	0.33	0.58	0.84	1.23	1.52	1.91	2.66
	1:30:00	0.00	0.00	0.29	0.52	0.73	1.05	1.30	1.62	2.25
	1:35:00	0.00	0.00	0.25	0.45	0.63	0.89	1.10	1.36	1.88
	1:40:00	0.00	0.00	0.22	0.37	0.53	0.74	0.91	1.11	1.54
	1:45:00	0.00	0.00	0.18	0.30	0.44	0.59	0.73	0.88	1.22
	1:50:00	0.00	0.00	0.15	0.23	0.35	0.46	0.56	0.67	0.94
	1:55:00	0.00	0.00	0.12	0.19	0.30	0.33	0.42	0.49	0.70
	2:00:00	0.00	0.00	0.10	0.16	0.25	0.27	0.34	0.38	0.56
	2:05:00	0.00	0.00	0.08	0.13	0.20	0.20	0.25	0.28	0.42
	2:10:00	0.00	0.00	0.06	0.10	0.16	0.15	0.19	0.21	0.31
	2:15:00	0.00	0.00	0.05	0.08	0.13	0.11	0.15	0.15	0.23
	2:20:00	0.00	0.00	0.04	0.06	0.10	0.09	0.11	0.11	0.16
	2:25:00	0.00	0.00	0.03	0.05	0.08	0.07	0.08	0.08	0.12
	2:30:00	0.00	0.00	0.02	0.04	0.06	0.05	0.06	0.05	0.08
	2:35:00	0.00	0.00	0.02	0.03	0.04	0.04	0.05	0.04	0.06
	2:40:00	0.00	0.00	0.02	0.02	0.03	0.03	0.04	0.03	0.05
	2:45:00	0.00	0.00	0.01	0.02	0.03	0.02	0.03	0.02	0.04
	2:50:00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.03
	2:55:00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.02
	3:00:00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02
	3:05:00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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