October 9th, 2024

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

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

Dear Mr. LaForce:

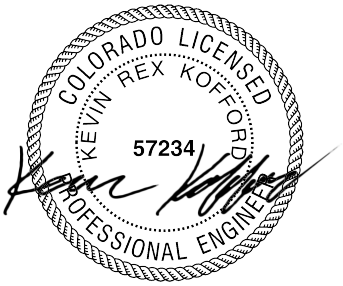
This letter serves as the certification for La Foret, El Paso County, CO consistent with El Paso County Engineering Manual ("ECM") Section 5.10.B, which states, *"Engineering Record Drawings shall be accompanied by a certification letter from the Engineer of Record which shall state that the site and 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."*

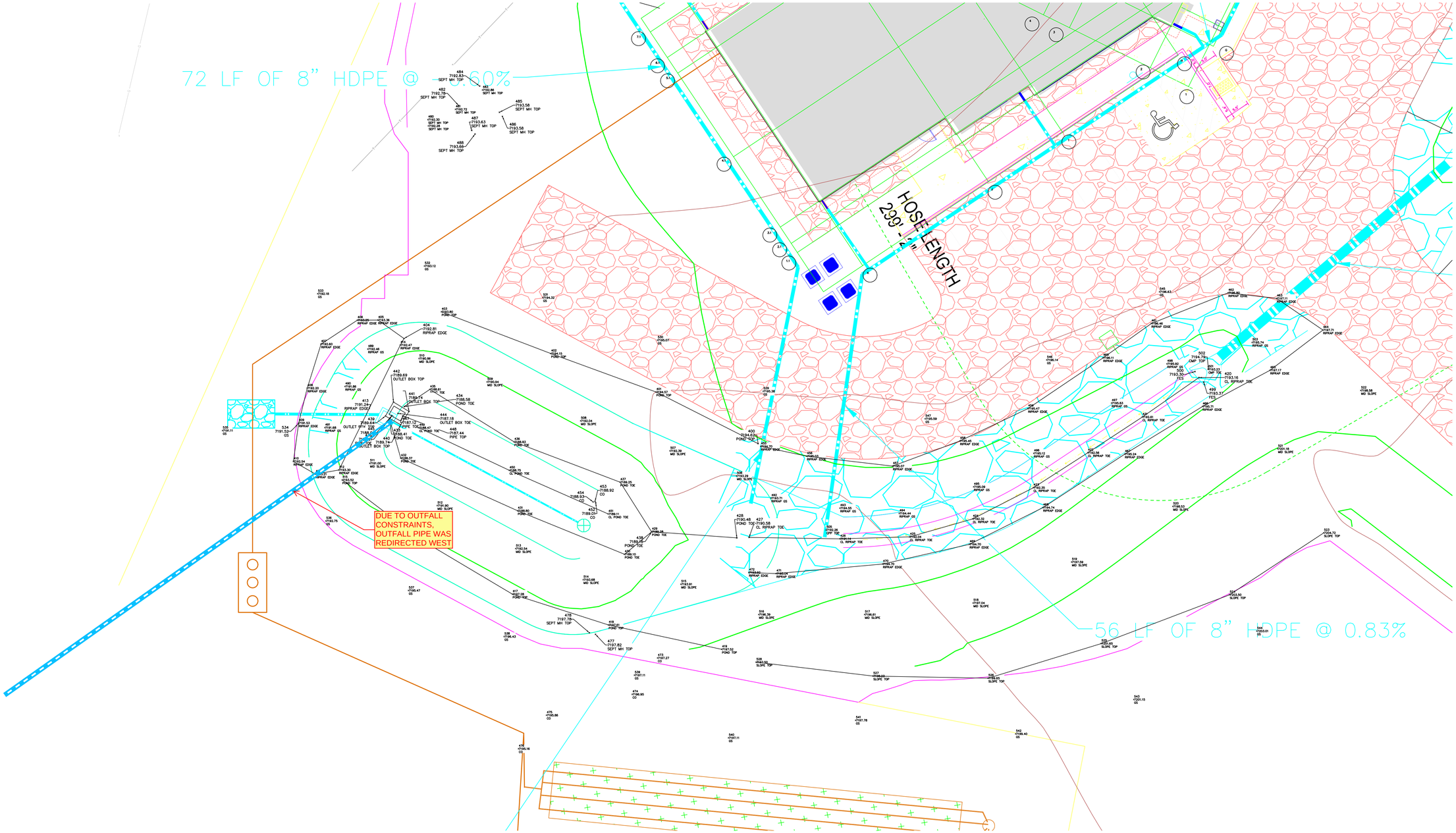
Based upon this information and information gathered during periodic site visits to the site during significant/key phases of the infrastructure installation, *Kimley-Horn & Associates, Inc*. is of the opinion that the work performed under the County Permit, per Section 5.10.B of the ECM, have been constructed 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



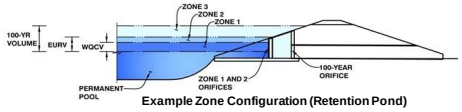

72 LF OF 8" HDPE @ 0.60%
HOSE LENGTH
299' - 4"
DUE TO OUTFALL CONSTRAINTS, OUTFALL PIPE WAS REDIRECTED WEST
56 LF OF 8" HDPE @ 0.83%

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: _____

Basin ID: _____



Example Zone Configuration (Retention Pond)

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 WQCV 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.

			Optional User Overrides
Water Quality Capture Volume (WQCV) =	0.027	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	0.076	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.077	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	0.130	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	0.179	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	0.255	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	0.312	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	0.389	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3.14 in.) =	0.535	acre-feet	inches
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	

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^3
Initial Surcharge Depth (ISD) =	N/A	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	N/A	ft
Slope of Trickle Channel (S_{TC}) =	N/A	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio (R_{LW}) =	user	

Total detention volume is less than 100-year volume.

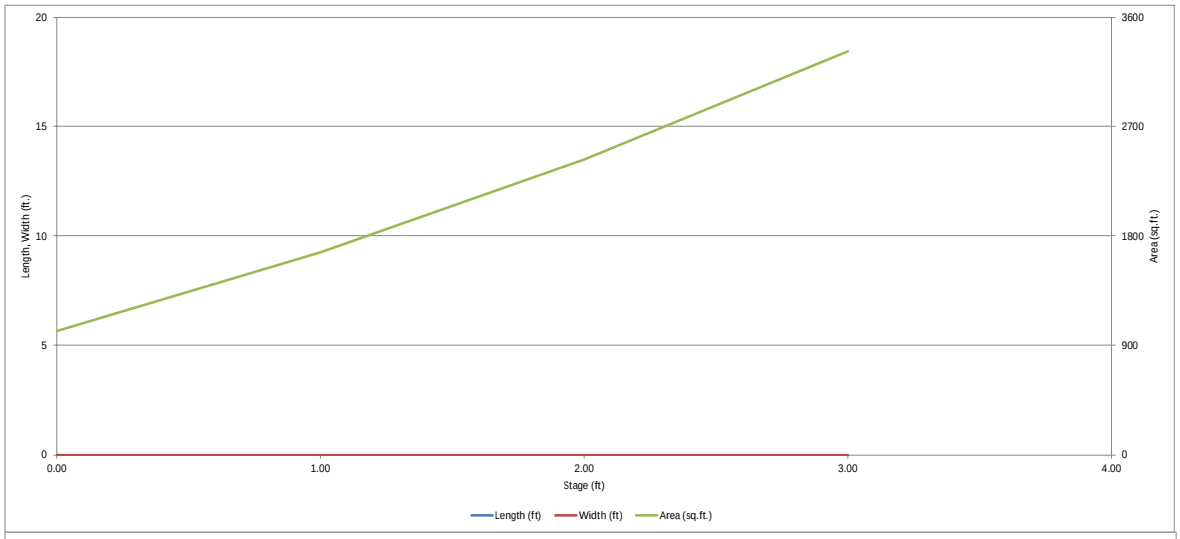
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

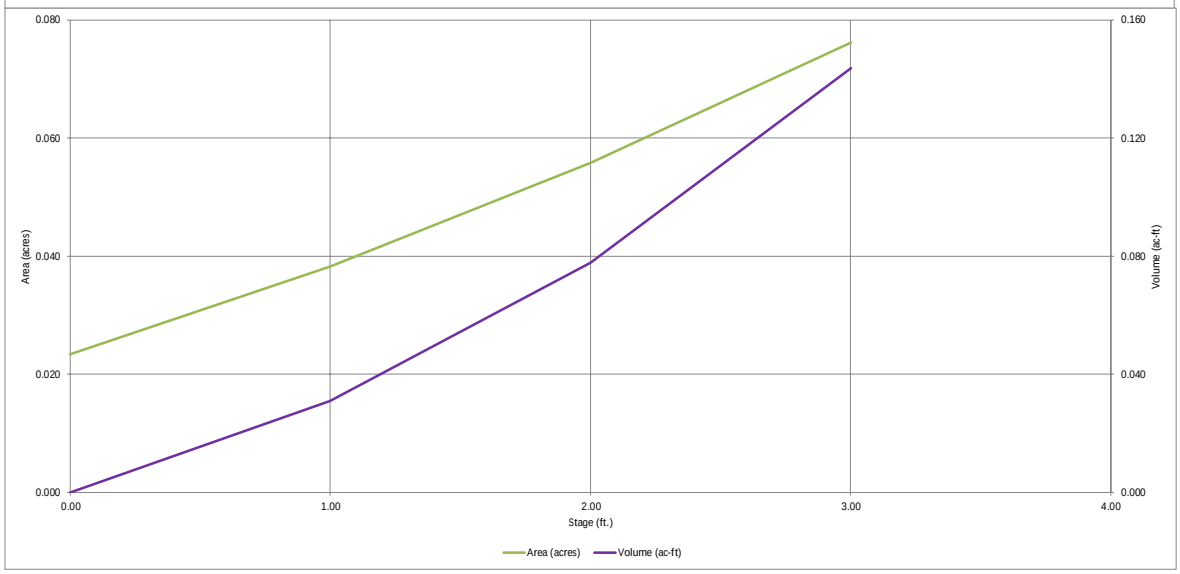
Depth Increment = ft

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)
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

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



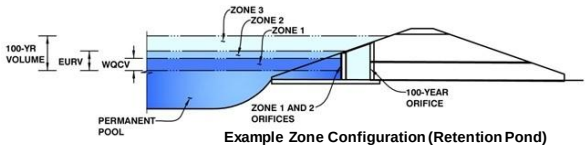


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project:

Basin ID:



Example Zone Configuration (Retention Pond)

	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 =	1.88	ft (distance below the filtration media surface)	Underdrain Orifice Area =	0.0	ft^2
Underdrain Orifice Diameter =	0.82	inches	Underdrain Orifice Centroid =	0.03	feet

Calculated Parameters for Underdrain

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)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =		ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =		inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =		sq. inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

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)								
Orifice Area (sq. inches)								

	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)

	Not Selected	Not Selected				
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =		ft^2
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =		feet
Vertical Orifice Diameter =			inches			

Calculated Parameters for Vertical Orifice

Not Selected	Not Selected

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

	Not Selected	Not Selected				
Overflow Weir Front Edge Height, Ho =	1.69		ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	1.69	feet
Overflow Weir Front Edge Length =	2.60		feet	Overflow Weir Slope Length =	2.60	feet
Overflow Weir Grate Slope =	0.00		H:V	Grate Open Area / 100-yr Orifice Area =		
Horiz. Length of Weir Sides =	2.60		feet	Overflow Grate Open Area w/o Debris =	4.70	ft^2
Overflow Grate Type =	Type C Grate			Overflow Grate Open Area w/ Debris =	2.35	ft^2
Debris Clogging % =	50%		%			

Calculated Parameters for Overflow Weir

Not Selected	Not Selected

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

	Not Selected	Not Selected				
Depth to Invert of Outlet Pipe =			ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =		ft^2
Circular Orifice Diameter =			inches	Outlet Orifice Centroid =		feet
				Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

Not Selected	Not Selected

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=		ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	feet
Spillway Crest Length =		feet	Stage at Top of Freeboard =	feet
Spillway End Slopes =		H:V	Basin Area at Top of Freeboard =	acres
Freeboard above Max Water Surface =		feet	Basin Volume at Top of Freeboard =	acre-ft

Calculated Parameters for Spillway

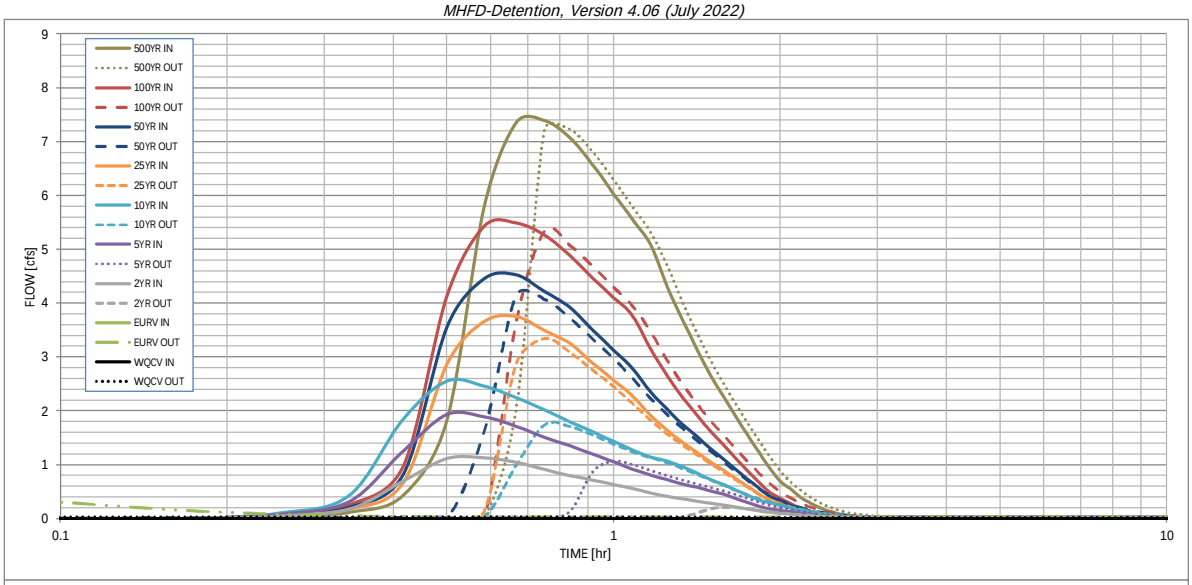
Routed Hydrograph Results

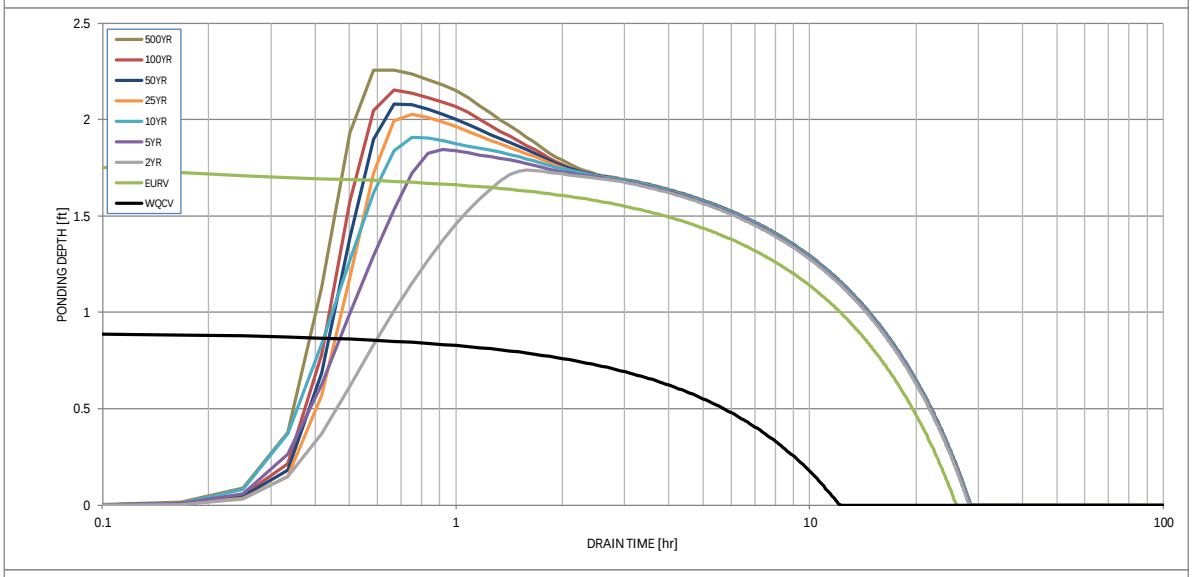
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

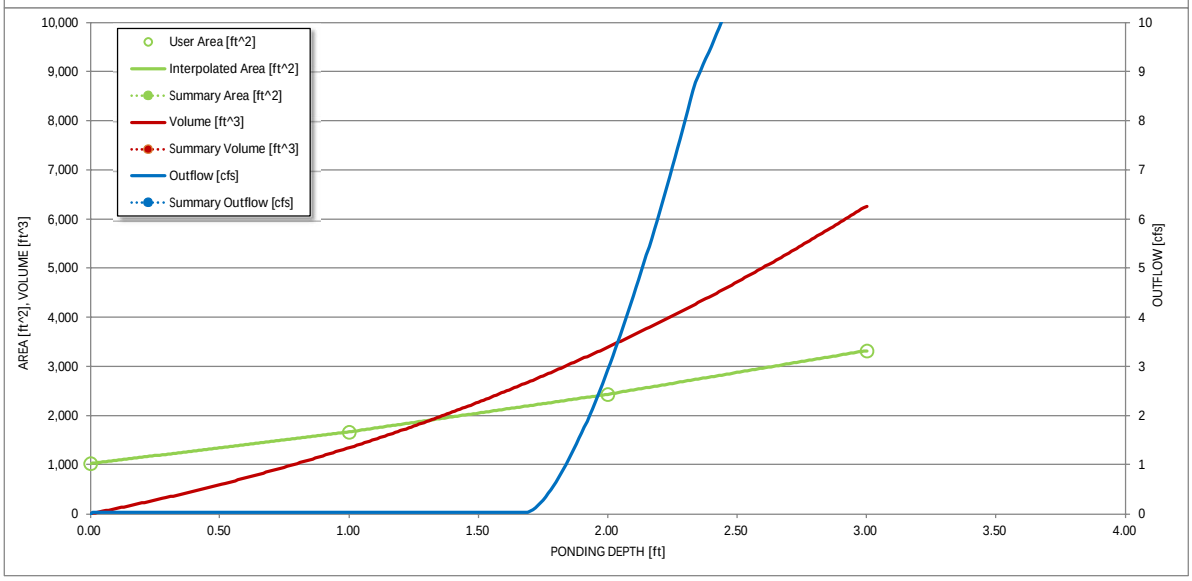
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.027	0.076	0.077	0.130	0.179	0.255	0.312	0.389	0.535
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.077	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 Grate 1 (fps) =	N/A	-0.01	-0.01	0.0	0.0	0.0	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) =	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.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	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