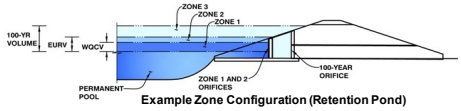
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.07 (June 2025)

Project: SUNSET VILLAGE FILING 4

Basin ID: DETENTION POND #2 (DESIGN POINT B) - REVISED 2026



Example Zone Configuration (Retention Pond)

Watershed Information

Selected SCM Type =	**EDB**	
Watershed Area =	22.23	acres
Watershed Length =	2,000	ft
Watershed Length to Centroid =	400	ft
Watershed Slope =	0.010	ft/ft
Watershed Imperviousness =	34.00%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	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.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.303	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	0.782	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.566	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	0.771	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	0.938	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	1.315	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	1.671	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	2.144	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	3.163	acre-feet		inches
Approximate 2-yr Detention Volume =	0.495	acre-feet		
Approximate 5-yr Detention Volume =	0.658	acre-feet		
Approximate 10-yr Detention Volume =	0.817	acre-feet		
Approximate 25-yr Detention Volume =	1.024	acre-feet		
Approximate 50-yr Detention Volume =	1.172	acre-feet		
Approximate 100-yr Detention Volume =	1.397	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.303	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.480	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.614	acre-feet
Total Detention Basin Volume =	1.397	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

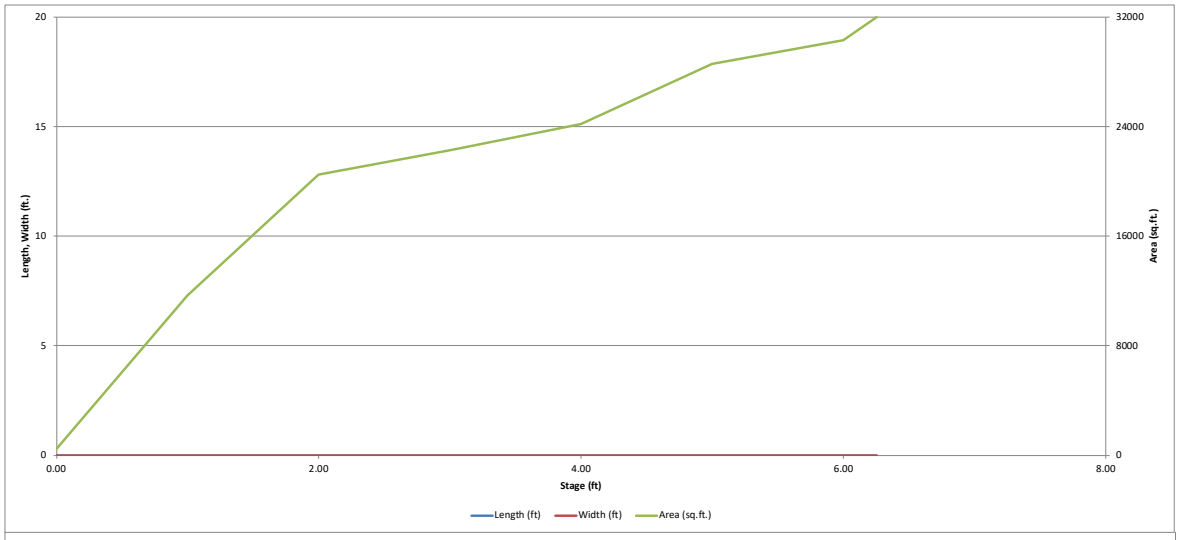
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	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

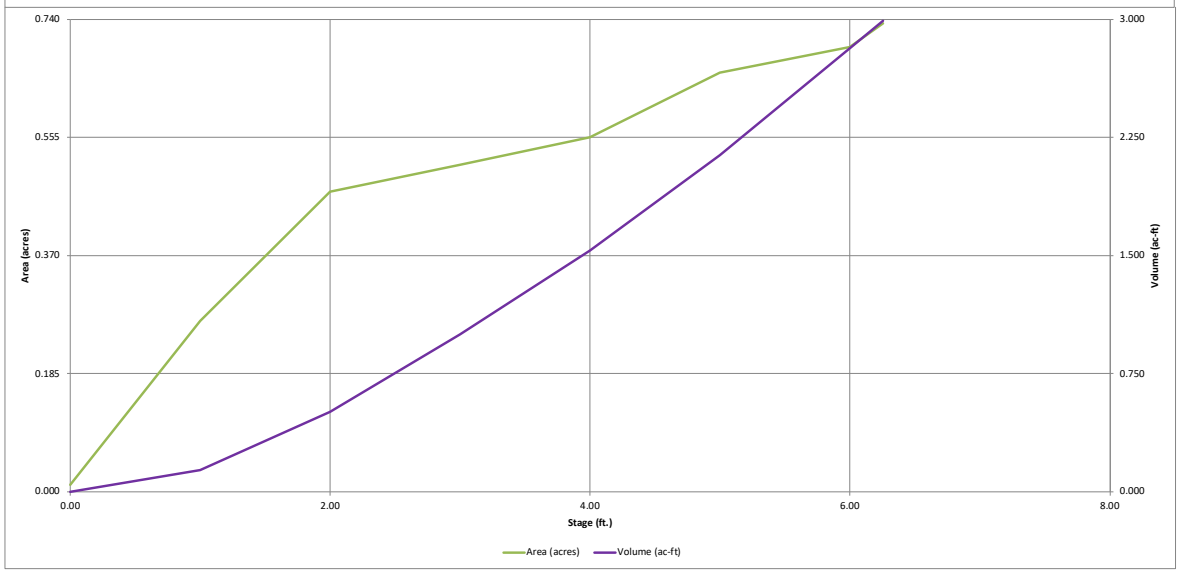
Depth Increment = ft

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)
5735 **Top of Micropool**	--	0.00	--	--	--	483	0.011		
5736	--	1.00	--	--	--	11,671	0.268	6,077	0.140
5737	--	2.00	--	--	--	20,480	0.470	22,152	0.509
5738	--	3.00	--	--	--	22,288	0.512	43,536	0.999
5739	--	4.00	--	--	--	24,167	0.555	66,764	1.533
5740	--	5.00	--	--	--	28,580	0.656	93,137	2.138
5741	--	6.00	--	--	--	30,331	0.696	122,593	2.814
5741.25	--	6.25	--	--	--	32,000	0.735	130,384	2.993

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.07 (June 2025)



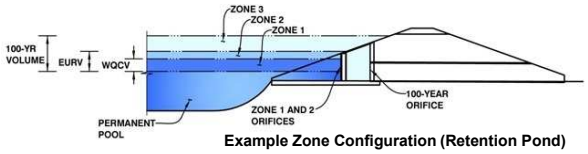


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)

Project: SUNSET VILLAGE FILING 4

Basin ID: DETENTION POND #2 (DESIGN POINT B) - REVISED 2026



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.52	0.303	Orifice Plate
Zone 2 (EURV)	2.57	0.480	Orifice Plate
Zone 3 (100-year)	3.76	0.614	Weir&Pipe (Restrict)
Total (all zones)		1.397	

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

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	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 SCM)

Centroid of Lowest Orifice =	0.00	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 =	4.00	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	10.80	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	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 (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	1.33	2.67					
Orifice Area (sq. inches)	2.85	2.85	20.00					

	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)

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

Calculated Parameters for Vertical Orifice

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

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.00	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	4.00	N/A	feet
Overflow Weir Front Edge Length =	3.00	N/A	feet	Overflow Weir Slope Length =	3.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	6.83	N/A	
Horiz. Length of Weir Sides =	3.00	N/A	feet	Overflow Grate Open Area w/o Debris =	6.26	N/A	ft^2
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	3.13	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.58	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	0.92	N/A	ft^2
Outlet Pipe Diameter =	24.00	N/A	inches	Outlet Orifice Centroid =	0.39	N/A	feet
Restrictor Plate Height Above Pipe Invert =	8.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	1.23	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	5.40	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.21	feet
Spillway Crest Length =	95.00	feet	Stage at Top of Freeboard =	6.61	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.73	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	2.99	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) =	0.303	0.782	0.566	0.771	0.938	1.315	1.671	2.144	3.163
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.566	0.771	0.938	1.315	1.671	2.144	3.163
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.4	0.8	1.0	4.6	8.5	13.3	23.4
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.02	0.03	0.05	0.21	0.38	0.60	1.05
Peak Inflow Q (cfs) =	N/A	N/A	6.2	8.7	10.7	16.7	22.0	28.7	42.2
Peak Outflow Q (cfs) =	0.2	0.3	0.2	0.2	0.5	0.9	1.1	5.7	10.2
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.3	0.4	0.2	0.1	0.4	0.4
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Outlet Plate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.7	1.4
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) =	38	62	54	62	68	71	73	72	68
Time to Drain 99% of Inflow Volume (hours) =	**40**	66	56	66	72	77	80	79	78
Maximum Ponding Depth (ft) =	1.52	2.57	2.04	2.45	2.75	3.39	3.98	4.38	5.16
Area at Maximum Ponding Depth (acres) =	0.37	0.49	0.47	0.49	0.50	0.53	0.55	0.59	0.66
Maximum Volume Stored (acre-ft) =	0.306	0.783	0.523	0.719	0.873	1.197	1.516	1.745	2.237

WQCV WSEL: 5736.52
EURV WSEL: 5737.57
100-YR WSEL: 5739.38
WEIR WSEL: 5739.40 (UNCHANGED)
TOP OF POND: 5741.25 (UNCHANGED)

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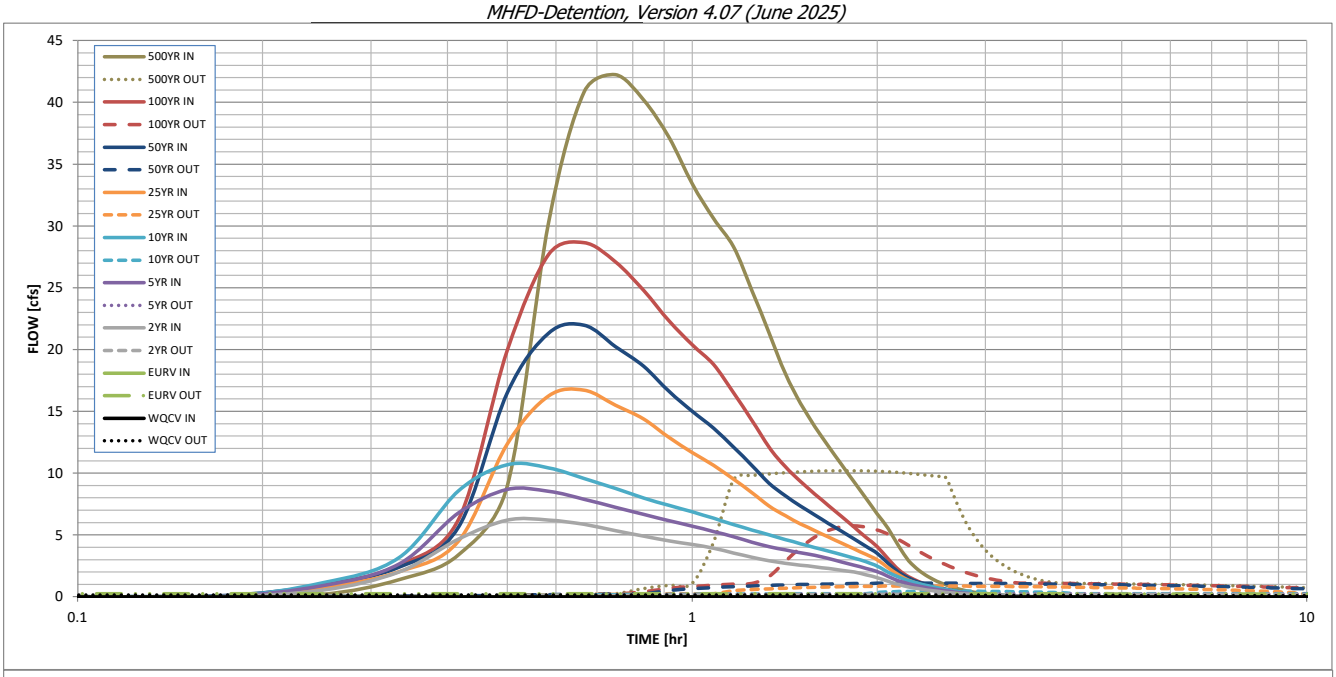

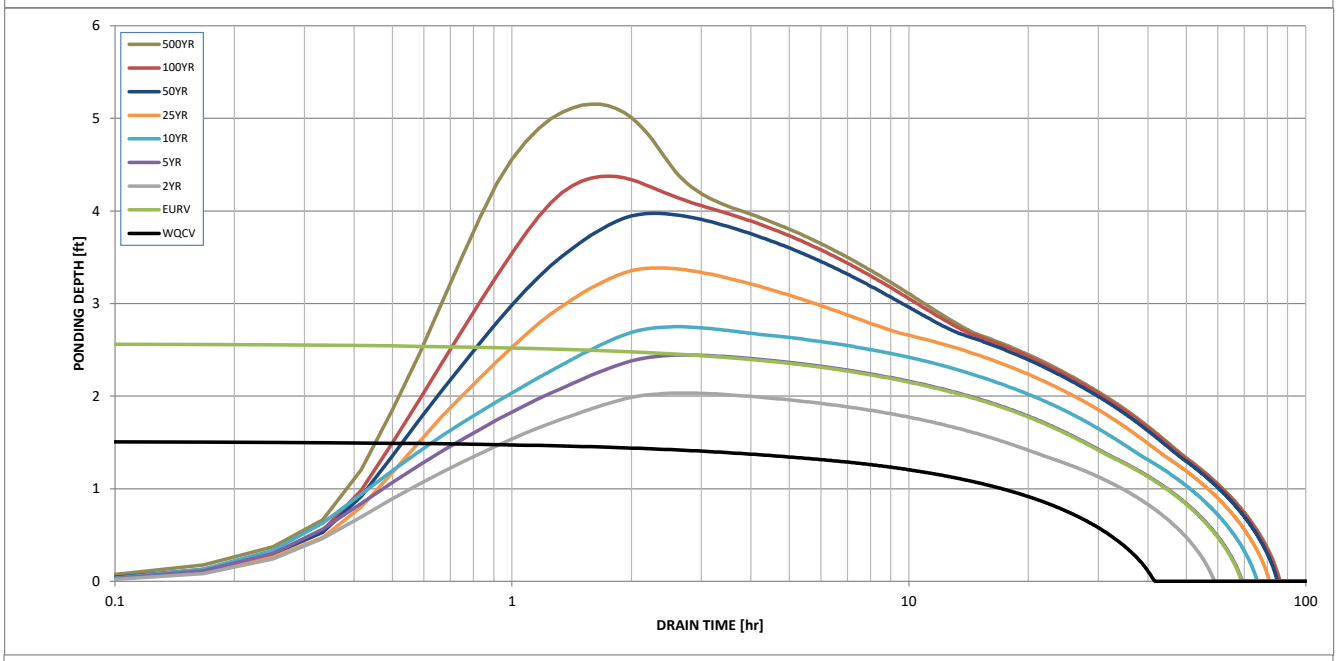

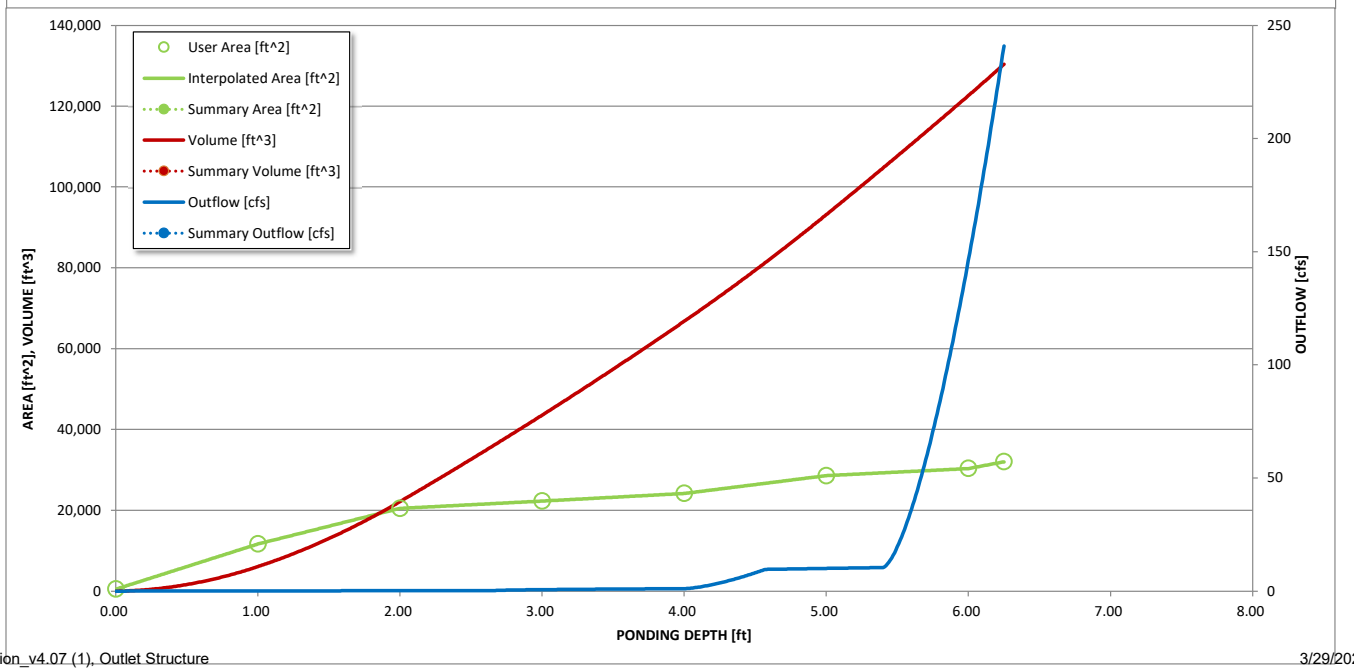

DETENTION BASIN OUTLET STRUCTURE DESIGN

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.21
	0:15:00	0	0.00	0.55	0.90	1.12	0.76	0.97	0.95	1.39
	0:20:00	0	0.00	2.02	2.66	3.18	2.03	2.40	2.57	3.42
	0:25:00	0	0.00	4.67	6.80	8.60	4.53	5.66	6.29	8.97
	0:30:00	0	0.00	6.22	8.70	10.68	12.38	16.52	19.96	30.28
	0:35:00	0	0.00	6.22	8.54	10.44	16.26	21.34	27.70	40.86
	0:40:00	0	0.00	5.87	7.90	9.58	16.73	21.99	28.66	42.24
	0:45:00	0	0.00	5.35	7.24	8.78	15.51	20.25	27.09	40.20
	0:50:00	0	0.00	4.91	6.68	8.00	14.40	18.65	24.79	37.15
	0:55:00	0	0.00	4.54	6.16	7.40	12.89	16.61	22.32	33.41
	1:00:00	0	0.00	4.23	5.72	6.87	11.67	15.02	20.39	30.60
	1:05:00	0	0.00	3.94	5.29	6.35	10.64	13.64	18.79	28.32
	1:10:00	0	0.00	3.56	4.87	5.85	9.52	12.12	16.51	24.80
	1:15:00	0	0.00	3.20	4.43	5.42	8.43	10.64	14.29	21.36
	1:20:00	0	0.00	2.92	4.05	5.02	7.36	9.20	12.10	18.06
	1:25:00	0	0.00	2.73	3.79	4.64	6.57	8.19	10.53	15.66
	1:30:00	0	0.00	2.57	3.57	4.31	5.91	7.34	9.33	13.78
	1:35:00	0	0.00	2.43	3.37	3.99	5.35	6.62	8.31	12.16
	1:40:00	0	0.00	2.29	3.10	3.70	4.83	5.94	7.38	10.69
	1:45:00	0	0.00	2.15	2.82	3.42	4.35	5.31	6.49	9.30
	1:50:00	0	0.00	2.01	2.56	3.14	3.89	4.69	5.64	7.97
	1:55:00	0	0.00	1.78	2.31	2.84	3.43	4.09	4.82	6.71
	2:00:00	0	0.00	1.56	2.04	2.49	3.00	3.52	4.05	5.53
	2:05:00	0	0.00	1.26	1.65	2.00	2.37	2.72	3.07	4.11
	2:10:00	0	0.00	1.00	1.30	1.60	1.78	2.00	2.19	2.93
	2:15:00	0	0.00	0.80	1.05	1.31	1.35	1.51	1.62	2.17
	2:20:00	0	0.00	0.67	0.87	1.09	1.06	1.19	1.25	1.66
	2:25:00	0	0.00	0.55	0.72	0.90	0.85	0.95	0.97	1.27
	2:30:00	0	0.00	0.45	0.60	0.74	0.69	0.77	0.76	0.98
	2:35:00	0	0.00	0.37	0.49	0.61	0.55	0.61	0.59	0.74
	2:40:00	0	0.00	0.30	0.40	0.49	0.44	0.49	0.45	0.56
	2:45:00	0	0.00	0.25	0.32	0.39	0.35	0.38	0.35	0.43
	2:50:00	0	0.00	0.20	0.26	0.31	0.28	0.30	0.28	0.34
	2:55:00	0	0.00	0.16	0.20	0.25	0.22	0.24	0.22	0.27
	3:00:00	0	0.00	0.13	0.16	0.20	0.18	0.19	0.18	0.21
	3:05:00	0	0.00	0.10	0.13	0.15	0.14	0.15	0.14	0.17
	3:10:00	0	0.00	0.08	0.10	0.12	0.10	0.11	0.10	0.12
	3:15:00	0	0.00	0.05	0.07	0.08	0.08	0.08	0.07	0.09
	3:20:00	0	0.00	0.04	0.05	0.06	0.05	0.05	0.05	0.06
	3:25:00	0	0.00	0.02	0.03	0.04	0.03	0.03	0.03	0.03
	3:30:00	0	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.02
	3:35:00	0	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
	3:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	5:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

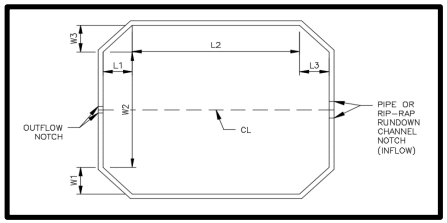
ELX FOREBAY SIZING CALCULATOR

PROJECT: SUNSET VILLAGE FILING NO. 4
DATE: 3/29/2026
DESIGNED BY: CDS
CHECKED BY: CDS
POND OR DP: POND 2

	INNER DIMENSIONS		OUTER DIMENSIONS	
LENGTH				
L1	3.50	FT	4.33	FT
L2	7.00	FT	7.83	FT
L3	3.50	FT	4.33	FT
INNER L	14.00	FT	OUTER TOTAL L	15.666 FT
WIDTH				
W1	3.50	FT	4.33	FT
W2	7.00	FT	7.83	FT
W3	3.50	FT	4.33	FT
INNER W	14.00	FT	OUTER TOTAL W	15.67 FT

BAFFLE (W2x1.50 x 0.83' + 4' x 0.83')
AREA 12.0785 SF

TRIANGLES	24.5	
RECTANGLE	49.0	
BAFFLE	12.0785	
TOTAL SURFACE AREA	**61.4**	**SQ FT**



FOREBAY HT.	**2.5**	**FT**		
FOREBAY VOLUME	**154**	**CF**	SUFFICIENT VOLUME?	**YES**
	5.7	**CY**		
	0.004	**AC-FT**		

Sub-Watershed Imperviousness	0.340	
Sub-Watershed Area	22.2	AC
Sub-Watershed WQCV	0.303	AC-FT
REQ'D VOL (1% SUB-WATERSHED WQCV)	0.003	AC-FT
(per UD-BMP calc)	132	CF
Notch Width per UD-BMP	1.2	in

*t = 5 mins

TABLE 4-12. FOREBAY SIZING CRITERIA

FOREBAY SIZING CRITERIA	WATERSHED IMPERVIOUS AREA (IA)				
	IA UP TO 2 ACRES	IA 2 UP TO 5 ACRES	IA 5 UP TO 10 ACRES	IA 10 UP TO 20 ACRES	IA GREATER THAN 20 ACRES
Forebay Release Rate and Configuration	Concrete sediment pad with dense grasses surrounding, concrete pad with slotted metal edge, or similar design	Size to drain in 4 to 5 minutes using Equation 4-1			
Minimum Forebay Volume [1]		1% of WQCV			
Forebay Depth [1]		12 to 15 inches	15 to 18 inches	18 to 24 inches	24 to 30 inches

[1] Appropriate volume and depth should consider maintenance and access needs. The values provided are approximate and provide a starting point for design.

$$w = 9.23\ (A_{FB} / t)\ (1 / \sqrt{h_{max}})$$ **Equation 4-1**

Where:

w = width of the rectangular vertical notch (inches)

A_{FB} = surface area of the forebay (square feet)

t = emptying time of the brim-full forebay (seconds)

h_{max} = maximum depth of the forebay (feet)

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: CARLOS SERRANO, PE
Company: ELX
Date: March 30, 2026
Project: SUNSET VILLAGE FILING NO. 4
Location: POND B

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a — I_a = 34.0 %

B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$) — i = 0.340

C) Contributing Watershed Area — Area = 22.230 ac

D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm — d_6 = in

E) Design Concept (Select EURV when also designing for flood control)

Choose One
- ○ Water Quality Capture Volume (WQCV)
- ◉ Excess Urban Runoff Volume (EURV)

F) Design Volume (WQCV) Based on 40-hour Drain Time
($V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area$)
V_{DESIGN} = 0.303 ac-ft

G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume
($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN}/0.43))$)
$V_{DESIGN\ OTHER}$ = ac-ft

H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)
$V_{DESIGN\ USER}$ = ac-ft

I) NRCS Hydrologic Soil Groups of Tributary Watershed
i) Percentage of Watershed consisting of Type A Soils — HSG_A = 100 %
ii) Percentage of Watershed consisting of Type B Soils — HSG_B = 0 %
iii) Percentage of Watershed consisting of Type C/D Soils — $HSG_{C/D}$ = 0 %

J) Excess Urban Runoff Volume (EURV) Design Volume
For HSG A: $EURV_A = 1.68 * i^{1.28}$
For HSG B: $EURV_B = 1.36 * i^{1.08}$
For HSG C/D: $EURV_{C/D} = 1.20 * i^{1.08}$
$EURV_{DESIGN}$ = ac-f t

K) User Input of Excess Urban Runoff Volume (EURV) Design Volume (Only if a different EURV Design Volume is desired)
$EURV_{DESIGN\ USER}$ = 0.782 ac-f t

2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)
L : W = 2.0 : 1

3. Basin Side Slopes

A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)
Z = 4.00 ft / ft

4. Inlet

A) Describe means of providing energy dissipation at concentrated inflow locations:

5. Forebay

A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV)
V_{FMIN} = 0.009 ac-ft

B) Actual Forebay Volume
V_F = 0.003 ac-ft **VF < MINIMUM VF**

C) Forebay Depth (D_F = 18 inch maximum)
D_F = 30.0 in **DF > DF MAXIMUM**

D) Forebay Discharge

i) Undetained 100-year Peak Discharge
Q_{100} = 28.70 cfs

ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)
Q_F = 0.57 cfs

E) Forebay Discharge Design

Choose One
- ○ Berm With Pipe
- ◉ Wall with Rect. Notch
- ○ Wall with V-Notch Weir

Flow too small for berm w/ pipe

F) Discharge Pipe Size (minimum 8-inches)
Calculated D_P = in

G) Rectangular Notch Width
Calculated W_N = 6.5 in

Design Procedure Form: Extended Detention Basin (EDB)

Designer: CARLOS SERRANO, PE
Company: ELX
Date: March 30, 2026
Project: SUNSET VILLAGE FILING NO. 4
Location: POND B

6. Trickle Channel

A) Type of Trickle Channel — Choose One: (●) Concrete ( ) Soft Bottom

F) Slope of Trickle Channel — S = 0.0050 ft / ft

7. Micropool and Outlet Structure

A) Depth of Micropool (2.5-feet minimum) — D_M = 2.5 ft

B) Surface Area of Micropool (10 ft^2 minimum) — A_M = 15 sq ft

C) Outlet Type — Choose One: (●) Orifice Plate ( ) Other (Describe):

D) Smallest Dimension of Orifice Opening Based on Hydrograph Routing (Use UD-Detention) — $D_{orifice}$ = inches

E) Total Outlet Area — A_{ot} = square inches

8. Initial Surcharge Volume

A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches) — D_{IS} = in

B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV) — V_{IS} = 40 cu ft

C) Initial Surcharge Provided Above Micropool — V_s = cu ft

9. Trash Rack

A) Water Quality Screen Open Area: $A_t = A_{ot} * 38.5*(e^{-0.095D})$ — A_t = square inches

B) Type of Screen (If specifying an alternative to the materials recommended in the USDCM, indicate "other" and enter the ratio of the total open are to the total screen are for the material specified.)

Other (Y/N): N

C) Ratio of Total Open Area to Total Area (only for type 'Other') — User Ratio =

D) Total Water Quality Screen Area (based on screen type) — A_{total} = sq. in.

E) Depth of Design Volume (EURV or WQCV) (Based on design concept chosen under 1E) — H= feet

F) Height of Water Quality Screen (H_{TR}) — H_{TR}= inches

G) Width of Water Quality Screen Opening ($W_{opening}$) (Minimum of 12 inches is recommended) — $W_{opening}$ = inches