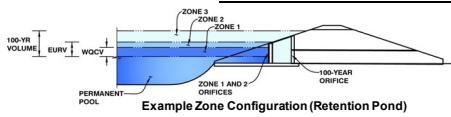


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: **Falcon Field Filing 1**

Basin ID: **Pond B**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB
Watershed Area =	14.77 acres
Watershed Length =	915 ft
Watershed Length to Centroid =	450 ft
Watershed Slope =	0.030 ft/ft
Watershed Imperviousness =	89.40% 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.

Water Quality Capture Volume (WQCV) =	0.488 acre-feet
Excess Urban Runoff Volume (EURV) =	1.792 acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	1.212 acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	1.562 acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	1.844 acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	2.153 acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	2.455 acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	2.795 acre-feet
500-yr Runoff Volume (P1 = 3.49 in.) =	3.992 acre-feet
Approximate 2-yr Detention Volume =	1.182 acre-feet
Approximate 5-yr Detention Volume =	1.532 acre-feet
Approximate 10-yr Detention Volume =	1.820 acre-feet
Approximate 25-yr Detention Volume =	2.146 acre-feet
Approximate 50-yr Detention Volume =	2.336 acre-feet
Approximate 100-yr Detention Volume =	2.501 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
3.49	inches

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.488 acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.304 acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.709 acre-feet
Total Detention Basin Volume =	2.501 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 _{MAN}) =	user ft
Length of Main Basin (L _{MAN}) =	user ft
Width of Main Basin (W _{MAN}) =	user ft
Area of Main Basin (A _{MAN}) =	user ft ²
Volume of Main Basin (V _{MAN}) =	user ft ³
Calculated Total Basin Volume (V _{total}) =	user acre-feet

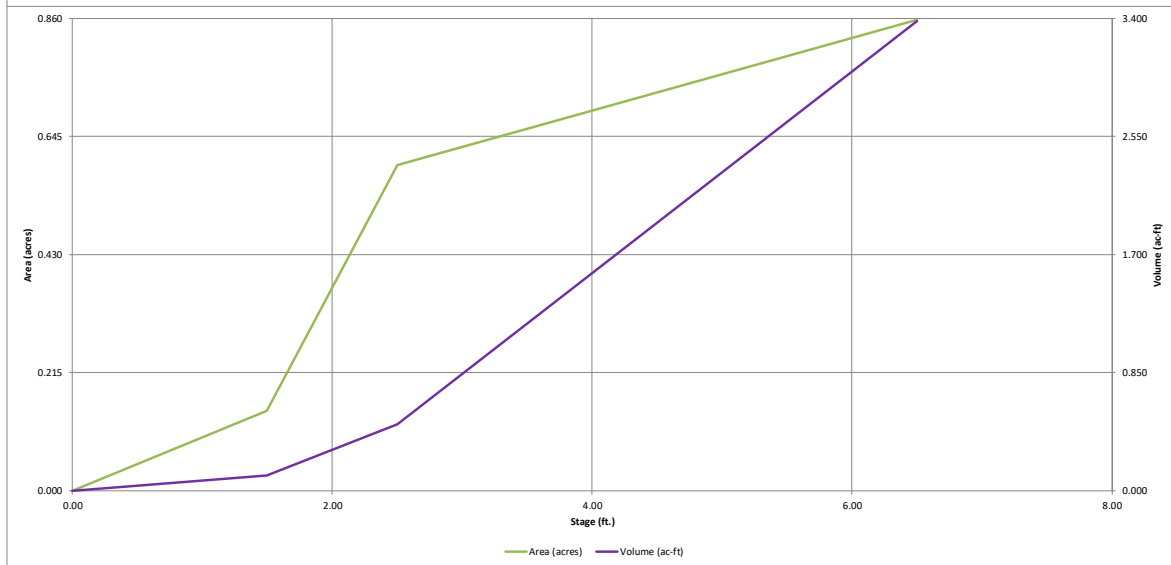
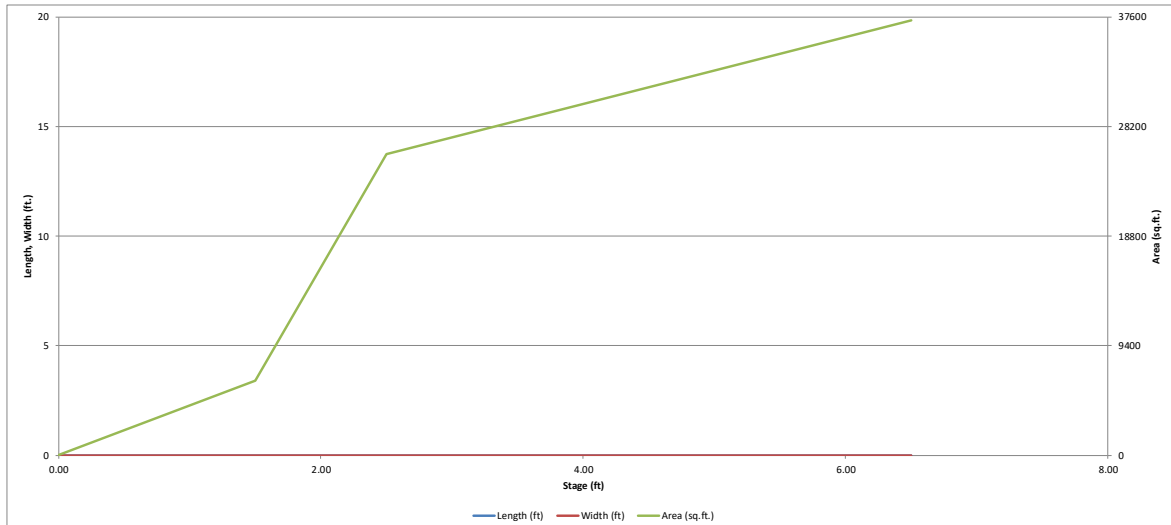
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft ²)	Optional Override Area (ft ²)	Area (acre)	Volume (ft ³)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6827	--	1.50	--	--	--	6,362	0.146	4,801	0.110
6828	--	2.50	--	--	--	25,828	0.593	20,896	0.480
6832	--	6.50	--	--	--	37,351	0.857	147,254	3.380

see comments on drainage report, address, and resubmit

EPC STORMWATER REVIEW COMMENTS
IN ORANGE BOXES WITH BLACK TEXT

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

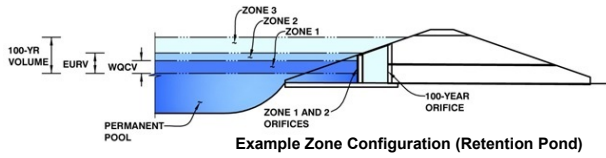
MHFD-Detention, Version 4.06 (July 2022)



DETENTION BASIN OUTLET STRUCTURE DESIGN

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

Project: Falcon Field Filing 1
Basin ID: Pond B



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.52	0.488	Orifice Plate
Zone 2 (EURV)	4.50	1.304	Orifice Plate
Zone 3 (100-year)	5.43	0.709	Weir&Pipe (Circular)
Total (all zones)		2.501	

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

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

Calculated Parameters for Underdrain	
Underdrain Orifice Area =	N/A ft ²
Underdrain Orifice Centroid =	N/A 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 =	4.50	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	15.10	inches
Orifice Plate: Orifice Area per Row =	N/A	sq. inches

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

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	1.50	3.00					
Orifice Area (sq. inches)	2.57	2.50	12.00					

	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	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orific	
Vertical Orifice Area =	N/A N/A
Vertical Orifice Centroid =	N/A N/A

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

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.55	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	6.50	N/A	feet
Overflow Weir Gate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	6.50	N/A	feet
Overflow Gate Type =	Type C Gate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir	
Height of Gate Upper Edge, H ₁ =	4.55 N/A
Overflow Weir Slope Length =	6.50 N/A
Gate Open Area / 100-yr Orifice Area =	16.64 N/A
Overflow Gate Open Area w/o Debris =	29.41 N/A
Overflow Gate Open Area w/ Debris =	14.70 N/A

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

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	18.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate	
Outlet Orifice Area =	1.77 N/A
Outlet Orifice Centroid =	0.75 N/A
Half-Central Angle of Restrictor Plate on Pipe =	N/A N/A

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	4.97	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	50.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway	
Spillway Design Flow Depth =	0.53 feet
Stage at Top of Freeboard =	6.50 feet
Basin Area at Top of Freeboard =	0.86 acres
Basin Volume at Top of Freeboard =	3.38 acre-ft

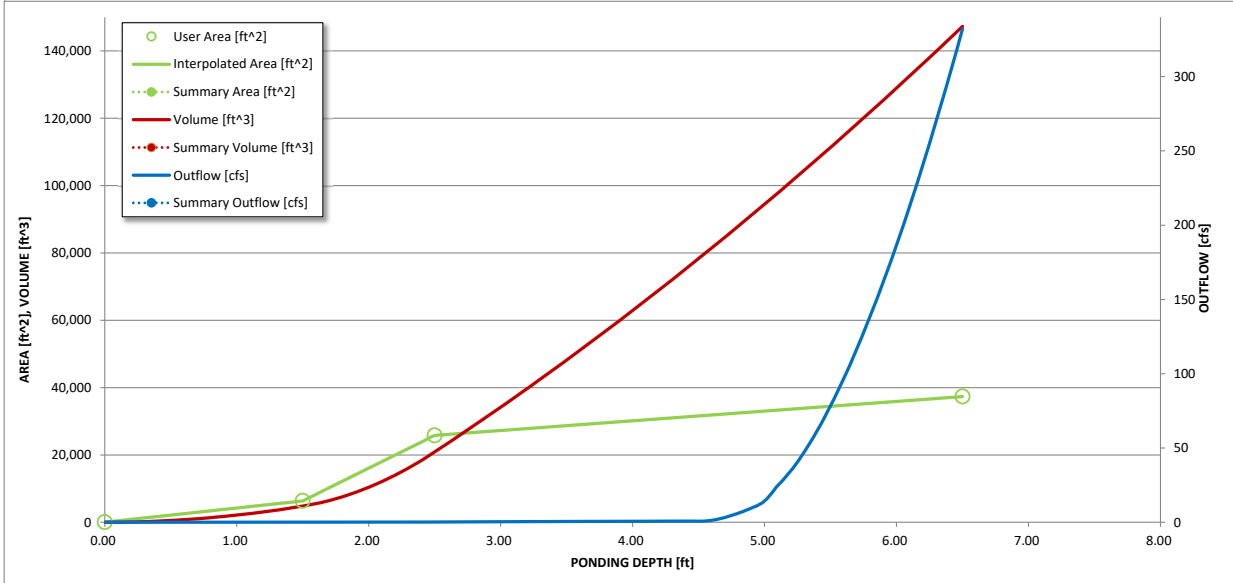
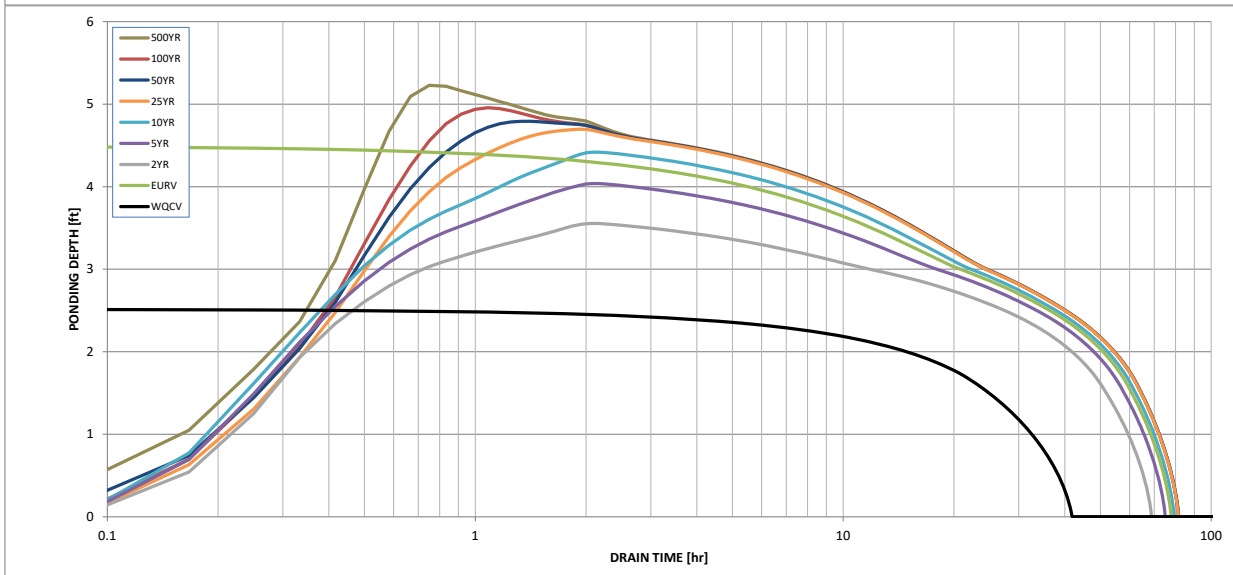
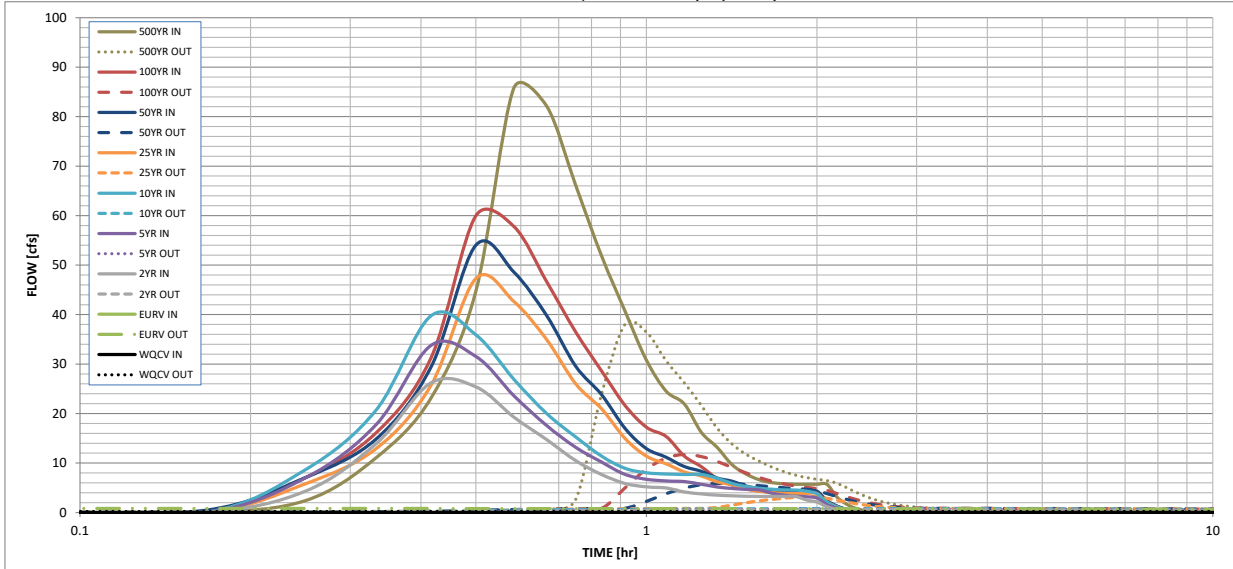
Routed Hydrograph Results

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
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52
One-Hour Rainfall Depth (in) =	N/A	N/A	1.212	1.562	1.844	2.153	2.455	2.795
CUHP Runoff Volume (acre-ft) =	0.488	1.792	1.212	1.562	1.844	2.153	2.455	2.795
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	1.212	1.562	1.844	2.153	2.455	2.795
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.1	0.3	0.4	3.5	7.0	11.4
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A						
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.02	0.03	0.24	0.47	0.77
Peak Inflow Q (cfs) =	N/A	N/A	26.2	33.8	39.8	47.3	54.0	59.9
Peak Outflow Q (cfs) =	0.2	0.8	0.6	0.7	0.8	3.2	5.9	11.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	2.5	2.0	0.9	0.8	1.0
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1
Max Velocity through Gate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.1	0.2	0.4
Max Velocity through Gate 2 (fps) =	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	68	62	66	69	70	69	68
Time to Drain 99% of Inflow Volume (hours) =	40	74	66	71	75	76	76	76
Maximum Ponding Depth (ft) =	2.52	4.50	3.55	4.04	4.42	4.70	4.79	4.96
Area at Maximum Ponding Depth (acres) =	0.59	0.73	0.66	0.69	0.72	0.74	0.74	0.75
Maximum Volume Stored (acre-ft) =	0.492	1.798	1.139	1.464	1.733	1.937	2.011	2.131

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	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
	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	0.48	0.05	2.40
	0:15:00	0.00	0.00	4.31	7.01	8.66	5.81	7.08	7.04	11.06
	0:20:00	0.00	0.00	13.90	17.77	20.69	12.91	14.85	16.12	23.14
	0:25:00	0.00	0.00	26.20	33.76	39.76	25.71	29.40	31.26	44.71
	0:30:00	0.00	0.00	25.39	31.54	35.92	47.27	54.00	59.95	85.72
	0:35:00	0.00	0.00	19.28	23.63	26.93	42.66	48.62	57.84	82.10
	0:40:00	0.00	0.00	14.72	17.58	20.00	34.93	39.79	46.64	66.13
	0:45:00	0.00	0.00	10.48	13.17	15.28	26.00	29.57	36.50	51.85
	0:50:00	0.00	0.00	7.68	10.19	11.40	20.96	23.81	28.60	40.72
	0:55:00	0.00	0.00	5.88	7.70	8.93	14.98	17.01	21.66	30.79
	1:00:00	0.00	0.00	5.18	6.72	8.05	11.39	12.93	17.24	24.53
	1:05:00	0.00	0.00	4.95	6.38	7.79	9.85	11.18	15.39	21.95
	1:10:00	0.00	0.00	4.16	6.24	7.69	8.21	9.29	11.39	16.21
	1:15:00	0.00	0.00	3.76	5.72	7.67	7.38	8.34	9.26	13.16
	1:20:00	0.00	0.00	3.51	5.17	6.92	6.19	6.98	6.84	9.64
	1:25:00	0.00	0.00	3.38	4.86	5.87	5.60	6.31	5.55	7.78
	1:30:00	0.00	0.00	3.29	4.68	5.26	4.75	5.34	4.74	6.61
	1:35:00	0.00	0.00	3.25	4.58	4.90	4.29	4.83	4.34	6.03
	1:40:00	0.00	0.00	3.25	3.89	4.69	4.04	4.54	4.19	5.81
	1:45:00	0.00	0.00	3.25	3.52	4.58	3.91	4.40	4.13	5.72
	1:50:00	0.00	0.00	3.25	3.30	4.54	3.85	4.33	4.13	5.72
	1:55:00	0.00	0.00	2.53	3.18	4.33	3.82	4.30	4.13	5.72
	2:00:00	0.00	0.00	2.13	2.93	3.79	3.82	4.30	4.13	5.72
	2:05:00	0.00	0.00	1.17	1.61	2.11	2.13	2.40	2.30	3.18
	2:10:00	0.00	0.00	0.63	0.89	1.15	1.19	1.33	1.28	1.77
	2:15:00	0.00	0.00	0.30	0.46	0.58	0.61	0.68	0.66	0.91
	2:20:00	0.00	0.00	0.13	0.22	0.26	0.29	0.33	0.32	0.44
	2:25:00	0.00	0.00	0.04	0.06	0.07	0.09	0.10	0.10	0.13
	2:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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

Pond B

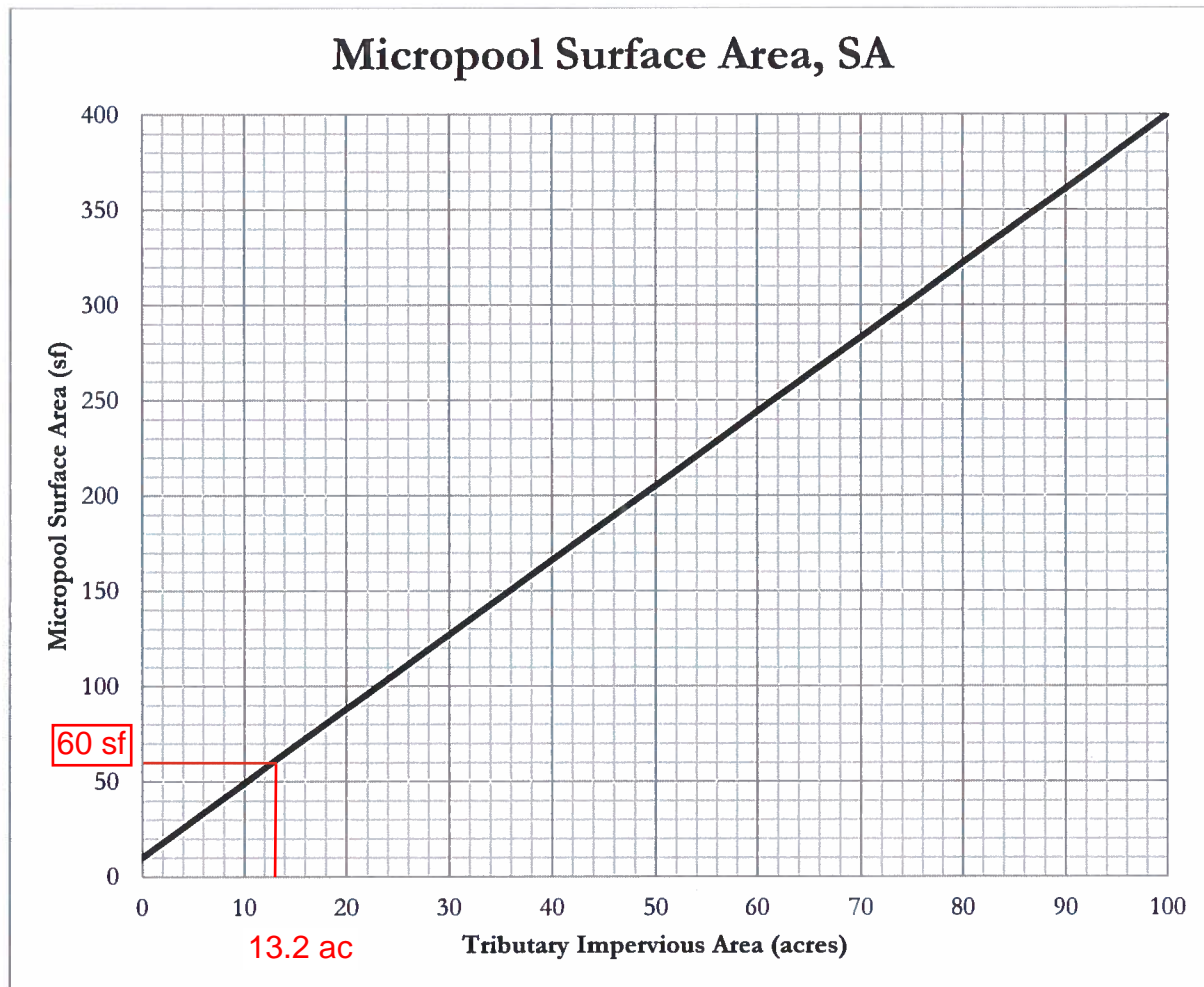


Figure 1 – Micropool surface area (SA) determination chart

The tributary impervious area is the effective number of impervious acres that will be treated by the extended detention basin (EDB). It is calculated by multiplying the tributary area to be treated by the impervious fraction of that area.

$$TIA = I \times A = (89.4/100) \times 14.8 \text{ ac} = 13.2 \text{ ac}$$

TIA = Tributary impervious area (acres)
I = Imperviousness (fraction)
A = Tributary catchment area upstream (acres)

For EDBs with tributary impervious areas greater than 100 acres, the micropool surface area is 400 sf. The initial surcharge depth (ISD) is defined as the depth of the initial surcharge volume (ISV). The surface area determined using Figure 1 assumes an ISD of 4 inches. The initial surcharge volume is thus calculated by multiplying the micropool surface area by 4 inches.

$$ISV = SA \times 4 \text{ inches}$$

ISV = Initial surcharge volume (cf)
SA = Surface area (from Figure 1, sf)

Figure 13-12c. Emergency Spillway Protection

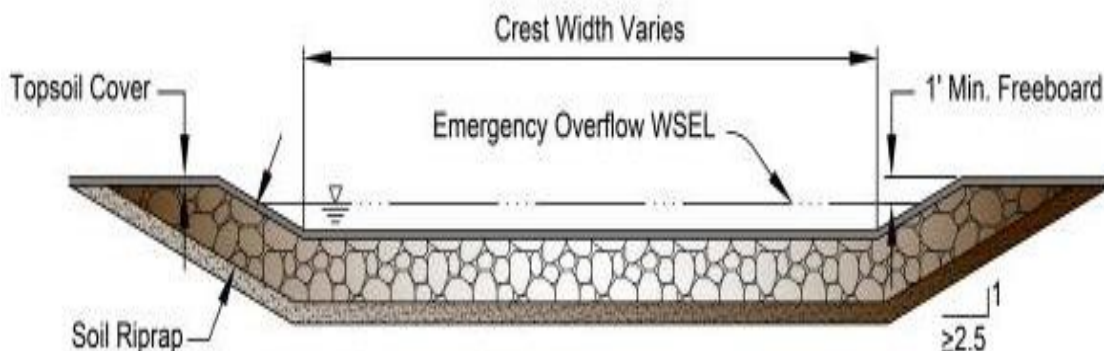
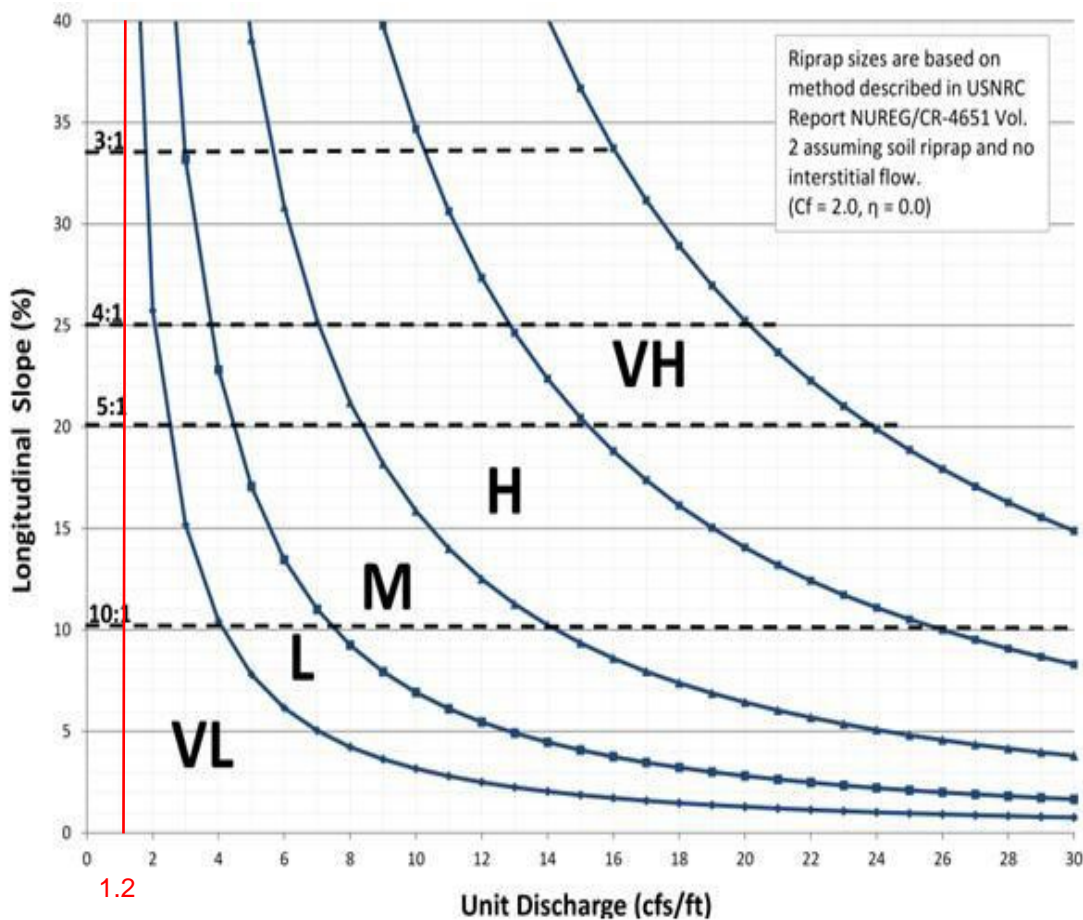


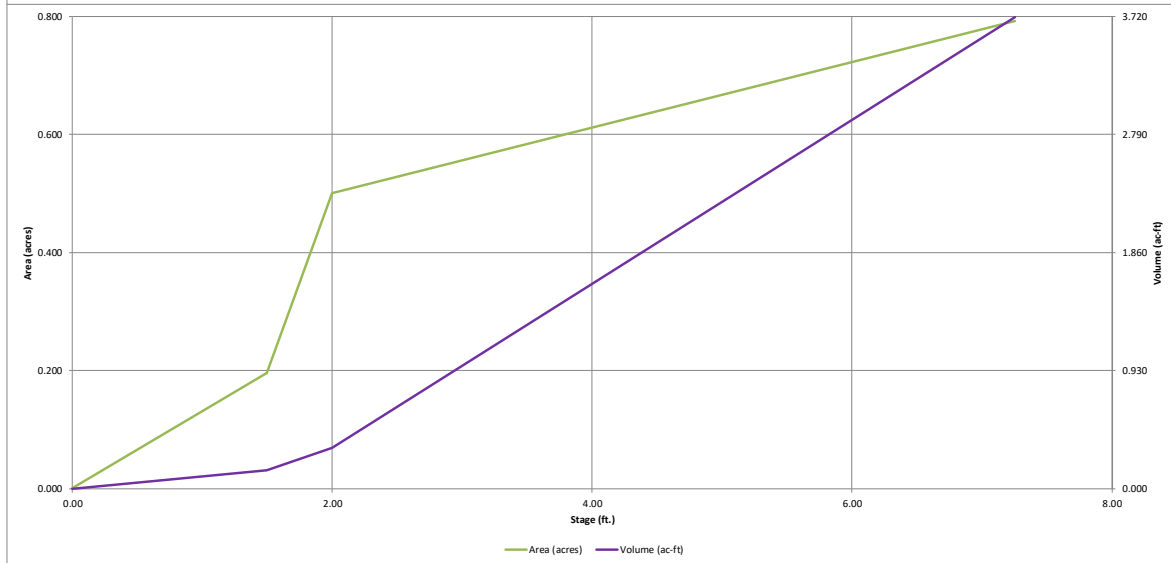
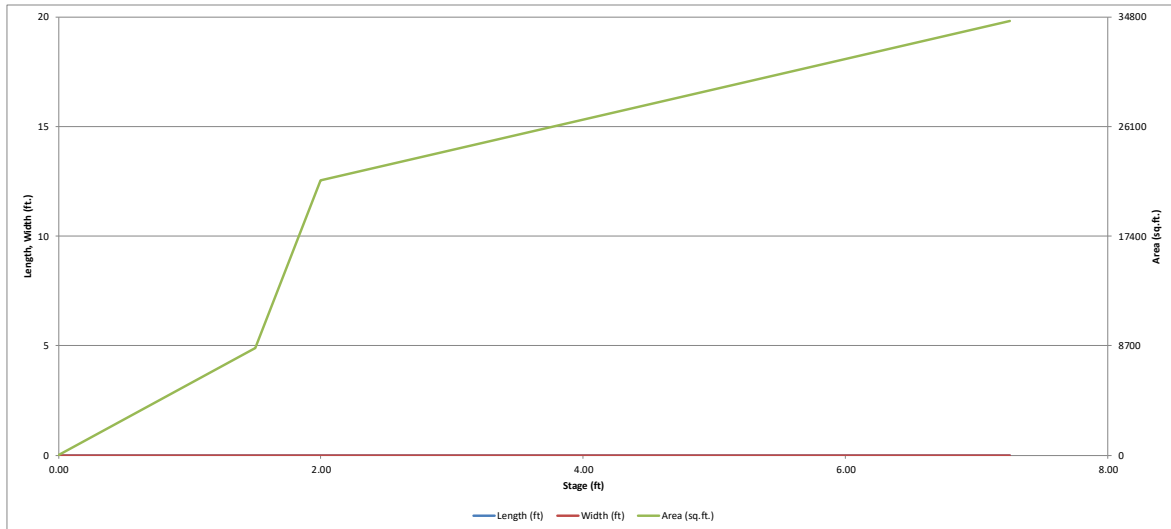
Figure 13-12d. Riprap Types for Emergency Spillway Protection



Q100=59.9 cfs
 Spillway length=50 ft
 59.9 cfs/50 ft = 1.2 cfs/ft

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

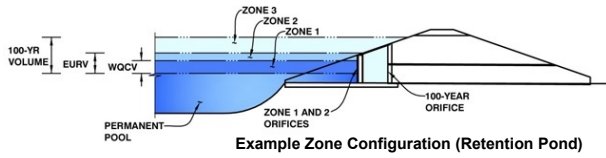
MHFD-Detention, Version 4.06 (July 2022)



DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: Falcon Field Filing 1
Basin ID: Pond C - INTERIM CONDITION



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.98	0.308	Orifice Plate
Zone 2 (EURV)	2.82	0.439	Orifice Plate
Zone 3 (100-year)	3.91	0.630	Weir&Pipe (Restrict)
Total (all zones)		1.377	

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

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

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	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 =	3.91	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	N/A	sq. inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

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	1.30	2.61	3.73				
Orifice Area (sq. inches)	2.05	2.05	10.00	96.00				

	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	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orific

	Not Selected	Not Selected
Vertical Orifice Area =	N/A	N/A
Vertical Orifice Centroid =	N/A	N/A

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

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.85	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	3.92	N/A	feet
Overflow Weir Gate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	3.92	N/A	feet
Overflow Gate Type =	Type C Gate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected
Height of Gate Upper Edge, H _t =	4.85	N/A
Overflow Weir Slope Length =	3.92	N/A
Gate Open Area / 100-yr Orifice Area =	6.81	N/A
Overflow Gate Open Area w/o Debris =	10.70	N/A
Overflow Gate Open Area w/ Debris =	5.35	N/A

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	1.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	24.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	12.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected
Outlet Orifice Area =	1.57	N/A
Outlet Orifice Centroid =	0.58	N/A
Half-Central Angle of Restrictor Plate on Pipe =	1.57	N/A

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	5.69	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	58.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth =	0.55	feet
Stage at Top of Freeboard =	7.24	feet
Basin Area at Top of Freeboard =	0.79	acres
Basin Volume at Top of Freeboard =	3.71	acre-ft

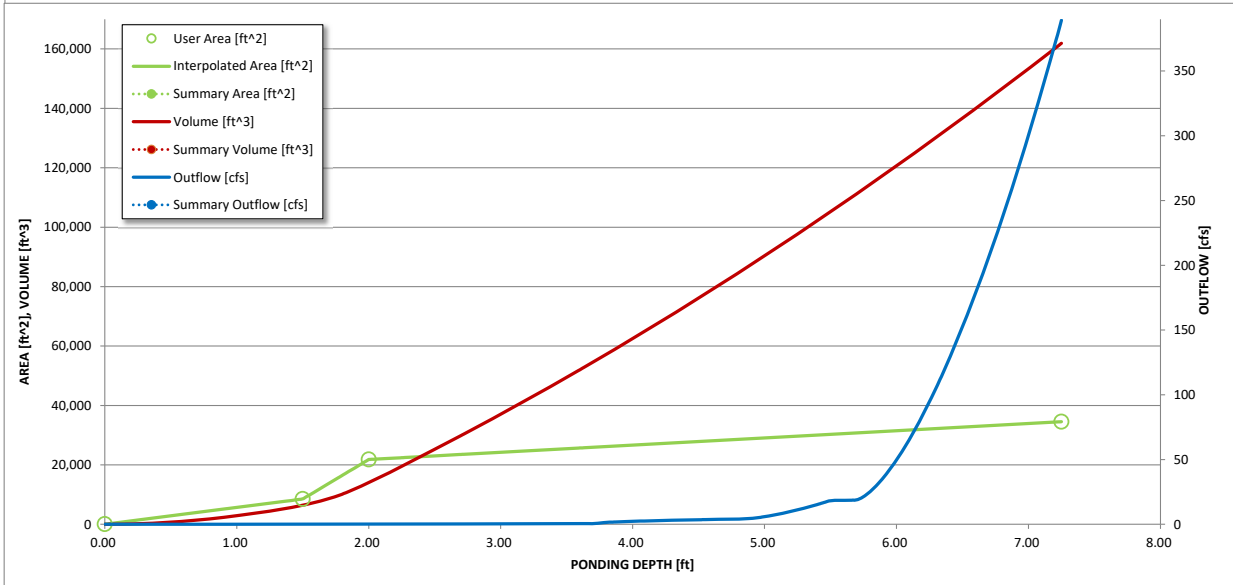
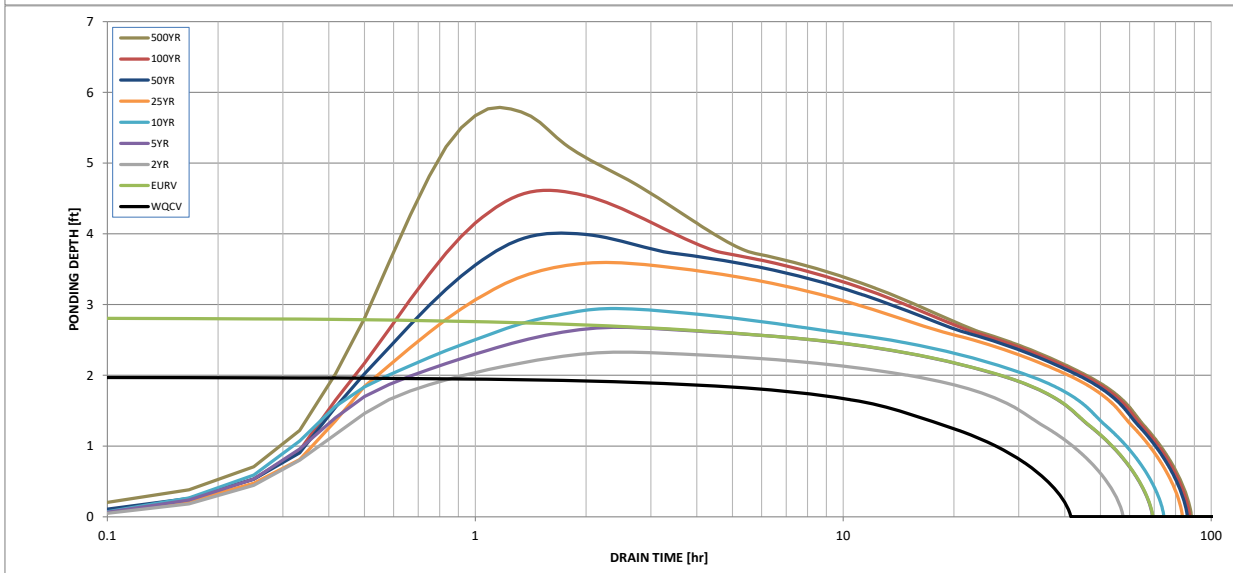
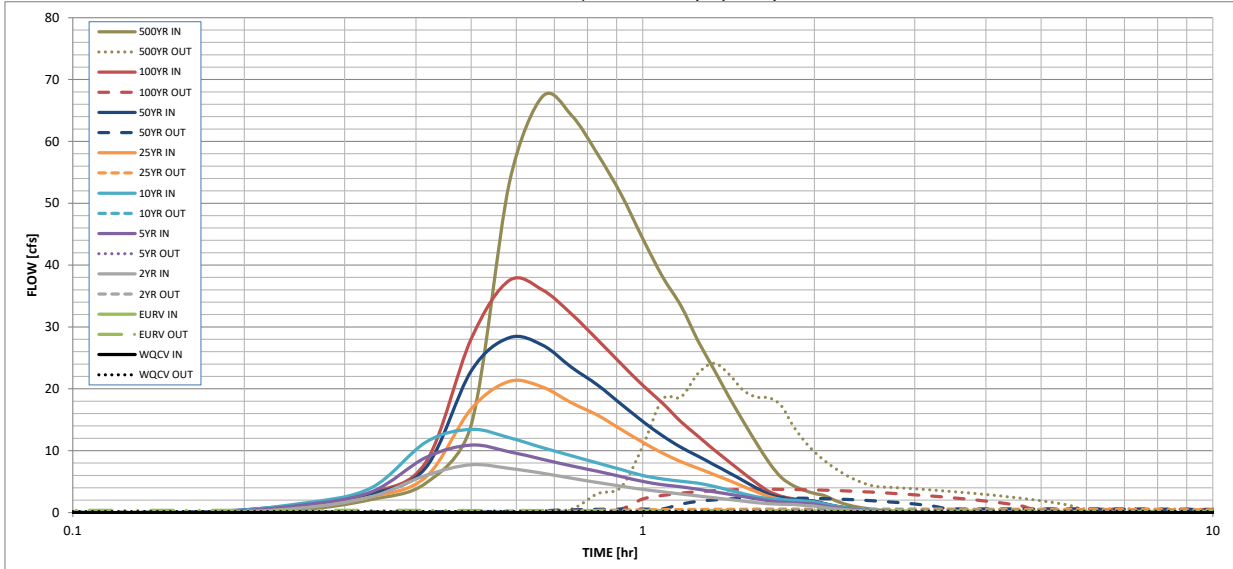
Routed Hydrograph Results

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
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52
One-Hour Rainfall Depth (in) =	0.308	0.747	0.520	0.713	0.875	1.271	1.642	2.138
CUHP Runoff Volume (acre-ft) =	N/A	N/A	0.520	0.713	0.875	1.271	1.642	2.138
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.2	0.5	0.7	5.9	11.6	19.1
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.01	0.02	0.03	0.25	0.49	0.80
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A	7.7	10.9	13.4	21.2	28.3	37.5
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.2	0.3	0.4	0.6	2.3	3.8
Peak Inflow Q (cfs) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Peak Outflow Q (cfs) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate
Max Velocity through Gate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Gate 2 (fps) =	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	63	52	63	67	73	74	72
Time to Drain 99% of Inflow Volume (hours) =	40	66	55	66	71	79	81	81
Maximum Ponding Depth (ft) =	1.98	2.82	2.33	2.68	2.94	3.59	4.01	4.62
Area at Maximum Ponding Depth (acres) =	0.49	0.55	0.52	0.54	0.55	0.59	0.61	0.65
Maximum Volume Stored (acre-ft) =	0.312	0.751	0.485	0.670	0.817	1.188	1.435	1.818

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	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
	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	0.08	0.01	0.42
	0:15:00	0.00	0.00	0.70	1.14	1.44	0.98	1.23	1.21	2.08
	0:20:00	0.00	0.00	2.52	3.30	3.94	2.51	2.96	3.18	4.78
	0:25:00	0.00	0.00	6.03	8.91	11.39	5.77	7.31	8.20	14.16
	0:30:00	0.00	0.00	7.72	10.90	13.44	16.74	22.89	28.08	53.25
	0:35:00	0.00	0.00	7.13	9.83	12.09	21.20	28.27	37.51	67.24
	0:40:00	0.00	0.00	6.36	8.60	10.50	20.28	27.07	35.99	64.22
	0:45:00	0.00	0.00	5.54	7.53	9.18	17.73	23.46	32.09	57.93
	0:50:00	0.00	0.00	4.85	6.66	8.00	15.73	20.61	27.92	51.38
	0:55:00	0.00	0.00	4.25	5.81	6.94	13.42	17.51	24.01	44.29
	1:00:00	0.00	0.00	3.73	5.03	6.00	11.36	14.74	20.58	38.13
	1:05:00	0.00	0.00	3.36	4.50	5.42	9.61	12.40	17.68	33.42
	1:10:00	0.00	0.00	2.99	4.15	5.06	8.22	10.54	14.68	27.78
	1:15:00	0.00	0.00	2.68	3.77	4.74	7.16	9.12	12.34	23.14
	1:20:00	0.00	0.00	2.39	3.36	4.23	6.14	7.73	10.16	18.69
	1:25:00	0.00	0.00	2.11	2.96	3.62	5.18	6.43	8.20	14.77
	1:30:00	0.00	0.00	1.84	2.58	3.05	4.23	5.16	6.42	11.22
	1:35:00	0.00	0.00	1.60	2.24	2.56	3.35	3.97	4.77	8.03
	1:40:00	0.00	0.00	1.42	1.88	2.24	2.58	2.95	3.39	5.67
	1:45:00	0.00	0.00	1.34	1.67	2.08	2.11	2.40	2.64	4.39
	1:50:00	0.00	0.00	1.30	1.55	1.98	1.86	2.12	2.25	3.61
	1:55:00	0.00	0.00	1.16	1.46	1.88	1.72	1.95	2.00	3.09
	2:00:00	0.00	0.00	1.04	1.36	1.73	1.62	1.84	1.83	2.72
	2:05:00	0.00	0.00	0.83	1.08	1.37	1.28	1.44	1.40	2.02
	2:10:00	0.00	0.00	0.64	0.84	1.06	0.98	1.09	1.03	1.45
	2:15:00	0.00	0.00	0.50	0.65	0.82	0.75	0.83	0.77	1.06
	2:20:00	0.00	0.00	0.39	0.50	0.63	0.57	0.63	0.59	0.79
	2:25:00	0.00	0.00	0.30	0.38	0.47	0.43	0.47	0.44	0.59
	2:30:00	0.00	0.00	0.23	0.29	0.35	0.32	0.35	0.33	0.44
	2:35:00	0.00	0.00	0.17	0.21	0.26	0.24	0.26	0.24	0.32
	2:40:00	0.00	0.00	0.13	0.16	0.20	0.18	0.19	0.18	0.24
	2:45:00	0.00	0.00	0.09	0.11	0.14	0.13	0.14	0.13	0.17
	2:50:00	0.00	0.00	0.06	0.08	0.10	0.09	0.09	0.09	0.11
	2:55:00	0.00	0.00	0.04	0.05	0.06	0.05	0.06	0.05	0.06
	3:00:00	0.00	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.03
	3:05:00	0.00	0.00	0.01	0.01	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	0.00
	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

Pond C

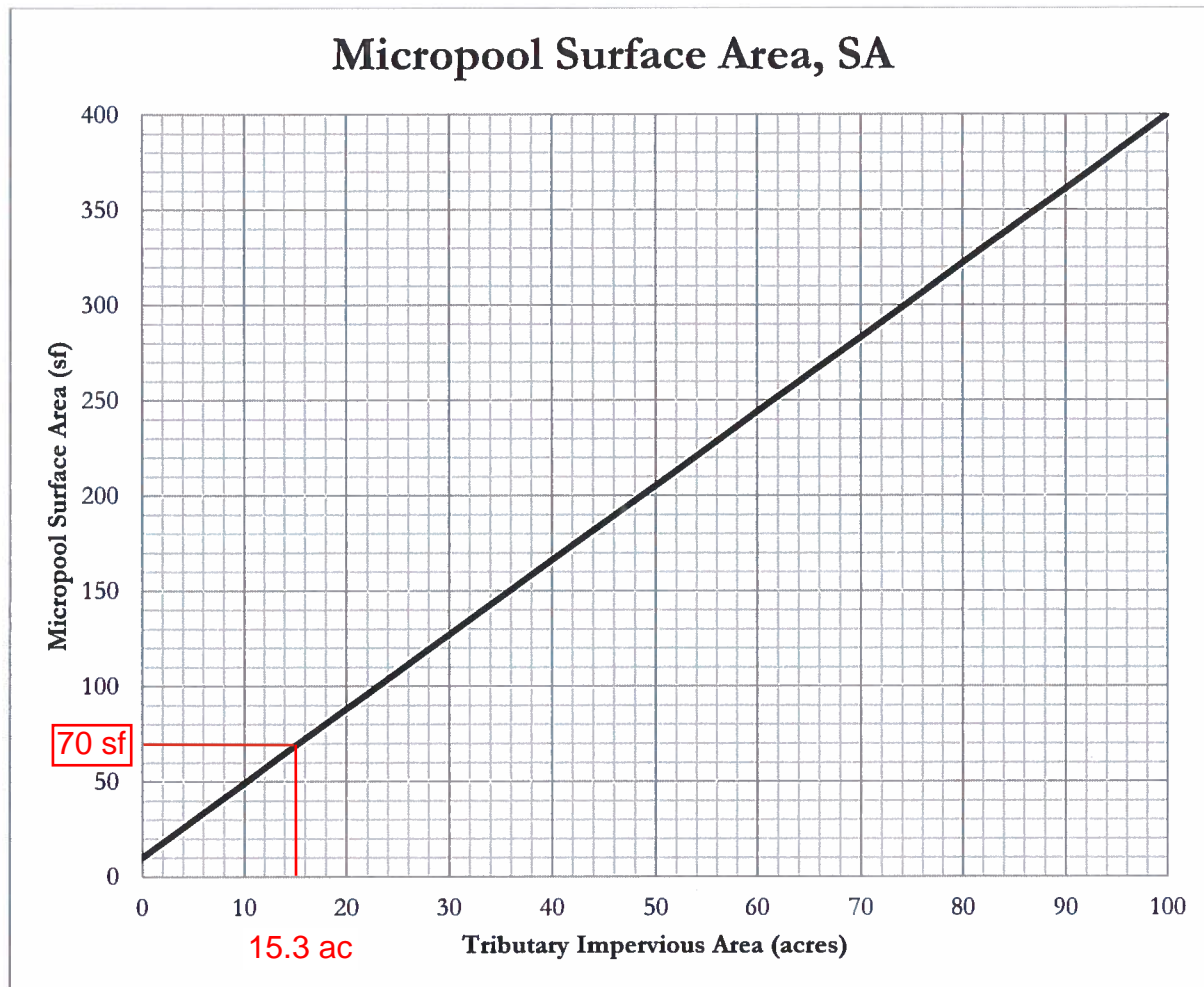


Figure 1 – Micropool surface area (SA) determination chart

The tributary impervious area is the effective number of impervious acres that will be treated by the extended detention basin (EDB). It is calculated by multiplying the tributary area to be treated by the impervious fraction of that area.

$$TIA = I \times A = (64.0/100) \times 23.9 \text{ ac} = 15.3 \text{ ac}$$

TIA = Tributary impervious area (acres)
I = Imperviousness (fraction)
A = Tributary catchment area upstream (acres)

For EDBs with tributary impervious areas greater than 100 acres, the micropool surface area is 400 sf. The initial surcharge depth (ISD) is defined as the depth of the initial surcharge volume (ISV). The surface area determined using Figure 1 assumes an ISD of 4 inches. The initial surcharge volume is thus calculated by multiplying the micropool surface area by 4 inches.

$$ISV = SA \times 4 \text{ inches}$$

ISV = Initial surcharge volume (cf)
SA = Surface area (from Figure 1, sf)

Figure 13-12c. Emergency Spillway Protection

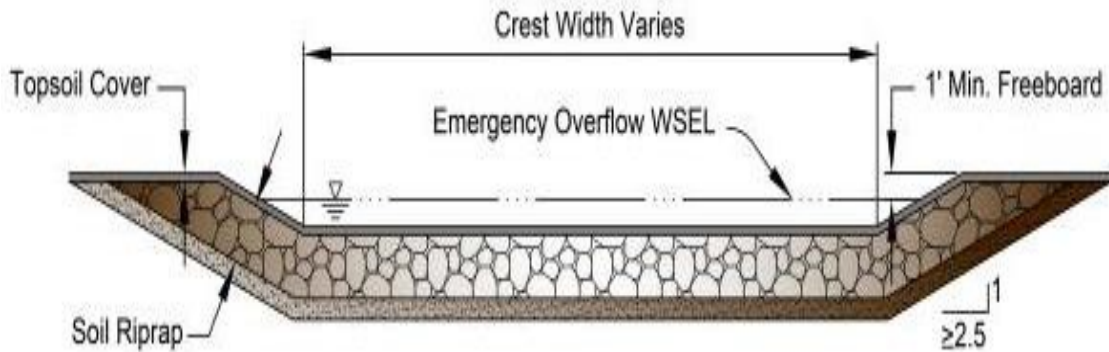
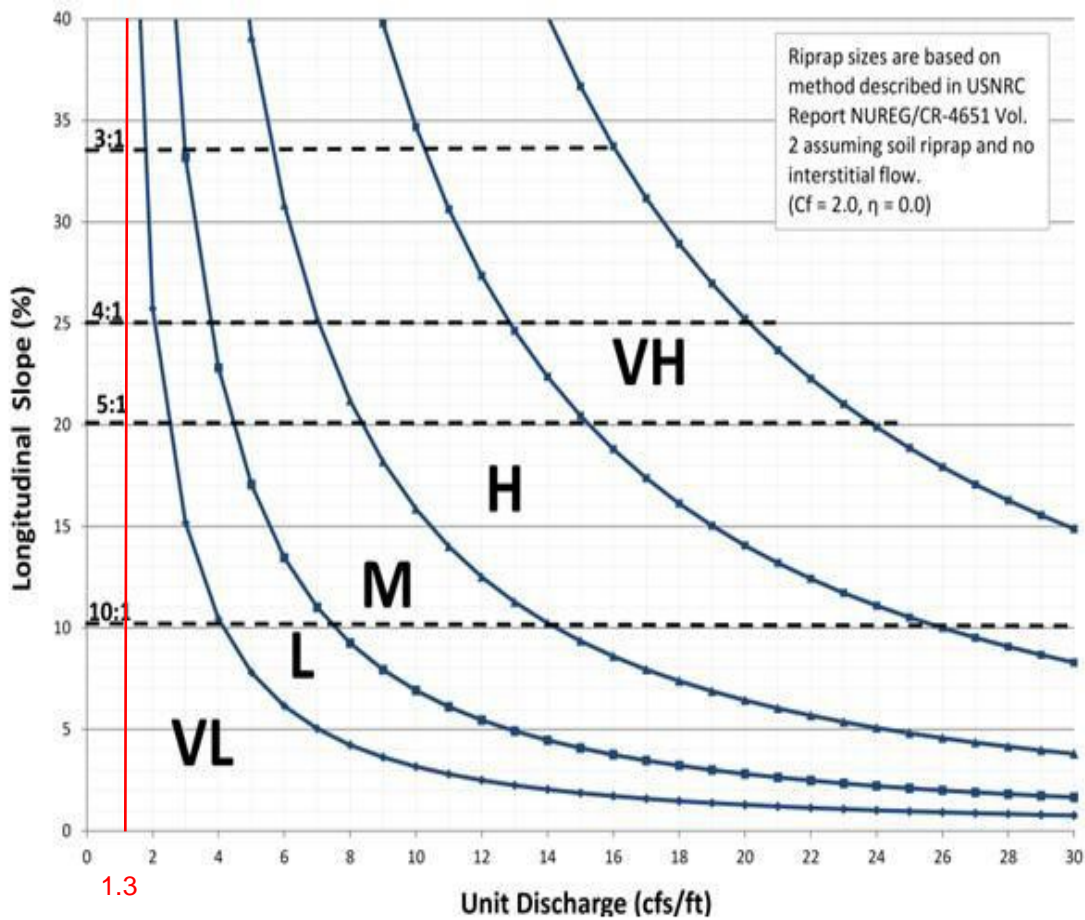
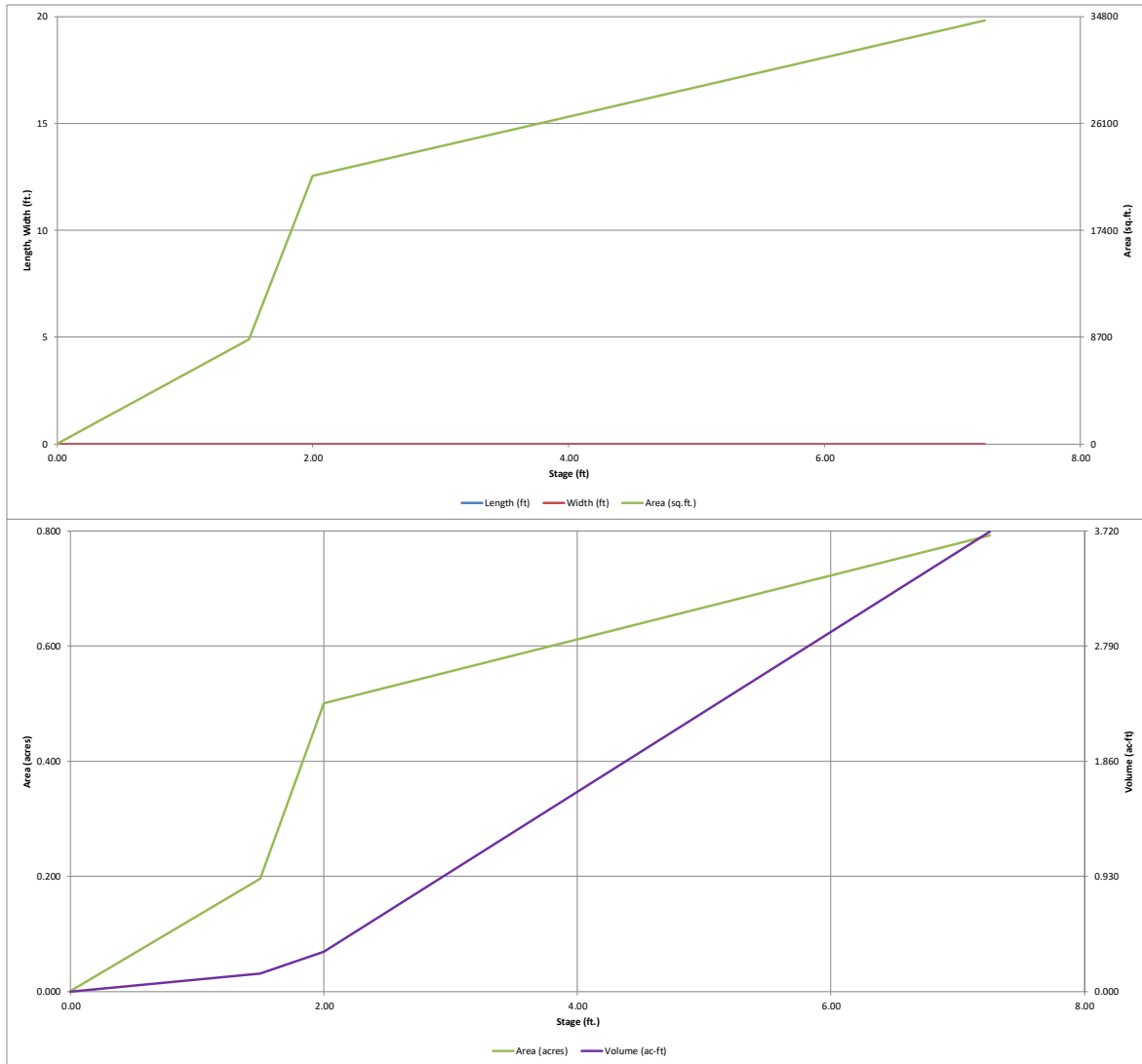


Figure 13-12d. Riprap Types for Emergency Spillway Protection



$Q_{100} = 75.1 \text{ cfs}$
 Spillway length = 58 ft
 $75.1 \text{ cfs} / 58 \text{ ft} = 1.3 \text{ cfs/ft}$

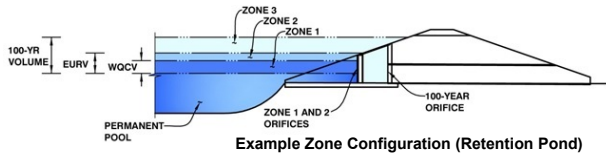
THIS UTILIMATE DESIGN IS INCLUDED FOR REFERENCE ONLY. TO BE CONFIRMED AT FINAL DRAINAGE REPORT FOR FUTURE RESIDENTIAL FILING.



DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: Falcon Field Filing 1
Basin ID: Pond C



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.35	0.498	Orifice Plate
Zone 2 (EURV)	4.72	1.391	Orifice Plate
Zone 3 (100-year)	6.08	0.936	Weir&Pipe (Restrict)
Total (all zones)		2.825	

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 = 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 = ft²
Elliptical Half-Width = feet
Elliptical Slot Centroid = feet
Elliptical Slot Area = ft²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest) 8

	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	1.57	3.15					
Orifice Area (sq. inches)	2.78	4.00	6.00					

	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	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orific

	Not Selected	Not Selected
Vertical Orifice Area =	N/A	N/A
Vertical Orifice Centroid =	N/A	N/A

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

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.85	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	3.92	N/A	feet
Overflow Weir Gate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	3.92	N/A	feet
Overflow Gate Type =	Type C Gate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected
Height of Gate Upper Edge, H _t =	4.85	N/A
Overflow Weir Slope Length =	3.92	N/A
Gate Open Area / 100-yr Orifice Area =	6.81	N/A
Overflow Gate Open Area w/o Debris =	10.70	N/A
Overflow Gate Open Area w/ Debris =	5.35	N/A

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	1.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	24.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	12.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected
Outlet Orifice Area =	1.57	N/A
Outlet Orifice Centroid =	0.58	N/A
Half-Central Angle of Restrictor Plate on Pipe =	1.57	N/A

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	5.69	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	58.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth =	0.54	feet
Stage at Top of Freeboard =	7.23	feet
Basin Area at Top of Freeboard =	0.79	acres
Basin Volume at Top of Freeboard =	3.70	acre-ft

Routed Hydrograph Results

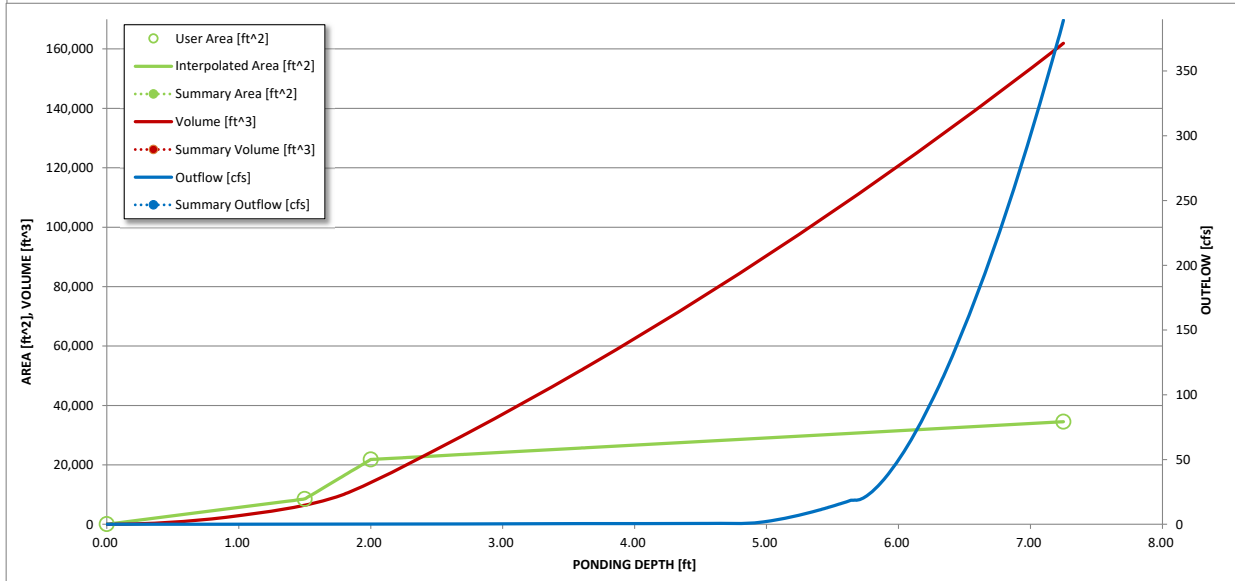
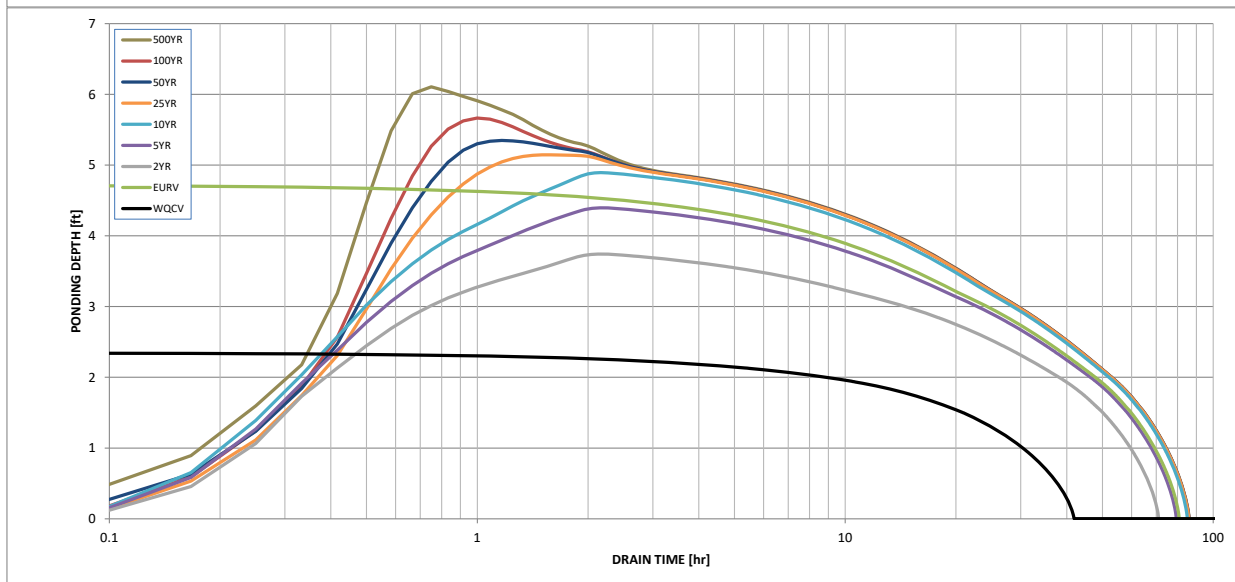
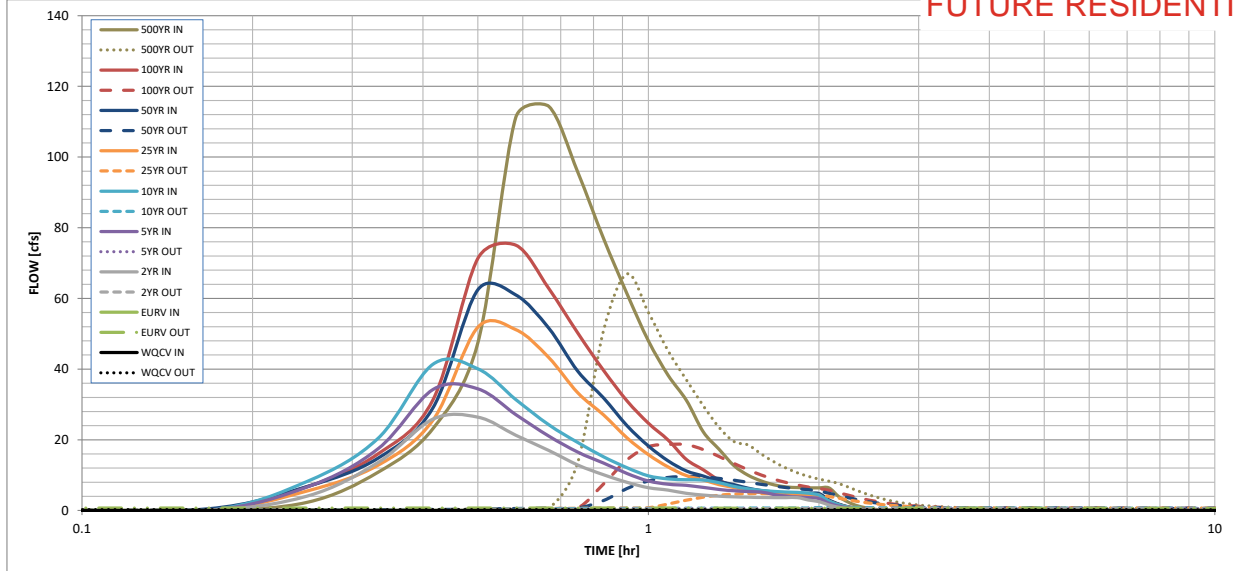
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF)

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52
One-Hour Rainfall Depth (in) =	N/A	N/A	1.349	1.770	2.107	2.552	2.988	3.521
CUHP Runoff Volume (acre-ft) =	0.498	1.889	1.349	1.770	2.107	2.552	2.988	3.521
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	1.349	1.770	2.107	2.552	2.988	3.521
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.2	0.5	0.7	0.9	1.1	1.3
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A						
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.02	0.03	0.05	0.07	0.10
Peak Inflow Q (cfs) =	N/A	N/A	26.4	34.4	41.4	51.8	62.4	75.1
Peak Outflow Q (cfs) =	0.3	0.7	0.5	0.6	0.9	1.4	2.1	3.0
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.3	1.4	0.8	0.8	1.0
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1
Max Velocity through Gate 1 (fps) =	N/A	N/A	N/A	N/A	0.0	0.4	0.8	1.7
Max Velocity through Gate 2 (fps) =	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	71	63	70	74	73	72	70
Time to Drain 99% of Inflow Volume (hours) =	40	76	68	75	80	80	80	79
Maximum Ponding Depth (ft) =	2.35	4.72	3.74	4.39	4.89	5.14	5.35	5.66
Area at Maximum Ponding Depth (acres) =	0.52	0.65	0.60	0.63	0.66	0.68	0.69	0.70
Maximum Volume Stored (acre-ft) =	0.500	1.890	1.277	1.678	2.001	2.168	2.305	2.527

THIS UTILIMATE DESIGN IS INCLUDED FOR REFERENCE ONLY. TO BE CONFIRMED AT FINAL DRAINAGE REPORT FOR FUTURE RESIDENTIAL FILING.

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	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
	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	0.46	0.05	2.31
	0:15:00	0.00	0.00	4.10	6.67	8.27	5.56	6.82	6.77	10.84
	0:20:00	0.00	0.00	13.59	17.49	20.45	12.82	14.80	16.03	23.20
	0:25:00	0.00	0.00	25.87	34.22	41.37	25.61	29.08	31.34	47.43
	0:30:00	0.00	0.00	26.43	34.42	40.10	51.85	62.44	71.30	111.17
	0:35:00	0.00	0.00	21.28	27.12	31.38	51.18	60.99	75.06	114.37
	0:40:00	0.00	0.00	16.98	21.07	24.26	43.30	51.62	62.83	95.79
	0:45:00	0.00	0.00	12.89	16.52	19.26	33.32	39.42	50.25	76.93
	0:50:00	0.00	0.00	10.11	13.41	15.20	27.06	31.83	39.65	61.35
	0:55:00	0.00	0.00	7.96	10.47	12.09	20.55	23.99	31.01	48.00
	1:00:00	0.00	0.00	6.45	8.36	9.81	15.79	18.25	24.68	38.26
	1:05:00	0.00	0.00	5.78	7.42	8.95	12.32	14.04	19.95	31.20
	1:10:00	0.00	0.00	4.87	7.11	8.70	9.88	11.20	14.45	22.23
	1:15:00	0.00	0.00	4.34	6.55	8.60	8.65	9.77	11.49	17.32
	1:20:00	0.00	0.00	4.05	5.95	7.86	7.32	8.24	8.58	12.66
	1:25:00	0.00	0.00	3.87	5.57	6.80	6.51	7.32	6.89	9.97
	1:30:00	0.00	0.00	3.76	5.35	6.11	5.60	6.30	5.85	8.33
	1:35:00	0.00	0.00	3.68	5.21	5.68	5.03	5.65	5.19	7.27
	1:40:00	0.00	0.00	3.64	4.52	5.41	4.67	5.24	4.81	6.67
	1:45:00	0.00	0.00	3.64	4.07	5.23	4.47	5.03	4.68	6.49
	1:50:00	0.00	0.00	3.64	3.80	5.12	4.36	4.90	4.62	6.40
	1:55:00	0.00	0.00	2.96	3.65	4.88	4.31	4.84	4.62	6.40
	2:00:00	0.00	0.00	2.52	3.37	4.35	4.28	4.81	4.62	6.40
	2:05:00	0.00	0.00	1.55	2.08	2.69	2.66	2.99	2.86	3.96
	2:10:00	0.00	0.00	0.93	1.25	1.63	1.62	1.82	1.74	2.40
	2:15:00	0.00	0.00	0.53	0.73	0.94	0.95	1.06	1.01	1.39
	2:20:00	0.00	0.00	0.28	0.41	0.52	0.54	0.60	0.57	0.79
	2:25:00	0.00	0.00	0.12	0.21	0.25	0.27	0.30	0.29	0.39
	2:30:00	0.00	0.00	0.04	0.07	0.08	0.09	0.10	0.09	0.13
	2:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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