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► **HRGREEN.COM**

October 3, 2025

El Paso County Engineering Division
Department of Public Works
3275 Akers Drive
Colorado Springs, Colorado 80922

Re: Professional Engineer's Certification of Permanent Control Measure
Flying Horse North Filing No. 3, Pond A

This letter serves as a Pond Certification for the constructed Full Spectrum Detention Facility "Pond A" located in Flying Horse North Filing No. 3. The permanent control measure is located south of Old Stagecoach Road, east of Allen Ranch Road, and north of Lot 51 within the Flying Horse North subdivision, Filing No. 3, El Paso County, Colorado.

The detention facility was designed by a Colorado Licensed Professional Engineer of HR Green Development, LLC. and the design is within the County approved Construction Drawings dated July 8, 2024 and is referred to as "Pond A" within Tract A of the development. A Colorado Licensed Professional Surveyor conducted an as-built survey of the facility in August of 2025 to verify the basin and infrastructure dimensions, elevations, materials, inverts, and slopes as required for determination of inflow and outflow hydraulics.

The as-built conditions of the basin and its infrastructure were assessed and compared to the approved Construction Drawings and design worksheets within the approved Final Drainage Report. The facility was found to be in general compliance with the design, and it is anticipated that the facility will function as intended with no negative impacts to surrounding and downstream developments, property, or infrastructure. General compliance allows for construction tolerances and is based on the information provided by the as-built survey.

The pond basin required a modified grading of side slopes from 4:1 to 3:1 and a new spillway configuration to accommodate future development of the Flying Horse North Clubhouse, anticipated to be built in the near future. These modifications were completed in August of 2025.

The August 2025 as-built survey determined that the pond outlet structure orifice plate was required to be replaced and was completed.

The facility is in a stabilized condition and there are no proposed modifications required at this time.

Sincerely,

HR GREEN, INC.

Richard D. Lyon

Richard D. Lyon, PE
Project Manager, Civil Engineer
HR Green Development, LLC.



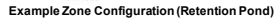
Revise the PCM Certification Letter to include the required statements listed in ECM Section 5.10.6.B:

"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. The PCM(s) provide the required storage volume and meet the required release rates, stage areas, elevations, and outlet dimensions, as documented by the attached revised MHFD-Detention spreadsheet that shows the as-built conditions."

HR Green | Building Communities. Improving Lives.

MHFD-Detention, Version 4.06 (July 2022)

Basin ID: PROPOSED POND A MODIFICATIONS



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

7559

Please update the MHPD-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.

as-built condition - August 2025 survey

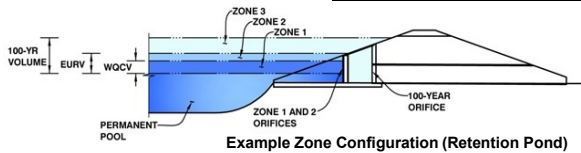
And please highlight/outline (like with a red rectangle) the input cells that changed from original design to as-built.

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHPD-Detention, Version 4.06 (July 2022)

Project: FLYING HORSE NORTH FILING NO. 3 - 9/22/25 as-built conditions

Basin ID: DESIGN POINT 2 (FLATS/CONDO AREA)



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.89	0.350	Orifice Plate
Zone 2 (EURV)	4.27	0.570	Orifice Plate
Zone 3 (100-year)	5.81	0.933	Weir&Pipe (Restrict)
Total (all zones)		1.853	

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 ft²
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 = 4.00 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 ft²
Elliptical Half-Width = N/A feet
Elliptical Slot Centroid = N/A feet
Elliptical Slot Area = N/A ft²

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	2.60						
Orifice Area (sq. inches)	3.14	3.14						

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

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

Calculated Parameters for Vertical Orifice
Vertical Orifice Area = N/A ft²
Vertical Orifice Centroid = N/A 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, H_o = 5.00 ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length = 6.00 feet
Overflow Weir Gate Slope = 0.00 H:V
Horiz. Length of Weir Sides = 3.00 feet
Overflow Gate Type = Type C Gate
Debris Clogging % = 50%

Calculated Parameters for Overflow Weir
Height of Gate Upper Edge, H_u = 5.00 feet
Overflow Weir Slope Length = 3.00 feet
Gate Open Area / 100-yr Orifice Area = 6.07
Overflow Gate Open Area w/o Debris = 12.53 ft²
Overflow Gate Open Area w/ Debris = 6.26 ft²

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

Depth to Invert of Outlet Pipe = 0.50 ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter = 24.00 inches
Restrictor Plate Height Above Pipe Invert = 15.00 inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate
Outlet Orifice Area = 2.07 ft²
Outlet Orifice Centroid = 0.71 feet
Half-Central Angle of Restrictor Plate on Pipe = 1.82 radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage = 8.00 ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length = 23.00 feet
Spillway End Slopes = 4.00 H:V
Freeboard above Max Water Surface = 1.00 feet

Calculated Parameters for Spillway
Spillway Design Flow Depth = 0.91 feet
Stage at Top of Freeboard = 9.91 feet
Basin Area at Top of Freeboard = 1.24 acres
Basin Volume at Top of Freeboard = 4.92 acre-ft

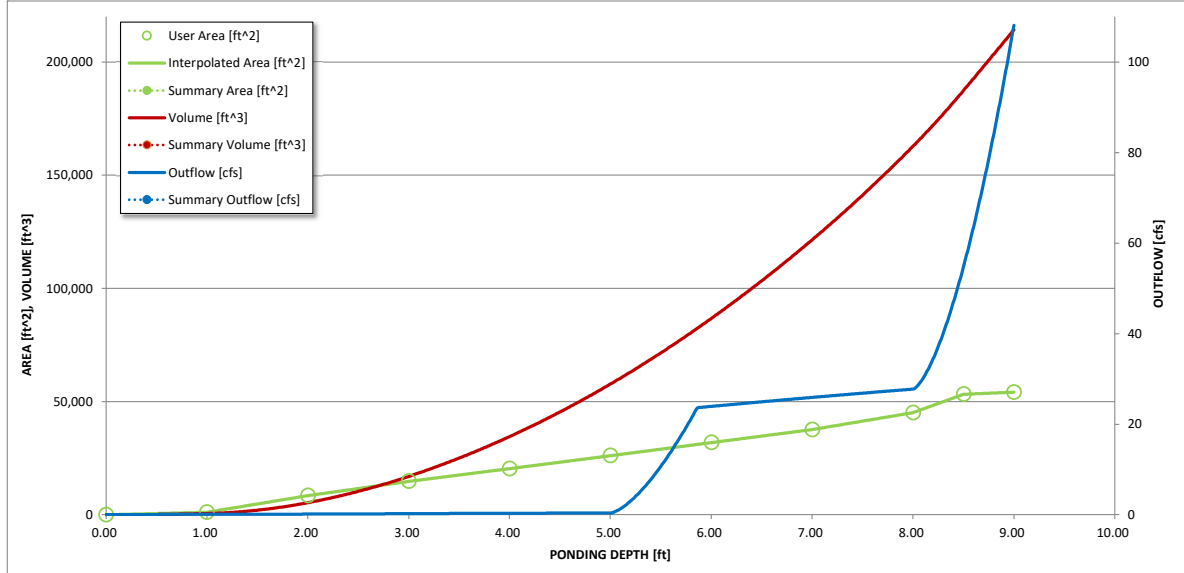
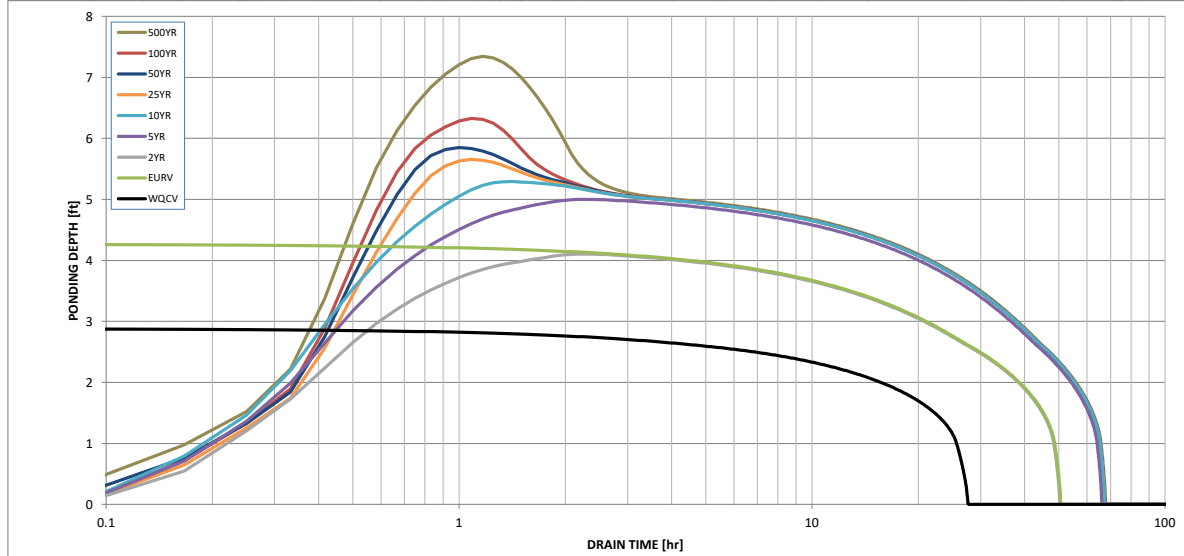
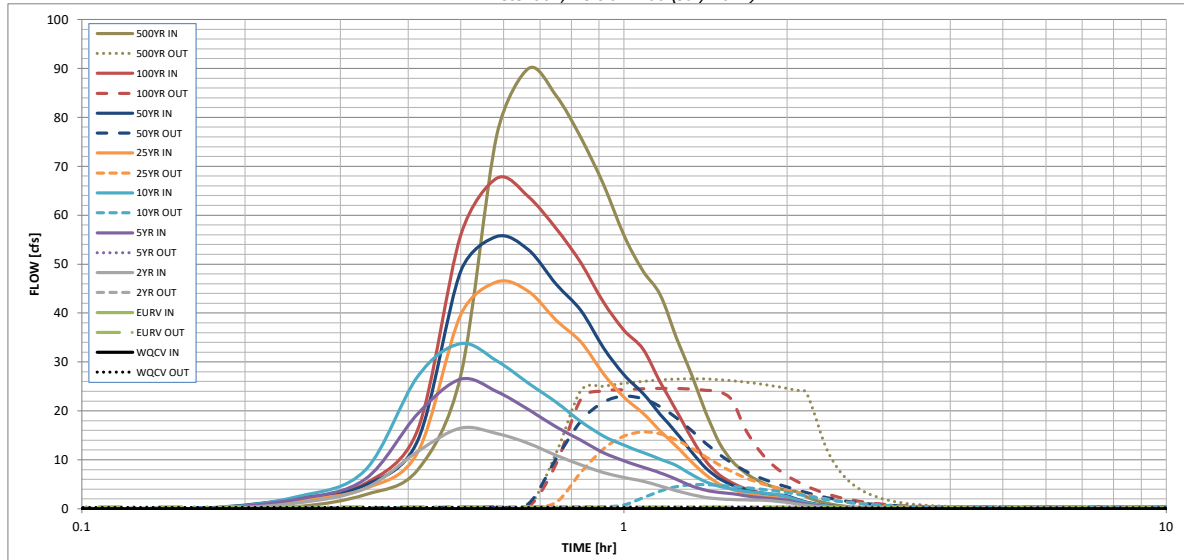
Routed Hydrograph Results

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 =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
One-Hour Rainfall Depth (in) =	N/A	N/A	0.896	1.390	1.839	2.496	3.004	3.671	4.979
CUHP Runoff Volume (acre-ft) =	N/A	N/A	0.896	1.390	1.839	2.496	3.004	3.671	4.979
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	4.0	10.9	16.1	28.3	35.4	44.3	61.5
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A							
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.16	0.43	0.64	1.12	1.40	1.75	2.43
Peak Inflow Q (cfs) =	N/A	N/A	16.5	26.5	33.7	46.4	55.6	67.6	90.0
Peak Outflow Q (cfs) =	0.2	0.4	0.3	0.4	4.9	15.7	23.0	24.6	26.6
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.0	0.3	0.6	0.6	0.6	0.4
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1
Max Velocity through Gate 1 (fps) =	N/A	N/A	N/A	N/A	0.4	1.2	1.8	1.9	2.1
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) =	26	47	47	61	61	60	58	57	54
Time to Drain 99% of Inflow Volume (hours) =	27	49	49	64	65	64	64	63	62
Maximum Ponding Depth (ft) =	2.89	4.27	4.10	5.00	5.29	5.65	5.85	6.32	7.34
Area at Maximum Ponding Depth (acres) =	0.32	0.50	0.48	0.60	0.64	0.69	0.71	0.77	0.92
Maximum Volume Stored (acre-ft) =	0.353	0.923	0.839	1.319	1.498	1.742	1.875	2.231	3.092

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)



DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename: _____

Inflow Hydrographs

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

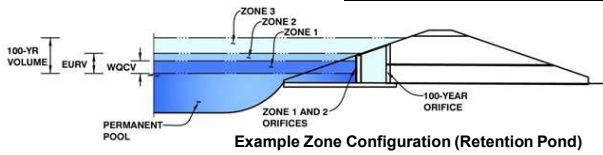
	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.01	0.45
	0:15:00	0.00	0.00	1.20	1.98	2.46	1.66	2.06	2.03	2.90
	0:20:00	0.00	0.00	4.20	6.05	7.89	4.12	4.80	5.16	7.95
	0:25:00	0.00	0.00	11.73	19.44	27.07	11.59	13.98	16.18	27.22
	0:30:00	0.00	0.00	16.48	26.46	33.72	39.65	48.53	55.91	76.43
	0:35:00	0.00	0.00	15.39	23.95	30.18	46.35	55.64	67.59	90.00
	0:40:00	0.00	0.00	13.34	20.25	25.65	44.39	52.88	63.75	84.45
	0:45:00	0.00	0.00	10.91	16.76	21.76	38.54	45.89	57.28	75.78
	0:50:00	0.00	0.00	8.93	13.97	17.79	34.04	40.51	50.20	66.31
	0:55:00	0.00	0.00	7.40	11.45	14.85	27.59	32.92	42.22	55.94
	1:00:00	0.00	0.00	6.37	9.77	12.98	22.81	27.38	36.51	48.67
	1:05:00	0.00	0.00	5.62	8.51	11.51	19.57	23.63	32.71	43.72
	1:10:00	0.00	0.00	4.61	7.34	10.11	15.92	19.30	25.90	34.95
	1:15:00	0.00	0.00	3.68	5.99	8.79	12.73	15.51	20.03	27.35
	1:20:00	0.00	0.00	2.88	4.65	6.96	9.56	11.60	14.39	19.62
	1:25:00	0.00	0.00	2.31	3.77	5.47	6.89	8.32	9.72	13.47
	1:30:00	0.00	0.00	2.00	3.33	4.59	5.05	6.16	6.93	9.75
	1:35:00	0.00	0.00	1.86	3.09	4.01	3.93	4.83	5.29	7.51
	1:40:00	0.00	0.00	1.79	2.68	3.61	3.23	3.99	4.19	5.99
	1:45:00	0.00	0.00	1.74	2.36	3.33	2.76	3.42	3.44	4.95
	1:50:00	0.00	0.00	1.70	2.12	3.13	2.47	3.06	2.93	4.23
	1:55:00	0.00	0.00	1.48	1.95	2.86	2.27	2.80	2.57	3.72
	2:00:00	0.00	0.00	1.29	1.77	2.48	2.14	2.64	2.36	3.43
	2:05:00	0.00	0.00	0.96	1.30	1.81	1.57	1.93	1.74	2.50
	2:10:00	0.00	0.00	0.71	0.94	1.28	1.12	1.38	1.24	1.78
	2:15:00	0.00	0.00	0.51	0.67	0.91	0.80	0.98	0.90	1.29
	2:20:00	0.00	0.00	0.37	0.47	0.65	0.57	0.69	0.64	0.91
	2:25:00	0.00	0.00	0.26	0.32	0.45	0.39	0.48	0.44	0.63
	2:30:00	0.00	0.00	0.17	0.21	0.31	0.27	0.33	0.31	0.43
	2:35:00	0.00	0.00	0.11	0.14	0.20	0.18	0.22	0.20	0.29
	2:40:00	0.00	0.00	0.07	0.09	0.12	0.11	0.13	0.12	0.17
	2:45:00	0.00	0.00	0.03	0.05	0.06	0.06	0.07	0.06	0.08
	2:50:00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.03
	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
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	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
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	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

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: THE CLUBHOUSE AT FLYING HORSE NORTH (AS-BUILT CONDITION POND CERTIFICATION)

Basin ID: PROPOSED POND A MODIFICATIONS



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.05	0.403	Orifice Plate
Zone 2 (EURV)	4.56	0.669	Orifice Plate
Zone 3 (100-year)	6.20	1.063	Weir&Pipe (Restrict)
Total (all zones)		2.135	

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 ft²
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 = 3.58 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

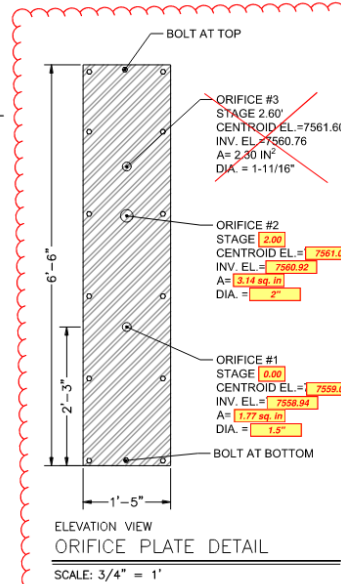
Calculated Parameters for Plate
WQ Orifice Area per Row = N/A ft²
Elliptical Half-Width = N/A feet
Elliptical Slot Centroid = N/A feet
Elliptical Slot Area = N/A ft²

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	2.00						
Orifice Area (sq. inches)	1.77	3.14						
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

elevation: 7559.00
D = 1.5 in.

elevation: 7561.00
D = 2 in.



User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice = Not Selected Not Selected ft (re)
Depth at top of Zone using Vertical Orifice = Not Selected Not Selected ft (re)
Vertical Orifice Diameter = Not Selected Not Selected inches

Calculated Parameters for Vertical Orifice
Orifice Area = Not Selected Not Selected ft²
Orifice Centroid = Not Selected Not Selected feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Gate and Outlet Pipe OR Rectangular)

Overflow Weir Front Edge Height, H_o = 4.50 ft (re)
Overflow Weir Front Edge Length = 6.00 feet
Overflow Weir Gate Slope = 0.00 H:V
Horiz. Length of Weir Sides = 3.00 feet
Overflow Gate Type = Type C Gate N/A
Debris Clogging % = 50% N/A %

Calculated Parameters for Overflow Weir
per Edge, H_t = 4.50 feet
Slope Length = 3.00 feet
Orifice Area = 6.07 ft²
a w/o Debris = 12.53 ft²
a w/ Debris = 6.26 ft²

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

Depth to Invert of Outlet Pipe = 0.50 ft (di)
Outlet Pipe Diameter = 24.00 inches
Restrictor Plate Height Above Pipe Invert = 15.00 inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate
Orifice Area = 2.07 ft²
Orifice Centroid = 0.71 feet
Plate on Pipe = 1.82 radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage = 6.00 ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length = 16.00 feet
Spillway End Slopes = 4.00 H:V
Freeboard above Max Water Surface = 1.00 feet

Calculated Parameters for Spillway
Spillway Design Flow Depth = 0.97 feet
Stage at Top of Freeboard = 7.97 feet
Basin Area at Top of Freeboard = 1.03 acres
Basin Volume at Top of Freeboard = 3.71 acre-ft

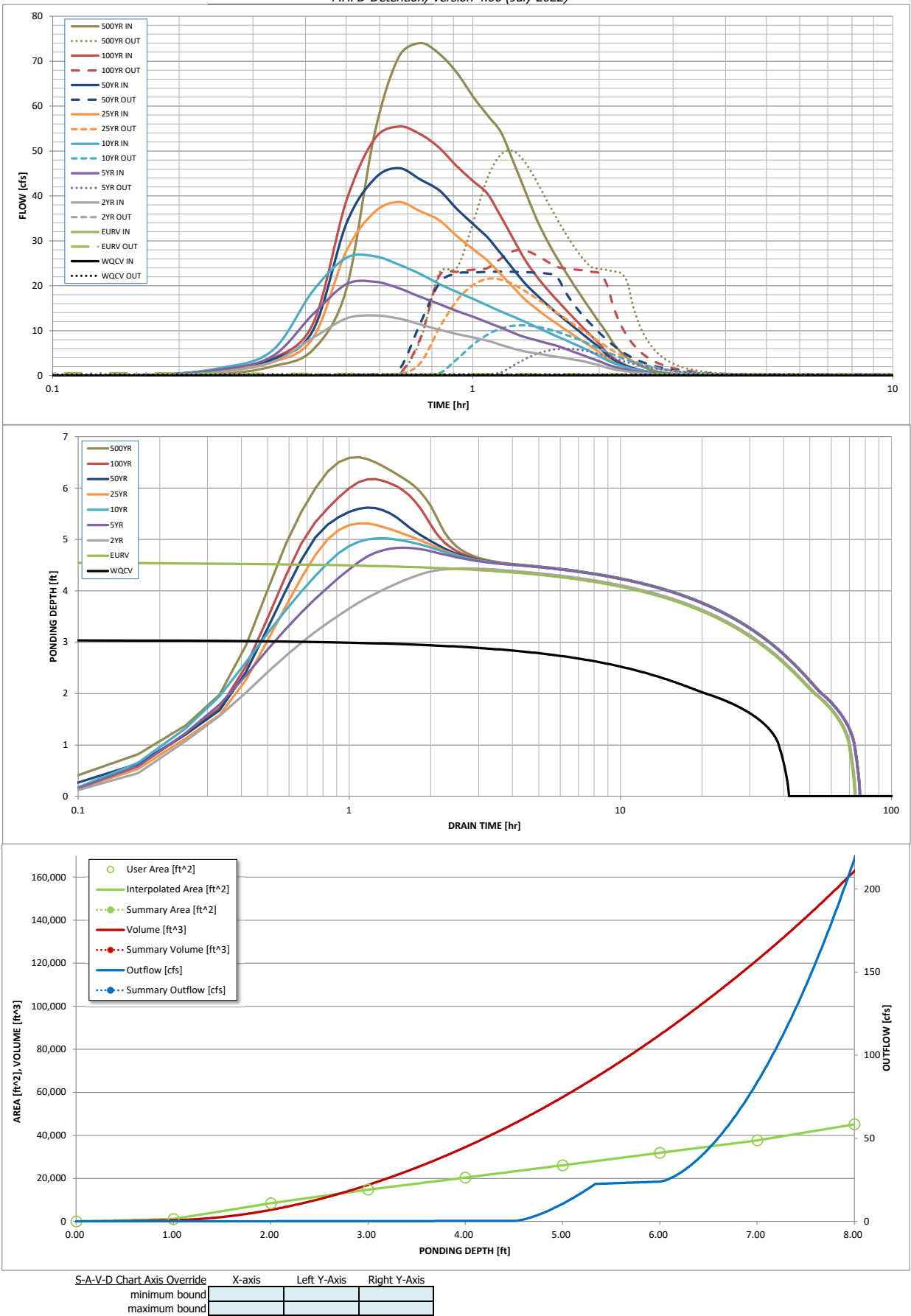
Routed Hydrograph Results

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	500 Year
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
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) =	0.403	1.072	1.063	1.639	2.162	2.922	3.515	4.288	5.809
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	1.063	1.639	2.162	2.922	3.515	4.288	5.809
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	2.8	7.8	11.9	21.4	26.8	34.2	47.8
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.10	0.27	0.41	0.75	0.94	1.19	1.67
Peak Inflow Q (cfs) =	N/A	N/A	13.4	20.9	26.6	38.6	46.2	55.5	74.0
Peak Outflow Q (cfs) =	0.2	0.6	0.3	6.0	11.2	21.5	23.1	27.8	50.0
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.8	0.9	1.0	0.9	0.8	1.0
Structure Controlling Flow =	Plate	Overflow Weir 1	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway	Spillway
Max Velocity through Gate 1 (fps) =	N/A	0.03	N/A	0.5	0.9	1.7	1.8	1.9	2.0
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) =	39	66	67	67	64	61	58	55	50
Time to Drain 99% of Inflow Volume (hours) =	41	70	71	72	71	70	69	68	65
Maximum Ponding Depth (ft) =	3.05	4.56	4.43	4.84	5.02	5.31	5.62	6.17	6.60
Area at Maximum Ponding Depth (acres) =	0.34	0.54	0.52	0.58	0.60	0.64	0.68	0.75	0.81
Maximum Volume Stored (acre-ft) =	0.406	1.074	1.005	1.225	1.331	1.517	1.715	2.116	2.445

DETENTION BASIN OUTLET STRUCTURE DESIGN

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



DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename: _____

Inflow Hydrographs

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

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time 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	0.09	0.01	0.30
	0:15:00	0.00	0.00	0.81	1.33	1.66	1.12	1.41	1.37	2.02
	0:20:00	0.00	0.00	3.00	4.28	5.56	3.02	3.55	3.78	5.71
	0:25:00	0.00	0.00	8.38	13.67	18.85	8.34	10.04	11.50	19.06
	0:30:00	0.00	0.00	12.70	20.32	26.17	27.60	33.69	38.75	53.72
	0:35:00	0.00	0.00	13.36	20.91	26.59	36.36	43.78	52.64	70.91
	0:40:00	0.00	0.00	12.70	19.46	24.71	38.64	46.18	55.46	74.02
	0:45:00	0.00	0.00	11.39	17.54	22.62	36.60	43.67	53.76	71.62
	0:50:00	0.00	0.00	10.21	15.90	20.37	34.54	41.19	50.66	67.44
	0:55:00	0.00	0.00	9.26	14.40	18.61	31.07	37.14	46.62	62.23
	1:00:00	0.00	0.00	8.50	13.11	17.10	28.19	33.80	43.38	57.98
	1:05:00	0.00	0.00	7.76	11.87	15.65	25.61	30.79	40.54	54.20
	1:10:00	0.00	0.00	6.85	10.69	14.26	22.57	27.19	35.44	47.59
	1:15:00	0.00	0.00	6.00	9.50	13.11	19.63	23.70	30.39	41.12
	1:20:00	0.00	0.00	5.37	8.56	11.98	16.92	20.46	25.74	35.01
	1:25:00	0.00	0.00	4.93	7.86	10.82	14.94	18.05	22.23	30.27
	1:30:00	0.00	0.00	4.55	7.23	9.74	13.14	15.89	19.36	26.34
	1:35:00	0.00	0.00	4.21	6.65	8.76	11.58	13.99	16.89	22.96
	1:40:00	0.00	0.00	3.87	5.92	7.85	10.15	12.25	14.66	19.89
	1:45:00	0.00	0.00	3.53	5.20	6.98	8.84	10.66	12.58	17.04
	1:50:00	0.00	0.00	3.20	4.50	6.14	7.58	9.13	10.62	14.36
	1:55:00	0.00	0.00	2.74	3.84	5.27	6.38	7.68	8.80	11.87
	2:00:00	0.00	0.00	2.30	3.21	4.37	5.25	6.32	7.11	9.56
	2:05:00	0.00	0.00	1.79	2.50	3.44	3.90	4.69	5.20	7.03
	2:10:00	0.00	0.00	1.41	1.98	2.76	2.89	3.51	3.83	5.27
	2:15:00	0.00	0.00	1.13	1.60	2.24	2.19	2.68	2.88	4.00
	2:20:00	0.00	0.00	0.93	1.30	1.83	1.70	2.08	2.16	3.03
	2:25:00	0.00	0.00	0.76	1.05	1.48	1.31	1.61	1.62	2.28
	2:30:00	0.00	0.00	0.61	0.85	1.19	1.02	1.25	1.21	1.70
	2:35:00	0.00	0.00	0.49	0.68	0.94	0.79	0.97	0.88	1.25
	2:40:00	0.00	0.00	0.39	0.54	0.73	0.61	0.74	0.65	0.92
	2:45:00	0.00	0.00	0.32	0.42	0.56	0.47	0.57	0.50	0.70
	2:50:00	0.00	0.00	0.25	0.33	0.43	0.36	0.44	0.39	0.55
	2:55:00	0.00	0.00	0.20	0.25	0.34	0.28	0.35	0.31	0.44
	3:00:00	0.00	0.00	0.16	0.19	0.26	0.22	0.27	0.24	0.34
	3:05:00	0.00	0.00	0.12	0.14	0.20	0.17	0.20	0.18	0.26
	3:10:00	0.00	0.00	0.08	0.10	0.14	0.12	0.15	0.13	0.18
	3:15:00	0.00	0.00	0.06	0.07	0.09	0.08	0.10	0.09	0.12
	3:20:00	0.00	0.00	0.03	0.04	0.06	0.05	0.06	0.06	0.07
	3:25:00	0.00	0.00	0.02	0.02	0.03	0.03	0.03	0.03	0.04
	3:30:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	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

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

[illegible]