



FINAL DRAINAGE REPORT

FALCON RANCHETTES FILING NO. 1A
MERIDIAN STORAGE
El Paso County, Colorado

PCD File No. VR239 & PPR2336

PREPARED FOR:

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DATE:

May 6, 2024



As the subdivision was submitted in 2023 you may use the 2023 fees. please update

Updated fees and totals for 2023

drainage basin fees shall be assessed on the additional impervious acreage. The two lots proposed for vacation and replat were previously platted as 5-acre residential lots. The Falcon DBPS was used to approximate the existing impervious acres by multiplying the total parcel area by 3%.

Note: a proposed impervious exhibit is provided in **Appendix A** and should be referenced when reading the table below.

	Existing Impervious Acres	Proposed Impervious Acres	Impervious Acres Eligible for Fee Calculation
Lot 1a	3% x 5.00 = 0.150	2.832	2.832 - 0.150 = 2.682
Lot 2a	3% x 4.61 = 0.138	3.598	3.598 - 0.138 = 3.460
Tract A	3% x 0.732 = 0.022	0.125	0.125 - 0.022 = 0.103
Meridian Park Drive	3% x 0.879 = 0.026	0.748	0.748 - 0.026 = 0.722
Meridian Road	3% x 0.507 = 0.015	0.067	0.067 - 0.015 = 0.052
		Total =	7.019

Drainage Fee (2024)

\$40,088 x 7.019 Impervious Acres = \$281,377

Bridge Fee (2024)

\$5,507 x 7.019 Impervious Acres = \$38,653

Improvements and Reimbursable Costs

The Falcon Drainage Basin Planning Study – Fee Development, categorizes improvements into Developer Costs, County Costs, and Metro District Costs. Items identified as Developer Costs (those incurred by the Developer) are eligible for reimbursement. County Costs and Metro District Costs are not eligible for reimbursement. The applicable reach is classified in the DBPS as follows:

Reach/Feature	Reach Length (ft)	Improvement	Cost Category	Eligible for Reimbursement	Cost As Shown in Falcon DBPS
RMT064	3,358	Small Drop Structures w/ Toe Protection	County	No	\$1,231,110 (\$366/LF)

The developer intends to amend the Falcon DBPS to allow for the costs of ~700 LF of RMT064 (starting at Owl Place and measuring north) to become reimbursable by the process outlined below:

1. Drainage Reimbursement request application with PCD.
2. Prepare an amendment to the DBPS outlining the request for a portion of RMT064 changed from a County Cost to Developer Cost
 - a. Amendment request hearing to the Drainage Board and Board of County Commissioners (BOCC).
3. Once construction of the reimbursable facilities is completed, procedures for Drainage Improvement Credits and Reimbursement outlined in Chapter 3 of the Drainage Criteria Manual will be utilized.

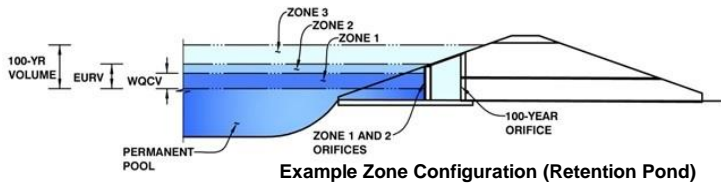
An Engineering Opinion of Probable Cost (OPC) for all drainage improvements is provided below:

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: **Falcon Ranchettes Filing No. 1a (Meridian Storage)**

Basin ID: **Pond #1**



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.24	0.264	Orifice Plate
Zone 2 (EURV)	5.71	0.740	Orifice Plate
Zone 3 (100-year)	6.80	0.417	Weir&Pipe (Restrict)
Total (all zones)		1.421	

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

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 =	5.71	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

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	1.67	3.50					
Orifice Area (sq. inches)	0.99	1.22	5.94					

	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 =	Not Selected	Not Selected	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

Vertical Orifice Area =	Not Selected	Not Selected	ft ²
Vertical Orifice Centroid =	N/A	N/A	feet

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	
Overflow Weir Front Edge Height, H _o =	5.75	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	2.92	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V
Horiz. Length of Weir Sides =	2.92	N/A	feet
Overflow Grate Type =	Close Mesh Grate	N/A	
Debris Clogging % =	50%	N/A	%

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H _t =	6.48	N/A	feet
Overflow Weir Slope Length =	3.01	N/A	feet
Grate Open Area / 100-yr Orifice Area =	13.18	N/A	
Overflow Grate Open Area w/o Debris =	6.95	N/A	ft ²
Overflow Grate Open Area w/ Debris =	3.48	N/A	ft ²

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 =	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	18.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	6.10		inches

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	0.53	N/A	ft ²
Outlet Orifice Centroid =	0.30	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	1.24	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	8.33	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	60.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.18	feet

Spillway Design Flow Depth =	0.32	feet
Stage at Top of Freeboard =	9.83	feet
Basin Area at Top of Freeboard =	0.58	acres
Basin Volume at Top of Freeboard =	2.92	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	3.68
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.68
CUHP Runoff Volume (acre-ft) =	0.264	1.004	0.691	0.893	1.057	1.243	1.426	1.635	2.513
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.691	0.893	1.057	1.243	1.426	1.635	2.513
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.1	0.1	0.2	1.8	3.6	5.9	15.0
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	0.02	0.20	0.40	0.65	1.65
Peak Inflow Q (cfs) =	N/A	N/A	13.0	16.5	19.1	23.2	26.8	31.2	47.8
Peak Outflow Q (cfs) =	0.1	0.5	0.4	0.4	0.5	1.3	2.5	4.7	7.1
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	2.8	2.3	0.7	0.7	0.8	0.5
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.1	0.3	0.6	0.9
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) =	40	65	60	64	67	68	67	66	62
Time to Drain 99% of Inflow Volume (hours) =	42	72	64	70	73	75	75	75	73
Maximum Ponding Depth (ft) =	3.24	5.71	4.63	5.22	5.68	6.07	6.26	6.52	7.82
Area at Maximum Ponding Depth (acres) =	0.22	0.36	0.31	0.34	0.36	0.38	0.39	0.40	0.47
Maximum Volume Stored (acre-ft) =	0.265	1.004	0.641	0.834	0.990	1.133	1.209	1.307	1.874

Saw the comment responses, the justification makes sense. Please add this discussion to the report text under the Proposed Pond #1 Full Spectrum EDB section so it is documented outside of the response document.

Added paragraph under requested section.