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November 21, 2022

El Paso County Planning and Community Development Department  
2880 International Circle  
Colorado Springs, CO 80910

**SUBJECT: Rollin Ridge Filing No. 1 Subdivision  
Certification Letter**

Ladies and Gentlemen:

Based upon information gathered from periodic site visits to the project, JPS Engineering, Inc. is of the opinion that the subdivision improvements have been constructed in general compliance with the approved design plans as filed with El Paso County.

The site and adjacent properties (as affected by work performed under the County permit) appear to be stable with respect to settlement and subsidence, sloughing of cut and fill slopes, revegetation or other ground cover, and the improvements (public improvements, common development improvements, site grading and paving) meet or exceed the minimum design requirements.

Drainage improvements for this project include two on-site private Detention Basins. The facilities provide the required storage volume and will meet the required release rates, as documented by the attached MHFD design forms. The As-Built drawings accurately depict the installation of the Detention Basin improvements and verify the detention volume provided.

Sincerely,  
**JPS Engineering, Inc.**

John P. Schwab, P.E.  
Colorado P.E. No. 29891

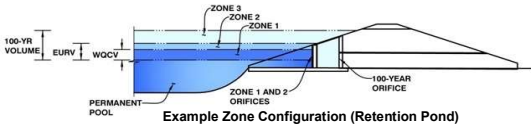


# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: **ROLLIN RIDGE ESTATES**

Basin ID: **A - INTERIM CONDITIONS (FILING NO. 1 RESIDENTIAL ONLY) - AS-BUILT**



Example Zone Configuration (Retention Pond)

### Required Volume Calculation

Selected BMP Type =	<b>EDB</b>
Watershed Area =	54.60 acres
Watershed Length =	2,250 ft
Watershed Slope =	0.045 ft/ft
Watershed Imperviousness =	8.59% percent
Percentage Hydrologic Soil Group A =	30.0% percent
Percentage Hydrologic Soil Group B =	70.0% percent
Percentage Hydrologic Soil Groups C/D =	0.0% percent
Desired WQCV Drain Time =	40.0 hours
Location for 1-hr Rainfall Depths =	User Input
Water Quality Capture Volume (WQCV) =	0.268 acre-feet
Excess Urban Runoff Volume (EURV) =	0.404 acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.270 acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.413 acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.917 acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	2.425 acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	3.490 acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	5.015 acre-feet
500-yr Runoff Volume (P1 = 3.07 in.) =	7.948 acre-feet
Approximate 2-yr Detention Volume =	0.250 acre-feet
Approximate 5-yr Detention Volume =	0.386 acre-feet
Approximate 10-yr Detention Volume =	0.785 acre-feet
Approximate 25-yr Detention Volume =	1.115 acre-feet
Approximate 50-yr Detention Volume =	1.213 acre-feet
Approximate 100-yr Detention Volume =	1.665 acre-feet

### Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.07	inches

### Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.268 acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.136 acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.261 acre-feet
Total Detention Basin Volume =	1.665 acre-feet

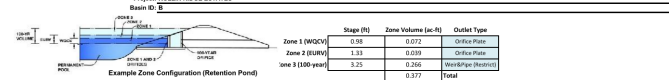
Depth Increment =  ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft <sup>2</sup> )	Optional Override Area (ft <sup>2</sup> )	Area (acre)	Volume (ft <sup>3</sup> )	Volume (ac-ft)
<b>Top of Micropool</b>	--	0.00	--	--	--	10	0.000		
<b>Bot EL=7524.0</b>	--	1.00	--	--	--	1,901	0.044	937	0.022
	--	3.00	--	--	--	5,309	0.122	8,165	0.187
	--	5.00	--	--	--	7,742	0.178	21,216	0.487
	--	7.00	--	--	--	11,097	0.255	40,055	0.920
	--	9.00	--	--	--	14,790	0.340	65,942	1.514
	--	10.00	--	--	--	16,645	0.382	81,660	1.875
<b>Spillway=7534.0</b>	--	11.00	--	--	--	18,500	0.425	99,232	2.278
<b>Top Berm=7536.0</b>	--	13.00	--	--	--	22,180	0.509	139,912	3.212

Provide the "Detention Basin Outlet Structure Design" sheet for both detention facilities. Input data to be updated to reflect the as-built condition.

## Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



Zone	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.00	0.072	Orifice Plate
Zone 2 (EURV)	1.33	0.059	Orifice Plate
Zone 3 (100-year)	2.25	0.268	Rectangular Weir
<b>TOTAL</b>		<b>0.377</b>	

<b>User Input: Orifice at Underdrain Outlet (Typically used to drain WQCV in a Filtration BMP)</b>		<b>Calculated Parameters for Underdrain</b>	
Underdrain Orifice Invert Depth =	N/A	Invert below the filtration media surface =	N/A
Underdrain Orifice Diameter =	N/A	Underdrain Orifice Centroid =	N/A

<b>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)</b>		<b>Calculated Parameters for Plate</b>	
Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WL Orifice Area per Row =
Depth at top of Zone using Orifice Plate =	1.33	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Slot Width =
Orifice Plate Orifice Vertical Spacing =	3.30	inches	Elliptical Slot Centroid =
Orifice Plate Orifice Area per Row =	0.69	sq. inches (diameter = 15/16 inch)	Elliptical Slot Area =

<b>User Input: Stage and Total Area of Each Orifice</b>		<b>Calculated Parameters for Vertical Orifice</b>							
Stage of Orifice Central (ft)	0.00	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Orifice Area (sq. inches)	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69

<b>User Input: Vertical Orifice (Circular or Rectangular)</b>		<b>Calculated Parameters for Vertical Orifice</b>	
Invert of Vertical Orifice =	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =
Depth at top of Zone using Vertical Orifice =	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =
Vertical Orifice Diameter =	N/A	inches	Vertical Orifice Area =

<b>User Input: Overflow Weir (Triangular) and/or Zone 3 Weir</b>		<b>Calculated Parameters for Overflow Weir</b>	
Overflow Weir Front Edge Height, H <sub>o</sub> =	2.50	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H <sub>g</sub> =
Overflow Weir Front Edge Length =	4.00	ft	Overflow Weir Slope Length =
Overflow Weir Slope =	0.00	N/A	H/V (center area for flat grate) =
Grate Length =	2.50	ft	Grate Open Area / 100-yr Orifice Area =
Overflow Grate Open Area =	206	sq. ft	Overflow Grate Open Area w/o Debris =
Debris Chugging % =	50%	%	Overflow Grate Open Area w/ Debris =

<b>User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)</b>		<b>Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate</b>	
Depth to Invert of Outlet Pipe =	0.00	ft (relative to basin bottom at Stage = 0 ft)	Outlet Orifice Area =
Outlet Pipe Diameter =	18.00	N/A	Outlet Orifice Centroid =
Restrictor Plate Height Above Pipe Invert =	12.40	inches	Half-Centroid Angle of Restrictor Plate on Pipe =

<b>User Input: Emergency Spillway (Rectangular or Triangular)</b>		<b>Calculated Parameters for Spillway</b>	
Spillway Invert Stage =	0.00	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth =
Spillway Crest Length =	6.00	ft	Stage at Top of Freeboard =
Spillway End Slopes =	4:00	H:V	Basin Area at Top of Freeboard =
Freeboard above Max Water Surface =	1.00	ft	Basin Area at Top of Freeboard =

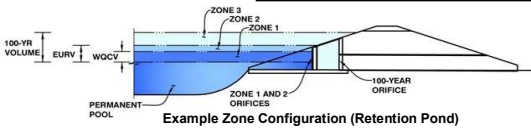
Required Hydrograph Results	WQCV	EURV	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
Design Storm Return Period	1.33	1.00	1.33	1.50	1.75	2.00	2.25	2.50	3.16
Design Rainfall Depth (in)	0.072	0.113	0.075	0.100	0.120	0.150	0.185	0.262	0.416
Calculated Runoff Volume (acre-ft)	0.072	0.113	0.075	0.100	0.120	0.150	0.185	0.262	0.416
OPTIONAL: Overflow Runoff Volume (acre-ft)	0.072	0.113	0.075	0.100	0.120	0.150	0.185	0.262	0.416
Inflow Hydrograph Volume (acre-ft)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Predevelopment Peak Q (cfs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peak Inflow Q (cfs)	1.3	2.0	1.4	2.0	2.7	3.7	4.4	7.1	28.9
Peak Outflow Q (cfs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Storage Controlling Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
Max Velocity Through Grate 1 (ft/s)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity Through Grate 2 (ft/s)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 95% of Inflow Volume (hours)	28	35	39	45	59	76	95	130	411
Time to Drain 99% of Inflow Volume (hours)	42	58	64	78	101	130	165	225	698
Maximum Ponding Depth (ft)	0.02	1.25	0.04	1.24	1.97	2.30	2.70	3.37	4.09
Area at Maximum Ponding Depth (ac-ft)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Maximum Volume Stored (acre-ft)	0.065	0.102	0.068	0.100	0.120	0.150	0.185	0.262	0.416

# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: ROLLIN RIDGE ESTATES

Basin ID: B - As-Built



**Required Volume Calculation**

Selected BMP Type =	<b>EDB</b>	
Watershed Area =	11.83	acres
Watershed Length =	1,090	ft
Watershed Slope =	0.053	ft/ft
Watershed Imperviousness =	11.00%	percent
Percentage Hydrologic Soil Group A =	50.0%	percent
Percentage Hydrologic Soil Group B =	50.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.072	acre-feet
Excess Urban Runoff Volume (EURV) =	0.111	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.075	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.110	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.202	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	0.450	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	0.655	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	0.962	acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	1.616	acre-feet
Approximate 2-yr Detention Volume =	0.069	acre-feet
Approximate 5-yr Detention Volume =	0.102	acre-feet
Approximate 10-yr Detention Volume =	0.176	acre-feet
Approximate 25-yr Detention Volume =	0.241	acre-feet
Approximate 50-yr Detention Volume =	0.272	acre-feet
Approximate 100-yr Detention Volume =	0.377	acre-feet

Optional User Override 1-hr Precipitation	
1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.14	inches

**Stage-Storage Calculation**

Zone 1 Volume (WQCV) =	0.072	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.039	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.266	acre-feet
Total Detention Basin Volume =	0.377	acre-feet

Depth Increment =  ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft <sup>2</sup> )	Optional Override Area (ft <sup>2</sup> )	Area (acre)	Volume (ft <sup>3</sup> )	Volume (ac-ft)
<b>Top of Micropool</b>	--	0.00	--	--	--	10	0.000		
<b>Bot EL=7533.0</b>	--	0.50	--	--	--	2,780	0.064	670	0.015
--	--	1.50	--	--	--	5,331	0.122	4,700	0.108
<b>Spillway EL=7535.5</b>	--	3.50	--	--	--	7,883	0.181	17,967	0.412
<b>Top EL=7538.0</b>	--	5.50	--	--	--	9,723	0.223	35,573	0.817
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