

December 20, 2023

El Paso County Planning and Community Development 2880 International Circle, Suite 110 Colorado Springs, CO 80910



Attn.: Mr. Brad Walters, Inspection Supervisor

RE: Solace Apartments Filing No. 1 - Pond Certifications

To whom it may concern,

This letter is intended to provide documentation with County Inspection Staff that the Pond facilities in Solace Apartments Filing No. 1 have been constructed within reasonable conformance to the design. The District owned pond facilities for Solace Apartments Filing No. 1 are described by the following:

Pond A – north portion of Tract B (FSD Pond)

Pond B – south portion of Tract B (FSD Pond)

JR Engineering reviewed the final constructed facilities and recently completed as-builts which confirm the appropriate size and design of the ponds.

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.

Based upon this information and information gathered during periodic site visits to the project under construction, JR Engineering is of the opinion that the stormwater BMPs have been constructed in general compliance with the approved Construction Plans, and Specifications as filed with El Paso County.

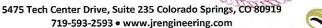
(See attached documents – UD Detention sheets and as-built drawings)

## Statement Of Engineer In Responsible Charge:

To the best of my knowledge, information and belief, the referenced **Solace Apartments Filing No.** 1 Pond facilities have been constructed in general compliance with the approved design plans and specifications as filed with El Paso County.

Mike Bramlett, P.E. Colorado No. 32314

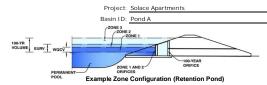
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### DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.03 (May 2020)



#### Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	7.89	acres
Watershed Length =	790	ft
Watershed Length to Centroid =	340	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	49.43%	percent
Percentage Hydrologic Soil Group A =	1.0%	percent
Percentage Hydrologic Soil Group B =	99.0%	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
acre-feet
acre-feet
inches
1.50
1.75
inches

2.00 inches 2.26 inches 2.52 inches inches

the embedded colorado orban rijare	grupiririoccuu	
Water Quality Capture Volume (WQCV) =	0.135	acre-feet
Excess Urban Runoff Volume (EURV) =	0.417	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.382	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.546	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.691	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	0.887	acre-feet
50-yr Runoff Volume (P1 = 2.26 in.) =	1.052	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	1.247	acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	1.654	acre-feet
Approximate 2-yr Detention Volume =	0.314	acre-feet
Approximate 5-yr Detention Volume =	0.430	acre-feet
Approximate 10-yr Detention Volume =	0.570	acre-feet
Approximate 25-yr Detention Volume =	0.626	acre-feet
Approximate 50-yr Detention Volume =	0.657	acre-feet
Approximate 100-yr Detention Volume =	0.732	acre-feet
		-

#### Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.135	acre-fee
Zone 2 Volume (EURV - Zone 1) =	0.282	acre-fee
Zone 3 Volume (100-year - Zones 1 & 2) =	0.315	acre-fee
Total Detention Basin Volume =	0.732	acre-fee
Initial Surcharge Volume (ISV) =	user	ft <sup>3</sup>
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H <sub>total</sub> ) =	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 <sub>main</sub> ) =	user	H:V
Basin Length-to-Width Ratio (R <sub>L/W</sub> ) =	user	

Initial Surcharge Area (A <sub>ISV</sub> ) =	user	ft 2
Surcharge Volume Length $(L_{ISV}) =$	user	ft
Surcharge Volume Width (W <sub>ISV</sub> ) =	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 <sub>FLOOR</sub> ) =		ft 2
Volume of Basin Floor (V <sub>FLOOR</sub> ) =	user	ft 3
Depth of Main Basin (H <sub>MAIN</sub> ) =	user	ft
Length of Main Basin $(L_{MAIN}) =$	user	ft
Width of Main Basin ( $W_{MAIN}$ ) =	user	ft
Area of Main Basin (A <sub>MAIN</sub> ) =	user	ft <sup>2</sup>
Volume of Main Basin ( $V_{MAIN}$ ) =	user	ft 3
Calculated Total Basin Volume ( $V_{total}$ ) =	user	acre-feet

_	Depth Increment =		ft							
		_	Optional				Optional		Malana	
	Stage - Storage Description	Stage (ft)	Override Stage (ft)	Length (ft)	Width (ft)	Area (ft 2)	Override Area (ft <sup>2</sup> )	Area (acre)	Volume (ft 3)	Volume (ac-ft)
6251	Top of Micropool		0.00				10	0.000	(11)	(dC-11)
0231	ELEV:6252		1.00				2,043	0.047	1,026	0.024
	ELEV:6253		2.00				5,660	0.130	4,878	0.112
	ELEV:6254		3.00				10,498	0.241	12,957	0.297
	ELEV:6255		4.00				14,961	0.343	25,687	0.590
	ELEV:6256		5.00				18,037	0.414	42,186	0.968
	ELEV:6257		6.00				20,826	0.478	61,617	1.415
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## DETENTION BASIN OUTLET STRUCTURE DESIGN

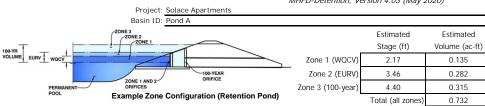
MHFD-Detention, Version 4.03 (May 2020)

Outlet Type

Weir&Pipe (Restrict)

Orifice Plate

Circular Orifice



User Input: Orifice at Underdrain Outlet (typically	used to drain WQC	V in a Filtration BMP)	` ′∟		Calculated Parameters fo	r Underdrain
Underdrain Orifice Invert Depth =	f	ft (distance below the filtration media surface)		Underdrain Orifice Area =	ft <sup>2</sup>	
Underdrain Orifice Diameter =	i	inches		Underdrain Orifice Centroid =	feet	

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WOCV and/or EURV in a sedimentation BMP)  Calculated Parameters for Pla									
Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	3.125E-03	ft <sup>2</sup>				
Depth at top of Zone using Orifice Plate =	2.49	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet				
Orifice Plate: Orifice Vertical Spacing =	N/A	inches	Elliptical Slot Centroid =	N/A	feet				
Orifice Plate: Orifice Area per Row =	0.45	sq. inches (diameter = 3/4 inch)	Elliptical Slot Area =	N/A	ft <sup>2</sup>				

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	0.55	1.40	2.10				
Orifice Area (sq. inches)	0.45	0.45	0.45	0.45				

	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 Rectangul	lar)				Calculated Paramet	ers for Vertical Orif	ice
	Zone 2 Circular	Not Selected			Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	2.49	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	0.00	N/A	ft <sup>2</sup>
Depth at top of Zone using Vertical Orifice =	3.77	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	0.02	N/A	feet
Vertical Orifice Diameter -	U 38	N/A	inches	•			•

User Input: Overflow Weir (Dropbox with Flat or	Calculated Parameters for Overflow Weir					
	Zone 3 Weir	Not Selected		Zone 3 Weir	Not Selected	İ
Overflow Weir Front Edge Height, Ho =	3.94	N/A	ft (relative to basin bottom at Stage = 0 ft) $\frac{1}{2}$ Height of Grate Upper Edge, $\frac{1}{2}$ Height of Grate Upper Edge, $\frac{1}{2}$	3.94	N/A	feet
Overflow Weir Front Edge Length =	4.00	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 =	28.73	N/A	İ
Horiz. Length of Weir Sides =	3.00	N/A	feet Overflow Grate Open Area w/o Debris =	8.40	N/A	ft <sup>2</sup>
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area	4.20	N/A	ft <sup>2</sup>
Debris Clogging % =	50%	N/A	%			

User Input: Outlet Pipe w/ Flow Restriction Plate	Rectangular Orifice)		Calculated Parameters for Outlet Pipe w/ Flow Restriction			<u>ate</u>		
	Zone 3 Restrictor	Not Selected				Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stag	e = 0 ft)	Outlet Orifice Area =	0.29	N/A	ft <sup>2</sup>
Outlet Pipe Diameter =	18.00	N/A	inches	Ou	ıtlet Orifice Centroid =	0.20	N/A	feet
Restrictor Plate Height Above Pipe Invert =	4.00		inches Half-C	entral Angle of Res	trictor Plate on Pipe =	0.98	N/A	radians

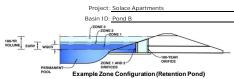
User Input: Emergency Spillway (Rectangular or	Trapezoidal)	-		Calculated Parame	ters for Spillway
Spillway Invert Stage=	5.28	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.31	feet
Spillway Crest Length =	40.00	feet	Stage at Top of Freeboard =	6.59	feet
Spillway End Slopes =	10.00	H:V	Basin Area at Top of Freeboard =	0.48	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	1.41	acre-ft

Routed Hydrograph Results 7	The user can ove	rride the default CUF	IP hydrographs and	runoff volumes by	entering new value	s in the Inflow Hydi	rographs table (Coll	umns W through Af	<del>5</del> ).
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	2.26	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.135	0.417	0.382	0.546	0.691	0.887	1.052	1.247	1.654
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.382	0.546	0.691	0.887	1.052	1.247	1.654
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.9	2.7	4.0	7.2	9.1	11.2	15.7
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.12	0.34	0.51	0.91	1.15	1.42	1.99
Peak Inflow Q (cfs) =	N/A	N/A	6.7	9.8	12.0	15.6	18.5	22.1	28.9
Peak Outflow Q (cfs) =	0.1	0.1	0.1	0.1	1.3	2.8	3.0	3.1	11.6
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.0	0.3	0.4	0.3	0.3	0.7
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.1	0.3	0.3	0.4	0.4
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) =	47	82	79	96	99	97	95	93	89
Time to Drain 99% of Inflow Volume (hours) =	51	90	861	104	108	106	106	105	103
Maximum Ponding Depth (ft) =	2.17	3.46	3,27	3.82	4.06	4.29	4.60	5.03	5.45
Area at Maximum Ponding Depth (acres) =	0.15	0.29	0.27	0.32	0.35	0.36	0.39	0.42	0.44
Maximum Volume Stored (acre-ft) =	0.136	0.419	0.364	0.526	0.607	0.692	0.808	0.977	1.157

The drain time exceeds the allowable limits for the 2-year and 5-year. The pond must be within allowable ranges for drain time.

### DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.03 (May 2020)



ersneu miormation		
Selected BMP Type =	EDB	
Watershed Area =	17.50	acres
Watershed Length =	1,631	ft
Watershed Length to Centroid =	740	ft
Watershed Slope =	0.014	ft/ft
Watershed Imperviousness =	40.55%	percent
Percentage Hydrologic Soil Group A =	1.0%	percent
Percentage Hydrologic Soil Group B =	99.0%	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

the embedded Colorado Urban Hydrograph Procedure.						
Water Quality Capture Volume (WQCV) =	0.264	acre-feet				
Excess Urban Runoff Volume (EURV) =	0.746	acre-feet				
2-yr Runoff Volume (P1 = 1.19 in.) =	0.729	acre-feet				
5-yr Runoff Volume (P1 = 1.5 in.) =	1.088	acre-feet				
10-yr Runoff Volume (P1 = 1.75 in.) =	1.408	acre-feet				
25-yr Runoff Volume (P1 = 2 in.) =	1.872	acre-feet				
50-yr Runoff Volume (P1 = 2.26 in.) =	2.246	acre-feet				
100-yr Runoff Volume (P1 = 2.52 in.) =	2.702	acre-feet				
500-yr Runoff Volume (P1 = 3.14 in.) =	3.634	acre-feet				
Approximate 2-yr Detention Volume =	0.550	acre-feet				
Approximate 5-yr Detention Volume =	0.767	acre-feet				
Approximate 10-yr Detention Volume =	1.052	acre-feet				
Approximate 25-yr Detention Volume =	1.176	acre-feet				
Approximate 50-yr Detention Volume =	1.240	acre-feet				
Approximate 100-yr Detention Volume =	1.412	acre-feet				

	acre-feet
	acre-feet
1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.26	inches
2.52	inches
	inches
	•

Define Zones and Basin Geometry

Jerine Zones and Basin Geometry		
Zone 1 Volume (WQCV) =	0.264	acre-fe
Zone 2 Volume (EURV - Zone 1) =	0.482	acre-fe
Zone 3 Volume (100-year - Zones 1 & 2) =	0.666	acre-fe
Total Detention Basin Volume =	1.412	acre-fe
Initial Surcharge Volume (ISV) =	user	ft <sup>3</sup>
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H <sub>total</sub> ) =	user	ft
Depth of Trickle Channel (H <sub>TC</sub> ) =	user	ft
Slope of Trickle Channel (S <sub>TC</sub> ) =	user	ft/ft
Slopes of Main Basin Sides (Smain) =	user	H:V
Basin Length-to-Width Ratio (R <sub>L/W</sub> ) =	user	

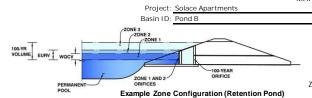
Initial Surcharge Area (A <sub>ISV</sub> ) =	user	ft <sup>2</sup>
Surcharge Volume Length (L <sub>ISV</sub> ) =	user	ft
Surcharge Volume Width (W <sub>ISV</sub> ) =	user	ft
Depth of Basin Floor (H <sub>FLOOR</sub> ) =	user	ft
Length of Basin Floor (LFLOOR) =	user	ft
Width of Basin Floor (W <sub>FLOOR</sub> ) =	user	ft
Area of Basin Floor (A <sub>FLOOR</sub> ) =	user	ft <sup>2</sup>
Volume of Basin Floor (V <sub>FLOOR</sub> ) =	user	ft <sup>3</sup>
Depth of Main Basin (H <sub>MAIN</sub> ) =	user	ft
Length of Main Basin (L <sub>MAIN</sub> ) =	user	ft
Width of Main Basin (W <sub>MAIN</sub> ) =	user	ft
Area of Main Basin (A <sub>MAIN</sub> ) =	user	ft <sup>2</sup>
Volume of Main Basin (V <sub>MAIN</sub> ) =	user	ft <sup>3</sup>
Calculated Total Basin Volume (Vtotal) =	user	acre-feet

rear			1.							
FEAR FICE	Depth Increment =		ft Optional			1	Optional		1	
ention Pond)	Stage - Storage	Stage	Override	Length	Width	Area	Override	Area	Volume	Volume
ention Fond)	Description	(ft)	Stage (ft)	(ft)	(ft)	(ft 2)	Area (ft 2)	(acre)	(ft 3)	(ac-ft)
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6243										
	ELEV:6244		0.83				3,044	0.070	1,275	0.029
	ELEV:6245		1.83				16,597	0.381	11,095	0.255
	ELEV:6246		2.83				24,667	0.566	31,727	0.728
	ELEV:6247		3.83				30,072	0.690	59,097	1.357
	ELEV:6248		4.83				34,123	0.783	91,194	2.094
	ELEV:6549		5.83				38,038	0.873	127,274	2.922
	ELEV:6549.5		6.33				39,901	0.916	146,759	3.369
Optional User Overrides										
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(AB)MHFD-Detention\_v4 03 (Pond B).xlsm, Basin 12/19/2023, 7:17 AM

#### DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.03 (May 2020)



	Estimated	Estimated	
	Stage (ft)	Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.86	0.264	Orifice Plate
Zone 2 (EURV)	2.87	0.482	Circular Orifice
Zone 3 (100-year)	3.91	0.666	Weir&Pipe (Restrict)
•	Total (all zones)	1.412	

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

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 <sup>2</sup>				
Underdrain Orifice Centroid =	N/A	feet				

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WOCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice = 0.00 ft (relative to basin bottom at Stage = 0 ft)

Depth at top of Zone using Orifice Plate = 2.60 ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Area per Row = N/A inches

	Calculated Paramete	ers for Plate
WQ Orifice Area per Row =	N/A	ft <sup>2</sup>
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft <sup>2</sup>
· ·		

<u>User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)</u>

	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	0.50	1.04	1.56	2.29			
Orifice Area (sq. inches)	0.56	0.56	0.56	0.52	0.52			

	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)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	2.53	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	3.63	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	1.50	N/A	inches

	Calculated Parameters for Vertical Orifice					
	Zone 2 Circular	Not Selected				
Vertical Orifice Area =	0.01	N/A	ft <sup>2</sup>			
Vertical Orifice Centroid =	0.06	N/A	fee			

User Input: Overflow Weir (Dropbox with Flat or SI	Calculated Paramete	ers for Overflow Wei	<u>r</u>				
	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.77	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, $H_t$ =	3.77	N/A	feet
Overflow Weir Front Edge Length =	4.00	N/A	feet	Overflow Weir Slope Length =	3.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V Gr	ate Open Area / 100-yr Orifice Area =	28.73	N/A	
Horiz. Length of Weir Sides =	3.00	N/A	feet Ov	verflow Grate Open Area w/o Debris =	8.40	N/A	ft <sup>2</sup>
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area	Overflow Grate Open Area w/ Debris =	4.20	N/A	ft <sup>2</sup>
Debris Clogging % =	50%	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 =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet
Outlet Pipe Diameter =	18.00	N/A	inches	Outlet Or
Restrictor Plate Height Above Pipe Invert =	4.00		inches Half-Central	Angle of Restrictor

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate						
	Zone 3 Restrictor	Not Selected				
Outlet Orifice Area =	0.29	N/A	ft <sup>2</sup>			
Outlet Orifice Centroid =	0.20	N/A	feet			
estrictor Plate on Pipe =	0.98	N/A	radians			

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.42	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	50.00	feet
Spillway End Slopes =	10.00	H:V
eboard above Max Water Surface =	1.00	feet

	Calculated Parameters for Spillwa		
Spillway Design Flow Depth=	0.34	feet	
Stage at Top of Freeboard =	7.76	feet	
Basin Area at Top of Freeboard =	0.92	acres	
Basin Volume at Top of Freeboard =	3.37	acre-ft	

Routed Hydrograph Results	The user can over	ride the default CUHP	hydrographs and ru	noff volumes by ente	ering new values in t	the Inflow Hydrograp	ohs table (Columns V	V 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	2.26	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.264	0.746	0.729	1.088	1.408	1.872	2.246	2.702	3.634
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.729	1.088	1.408	1.872	2.246	2.702	3.634
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	1.4	4.0	6.1	11.3	14.3	18.2	25.4
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.08	0.23	0.35	0.64	0.82	1.04	1.45
Peak Inflow Q (cfs) =	N/A	N/A	8.4	12.8	16.1	23.1	27.6	32.7	43.5
Peak Outflow Q (cfs) =	0.1	0.1	0.1	0.2	0.6	2.8	3.0	3.1	3.4
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.0	0.1	0.2	0.2	0.2	0.1
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.0	0.3	0.3	0.3	0.4
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) =	68	118	117	≥120	>120	>120	>120	>120	>120
Time to Drain 99% of Inflow Volume (hours) =	74	>120	>120	/120	>120	>120	>120	>120	>120
Maximum Ponding Depth (ft) =	1.86	2.87	2.78	3.37	3.82	4.20	4.60	5.12	6.12
Area at Maximum Ponding Depth (acres) =	0.39	0.57	0.56	0.63	0.69	0.72	0.76	0.81	0.90
Maximum Volume Stored (acre-ft) =	0.266	0.751	0.700	1.046	1.350	1.611	1.916	2.324	3.170

The drain time exceeds the allowable limits for the 2-year and 5-year. The pond must be within allowable ranges for drain time. December 20, 2023

El Paso County Development Services Division 2880 International Circle Colorado Springs, CO 80910



## **RE:** Solace Apartments Filing 1 – Public Storm Sewer

The public storm drainage facilities for Solace Apartments Filing No. 1 consist of the following facilities:

=	(5) 10' Type R Inlet	- (117 LF)	18" RCP Storm Drain
_	(3) 15' Type R Inlet	- ( 44 LF)	24" RCP Storm Drain
-	(2) Storm Manholes	- (187 LF)	36" RCP Storm Drain
		- ( 33 LF)	42" RCP Storm Drain

The above listed storm system was recently installed by CS Powers and Galley, LLC and per the approved drainage report, the storm system drains to Ponds A and B which are subject to a separate certification.

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.

Based upon information gathered during periodic site visits to the project and the as-built drawings, JR Engineering is of the opinion that the storm drainage facilities have been constructed in general compliance with the approved design plans and specifications as filed with the County.

On behalf of CS Powers and Galley, LLC, JR Engineering hereby requests probationary inspection of these facilities by County Engineering so that the warranty period can begin.

# Statement Of Engineer In Responsible Charge:

To the best of my knowledge, information and belief, the referenced public storm drainage facilities have been constructed in general compliance with the approved design plans and specifications as filed with El Paso County.

Respectfully submitted,

JR ENGINEERING, LLC

Mike Bramlett, PE Colorado No. 32314



El Paso County Development Services Division 2880 International Circle Colorado Springs, CO 80910

RE: Solace Apartments Filing No. 1 – Paonia Street Improvements

The public Paonia Street improvements associated with Solace Apartments Filing 1 consist of the paving, curb and gutter, cross pans, sidewalk, pedestrian ramps and driveways to Solace Pond View and Tranquil Glen Grove which have been recently installed by CS Powers and Galley, LLC.

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.

Based upon information gathered during periodic site visits during the installation of the street improvements and the as-built drawings, JR Engineering is of the opinion that the street improvements have been constructed in general compliance with the approved design plans and specifications as filed with the County.

On behalf of CS Powers and Galley, LLC, JR Engineering hereby requests probationary inspection of these facilities by County Engineering so that the warranty period can begin.

## STATEMENT OF ENGINEER IN RESPONSIBLE CHARGE:

To the best of my knowledge, information and belief, the referenced public street improvements have been constructed in general compliance with the approved design plans and specifications as filed with El Paso County.

Respectfully submitted,

JR ENGINEERING, LLC

Mike Bramlett, PE Colorado No. 32314