



November 30, 2023

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

Attn.: Project Manager

RE: Claremont Business Park Filing No. 1A, Lot 2, Private Detention/Stormwater Quality
Pond - Asbuilt Certification
EPC Project # PPR-192

Dear Project Manager:

Per the approved construction drawings for " Claremont Business Park Filing No. 1A, Lot 2", improvements were made to construct a water quality facility in compliance with the current El Paso County Drainage Criteria and the approved Final Drainage Report for this project.

Based upon this information and periodic site visits to the project during significant/key phases of the stormwater BMP installation, M&S Civil Consultants, Inc. is of the opinion that the stormwater BMPs have been constructed in general compliance with the approved design plans, and specifications as filed with El Paso County. The site and adjacent properties (as affected by work performed under for this project EPC #PPR-192) are stable with respect to settlement and subsidence, sloughing of cut and fill slopes, revegetation or other ground cover, and the improvements (private) meet or exceed the minimum design requirements.

Statement Of Engineer In Responsible Charge

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

Virgil A. Sanchez
Colorado P.E. No.37160
For and on behalf of M&S Civil
Consultants, Inc.

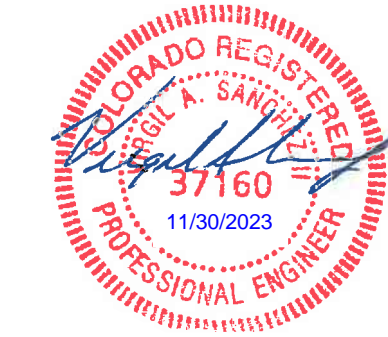


CLAREMONT BUSINESS PARK FIL NO. 1A, LOT 2

COUNTY OF EL PASO, STATE OF COLORADO

ASBUILT - DRAINAGE MAP

NOVEMBER 2023



LEGEND

- BASIN DESIGNATION: Z, C5, C100
- PIPE RUN REFERENCE LABEL: 4
- SURFACE DESIGN POINT: 6
- BASIN BOUNDARY: Dashed line
- EXISTING CONTOUR: (6920) Dashed line
- PROP CONTOUR: Solid line
- SITE BOUNDARY: Thick solid line
- PROPOSED STORM SEWER PIPE: Thick dashed line
- EXISTING STORM SEWER PIPE: Thin dashed line
- CROSSSPAN: T-shaped symbol
- INLET: Square symbol
- EXISTING FLOW DIRECTION: Arrow
- EMERGENCY OVERFLOW DIRECTION: Arrow with 'E' symbol
- PROPOSED FLOW DIRECTION: Arrow with 'P' symbol
- HIGH POINT: H.P. symbol
- LOW POINT: L.P. symbol
- SC250 PERM. EROSION CONTROL MAT: Grid pattern
- RIPRAP TYPE VL OR L: Stippled pattern

BASIN SUMMARY

BASIN	AREA (ACRES)	Q ₅	Q ₁₀₀
EX1	0.25	0.1	0.8
EX2	0.36	0.2	1.1
A	0.93	3.9	7.0
B	0.92	3.8	7.0
C	0.21	0.1	0.6
D	0.26	0.5	1.2

DESIGN POINT SUMMARY

DESIGN POINT	Q ₅	Q ₁₀₀	BASIN	STRUCTURE
1	3.7	7.3	EX1, A	RUNDOWN TO SFB
2	3.7	7.5	EX2, B	RUNDOWN TO SFB
3	7.5	15.4	DP1, DP2, C	WO SAND FILTER BASIN & OUTLET STRUCTURE

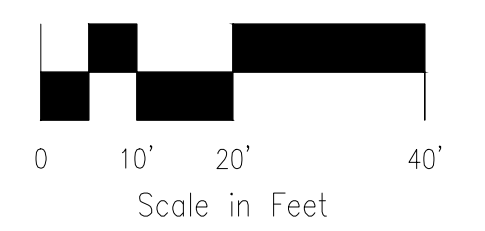
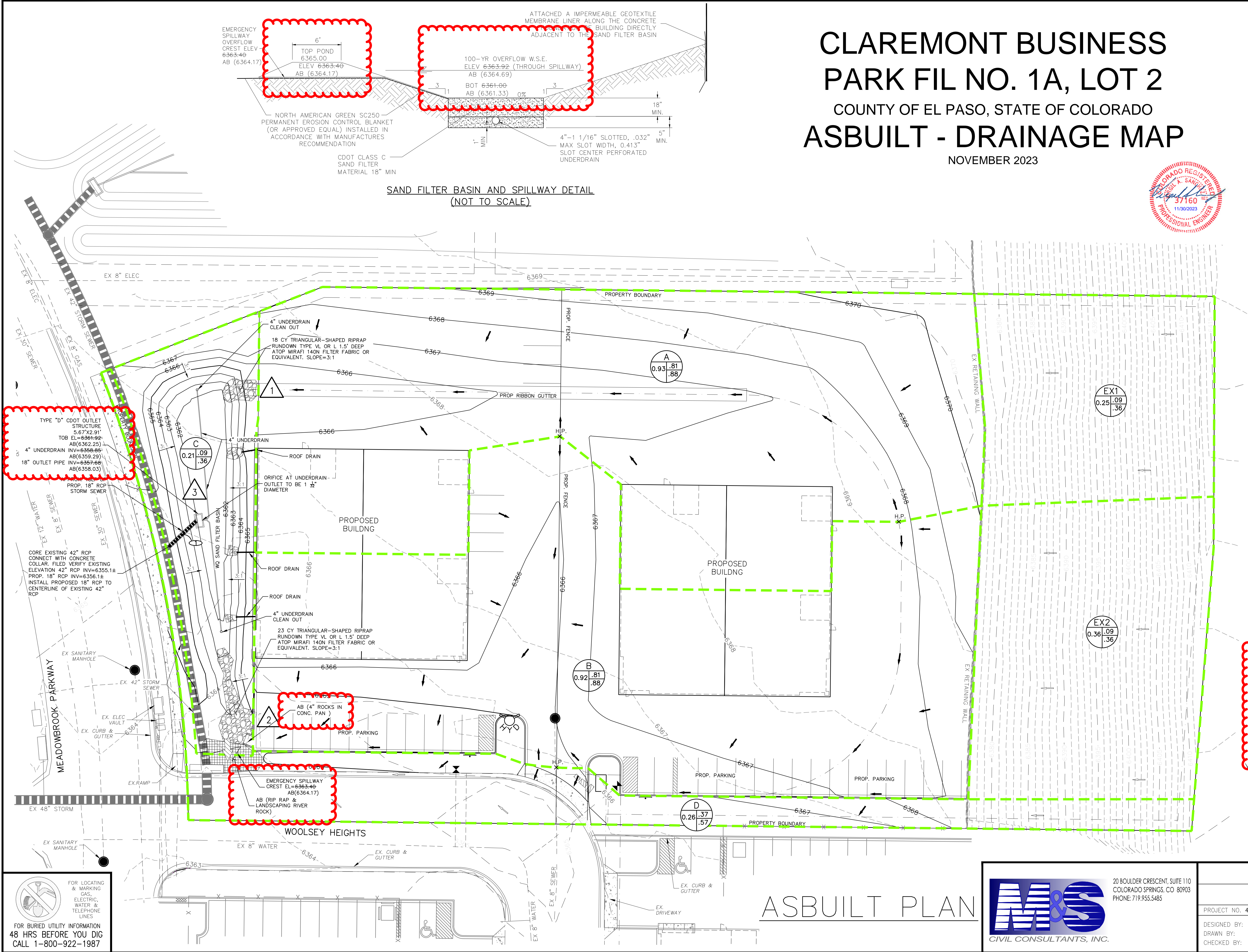
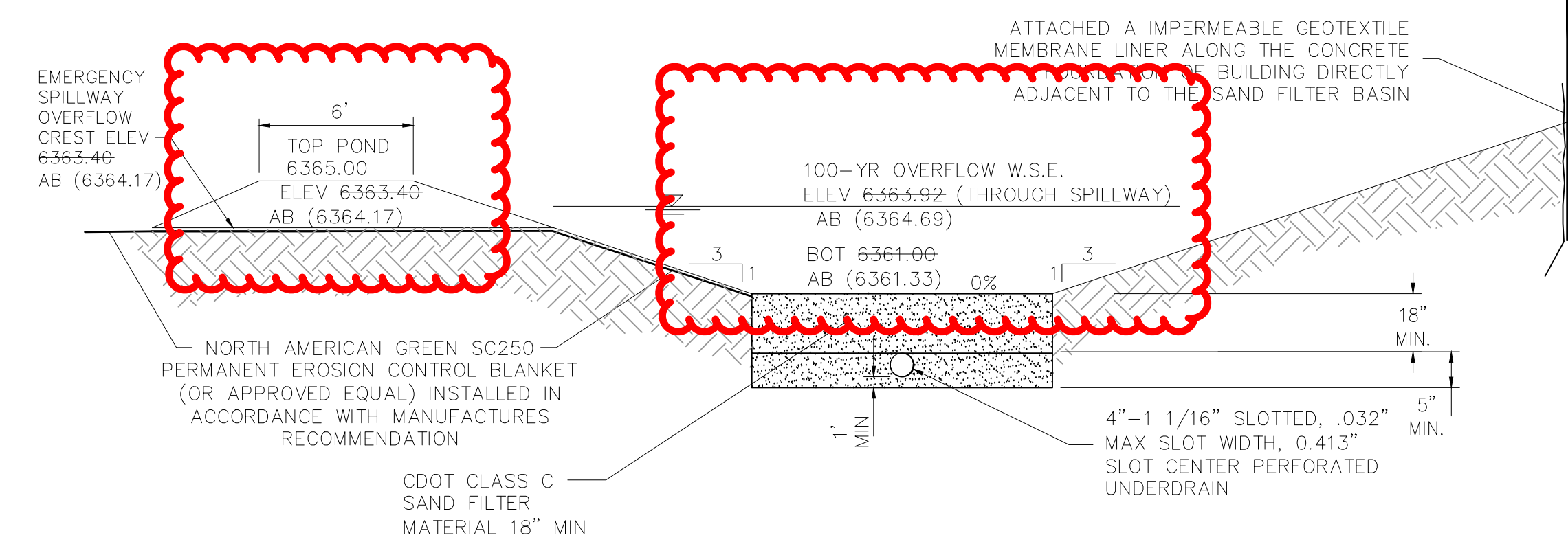
STORM SEWER SUMMARY

PIPE RUN	Q ₅	Q ₁₀₀	PIPE SIZE	CONTRIBUTING PIPES
1	7.5	15.4	18" RCP	DP3/SFB

WQCV SUMMARY

EPC/URBAN DRAINAGE SAND FILTER BASIN-SEE STD. DET.	ASBUILT
WQCV PROVIDED	1,830 CF
AREA REQUIRED	965 SF
AREA PROVIDED	1,494 SF
100 YR WATER SURFACE EL	6362.45
EMERGENCY SPILLWAY CREST ELEVATION	6363.40 FT
SPILLWAY DESIGN FLOW DEPTH	0.52 FT
CDOT TYPE D OUTLET STRUCTURE TOB ELEVATION	6361.92 FT
	6362.25

SAND FILTER BASIN AND SPILLWAY DETAIL (NOT TO SCALE)



FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION 48 HRS BEFORE YOU DIG CALL 1-800-922-1987

ASBUILT PLAN



CBP LOT 2-1A
ASBUILT - DRAINAGE MAP

PROJECT NO. 44-034	SCALE: HORIZONTAL: 1"=20' VERTICAL: N/A	DATE: 11/29/2023
DESIGNED BY: CMN	CHECKED BY: VAS	SHEET 1 OF 1
		PDM

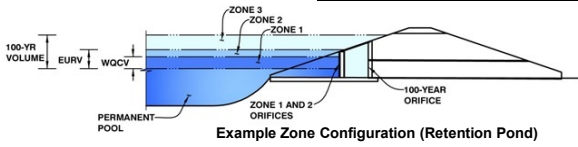
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Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: CBP LOT 2-1A

Basin ID: _____



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.91	0.046	Filtration Media
Zone 2			
Zone 3			
		0.046	Total

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

Underdrain Orifice Invert Depth = 2.15 ft (distance below the filtration media surface)
 Underdrain Orifice Diameter = 1.04 inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = 0.0 ft²
 Underdrain Orifice Centroid = 0.04 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)

Invert 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 = _____ 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 (optional)	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)								
Orifice Area (sq. inches)								
	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 ft (relative to basin bottom at Stage = 0 ft)
 Depth at top of Zone using Vertical Orifice = Not Selected ft (relative to basin bottom at Stage = 0 ft)
 Vertical Orifice Diameter = Not Selected inches

Calculated Parameters for Vertical Orifice

Vertical Orifice Area = Not Selected ft²
 Vertical Orifice Centroid = Not Selected feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

Overflow Weir Front Edge Height, Ho = 0.92 ft (relative to basin bottom at Stage = 0 ft)
 Overflow Weir Front Edge Length = 5.67 feet
 Overflow Weir Slope = 0.00 H:V (enter zero for flat grate)
 Horiz. Length of Weir Sides = 2.91 feet
 Overflow Grate Open Area % = 70% % grate open area/total area
 Debris Clogging % = 50% %

Calculated Parameters for Overflow Weir

Height of Grate Upper Edge, H₁ = 0.92 feet
 Over Flow Weir Slope Length = 2.91 feet
 Grate Open Area / 100-yr Orifice Area = 6.54 should be ≥ 4
 Overflow Grate Open Area w/o Debris = 11.55 ft²
 Overflow Grate Open Area w/ Debris = 5.77 ft²

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

Depth to Invert of Outlet Pipe = 4.20 ft (distance below basin bottom at Stage = 0 ft)
 Circular Orifice Diameter = 18.00 inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

Outlet Orifice Area = 1.77 ft²
 Outlet Orifice Centroid = 0.75 feet
 Half-Central Angle of Restrictor Plate on Pipe = N/A radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage = 2.40 ft (relative to basin bottom at Stage = 0 ft)
 Spillway Crest Length = 12.00 feet
 Spillway End Slopes = 4.00 H:V
 Freeboard above Max Water Surface = 1.00 feet

Calculated Parameters for Spillway

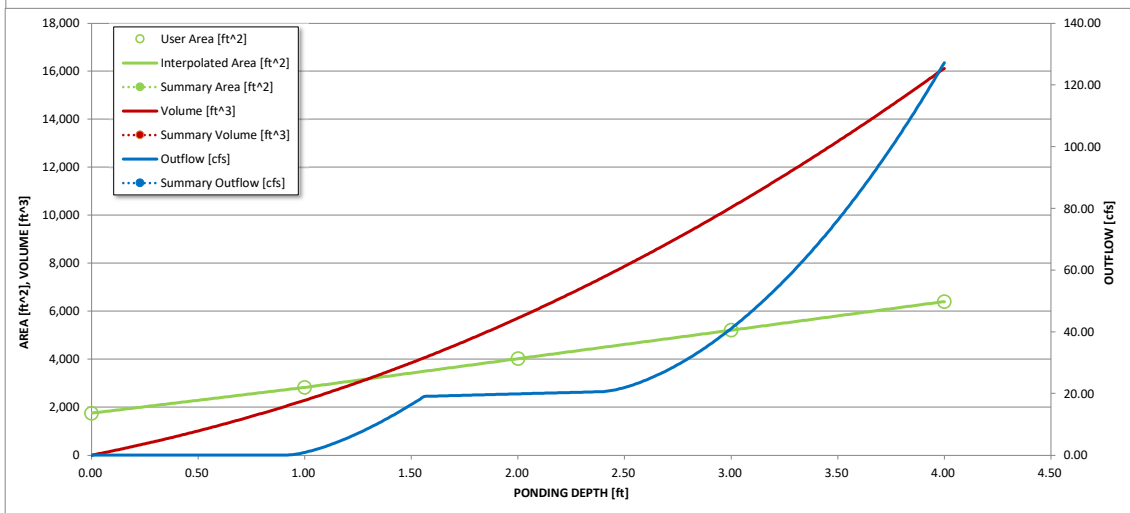
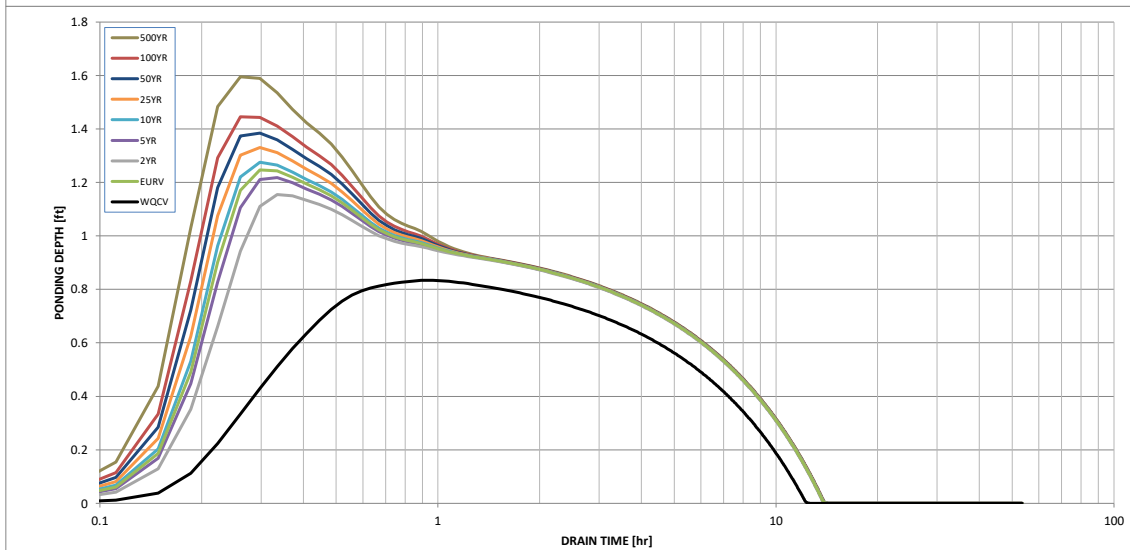
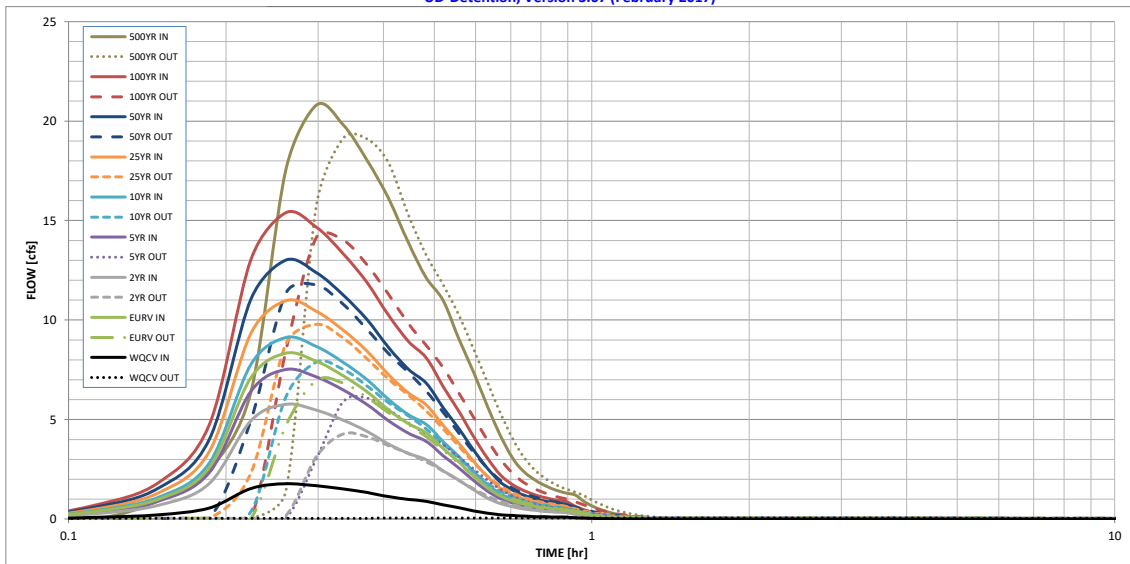
Spillway Design Flow Depth = 0.52 feet
 Stage at Top of Freeboard = 3.92 feet
 Basin Area at Top of Freeboard = 0.14 acres

Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period									
One-Hour Rainfall Depth (in)	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	3.14
Calculated Runoff Volume (acre-ft)	0.046	0.221	0.152	0.199	0.242	0.292	0.347	0.411	0.557
OPTIONAL Override Runoff Volume (acre-ft)									
Inflow Hydrograph Volume (acre-ft)	0.046	0.221	0.152	0.199	0.242	0.292	0.347	0.411	0.557
Predevelopment Unit Peak Flow, q (cfs/acre)	0.00	0.00	0.00	0.01	0.02	0.04	0.27	0.64	1.42
Predevelopment Peak Q (cfs)	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.7	3.8
Peak Inflow Q (cfs)	1.8	8.3	5.8	7.5	9.1	11.0	13.0	15.4	20.8
Peak Outflow Q (cfs)	0.0	7.0	4.3	6.1	7.9	9.8	11.8	14.1	19.1
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	327.2	182.2	101.6	16.5	8.2	5.1
Structure Controlling Flow	Filtration Media	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Outlet Plate 1
Max Velocity through Grate 1 (fps)	N/A	0.58	0.35	0.5	0.6	0.8	1.0	1.2	1.6
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)	12	12	13	12	12	11	11	10	9
Time to Drain 99% of Inflow Volume (hours)	12	13	13	13	13	13	13	13	12
Maximum Ponding Depth (ft)	0.83	1.25	1.16	1.22	1.27	1.33	1.38	1.45	1.60
Area at Maximum Ponding Depth (acres)	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08
Maximum Volume Stored (acre-ft)	0.042	0.069	0.063	0.067	0.071	0.075	0.079	0.084	0.096

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

