EPC STORMWATER REVIEW COMMENTS
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PRELIMINARY DRAINAGE REPORT

for

THE COMMONS AT FALCON FIELD

El Paso County, Colorado

March 16, 2023

Prepared for:

Falcon Field, LLC
30 N. Tejon Street, #516
Colorado Springs, CO 80903
Contact: PJ Anderson
(719) 475-7474

Prepared by:

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Add PCD File No.
SP-232

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PRELIMINARY DRAINAGE REPORT

for

THE COMMONS AT FALCON FIELD

Falcon, Colorado

1.0 CERTIFICATION STATEMENTS

ENGINEER'S STATEMENT

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by El Paso County for drainage reports, and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omission on my part in preparing this report.

Tim D. McConnell, P.E. Date
Colorado P.E. License No. 33797
For and on Behalf of Drexel, Barrell & Co.

DEVELOPER'S STATEMENT

I, the developer have read and will comply with all the requirements specified in this drainage report and plan.

Business Name: Falcon Field, LLC.

By:

PJ Anderson Date
Title: Owner
Address: 30 N. Tejon St., #516
Colorado Springs, CO 80903

EL PASO COUNTY

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual Volumes 1 and 2, and the Engineering Criteria Manual, as amended.

For the County Engineer Date
CONDITIONS:

Josh Palmer, P.E.
County
Engineer/ECM
Administrator

PRELIMINARY DRAINAGE REPORT

for

THE COMMONS AT FALCON FIELD

Falcon, Colorado

2.0 PURPOSE

This report is prepared by Drexel, Barrel & Co in support of The Commons at Falcon Field project. The purpose of this report is to identify onsite and offsite drainage patterns, storm sewer, inlet locations, and areas tributary to the site, and to safely route developed storm water runoff to adequate outfall facilities.

3.0 GENERAL SITE DESCRIPTION

This should be identified at this stage

Location

The Commons at Falcon Field site is approximately 57.7 acres and is bounded by U.S. Highway 24 along the northwest, a school to the south, and a large-lot residential development to the east and northeast. The site is in the east half of Section 7, Township 13 South, Range 64 West of the 6th PM.

Design, phasing, responsibility for and maintenance of any proposed improvements will be discussed in the final drainage report(s) as development of the site proceeds. Fees will be assessed and paid according to the current rates at the time of platting. All easements for utilities and drainage features will be provided with the final plat process.

northeast?

Existing Site Conditions

The site is currently open grass land with one single-family residence and barn. The residence is supported by a well and individual septic system. There are no known utilities on site. One offsite basin contributes flow to the site. Offsite runoff enters the site at the northwesterly corner through a box culvert under Highway 24, and discharges through the site in an open drainage to the south.

Address/discuss runoff from Hwy 24 that maybe entering the site. Flows from hwy 24 shall be accounted for in your analysis

Proposed Site Conditions

The Commons at Falcon Field is a proposed mixed-use commercial and residential Development. The development will consist of 169 single-family lots and 8 commercial pads, along with associated roadways and open space.

Soils

According to the Soil Survey of El Paso County Area, Colorado, prepared by the U.S. Department of Agriculture Soil Conservation Service, the site is partially underlain by Blakeland Loamy Sand (Soil No. 8), and predominantly by Columbine gravelly sandy loam (Soil No. 19). Both soils are type 'A' hydrological soil group. See appendix for map.

Please clarify in the text that this is a Zone A floodplain within the site even though it may not be designated as a regulatory floodway

Climate

This area of El Paso County can be described as the foothills, with total precipitation amounts typical of a semi-arid region, roughly 15 inches annually. The climate of the site is typical of a sub-humid to semi-arid climate with mild summers and winters. The average temperature is 31 degrees F in the winter and 68.4 degrees F in the summer.

Floodplain Statement

The Flood Insurance Rate Maps (FIRM No. 08041C0553-G & 08041C0561-G both dated 12/7/18) indicates that there are no designated regulatory floodplains in the vicinity of the proposed site. There is a Zone A area that covers the "Falcon Creek East Tributary" that bisects the site. This reach of the channel is the subject of a FEMA floodplain study being completed by separate report and analysis.

Previous Drainage Studies

The site is located within the East Tributary Basin of the Falcon Basin Watershed, as studied in the Falcon Drainage Basin Planning Study, prepared by Matrix Design Group, September, 2015. DBPS recommendations are presented later in this report.

4.0 DRAINAGE CRITERIA

The drainage analysis has been prepared in accordance with the current El Paso County Drainage Criteria Manual. Calculations were performed to determine runoff quantities during the 5-year and 100-year frequency storms for historic and developed conditions using the Rational Method as required for basins containing less than 100 acres.

In addition, the following Mile High Flood District (MHFD) provided spreadsheet MHFD-Detention v4.04 was used for preliminary design of the detention facilities.

Please discuss the problems identified in the DBPS for this site and the solutions indicated in the DBPS.

5.0 DBPS ANALYSIS

Existing Conditions

The Falcon DBPS completed hydrologic analysis for the Falcon Basin Watershed, using HEC-HMS v.3.5 software, for historical, existing and future land use conditions by applying a 24-hour storm event with 2-, 5-, 10-, 25-, 50-, and 100-year recurrence intervals and current drainage conveyance infrastructure.

As mentioned earlier, offsite flows from the Woodmen Hills Detention Pond #4 enter the Commons at Falcon Field site via two 4.83'x12' box culverts underneath U.S. Highway 24, these combine with onsite flows and follow the historic reach ET100 of the Falcon Creek East Tributary to the south.

The following table details the HEC-HMS analysis of existing conditions across the Commons at Falcon Field development.

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Peak Discharges for the Existing Condition at Points of Interest in vicinity of Falcon Marketplace Development (DBPS)

Location	Existing Conditions (source: Falcon Basin, Drainage Planning Study, HEC-HMS model)							
	HEC-HMS Element	Area (sq mi)	Peak Flow (cfs)					
			2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
East tributary at North Property Line of Commons at Falcon Field	RET090	1.66	14	36	55	170	230	320
East tributary through Commons at Falcon Field	RET100	1.78	15	39	64	170	270	370
Local Basin	ET100	0.05	1	6	10	21	27	34
East tributary South of Commons at Falcon Field Property Line	RET110	1.83	15	40	65	170	270	380

The DBPS flow rates shown in the table above were used as the basis of the existing condition analysis of the Commons at Falcon Field development. Site specific basins have been allocated and referenced on the existing conditions map in the appendix.

6.0 EXISTING CONDITION

In addition to the DBPS, a site specific analysis of the existing conditions was completed. The flows determined by the DBPS for the tributary entering the site from the north (RET090), were used in combination with rational method analysis for the surrounding onsite/offsite flows.

Were the DBPS flows added to the rational method flows? Adding flows from different methodologies can lead to inaccurate results.

BASIN & DESIGN POINT SUMMARY				
BASIN	DP	AREA (AC)	Q5 (cfs)	Q100 (cfs)
OS1	A	1.79	4.1	9.2
E1		13.85	3.2	22.4
RET090 (DBPS)			36.0	320.0
	B	15.64	41.6	347.8
OS2	C	0.65	1.5	3.3
E2		12.88	2.5	18.6
	D	13.53	3.3	20.3
E3	E	13.11	2.7	19.6
E4	F	1.57	0.3	2.6
E5	G	5.91	2.2	11.7
OS3	H	0.66	1.5	3.5
E6		10.37	1.7	12.5
	J	11.02	2.4	14.0

Revise to DPA as shown on drainage maps.

Basin OS1 represents a portion of the southern half of U.S. Highway 24 along the northwest boundary for the Commons at Falcon Field site. Due to no curb and gutter along this stretch of U.S. Highway 24, flows from this basin discharge directly into basin E1 and are represented by Design Point A (DPA). Runoff rates at existing DP1 are Q_5=4.1 cfs and Q_{100}=9.2 cfs.

Basin E1 covers 13.85 acres of open space in the northwestern portion of the site. Flows from this basin combine with those from DPA and travel to the southwest towards the East Tributary of Falcon Creek. The east tributary bisects basin E1 running from northern most portion of the site south towards the bottom of Basin E1 where flows are discharged at rates of Q_5= 5.6 cfs and Q_{100}= 27.8 cfs. These are flows are consistent with those established by the DBPS for the local basin, see table above. These flows combine with those from the DBPS RET090 reach at DPB with rates of Q_5= 41.6 cfs and Q_{100}= 347.8 cfs.

How were the flows combined?

Basin OS2 represents the remainder of the southern half of U.S. Highway 24 along the northwest boundary for the Commons at Falcon Field site. Due to no curb and gutter along this stretch of U.S. Highway 24, flows from this basin discharge directly into basin E2 and are represented by Design Point C (DPC). Runoff rates at existing DPC are Q_5=1.5 cfs and Q_{100}=3.3 cfs.

Basin E2 is 12.88 acres of open space located to the west of Basin E1. The basin is sloped to the southeast at roughly 3% before turning directly south upon reaching the eastern border of the basin. Flows combine with those from Basin OS2 then travel south until they reach the bottom of the site where they are released from the site at Design Point D at rates of Q_5=3.3 cfs and Q_{100}=20.3 cfs.

Basin E3 represents 13.11 acres in the southwest corner of the site. Basin E3 directs flows from the north and south to the southern border, exiting the site with runoff rates of Q_5=2.7 cfs and Q_{100}=19.6 cfs at Design Point E.

Basin E4 is a small, 1.57-acre basin on the far western side of the site. Basin E4's flow runs south where it exits the western side of the site at Design Point 4 with runoff rates of Q_5=0.3 cfs and Q_{100}=2.6 cfs.

Per table this should be DPF. Revise.

Basin E5 is 5.91 acres located on the eastern side of the site, sandwiched between the southern portions of Basin E1 and E6. The basin directs all of its flows south towards the existing Design Point G which sits on the southern border of the site, directly in the middle of Basin E5. This basin generates runoff rates of Q_5=2.2 cfs and Q_{100}=11.7 cfs.

Basin OS3 covers the southern half of Rio Lane along the northern boundary of the Commons at Falcon Field site. Due to no curb and gutter along Rio Lane, flows from this basin discharge directly into basin E6 and are represented by Design Point H (DPH) with runoff rates of Q_5=1.5 cfs and Q_{100}=3.5 cfs.

Basin E6 represents the eastern most basin of the site. At 10.37 acres, the basin directs flows from its northwestern corner, and from OS3, southeast until they reach the existing Design Point J where they exit the site. Runoff rates at DPJ will be Q_5=2.4 cfs and Q_{100}=14.0 cfs.

Identify the type of flow at each design point flowing offsite (most appear to be sheet flow conditions).

7.0 PROPOSED CONDITION

For the purposes of site specific analysis, the project site has been divided into several grouped drainage basins as shown on the proposed drainage plan.

The Rational Method was used to determine runoff quantities for the 5- and 100-year storm recurrence intervals. Mile High Flood District MHFD-Detention v,4.04 was used for preliminary pond sizing, see appendix for calculations and below for a summary runoff table.

A-group basins represent flows at the eastern residential portion of the site that will be intercepted by Pond A, ultimately discharging out to the redefined tributary open channel.

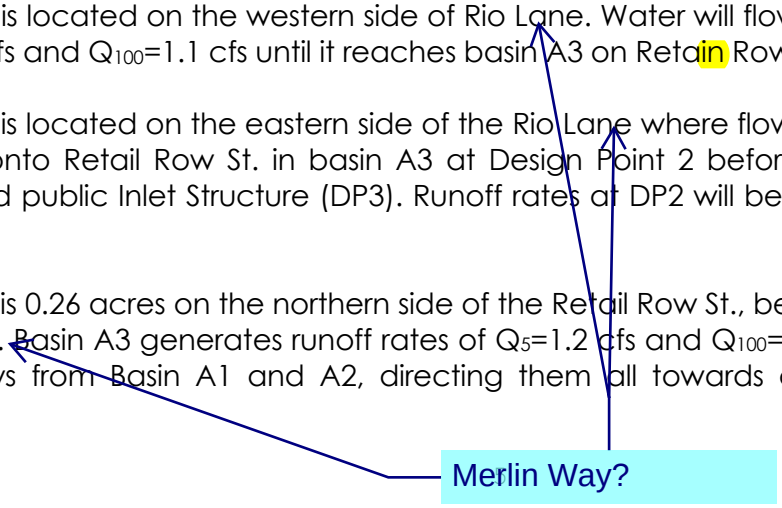
Rational Method Runoff Summary (A-group)

BASIN & DESIGN POINT SUMMARY					BASIN & DESIGN POINT SUMMARY				
BASIN	DP	AREA (AC)	Q5	Q100	BASIN	DP	AREA (AC)	Q5	Q100
A-BASINS									
A1	1	0.46	0.1	1.1	A9		1.89	3.8	8.4
A2	2	0.39	0.1	0.9		9	6.66	9.8	21.9
A3		0.26	1.2	2.2	A10		2.34	4.8	10.5
	3	1.11	1.2	3.7		10	9.00	13.2	29.5
A4	4	0.22	1.0	1.8	A11	11	0.87	1.9	4.1
	4A	1.33	2.0	5.1	A12	12	3.05	5.9	13.0
A5	5	1.52	2.1	5.5		12A	12.05	17.7	39.4
	5A	2.85	3.9	10.1	A13	13	1.61	3.2	7.1
OSA1		0.58	2.7	4.8		13A	14.53	21.1	46.9
A6		0.82	0.2	1.7	A14		1.19	0.8	3.3
	6	1.40	2.1	5.1		14	18.57	24.8	57.4
A7		2.05	3.7	8.2	A15		2.16	0.9	6.6
	7	3.45	5.4	12.2	OSA2		0.73	3.4	6.1
A8		1.32	2.3	5.1					
	8	4.77	7.0	15.8					

Basin A1 is located on the western side of Rio Lane. Water will flow south at runoff rates of Q_5=0.1 cfs and Q_{100}=1.1 cfs until it reaches basin A3 on Retain Row St. at Design Point 1.

Basin A2 is located on the eastern side of the Rio Lane where flows will travel south, briefly turning onto Retail Row St. in basin A3 at Design Point 2 before being collected by a proposed public Inlet Structure (DP3). Runoff rates at DP2 will be Q_5=0.1 cfs and Q_{100}=0.9 cfs.

Basin A3 is 0.26 acres on the northern side of the Retail Row St., beginning directly south of Rio Lane. Basin A3 generates runoff rates of Q_5=1.2 cfs and Q_{100}=2.2 cfs and will combine with flows from Basin A1 and A2, directing them all towards a proposed public Inlet



Per the previous TIS Rio lane is to be improved. Please be sure to coordinate with the traffic engineer as to the recommendations and account for drainage and water quality due to the street improvements.

merlin way

[illegible] (DP3) at the north eastern side of basin A3.

Basin A4 is 0.22 acres on the southern portion of Retail Row St., that begins directly south of Rio Lane. Flows from this basin will travel via curb and gutter towards a proposed low point and proposed public Inlet Structure (DP4) located on the southern side of basin A4. Runoff rates within this basin will be Q_5=1.0 cfs and Q_{100}=1.8 cfs.

Design Point 4A collects flows from both DP3 and DP4 and directs them east towards DP5A via proposed public storm sewer.

Basin A5 is located between Rio Lane to the west and a neighborhood street to the east. Runoff flows from the northwest corner of the site to the southeast corner with runoff rates of Q_5=2.1 cfs and Q_{100}=5.5 cfs towards a proposed public Inlet Structure at DP5.

Design Point 5A is located at the intersection of Retail Row St., and a residential street where it combines flows from DP4A and DP5, directing them south towards Pond #1 via proposed storm sewer. The combined flows at DP5A are Q_5=3.9 cfs and Q_{100}=10.1 cfs.

Basin OSA1 represents the south half of Rio Lane. Flows of Q_5=2.7 cfs and Q_{100}=4.8 cfs. from this basin travels to the east until it reaches the proposed residential street, where flows will be captured by curb and gutter and directed to the south.

Basin A6 covers the rear of the Basin A7 lots, to the south of Rio Lane. Runoff generated by basin A6 is directed to the east towards the northeastern entrance to the neighborhood, ultimately combing with offsite flows from basin OSA1 at Design Point 6 and traveling south via proposed curb and gutter.

Basin A7 is 2.05 acres made up of 11 residential lots to the south of Basin A6. Runoff (Q_5=3.7 cfs and Q_{100}=8.2 cfs) flows from west to east as side lot flow and curb and gutter flow towards the easterly intersection at DP7, combining with flows from upstream DP6.

Basin A8 covers an area of residential lots and generates flows of Q_5=2.3 cfs and Q_{100}=5.1 cfs. Flows will generally travel as curb and gutter flows towards DP8 at the southern end of the basin, where flows combine with those from DP7 and continue to the west as curb and gutter flow.

Basin A9 covers 1.89-acres of residential area. Flows generated by this basin (Q_5=3.8 cfs and Q_{100}=8.4 cfs) are directed towards the south of the basin towards DP9, where flows combine with those from DP8 and continue to the west as curb and gutter flow.

Basin A10 covers an area of residential lots and generates flows of Q_5=4.8 cfs and Q_{100}=10.5 cfs. Flows will generally travel as curb and gutter flow to the east and south towards DP10 at the southern end of the basin. DP10 is located at a proposed Inlet Structure, where flows from DP9 and Basin A10 are intercepted, and directed to the south to continue within the proposed storm sewer.

Basin A11 covers the front portion of a bank of residential lots. Flows from this basin (Q_5=1.9 cfs and Q_{100}=4.1 cfs) are directed south along the adjacent neighborhood street towards a proposed Inlet Structure at DP11.

per TIS, Rio lane will be improved, please address drainage and water quality due to the improvements

Basin A12 is 3.05 acres of residential lots. Flows from this basin will be directed via side lot swales and curb and gutter to the south at rates of Q_5=5.9 cfs and Q_{100}=13.0 cfs, towards a proposed Inlet Structure at DP 12 and continue to the east via proposed storm sewer.

Design Point 12A represents the combining of flows from DP12 and DP10 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the west via proposed storm sewer.

Basin A13 consists of the remaining 10 residential lots along the south side of bottom most neighborhood street. The flows from this site travel via overlot and then as curb and gutter flow at rates of Q_5=3.2 cfs and Q_{100}=7.1 cfs towards a proposed Inlet Structure at DP 13.

Design Point 13A represents the combining of flows from DP12A, DP11 and DP13 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the west via proposed storm sewer.

Basin A14 covers the area of the proposed full-spectrum detention facility (Pond A). Flows generated by this basin (Q_5=0.8 cfs and Q_{100}=3.3 cfs) will be captured by the pond in their entirety. Design Point 14 is located within Pond A and is where all of the flows from the A-Basins will combine for treatment. The rates at which the flows will enter Pond A are Q_5=24.8 cfs and Q_{100}=57.4 cfs. See further discussion related to Pond A in Section 8.0 below.

Basin A15 covers the rear of lots along the east and southern boundary. Flows generated by this 2.16-acre basin are directed offsite. It is anticipated that this area will fall under ECM 1.7.1.C.1. as the ability to capture and treat flows generated by Basin A15 is restricted due to grading constraints.

Basin OSA2 represents the north half of Rio Lane. Flows of Q_5=3.4 cfs and Q_{100}=6.1 cfs are generated by this basin, and will continue to travel and discharge to the east, as in the existing condition. No changes to this roadway are proposed with this development.

B-group basins represent the central commercial portion of the site that will be intercepted by Pond B, ultimately discharging out to the redefined tributary open channel.

The OSB1 Basin represents 1.40 acres of US-HWY 24, which acts as the northwestern boundary for the site. The runoff generated by this basin, Q_5=6.5 cfs and Q_{100}=11.7 cfs, is directed northeast via proposed curb and gutter towards a proposed Inlet Structure at DP1, where captured flows will continue to the southeast via proposed storm sewer.

Basin B1 is 2.50 acres at the northeast corner of the commercial area. Flows from this basin will travel overland towards a proposed storm sewer stub at the southwest corner. The runoff flows generated by this basin are Q_5=10.5 cfs and Q_{100}=19.1 cfs. Flows from this stub travel to the southwest via proposed storm sewer towards DP1A where they combine with piped flows from DP1.

Rational Method Runoff Summary (B-group)

BASIN & DESIGN POINT SUMMARY				
BASIN	**DP**	**AREA (AC)**	**Q5**	**Q100**
B-BASINS				
OSB1	1	1.40	6.5	11.7
B1		2.50	10.5	19.1
	1A	3.90	16.4	29.8
B2	2	1.23	5.2	9.4
B3	3	0.58	2.7	4.9
B4	4	1.30	5.5	10.0
	4A	7.02	28.7	52.1
B5	5	2.05	8.7	15.8
	5A	9.07	35.9	65.2
B6	6	1.47	6.2	11.2
B7		1.18	5.5	9.8
	7	2.65	11.6	21.0
B8		0.55	2.6	4.6
	8	3.20	14.1	25.4
	8A	12.27	48.4	87.7
B9		1.42	0.6	4.3
	9	13.69	48.7	91.1

Drainage map says 0.49 ac.

Drainage Map says 1.92 ac.

Drainage map says 1.59 ac.

Basin B2 is located along the northern boundary of the commercial area. Flows of Q_5=5.2 cfs and Q_{100}=9.4 cfs are generated by this basin, and travel overland to the south towards a proposed storm sewer stub at DP2.

Basin B3 covers a portion of right-of-way at the center of the commercial area. Flows of Q_5=2.7 cfs and Q_{100}=4.9 cfs are generated by this basin, and travel via curb and gutter to the south towards a proposed Inlet Structure at DP3. Captured flows continue to the east via proposed storm sewer.

Basin B4 is located along the northern boundary of the commercial area, to the southwest of Basin B2. Flows of Q_5=5.5 cfs and Q_{100}=10.0 cfs are generated by this basin, and travel overland to the southeast towards DP4.

Design Point 4A represents the combining of flows from DP1A, DP2, DP3 and DP4 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the south via proposed storm sewer.

Basin B5 is located in the central portion of the commercial area. Flows of Q_5=8.7 cfs and Q_{100}=15.8 cfs, generated by this basin travel overland to the southeast towards a proposed storm sewer stub at DP5.

Design Point 5A represents the combining of flows from DP4A and Basin 5 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the south via

please also discuss the inlets within this basin

Explain how these flows are going to combine and travel in storm sewer since there is no inlet at this location.

proposed storm sewer.

Basin B6 covers 1.47-acres in the central portion of the commercial area. Flows of Q_5=6.2 cfs and Q_{100}=11.2 cfs that are generated by this basin travel overland to the southeast towards a proposed storm sewer stub at DP6. Flows continue on to the south via proposed storm sewer.

Basin B7 covers a portion of right-of-way at the center of the commercial area. Flows of Q_5=5.5 cfs and Q_{100}=9.8 cfs are generated by this basin, and travel via curb and gutter to the south and northeast towards a proposed Inlet Structure at DP7. Captured flows at this inlet combine with those from DP6 and continue to the south via proposed storm sewer.

Basin B8 covers a portion of right-of-way at the center of the commercial area, to the south of Basin B7. Flows of Q_5=2.6 cfs and Q_{100}=4.6 cfs are generated by this basin, and travel via curb and gutter to the northeast towards a proposed Inlet Structure at DP8. Flows captured by this inlet combine with those from DP7 and continue to the south and west via proposed storm sewer.

Design Point 8A represents the combining of flows from DP5A and DP8 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the south via proposed storm sewer.

Basin B9 covers the area of the proposed full-spectrum detention facility (Pond B). Flows generated by this basin (Q_5=0.6 cfs and Q_{100}=4.3 cfs) will be captured by the pond in their entirety. Design Point 9 is located within Pond B and is where all of the flows from the B-Basins will combine for treatment. The rates at which the flows will enter Pond B are Q_5=48.7 cfs and Q_{100}=91.1 cfs. See further discussion related to Pond B in Section 8.0 below.

C-group basins represent the western commercial portion of the site that will be intercepted by Pond C, ultimately discharging out to follow historic conditions to the southeast.

The OSC1 Basin represents 0.35-acres of US-HWY 24, which acts as the northwestern boundary for the site. The runoff generated by this basin, Q_5=1.6 cfs and Q_{100}=2.9 cfs, is directed northeast via proposed curb and gutter towards the proposed roadway extension into the project site.

Basin C1 covers a portion of right-of-way at the center of the commercial area, adjacent to Basin B3. Flows of Q_5=1.7 cfs and Q_{100}=3.1 cfs are generated by this basin, and travel via curb and gutter to the south towards a proposed Inlet Structure at DP1, where they combine with flows from Basin OSC1. Captured flows continue to the west via proposed storm sewer.

Basin C2 covers 1.73-acres in the west-central portion of the commercial area. Flows of Q_5=7.3 cfs and Q_{100}=13.2 cfs are generated by this basin and travel overland to southwest towards DP2, combining with flows from DP1 and continuing on to the south via proposed storm sewer.

Please indicate where these flows are captured. Is there a stub at this location?

Rational Method Runoff Summary (C-group)

Drainage map says 1.90 ac.

Drainage map says 0.29 ac.

BASIN & DESIGN POINT SUMMARY				
BASIN	DP	AREA (AC)	Q5	Q100
C-BASINS				
OSC1		0.35	1.6	2.9
C1		0.37	1.7	3.1
	1	0.72	3.2	5.8
C2		1.73	7.3	13.2
	2	2.10	11.6	21.0
C3	3	1.63	6.9	12.5
C4		1.72	7.2	13.2
	4	5.45	24.1	43.8
C5	5	1.31	5.9	10.7
C6		1.01	4.5	8.2
	6	2.32	10.4	18.8
	6A	7.77	32.2	58.4

please show the storm sewer stub on the drainage plan

Basin C3 covers 1.63-acres in the commercial area. Runoff rates of Q_5=6.9 cfs and Q_{100}=12.5 cfs are generated by this basin and travel overland to the south towards a proposed Inlet Structure at DP3.

Basin C4 is located along the western boundary of the commercial area. Runoff rates of Q_5=7.2 cfs and Q_{100}=13.2 cfs are generated by this basin and travel overland to the south towards a proposed storm sewer stub.

Design Point 4 represents the combining of flows from DP2, DP3 and Basin C4 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the south via proposed storm sewer.

Basin C5 covers a portion of right-of-way to the west of the commercial area. Flows of Q_5=5.9 cfs and Q_{100}=10.7 cfs are generated by this basin, and travel via curb and gutter to the southwest towards a proposed Inlet Structure at DP5.

Basin C6 covers a portion of right-of-way to the west of the commercial area, to the south of Basin C5. Flows of Q_5=4.5 cfs and Q_{100}=8.2 cfs are generated by this basin, and travel via curb and gutter to the northeast towards a proposed Inlet Structure at DP6. Flows captured by this inlet combine with those from DP5 and continue to the south via proposed storm sewer.

Design Point 6A represents the combining of flows from DP4 and DP6 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the south via proposed storm sewer.

D-group basins represent the southern residential portion of the site that will be intercepted by Pond C, ultimately discharging out to follow historic conditions to the southeast.

Rational Method Runoff Summary (D-group)

BASIN & DESIGN POINT SUMMARY				
BASIN	**DP**	**AREA (AC)**	**Q5**	**Q100**
D-BASINS				
D1	1	1.35	1.9	4.8
D2		1.93	3.0	7.4
	2	3.28	4.6	11.6
D3	3	1.02	1.6	3.7
	3A	12.07	33.5	64.7
D4	4	2.59	4.2	10.1
D5		0.69	1.6	3.4
	5	3.27	5.7	13.2
D6	6	2.66	5.3	11.8
D7		0.40	0.9	1.9
	7	6.33	11.3	25.5
D8	8	0.43	0.8	1.7
D9	9	0.31	0.6	1.4
D10	10	1.64	2.6	6.5
D11		0.33	1.5	2.7
	11	1.97	3.9	8.8
D12		1.58	0.6	4.4
	12	22.69	52.1	108.6
D13	13	1.50	0.6	3.4
D14	14	0.15	0.7	1.3
D15	15	0.17	0.8	1.4
D16	16	0.82	0.3	2.2

Basin D1 is located at the northeast corner of this residential portion of the development. Flows generated by this basin (Q_5=1.9 cfs and Q_{100}=4.8 cfs) travel to the southwest via side lot swale and curb and gutter towards DP1.

D2?

Basin D1 is located at the northwest corner of this residential portion of the development. Flows generated by this basin (Q_5=3.0 cfs and Q_{100}=7.4 cfs) travel to the east via side lot swale and to the south via curb and gutter, combining with flows from D1 ultimately reaching a proposed low point and inlet structure at DP2.

Basin D3 is located centrally within this residential portion of the development. Flows generated by this basin (Q_5=1.6 cfs and Q_{100}=3.7 cfs) travel to the southwest via side lot swale and curb and gutter towards a low point and proposed inlet structure at DP3.

Design Point 3A represents the combining of flows from DP6A(C-Basins), DP2 and DP3 at a proposed storm sewer manhole. Flows reaching this Design Point will continue to the south via proposed storm sewer. Discharging directly into the proposed full-spectrum

detention facility (Pond C).

Basin D4 is located centrally within this residential portion of the development. Flows generated by this basin (Q_5=4.2 cfs and Q_{100}=10.1 cfs) travel to the south and east via side lot swale and curb and gutter towards DP4.

Basin D5 is located centrally within this residential portion of the development, to the south of Basin D4. Flows generated by this basin (Q_5=1.6 cfs and Q_{100}=3.4 cfs) travel to the south and east via side lot swale and curb and gutter towards DP5, where flows combine with those from DP4 and continue to the south.

The D6 basin is 2.66 acres along the eastern boundary. Flows of Q_5=5.3 cfs and Q_{100}=11.8 cfs travel to the west and south as curb and gutter flow towards a proposed inlet structure at DP6.

Please clarify how these basins flow will enter the pond as the contours indicate that flow will continue to the south bypassing the pond

Basin D7 covers the front of a portion of residential lots at the south of this residential area. Flows of Q_5=0.9 cfs and Q_{100}=1.9 cfs travel to the east and south as curb and gutter flow, combining with street flows from DP5 reaching a proposed inlet structure at DP7. Captured flows combine with those from DP6 and continue via proposed storm sewer to the west.

Basin D8 covers the rear of a portion of residential lots directly south of Basin D5. Flows of Q_5=0.8 cfs and Q_{100}=1.7 cfs travel to the east and south towards DP8 and the adjacent detention facility

Basin D9 covers the rear of a portion of residential lots directly west of Basin D7. Flows of Q_5=0.6 cfs and Q_{100}=1.4 cfs travel to the west and south towards DP9 and the adjacent detention facility

Basin D10 covers the southern portion of the western boundary. Flows of Q_5=2.6 cfs and Q_{100}=6.5 cfs generated by this basin will be directed east to the adjacent roadway before traveling south via curb and gutter towards a low point and proposed inlet structure at DP10.

Basin D11 covers the southern portion of roadway adjacent to Basin D10. Flows of Q_5=1.5 cfs and Q_{100}=2.7 cfs generated by this basin will travel south via curb and gutter towards a low point and proposed inlet structure at DP11. Captured flows will combine with those from DP10 and discharge directly into the proposed detention facility.

Basin D12 covers the area of the proposed full-spectrum detention facility (Pond C). Flows generated by this basin (Q_5=0.6 cfs and Q_{100}=4.4 cfs) will be captured by the pond in their entirety. Design Point 12 is located within Pond X and is where all of the flows from the C and D-Basins will combine for treatment. The rates at which the flows will enter Pond C are Q_5=52.1 cfs and Q_{100}=108.6 cfs. See further discussion related to Pond C in Section 8.0 below.

Basin D13 covers the rear of lots along the eastern boundary of this residential area. Flows generated by this 1.50-acre basin are directed offsite. It is anticipated that this area will fall under ECM 1.7.1.C.1. as the ability to capture and treat flows generated by Basin D13

The exclusion in this section is limited to 1 acre. Revise the design accordingly.

is restricted due to grading constraints.

The exclusion is limited to 1 acre total. revise the design accordingly so that the developed flow is treated.

Basins D14 and D15 cover a small section of right-of-way at the southeastern corner of this residential area. Flows generated by this 0.32-acre area are directed offsite. As with Basin D13 It is anticipated that this area will fall under ECM 1.7.1.C.1. as the ability to capture and treat flows generated by Basins D14 and D15 is restricted due to grading constraints.

Basin D16 covers a small section of landscaped area along the southern boundary of this residential area. Flows generated by this 0.82-acre basin are directed offsite. As with Basin D13 It is anticipated that this area will fall under ECM 1.7.1.C.1. as the ability to capture and treat flows generated by Basins D16 is restricted due to grading constraints.

8.0 PROPOSED FULL-SPECTRUM DETENTION FACILITIES

As previously mentioned, three separate full-spectrum Extended Detention Basin facilities are proposed with this development:

Pond A , a private 1.91 ac-ft full-spectrum Extended Detention Basin is proposed in the southwestern corner of the A-basin neighborhood, to intercept and treat flows from the neighborhood area and discharge at historic rates into the adjacent redefined East Tributary. In accordance with El Paso County criteria, an outlet structure with a permanent micropool will release the WQCV over a 40-hour period.

Pond B, is a proposed private 2.25 ac-ft full-spectrum Extended Detention Basin, designed to intercept the flows generated by the B-basin commercial region of the site, treat and discharge at historic rates into the adjacent redefined East Tributary. As with Pond A, in accordance with El Paso County criteria, an outlet structure with permanent micropool will release the WQCV over a 40-hour period.

Pond C, is a proposed private 2.81 ac-ft full-spectrum Extended Detention Basin intended to intercept the flows generated by both the C and D-basin areas of the site. As with both other ponds, in accordance with El Paso County criteria, an outlet structure with permanent micropool will release the WQCV over a 40-hour period. Flows will discharge into a proposed storm sewer discharging to the south at historic rates.

Maintenance access will be provided to each of the ponds. Private maintenance agreements and O&M manuals will be established for all 3 ponds prior to Final Plat.

9.0 FOUR-STEP PROCESS

In conformance with the Four-Step development design is focused on capture volume, and creating stab in the Final Drainage Report.

Please address the suitable outfall per ECM 3.2.4 of each of these ponds in your report.

Provide analysis of the downstream for each of these outfalls as well as the emergency overflow (spillway) and discuss any improvements that are needed.

Diversion of flows from sheet flow areas to point discharges requires thourough analysis of stabilized conveyances and easements to a suitable location.

10.0 CONDITIONAL LETTER OF MAP REVISION (CLOMR)

A Conditional Letter of Map Revision (CLOMR) is currently in the design stage for the Falcon Creek East Tributary reach that bisects the site. Further information will be added to this report upon completion.

11.0 DRAINAGE/BRIDGE FEES

Design, phasing, responsibility for and maintenance of any proposed improvements will be discussed in the final drainage report(s) as development of the site proceeds. Fees will be assessed and paid according to the current rates at the time of platting.

12.0 CONCLUSIONS

The Falcon Field project has been designed in accordance with El Paso County criteria. The detention pond and water quality basins have been designed to limit the release of storm runoff to historic flows. This development will not negatively impact the downstream facilities.

A portion of the site will remain in the 100-year floodplain after grading is complete. A LOMR will be submitted to FEMA after construction to revise the FIRM map. Future buildings will not be constructed in the floodplain.

13.0 REFERENCES

The sources of information

1. City of Colorado Sp

2. Urban Storm Draina
June 2001, Revised

3. Natural Resources C

4. Federal Emergency
County, Colorado
8041C0561G, Effect

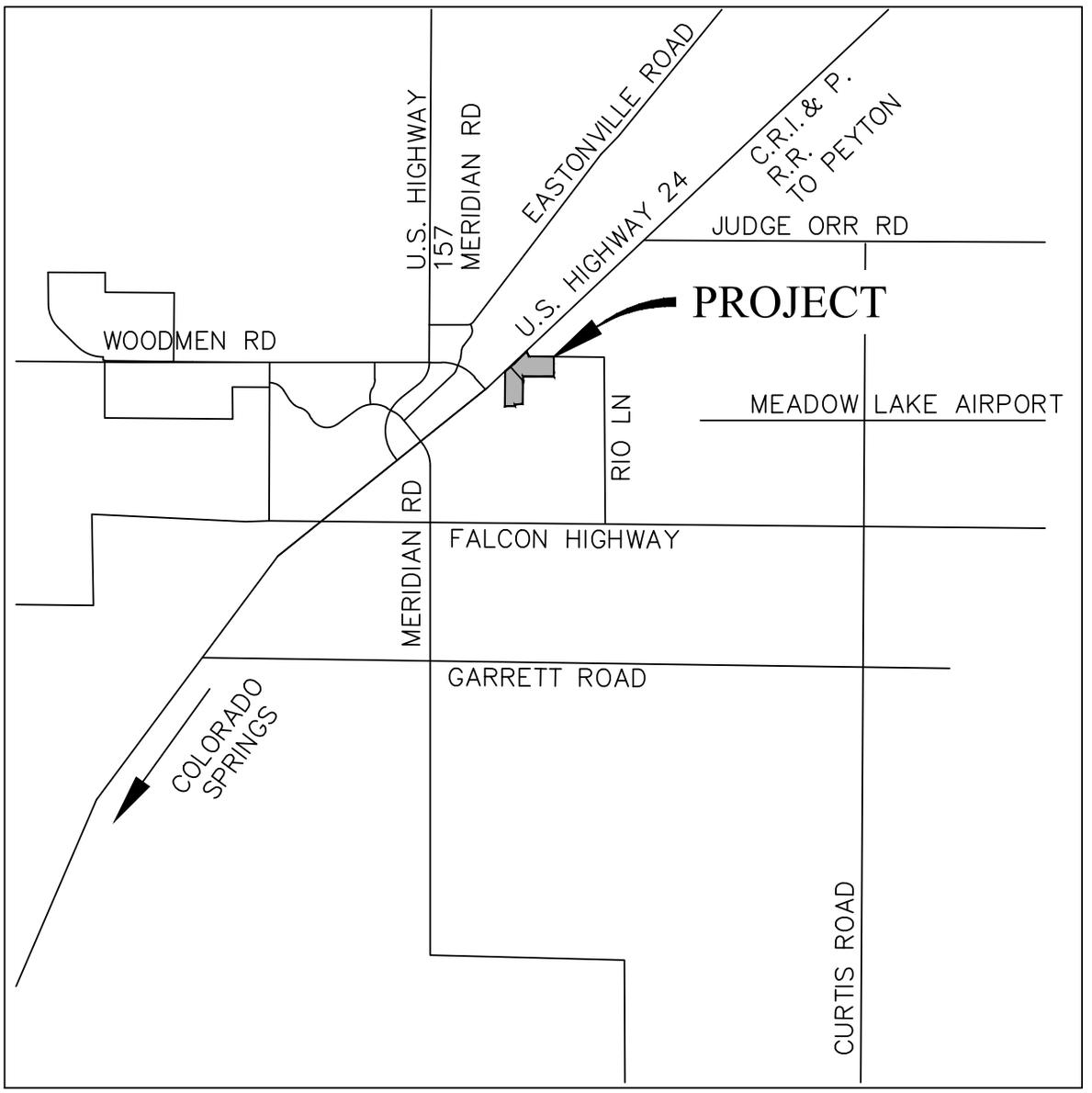
6. EL Paso County Boo
and Section 3.2.1, Chapter 13 of the City of Colorado Springs Drainage Criteria Manual, May 2014.

7. Falcon Drainage Basin Planning Study. Prepared by Matrix Design Group, September 2015.

Please provide discussion/analysis of the proposed improvements at the existing floodplain/channel that traverses the site. Identify what is proposed in the DBPS and compare it with what this development proposes for this reach. Address DBPS recommendations downstream of the site. Are offsite downstream improvements needed? please provide more information and analysis.

Also, Discuss the estimated cost of the improvements and how it compares to listed costs in the DBPS. Are the improvements reimbursable? will the developer seek reimbursement? DBPS amendment will be required for changes to the DBPS. Also identify if the proposed improvement is intended to be public or privately owned and maintained. Address estimated drainage basin fees and any potential drainage fee offset credits in general.

Appendix



Vicinity Map
Not to scale

-N-

THE COMMONS AT FALCON FIELD
EL PASO COUNTY, CO
VICINITY MAP

Drexel, Barrell & Co.
Engineers • Surveyors

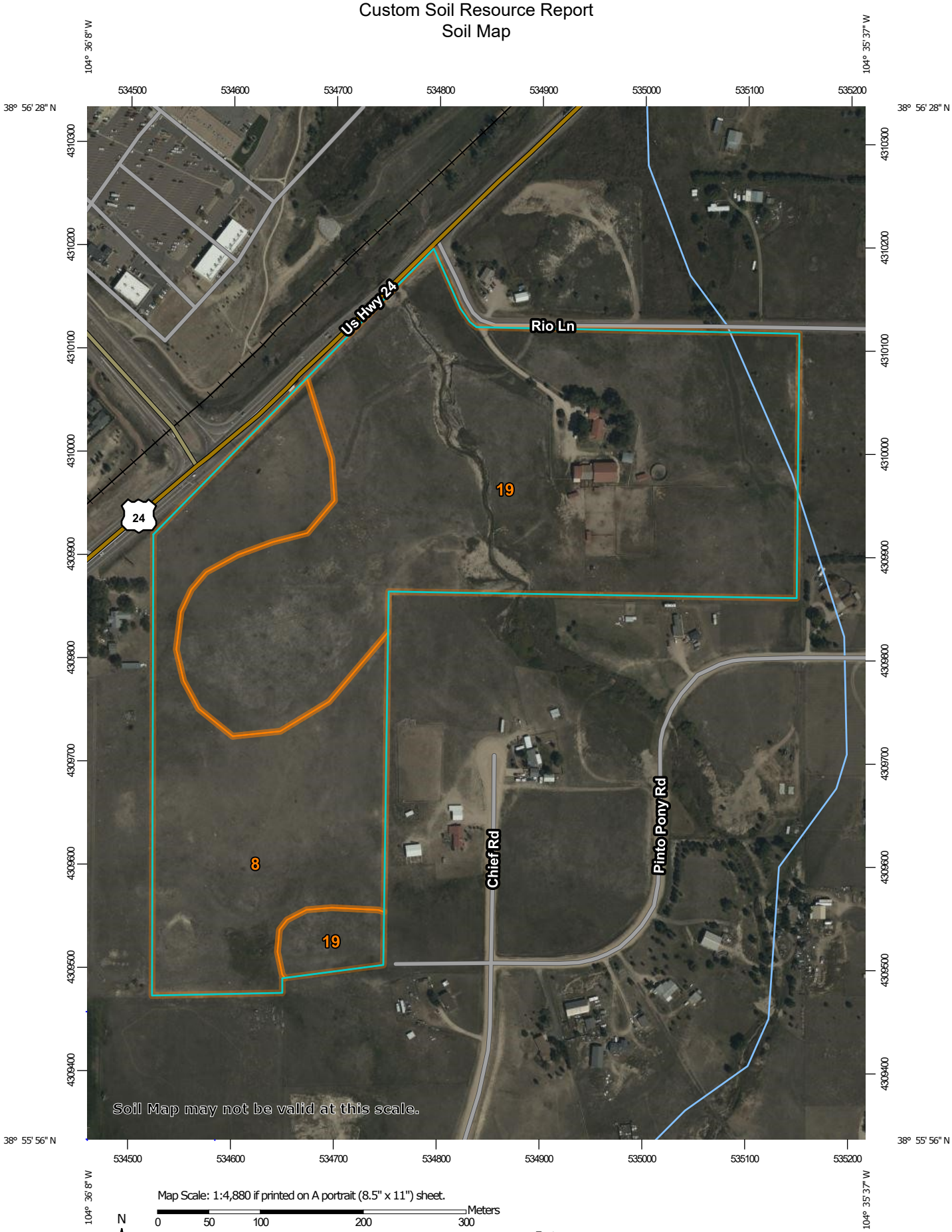
DATE:

JOB NO: 21604-00CSCV

DWG. NO. VMAP

SHEET 1 OF 1

Custom Soil Resource Report
Soil Map



Map Scale: 1:4,880 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	18.8	32.8%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	38.6	67.2%
Totals for Area of Interest		**57.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 1 percent

Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Flood plains, fan terraces, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill

Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

National Flood Hazard Layer FIRMette

FEMA

104°36'16"W 38°56'26"N

104°35'38"W 38°55'58"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/12/2022 at 2:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

PROJECT INFORMATION

PROJECT: Commons at Falcon Field
PROJECT NO: 21604-00
DESIGN BY: KGV
REV. BY: TDM
AGENCY: El Paso County
REPORT TYPE: Preliminary
DATE: 3/16/2023

Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Pasture/Meadow		0.08		0.35	0
Roofs		0.73		0.81	90
Lawns		0.08		0.35	0
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.59		0.70	80

EXISTING CONIDTION

SUB-BASIN	SURFACE DESIGNATION	AREA	COMPOSITE RUNOFF COEFFICIENTS				% IMPERV
		ACRE	**C2**	**C5**	**C10**	**C100**	
OS1	Pasture/Meadow	0.90		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.90		0.90		0.96	100
	Streets: Gravel	0.00		0.59		0.70	80
	WEIGHTED AVERAGE			0.49		0.66	50%
TOTAL OS1		1.79					
OS2	Pasture/Meadow	0.32		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.32		0.90		0.96	100
	Streets: Gravel	0.00		0.59		0.70	80
	WEIGHTED AVERAGE			0.49		0.66	50%
TOTAL OS2		0.65					
OS3	Pasture/Meadow	0.33		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.33		0.90		0.96	100
	Streets: Gravel	0.00		0.59		0.70	80
	WEIGHTED AVERAGE			0.49		0.66	50%
TOTAL OS3		0.66					
E1	Pasture/Meadow	13.74		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.11		0.59		0.70	80
	WEIGHTED AVERAGE			0.08		0.35	1%
TOTAL E1		13.85					
E2	Pasture/Meadow	12.88		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.59		0.70	80

PROJECT INFORMATION

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AGENCY: El Paso County
REPORT TYPE: Preliminary
DATE: 3/16/2023

Drexel, Barrell & Co.

		C2*	C5*	C10*	C100*	% IMPERV
Pasture/Meadow			0.08		0.35	0
Roofs			0.73		0.81	90
Lawns			0.08		0.35	0
Streets: Paved			0.90		0.96	100
Streets: Gravel			0.59		0.70	80

	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL E2		12.88					
E3	Pasture/Meadow	13.11		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.59		0.70	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL E3		13.11					
E4	Pasture/Meadow	1.57		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.59		0.70	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL E4		1.57					
E5	Pasture/Meadow	5.49		0.08		0.35	0
	Roofs	0.25		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.17		0.59		0.70	80
	WEIGHTED AVERAGE			0.12		0.38	6%
TOTAL E5		5.91					
E6	Pasture/Meadow	10.37		0.08		0.35	0
	Roofs	0.00		0.73		0.81	90
	Lawns	0.00		0.08		0.35	0
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.59		0.70	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL E6		10.37					

PROJECT INFORMATION

PROJECT:	Commons at Falcon Field
PROJECT NO:	21604-00
DESIGN BY:	KGV
REV. BY:	TDM
AGENCY:	El Paso County
REPORT TYPE:	Preliminary
DATE:	3/16/2023

RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF

EXISTING TIME OF CONCENTRATION

SUB-BASIN DATA					INITIAL/OVERLAND TIME (t_i)			TRAVEL TIME (t_t)				TIME OF CONCENTRATION		FINAL t_c
BASIN	DESIGN PT:	C_5	C_{100}	AREA	LENGTH	SLOPE	t_i	LENGTH	SLOPE	VEL.	t_t	COMP.	MINIMUM	
				Ac	Ft	%	Min	Ft	%	FPS	Min	t_c	t_c	Min
OS1	A	0.49	0.66	1.79	60	2.0	7.0				0.0	7.0	5.0	7.0
E1		0.08	0.35	13.85	300	3.0	22.8	530	3.0	3.5	2.5	25.3	5.0	25.3
DPA+E1	B	0.13	0.39	15.64	From E1							25.3	5.0	25.3
OS2	C	0.49	0.66	0.65	60	2.0	7.0				0.0	7.0	5.0	7.0
E2		0.08	0.35	12.88	300	2.3	24.9	1360	3.5	4.0	5.7	30.6	5.0	30.6
DPC+E2	D	0.10	0.36	13.53	From E2							30.6	5.0	30.6
E3	E	0.08	0.35	13.11	300	2.3	24.9	1120	4.2	5.0	3.7	28.6	5.0	28.6
E4	F	0.08	0.35	1.57	300	2.7	23.8	250	4.0	5.0	0.8	24.7	5.0	24.7
E5	G	0.12	0.38	5.91	100	2.0	14.5	550	2.2	1.8	5.1	19.6	5.0	19.6
OS3	H	0.49	0.66	0.66	50	2.0	6.4				0.0	6.4	5.0	6.4
E6		0.08	0.35	10.37	300	2.3	24.9	1080	1.5	1.2	15.0	39.9	5.0	39.9

PROJECT INFORMATION

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PROJECT NO:	21604-00
DESIGN BY:	KGV
REV. BY:	TDM
AGENCY:	El Paso County
REPORT TYPE:	Preliminary
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RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF

EXISTING RUNOFF 5 YR STORM P1= **1.50**

			DIRECT RUNOFF				
BASIN (S)	DESIGN POINT	AREA (AC)	RUNOFF COEFF	t_c (MIN)	C * A	I (IN/HR)	Q (CFS)
OS1	A	1.79	0.49	7.0	0.88	4.66	4.1
E1		13.85	0.08	25.3	1.16	2.73	3.2
RET090 (DBPS)							36.0
DPA+E1+RET090	B	15.64	0.13	25.3	2.04	2.73	41.6
OS2	C	0.65	0.49	7.0	0.32	4.66	1.5
E2		12.88	0.08	30.6	1.03	2.45	2.5
DPC+E2	D	13.53	0.10	30.6	1.35	2.45	3.3
E3	E	13.11	0.08	28.6	1.05	2.55	2.7
E4	F	1.57	0.08	24.7	0.13	2.78	0.3
E5	G	5.91	0.12	19.6	0.72	3.12	2.2

PROJECT INFORMATION

PROJECT:	Commons at Falcon Field
PROJECT NO:	21604-00
DESIGN BY:	KGV
REV. BY:	TDM
AGENCY:	El Paso County
REPORT TYPE:	Preliminary
DATE:	3/16/2023

Drexel, Barrell & Co.

RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF

EXISTING RUNOFF 100 YR STORM P1= **2.52**

			DIRECT RUNOFF				
BASIN (S)	DESIGN POINT	AREA (AC)	RUNOFF COEFF	t_c (MIN)	C * A	I (IN/HR)	Q (CFS)
OS1	A	1.79	0.66	7.0	1.18	7.83	9.2
E1		13.85	0.35	25.3	4.88	4.59	22.4
RET090 (DBPS)							320.0
DPA+E1+RET090	B	15.64	0.39	25.3	6.06	4.59	347.8
OS2	C	0.65	0.66	7.0	0.42	7.83	3.3
E2		12.88	0.35	30.6	4.51	4.12	18.6
DPC+E2	D	13.53	0.36	30.6	4.93	4.12	20.3
E3	E	13.11	0.35	28.6	4.59	4.28	19.6
E4	F	1.57	0.35	24.7	0.55	4.66	2.6
E5	G	5.91	0.38	19.6	2.24	5.23	11.7
OS3	H	0.66	0.66	6.4	0.43	8.06	3.5

PROJECT INFORMATION

PROJECT: Commons at Falcon Field
PROJECT NO: 21604-00
DESIGN BY: KGV
REV. BY: TDM
AGENCY: El Paso County
REPORT TYPE: Preliminary
DATE: 3/16/2023

Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

DEVELOPED CONIDTION

SUB-BASIN	SURFACE DESIGNATION	AREA ACRE	COMPOSITE RUNOFF COEFFICIENTS C2	C5	C10	C100	% IMPERV
A-BASINS							
A1	Open Space	0.46		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL A1		0.46					
A2	Open Space	0.39		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL A2		0.39					
A3	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.26		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL A3		0.26					
A4	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.22		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL A4		0.22					
A5	Open Space	0.54		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.98		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100

PROJECT INFORMATION

PROJECT:	Commons at Falcon Field
PROJECT NO:	21604-00
DESIGN BY:	KGV
REV. BY:	TDM
AGENCY:	El Paso County
REPORT TYPE:	Preliminary
DATE:	3/16/2023

Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.32		0.50	42%
TOTAL A5		1.52					
OSA1	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.58		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL OSA1		0.58					
A6	Open Space	0.82		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL A6		0.82					
A7	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	2.05		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.45		0.59	65%
TOTAL A7		2.05					
A8	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	1.32		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.45		0.59	65%
TOTAL A8		1.32					
A9	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	1.89		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100

PROJECT INFORMATION

PROJECT: Commons at Falcon Field
PROJECT NO: 21604-00
DESIGN BY: KGV
REV. BY: TDM
AGENCY: El Paso County
REPORT TYPE: Preliminary
DATE: 3/16/2023

Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.45		0.59	65%
TOTAL A9		1.89					
A10	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	2.34		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.45		0.59	65%
TOTAL A10		2.34					
A11	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.87		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.45		0.59	65%
TOTAL A11		0.87					
A12	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	3.05		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.45		0.59	65%
TOTAL A12		3.05					
A13	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	1.61		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.45		0.59	65%
TOTAL A13		1.61					
A14	Open Space	0.92		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.27		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100

PROJECT INFORMATION

PROJECT: Commons at Falcon Field
PROJECT NO: 21604-00
DESIGN BY: KGV
REV. BY: TDM
AGENCY: El Paso County
REPORT TYPE: Preliminary
DATE: 3/16/2023

Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.16		0.40	15%
TOTAL A14		1.19					
A15	Open Space	2.16		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL A15		2.16					
OSA2	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.73		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL OSA2		0.73					
B-BASINS							
OSB1	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	1.40		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL OSB1		1.40					

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Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

B1	Open Space	0.00		0.08		0.35	0
	Commercial Development	2.50		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.81		0.88	95%
TOTAL B1		2.50					
B2	Open Space	0.00		0.08		0.35	0
	Commercial Development	1.17		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.06		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.81		0.88	95%
TOTAL B2		1.23					
B3	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.58		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL B3		0.58					

PROJECT INFORMATION

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Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

B4	Open Space	0.00		0.08		0.35	0
	Commercial Development	1.23		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.07		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.81		0.88	95%
TOTAL B4		1.30					
B5	Open Space	0.00		0.08		0.35	0
	Commercial Development	1.79		0.81		0.88	95
	Streets: Paved	0.26		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.82		0.89	96%
TOTAL B5		2.05					
B6	Open Space	0.00		0.08		0.35	0
	Commercial Development	1.47		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.81		0.88	95%
TOTAL B6		1.47					
B7	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	1.18		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL B7		1.18					
B8	Open Space	0.00		0.08		0.35	0

PROJECT INFORMATION

Drexel, Barrell & Co.

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DESIGN BY:	KGV
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REPORT TYPE:	Preliminary
DATE:	3/16/2023

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

	Commercial Development	0.00		0.81		0.88	95
	Streets: Paved	0.55		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL B8		0.55					
B9	Open Space	1.42		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.08		0.35	0%
TOTAL B9		1.42					
C-BASINS							
OSC1	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.35		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL OSC1		0.35					
C1	Open Space	0.00		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.37		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.90		0.96	100%
TOTAL C1		0.37					
C2	Open Space	0.00		0.08		0.35	0
	Commercial Development	1.69		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65

PROJECT INFORMATION

PROJECT: Commons at Falcon Field
PROJECT NO: 21604-00
DESIGN BY: KGV
REV. BY: TDM
AGENCY: El Paso County
REPORT TYPE: Preliminary
DATE: 3/16/2023

Drexel, Barrell & Co.

	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

	Streets: Paved	0.04		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.81		0.88	95%
TOTAL C2		1.73					
C3	Open Space	0.00		0.08		0.35	0
	Commercial Development	1.54		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.09		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.81		0.88	95%
TOTAL C3		1.63					
C4	Open Space	0.00		0.08		0.35	0
	Commercial Development	1.67		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.05		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.81		0.88	95%
TOTAL C4		1.72					
C5	Open Space	0.04		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Streets: Paved	1.27		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.87		0.94	97%
TOTAL C5		1.31					
C6	Open Space	0.04		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.00		0.45		0.59	65
	Streets: Paved	0.97		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80

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	C2*	C5*	C10*	C100*	% IMPERV
Open Space		0.08		0.35	0
Commercial Development		0.81		0.88	95
Residential (< 1/8 Acre)		0.45		0.59	65
Streets: Paved		0.90		0.96	100
Streets: Gravel		0.80		0.85	80

	WEIGHTED AVERAGE			0.87		0.94	96%
TOTAL C6		1.01					
D-BASINS							
D1	Open Space	0.44		0.08		0.35	0
	Commercial Development	0.00		0.81		0.88	95
	Residential (< 1/8 Acre)	0.91		0.45		0.59	65
	Streets: Paved	0.00		0.90		0.96	100
	Streets: Gravel	0.00		0.80		0.85	80
	WEIGHTED AVERAGE			0.33		0.51	44%
TOTAL D1		1.35					
D2	Open Space	0.47		0.08		0.35	0

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RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF

DEVELOPED TIME OF CONCENTRATION

SUB-BASIN DATA							INITIAL/OVERLAND TIME (t_i)			TRAVEL TIME (t_t)				PIPE TRAVEL TIME (t_t)				TIME OF CONCENTRATION		FINAL t_c
BASIN	DESIGN PT:	C_5	C_{100}	AREA	COMP		LENGTH	SLOPE	t_i	LENGTH	SLOPE	VEL.	t_t	LENGTH	SLOPE	VEL.	t_t	COMP.	MINIMUM	
				Ac			Ft	%	Min	Ft	%	FPS	Min	Ft	%	FPS	Min	t_c	t_c	Min
A-BASINS																				
A1	1	0.08	0.35	0.46	0.04	0.16	60	4.0	9.3	528	4.0	8.0	1.1					10.4	5.0	10.4
A2	2	0.08	0.35	0.39	0.03	0.14	60	4.0	9.3	462	3.9	8.0	1.0					10.3	5.0	10.3
A3		0.90	0.96	0.26	0.23	0.25	30	2.1	1.6	138	1.5	6.3	0.4					2.0	5.0	5.0
DP1+DP2+A3	3	0.27	0.49	1.11	0.30	0.55	From DP1			100	1.0	3.2	0.5					10.9	5.0	10.9
A4	4	0.90	0.96	0.22	0.20	0.21	30	2.2	1.6	126	1.4	6.3	0.3					1.9	5.0	5.0
DP3+DP4	4A	0.38	0.57	1.33	0.50	0.76	From DP3							40	1.0	7.2	0.1	11.0	5.0	11.0
A5	5	0.32	0.50	1.52	0.48	0.77	70	3.8	7.9	485	2.3	5.6	1.4					9.3	5.0	9.3
DP4A+DP5	5A	0.35	0.54	2.85	0.98	1.53	From DP4A							100	1.0	7.2	0.2	11.3	5.0	11.3
OSA1		0.90	0.96	0.58	0.52	0.56	40	1.8	2.0	820	1.8	6.3	2.2					4.1	5.0	5.0
A6		0.08	0.35	0.82	0.07	0.29	50	2.0	10.7	792	1.4	3.8	3.5					14.2	5.0	14.2
OSA1+A6	6	0.42	0.60	1.40	0.59	0.84	From A6											14.2	5.0	14.2
A7		0.45	0.59	2.05	0.92	1.21	60	1.7	7.9	702	1.1	4.5	2.6					10.5	5.0	10.5
DP6+A7	7	0.44	0.60	3.45	1.51	2.05	From DP6			160	1.1	4.5	0.6					14.8	5.0	14.8
A8		0.45	0.59	1.32	0.59	0.78	80	1.5	9.5	678	1.4	4.7	2.4					11.9	5.0	11.9
DP7+A8	8	0.44	0.59	4.77	2.10	2.83	From DP7			678	1.4	4.7	2.4					17.2	5.0	17.2
A9		0.45	0.59	1.89	0.85	1.12	70	3.1	7.0	403	2.3	6.5	1.0					8.0	5.0	8.0
DP8+A9	9	0.44	0.59	6.66	2.95	3.95	From DP8			20	1.1	4.5	0.1					17.2	5.0	17.2
A10		0.45	0.59	2.34	1.05	1.38	70	4.1	6.4	509	3.1	6.9	1.2					7.6	5.0	7.6
DPA9+A10	10	0.45	0.59	9.00	4.01	5.33	From DP9			50	1.1	4.5	0.2					17.4	5.0	17.4
A11	11	0.45	0.59	0.87	0.39	0.51	40	2.6	5.6	392	2.6	6.6	1.0					6.6	5.0	6.6
A12	12	0.45	0.59	3.05	1.37	1.80	40	2.0	6.1	843	0.5	4.9	2.9					9.0	5.0	9.0
DP10+DP12	12A	0.45	0.59	12.05	5.38	7.13	From DP10							30	1.0	7.2	0.1	17.5	5.0	17.5
A13	13	0.45	0.59	1.61	0.72	0.95	40	2.0	6.1	529	0.5	4.9	1.8					7.9	5.0	7.9
DP12A+DP13+DP11	13A	0.45	0.59	14.53	6.50	8.59	From DP12A							206	1.0	7.2	0.5	18.0	5.0	18.0
A14		0.16	0.40	1.19	0.20	0.48	60	2.8	9.6	242	2.8	5.8	0.7					10.3	5.0	10.3
DP5A+DP13A+A14	14	0.41	0.57	18.57	7.68	10.60	From DP13A							111	1.0	7.2	0.3	18.2	5.0	18.2
A15		0.08	0.35	2.16	0.17	0.76	25	18.0	3.6	72	10.0	14.0	0.1					3.7	5.0	5.0
OSA2		0.90	0.96	0.73	0.66	0.70	40	2.0	1.9	1058	1.9	6.3	2.8					4.7	5.0	5.0
B-BASINS																				
OSB1	1	0.90	0.96	1.40	1.26	1.35	40	2.0	1.9	362	1.0	6.1	1.0					2.9	5.0	5.0
B1		0.81	0.88	2.50	2.03	2.20	60	2.3	3.2	511	3.3	6.6	1.3					4.5	5.0	5.0
DP1+B1	1A	0.84	0.91	3.90	3.29	3.55	From DP1							250	1.0	7.2	0.6	5.6	5.0	5.6
B2	2	0.81	0.88	1.23	1.00	1.09	40	4.0	2.1	308	4.0	7.0	0.7					2.9	5.0	5.0
B3	3	0.90	0.96	0.58	0.53	0.56	20	2.0	1.3	199	2.0	7.0	0.5					1.8	5.0	5.0
B4	4	0.81	0.88	1.30	1.06	1.15	50	3.5	2.5	326	3.3	6.3	0.9					3.3	5.0	5.0
DP1A+DP2+DP3+DP4	4A	0.84	0.90	7.02	5.87	6.34	From DP1A							195	1.0	7.2	0.5	6.0	5.0	6.0
B5	5	0.82	0.89	2.05	1.68	1.82	60	3.5	2.7	286	2.6	5.5	0.9					3.5	5.0	5.0
DP4A+DP5	5A	0.83	0.90	9.07	7.56	8.17	From DP4A							245	1.0	7.2	0.6	6.6	5.0	6.6
B6	6	0.81	0.88	1.47	1.19	1.29	50	3.9	2.4	388	3.6	6.9	0.9					3.4	5.0	5.0
B7		0.90	0.96	1.18	1.06	1.13	40	2.0	1.9	762	2.3	7.0	1.8					3.7	5.0	5.0
DP6+B7	7	0.85	0.92	2.65	2.25	2.43	From DP6							20	1.0	7.2	0.0	5.0	5.0	5.0
B8		0.90	0.96	0.55	0.50	0.53	40	1.0	2.4	544	2.8	7.0	1.3					3.7	5.0	5.0
DP7+DP8	8	0.86	0.92	3.20	2.75	2.95	From DP7							50	1.0	7.2	0.1	5.2	5.0	5.2
DP8+DP5A	8A	0.84	0.91	12.27	10.30	11.12	From DP5A							115	1.0	7.2	0.3	6.9	5.0	6.9
B9		0.08	0.35	1.42	0.11	0.50	30	13.0	4.4	259	20.0	14.0	0.3					4.8	5.0	5.0
DP8A+B9	9	0.76	0.85	13.69	10.42	11.62	From DP8A							46	1.0	7.2	0.1	7.0	5.0	7.0

C-BASINS																				
OSC1		0.90	0.96	0.35	*0.31*	*0.33*	40	2.5	1.7	165	2.0	7.0	0.4					2.1	5.0	5.0
C1		0.90	0.96	0.37	*0.33*	*0.36*	40	2.5	1.7	193	2.0	7.0	0.5					2.2	5.0	5.0
OS1+C1	1	0.90	0.96	0.72	*0.65*	*0.69*	From OSC1			185	2.0	7.0	0.5					5.5	5.0	5.5
C2		0.81	0.88	1.73	*1.40*	*1.53*	60	3.2	2.8	412	3.0	6.0	1.1					4.0	5.0	5.0
DP1+C2	2	1.14	1.22	2.10	*2.38*	*2.57*	From DP1							260	1.0	7.2	0.6	6.1	5.0	6.1
C3	3	0.81	0.88	1.63	*1.33*	*1.44*	70	2.6	3.2	496	2.7	5.8	1.4					4.7	5.0	5.0
C4		0.81	0.88	1.72	*1.40*	*1.52*	60	4.8	2.5	371	4.7	7.5	0.8					3.3	5.0	5.0
DP2+DP3+C4	4	0.94	1.01	5.45	*5.11*	*5.53*	From DP2							286	1.0	7.2	0.7	6.8	5.0	6.8
C5	5	0.87	0.94	1.31	*1.15*	*1.23*	40	2.0	2.1	938	2.0	7.0	2.2					4.3	5.0	5.0
C6		0.87	0.94	1.01	*0.88*	*0.95*	40	2.0	2.2	703	2.0	7.0	1.7					3.9	5.0	5.0
DP5+C6	6	0.87	0.94	2.32	*2.02*	*2.18*	From DP5							58	1.0	7.2	0.1	5.1	5.0	5.1
DP4+DP6	6A	0.92	0.99	7.77	*7.13*	*7.71*	From DP4							430	1.0	7.2	1.0	7.8	5.0	7.8

D-BASINS																				
D1	1	0.33	0.51	1.35	*0.45*	*0.69*	70	2.7	8.7	594	2.6	9.6	1.0					9.7	5.0	9.7
D2		0.36	0.53	1.93	*0.69*	*1.02*	60	2.7	7.7	559	1.2	7.2	1.3					9.0	5.0	9.0
DP1+D2	2	0.35	0.52	3.28	*1.14*	*1.71*	From DP1			430	1.2	7.2	1.0					10.7	5.0	10.7
D3	3	0.40	0.56	1.02	*0.41*	*0.57*	70	1.2	10.3	592	1.4	6.4	1.5					11.8	5.0	11.8
DP6A(C)+DP2+DP3	3A	0.72	0.83	12.07	*8.68*	*9.99*	From DP3							83	1.0	7.2	0.2	12.0	5.0	12.0
D4	4	0.38	0.55	2.59	*0.99*	*1.42*	70	2.3	8.6	475	3.3	8.8	0.9					9.5	5.0	9.5
D5		0.52	0.65	0.69	*0.36*	*0.45*	50	1.5	6.7	386	1.9	7.2	0.9					7.6	5.0	7.6
DP4+D5	5	0.41	0.57	3.27	*1.35*	*1.87*	From DP4			30	1.9	7.2	0.1					9.5	5.0	9.5
D6	6	0.45	0.59	2.66	*1.20*	*1.57*	60	3.0	6.5	913	3.2	10.1	1.5					8.0	5.0	8.0
D7		0.45	0.59	0.40	*0.18*	*0.23*	50	4.0	5.4	287	3.8	11.6	0.4					5.8	5.0	5.8
DP5+DP6+D7	7	0.43	0.58	6.33	*2.73*	*3.67*	From DP5			307	3.8	11.6	0.4					10.0	5.0	10.0
D8	8	0.45	0.59	0.43	*0.19*	*0.25*	80	1.5	9.5	362	1.5	6.4	0.9					10.4	5.0	10.4
D9	9	0.45	0.59	0.31	*0.14*	*0.18*	80	4.0	6.8	229	5.5	12.2	0.3					7.2	5.0	7.2
D10	10	0.36	0.53	1.64	*0.59*	*0.87*	70	3.9	7.4	479	4.5	11.6	0.7					8.1	5.0	8.1
D11		0.90	0.96	0.33	*0.29*	*0.31*	40	3.9	1.5	429	4.1	11.6	0.6					2.1	5.0	5.0
DP10+D11	11	0.45	0.60	1.97	*0.88*	*1.19*	From DP10							50	1.0	7.2	0.1	8.2	5.0	8.2
D12		0.08	0.35	1.58	*0.13*	*0.55*	80	25.0	5.8	166	25.0	4.0	0.7					6.5	5.0	6.5
DP3A+DP7+DP8+DP9+DP11+D12	12	0.56	0.70	22.69	*12.75*	*15.84*	From DP7							150	1.0	7.2	0.3	10.3	5.0	10.3
D13	13	0.10	0.36	1.50	*0.15*	*0.54*	80	5.9	9.3	1093	2.7	5.4	3.4					12.6	5.0	12.6
D14	14	0.90	0.96	0.15	*0.14*	*0.15*	40	0.8	2.5	165	2.2	5.6	0.5					3.0	5.0	5.0
D15	15	0.90	0.96	0.17	*0.15*	*0.16*	40	1.0	2.4	223	2.2	5.6	0.7					3.0	5.0	5.0
D16	16	0.08	0.35	0.82	*0.07*	*0.29*	80	15.0	6.9	183	6.5	6.8	0.4					7.4	5.0	7.4

PROJECT INFORMATION

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AGENCY:	El Paso County
REPORT TYPE:	Preliminary
DATE:	3/16/2023

Drexel, Barrell & Co.

RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF

DEVELOPED RUNOFF 5 YR STORM P1= **1.50**

			DIRECT RUNOFF				
BASIN (S)	DESIGN POINT	AREA (AC)	RUNOFF COEFF	t_c (MIN)	C * A	I (IN/HR)	Q (CFS)
A-BASINS							
A1	1	0.46	0.08	10.4	0.04	4.07	0.1
A2	2	0.39	0.08	10.3	0.03	4.09	0.1
A3		0.26	0.90	5.0	0.23	5.17	1.2
DP1+DP2+A3	3	1.11	0.27	10.9	0.30	4.00	1.2
A4	4	0.22	0.90	5.0	0.20	5.17	1.0
DP3+DP4	4A	1.33	0.38	11.0	0.50	3.98	2.0
A5	5	1.52	0.32	9.3	0.48	4.24	2.1
DP4A+DP5	5A	2.85	0.35	11.3	0.98	3.95	3.9
OSA1		0.58	0.90	5.0	0.52	5.17	2.7
A6		0.82	0.08	14.2	0.07	3.61	0.2
OSA1+A6	6	1.40	0.42	14.2	0.59	3.61	2.1
A7		2.05	0.45	10.5	0.92	4.06	3.7
DP6+A7	7	3.45	0.44	14.8	1.51	3.54	5.4
A8		1.32	0.45	11.9	0.59	3.87	2.3
DP7+A8	8	4.77	0.44	17.2	2.10	3.32	7.0
A9		1.89	0.45	8.0	0.85	4.46	3.8
DP8+A9	9	6.66	0.44	17.2	2.95	3.31	9.8
A10		2.34	0.45	7.6	1.05	4.54	4.8
DPA9+A10	10	9.00	0.45	17.4	4.01	3.30	13.2
A11	11	0.87	0.45	6.6	0.39	4.76	1.9
A12	12	3.05	0.45	9.0	1.37	4.29	5.9
DP10+DP12	12A	12.05	0.45	17.5	5.38	3.29	17.7
A13	13	1.61	0.45	7.9	0.72	4.48	3.2
DP12A+DP13+DP11	13A	14.53	0.45	18.0	6.50	3.25	21.1
A14		1.19	0.16	10.3	0.20	4.08	0.8
DP5A+DP13A+A14	14	18.57	0.41	18.2	7.68	3.23	24.8
A15		2.16	0.08	5.0	0.17	5.17	0.9
OSA2		0.73	0.90	5.0	0.66	5.17	3.4
B-BASINS							
OSB1	1	1.40	0.90	5.0	1.26	5.17	6.5
B1		2.50	0.81	5.0	2.03	5.17	10.5
DP1+B1	1A	3.90	0.84	5.6	3.29	5.00	16.4
B2	2	1.23	0.81	5.0	1.00	5.17	5.2

B3	3	0.58	0.90	5.0	0.53	5.17	2.7
B4	4	1.30	0.81	5.0	1.06	5.17	5.5
DP1A+DP2+DP3+DP4	4A	7.02	0.84	6.0	5.87	4.89	28.7
B5	5	2.05	0.82	5.0	1.68	5.17	8.7
DP4A+DP5	5A	9.07	0.83	6.6	7.56	4.75	35.9
B6	6	1.47	0.81	5.0	1.19	5.17	6.2
B7		1.18	0.90	5.0	1.06	5.17	5.5
DP6+B7	7	2.65	0.85	5.0	2.25	5.16	11.6
B8		0.55	0.90	5.0	0.50	5.17	2.6
DP7+DP8	8	3.20	0.86	5.2	2.75	5.12	14.1
DP8+DP5A	8A	12.27	0.84	6.9	10.30	4.69	48.4
B9		1.42	0.08	5.0	0.11	5.17	0.6
DP8A+B9	9	13.69	0.76	7.0	10.42	4.67	48.7
C-BASINS							
OSC1		0.35	0.90	5.0	0.31	5.17	1.6
C1		0.37	0.90	5.0	0.33	5.17	1.7
OS1+C1	1	0.72	0.90	5.5	0.65	5.03	3.2
C2		1.73	0.81	5.0	1.40	5.17	7.3
DP1+C2	2	2.10	1.14	6.1	2.38	4.87	11.6
C3	3	1.63	0.81	5.0	1.33	5.17	6.9
C4		1.72	0.81	5.0	1.40	5.17	7.2
DP2+DP3+C4	4	5.45	0.94	6.8	5.11	4.72	24.1
C5	5	1.31	0.87	5.0	1.15	5.17	5.9
C6		1.01	0.87	5.0	0.88	5.17	4.5
DP5+C6	6	2.32	0.87	5.1	2.02	5.13	10.4
DP4+DP6	6A	7.77	0.92	7.8	7.13	4.51	32.2
D-BASINS							
D1	1	1.35	0.33	9.7	0.45	4.18	1.9
D2		1.93	0.36	9.0	0.69	4.29	3.0
DP1+D2	2	3.28	0.35	10.7	1.14	4.03	4.6
D3	3	1.02	0.40	11.8	0.41	3.88	1.6
DP6A(C)+DP2+DP3	3A	12.07	0.72	12.0	8.68	3.86	33.5
D4	4	2.59	0.38	9.5	0.99	4.21	4.2
D5		0.69	0.52	7.6	0.36	4.54	1.6
DP4+D5	5	3.27	0.41	9.5	1.35	4.20	5.7
D6	6	2.66	0.45	8.0	1.20	4.46	5.3
D7		0.40	0.45	5.8	0.18	4.94	0.9
DP5+DP6+D7	7	6.33	0.43	10.0	2.73	4.13	11.3
D8	8	0.43	0.45	10.4	0.19	4.06	0.8
D9	9	0.31	0.45	7.2	0.14	4.63	0.6
D10	10	1.64	0.36	8.1	0.59	4.45	2.6
D11		0.33	0.90	5.0	0.29	5.17	1.5
DP10+D11	11	1.97	0.45	8.2	0.88	4.43	3.9
D12		1.58	0.08	6.5	0.13	4.77	0.6
DP3A+DP7+DP8+DP9+DP11+D12	12	22.69	0.56	10.3	12.75	4.08	52.1

D13	13	1.50	0.10	12.6	0.15	3.78	0.6
D14	14	0.15	0.90	5.0	0.14	5.17	0.7
D15	15	0.17	0.90	5.0	0.15	5.17	0.8
D16	16	0.82	0.08	7.4	0.07	4.59	0.3

PROJECT INFORMATION

PROJECT:	Commons at Falcon Field
PROJECT NO:	21604-00
DESIGN BY:	KGV
REV. BY:	TDM
AGENCY:	El Paso County
REPORT TYPE:	Preliminary
DATE:	3/16/2023

Drexel, Barrell & Co.

RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF

DEVELOPED RUNOFF 100 YR STORM P1= **2.52**

			DIRECT RUNOFF				
BASIN (S)	DESIGN POINT	AREA (AC)	RUNOFF COEFF	t_c (MIN)	C * A	I (IN/HR)	Q (CFS)
A-BASINS							
A1	1	0.46	0.35	10.4	0.16	6.83	1.1
A2	2	0.39	0.35	10.3	0.14	6.87	0.9
A3		0.26	0.96	5.0	0.25	8.68	2.2
DP1+DP2+A3	3	1.11	0.49	10.9	0.55	6.71	3.7
A4	4	0.22	0.96	5.0	0.21	8.68	1.8
DP3+DP4	4A	1.33	0.57	11.0	0.76	6.69	5.1
A5	5	1.52	0.50	9.3	0.77	7.11	5.5
DP4A+DP5	5A	2.85	0.54	11.3	1.53	6.64	10.1
OSA1		0.58	0.96	5.0	0.56	8.68	4.8
A6		0.82	0.35	14.2	0.29	6.05	1.7
OSA1+A6	6	1.40	0.60	14.2	0.84	6.05	5.1
A7		2.05	0.59	10.5	1.21	6.81	8.2
DP6+A7	7	3.45	0.60	14.8	2.05	5.95	12.2
A8		1.32	0.59	11.9	0.78	6.49	5.1
DP7+A8	8	4.77	0.59	17.2	2.83	5.57	15.8
A9		1.89	0.59	8.0	1.12	7.49	8.4
DP8+A9	9	6.66	0.59	17.2	3.95	5.56	21.9
A10		2.34	0.59	7.6	1.38	7.63	10.5
DPA9+A10	10	9.00	0.59	17.4	5.33	5.53	29.5
A11	11	0.87	0.59	6.6	0.51	7.99	4.1
A12	12	3.05	0.59	9.0	1.80	7.21	13.0
DP10+DP12	12A	12.05	0.59	17.5	7.13	5.52	39.4
A13	13	1.61	0.59	7.9	0.95	7.53	7.1
DP12A+DP13+DP11	13A	14.53	0.59	18.0	8.59	5.45	46.9
A14		1.19	0.40	10.3	0.48	6.85	3.3
DP5A+DP13A+A14	14	18.57	0.57	18.2	10.60	5.42	57.4
A15		2.16	0.35	5.0	0.76	8.68	6.6
OSA2		0.73	0.96	5.0	0.70	8.68	6.1
B-BASINS							
OSB1	1	1.40	0.96	5.0	1.35	8.68	11.7
B1		2.50	0.88	5.0	2.20	8.68	19.1
DP1+B1	1A	3.90	0.91	5.6	3.55	8.40	29.8
B2	2	1.23	0.88	5.0	1.09	8.68	9.4

B3	3	0.58	0.96	5.0	0.56	8.68	4.9
B4	4	1.30	0.88	5.0	1.15	8.68	10.0
DP1A+DP2+DP3+DP4	4A	7.02	0.90	6.0	6.34	8.21	52.1
B5	5	2.05	0.89	5.0	1.82	8.68	15.8
DP4A+DP5	5A	9.07	0.90	6.6	8.17	7.98	65.2
B6	6	1.47	0.88	5.0	1.29	8.68	11.2
B7		1.18	0.96	5.0	1.13	8.68	9.8
DP6+B7	7	2.65	0.92	5.0	2.43	8.66	21.0
B8		0.55	0.96	5.0	0.53	8.68	4.6
DP7+DP8	8	3.20	0.92	5.2	2.95	8.60	25.4
DP8+DP5A	8A	12.27	0.91	6.9	11.12	7.88	87.7
B9		1.42	0.35	5.0	0.50	8.68	4.3
DP8A+B9	9	13.69	0.85	7.0	11.62	7.84	91.1
C-BASINS							
OSC1		0.35	0.96	5.0	0.33	8.68	2.9
C1		0.37	0.96	5.0	0.36	8.68	3.1
OS1+C1	1	0.72	0.96	5.5	0.69	8.44	5.8
C2		1.73	0.88	5.0	1.53	8.68	13.2
DP1+C2	2	2.10	1.22	6.1	2.57	8.18	21.0
C3	3	1.63	0.88	5.0	1.44	8.68	12.5
C4		1.72	0.88	5.0	1.52	8.68	13.2
DP2+DP3+C4	4	5.45	1.01	6.8	5.53	7.92	43.8
C5	5	1.31	0.94	5.0	1.23	8.68	10.7
C6		1.01	0.94	5.0	0.95	8.68	8.2
DP5+C6	6	2.32	0.94	5.1	2.18	8.61	18.8
DP4+DP6	6A	7.77	0.99	7.8	7.71	7.57	58.4
D-BASINS							
D1	1	1.35	0.51	9.7	0.69	7.01	4.8
D2		1.93	0.53	9.0	1.02	7.20	7.4
DP1+D2	2	3.28	0.52	10.7	1.71	6.77	11.6
D3	3	1.02	0.56	11.8	0.57	6.52	3.7
DP6A(C)+DP2+DP3	3A	12.07	0.83	12.0	9.99	6.48	64.7
D4	4	2.59	0.55	9.5	1.42	7.07	10.1
D5		0.69	0.65	7.6	0.45	7.63	3.4
DP4+D5	5	3.27	0.57	9.5	1.87	7.06	13.2
D6	6	2.66	0.59	8.0	1.57	7.49	11.8
D7		0.40	0.59	5.8	0.23	8.29	1.9
DP5+DP6+D7	7	6.33	0.58	10.0	3.67	6.94	25.5
D8	8	0.43	0.59	10.4	0.25	6.82	1.7
D9	9	0.31	0.59	7.2	0.18	7.77	1.4
D10	10	1.64	0.53	8.1	0.87	7.48	6.5
D11		0.33	0.96	5.0	0.31	8.68	2.7
DP10+D11	11	1.97	0.60	8.2	1.19	7.44	8.8
D12		1.58	0.35	6.5	0.55	8.01	4.4
DP3A+DP7+DP8+DP9+DP11+D12	12	22.69	0.70	10.3	15.84	6.85	108.6
D13	13	1.50	0.36	12.6	0.54	6.34	3.4

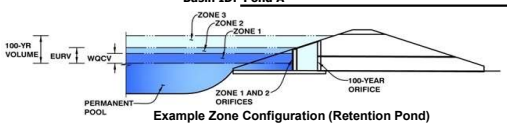
D14	14	0.15	0.96	5.0	0.15	8.68	1.3
D15	15	0.17	0.96	5.0	0.16	8.68	1.4
D16	16	0.82	0.35	7.4	0.29	7.70	2.2

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: **The Commons at Falcon Field**

Basin ID: **Pond A**



Example Zone Configuration (Retention Pond)

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft²)	Optional Override Area (ft²)	Area (acre)	Volume (ft³)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	400	0.009		
6835	--	1.00	--	--	--	14,788	0.339	7,594	0.174
6840	--	6.00	--	--	--	27,694	0.636	113,799	2.612

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	18.57	acres
Watershed Length =	1,191	ft
Watershed Length to Centroid =	550	ft
Watershed Slope =	0.025	ft/ft
Watershed Imperviousness =	56.00%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	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	
Water Quality Capture Volume (WQCV) =	0.346	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	1.238	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.898	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	1.186	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	1.417	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	1.751	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	2.077	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	2.486	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.49 in.) =	3.903	acre-feet	3.49	inches
Approximate 2-yr Detention Volume =	0.800	acre-feet		
Approximate 5-yr Detention Volume =	1.050	acre-feet		
Approximate 10-yr Detention Volume =	1.274	acre-feet		
Approximate 25-yr Detention Volume =	1.548	acre-feet		
Approximate 50-yr Detention Volume =	1.717	acre-feet		
Approximate 100-yr Detention Volume =	1.911	acre-feet		

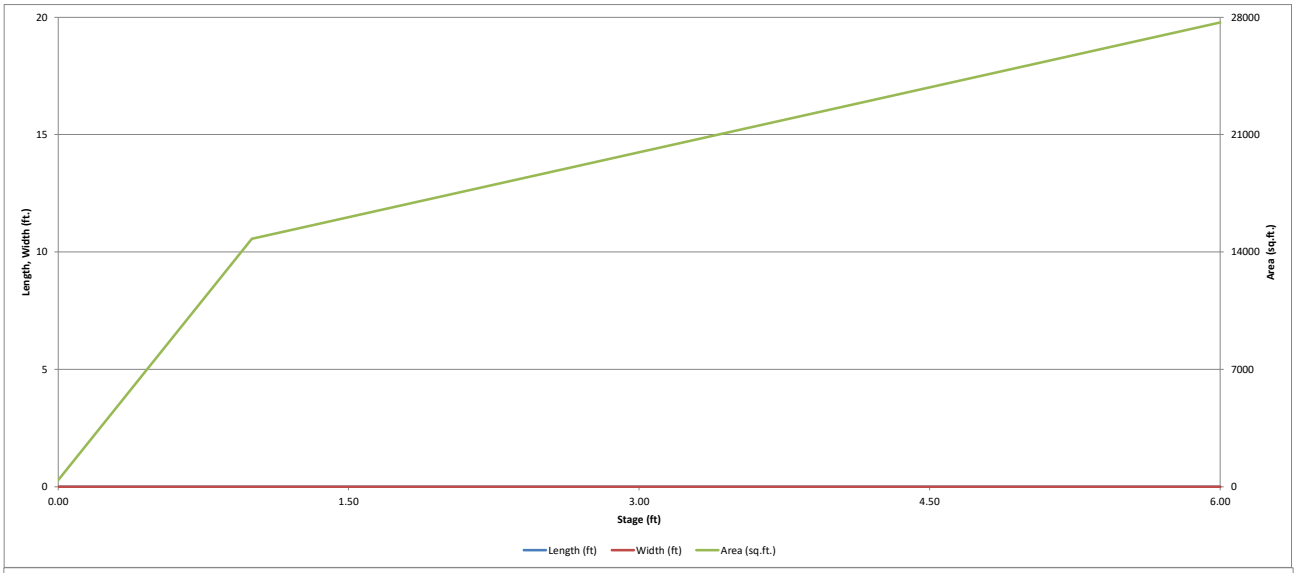
Define Zones and Basin Geometry

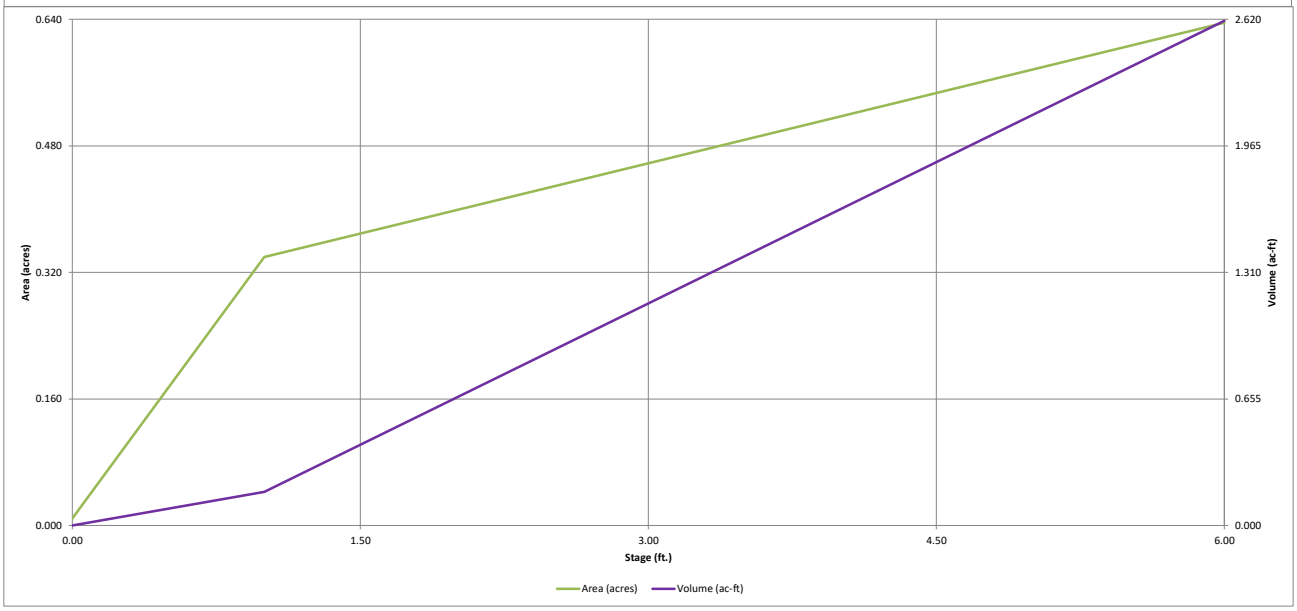
Zone 1 Volume (WQCV) =	0.346	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.892	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.673	acre-feet
Total Detention Basin Volume =	1.911	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	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_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	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_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Note: Detention worksheets will be reviewed more with the FDR when pond details and plans have been finalized.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)



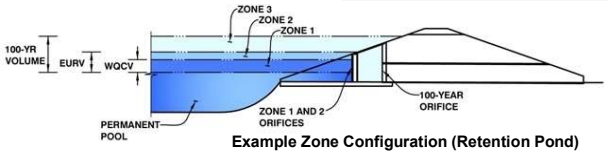


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: **The Commons at Falcon Field**

Basin ID: **Pond A**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.49	0.346	Orifice Plate
Zone 2 (EURV)	3.57	0.892	Orifice Plate
Zone 3 (100-year)	4.84	0.673	Weir&Pipe (Restrict)
Total (all zones)		1.911	

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

Underdrain Orifice Invert Depth = [ ] ft (distance below the filtration media surface)

Underdrain Orifice Diameter = [ ] inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = [ ] ft^2

Underdrain Orifice Centroid = [ ] 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 = 0.00 ft (relative to basin bottom at Stage = 0 ft)

Depth at top of Zone using Orifice Plate = 3.57 ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = 13.00 inches

Orifice Plate: Orifice Area per Row = 3.22 sq. inches (diameter = 2 inches)

Calculated Parameters for Plate

WQ Orifice Area per Row = 2.236E-02 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	1.19	2.38					
Orifice Area (sq. inches)	3.22	3.22	3.22					

	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)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	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

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	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, Ho =	3.75	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.92	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	4.92	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	3.75	N/A	feet
Overflow Weir Slope Length =	4.92	N/A	feet
Grate Open Area / 100-yr Orifice Area =	12.33	N/A	
Overflow Grate Open Area w/o Debris =	16.85	N/A	ft^2
Overflow Grate Open Area w/ Debris =	8.42	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 =	0.00	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 =	13.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	1.37	N/A	ft^2
Outlet Orifice Centroid =	0.60	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	2.03	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= 4.50 ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = 45.00 feet

Spillway End Slopes = 4.00 H:V

Freeboard above Max Water Surface = 1.00 feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= 0.48 feet

Stage at Top of Freeboard = 5.98 feet

Basin Area at Top of Freeboard = 0.63 acres

Basin Volume at Top of Freeboard = 2.60 acre-ft

Routed Hydrograph Results

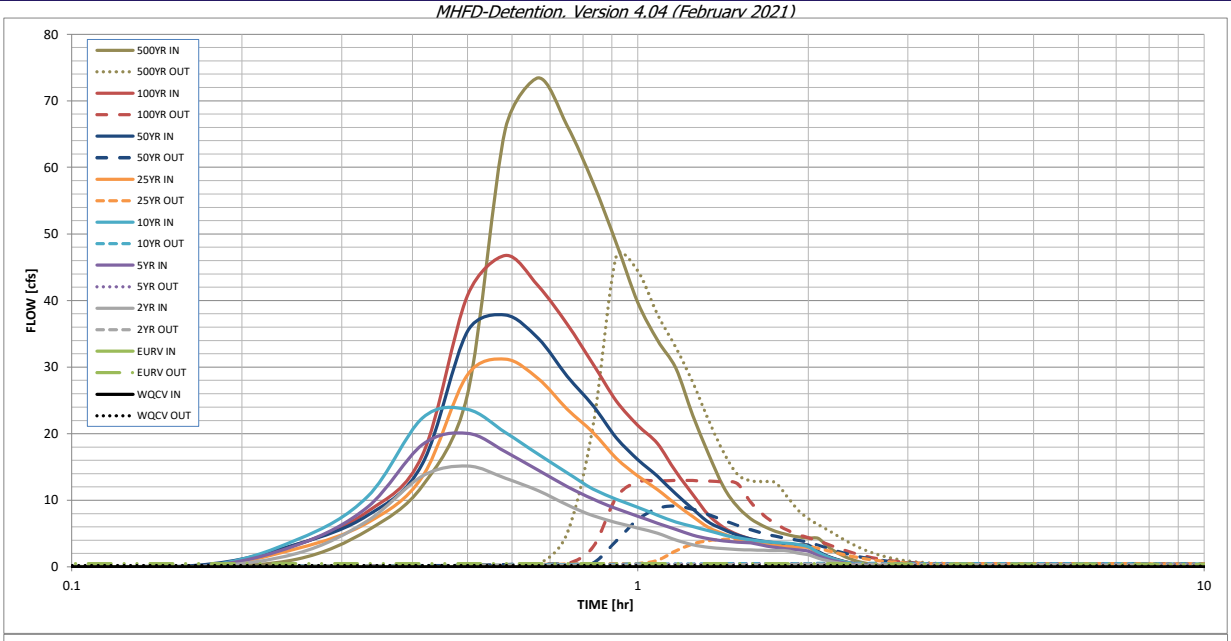
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

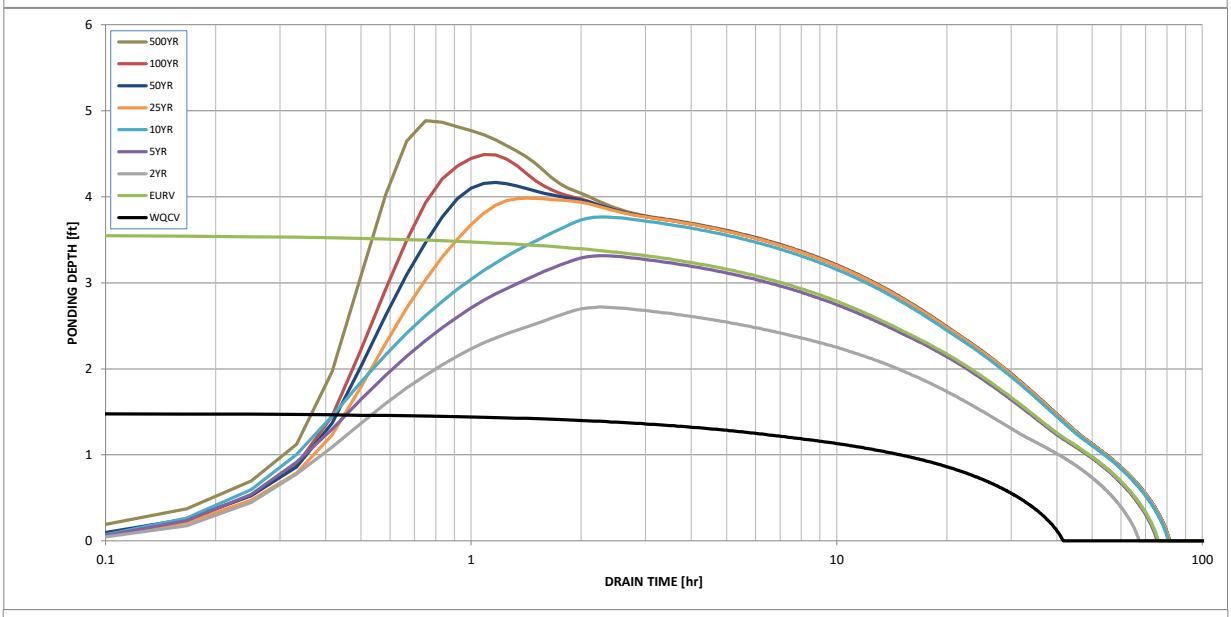
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.49
CUHP Runoff Volume (acre-ft) =	0.346	1.238	0.898	1.186	1.417	1.751	2.077	2.486	3.903
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.898	1.186	1.417	1.751	2.077	2.486	3.903
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.2	0.3	0.4	3.9	7.8	12.8	29.0
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	0.21	0.42	0.69	1.56
Peak Inflow Q (cfs) =	N/A	N/A	15.2	20.1	23.6	31.2	37.8	46.8	73.5
Peak Outflow Q (cfs) =	0.2	0.5	0.4	0.5	0.6	4.1	9.1	13.0	46.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.5	1.3	1.1	1.2	1.0	1.6
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.0	0.2	0.5	0.7	0.8
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) =	38	67	60	67	71	70	69	67	62
Time to Drain 99% of Inflow Volume (hours) =	**40**	72	64	71	76	76	76	75	73
Maximum Ponding Depth (ft) =	1.49	3.57	2.72	3.32	3.77	3.98	4.17	4.49	4.88
Area at Maximum Ponding Depth (acres) =	0.37	0.49	0.44	0.48	0.50	0.52	0.53	0.55	0.57
Maximum Volume Stored (acre-ft) =	0.348	1.242	0.841	1.117	1.337	1.449	1.543	1.720	1.938

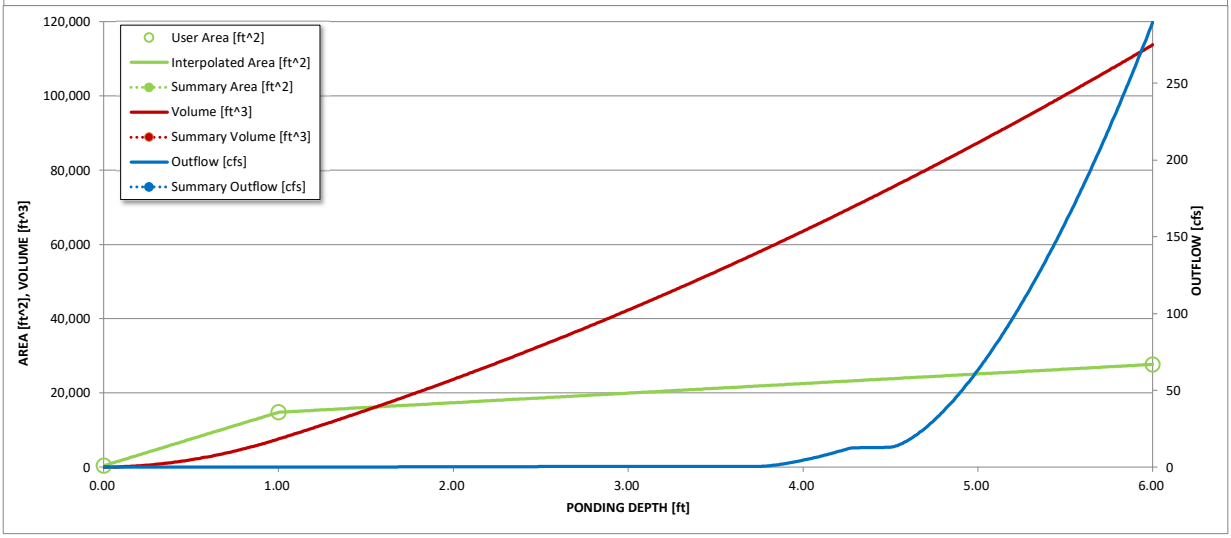
Verify and fix - these boxes should be approximately 1

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)







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

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.

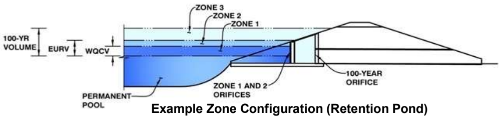
	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.02	1.15
	0:15:00	0.00	0.00	2.02	3.29	4.08	2.75	3.40	3.35	5.51
	0:20:00	0.00	0.00	6.94	9.01	10.57	6.65	7.72	8.32	12.18
	0:25:00	0.00	0.00	13.65	18.35	22.35	13.54	15.46	16.77	25.92
	0:30:00	0.00	0.00	15.15	20.07	23.64	28.85	35.38	40.74	65.71
	0:35:00	0.00	0.00	13.33	17.28	20.19	31.19	37.83	46.78	73.46
	0:40:00	0.00	0.00	11.45	14.52	16.91	28.27	34.30	42.18	66.29
	0:45:00	0.00	0.00	9.31	12.05	14.12	23.72	28.65	36.47	57.72
	0:50:00	0.00	0.00	7.70	10.18	11.70	20.20	24.23	30.49	48.58
	0:55:00	0.00	0.00	6.65	8.73	10.16	16.29	19.36	24.90	39.69
	1:00:00	0.00	0.00	5.83	7.61	8.94	13.65	16.10	21.25	34.05
	1:05:00	0.00	0.00	5.07	6.56	7.77	11.60	13.62	18.50	29.85
	1:10:00	0.00	0.00	4.06	5.65	6.76	9.41	10.95	14.32	22.75
	1:15:00	0.00	0.00	3.32	4.77	6.05	7.56	8.70	10.88	16.99
	1:20:00	0.00	0.00	2.93	4.22	5.44	5.90	6.71	7.79	12.01
	1:25:00	0.00	0.00	2.73	3.92	4.81	4.97	5.63	5.94	9.03
	1:30:00	0.00	0.00	2.61	3.72	4.36	4.22	4.76	4.86	7.24
	1:35:00	0.00	0.00	2.54	3.59	4.05	3.74	4.21	4.19	6.12
	1:40:00	0.00	0.00	2.49	3.20	3.82	3.41	3.84	3.74	5.36
	1:45:00	0.00	0.00	2.45	2.92	3.67	3.20	3.60	3.44	4.85
	1:50:00	0.00	0.00	2.43	2.71	3.56	3.05	3.43	3.24	4.51
	1:55:00	0.00	0.00	2.08	2.56	3.37	2.96	3.32	3.12	4.33
	2:00:00	0.00	0.00	1.82	2.37	3.04	2.90	3.26	3.08	4.27
	2:05:00	0.00	0.00	1.30	1.69	2.15	2.06	2.31	2.19	3.03
	2:10:00	0.00	0.00	0.90	1.18	1.50	1.44	1.62	1.54	2.12
	2:15:00	0.00	0.00	0.62	0.81	1.04	1.00	1.12	1.07	1.47
	2:20:00	0.00	0.00	0.42	0.53	0.70	0.67	0.75	0.72	0.99
	2:25:00	0.00	0.00	0.27	0.34	0.46	0.44	0.49	0.47	0.65
	2:30:00	0.00	0.00	0.16	0.23	0.29	0.29	0.32	0.31	0.42
	2:35:00	0.00	0.00	0.09	0.13	0.16	0.17	0.19	0.18	0.24
	2:40:00	0.00	0.00	0.04	0.06	0.07	0.08	0.09	0.08	0.11
	2:45:00	0.00	0.00	0.01	0.02	0.02	0.02	0.03	0.02	0.03
	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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
	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 STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: **The Commons at Falcon Field**

Basin ID: **Pond B**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	13.69	acres
Watershed Length =	915	ft
Watershed Length to Centroid =	450	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	87.00%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	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	
Water Quality Capture Volume (WQCV) =	0.430	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	1.604	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	1.089	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	1.405	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	1.660	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	1.943	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	2.220	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	2.534	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.49 in.) =	3.637	acre-feet	3.49	inches
Approximate 2-yr Detention Volume =	1.057	acre-feet		
Approximate 5-yr Detention Volume =	1.371	acre-feet		
Approximate 10-yr Detention Volume =	1.630	acre-feet		
Approximate 25-yr Detention Volume =	1.926	acre-feet		
Approximate 50-yr Detention Volume =	2.098	acre-feet		
Approximate 100-yr Detention Volume =	2.250	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.430	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.173	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.646	acre-feet
Total Detention Basin Volume =	2.250	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	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_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	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_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	40	0.001		
6835	--	1.00	--	--	--	28,695	0.659	14,367	0.330
6839	--	5.00	--	--	--	40,779	0.936	153,315	3.520
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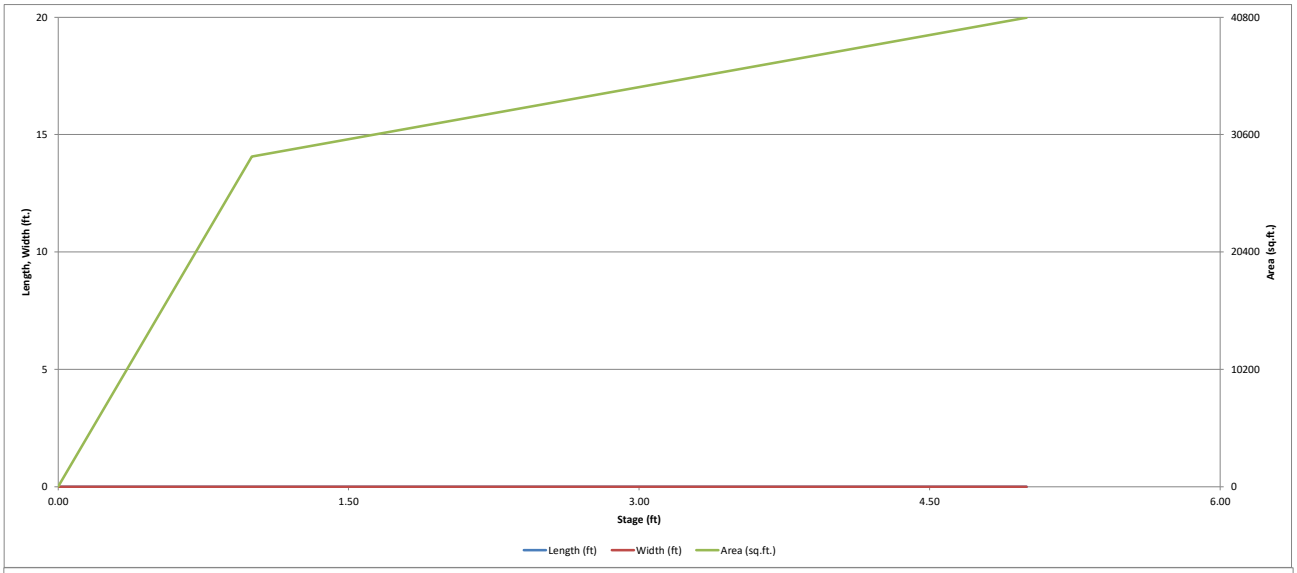
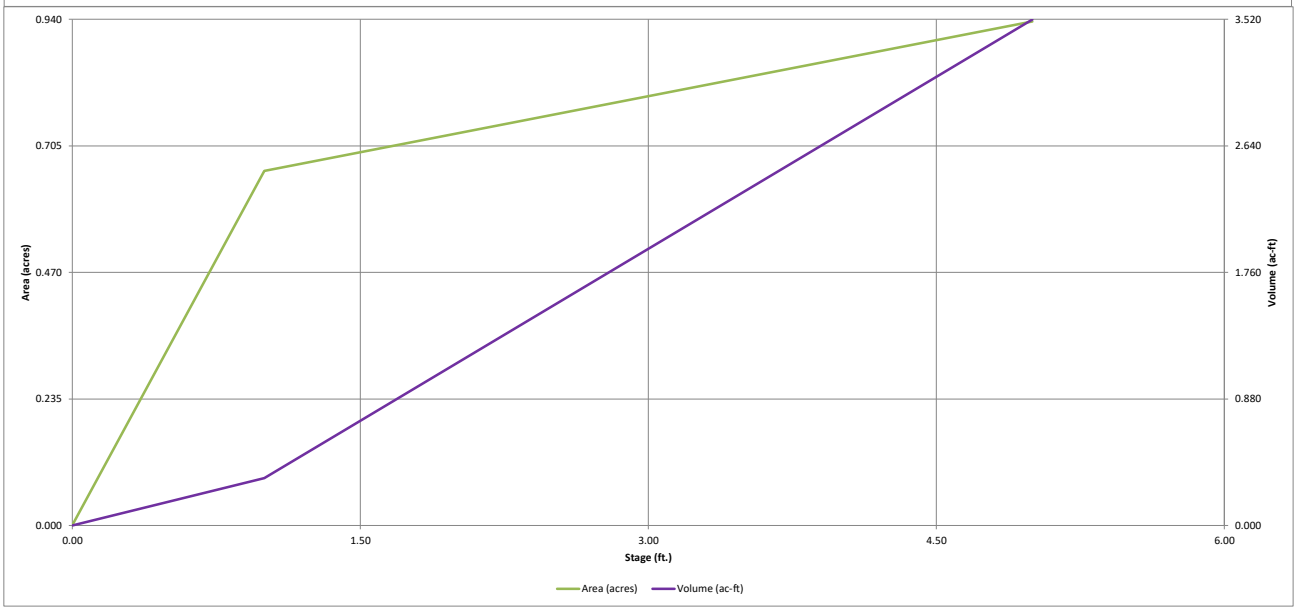
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)



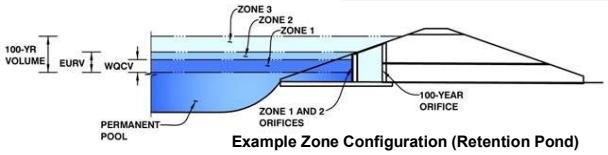


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: **The Commons at Falcon Field**

Basin ID: **Pond B**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.16	0.430	Orifice Plate
Zone 2 (EURV)	2.77	1.173	Orifice Plate
Zone 3 (100-year)	3.57	0.646	Weir&Pipe (Circular)
Total (all zones)		2.250	

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 Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

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 =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	2.77	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	11.10	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

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	0.92	1.85					
Orifice Area (sq. inches)	4.30	6.00	8.00					

	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)

	Not Selected	Not Selected			Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	N/A	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches				

Calculated Parameters for Vertical Orifice

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			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.80	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	2.80	N/A	feet
Overflow Weir Front Edge Length =	6.00	N/A	feet	Overflow Weir Slope Length =	6.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	14.18	N/A	
Horiz. Length of Weir Sides =	6.00	N/A	feet	Overflow Grate Open Area w/o Debris =	25.06	N/A	ft^2
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	12.53	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Circular	Not Selected			Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	1.77	N/A	ft^2
Circular Orifice Diameter =	18.00	N/A	inches	Outlet Orifice Centroid =	0.75	N/A	feet
				Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	3.25	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.74	feet
Spillway Crest Length =	25.00	feet	Stage at Top of Freeboard =	4.99	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.94	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	3.51	acre-ft

Calculated Parameters for Spillway

Routed Hydrograph Results

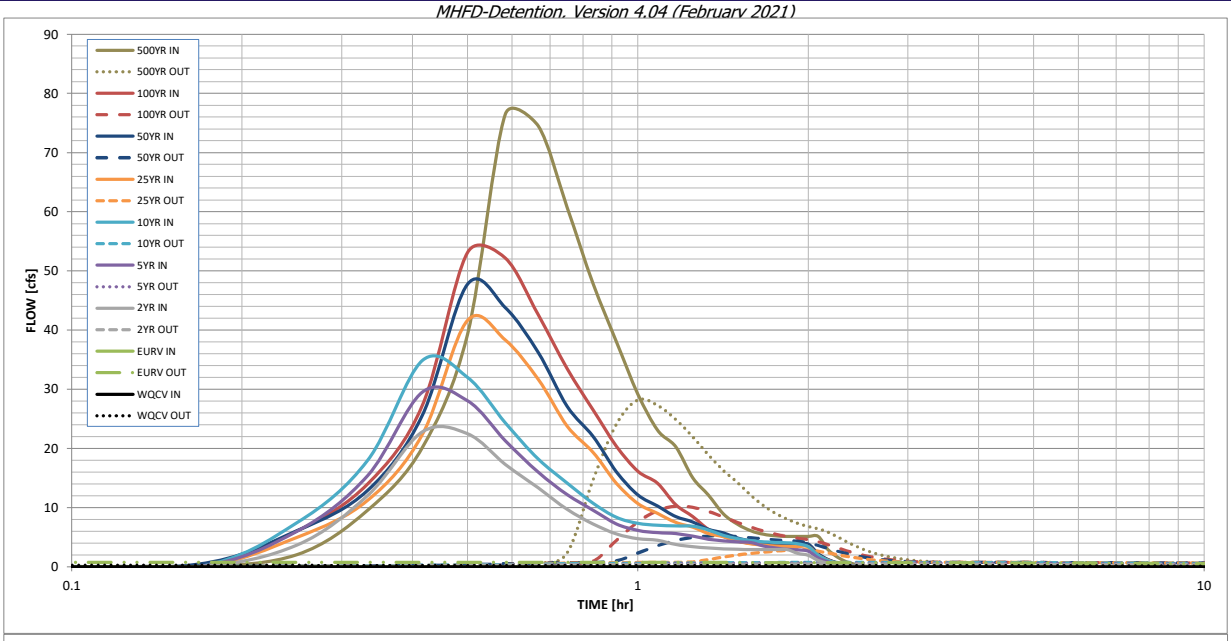
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

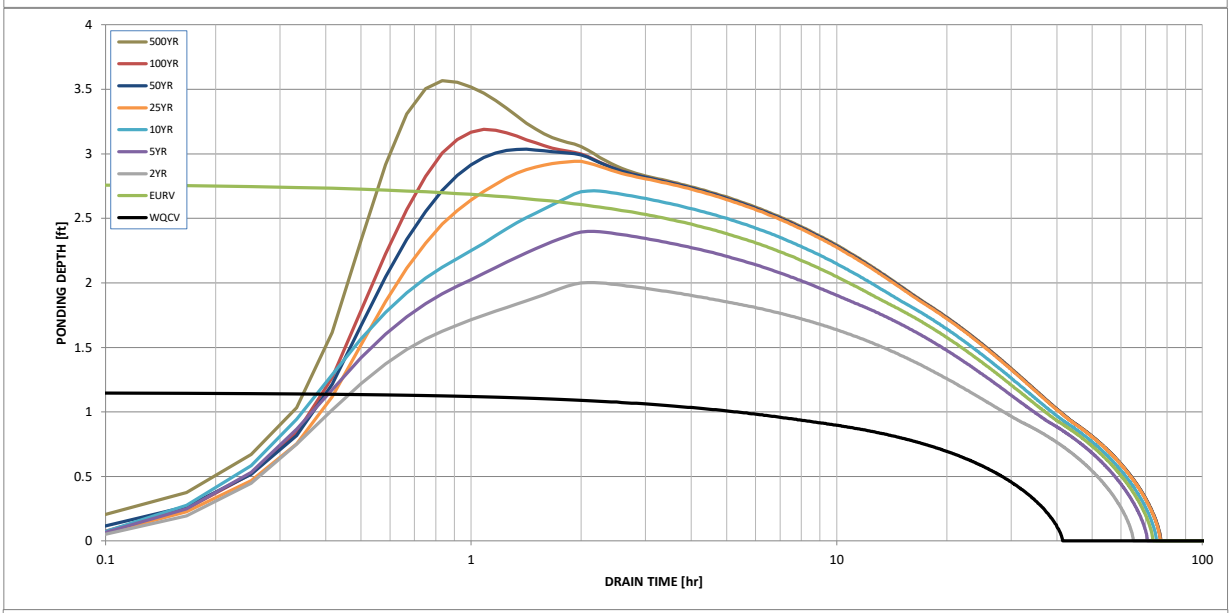
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.49
CUHP Runoff Volume (acre-ft) =	0.430	1.604	1.089	1.405	1.660	1.943	2.220	2.534	3.637
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	1.089	1.405	1.660	1.943	2.220	2.534	3.637
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.1	0.3	0.4	3.2	6.3	10.3	23.4
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	0.03	0.23	0.46	0.76	1.71
Peak Inflow Q (cfs) =	N/A	N/A	22.8	29.5	34.9	41.7	47.8	53.1	76.4
Peak Outflow Q (cfs) =	0.3	0.8	0.5	0.7	0.8	2.9	5.2	10.2	28.2
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	2.5	2.1	0.9	0.8	1.0	1.2
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.1	0.2	0.4	0.5
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) =	38	65	58	63	66	67	66	65	61
Time to Drain 99% of Inflow Volume (hours) =	**40**	70	62	67	71	72	72	72	70
Maximum Ponding Depth (ft) =	1.16	2.77	2.00	2.40	2.71	2.94	3.03	3.19	3.57
Area at Maximum Ponding Depth (acres) =	0.67	0.78	0.73	0.76	0.78	0.79	0.80	0.81	0.84
Maximum Volume Stored (acre-ft) =	0.436	1.604	1.023	1.312	1.558	1.738	1.810	1.931	2.243

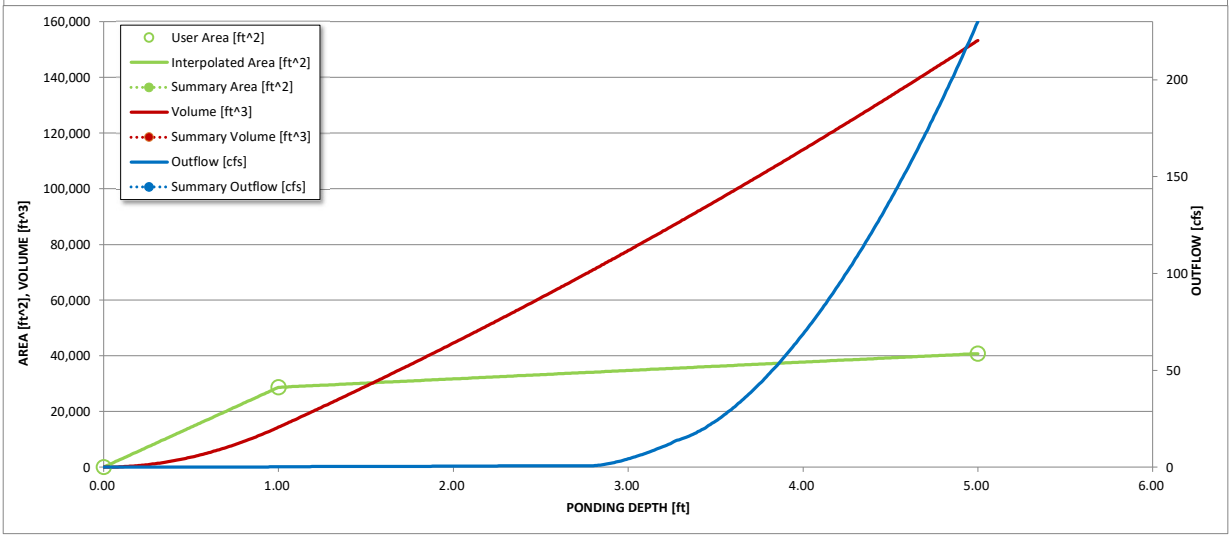
Verify and fix - these boxes should be approximately 1

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)







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

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.

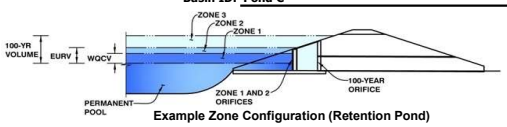
	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.04	2.07
	0:15:00	0.00	0.00	3.71	6.03	7.45	5.00	6.10	6.07	9.58
	0:20:00	0.00	0.00	12.06	15.44	17.99	11.24	12.93	14.03	20.18
	0:25:00	0.00	0.00	22.82	29.53	34.85	22.37	25.66	27.31	39.24
	0:30:00	0.00	0.00	22.50	28.06	32.04	41.66	47.75	53.10	76.45
	0:35:00	0.00	0.00	17.33	21.33	24.34	38.31	43.81	52.16	74.49
	0:40:00	0.00	0.00	13.34	16.00	18.22	31.72	36.25	42.59	60.76
	0:45:00	0.00	0.00	9.71	12.21	14.16	23.79	27.13	33.51	47.88
	0:50:00	0.00	0.00	7.27	9.60	10.77	19.38	22.07	26.55	38.05
	0:55:00	0.00	0.00	5.55	7.25	8.38	14.14	16.07	20.41	29.21
	1:00:00	0.00	0.00	4.76	6.17	7.35	10.69	12.15	16.15	23.12
	1:05:00	0.00	0.00	4.49	5.78	7.04	9.03	10.27	14.14	20.30
	1:10:00	0.00	0.00	3.77	5.63	6.92	7.50	8.49	10.50	15.02
	1:15:00	0.00	0.00	3.40	5.17	6.88	6.71	7.58	8.51	12.13
	1:20:00	0.00	0.00	3.18	4.68	6.24	5.63	6.35	6.31	8.92
	1:25:00	0.00	0.00	3.05	4.39	5.32	5.08	5.73	5.13	7.20
	1:30:00	0.00	0.00	2.97	4.23	4.77	4.33	4.87	4.37	6.09
	1:35:00	0.00	0.00	2.93	4.13	4.44	3.90	4.39	3.96	5.49
	1:40:00	0.00	0.00	2.92	3.53	4.25	3.66	4.11	3.79	5.26
	1:45:00	0.00	0.00	2.92	3.19	4.13	3.53	3.97	3.72	5.15
	1:50:00	0.00	0.00	2.92	2.99	4.08	3.47	3.90	3.71	5.14
	1:55:00	0.00	0.00	2.30	2.88	3.90	3.44	3.87	3.71	5.14
	2:00:00	0.00	0.00	1.94	2.65	3.43	3.44	3.86	3.71	5.14
	2:05:00	0.00	0.00	1.10	1.51	1.97	1.98	2.22	2.13	2.95
	2:10:00	0.00	0.00	0.62	0.85	1.11	1.13	1.27	1.22	1.68
	2:15:00	0.00	0.00	0.31	0.45	0.58	0.60	0.67	0.64	0.89
	2:20:00	0.00	0.00	0.14	0.23	0.29	0.31	0.35	0.34	0.46
	2:25:00	0.00	0.00	0.05	0.08	0.10	0.12	0.13	0.12	0.17
	2:30:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02
	2:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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
	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 STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: **The Commons at Falcon Field**

Basin ID: **Pond C**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	23.03	acres
Watershed Length =	1,500	ft
Watershed Length to Centroid =	650	ft
Watershed Slope =	0.050	ft/ft
Watershed Imperviousness =	66.00%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	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	
Water Quality Capture Volume (WQCV) =	0.495	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	1.894	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	1.351	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	1.771	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	2.108	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	2.544	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	2.973	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	3.492	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.49 in.) =	5.295	acre-feet	3.49	inches
Approximate 2-yr Detention Volume =	1.233	acre-feet		
Approximate 5-yr Detention Volume =	1.612	acre-feet		
Approximate 10-yr Detention Volume =	1.941	acre-feet		
Approximate 25-yr Detention Volume =	2.334	acre-feet		
Approximate 50-yr Detention Volume =	2.569	acre-feet		
Approximate 100-yr Detention Volume =	2.813	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.495	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.399	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.919	acre-feet
Total Detention Basin Volume =	2.813	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	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_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

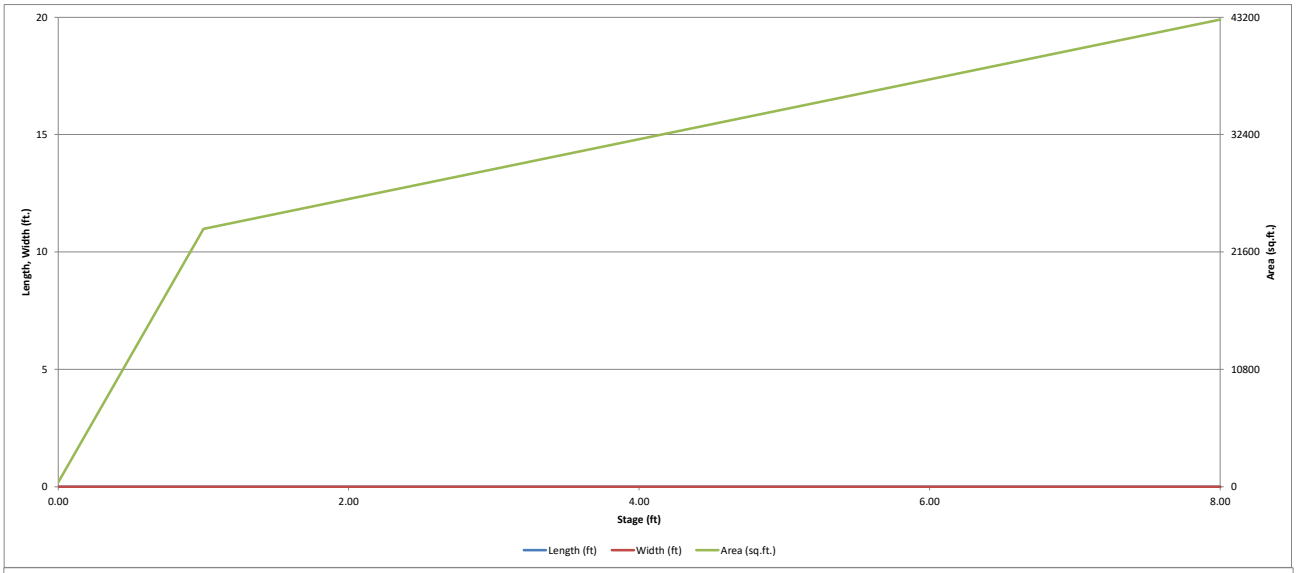
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

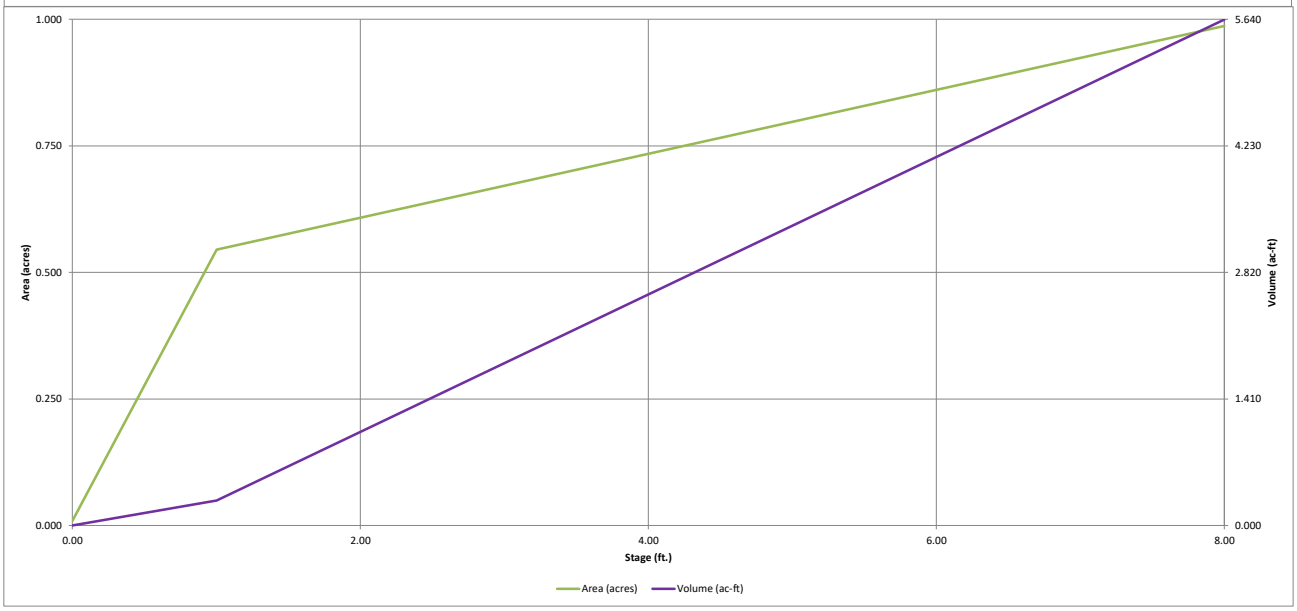
Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	400	0.009		
6808	--	1.00	--	--	--	23,745	0.545	12,072	0.277
6815	--	8.00	--	--	--	42,990	0.987	245,645	5.639

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)



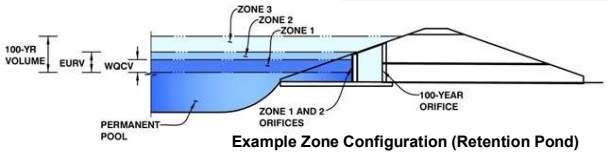


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: **The Commons at Falcon Field**

Basin ID: **Pond C**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.40	0.495	Orifice Plate
Zone 2 (EURV)	3.59	1.399	Orifice Plate
Zone 3 (100-year)	4.82	0.919	Weir&Pipe (Circular)
Total (all zones)		2.813	

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 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)

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

Depth at top of Zone using Orifice Plate = 3.59 ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = 14.40 inches

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

Calculated Parameters for Plate

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	1.20	2.39					
Orifice Area (sq. inches)	4.85	4.85	10.00					

	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)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	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

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	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, Ho =	3.90	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.92	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	4.92	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	3.90	N/A	feet
Overflow Weir Slope Length =	4.92	N/A	feet
Grate Open Area / 100-yr Orifice Area =	9.53	N/A	
Overflow Grate Open Area w/o Debris =	16.85	N/A	ft^2
Overflow Grate Open Area w/ Debris =	8.42	N/A	ft^2

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

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	2.83	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	18.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	1.77	N/A	ft^2
Outlet Orifice Centroid =	0.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= 5.00 ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = 20.00 feet

Spillway End Slopes = 4.00 H:V

Freeboard above Max Water Surface = 1.00 feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= 1.00 feet

Stage at Top of Freeboard = 7.00 feet

Basin Area at Top of Freeboard = 0.92 acres

Basin Volume at Top of Freeboard = 4.68 acre-ft

Routed Hydrograph Results

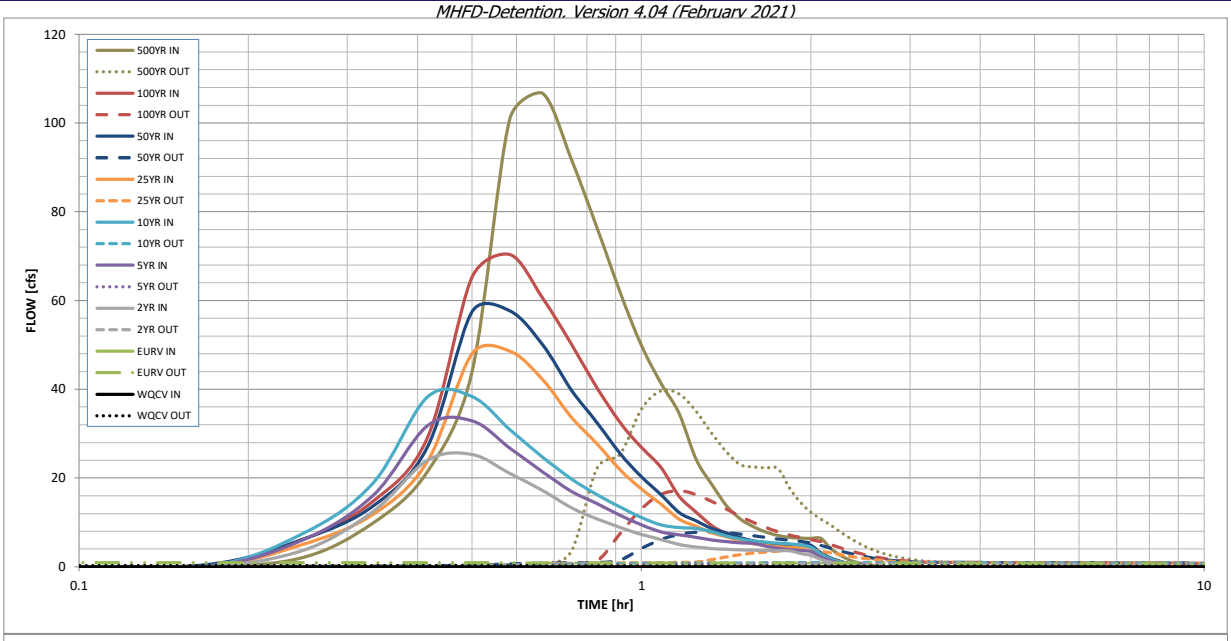
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

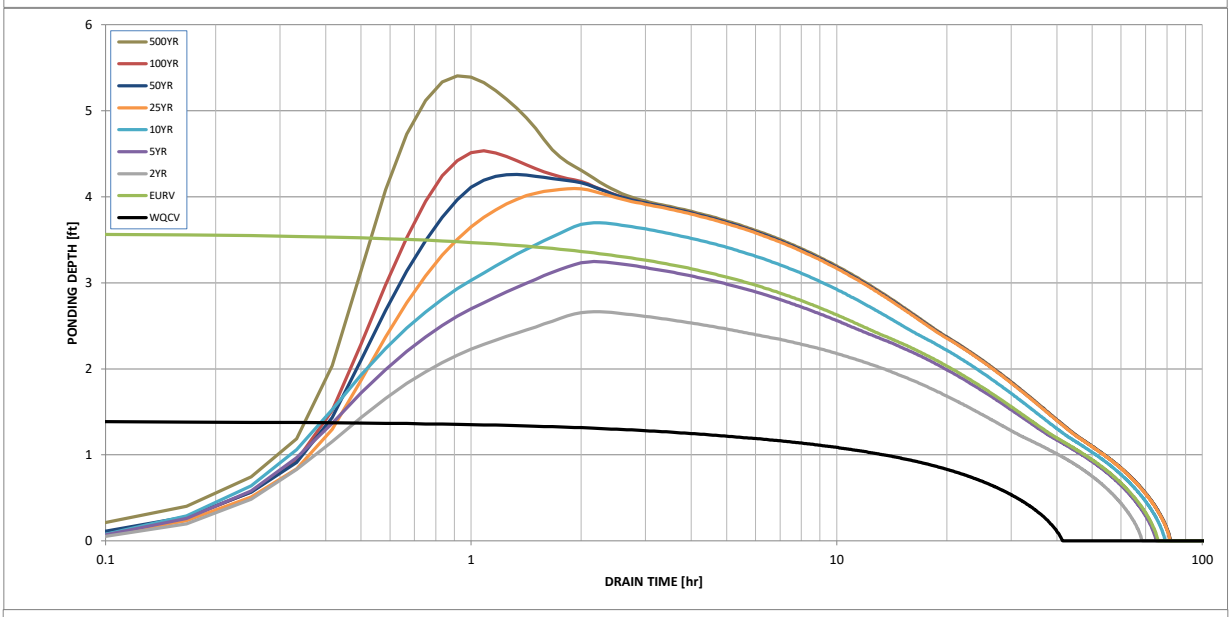
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.49
CUHP Runoff Volume (acre-ft) =	0.495	1.894	1.351	1.771	2.108	2.544	2.973	3.492	5.295
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	1.351	1.771	2.108	2.544	2.973	3.492	5.295
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.2	0.4	0.6	5.2	10.3	16.8	38.1
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	0.22	0.45	0.73	1.66
Peak Inflow Q (cfs) =	N/A	N/A	25.3	32.9	38.4	48.6	57.7	70.4	106.7
Peak Outflow Q (cfs) =	0.3	0.9	0.6	0.8	1.0	3.8	7.9	17.1	39.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	2.0	1.7	0.7	0.8	1.0	1.0
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.2	0.4	0.9	1.3
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) =	38	67	62	67	70	71	70	68	64
Time to Drain 99% of Inflow Volume (hours) =	**40**	72	65	71	75	77	76	76	74
Maximum Ponding Depth (ft) =	1.40	3.59	2.67	3.25	3.70	4.10	4.26	4.53	5.40
Area at Maximum Ponding Depth (acres) =	0.57	0.71	0.65	0.69	0.71	0.74	0.75	0.77	0.82
Maximum Volume Stored (acre-ft) =	0.500	1.901	1.269	1.657	1.972	2.263	2.382	2.595	3.287

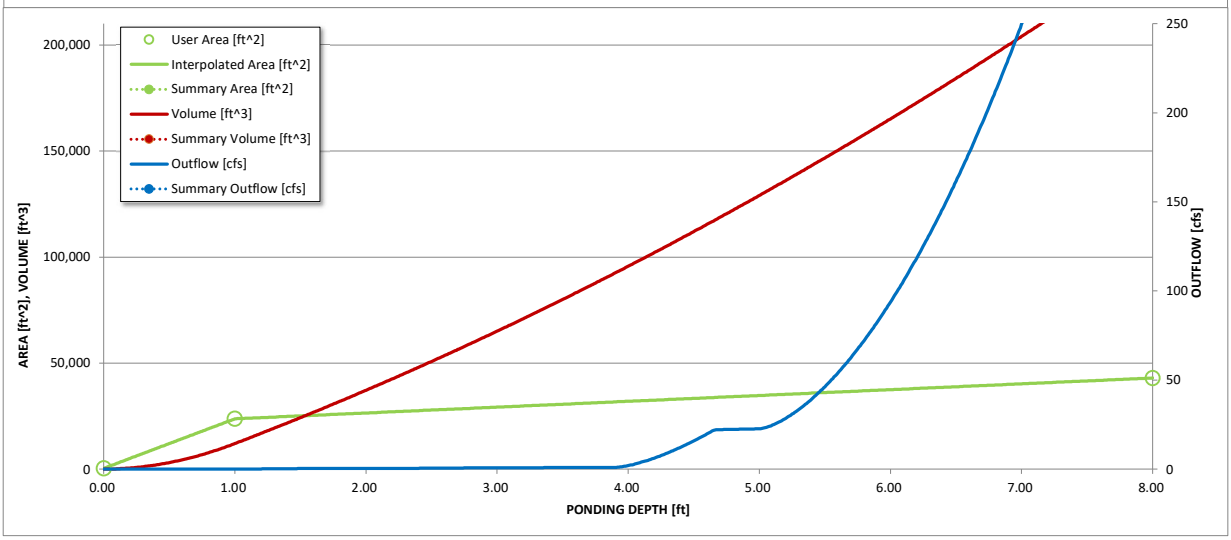
Verify and fix - these boxes should be approximately 1

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)







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

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	0.42	0.04	2.09
	0:15:00	0.00	0.00	3.72	6.04	7.49	5.03	6.20	6.13	9.91
	0:20:00	0.00	0.00	12.48	16.11	18.86	11.84	13.69	14.80	21.49
	0:25:00	0.00	0.00	24.04	31.78	38.30	23.79	27.05	29.15	43.94
	0:30:00	0.00	0.00	25.34	32.91	38.36	48.00	57.44	65.27	100.88
	0:35:00	0.00	0.00	21.04	26.76	30.97	48.60	57.69	70.39	106.69
	0:40:00	0.00	0.00	17.23	21.44	24.75	42.22	50.11	60.61	91.93
	0:45:00	0.00	0.00	13.34	17.05	19.85	33.78	39.90	50.25	76.52
	0:50:00	0.00	0.00	10.82	14.27	16.27	27.75	32.55	40.36	61.82
	0:55:00	0.00	0.00	8.91	11.63	13.45	21.86	25.50	32.49	49.85
	1:00:00	0.00	0.00	7.28	9.45	11.12	17.50	20.27	26.88	41.34
	1:05:00	0.00	0.00	6.16	7.89	9.44	14.11	16.24	22.39	34.57
	1:10:00	0.00	0.00	5.06	7.25	8.85	10.76	12.26	15.93	24.27
	1:15:00	0.00	0.00	4.48	6.66	8.67	9.14	10.36	12.36	18.60
	1:20:00	0.00	0.00	4.13	6.06	7.96	7.66	8.65	9.33	13.81
	1:25:00	0.00	0.00	3.94	5.68	6.95	6.78	7.64	7.41	10.78
	1:30:00	0.00	0.00	3.82	5.42	6.28	5.82	6.55	6.29	9.00
	1:35:00	0.00	0.00	3.73	5.27	5.82	5.22	5.87	5.53	7.81
	1:40:00	0.00	0.00	3.67	4.63	5.53	4.83	5.43	5.05	7.05
	1:45:00	0.00	0.00	3.64	4.18	5.33	4.57	5.14	4.78	6.62
	1:50:00	0.00	0.00	3.64	3.89	5.20	4.43	4.99	4.68	6.48
	1:55:00	0.00	0.00	3.02	3.70	4.93	4.35	4.89	4.64	6.42
	2:00:00	0.00	0.00	2.60	3.44	4.42	4.31	4.85	4.64	6.42
	2:05:00	0.00	0.00	1.69	2.24	2.89	2.82	3.17	3.04	4.21
	2:10:00	0.00	0.00	1.07	1.42	1.85	1.82	2.04	1.96	2.70
	2:15:00	0.00	0.00	0.66	0.88	1.15	1.14	1.28	1.23	1.69
	2:20:00	0.00	0.00	0.38	0.52	0.68	0.68	0.77	0.73	1.01
	2:25:00	0.00	0.00	0.20	0.31	0.39	0.40	0.45	0.43	0.59
	2:30:00	0.00	0.00	0.09	0.15	0.18	0.20	0.22	0.21	0.29
	2:35:00	0.00	0.00	0.03	0.05	0.05	0.06	0.07	0.07	0.09
	2:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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
	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

It appears that there may be flow from the property to the north as County GIS identifies a culvert at this location under Rio Lane into this property. Also, the soils and Geology report indicate at spring at this location. Please address and account for this in your analysis/design.

If there is runoff from this area include it in the drainage basins

Show RET090 (DBPS) on the map per section 6 from the drainage report text. It is unclear where RET090 combines with the on-site watersheds.

Show surrounding contours if they are available

Revise to add a summary table for basins and design points.

OS1 1.79 0.49 0.66
OS2 0.65 0.49 0.66
OS3 0.66 0.49 0.66
E1 13.85 0.08 0.35
E2 12.88 0.08 0.35
E3 13.11 0.08 0.35
E4 1.57 0.08 0.35
E5 5.91 0.12 0.38
E6 10.37 0.08 0.35

EL PASO COUNTY 4200000265
JOSEPH D. HEFFNER LIVING TRUST 4307001001
LARRY WADE 4307001002
BURT & MELISSA CHAFFIN 4307003001
TERRY HIGGINS TRUST & TRUSTEE 4307003002
MICAH & KRISTEN NORTH 4307003012
TANNER & HEIDEMARIE POLLARD 4307003010
RUSSELL L. FREDERICK 4307003013
RHONDA L EVANOSKA 4307200010
CAROLYN S. SCHUTTS 4307003007
DIOCESE OF COLORADO SPRINGS 4300000117
ELVA & BOYD MOON 4307004001

120 0 120 240
SCALE: 1"=120'

LEGEND
- EX. MINOR CONTOUR
- 6800 EX. MAJOR CONTOUR
- EX. FENCE LINE
- ST EX. STORM DRAIN
- BASIN BOUNDARY
- FLOW DIRECTION
- DESIGN POINT
- E5 BASIN
- AREA (ACRE) 5.91 0.12 0.38 C5 C100

PREPARED BY:

DREXEL, BARRELL & CO.
Engineers • Surveyors
3 SOUTH 7TH STREET
COLORADO SPGS, COLORADO 80905
CONTACT: TIM D. McCONNELL, P.E.
(719)260-0887
BOULDER • COLORADO SPRINGS • GREELEY

CLIENT:

FALCON FIELD, LLC.
3230 ELECTRA DR N.
COLORADO SPRINGS, CO 80906
(719) 475-7474
CONTACT: PJ ANDERSON

DRAINAGE PLANS FOR
THE COMMONS AT FALCON FIELD
12445 RIO LANE, AND VACANT LAND
PEYTON, EL PASO COUNTY, COLORADO

ISSUE	DATE
INITIAL ISSUE	3/16/23

DESIGNED BY:	TDM
DRAWN BY:	CGH
CHECKED BY:	KGV
FILE NAME:	21604-00EDR

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF DREXEL, BARRELL & CO.

DRAWING SCALE:
HORIZONTAL: 1" = 120'
VERTICAL: N/A

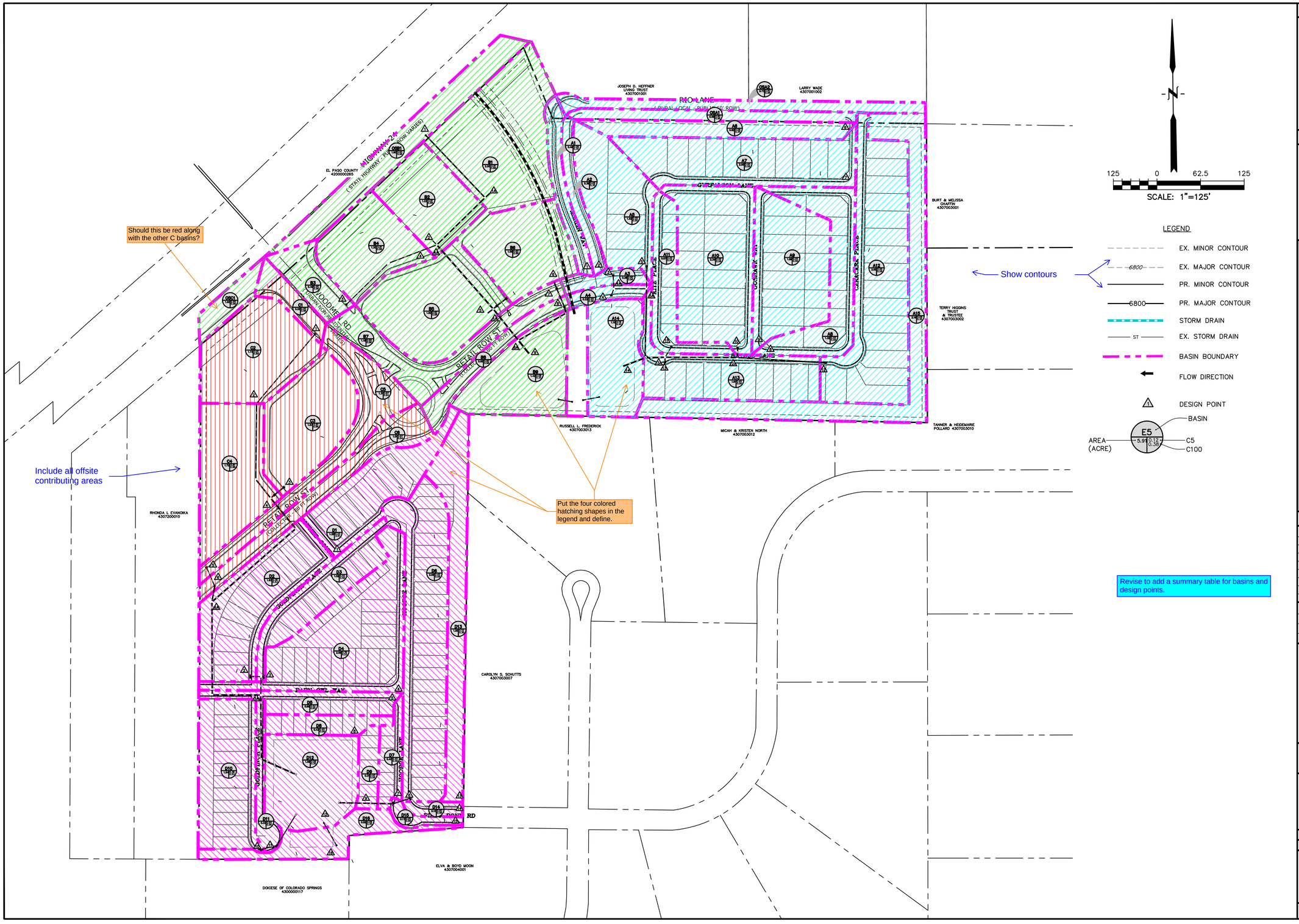
OVERALL EXISTING DRAINAGE MAP

PROJECT NO. 21604-00CSCV

DRAWING NO.

EDR1

SHEET: 1 OF 6



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DRAINAGE PLANS FOR
THE COMMONS AT FALCON FIELD
12445 RIO LANE, AND VACANT LAND
PEYTON, EL PASO COUNTY, COLORADO

ISSUE	DATE
INITIAL ISSUE	3/16/23

DESIGNED BY:	TDM
DRAWN BY:	CGH
CHECKED BY:	KGV
FILE NAME:	21604-00DR

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF DREXEL, BARRELL & CO.

DRAWING SCALE:
HORIZONTAL: 1" = 125'
VERTICAL: N/A

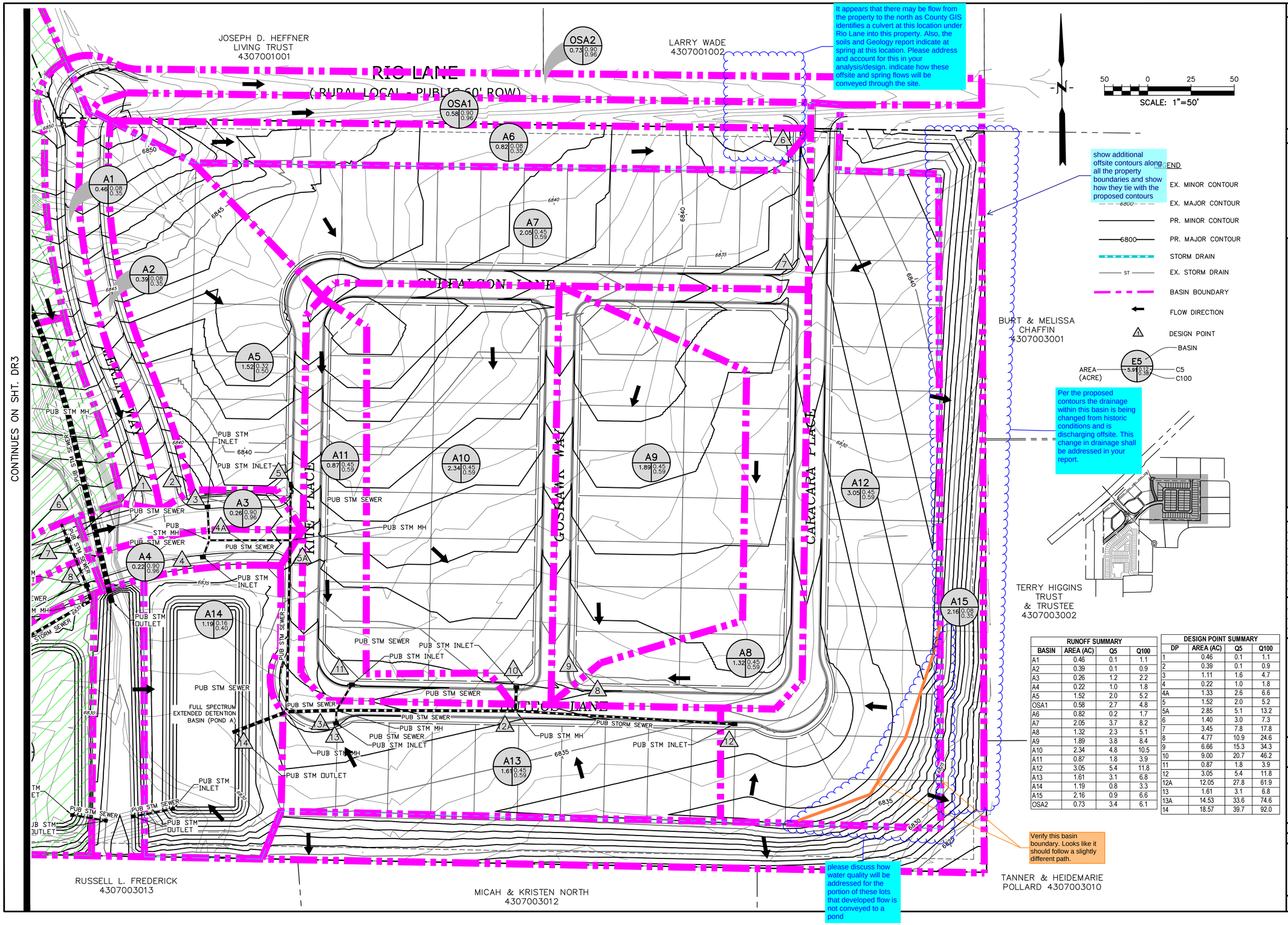
OVERALL PROPOSED DRAINAGE MAP

PROJECT NO. 21604-00CSCV

DRAWING NO.

DR1

SHEET: 2 OF 6



RUNOFF SUMMARY			
BASIN	AREA (AC)	Q5	Q100
A1	0.46	0.1	1.1
A2	0.39	0.1	0.9
A3	0.26	1.2	2.2
A4	0.22	1.0	1.8
A5	1.52	2.0	5.2
OSA1	0.58	2.7	4.8
A6	0.82	0.2	1.7
A7	2.05	3.7	8.2
A8	1.32	2.3	5.1
A9	1.89	3.8	8.4
A10	2.34	4.8	10.5
A11	0.87	1.8	3.9
A12	3.05	5.4	11.8
A13	1.61	3.1	6.8
A14	1.19	0.8	3.3
A15	2.16	0.9	6.6
OSA2	0.73	3.4	6.1

DESIGN POINT SUMMARY			
DP	AREA (AC)	Q5	Q100
1	0.46	0.1	1.1
2	0.39	0.1	0.9
3	1.11	1.6	4.7
4	0.22	1.0	1.8
4A	1.33	2.6	6.6
5	1.52	2.0	5.2
5A	2.85	5.1	13.2
6	1.40	3.0	7.3
7	3.45	7.8	17.8
8	4.77	10.9	24.6
9	6.66	15.3	34.3
10	9.00	20.7	46.2
11	0.87	1.8	3.9
12	3.05	5.4	11.8
12A	12.05	27.8	61.9
13	1.61	3.1	6.8
13A	14.53	33.6	74.6
14	18.57	39.7	92.0

PREPARED BY:

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Engineers • Surveyors
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COLORADO SPGS, COLORADO 80905
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DRAINAGE PLANS FOR
THE COMMONS AT FALCON FIELD
12445 RIO LANE, AND VACANT LAND
PEYTON, EL PASO COUNTY, COLORADO

ISSUE	DATE
INITIAL ISSUE	3/16/23

DESIGNED BY:	TDM
DRAWN BY:	CGH
CHECKED BY:	KGV
FILE NAME:	21604-00DR

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF DREXEL, BARRELL & CO.

DRAWING SCALE:
HORIZONTAL: 1" = 50'
VERTICAL: N/A

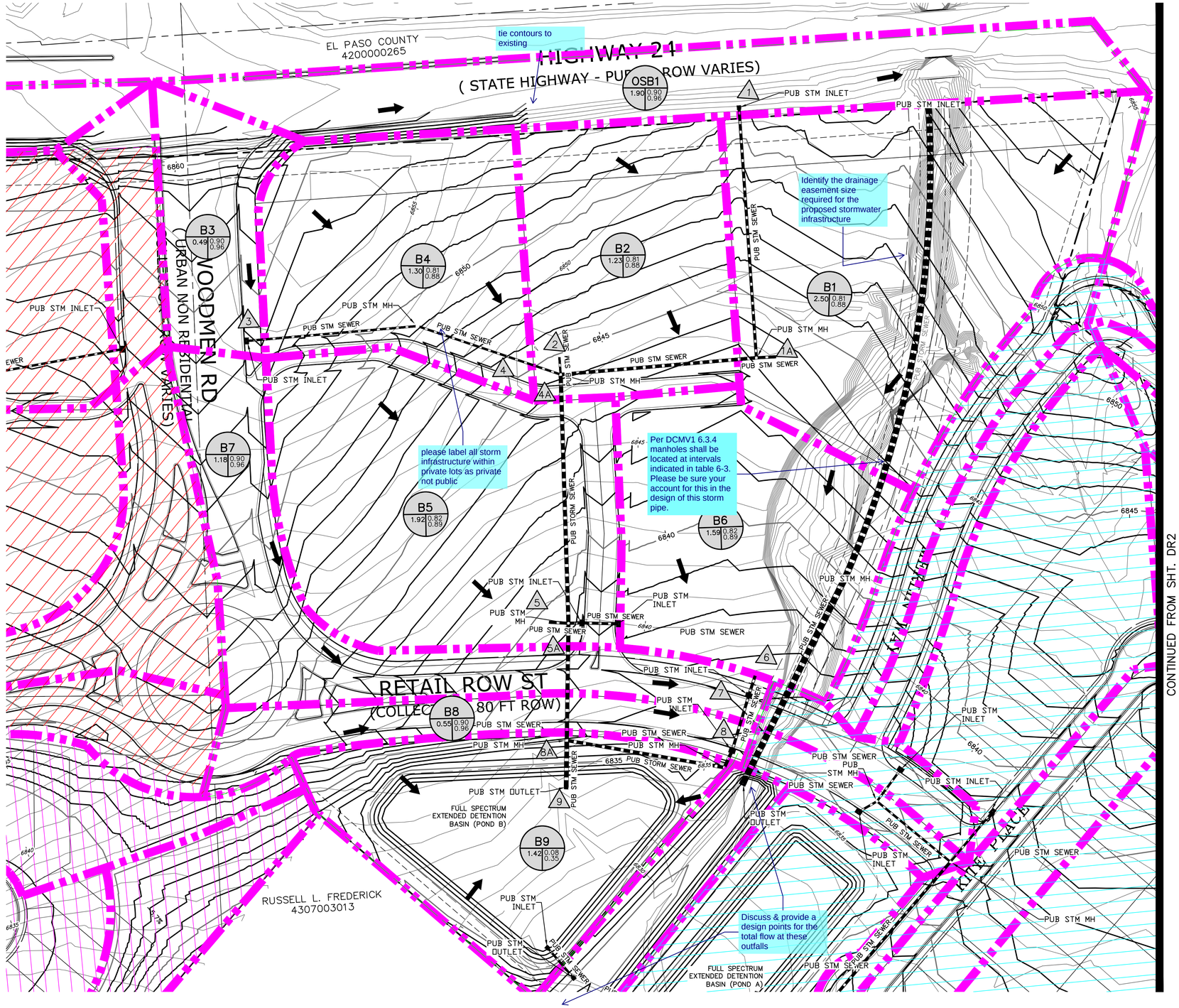
PROPOSED DRAINAGE MAP

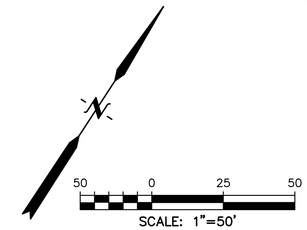
PROJECT NO. 21604-00CSCV

DRAWING NO.

DR2

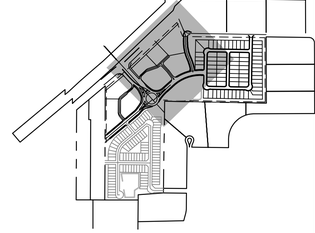
SHEET: 3 OF 6





LEGEND

- EX. MINOR CONTOUR
- 6800 EX. MAJOR CONTOUR
- PR. MINOR CONTOUR
- 6800 PR. MAJOR CONTOUR
- STORM DRAIN
- ST EX. STORM DRAIN
- BASIN BOUNDARY
- FLOW DIRECTION
- DESIGN POINT
- BASIN
- AREA (ACRE) — E5 — 5.91 0.12 0.35 — C5 C100



RUNOFF SUMMARY			
BASIN	AREA (AC)	Q5	Q100
OSB1	1.90	8.8	15.8
B1	2.50	10.5	19.1
B2	1.23	5.2	9.4
B3	0.49	2.3	4.1
B4	1.30	5.5	10.0
B5	1.59	6.7	12.2
B6	1.92	8.1	14.8
B7	1.18	5.3	9.5
B8	0.55	2.6	4.6
B9	1.42	0.6	4.3

DESIGN POINT SUMMARY			
DP	AREA (AC)	Q5	Q100
1	1.90	8.8	15.8
1A	4.40	19.3	34.9
2	1.23	5.2	9.4
3	0.49	2.3	4.1
4	1.30	5.5	10.0
4A	7.42	32.2	58.4
5	1.59	6.7	12.2
6	1.92	8.1	14.8
6A	10.93	47.0	85.4
7	1.18	5.3	9.5
8	1.73	8.0	14.4
8A	12.66	55.1	99.8
9	14.08	55.7	104.1

PREPARED BY:

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CLIENT:

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DRAINAGE PLANS FOR
THE COMMONS AT FALCON FIELD
12445 RIO LANE, AND VACANT LAND
PEYTON, EL PASO COUNTY, COLORADO

ISSUE	DATE
INITIAL ISSUE	3/16/23

DESIGNED BY:	TDM
DRAWN BY:	CGH
CHECKED BY:	KGV
FILE NAME:	21604-00DR

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF DREXEL, BARRELL & CO.

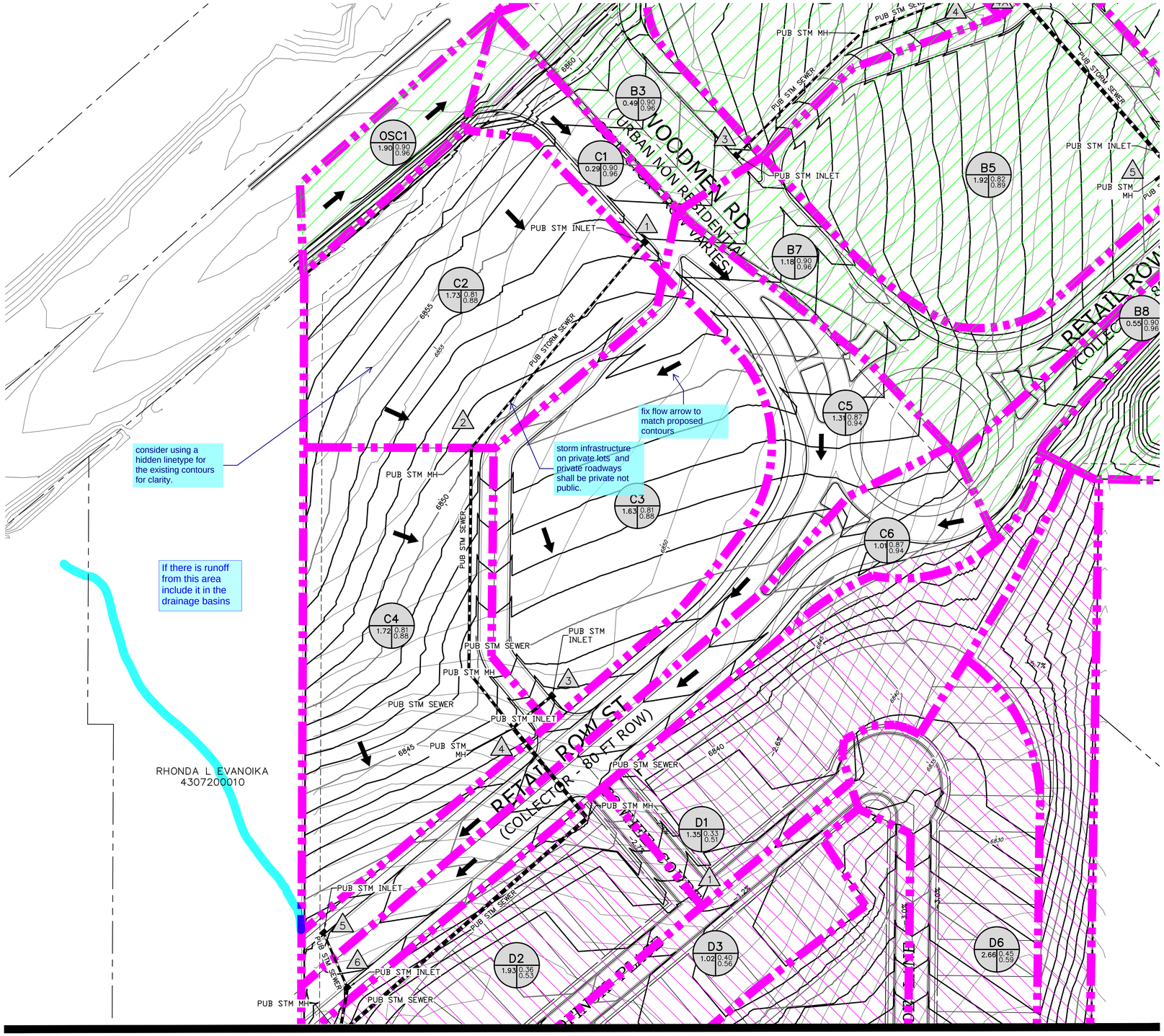
DRAWING SCALE:
HORIZONTAL: 1" = 50'
VERTICAL: N/A

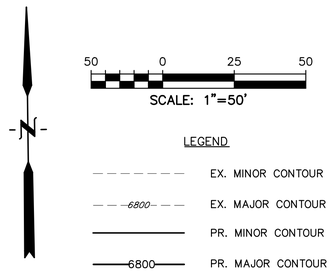
PROPOSED DRAINAGE MAP

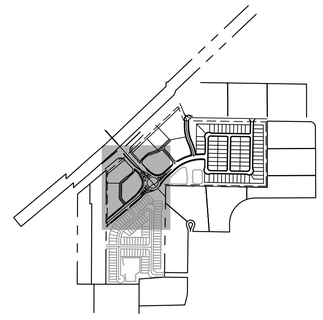
PROJECT NO. 21604-00CSCV

DRAWING NO.

DR3







RUNOFF SUMMARY			
BASIN	AREA (AC)	Q5	Q100
C1	0.29	1.3	2.4
C2	1.73	7.3	13.2
C3	1.63	6.5	11.9
C4	1.72	7.2	13.2
C5	1.31	5.4	9.8
C6	1.01	4.5	8.2

DESIGN POINT SUMMARY			
DP	AREA (AC)	Q5	Q100
1	0.29	1.3	2.4
2	2.02	8.6	15.7
3	1.63	6.5	11.9
4	5.37	22.7	41.3
5	1.31	5.4	9.8
6	2.32	10.5	18.9
6A	7.69	33.2	60.2

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DRAWING SCALE:
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VERTICAL: N/A

PROPOSED DRAINAGE MAP

PROJECT NO. 21604-00CSCV

DRAWING NO.

DR4

SHEET: 5 OF 6

LEGEND

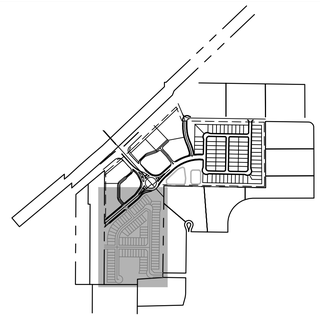
EX. MINOR CONTOUR
6800 EX. MAJOR CONTOUR
PR. MINOR CONTOUR
6800 PR. MAJOR CONTOUR
STORM DRAIN
ST EX. STORM DRAIN
BASIN BOUNDARY
FLOW DIRECTION

DESIGN POINT
BASIN
AREA (ACRE) — E5 5.9 0.12 0.38 — C5 C100

match existing contours to legend

Please clarify how flow from this basin will be conveyed to the inlet as indicated in the study, per the contours shown it appears that a large portion will continue south and will not be captured by the inlet at DP 10

50 0 25 50
SCALE: 1"=50'



BASIN & DESIGN POINT SUMMARY				
BASIN	DP	AREA (AC)	Q5	Q100
D-BASINS				
D1	1	1.35	1.9	0.0
D2		1.93	3.0	4.8
	2	3.28	4.6	7.4
D3	3	1.02	1.6	11.6
	3A	12.07	33.5	3.7
D4	4	2.59	4.2	64.7
D5	5	0.69	1.6	10.1
D6	6	2.66	5.3	3.4
D7		0.40	0.9	11.8
	7	6.33	11.3	1.9
D8	8	0.43	0.8	25.6
D9	9	0.31	0.6	1.7
D10	10	1.64	2.6	1.4
D11		0.33	1.5	6.5
	11	1.97	3.9	2.7
D12		1.58	0.6	8.8
	12	22.69	52.2	4.4
D13	13	1.50	0.6	108.9
D14	14	0.15	0.7	3.4
D15	15	0.17	0.8	1.3
D16	16	0.82	0.3	1.4

RHONDA L EVANOIKA
4307200010

DOICESE OF COLORADO SPRINGS
4300000117

ELVA & BOYD MOON
4307004001

CAROLYN S. SCHUTTS
4307003007

RUSSELL L. FREDERICK
4307003013

please additional contour labels throughout the drainage plan

tie proposed contours to the existing

tie proposed contours into existing

show all necessary downstream conveyances to an adequate suitable outfall

Per the proposed contours the drainage within this basin is being changed from historic conditions and is discharging offsite. This change in drainage shall be addressed in your report.

show both existing and proposed contours

Proposed contours appear to be missing for a large portion of the D basin group. please provide

Adjust text for legibility

Address water quality for this area that isnt being conveyed to the pond

CONTINUED FROM SHT. DR4

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VERTICAL: N/A

PROPOSED DRAINAGE MAP

PROJECT NO. 21604-00CSCV
DRAWING NO.
DR5