

**Preliminary Drainage Report
for
Mayberry Phase 2
A Portion of Mayberry Filing No. 1A
El Paso County, Colorado**

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PROJECT 8787-0001
PCD File No. PUDSP251

Date: September 18th, 2026



PRELIMINARY DRAINAGE REPORT
Mayberry Phase 2

Mayberry Phase 2 Preliminary Drainage Report

Project No.: 8787-0001
Document Title: Preliminary Drainage Report
Document No.: 1
Revision: 1
Date: September 18, 2026
Client name: John Mick - Mayberry Communities, LLC
Client No: 8787
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File name: Mayberry Phase 2 Preliminary Drainage Report

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Document history and status

Revision	Date	Description	By	Review	Approved
1	06/15/2026	2 nd Submittal	RNM	XWL	AKM
2	08/21/2026	3 rd Submittal	RNM	XWL	AKM
3	09/18/2026	4 th Submittal	JAV	XWL	AKM

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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 the County for drainage reports and said report is in conformity with the master of the drainage basin. I accept responsibility for liability caused by negligent acts, errors or omissions on my part in preparing this report.



Alaina Kneebone Marler, P.E.
Registered Professional Engineer
State of Colorado No. 35781

08/21/2026

Date

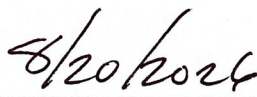
Developer's Statement:

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

By:



John Mick
Mayberry Communities, LLC



Date

El Paso County's Statement:

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

Joshua J. Palmer, P.E.
County Engineer/ECM Administrator

Date

Conditions:

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1. General Location & Description

1.1 Location

The proposed Mayberry Phase 2 project (hereafter, the Site) is located within a portion of Mayberry Filing No. 1A (PCD File No. VR2113) located in the Northwest Quarter of Section 14 and Northeast Quarter of Section 15, Township 14 South, Range 63 West of the 6th Principal Meridian, County of El Paso, State of Colorado (see Vicinity Map in Appendix A). The Site is located at the intersection of Mayberry Drive (formerly "New Log Road") and State Highway 94 and is approximately 18.70 acres in size.

The Site is bounded to the north by State Highway 94 and to the east by Mayberry Filing No. 1 (EPC Project No. SF-18-025) (residential).

1.2 Description of Property

The total area of the property is 18.70 acres, with a majority of the site being disturbed as a part of this development. A portion of the site, known as Tract K, includes the construction of 98 lots (paired homes and single-family homes), a clubhouse, parking lots, drive aisles and associated utilities. The rest of the site consists of a park, pickleball courts, a soccer field, public roadways, and associated utilities.

The existing terrain of the Site has already been overlot graded and it generally slopes from the northwest to southeast at grades ranging from 1%-3%, except a small hill with 25% slopes. The existing Site ground coverage consists of native grasses, brush, and vegetation where the site has not already been cleared due to the overlot grading being done as part of the overall development. For the overlot graded area, a temporary sediment basin was installed on the southwest corner of the Village Main Street and Marketplace Drive intersection. The existing sediment basin grading can be seen in the existing topography within the proposed soccer field.

The Soil Survey of El Paso County Area, Colorado, prepared by the U.S. Department of Agriculture Soil Conservation Service, shows the site is underlain by Blakeland loamy sand, 1 to 9 percent slopes, and Truckton-Bresser complex, eroded – both included in Hydrologic Soil Group A. The NRCS Soils Survey Report for this site is included in Appendix A.

There are no major drainageways within the Site. No portion of the site is located within a 100-year floodplain as determined by the Flood Insurance Rate Map (FIRM) number 08041C0810G, Panel 810 of 1300, effective date, December 2018 (see appendix).

There are no existing irrigation facilities or canals on the Site.

The current zoning is PUD.

2. Drainage Basins & Sub-Basins

2.1 Major Basin Description

There are two major basins located on site – Basin A and Basin C. The major basins for the Site are split according to the Mayberry Communities Master Development Drainage Plan (MDDP), prepared by R&R Engineers-Surveyors, Inc., and approved March 26, 2025.

Basin A consists of nine (9) basins and has a total area of 6.80 acres. Runoff from Basin A will drain to Pond A in the ultimate condition but will be routed to Interim Pond A1 in the interim condition located at Design Point 1A. Interim Pond A1 will provide treatment and detention for the built out condition for Phase 2 until Pond A is built. Pond A will be constructed when development occurs adjacent to where Pond A is shown on the MDDP at Design Point 1. The MDDP was submitted with the Mayberry Sketch Plan (EPC Project No. SKP236). Providing a interim pond that is closer to the site will reduce offsite disturbance until later phases are developed.

Basin C consists of nineteen (19) basins and has a total of 12.12 acres. Some of this area includes portions that were built with Mayberry Filing No. 1, such as a portion of Village Main Street and Mayberry Drive. Runoff from Basin C will drain to Pond C1 (referred to as Pond C in MDDP located at Design Point 3).

Existing available drainage studies that impact the site are:

- "Final Drainage Report for Mayberry, Colorado Springs – Filing No. 1A Replat" (PCD File No. VR2113) prepared by JPS Engineering, dated November 19, 2021, revised April 8, 2022, and El Paso County approved June 27, 2022.
- "Preliminary Drainage Report Amendment for Mayberry, Colorado Springs – Phase 1 PUD" prepared by JPS Engineering, dated May 5, 2021, revised February 15, 2022
- "Mayberry Communities Master Development Drainage Plan for Mayberry, Colorado Springs" prepared by R&R Engineers-Surveyors, dated March 2025, approved by El Paso County on March 26, 2025.
- "Preliminary & Final Drainage Report for Mayberry, Colorado Springs – Filing No. 1" (EPC Project No. SF-18-025) prepared by JPS Engineering, dated January 15, 2007, most recently revised October 27, 2020.
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), El Paso County, Colorado and Incorporated Areas, Panel 810 of 1300, Map No. 08041C0810G (December 2018).

2.2 Sub-basin Description

A majority of the Site was analyzed in the Mayberry Filing No. 1A Developed Drainage Plan (PCD File No. VR2113) and is encompassed by drainage Basins C1.1, C1.2, C1.7B (see Drainage maps from Mayberry Filing No. 1A Drainage report in Appendix C). These existing basins in addition to the remaining area of the Site make up the two proposed basins, Basin C and Basin A.

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In the existing condition, Basins C1.1, C1.2, and C1.7B from Filing No. 1 (EPC Project No. SF-18-025) are conveyed to Pond C1. In the proposed condition, Basins C1.1, C1.2, and the additional area of the proposed Basin C, will be conveyed to Pond C1, while a majority of Basin C1.7B and the additional area of proposed Basin A will be conveyed to Pond A, as identified by the Master Development Drainage Plan submitted with the Mayberry Sketch Plan (EPC Project No. SKP236).

A Basins

As previously mentioned, there are nine (9) A basins, Basin A2 – A10 that include roadways, pickleball courts, a soccer field, and an exterior portion of an amphitheater. The roadway basins overland flow to the curb and gutter before being captured by Type R street inlets. The pickleball courts overland flow southerly and soccer field overland flow easterly to low points on one side of the field/courts where it's captured by trench drains. Once runoff is captured, flow is routed through storm sewer to Interim Pond A1. In the ultimate build out condition, runoff from Basin A will be routed to Pond A. The ultimate Pond A will be constructed when development occurs adjacent to where Pond A is shown on the MDDP at Design Point 1. An interim pond located closer to the site will improve access and limit offsite disturbance during initial phases, while preserving flexibility for future design changes around Pond A.

C Basins

There are nineteen (18) C basins, Basin C1.2 – C19 that include roadways, parks, residential paired homes, alleys, and a portion of an amphitheater. Runoff for these basins will overland flow to nearby streets where they are conveyed by curb and gutter to Type R or Type 13 inlets located in streets and alleys. Once runoff is captured, it will be routed to the existing Mayberry Filing 1A storm system where it is routed to Pond C1.

Basin S1 is an on-site basin that is located on the north side of Tract K. It flows north offsite into Basin OS1. From here it is routed east through a swale before being routed south through Filing No. 1 in a storm pipe. This flow will bypass all detention facilities and outfall into existing Channel C1 where it will follow historic drainage patterns. Water quality for this basin will be provided in the over 1600 linear feet of grass swale that it travels in before entering a storm pipe system.

Runoff will be discharged from Pond C1 and Interim Pond A1 to the southeast, ultimately tributary to the West Fork of Black Squirrel Creek. This is consistent with historic drainage patterns. Detention pond release rates will be restricted to at least 90% of the historic discharge rate.

Offsite Basins

There are two (2) offsite basins, OS1-OS2, located on the western and northern side of the site.

OS1 is located to the north of Tract K and runoff from this basin will be conveyed east by a proposed swale which ties into an existing Filing No. 1 swale. From here, the flow is captured by a 30-in FES and conveyed by storm sewer south down Atchison Way and outfall into a channel adjacent to Pond C1. This offsite runoff bypasses Mayberry detention ponds.

OS2 runs along the western site boundary. Runoff from this basin overland flows east toward the site before being intercepted by a proposed swale that will divert runoff south around the site. The swale will outfall near the southwest corner of the site. Outfall protection will be analyzed in final design. This offsite runoff bypasses Mayberry detention ponds.

3. Drainage Design Criteria

3.1 Development Criteria Reference

The Site's drainage analysis is performed in accordance with the current El Paso County Drainage Criteria Manual (DCM) and Mile High Flood District (MHFD) "Urban Storm Drainage Criteria Manual" (USDCM).

The drainage design for the Site is influenced by the following previous studies:

- "Final Drainage Report for Mayberry, Colorado Springs – Filing No. 1A Replat" (PCD File No. VR2113) prepared by JPS Engineering, dated November 19, 2021, revised April 8, 2022.
- "Mayberry Communities Master Development Drainage Plan for Mayberry, Colorado Springs" (EPC Project No. SKP236) dated July 2023, revised December 2024.

3.2 Four-Step Process

3.2.1 Runoff Reduction

The Mayberry Phase 2 development is proposing a grass soccer field and a large park space with grass open space and gravel walking paths. Runoff reduction will be provided for Basin S1 through grass buffer and grass swales. Runoff reduction calculations will be provided in final design. Beyond these green spaces, there are limited opportunities to provide runoff reduction to impervious areas. The MDDP has several channels planned which would provide runoff reduction for the overall Mayberry Communities development.

3.2.2 Stabilization of Drainageways

The Mayberry Phase 2 does not propose any channels or drainageway. The MDDP includes several channels and stabilization for those channels will be provided during site design for those phases. There are two swales proposed with the Phase 2 development – one temporary and one permanent. Stabilization for both of these swales will be considered in final design. Types of stabilization may include erosion control blankets, riprap, and vegetation.

3.2.3 Proposed WQCV

The entire site area will drain to on site full spectrum detention ponds – Pond C1 and Interim Pond A1. Both ponds provided WQCV that MHFD requires which will treat site runoff before being released offsite. Runoff reduction will be provided for Basin S1 through grass buffer and grass swales.

3.2.4 BMP for Commercial and Industrial Pollutants

This site does not include any commercial and industrial areas therefore, this section does not apply.

3.3 Hydrologic Criteria

Calculations were performed to determine the existing and proposed runoff quantities for the 5-yr (minor storm) and 100-yr (major storm) 1-hour storm events for developed conditions using the Rational Method as required by El Paso County for basins containing less than 100 acres. Percent imperviousness and runoff coefficients for different land uses were calculated using Eq 5-2 of the DCM. Times of concentration (tc) were calculated as described in Section 5.2.3 of the DCM. Rainfall intensity (i) was calculated using the IDF equations in Figure 5-1. Figures and equations used are included in Appendix B. Flows will ultimately be routed to the existing Detention Pond C1 and proposed Interim Detention Pond A1. Both full spectrum detention ponds were designed using MHFD Detention spreadsheet. (Pond C1 version 4.06, Interim Pond A1 version 4.08). Ponds will be restricted to discharge a maximum of 90% of the historic flow rates.

4. Drainage Facility Design

4.1 General Concept

Consistent with generally accepted practices in eastern El Paso County, the general concept for stormwater management from development of Mayberry Phase 2 proposes to construct a storm sewer system which will outfall into existing detention pond, Pond C1 and proposed detention pond, Interim Pond A1.

The existing drainage ditch south of Highway 94 will be enhanced if necessary to keep CDOT R.O.W. offsite drainage from flowing into Tract K. This will be analyzed during final design in CDs.

4.2 Specific Details

4.2.1 Existing Drainage Conditions

Mayberry Drive (formerly named "New Log Road"), a portion of Village Main Street, and Marketplace Drive currently exist as part of Mayberry Filing No. 1A. The rest of the Site is undeveloped.

A majority of the site is located within basins designated as C1.1, C1.2, and C1.7B in the Filing No. 1A approved Drainage Report. See existing drainage map prepared by JPS. The Mayberry Phase 2 basins have been overlayed onto this existing drainage plan as well.

Basin C1.1 is a total of 9.38 acres and is ultimately captured by the existing inlet at design point C1.1 along Cattlemen Run and is conveyed to Pond C1. Tract K (of the proposed Basin C) contains 1.98 acres of basin C1.1. The 1.98 acres of Tract K will now be captured by proposed inlets and routed through DP C1.2C before outfalling into Pond C1. Runoff from this area was designed to be routed through DP C1.1 in Filing No. 1. Storm pipe capacities will be confirmed during final design.

Basin C1.2 is a total of 7.97 acres and encompasses the remaining area of Tract K, the existing Mayberry Drive, and portion of Village Main Street. In the existing condition, runoff goes to DP C1.2C and is conveyed to Pond C1. In the proposed condition, the storm sewer system will be extended from DP C1.2C into the residential neighborhood proposed in Tract K. The existing Basin C1.2 will still be conveyed to Pond C1 in the proposed condition.

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Basin C1.7B is a total of 4.34 acres and encompasses the proposed soccer field within proposed Basin A and C. Basin C1.7B is ultimately captured by the existing inlet at design point C1.7B and conveyed to Pond C1 in the existing condition. In the proposed condition, a portion of Basin C1.7B will be conveyed to Interim Pond A1 while the other portion will be conveyed to Pond C1.

The majority of the project site falls within basins C1.2 and C1.7B, which had a combined allowance to Pond C1 of 25.10 cfs for the 5-year storm and 53.20 cfs for the 100-year storm as determined by JPS. See Appendix B for the approved Drainage Report supporting calculations.

4.2.2 Proposed On-Site Basins

Refer to the Proposed Drainage Map located in Appendix C for drainage basin locations and boundaries.

Basin A (6.80 ac) consists of Positive Place, Mayberry Drive, and Griffith Square. Land use type is a mix of streets, recreational fields and courts, landscape, hardscape, and roof coverage. Surface runoff (sheet flow) will be captured by proposed curb and gutter, various storm inlets, and trench drains and will be conveyed to a proposed flared end section at design point 1A that outfalls to Interim Pond A1. Should any inlets or trench drains become clogged or otherwise nonfunctional, stormwater will overtop into existing Basins C1.7B and C1.10. from Filing No. 1. Basin A has been split into nine (9) smaller basins for each design point. See Table 1 below for basin summary and flowrates.

In the ultimate build out condition, runoff from Basin A will be routed to Pond A. The ultimate Pond A will be constructed when development occurs adjacent to where Pond A is shown on the MDDP at Design Point 1. An interim pond located closer to the site will improve access and limit offsite disturbance during initial phases, while preserving flexibility for future design changes around Pond A.

Basin C (12.12 ac) consists of Village Main Street, South and North Mayberry Drive, the Entry Park, and Tract K. Land use type is a mix of streets, dense single-family homes, parks, landscape and hardscape. Surface runoff (sheet flow) will be captured by proposed curb and gutter and various storm inlets and will be conveyed to existing Type R inlets. Should any inlets become clogged or otherwise nonfunctional, stormwater will overtop into existing Basin C1.3. from Filing No. 1. Basin C has been split into nineteen (19) smaller basins for each design point. See Table 1 below for basin summary and flowrates.

Basin S1 (0.33 acres) consist of single-family homes and landscaping. This basin is located on the northern side of the property and cannot be captured and routed south to the rest of the storm system. Runoff from this basin will sheet flow north to a swale located within Basin OS1 where it will be conveyed east to a Filing 1 swale. This runoff will bypass all Mayberry detention ponds. Water quality for this basin will be provided through grass buffers and swales. Runoff reduction calculations will be provided in final design.

Storm infrastructure that drains Mayberry Phase 2 Basin C, was built with Mayberry Filing 1A. Table 2 below compares the initial flowrates that were assumed for Basin C in Filing 1A to what is proposed in Phase 2 for Basin C. The flowrates proposed in Phase 2 are lower than what was assumed in Filing 1A which suggests that the existing storm infrastructure was sized adequately for the Phase 2 development. Storm infrastructure design will be analyzed in final design to confirm.

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Table 1. Runoff Summary

Summary Runoff Table					
Design Point	Tributary Basins	Tributary Area	Composite Imperv. %	Runoff (CFS)	
				5-Year	100-Year
2A	A2	0.57	85%	2.13	4.01
3A	A3	0.54	85%	2.00	3.77
4A	A4	2.07	9%	0.92	4.48
5A	A5	0.27	80%	1.03	1.99
6A	A6	0.27	80%	1.01	1.94
7A	A7	0.87	82%	3.38	6.44
8A	A8	0.40	90%	1.70	3.14
9A	A9	0.29	59%	0.85	1.81
10A	A10	1.98	64%	3.55	7.36
1A	Basin A	7.27	56%	12.05	26.27
C1.2C	C1.2	1.43	77%	3.78	7.52
C1.7B	C1.7B	1.79	68%	4.91	9.94
SC-13	C2	0.33	72%	0.83	1.70
SC-28	C3	0.44	69%	1.11	2.30
SC-32	C4	0.32	73%	0.97	1.92
SC-31	C5	0.59	70%	1.54	3.19
SC-33	C6	0.27	75%	0.80	1.60
SC-34	C7	0.42	71%	1.02	2.09
SC-14	C8	0.93	69%	1.98	4.15
SC-17	C9	0.68	59%	1.41	3.11
SC-24	C10	0.18	74%	0.60	1.19
SC-26	C11	0.45	61%	0.84	1.86
SC-27	C12	0.24	64%	0.65	1.35
SC-22	C13	0.43	62%	0.83	1.82
14C	C14	0.74	63%	1.50	3.27
SC-2B	C15	2.01	68%	4.52	9.26
17C	C17	0.05	97%	0.23	0.42
SC-4	C19	0.33	54%	0.68	1.50
C1.2C	Basin C	11.64	68%	18.89	39.04
1S	S1	0.33	19%	0.26	1.00
1OS	OS1	0.60	7%	0.25	1.38
2OS	OS2	12.71	7%	2.06	11.21

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Table 2. Filing 1A & Phase 2 Flowrate Comparison for Basin C

Filing 1A & Phase 2 Flowrate Comparison for Basin C				
Filing/Phase	Basins	Area	Q5	Q100
Filing 1A	C1.2 & C1.7B	12.31	24.00	51.20
Phase 2	Basin C	11.64	18.89	39.04
The Phase 2 proposed flows for the tributary area to Pond C is less than what was assumed in Mayberry Filing 1A.				

The difference in runoff between Filing 1A and Phase 2 is influenced by a change in tributary area, impervious values or runoff coefficients, and time of concentration. Basin C1.2 and C1.7B are the two basins in Filing 1A that encompass the Phase 2 Basin C area. The Filing 1A time of concentration values for Basin C1.2 and C1.7B were much shorter than what was calculated in Phase 2. In Filing 1A, Basin C1.2 is around 8 acres with an assumed time of concentration of 8.8 minutes and Basin C1.7B is around 4.3 acres with a time of concentration of 12.2 minutes. In Phase 2, Basin C is 11.64 acres with a time of concentration of 23.7 minutes. The impervious values cannot be compared between Filing 1A and Phase 2 since impervious values were not listed in Filing 1A Drainage Report. Runoff coefficients were similar between Filing 1A and Phase 2. Filing 1A Basin C1.2 and C1.7B have a C100 of 0.62 and Phase 2 Basin C has a C100 of 0.70. The differences in area, time of concentration, and runoff coefficients ultimately result in reduced flowrates.

4.2.3 Full Spectrum Detention Pond

Existing Pond C1 was designed as a full spectrum detention pond that provides WQCV, EURV, and 100-year + ½ WQCV detention volume. With the Mayberry Phase 2 development, about 3.27 acres of area is being proposed to go to Interim Pond A1 that was initially intended for existing Pond C1 but the approved Filing 1A Pond C1 impervious value is 51.7% and the Phase 2 proposed value is 58.4%. To check if the impervious increase will cause any adverse effects within the development or downstream, existing Pond C1 has been reanalyzed to see if the existing design volume is adequate. This analysis is provided in Appendix B. The new required Pond C1 volume is 4.81 ac-ft and the volume provided below the spillway is approximately 5.03 ac-ft which suggests that existing Pond C1 has capacity for the additional tributary area. The approved Filing 1A Pond C1 detention sheet does not include the additional ½ WQCV with the 100-year volume. To be conservative and to be consistent with the MDDP, the Phase 2 analysis of Pond C1 includes the additional 1/2 WQCV with the 100-year detention volume. Additional pond analysis will be provided during final design in CDs. See Table 3 below. Pond C1 tributary areas have been marked on the Filing 1A and MDDP excerpt in Appendix C.

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Table 3. Pond C1 Watershed Summary

Pond C1 Watershed Summary				
Filing/Phase	Basin	Area	Imp%	Notes
Phase 2	C1.2	1.43	77%	Modified for Phase 2 development
Phase 2	C1.7B	1.79	68%	Modified for Phase 2 development
Phase 2	C2	0.33	72%	
Phase 2	C3	0.44	69%	
Phase 2	C4	0.32	73%	
Phase 2	C5	0.59	70%	
Phase 2	C6	0.27	75%	
Phase 2	C7	0.42	71%	
Phase 2	C8	0.93	69%	
Phase 2	C9	0.68	59%	
Phase 2	C10	0.18	74%	
Phase 2	C11	0.45	61%	
Phase 2	C12	0.24	64%	
Phase 2	C13	0.43	62%	
Phase 2	C14	0.74	63%	
Phase 2	C15	2.01	68%	
Phase 2	C16	NOT IN USE	0%	
Phase 2	C17	0.05	97%	
Phase 2	C18	NOT IN USE	0%	
Phase 2	C19	0.33	54%	
Filing No. 1	C1.3	3.02	52.5%	
Filing No. 1	C1.4	3.23	52.5%	
Filing No. 1	C1.5	3.18	52.5%	
Filing No. 1	C1.6	3.01	52.5%	
Filing No. 1	C1.7A	0.58	52.5%	
Filing No. 1	C1.8	3.89	52.5%	
Filing No. 1	C1.9	4.39	52.5%	
Filing No. 1	C1.1	6.93	55.4%	Modified based on Phase 2 Basins
Filing No. 1	C1.10	1.20	84.5%	Modified based on Phase 2 Basins
Total for Pond C1:		41.07	58.4%	
Approved Filing 1A Pond C1:		44.81	51.7%	
Revised Req. 100YR Volume (acft)= 4.81				
Ex. Provided Volume (acft)*= 5.03				
*Available volume is measured up to spillway invert. Volume above spillway is reserved for emergency overflow and freeboard.				

Interim Pond A1 is designed as a full spectrum detention pond and will provide WQCV, EURV, and 100-year + ½ WQCV detention volume for the Phase 2 A basins. Interim Pond A1 is only designed for the Phase 2 A basins. See Table 4 below for Interim Pond A1 watershed summary. When future developments within the MDDP Basin A occur, revisions or additional analysis for the interim pond will need to be completed or additional ponds will be required. See the MDDP excerpt in Appendix C and the pond calculations in Appendix B.

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Table 4. Interim Pond A1 Watershed Summary

Temporary Pond A1 Watershed Summary			
Filing/Phase	Basin	Area	Imp%
Phase 2	A2	0.57	85%
Phase 2	A3	0.54	85%
Phase 2	A4	2.07	9%
Phase 2	A5	0.27	80%
Phase 2	A6	0.27	80%
Phase 2	A7	0.87	82%
Phase 2	A8	0.40	90%
Phase 2	A9	0.29	59%
Phase 2	A10	1.98	64%
Total for Pond A1		7.27	56%
Required 100YR Volume (acft)=		0.82	
Provided Volume (acft)=		1.07	

El Paso County drainage criteria refers to the City of Colorado Spring drainage criteria manual and according to Colorado Spring Drainage Criteria Manual Volume 1 (DCM V1), Full Spectrum Detention (FSD) facilities do not need to provide an additional ½ WQCV to the 100-year storage volume because the ½ WQCV is included in the EURV volume provided. This is stated in CO Springs DCM V1 Chapter 13 Section 4.1 (Page 255 of the CO Springs DCM V1). Pond C1, Interim Pond A1 and all ponds approved in the MDDP were designed as FSD facilities and they also include the additional ½ WQCV added to the flood storage volume. This additional ½ WQCV has not been removed from any of the Mayberry ponds at this time, but it is noted that additional storage volume is being provided that does not seem to be required by code.

4.2.4 Maintenance Access

Maintenance access for storm infrastructure and detention ponds will be provided by public and private streets. If there are areas that need additional access, such as access to pond bottoms, gravel maintenance paths will be provided. Additional details for maintenance access will be provided during final design in the CDs.

Storm drainage infrastructure within Mayberry Drive, Village Main Street, Positive Place, and Marketplace Drive are public and shall be owned and maintained by El Paso County. All other storm drainage infrastructure is private. Ownership and maintenance of private storm drainage infrastructure shall be provided by Mayberry Metropolitan District 1.

4.2.5 Downstream conveyance

For the Mayberry Phase 2 development, site runoff will be captured and conveyed to full spectrum detention ponds. The release rate of each detention pond is restricted to 90% of the historic predeveloped release rate. The historic predeveloped release rate is calculated in the MHFD Detention spreadsheet on the outlet structure tab. The release rates for Pond C1 and Interim Pond A1 will be restricted to 90% of the historic rate which will provide that the downstream conveyance will have capacity to convey the post development flowrates. Both ponds will outfall to the south to follow historic drainage patterns. See the historic drainage plan provided in the appendix. Interim Pond A1 outfalls into a proposed swale that routes flow southeast

PRELIMINARY DRAINAGE REPORT

Mayberry Phase 2

to a level spreader. Runoff will spread out once it overtops the level spreader and continue to sheet flow to the southeast open space. Pond C1 outfalls into an existing swale/channel (Channel C1 in Filing 1A Replat) that drains southeast into a plunge pool to provide energy dissipation. See historic drainage exhibit provided in Appendix D. Further analysis will be completed during final design.

5. Conclusion

The proposed Mayberry Phase 2 development includes residential lots, public streets, a park, pickleball courts, a soccer field, an amphitheater, public infrastructure such as water, sanitary, and storm sewer systems. Runoff from the proposed development will drain to two full spectrum detention ponds that will provide WQCV, EURV, and detention for the 5-year to 100-year storm event. Pond release rates are restricted to 90% of the historic flow rates with the intent that the development will not adversely affect downstream or surrounding areas.

All drainage facilities described herein and shown on the included drainage plans are subject to change due to final design considerations. Any revisions will continue to adhere to the Master Development Drainage Plan.

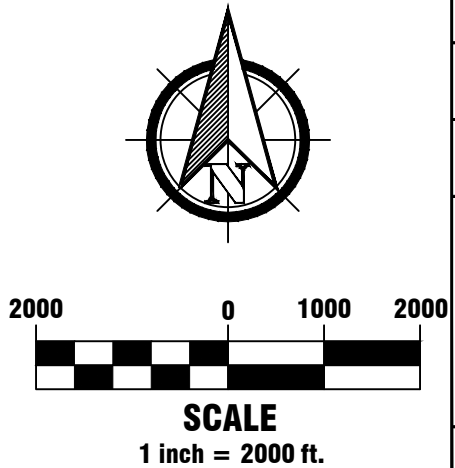
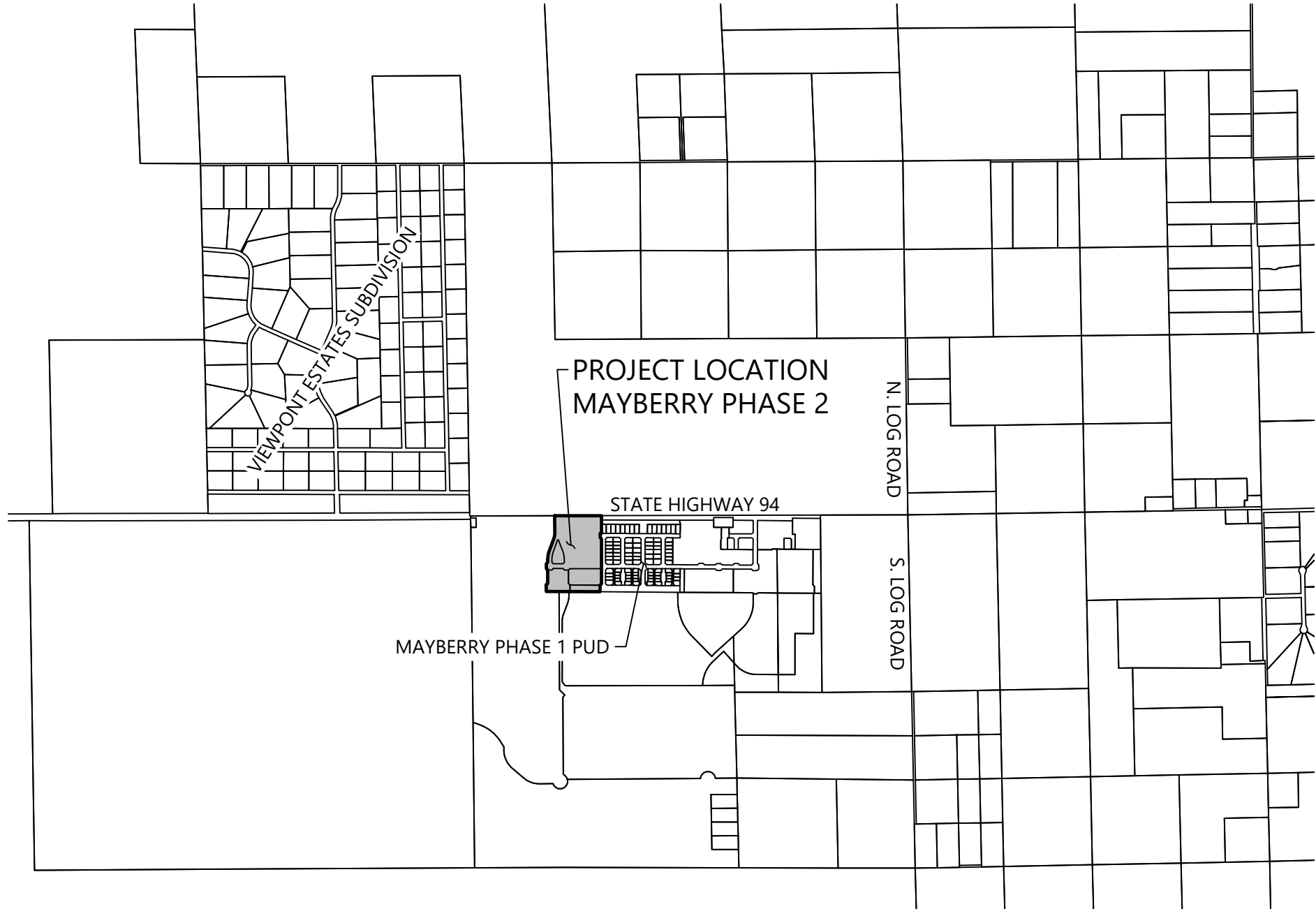
This drainage analysis has been prepared in accordance with the current El Paso County Drainage Criteria Manual and the Urban Storm Drainage Criteria Manual. Supporting information is included in the Appendix.

Appendix A. Vicinity Map, Soils, FEMA



PRELIMINARY DRAINAGE REPORT
Mayberry Phase 2

A1 Vicinity Map



1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

Proj. Name:	Mayberry Phase 2
Location:	El Paso County, Colorado
Plan Set:	--
Sheet Name:	Vicinity Map

Date: 06/12/2026
Job No.: 8787-0001

Scale H: 1" = 2000'
Scale V: N/A

Prepared: RNM
Approved: AKM

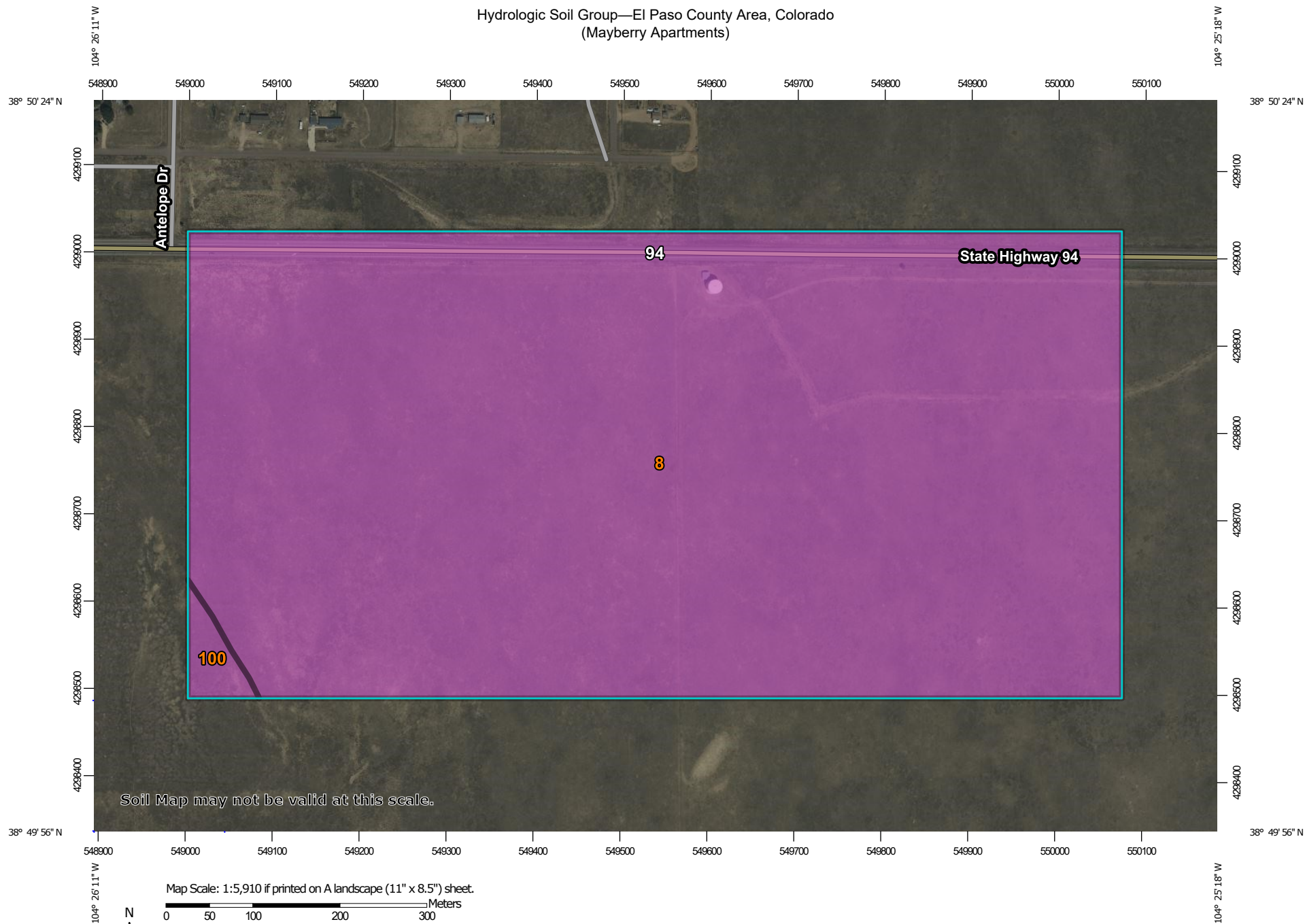


No.	EX1
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PRELIMINARY DRAINAGE REPORT
Mayberry Phase 2

A2 Soils Map

Hydrologic Soil Group—El Paso County Area, Colorado (Mayberry Apartments)



Soil Map may not be valid at this scale.

Map Scale: 1:5,910 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters

0 250 500 1000 1500 Feet

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



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

4/5/2022
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	141.2	99.0%
100	Truckton-Bresser complex, eroded	A	1.4	1.0%
Totals for Area of Interest			142.6	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

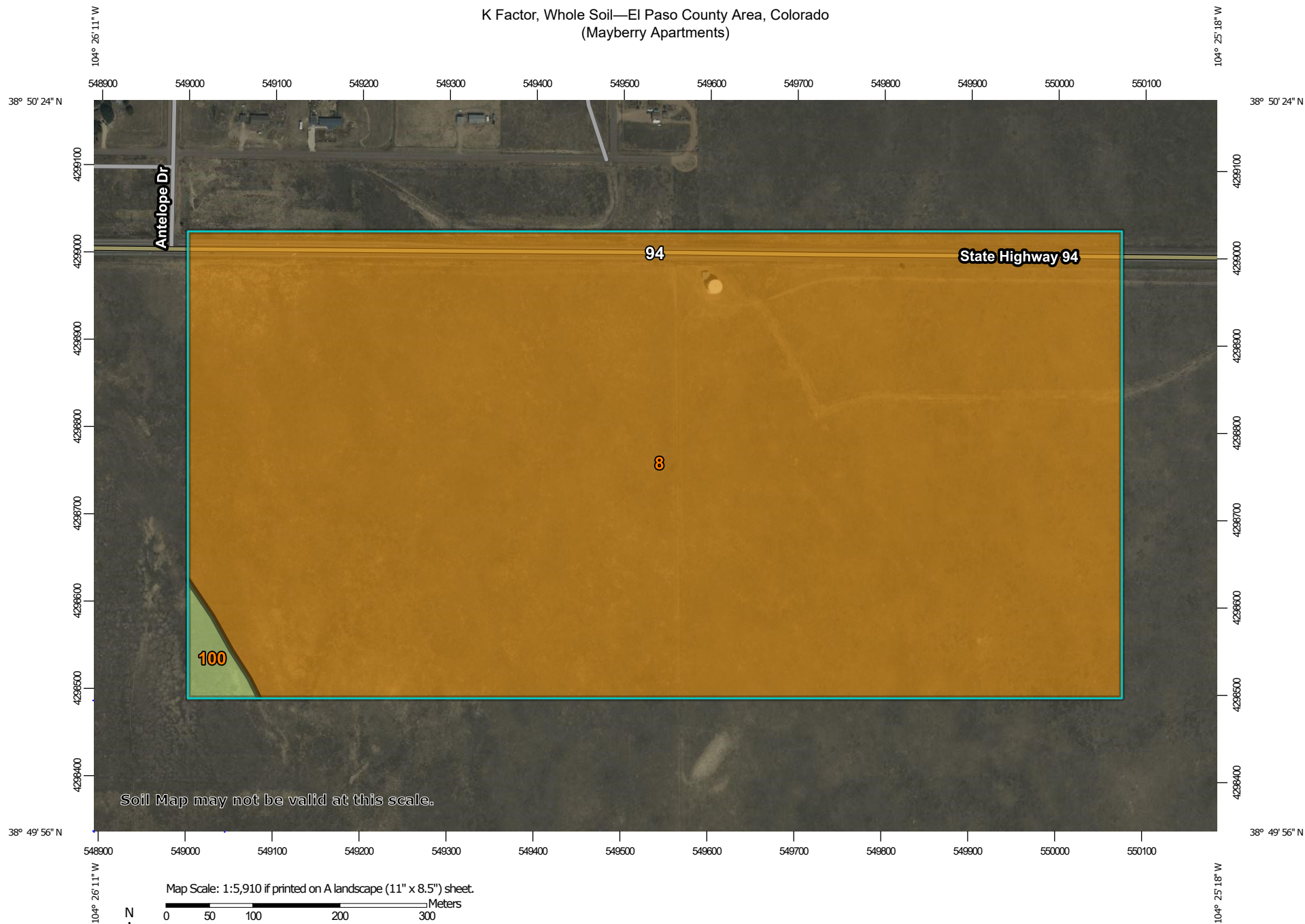
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

K Factor, Whole Soil—El Paso County Area, Colorado
(Mayberry Apartments)



Soil Map may not be valid at this scale.

Map Scale: 1:5,910 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters

0 250 500 1000 1500 Feet

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



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

4/5/2022
Page 1 of 3

K Factor, Whole Soil—El Paso County Area, Colorado
(Mayberry Apartments)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Lines

	.02
	.05
	.10
	.15
	.17
	.20

	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Points

	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Water Features

	Streams and Canals
	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.

K Factor, Whole Soil

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	.10	141.2	99.0%
100	Truckton-Bresser complex, eroded	.24	1.4	1.0%
Totals for Area of Interest			142.6	100.0%

Description

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Factor K does not apply to organic horizons and is not reported for those layers.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

PRELIMINARY DRAINAGE REPORT
Mayberry Phase 2

A3 FEMA

Appendix B. Hydrology Calculations



PRELIMINARY DRAINAGE REPORT
Mayberry Phase 2

B1 CO Springs Runoff Coefficient Table

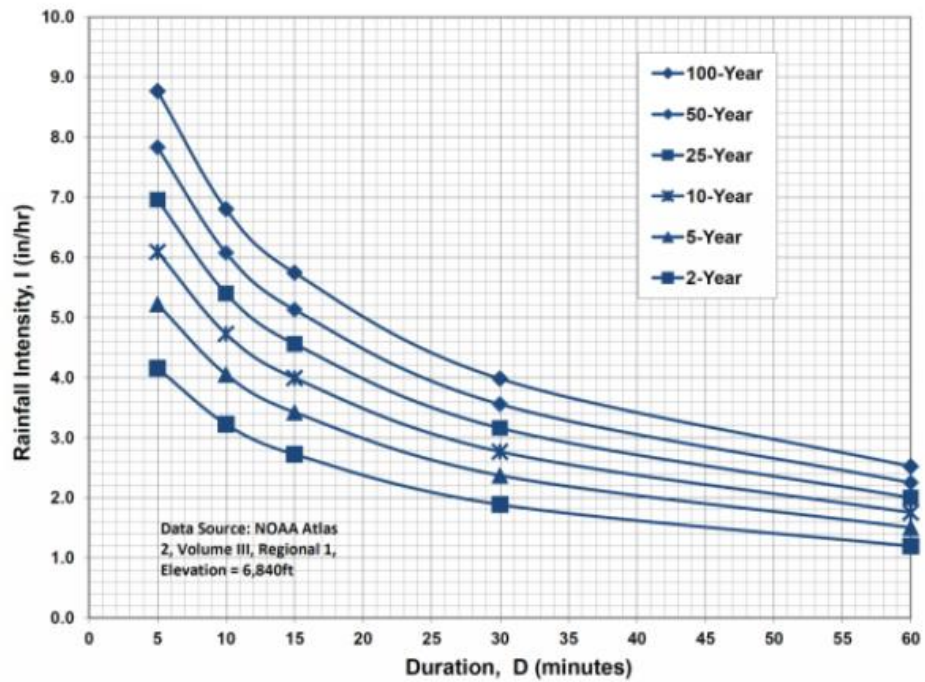
Table 6-6. Runoff Coefficients for Rational Method
 (Source: UDFCD 2001)

Land Use or Surface Characteristics	Percent Impervious	Runoff Coefficients											
		2-year		5-year		10-year		25-year		50-year		100-year	
		HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D
Business													
Commercial Areas	95	0.79	0.80	0.81	0.82	0.83	0.84	0.85	0.87	0.87	0.88	0.88	0.89
Neighborhood Areas	70	0.45	0.49	0.49	0.53	0.53	0.57	0.58	0.62	0.60	0.65	0.62	0.68
Residential													
1/8 Acre or less	65	0.41	0.45	0.45	0.49	0.49	0.54	0.54	0.59	0.57	0.62	0.59	0.65
1/4 Acre	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
1/3 Acre	30	0.18	0.22	0.25	0.30	0.32	0.38	0.39	0.47	0.43	0.52	0.47	0.57
1/2 Acre	25	0.15	0.20	0.22	0.28	0.30	0.36	0.37	0.46	0.41	0.51	0.46	0.56
1 Acre	20	0.12	0.17	0.20	0.26	0.27	0.34	0.35	0.44	0.40	0.50	0.44	0.55
Industrial													
Light Areas	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Heavy Areas	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Parks and Cemeteries	7	0.05	0.09	0.12	0.19	0.20	0.29	0.30	0.40	0.34	0.46	0.39	0.52
Playgrounds	13	0.07	0.13	0.16	0.23	0.24	0.31	0.32	0.42	0.37	0.48	0.41	0.54
Railroad Yard Areas	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
Undeveloped Areas													
Historic Flow Analysis-- Greenbelts, Agriculture	2	0.03	0.05	0.09	0.16	0.17	0.26	0.26	0.38	0.31	0.45	0.36	0.51
Pasture/Meadow	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Forest	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Exposed Rock	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Offsite Flow Analysis (when landuse is undefined)	45	0.26	0.31	0.32	0.37	0.38	0.44	0.44	0.51	0.48	0.55	0.51	0.59
Streets													
Paved	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Gravel	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Drive and Walks	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Roofs	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Lawns	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50

PRELIMINARY DRAINAGE REPORT
Mayberry Phase 2

B2 Runoff Calculations

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



IDF Equations

$$I_{100} = -2.52 \ln(D) + 12.735$$

$$I_{50} = -2.25 \ln(D) + 11.375$$

$$I_{25} = -2.00 \ln(D) + 10.111$$

$$I_{10} = -1.75 \ln(D) + 8.847$$

$$I_5 = -1.50 \ln(D) + 7.583$$

$$I_2 = -1.19 \ln(D) + 6.035$$

Note: Values calculated by equations may not precisely duplicate values read from figure.

Lot and ROW Impervious Calcs

Front Loaded Paired Homes - Impervious Calc				
8787-0001 08/19/26				
Single Lot Area (sf): 2,027.0				
Surface	Area (sf)	C _s C ₁₀₀		Impervious (%)
Landscape	733.00	0.12	0.39	7%
Roof	1,111.00	0.90	0.96	100%
Concrete Drive/Walk	183.00	0.90	0.96	100%
Composite Site Values:		0.58	0.76	66%
Composite % Impervious Used:		0.57	0.75	65%

Rear Loaded Paired Homes - Impervious Calc				
8787-0001 08/19/26				
Single Lot Area (sf): 2,035.0				
Surface	Area (sf)	C _s C ₁₀₀		Impervious (%)
Landscape	794.00	0.12	0.39	7%
Roof	1,111.00	0.90	0.96	100%
Concrete Drive/Walk	130.00	0.90	0.96	100%
Composite Site Values:		0.56	0.75	64%
Composite % Impervious Used:		0.57	0.75	65%

SFH Fil 1 w/ Front Street Road - Impervious Calc				
8787-0001 08/19/26				
Single Lot Area (sf): 7,665.0				
Surface	Area (sf)	C _s C ₁₀₀		Impervious (%)
Landscape	4,207.00	0.12	0.39	7%
Roof	1,663.00	0.90	0.96	100%
Concrete Drive/Walk	1,795.00	0.90	0.96	100%
Composite Site Values:		0.44	0.68	49%
Composite % Impervious Used:		0.47	0.70	52.5%

75' ROW				
8787-0001 08/19/26				
ROW WIDTH: 75.0				
Surface	Length (ft)	C _s C ₁₀₀		Impervious (%)
Landscape	16.00	0.12	0.39	7%
Street/Walk	59.00	0.90	0.96	100%
Composite Site Values:		0.73	0.84	80%

70' ROW				
8787-0001 08/19/26				
ROW WIDTH: 70.0				
Surface	Length (ft)	C _s C ₁₀₀		Impervious (%)
Landscape	9.00	0.12	0.39	7%
Street/Walk	61.00	0.90	0.96	100%
Composite Site Values:		0.80	0.89	88%

90' ROW				
8787-0001 08/19/26				
ROW WIDTH: 90.0				
Surface	Length (ft)	C _s C ₁₀₀		Impervious (%)
Landscape	15.00	0.12	0.39	7%
Street/Walk	75.00	0.90	0.96	100%
Composite Site Values:		0.77	0.87	85%

62' ROW				
8787-0001 08/19/26				
ROW WIDTH: 62.0				
Surface	Length (ft)	C _s C ₁₀₀		Impervious (%)
Landscape	7.00	0.12	0.39	7%
Street/Walk	55.00	0.90	0.96	100%
Composite Site Values:		0.81	0.90	90%

100' ROW				
8787-0001 08/19/26				
ROW WIDTH: 100.0				
Surface	Length (ft)	C _s C ₁₀₀		Impervious (%)
Landscape	22.00	0.12	0.39	7%
Street/Walk	78.00	0.90	0.96	100%
Composite Site Values:		0.73	0.83	80%

Land Use Is Comprised of following Surface Characteristics:			
NRCS Soil Group	A	Imperviousness	
Residential (1/8-Acre or Less)		65%	0.45
Street/Walks		100%	0.90
Landscape/Parks		7%	0.12

Project Name													
Basin Weighted Runoff Coefficient Calculations													
Land Use Is Comprised of following Surface Characteristics:													
NRCS Soil Group		A	Imperviousness		C ₂	C ₅	C ₁₀	C ₁₀₀					
A	Residential (1/8-Acre or Less)		65%			0.45		0.59					
B	Drive/Walks		100%			0.90		0.96					
C	Landscape/Parks		7%			0.12		0.39					
D	62' ROW		90%			0.81		0.90					
E	70' ROW		88%			0.80		0.89					
F	75' & 100' ROW		80%			0.73		0.84					
G	90' ROW		85%			0.77		0.87					
										Project No.: 8787-0001			
										Date: 8/19/2026			
Basin ID	Total Area (Ac.)	A Area (Ac.)	B Area (Ac.)	C Area (Ac.)	D Area (Ac.)	E Area (Ac.)	F Area (Ac.)	G Area (Ac.)	Weighted Imp. I (%)	Weighted Runoff Coefficients			
										C ₂	C ₅	C ₁₀	C ₁₀₀
Developed													
A2	0.57							0.57	85%	0.00	0.77	0.00	0.87
A3	0.54							0.54	85%	0.00	0.77	0.00	0.87
A4	2.07		0.05	2.02					9%	0.00	0.14	0.00	0.40
A5	0.27						0.27		80%	0.00	0.73	0.00	0.84
A6	0.27						0.27		80%	0.00	0.73	0.00	0.84
A7	0.87		0.70	0.17					82%	0.00	0.75	0.00	0.85
A8	0.40				0.40				90%	0.00	0.81	0.00	0.90
A9	0.29			0.10		0.19			59%	0.00	0.56	0.00	0.71
A10	1.98		0.16	0.63	0.97	0.22			64%	0.00	0.60	0.00	0.74
Basin A	7.27	0.00	0.91	2.92	1.37	0.41	0.54	1.11	56%	0.00	0.53	0.00	0.69
C1.2	1.43	0.79	0.10		0.33	0.21			77%	0.00	0.62	0.00	0.73
C1.7B	1.79		0.21	0.48	0.66	0.45			68%	0.00	0.64	0.00	0.77
C2	0.33	0.24	0.08	0.01					72%	0.00	0.55	0.00	0.67
C3	0.44	0.22	0.15	0.07					69%	0.00	0.56	0.00	0.69
C4	0.32	0.03	0.21	0.08					73%	0.00	0.66	0.00	0.78
C5	0.59	0.33	0.19	0.07					70%	0.00	0.56	0.00	0.69
C6	0.27	0.13	0.11	0.02					75%	0.00	0.61	0.00	0.73
C7	0.42	0.26	0.13	0.03					71%	0.00	0.56	0.00	0.69
C8	0.93	0.63	0.22	0.08					69%	0.00	0.53	0.00	0.66
C9	0.68	0.33	0.18	0.18					59%	0.00	0.48	0.00	0.64
C10	0.18	0.03	0.11	0.04					74%	0.00	0.65	0.00	0.77
C11	0.45	0.30	0.07	0.08					61%	0.00	0.47	0.00	0.62
C12	0.24	0.04	0.12	0.08					64%	0.00	0.57	0.00	0.71
C13	0.43	0.29	0.07	0.06					62%	0.00	0.48	0.00	0.62
C14	0.74	0.52	0.12	0.10					63%	0.00	0.48	0.00	0.62
C15	2.01	0.34	0.04	0.41	0.68	0.31	0.23		68%	0.00	0.60	0.00	0.74
C16	NOT IN USE												
C17	0.05		0.05	0.00					97%	0.00	0.88	0.00	0.94
C18	NOT IN USE												
C19	0.33		0.16	0.16					54%	0.00	0.51	0.00	0.68
Basin C	11.64	4.49	2.34	1.94	1.67	0.97	0.23	0.00	68%	0.00	0.57	0.00	0.70
S1	0.33	0.07		0.26					19%	0.00	0.19	0.00	0.43
Developed Imp.	19.25	4.56	3.26	5.12	3.05	1.38	0.77	1.11	63%	0	0.55	0	0.69
Offsite													
C1.1	5.51	3.28	0.82	1.41					55%	0.00	0.43	0.00	0.59
C1.10	1.20							1.20	85%	0.00	0.77	0.00	0.87
OS1	0.60			0.60					7%	0.00	0.12	0.00	0.39
OS2	12.71			12.71					7%	0.00	0.12	0.00	0.39
Total Offsite	20.01	3.28	0.82	14.71	0.00	0.00	0.00	1.20	25%	0	0.24	0	0.47

Time of Concentration

Project No.:

Sh. 1 of 3

8/19/2026

Basin ID	C ₅	Initial Flow Time T _i			Travel Time T _t							T _c Check				Final T _c (min)
		Length Li (ft)	Slope (%)	T _i (min)	Length Lt (ft)	Slope (%)	Convey. Element	Convey. Coeff. K	Vel. (fps)	T _t (min)	Total T _c (min)	Imp. (dec)	Travel Length (ft)	Avg. Travel Slope (%)	T _c = 26 - 17i + [Lt/{60*(14i+9)*(S ^{0.5})}] (min)	
Developed																
A2	0.77	27	2.00	2.5	452	1.00	Street	20	2.0	3.8	6.2	85%	452	1.0	15.3	6.2
A3	0.77	60	2.40	3.5	367	1.10	Street	20	2.1	2.9	6.4	85%	367	1.1	14.4	6.4
A4	0.14	120	7.00	10.0	258	0.50	Field	7	0.5	8.7	18.7	9%	258	0.5	30.3	18.7
A5	0.73	33	2.00	3.0	150	0.50	Street	20	1.4	1.8	4.8	80%	150	0.5	14.1	5.0
A6	0.73	30	2.00	2.9	147	0.50	Street	20	1.4	1.7	4.6	80%	147	0.5	14.1	5.0
A7	0.75	25	10.00	1.5	220	0.50	Courts	20	1.4	2.6	4.1	82%	220	0.5	14.6	5.0
A8	0.81	30	2.00	2.3	230	0.60	Street	20	1.5	2.5	4.7	90%	230	0.6	13.1	5.0
A9	0.56	22	2.00	3.6	141	2.10	Street	20	2.9	0.8	4.5	59%	141	2.1	16.8	5.0
A10	0.60	20	0.02	14.7	860	1.20	Street	20	2.2	6.5	21.3	64%	860	1.2	22.4	21.3
Basin A	0.53	160	1.00	13.0	569	0.50	Street	20	1.4	6.7	19.7	56%	569	0.5	24.4	19.7
C1.2	0.62	74	2.00	6.0	366	1.00	Street	20	2.0	3.1	9.0	77%	440	0.8	17.1	9.0
C1.7B	0.64	73	2.00	5.7	403	1.10	Street	20	2.1	3.2	8.9	68%	403	1.1	17.8	8.9
C2	0.55	72	2.00	6.7	133	1.70	Street	20	2.6	0.9	7.5	72%	133	1.7	14.6	7.5
C3	0.56	65	2.00	6.3	135	0.70	Street	20	1.7	1.3	7.6	69%	135	0.7	15.8	7.6
C4	0.66	95	1.60	6.7	118	1.50	Street	20	2.4	0.8	7.5	73%	118	1.5	14.4	7.5
C5	0.56	36	1.50	5.1	223	1.20	Street	20	2.2	1.7	6.8	70%	223	1.2	16.0	6.8
C6	0.61	50	2.00	5.0	209	1.80	Street	20	2.7	1.3	6.3	75%	209	1.8	14.6	6.3
C7	0.56	55	2.00	5.7	394	1.20	Street	20	2.2	3.0	8.7	71%	394	1.2	17.0	8.7
C8	0.53	78	2.00	7.2	368	0.70	Street	20	1.7	3.7	10.9	69%	368	0.7	18.3	10.9
C9	0.48	64	2.00	7.1	287	1.60	Street	20	2.5	1.9	9.0	59%	287	1.6	18.1	9.0
C10	0.65	13	2.00	2.3	198	1.60	Street	20	2.5	1.3	3.6	74%	198	1.6	14.8	5.0
C11	0.47	112	2.00	9.6	128	0.50	Street	20	1.4	1.5	11.1	61%	128	0.5	17.4	11.1
C12	0.57	27	2.00	3.9	322	1.00	Street	20	2.0	2.7	6.6	64%	322	1.0	18.1	6.6
C13	0.48	112	2.00	9.5	122	0.50	Street	20	1.4	1.4	10.9	62%	122	0.5	17.0	10.9
C14	0.48	85	2.00	8.2	128	0.70	Street	20	1.7	1.3	9.5	63%	128	0.7	16.8	9.5
C15	0.60	45	2.00	4.8	998	1.00	Street	20	2.0	8.3	13.1	68%	998	1.0	23.5	13.1
C16	NOT IN USE															
C17	0.88	25	2.00	1.6	37	1.00	Street	20	2.0	0.3	1.9	97%	37	1.0	9.7	5.0
C18	NOT IN USE															
C19	0.51	141	2.00	10.1	35	1.10	Swale	15	1.6	0.4	10.4	54%	35	1.1	17.2	10.4
Basin C	0.57	55	2.00	5.6	1534	0.50	Street	20	1.4	18.1	23.7	68%	1534	0.5	33.9	23.7
S1	0.19	86	4.10	9.6	1	2.00	Street	20	2.8	0.0	9.6	19%	1	2.0	22.8	9.6
C1.1	0.43	Assumed TC for Preliminary														5.0
C1.10	0.77															5.0
OS1	0.12	69	5.00	8.6	543	0.50	Street	20	1.4	6.4	15.0	7%	543	0.5	37.6	15.0
OS2	0.12	824	2.00	40.4	1652	0.50	Swale	15	1.1	26.0	66.4	7%	1652	0.5	63.8	63.8

Basin Runoff Calculations - Direct Runoff										
Project No.: 8787-0001										
8/19/2026										
Basin ID	Design Point	Total Area (Ac.)	Imp (%)	Tc (min)	Runoff Coeff.		Rainfall Intensity		Runoff Flow	
					C ₅	C ₁₀₀	I ₅	I ₁₀₀	Q ₅	Q ₁₀₀
Developed										
A2	2A	0.57	85%	6.23	0.77	0.87	4.84	8.13	2.13	4.01
A3	3A	0.54	85%	6.37	0.77	0.87	4.80	8.07	2.00	3.77
A4	4A	2.07	9%	18.69	0.14	0.40	3.19	5.36	0.92	4.48
A5	5A	0.27	80%	5.00	0.73	0.84	5.17	8.68	1.03	1.99
A6	6A	0.27	80%	5.00	0.73	0.84	5.17	8.68	1.01	1.94
A7	7A	0.87	82%	5.00	0.75	0.85	5.17	8.68	3.38	6.44
A8	8A	0.40	90%	5.00	0.81	0.90	5.17	8.68	1.70	3.14
A9	9A	0.29	59%	5.00	0.56	0.71	5.17	8.68	0.85	1.81
A10	10A	1.98	64%	21.28	0.60	0.74	3.00	5.03	3.55	7.36
Basin A	1A	7.27	56%	19.68	0.53	0.69	3.11	5.23	12.05	26.27
	C1.2C	1.43	77%	9.02	0.62	0.73	4.28	7.19	3.78	7.52
C1.7B	C1.7B	1.79	68%	8.90	0.64	0.77	4.30	7.23	4.91	9.94
C2	SC-13	0.33	72%	7.54	0.55	0.67	4.55	7.64	0.83	1.70
C3	SC-28	0.44	69%	7.62	0.56	0.69	4.54	7.62	1.11	2.30
C4	SC-32	0.32	73%	7.47	0.66	0.78	4.57	7.67	0.97	1.92
C5	SC-31	0.59	70%	6.84	0.56	0.69	4.70	7.89	1.54	3.19
C6	SC-33	0.27	75%	6.27	0.61	0.73	4.83	8.11	0.80	1.60
C7	SC-34	0.42	71%	8.73	0.56	0.69	4.33	7.28	1.02	2.09
C8	SC-14	0.93	69%	10.88	0.53	0.66	4.00	6.72	1.98	4.15
C9	SC-17	0.68	59%	8.99	0.48	0.64	4.29	7.20	1.41	3.11
C10	SC-24	0.18	74%	5.00	0.65	0.77	5.17	8.68	0.60	1.19
C11	SC-26	0.45	61%	11.15	0.47	0.62	3.97	6.66	0.84	1.86
C12	SC-27	0.24	64%	6.61	0.57	0.71	4.75	7.98	0.65	1.35
C13	SC-22	0.43	62%	10.89	0.48	0.62	4.00	6.72	0.83	1.82
C14	14C	0.74	63%	9.51	0.48	0.62	4.21	7.06	1.50	3.27
C15	SC-2B	2.01	68%	13.11	0.60	0.74	3.72	6.25	4.52	9.26
C16	NOT IN USE									
C17	17C	0.05	97%	5.00	0.88	0.94	5.17	8.68	0.23	0.42
C18	NOT IN USE									
C19	SC-4	0.33	54%	10.43	0.51	0.68	4.07	6.83	0.68	1.50
Basin C	C1.2C	11.64	68%	23.70	0.57	0.70	2.83	4.76	18.89	39.04
S1	1S	0.33	19%	9.61	0.19	0.43	4.19	7.03	0.26	1.00
C1.1	1.1C	5.51	55%	5.00	0.43	0.59	5.17	8.68	12.31	28.38
C1.10	1.10C	1.20	85%	5.00	0.77	0.87	5.17	8.68	4.77	9.00
OS1	1OS	0.60	7%	15.04	0.12	0.39	3.52	5.90	0.25	1.38
OS2	2OS	12.71	7%	63.83	0.12	0.39	1.35	2.26	2.06	11.21
Intensity = I₅ = -1.50 ln(D) + 7.583										
I₁₀₀ = -2.52 ln(D) + 12.735										
Where Duration (D) is equal to Time of Concentration (Tc)										

PRELIMINARY DRAINAGE REPORT
Mayberry Phase 2

B3 Detention Pond Calculations

MHFD-Detention, Version 4.08 (April 2026)

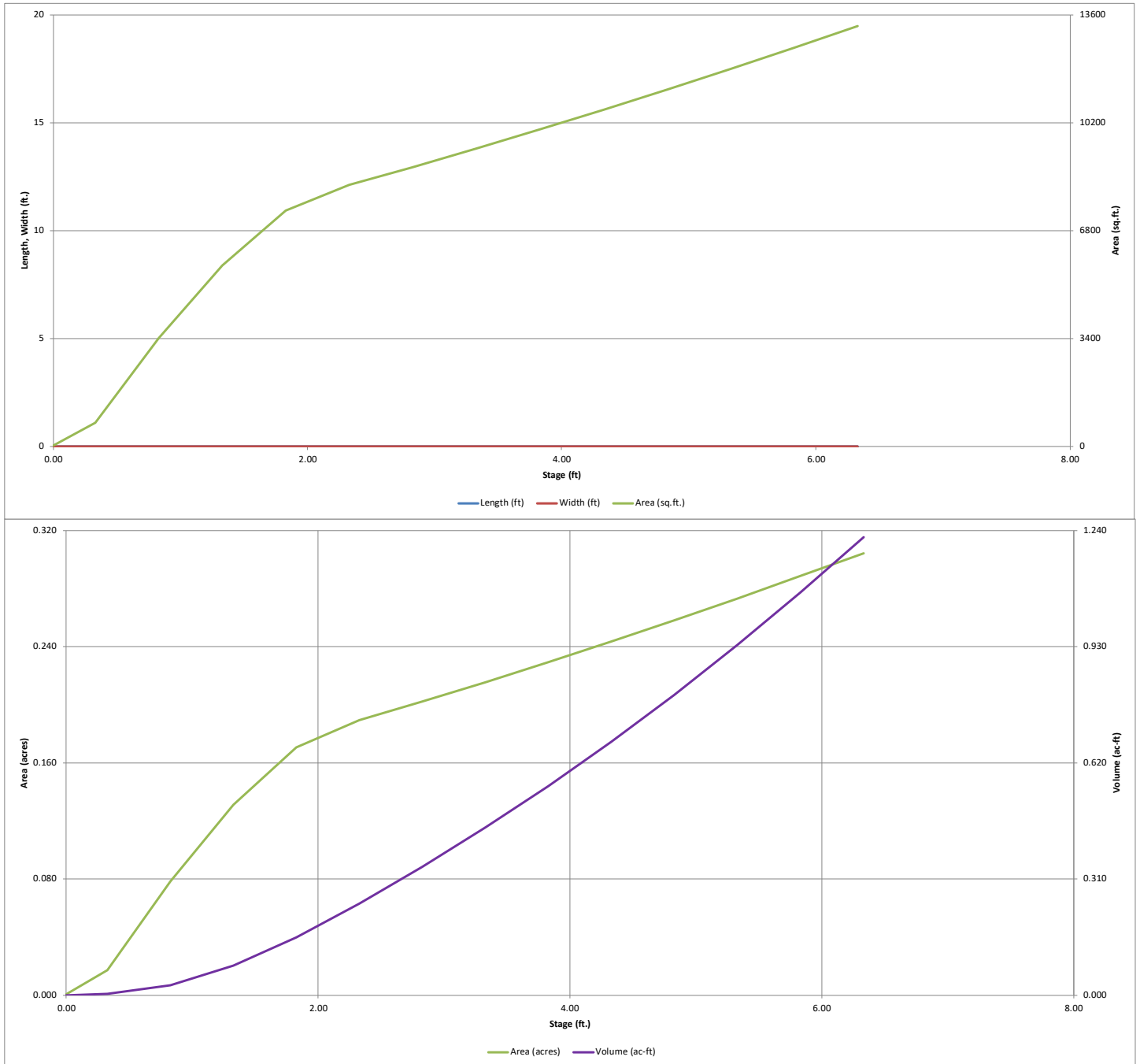
Basin ID: Interim Pond A1



8/19/2026, 5:06 PM

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.08 (April 2026)



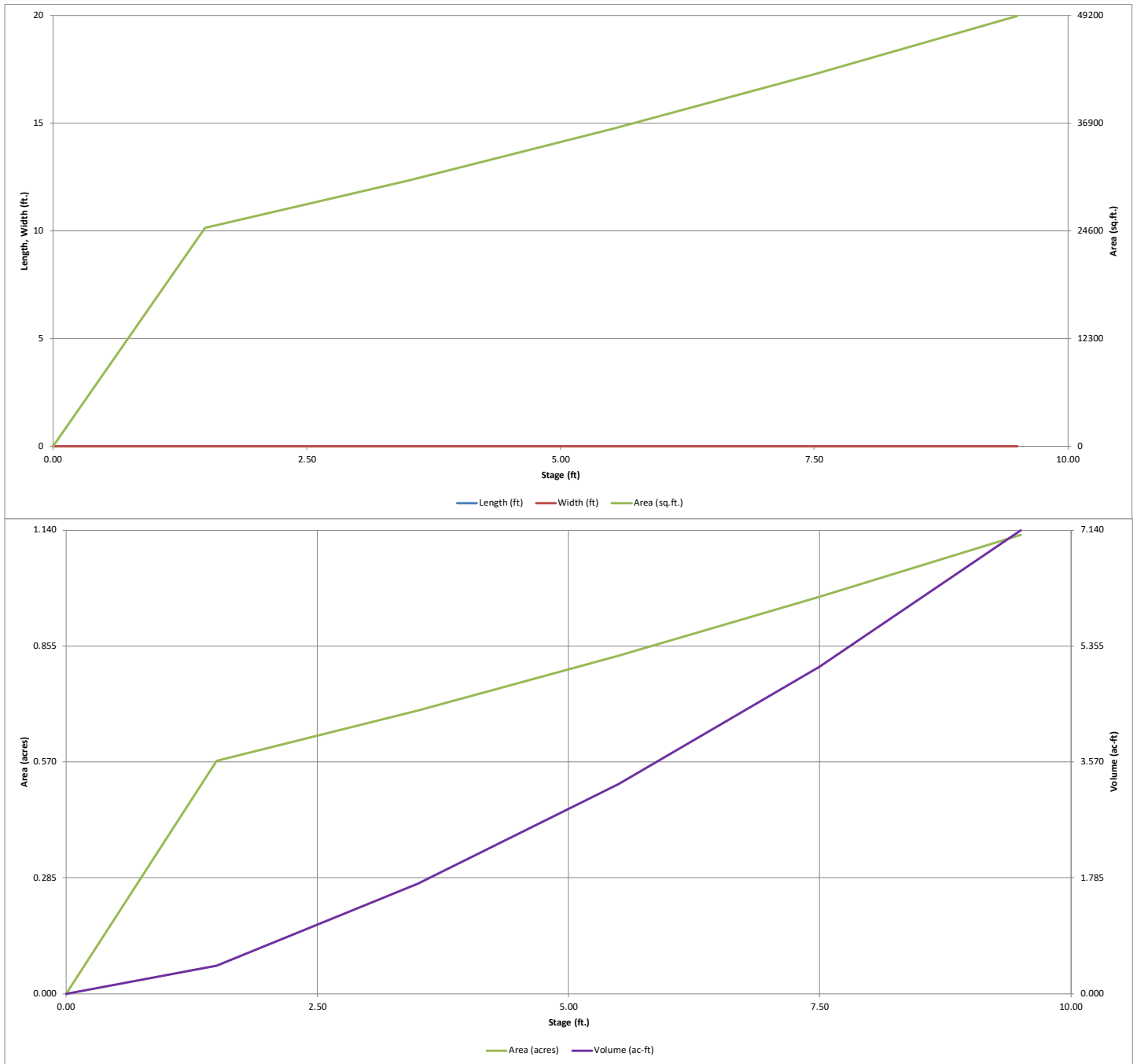
MHFD-Detention, Version 4.06 (July 2022)

Basin ID: Pond C1 (Stage 0 = 6046.50)

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DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-*Detention*, Version 4.06 (July 2022)

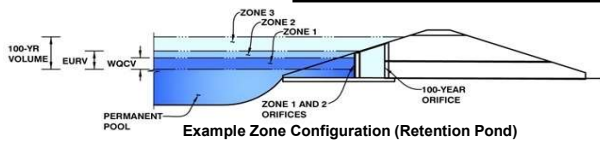


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: Mayberry, Colorado Springs

Basin ID: Detention Basin C1



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	44.81	acres
Watershed Length =	2,660	ft
Watershed Length to Centroid =	1,330	ft
Watershed Slope =	0.010	ft/ft
Watershed Imperviousness =	51.69%	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.

Water Quality Capture Volume (WQCV) =	0.788	acre-feet
Excess Urban Runoff Volume (EURV) =	2.696	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	2.026	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	2.688	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	3.218	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	4.035	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	4.833	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	5.841	acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	8.027	acre-feet
Approximate 2-yr Detention Volume =	1.736	acre-feet
Approximate 5-yr Detention Volume =	2.283	acre-feet
Approximate 10-yr Detention Volume =	2.782	acre-feet
Approximate 25-yr Detention Volume =	3.396	acre-feet
Approximate 50-yr Detention Volume =	3.784	acre-feet
Approximate 100-yr Detention Volume =	4.247	acre-feet

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.788	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.908	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.552	acre-feet
Total Detention Basin Volume =	4.247	acre-feet

Optional User Overrides

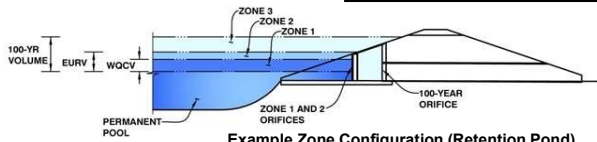
	acre-feet
	acre-feet
1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.14	inches

[illegible]

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: **Mayberry, Colorado Springs**
Basin ID: **Detention Basin C1**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.86	0.788	Orifice Plate
Zone 2 (EURV)	4.80	1.908	Orifice Plate
Zone 3 (100-year)	6.78	1.552	Weir&Pipe (Restrict)
Total (all zones)		4.247	

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 = ft²
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 = ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate = ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing = inches
Orifice Plate: Orifice Area per Row = sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row = ft²
Elliptical Half-Width = feet
Elliptical Slot Centroid = feet
Elliptical Slot Area = ft²

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	1.60	4.50					
Orifice Area (sq. inches)	7.32	7.32	7.32					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice = ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice = ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter = inches

Calculated Parameters for Vertical Orifice

Vertical Orifice Area = ft²
Vertical Orifice Centroid = feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe).

Overflow Weir Front Edge Height, H_o = ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length = feet
Overflow Weir Grate Slope = H:V
Horiz. Length of Weir Sides = feet
Overflow Grate Type =
Debris Clogging % =

Calculated Parameters for Overflow Weir

Height of Grate Upper Edge, H_u = feet
Overflow Weir Slope Length = feet
Grate Open Area / 100-yr Orifice Area =
Overflow Grate Open Area w/o Debris = ft²
Overflow Grate Open Area w/ Debris = ft²

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

Depth to Invert of Outlet Pipe = ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter = inches
Restrictor Plate Height Above Pipe Invert = inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

Outlet Orifice Area = ft²
Outlet Orifice Centroid = feet
Half-Central Angle of Restrictor Plate on Pipe = radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

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

Calculated Parameters for Spillway

Spillway Design Flow Depth = feet
Stage at Top of Freeboard = feet
Basin Area at Top of Freeboard = acres
Basin Volume at Top of Freeboard = acre-ft

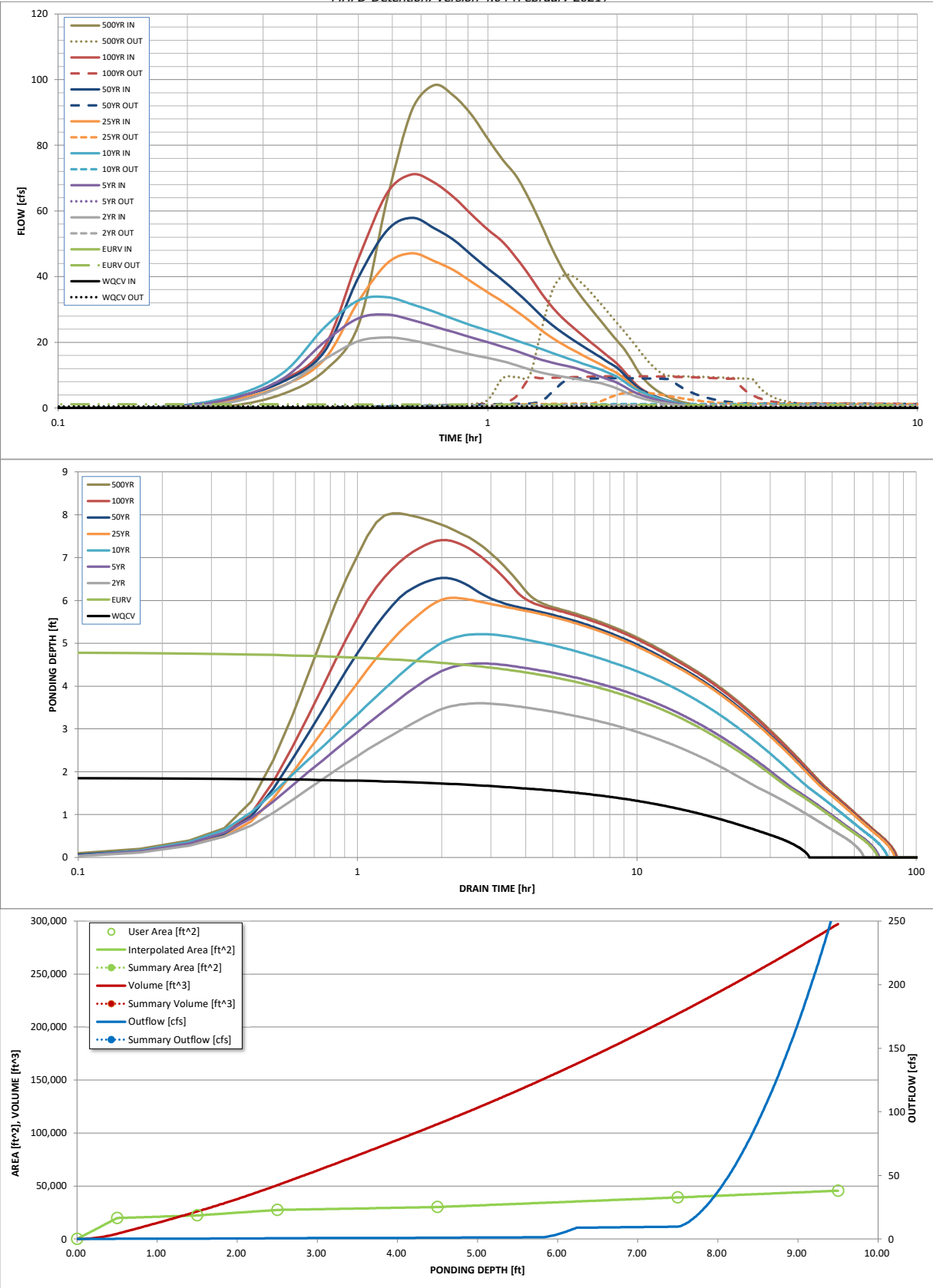
Routed Hydrograph Results

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

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
One-Hour Rainfall Depth (in) =	N/A	N/A	2.026	2.688	3.218	4.035	4.833	5.841	8.027
CUHP Runoff Volume (acre-ft) =	N/A	N/A	2.026	2.688	3.218	4.035	4.833	5.841	8.027
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.2	0.4	0.6	5.3	10.6	17.6	32.7
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.00	0.01	0.01	0.12	0.24	0.39	0.73
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A	21.5	28.4	33.7	47.1	57.9	71.1	98.3
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.5	1.1	1.2	4.8	9.1	9.7	40.4
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	2.4	2.1	0.9	0.9	0.6	1.2
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.3	0.7	0.7	0.7
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	66	70	73	71	70	67
Time to Drain 99% of Inflow Volume (hours) =	40	69	62	70	75	79	79	79	77
Maximum Ponding Depth (ft) =	1.87	4.80	3.60	4.53	5.22	6.06	6.53	7.41	8.04
Area at Maximum Ponding Depth (acres) =	0.55	0.71	0.66	0.69	0.74	0.80	0.83	0.89	0.94
Maximum Volume Stored (acre-ft) =	0.793	2.699	1.871	2.502	2.998	3.645	4.029	4.788	5.366

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	0.19	0.02	0.62
	0:15:00	0.00	0.00	1.67	2.72	3.39	2.29	2.94	2.81	4.29
	0:20:00	0.00	0.00	6.65	8.93	10.61	6.78	8.02	8.47	11.32
	0:25:00	0.00	0.00	14.81	20.12	24.51	14.81	17.21	18.62	25.21
	0:30:00	0.00	0.00	20.35	27.31	32.74	32.46	39.75	45.49	63.54
	0:35:00	0.00	0.00	21.47	28.41	33.73	44.04	54.11	65.48	90.75
	0:40:00	0.00	0.00	20.60	26.77	31.55	47.11	57.89	71.13	98.31
	0:45:00	0.00	0.00	19.05	24.81	29.29	44.76	54.78	68.64	95.06
	0:50:00	0.00	0.00	17.54	23.09	27.07	41.99	51.19	64.18	89.32
	0:55:00	0.00	0.00	16.26	21.45	25.16	38.47	46.63	58.96	82.03
	1:00:00	0.00	0.00	15.23	20.03	23.58	35.21	42.49	54.35	75.63
	1:05:00	0.00	0.00	14.25	18.66	22.05	32.37	38.93	50.58	70.51
	1:10:00	0.00	0.00	13.00	17.32	20.54	29.44	35.28	45.61	63.41
	1:15:00	0.00	0.00	11.76	15.94	19.20	26.55	31.67	40.32	55.75
	1:20:00	0.00	0.00	10.76	14.70	17.93	23.64	28.05	34.94	48.06
	1:25:00	0.00	0.00	10.06	13.77	16.70	21.26	25.14	30.55	41.92
	1:30:00	0.00	0.00	9.50	13.02	15.54	19.27	22.74	27.18	37.16
	1:35:00	0.00	0.00	9.00	12.33	14.48	17.57	20.67	24.44	33.24
	1:40:00	0.00	0.00	8.51	11.42	13.49	16.01	18.78	21.98	29.74
	1:45:00	0.00	0.00	8.03	10.46	12.55	14.59	17.05	19.71	26.50
	1:50:00	0.00	0.00	7.55	9.52	11.64	13.23	15.39	17.54	23.42
	1:55:00	0.00	0.00	6.79	8.63	10.66	11.91	13.78	15.46	20.48
	2:00:00	0.00	0.00	5.95	7.71	9.51	10.64	12.24	13.50	17.74
	2:05:00	0.00	0.00	4.90	6.41	7.90	8.79	10.05	10.96	14.27
	2:10:00	0.00	0.00	3.94	5.15	6.37	6.89	7.80	8.38	10.80
	2:15:00	0.00	0.00	3.20	4.18	5.22	5.32	6.00	6.33	8.14
	2:20:00	0.00	0.00	2.64	3.46	4.33	4.24	4.77	4.94	6.33
	2:25:00	0.00	0.00	2.18	2.85	3.59	3.43	3.84	3.90	4.96
	2:30:00	0.00	0.00	1.79	2.35	2.96	2.78	3.11	3.09	3.90
	2:35:00	0.00	0.00	1.47	1.93	2.42	2.24	2.51	2.44	3.06
	2:40:00	0.00	0.00	1.19	1.57	1.95	1.80	2.01	1.91	2.37
	2:45:00	0.00	0.00	0.96	1.26	1.56	1.43	1.59	1.48	1.83
	2:50:00	0.00	0.00	0.78	1.00	1.25	1.13	1.26	1.17	1.43
	2:55:00	0.00	0.00	0.63	0.80	0.99	0.91	1.01	0.94	1.15
	3:00:00	0.00	0.00	0.51	0.63	0.79	0.72	0.80	0.75	0.93
	3:05:00	0.00	0.00	0.39	0.49	0.62	0.57	0.63	0.60	0.73
	3:10:00	0.00	0.00	0.30	0.37	0.47	0.43	0.48	0.46	0.56
	3:15:00	0.00	0.00	0.21	0.27	0.34	0.32	0.35	0.33	0.41
	3:20:00	0.00	0.00	0.14	0.18	0.24	0.22	0.25	0.23	0.28
	3:25:00	0.00	0.00	0.09	0.12	0.15	0.15	0.16	0.15	0.18
	3:30:00	0.00	0.00	0.05	0.07	0.08	0.08	0.09	0.08	0.10
	3:35:00	0.00	0.00	0.02	0.03	0.04	0.04	0.04	0.04	0.04
	3:40:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	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

Appendix C. PDR Checklist





2880 International Circle, Suite 110
Colorado Springs, CO 80910
Phone 719-520-6300
Fax 719-520-6695
www.elpasoco.com

EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

PRELIMINARY DRAINAGE REPORT (PDR) CHECKLIST

Revised: January 2022

Preliminary Drainage Report		
The purpose of the Preliminary Drainage Report is to identify specific solutions to problems onsite and offsite resulting from proposed land development, including issues existing prior to development. The PDR shall generally conform to the following outline format and major headings, and contain the applicable information listed.		
	Applicant	PCD
Please confirm each item below has been included by placing a check mark in the "Applicant" column. See right for an example. The "PCD" column is for office use only.	✓	Office use only
Report Contents		
1	Table of contents, pages numbered	
2	Existing/Historic and Developed Conditions Plans at the end of the report	
General Location		
1	City and County, and local streets within and adjacent to the subdivision.	
2	Township, Range, section, 1/4 section.	
3	Major drainage ways and existing facilities.	
4	Names of surrounding platted developments.	
Description of Property		
1	Area in acres	
2	Ground cover, (type of trees, shrubs, vegetation)	
3	General topography	
4	General soil conditions	
5	Major drainageways	
6	Irrigation facilities	
7	Utilities and other encumbrances	
Major Basin Descriptions		
1	Reference should be made to major drainageway planning studies; Such as Drainage Basin Planning Studies; Flood Hazard delineation reports, and flood insurance studies or maps if available.	
2	A floodplain statement shall be provided indicating whether any portion of the development is in a designated floodplain as delineated on the current FEMA mapping.	
3	Major basin drainage characteristics.	
4	Identification of all nearby irrigation facilities and other obstructions which could influence or be influenced by local drainage.	
Sub-Basin Descriptions		
1	Discussion of historic drainage patterns of the property in question	
2	Discussion of offsite drainage flow patterns and their impact on the development	



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 Colorado Springs, CO 80910
 Phone 719-520-6300
 Fax 719-520-6695
 www.elpasoco.com

EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

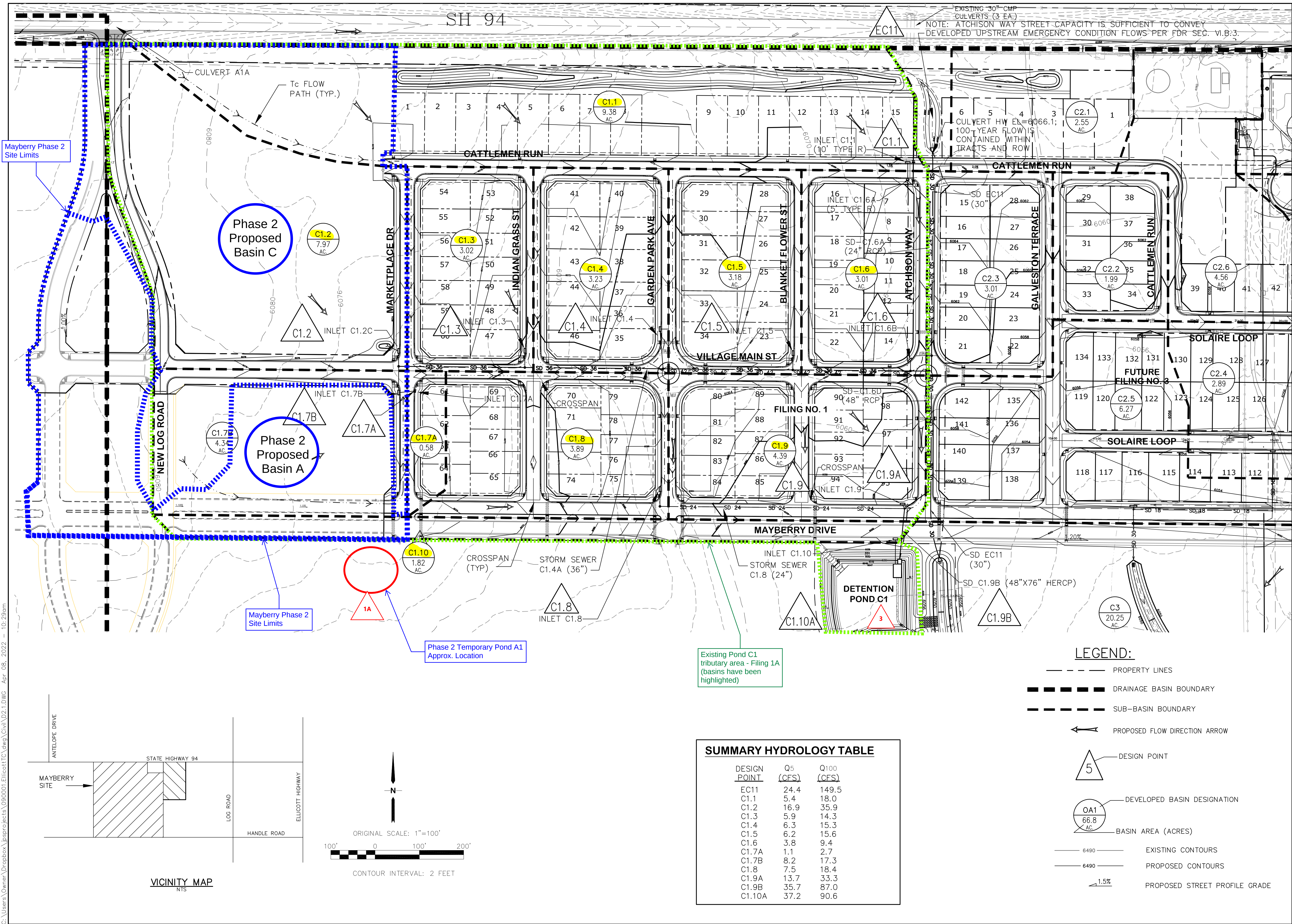
PRELIMINARY DRAINAGE REPORT (PDR) CHECKLIST

Revised: January 2022

Drainage Design Criteria		
1	Reference all criteria, master plans, and technical information used for report preparation and design; any deviation from such material must be discussed and justified.	
2	Discussion of previous drainage studies (i.e. PDR, drainage basin planning studies, master plans, flood insurance studies) for the site in question that influence or are influenced by the drainage design and how the studies affect drainage design for the site	
Four-Step Process		
1	Runoff reduction proposed.	
2	Stabilization of drainage ways proposed/discussed.	
3	Proposed Stormwater Quality Capture Volume (WQCV) proposed.	
4	Identify Best Management Practices (BMP's) to be used to control industrial and commercial pollutants.	
Hydrologic Criteria		
1	Identify design rainfall.	
2	Identify runoff calculation method.	
3	Identify design storm recurrence intervals	
4	Identify detention discharge and storage calculation method.	
5	Note ECM Appendix I Full Spectrum Detention (FSD) requirement.	
Drainage Facility Design - General Concept		
1	Discussion of compliance with offsite runoff considerations.	
2	Discussion of anticipated and proposed drainage patterns.	
3	Discussion of the content of tables, charts, figures, plates or drawings presented in the report.	
Drainage Facility Design - Specific Details		
1	Presentation of existing and proposed hydrologic conditions including approximate flow rates entering and exiting the subdivision with all necessary calculations.	
2	Presentation of approach to accommodate drainage impacts on existing or proposed improvements and facilities.	
3	Presentation of proposed facilities with respect to alignment, material and structure type.	
4	Discussion of drainage impact of site constraints such as streets, utilities, existing and proposed structures.	
5	Environmental features and issues shall be presented if applicable.	
6	Discussion of maintenance access and aspects of the preliminary design.	
7	Discussion and analysis of existing and proposed downstream drainage facilities and their ability to convey developed runoff from the proposed development.	
Drawing Contents		
1	General Location Map: A map shall be provided in sufficient detail to identify drainage flows entering and leaving the development and general drainage patterns. The map should be at a scale of 1"=50' to 1"=2000'. The map shall identify any major construction (i.e. development, irrigation ditches, existing detention facilities, culverts, storm sewers, etc.) that shall influence or be influenced by the subdivision.	
2	Drainage Plan: Map (s) of the proposed development at a scale of 1"=20' to 1"=200' shall be included to identify existing and proposed conditions on or adjacent to the site in question.	
3	The drainage plan shall delineate all sub-basins and proposed initial and major facilities as well as provide a summary of all initial and major flow rates at design points. All floodplains affecting the site shall be shown.	

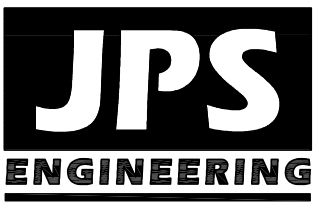
Appendix D. References

Existing Drainage Plan



MAYBERRY, COLORADO SPRINGS - FILING NO. 1

FILING NO. 1
DEVELOPED DRAINAGE PLAN



19 E. Willamette Ave.
Colorado Springs, CO
80903
PH: 719-477-9429
FAX: 719-471-0766
www.jpsengr.com

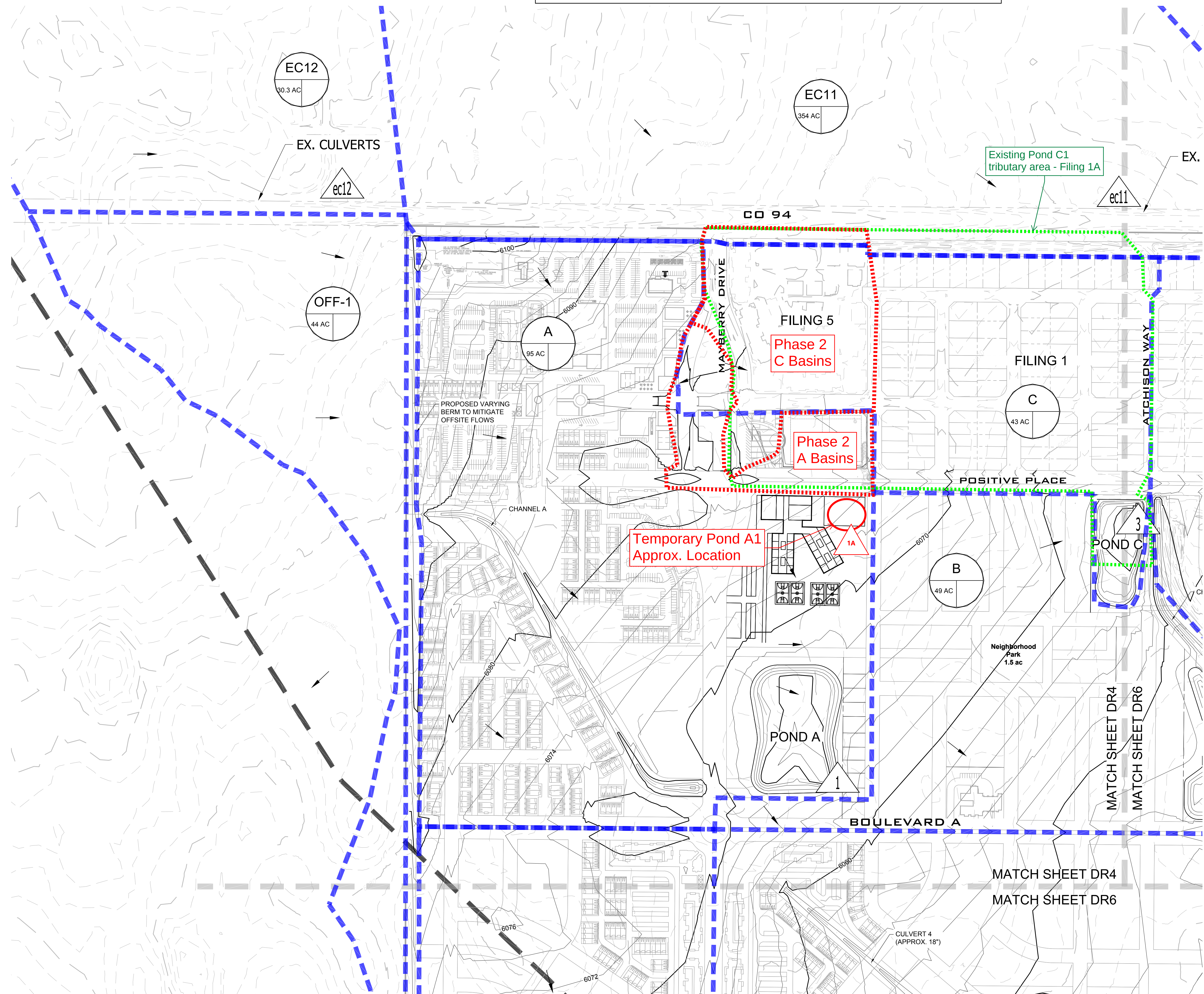


CALL UTILITY NOTIFICATION
CENTER OF COLORADO
1-800-922-1987
CALL BEFORE YOU DIG
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.

NO.	REVISION	BY	DATE

HORZ. SCALE: 1"=100'	DRAWN: BJJ
VERT. SCALE: N/A	DESIGNED: JPS
SURVEYED: RAMPART	CHECKED: JPS
CREATED: 12/03/00	LAST MODIFIED: 4/7/22
PROJECT NO: 090001	MODIFIED BY: JPS
SHEET: PROPOSED BASIN OVERLAY MAP BY R&R ENGINEERS	

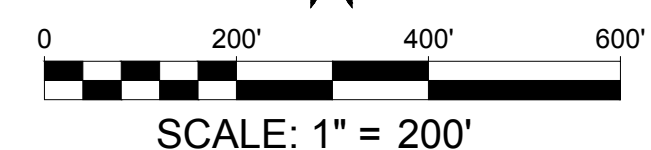
Master Development Drainage Plan Excerpt

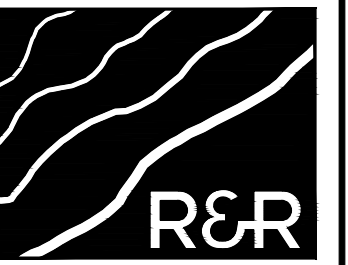


EXISTING		PROPOSED
	PROPERTY LINE	
	EASEMENT	
	EDGE OF PAVEMENT	
	VERTICAL CURB AND GUTTER	
	SPILL GUTTER	
	TRANSITION GUTTER	
	MAJOR CONTOUR	
	MINOR CONTOUR	
	STORM SEWER PIPE	
	DRAINAGE BASIN LABEL	
	* BASIN LABEL	
	** TRIBUTARY AREA (AC)	
	FLOW ARROW	
	DESIGN POINT	
	DRAINAGE AREA BOUNDARY	

BASIN SUMMARY TABLE			
Basin	Area (acres)	5-yr (cfs)	100-yr (cfs)
A	95.00	154.99	286.8
B	49.00	67.48	143.6
C	43.00	59.08	121.5
D	110.00	145.86	309.1
E	73.00	106.61	215.9
F	75.00	71.09	145.1
G	160.00	173.79	364.6
EC12	30.30	16.67	40.3
EC11	354.00	24.40	149.5
EC10	320.00	18.40	144.7
OFF-1	44.00	5.90	25.8

DESIGN POINT SUMMARY TABLE				
Design Point	Contributing Basins	Area (acres)	5-yr (cfs)	100-yr (cfs)
1	A	95.00	147.81	273.86
2	B	49.00	64.15	136.63
3	C	43.00	56.01	115.33
4	D	110.00	138.30	293.42
5	E	73.00	101.07	204.91
6	F	75.00	70.97	145.03
7	G	160.00	166.68	350.13





ENGINEERS **INC**
SURVEYORS

RR&R ENGINEERS-SURVEYORS, INC.
1635 WEST 13TH AVENUE, SUITE 310
DENVER, COLORADO 80204
PHONE: 303-753-6730

WWW.RRENGINEERS.COM



MAYBERRY SKETCH PLAN

SITE ADDRESS:	MAYBERRY, COLORADO SPRINGS, EL PASO COUNTY
PREPARED FOR:	MAYBERRY COMMUNITIES, LLC 3296 DEVINE HEIGHTS #208 COLORADO SPRINGS, CO 80922

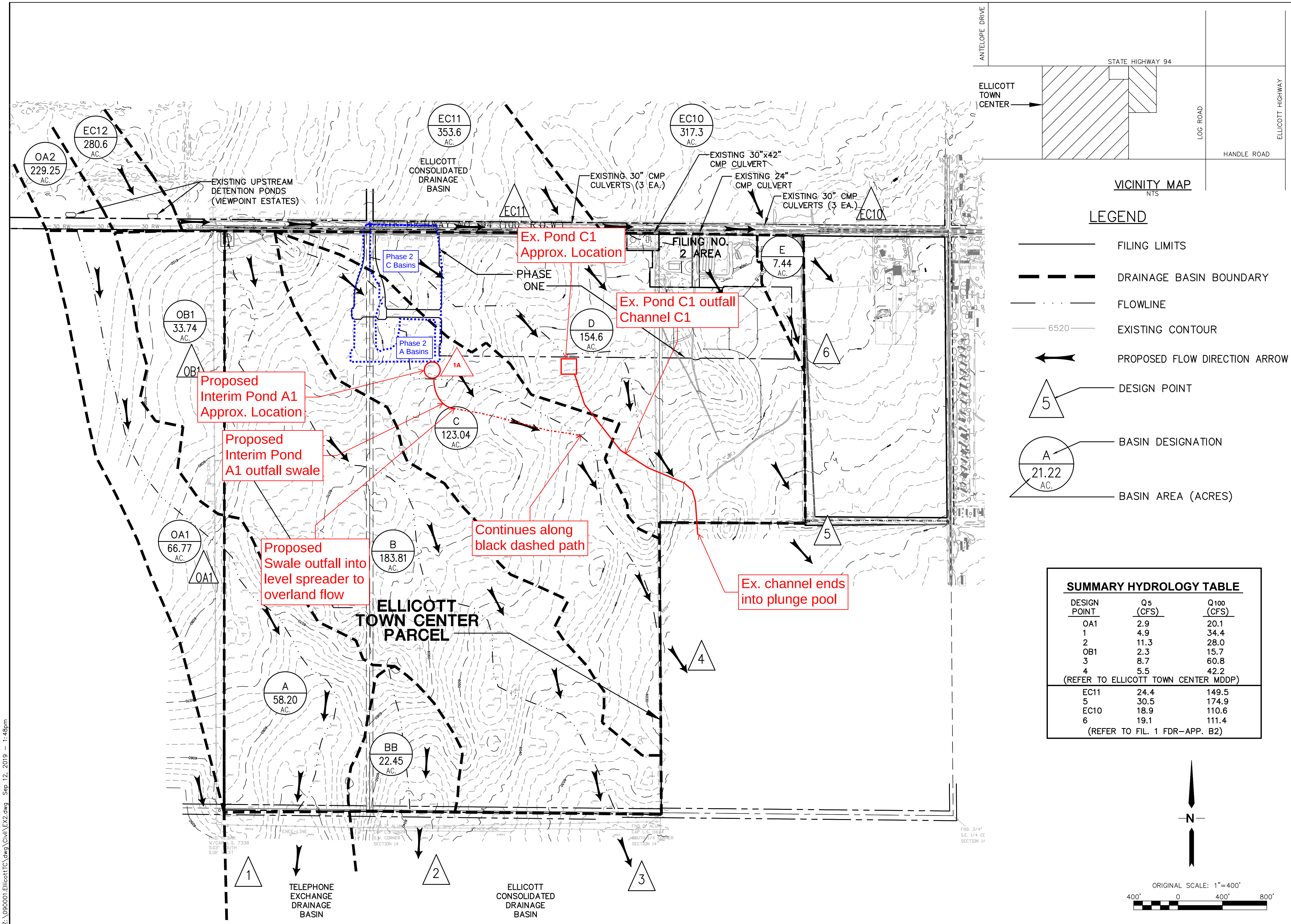
EXHIBIT

NO.		MC22208	
G. SUBM. DATE			
IN:	GWH	CHKD:	CJD
E			

PROPOSED DRAINAGE MAP

DR4

Historic Drainage Exhibit



**CALL UTILITY NOTIFICATION
CENTER OF COLORADO
1-800-922-1987**
CALL 2-BUSINESS DAYS IN ADVANCE
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.

ELLCOTT TOWN CENTER

HISTORIC DRAINAGE PLAN

HORIZ. SCALE:	1"=400'	DRAWN:	MJP
VERT. SCALE:	N/A	DESIGNED:	JPS
SURVEYED:	UP&E	CHECKED:	JPS
CREATED:	12/03/00	LAST MODIFIED:	9/12/19
PROJECT NO:	090001	MODIFIED BY:	BJJ
SHEET:			
EX2			

MAYBERRY, COLORADO SPRINGS (INTER) FILING NO. 1
STORM SEWER SIZING SUMMARY

F1A flows in Table 2 of Phase 2 Prelim report

PIPE FLOW				PIPE CAPACITY		
PIPE	INLETS / DP	Q5 FLOW (CFS)	Q100 FLOW (CFS)	MIN. PIPE SIZE	MIN. PIPE SLOPE	FULL PIPE CAPACITY (CFS)
C1.2	C1.2	16.9	35.9	30	1.0%	41.0
C1.7A	C1.7A	1.1	2.7	18	1.0%	10.5
C1.7B	C1.7A,C1.7B	9.3	20.0	24	1.0%	22.6
C1.2D	DP-C1.2D	24.0	51.2	36	0.89%	62.9
C1.3	C1.3	5.9	14.3	18	1.9%	14.5
C1.3A	DP-C1.3A	26.3	57.5	36	1.41%	79.2
C1.4	C1.4	6.3	15.3	18	2.2%	15.6
C1.4A	DP-C1.4A	28.6	63.5	36	1.0%	66.7
C1.5	C1.5	6.2	15.0	18	2.1%	15.2
C1.5A	DP-C1.5A	30.6	68.6	36	1.1%	70.0
C1.1	C1.1	5.4	18.0	24	1.0%	22.6
C1.6A	C1.6A	6.0	19.4	24	1.0%	22.6
C1.6B	C1.6B	5.2	12.8	24	1.0%	22.6
C1.6C	DP-C1.7C	31.0	75.5	42	0.8%	90.0
C1.6D	DP-C1.7C	31.0	75.5	42	0.8%	90.0
C1.8	C1.8	7.5	18.4	24	1.0%	22.6
C1.9	C1.9	8.5	20.8	24	1.0%	22.6
C1.9A	DP-C1.7C,C1.9	33.4	81.3	48	0.5%	101.6
C1.9B	DP-C1.9B	35.7	87.0	48	0.5%	101.6
C1.10A	C1.10A	2.1	5.2	18	1.0%	10.5

ASSUMPTIONS:

1. STORM DRAIN PIPE ASSUMED TO BE RCP OR HDPE

MAYBERRY, COLORADO SPRINGS (ELLCOTT TOWN CENTER)
RATIONAL METHOD - HYDROLOGIC CALCULATIONS

Tc of 8.8 mins

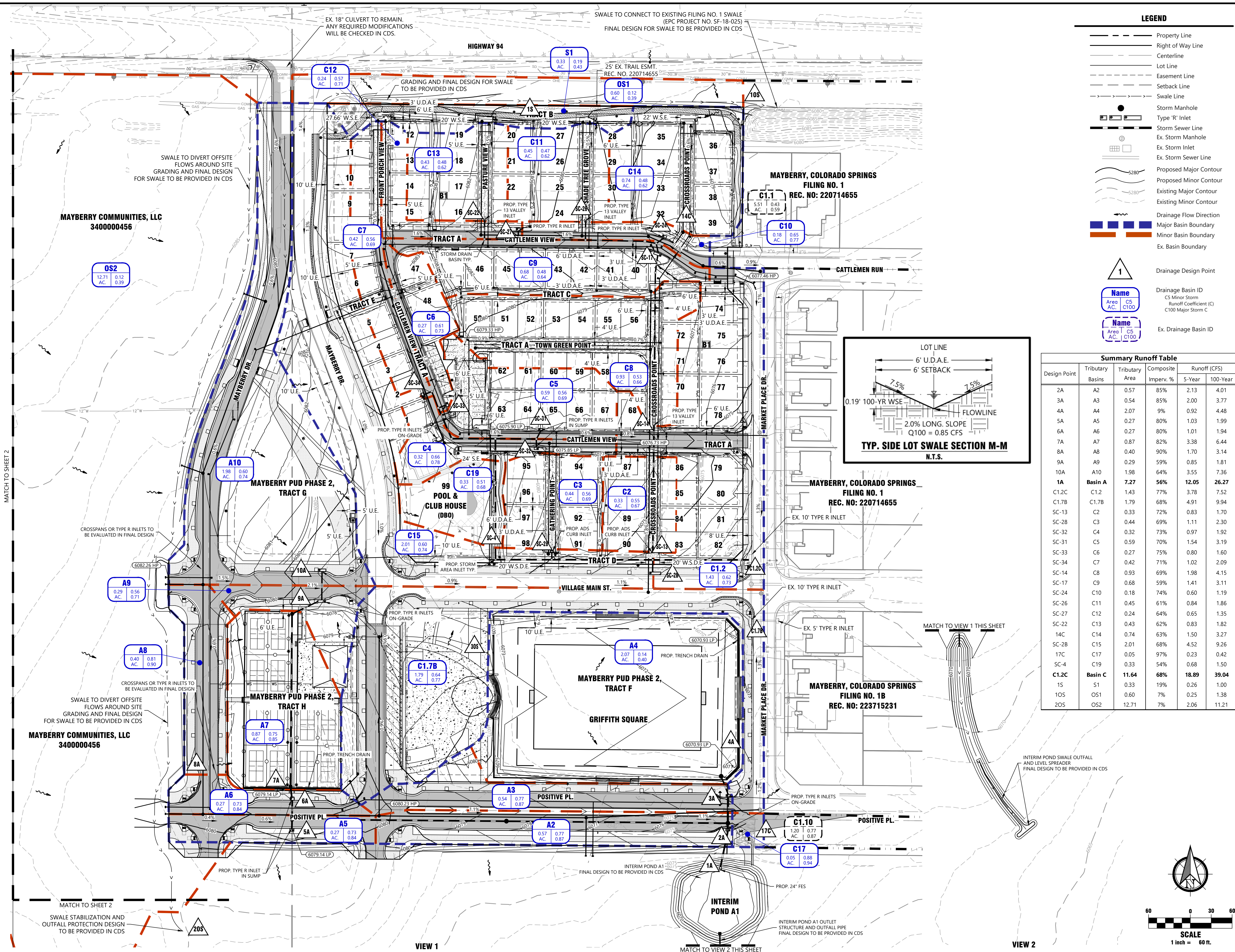
Tc of 12.2 mins

DEVELOPED FLOWS

BASIN	DESIGN POINT	AREA (AC)	C		Overland Flow			Channel flow					TOTAL Tc ⁽⁴⁾ (MIN)	TOTAL Tc ⁽⁴⁾ (MIN)	INTENSITY ⁽⁵⁾		PEAK FLOW	
			5-YEAR	100-YEAR	LENGTH (FT)	SLOPE (FT/FT)	Tco ⁽¹⁾ (MIN)	CHANNEL LENGTH (FT)	CONVEYANCE COEFFICIENT C	SLOPE (FT/FT)	SCS ⁽²⁾ VELOCITY (FT/S)	Tt ⁽³⁾ (MIN)			5-YR (IN/HR)	100-YR (IN/HR)	Q5 ⁽⁶⁾ (CFS)	Q100 ⁽⁶⁾ (CFS)
FILING NO. 1																		
A1A	A1A	2.80	0.355	0.555	40	0.020	6.8	2035	15	0.011	1.57	21.6	28.4	28.4	2.56	4.30	2.55	6.68
C1.2	C1.2	7.97	0.490	0.620			0.0	1000	20	0.009	1.90	8.8	8.8	8.8	4.32	7.26	16.88	35.87
C1.7A	C1.7A	0.58	0.375	0.545			0.0	680	20	0.013	2.28	5.0	5.0	5.0	5.17	8.68	1.12	2.74
C1.7B	C1.7B	4.34	0.490	0.620	100	0.020	8.9	400	20	0.01	2.00	3.3	12.2	12.2	3.83	6.43	8.15	17.31
C1.7A,C1.7B	C1.7B1	4.92	0.476	0.611									12.2	12.2	3.83	6.43	8.97	19.33
C1.2,C1.7	C1.2D	12.89	0.485	0.617									12.2	12.2	3.83	6.43	23.95	51.15
C1.3		3.02	0.375	0.545			0.0	280	20	0.01	2.00	2.3	2.3	5.0	5.17	8.68	5.85	14.29
C1.2,C1.3,C1.7	C1.3A	15.91	0.464	0.603									14.5	14.5	3.57	5.99	26.34	57.47
C1.4		3.23	0.375	0.545			0.0	300	20	0.01	2.00	2.5	2.5	5.0	5.17	8.68	6.26	15.28
C1.2-C1.4,C1.7	C1.4A	19.14	0.449	0.593									17.0	17.0	3.33	5.59	28.62	63.45
C1.5		3.18	0.375	0.545			0.0	300	20	0.01	2.00	2.5	2.5	5.0	5.17	8.68	6.16	15.04
C1.2-C1.5,C1.7	C1.5A	22.32	0.438	0.586									19.5	19.5	3.12	5.25	30.55	68.61
C1.1	C1.1	9.38	0.226	0.447	100	0.017	13.4	1800	20	0.01	2.00	15.0	28.4	28.4	2.56	4.30	5.43	18.04
C1.6		3.01	0.375	0.545			0.0	450	20	0.01	2.00	3.8	3.8	5.0	5.17	8.68	5.83	14.24
C1.1,C1.6	C1.6C	12.39	0.262	0.471									32.2	32.2	2.38	3.99	7.72	23.28
C1.1-C1.7	C1.7C	34.71	0.376	0.545									32.2	32.2	2.38	3.99	31.02	75.46
C1.8		3.89	0.375	0.545			0.0	600	20	0.016	2.53	4.0	4.0	5.0	5.17	8.68	7.54	18.40
C1.9		4.39	0.375	0.545			0.0	580	20	0.012	2.19	4.4	4.4	5.0	5.17	8.68	8.51	20.77
C1.1-C1.7, C1.9	C1.9A	39.10	0.375	0.545				272	20	0.01	2.00	2.3	34.4	34.4	2.27	3.82	33.35	81.34
Tt C1.7C to Pond C1								450	20	0.01	2.00	3.8						
C1.1-C1.9	C1.9B	42.99	0.375	0.545									35.9	35.9	2.21	3.71	35.65	86.95
C1.10	C1.10	1.82	0.375	0.545	50	0.020	7.5	1500	20	0.01	2.00	12.5	20.0	20.0	3.09	5.19	2.11	5.15
C1.1-C1.10	C1.10A	44.81	0.375	0.545									35.9	35.9	2.21	3.71	37.16	90.63

Appendix E. Drainage Plans





LEGEND

- Property Line
- Right of Way Line
- Centerline
- Lot Line
- Easement Line
- Setback Line
- Swale Line
- Storm Manhole
- Type 'R' Inlet
- Storm Sewer Line
- Ex. Storm Manhole
- Ex. Storm Inlet
- Ex. Storm Sewer Line
- Proposed Major Contour
- Proposed Minor Contour
- Existing Major Contour
- Existing Minor Contour
- Drainage Flow Direction
- Major Basin Boundary
- Minor Basin Boundary
- Ex. Basin Boundary
- Drainage Design Point
- Drainage Basin ID
CS Minor Storm
Runoff Coefficient (C)
C100 Major Storm C
- Ex. Drainage Basin ID

Summary Runoff Table						
Design Point	Tributary Basins	Tributary Area	Composite Imperv. %	Runoff (CFS)		
				5-Year	100-Year	
2A	A2	0.57	85%	2.13	4.01	
3A	A3	0.54	85%	2.00	3.77	
4A	A4	2.07	9%	0.92	4.48	
5A	A5	0.27	80%	1.03	1.99	
6A	A6	0.27	80%	1.01	1.94	
7A	A7	0.87	82%	3.38	6.44	
8A	A8	0.40	90%	1.70	3.14	
9A	A9	0.29	59%	0.85	1.81	
10A	A10	1.98	64%	3.55	7.36	
1A	Basin A	7.27	56%	12.05	26.27	
C1.2C	C1.2	1.43	77%	3.78	7.52	
C1.7B	C1.7B	1.79	68%	4.91	9.94	
SC-13	C2	0.33	72%	0.83	1.70	
SC-28	C3	0.44	69%	1.11	2.30	
SC-32	C4	0.32	73%	0.97	1.92	
SC-31	C5	0.59	70%	1.54	3.19	
SC-33	C6	0.27	75%	0.80	1.60	
SC-34	C7	0.42	71%	1.02	2.09	
SC-14	C8	0.93	69%	1.98	4.15	
SC-17	C9	0.68	59%	1.41	3.11	
SC-24	C10	0.18	74%	0.60	1.19	
SC-26	C11	0.25	61%	0.84	1.86	
SC-27	C12	0.24	64%	0.65	1.35	
SC-22	C13	0.43	62%	0.83	1.82	
14C	C14	0.74	63%	1.50	3.27	
SC-2B	C15	2.01	68%	4.52	9.26	
17C	C17	0.05	97%	0.23	0.42	
SC-4	C19	0.33	54%	0.68	1.50	
C1.2C	Basin C	11.64	68%	18.89	39.04	
1S	S1	0.33	19%	0.26	1.00	
10S	OS1	0.60	7%	0.25	1.38	
20S	OS2	12.71	7%	2.06	11.21	

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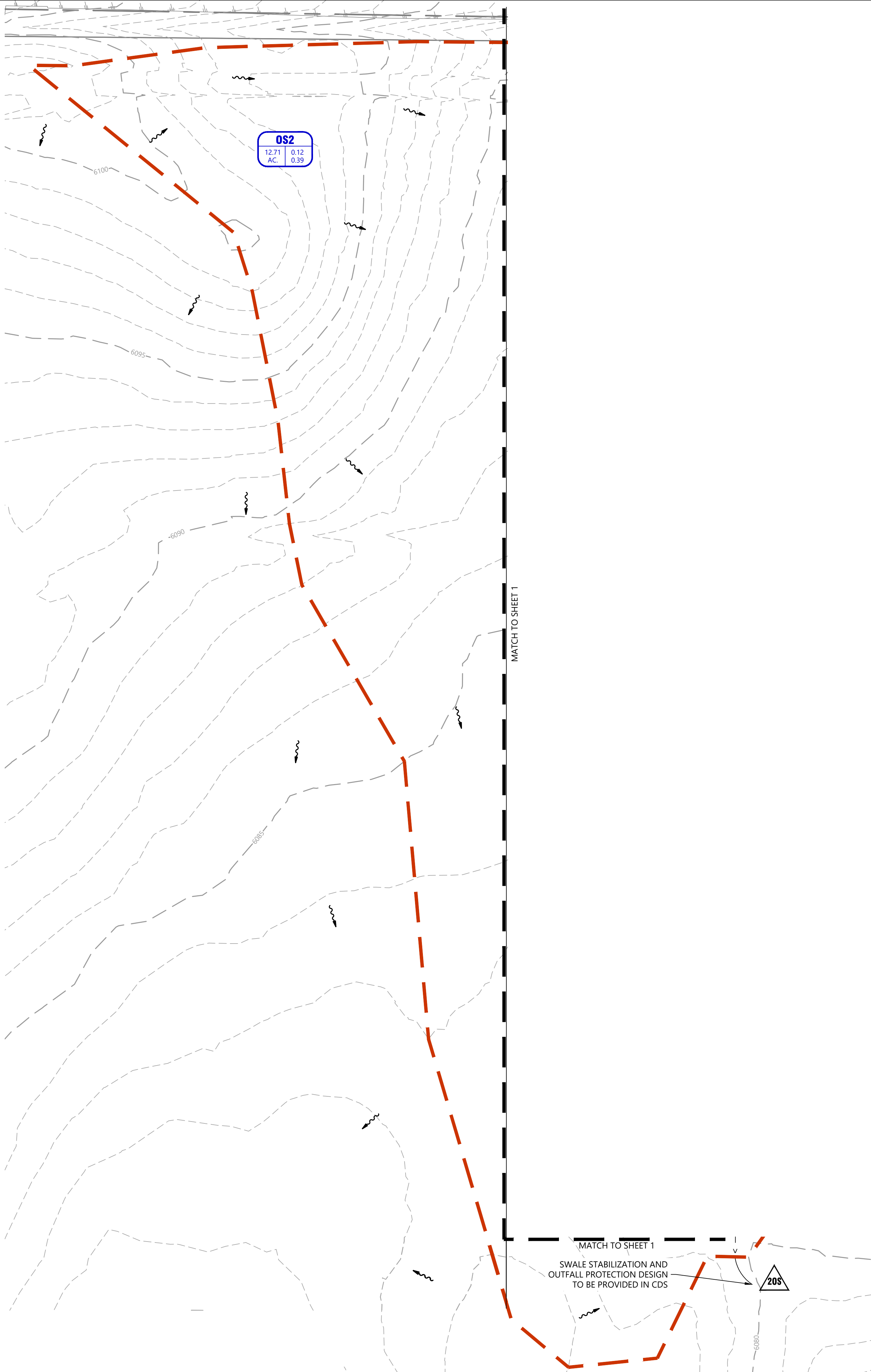
Rev. Date: 1 2 3 4 5 6
Rev. Type: No. 1 of 1
Job No.: 8787-0001
Scale Horiz: 1" = 60'
Scale Vert: N/A
Designed: RNM
Prepared: SCA
Approved: XWL

Mayberry Phase 2
El Paso County, Colorado
Preliminary Drainage Plans
Proposed Drainage Plan

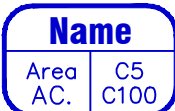
NOT FOR CONSTRUCTION

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No. 1

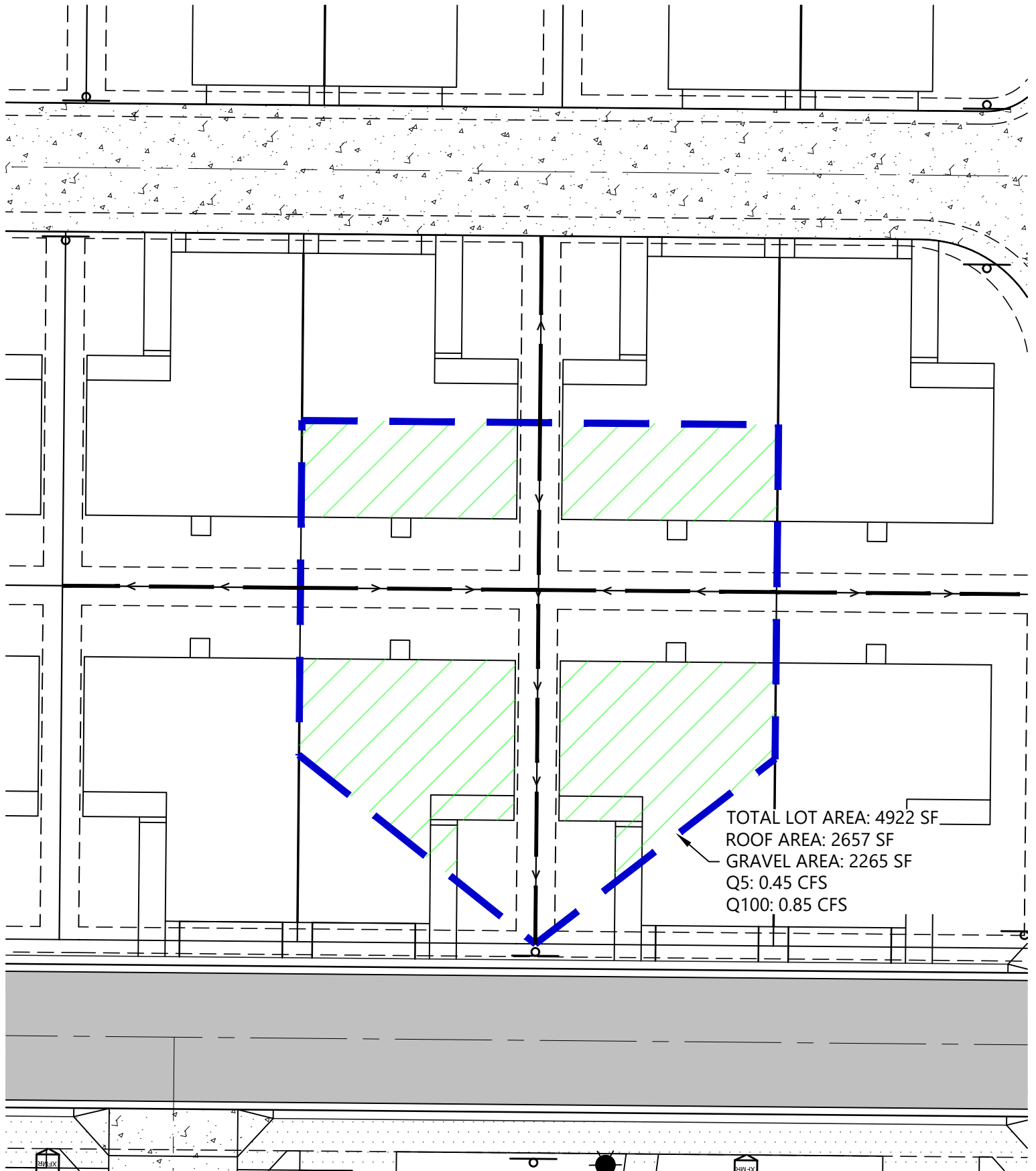


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	Property Line
	Right of Way Line
	Centerline
	Lot Line
	Easement Line
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	Storm Manhole
	Type 'R' Inlet
	Storm Sewer Line
	Ex. Storm Manhole
	Ex. Storm Inlet
	Ex. Storm Sewer Line
	Proposed Major Contour
	Proposed Minor Contour
	Existing Major Contour
	Existing Minor Contour
	Drainage Flow Direction
	Major Basin Boundary
	Minor Basin Boundary
	Ex. Basin Boundary
	Drainage Design Point
	Drainage Basin ID
	C5 Minor Storm
	Runoff Coefficient (C)
	C100 Major Storm C
	Ex. Drainage Basin ID

A compass rose is located at the top center of the map, with an arrow pointing North (N). Below the compass rose is a scale bar marked with 0, 30, and 60 feet. The text "SCALE" and "1 inch = 60 ft." is printed below the scale bar.

 Know what's below. Call before you dig.	NOT FOR CONSTRUCTION		Proj. Name:	Mayberry Phase 2 El Paso County, Colorado Preliminary Drainage Plans Proposed Drainage Plan	No.	Rev. Date:	Revision Type:	
			Location:		1			
			Plan Set:		2			
					3			
					4			
					5			
			Sheet Name:		6			
			Designed:	RNM	Job No.: 8787-0001	Sheet:	1 of 2	
			Prepared:	SCA	Scale Horiz. 1" = 60'	Date:		
			Approved:		Scale Vert. N/A	August 21, 2026		
			1765 W. 121st Avenue Suite 300 Westminster, CO 80234 303-421-4224 • www.lja.com					
								



Worksheet for A to B Lots Swale

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	2.000 %
Discharge	0.85 cfs

Section Definitions

Station (ft)	Elevation (ft)
-0+03	0.23
0+00	0.00
0+03	0.23

Roughness Segment Definitions

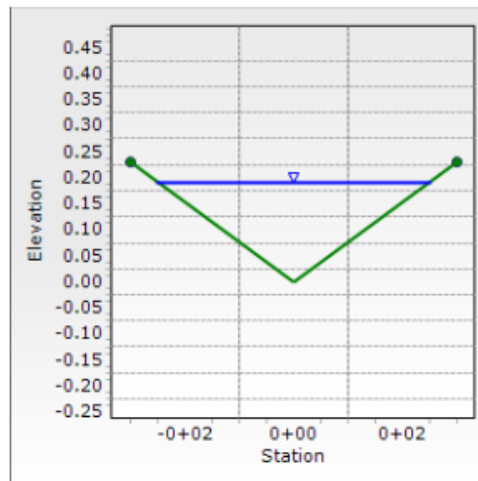
Start Station	Ending Station	Roughness Coefficient
(-0+03, 0.23)	(0+03, 0.23)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	2.3 in
Roughness Coefficient	0.025
Elevation	0.19 ft
Elevation Range	0.00 to 0.23 ft
Flow Area	0.5 ft ²
Wetted Perimeter	5.10 ft
Hydraulic Radius	1.1 in
Top Width	5.09 ft
Normal Depth	2.3 in
Critical Depth	2.3 in
Critical Slope	2.000 %
Velocity	1.75 ft/s
Velocity Head	0.05 ft
Specific Energy	0.24 ft
Froude Number	1.001
Flow Type	Critical



GVF Input Data