

MASTER DEVELOPMENT DRAINAGE PLAN AMENDMENT

For

REAGAN RANCH

Prepared for:

Pikes Peak Investments, LLC
90 South Cascade Avenue, Suite 1500
Colorado Springs, CO 80903
(719) 484-4034

Prepared by:



Matrix

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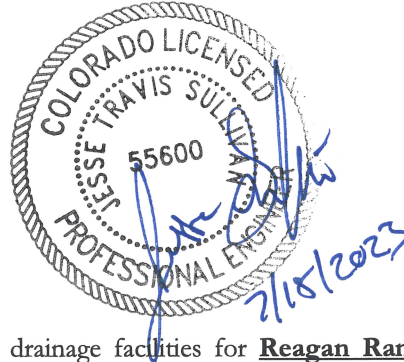
July 2023

Project No. 22.351.005

Engineer's Statement:

This report and plan for the drainage design of **Reagan Ranch** was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report and plan has been prepared in accordance with the City of Colorado Springs Drainage Criteria Manual and is in conformity with the master plan of the drainage basin. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

Jesse Sullivan
Registered Professional Engineer
State of Colorado
No. 55600



Developer's Statement:

Pikes Peak Investments, LLC hereby certifies that the drainage facilities for **Reagan Ranch** shall be constructed according to the design presented in this report. I understand that the City of Colorado Springs does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that are submitted to the City of Colorado Springs pursuant to section 7.7.906 of the City Code; and cannot, on behalf of **Reagan Ranch**, guarantee that final drainage design review will absolve **Pikes Peak Investments, LLC** and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

Pikes Peak Investments, LLC
Business Name

By: Kelly Nelson Date: 7/18/2023
Kelly Nelson

Title: _____
Address: 90 S. Cascade Avenue, Ste. 1500
Colorado Springs, CO 80903

City of Colorado Springs:

Filed in accordance with Section 7.7.906 of the Code of the City of Colorado Springs, 2001, as amended.

Heidi M. McMacken 07/26/23
For the City Engineer Heidi McMacken Date

Conditions:

Applicant represents and warrants that they have the legal authority to grade and/or construct improvements on adjacent property. The City has not reviewed the developer's authority to modify adjacent property.

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INTRODUCTION

A. PURPOSE AND SCOPE OF STUDY

The purpose of this Master Development Drainage Plan Amendment is to update the previously approved **Master Development Drainage Plan Amendment for Reagan Ranch**, prepared by Matrix Design Group, Dated May 2023 (**MDDPA**) (**STM-REV23-0061**), to show the proposed retaining wall located north of Space Village Avenue reflected in the drainage patterns shown in the previously referenced MDDPA, show updated over lot grading and provide an analysis of the existing culvert at Design Point 2 (DP-2) of the MDDP. 41.42 acres of disturbance is associated with this development however, no new disturbed areas are proposed which have not already been covered by recently approved reports.

Please note that the proposed retaining wall is the only improvement included with this report.

B. DRAINAGE CHARACTERISTICS

The addition of the proposed retaining wall will have a minimal effect to the existing drainage characteristics of the site. Stormwater will continue to sheet flow to the south to be collected in a roadside ditch along the north side of Space Village Avenue as in the existing conditions. All areas disturbed as a part of this project will return to a vegetated state upon the completion of the project. A drainage map showing the proposed improvements is included in the attachments.

C. EXISTING STORM SEWER INFRASTRUCTURE

The existing culverts Located at DP-2 of the MDDP have been analyzed to ensure that the existing storm sewer infrastructure can convey the undeveloped runoff from the existing site. There are currently three 30-inch CMP culverts at DP-2, one of which is buried at the downstream end, that are responsible for conveying the predevelopment stormwater runoff under Space Village Avenue. Runoff collected at DP-2 ($Q_5 = 3.8$ cfs, $Q_{100} = 25.8$ cfs) (Sub-basins: C; Area: 24.29 Ac.) includes only the flows from sub-basin C. Stormwater runoff that drains across Highway 94 from the north will continue to flow to the east in the ditch along the north side of Highway 94 toward Design Point 12 (DP-12) and around the site. Based on the culvert analysis included in the appendix of this report, the two unobstructed culverts at DP-2 have the capacity to convey the undeveloped 100-year flows across Space Village Avenue. Culvert capacity calculations can be found in the attachments.

I. Storm Water Quality

Per Chapter 1, Section 4, of the city of Colorado Springs DCM, the DCM requires the MHFD Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainageways, and implementing long-term source controls. Refer to the previously approved MDDPA (STM-REV23-0061) for the Four-Step process of the entire Reagan Ranch Development. The implementation of the four steps outlined in the approved MDDPA will need to be outlined for each phase/region included in the Reagan Ranch development in the respective Final Drainage Reports. The four-step process for this specific development has been completed below.

Step 1: Employ Volume Reduction Practices.

- Where possible runoff will be directed across and through grassed swales, however, please note that this report includes the development of only a single retaining wall with no impervious surfaces proposed. Because there are no proposed impervious surfaces involved with this development, volume reduction practices are not necessary.

Step 2: Implement Control Measures that provide a water quality capture volume with slow release.

- There are no proposed impervious surfaces involved with this development making water quality treatment and detention unnecessary.

Step 3: Stabilize drainageways.

- There are no drainageways within or adjacent to the proposed site.
- All new and re-development projects are required to construct or participate in the funding of channel stabilization measures. Drainage basin fees paid, at the time of platting, go towards channel stabilization within the drainage basin.

Step 4: Implement site specific and other source control measures.

- There are no plans for long term outdoor stockpiling of materials onsite after construction has been completed, therefore, no other source control CCMs are anticipated at this time.
- If long term storage of materials is needed, storage must be stabilized according to City criteria.
- Soil stockpiling will be done in accordance with the approved GEC and City criteria.

II. Fee Development

A. DRAINAGE BASIN FEES

This portion of the Reagan Ranch site is not being platted at this time, so drainage fees are not required.

III. Summary

This report demonstrates that the proposed retaining wall improvements associated with Reagan Ranch is in conformance with the City of Colorado Springs Drainage Criteria Manual, Volumes 1 and 2, May 2021 and all previously approved studies related to the project site. These proposed improvements will not adversely affect downstream or surrounding developments and are in conformance with the pertinent studies for the area.

IV. References

1. *City of Colorado Springs Drainage Criteria Manual Volumes I & II*, City of Colorado Springs, May 2014, and updated December 2021 and May 2022 respectively.
2. *Peterson Field Drainage Basin Master Plan* by Nelson, Haley, Patterson & Quirk, Inc., 1974
3. *Peterson Field Drainage Basin Master Plan Update* by URS, August 1984
4. *Final Drainage Report “Marksheffel Road South” Link Road to US-24* by HDR, April 2015
5. *Final Drainage Report for SDS Water Treatment Plant and Finished Water Pump Station*, by Carollo Engineers, Dated February 2013
6. *Master Development Drainage Plan for Reagan Ranch*, prepared by Matrix, dated February 2021. This is the original MDDP for the Reagan Ranch development.
7. *Master Development Drainage Plan Amendment for Reagan Ranch*, prepared by Matrix, dated May 2023. This is the most recent MDDPA for the Reagan Ranch development.

V. Attachments

Culvert Report

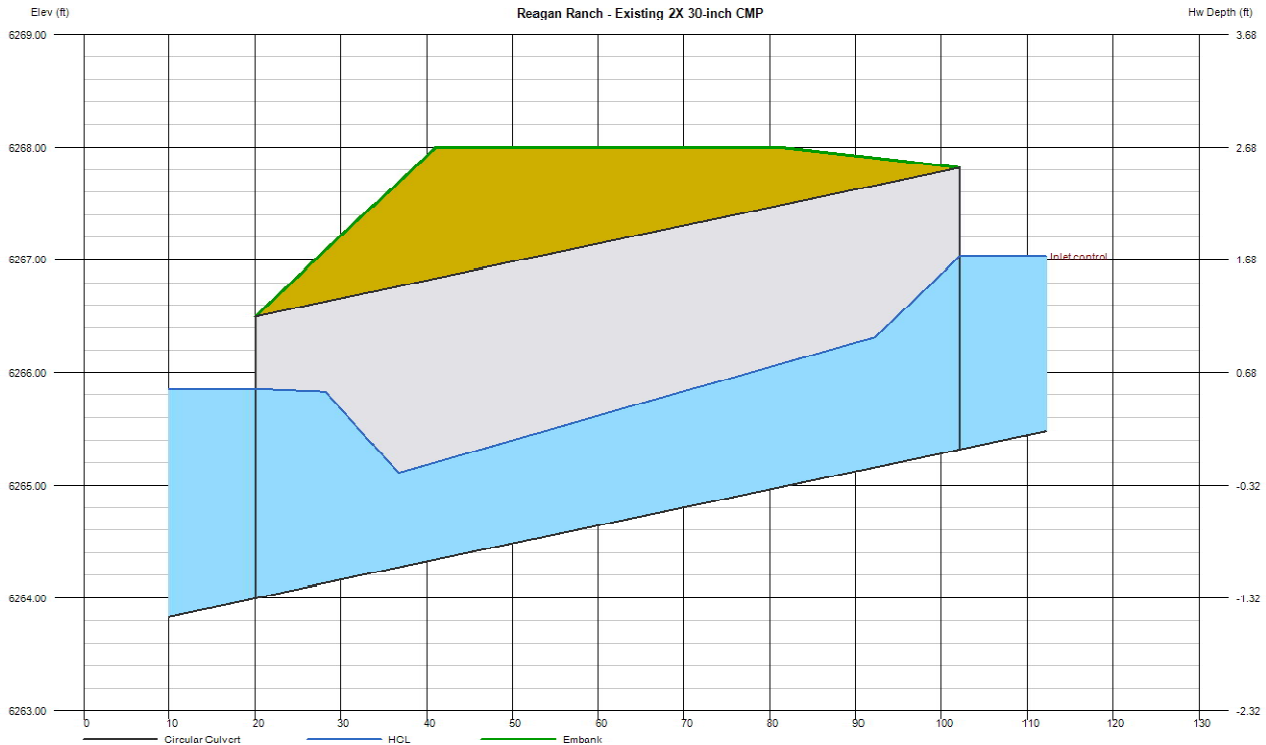
Reagan Ranch - Existing 2X 30-inch CMP

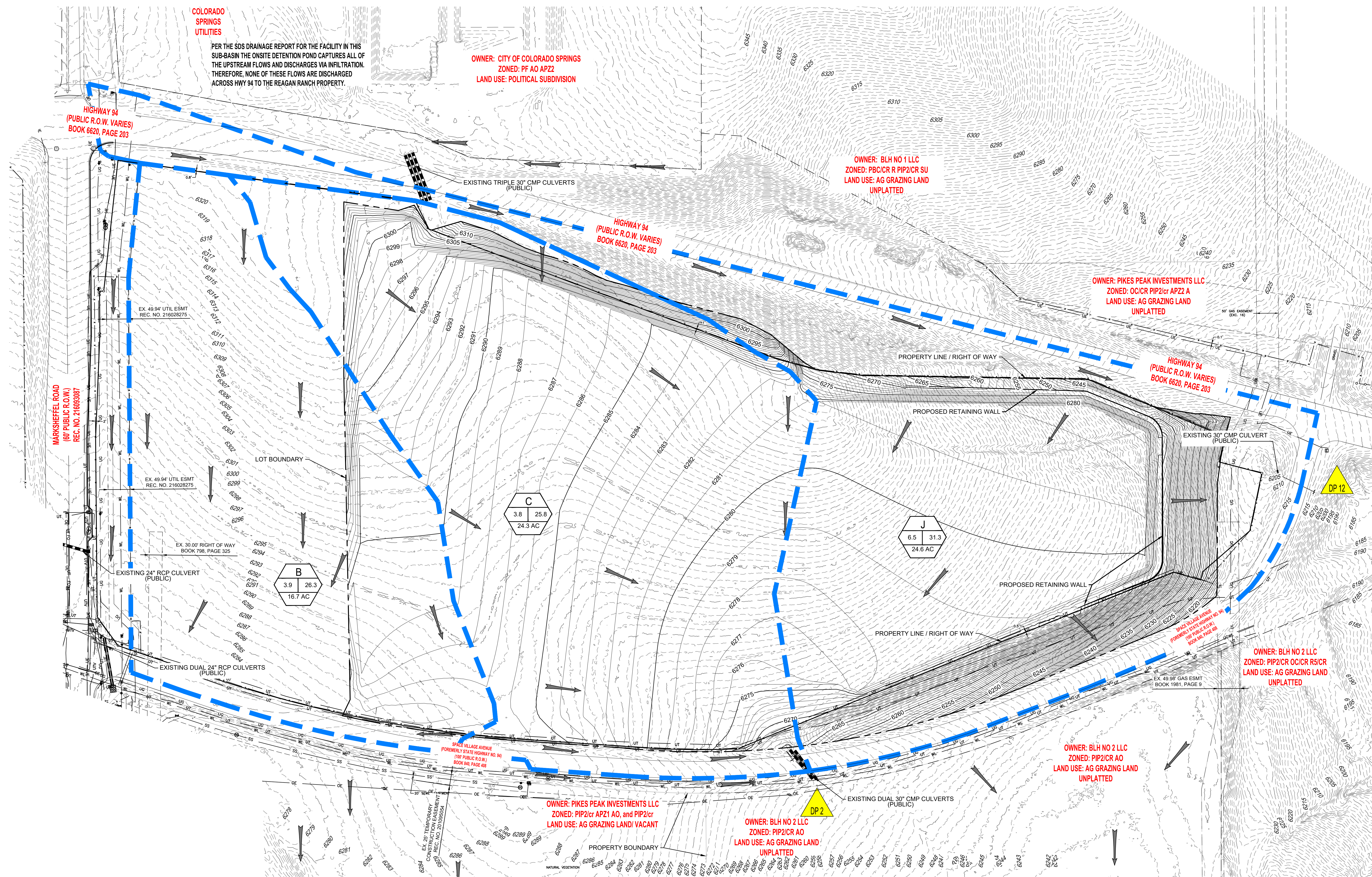
Invert Elev Dn (ft)	= 6264.00
Pipe Length (ft)	= 82.14
Slope (%)	= 1.61
Invert Elev Up (ft)	= 6265.32
Rise (in)	= 30.0
Shape	= Circular
Span (in)	= 30.0
No. Barrels	= 2
n-Value	= 0.012
Culvert Type	= Circular Corrugate Metal Pipe
Culvert Entrance	= Headwall
Coeff. K,M,c,Y,k	= 0.0078, 2, 0.0379, 0.69, 0.5

Embankment	
Top Elevation (ft)	= 6268.00
Top Width (ft)	= 40.00
Crest Width (ft)	= 50.00

Calculations	
Qmin (cfs)	= 25.80
Qmax (cfs)	= 25.80
Tailwater Elev (ft)	= (dc+D)/2

Highlighted	
Qtotal (cfs)	= 25.80
Qpipe (cfs)	= 25.80
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 3.31
Veloc Up (ft/s)	= 5.50
HGL Dn (ft)	= 6265.85
HGL Up (ft)	= 6266.53
Hw Elev (ft)	= 6267.03
Hw/D (ft)	= 0.68
Flow Regime	= Inlet Control

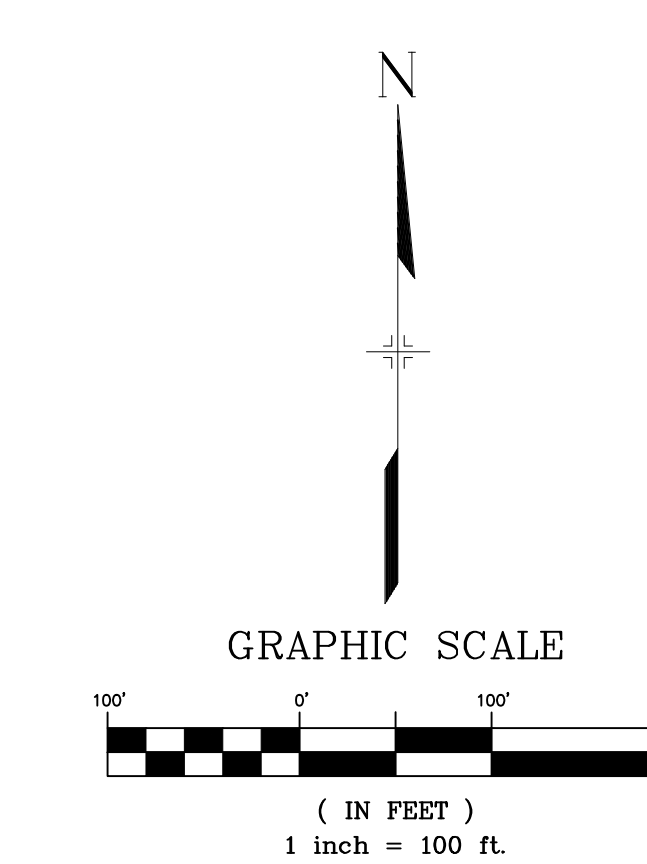




LEGEND

- EX BASIN BOUNDARY
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM DRAIN PIPE
- DRAINAGE CHANNEL
- EXISTING EDGE OF ROAD
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED FLOW DIRECTION

- DESIGN POINT
- SUB BASIN DESIGNATION
- 5-YEAR STORM EVENT PEAK FLOW (CFS)
- 100-YEAR STORM EVENT PEAK FLOW (CFS)
- SUB BASIN AREA (AC.)



REAGAN RANCH MDDP Existing Conditions Basin Summary Table

Area ID	Area (Acres)	Q5 (cfs)	Q100 (cfs)
Basin B	16.72	3.9	26.3
Basin C	24.29	3.8	25.8
Basin J	24.60	6.5	31.3

REAGAN RANCH MDDP Existing Design Point Summary

Design Point	Sub-Basins	Total Area (ac.)	Q(5) (cfs)	Q(100) (cfs)
DP2	Basin C ACROSS SPACE VILLAGE	24.29	3.84	25.84
DP12	Basin J Outfall	29.35	9.38	40.40

- NOTES:**
- NO NEW STORM INFRASTRUCTURE IS PROPOSED.
 - NO NEW IMPERVIOUS SURFACES ARE BEING ADDED.
 - THIS REPORT IS ASSOCIATED WITH THE HIGH PLAINS AT REAGAN RANCH DP.
 - PLEASE SEE THE REAGAN RANCH MDDPA APPROVED MAY 2023, STM-REV23-0061 FOR FURTHER DRAWINGS DESCRIBING FUTURE PROPOSED DEVELOPMENTS FOR REAGAN RANCH. THIS DRAWING IS SHOWING THE WALL WITH PREDEVELOPMENT CONDITIONS TO DEMONSTRATE THAT THE UNDEVELOPED FLOWS/CONDITIONS WILL BE CHANGING MINIMALLY POST WALL CONSTRUCTION.

CITY OF COLORADO SPRINGS
REAGAN RANCH
MDDPA

PROPOSED CONDITIONS DRAINAGE MAP

PRELIMINARY
THIS DRAWING HAS NOT BEEN APPROVED BY GOVERNING AGENCIES AND IS SUBJECT TO CHANGE

FOR AND ON BEHALF OF
MATRIX DESIGN GROUP, INC.
PROJECT No. 22-351-004

DATE ISSUED: JULY 2023
DRAWN BY: WJC
CHECKED BY: JTS

SCALE: 1" = 100'
DATE: NA
1 OF 1

Matrix
Excellence by Design

COMPUTER FILE MANAGEMENT
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THIS DRAWING IS CURRENT AS OF PLOT DATE AND MAY BE SUBJECT TO CHANGE

REVISIONS

NO.	DATE	DESCRIPTION	BY

REFERENCE DRAWINGS

- X:\22-351-004\DWG\220 Drainage\WR222 Reports\MDDPA\DWGDR01.dwg
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