

## MEMORANDUM

DATE: November 30, 2021

TO: Kari Parsons, PCD-Project Manager

FROM: Jeff Rice, PCD-Engineering  
719-520-7877

SUBJECT: SF-21-032– Sterling Ranch Filing No. 3  
First Submittal

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### **Engineering Division**

Planning and Community Development (PCD)-Engineering reviews plans and reports to ensure general conformance with El Paso County standards and criteria. The project engineer is responsible for compliance with all applicable criteria, including other governmental regulations. Notwithstanding anything depicted in the plans in words or graphic representation, all design and construction related to roads, storm drainage and erosion control shall conform to the standards and requirements of the most recent version of the relevant adopted El Paso County standards, including the Land Development Code (LDC), the Engineering Criteria Manual (ECM), the Drainage Criteria Manual (DCM), and the Drainage Criteria Manual Volume 2 (DCM2). Any deviations from regulations and standards must be requested, and approved by the ECM Administrator, in writing. Any modifications necessary to meet overlooked criteria after-the-fact will be entirely the developer's responsibility to rectify.

A written response to all comments and redlines is required for review of the re-submittal. Please arrange a meeting between the developer's team and County staff to review and discuss these comments and prepared revisions/responses prior to the next submittal. Additional comments may be generated on items added or revised after the original comments.

Note: see associated comments and approvals on SP-20-003:

<https://epcdevplanreview.com/Public/ProjectComments/162868>

This project: <https://epcdevplanreview.com/Public/ProjectComments/174777>

Sand Creek Channel CDR-20-004:

<https://epcdevplanreview.com/Public/ProjectComments/152502>

Marksheffel, Vollmer, and Sterling Ranch Roads:

<https://epcdevplanreview.com/Public/ProjectComments/152663>

### General / Letter of Intent

1. See minor LOI redlines.
2. Note: a channel maintenance agreement will be needed for Tract B. Staff will provide a draft agreement.
3. Note: This final plat is dependent on approval and construction of Sterling Ranch Filing No. 2 and CDR-20-005. Conditions of approval will be written accordingly, such as this draft condition: "Access to Sterling Ranch Filing No. 3 requires construction of Sterling Ranch Road and the other roads within and associated with Sterling Ranch Filing No. 2, which construction shall be complete or collateral provided for the incomplete portions prior to recording the Sterling Ranch Filing No. 3 final plat."

### Final Plat

1. See final plat redlines.  
**JR Response: Addressed**
2. Add a plat note addressing the retaining wall easement along the rear lot lines of Lots 31 and 38-43 including the responsible maintenance entity and access.  
**JR Response: Wall removed**

### Transportation / Traffic Impact Study

1. Address Table 4, items 7 and 9 from the Sterling Ranch Filing No. 2 and Sterling Ranch Phase 2 TIS.
2. Add the following or equivalent statement to the Recommended Improvements section: "An eastbound right-turn deceleration lane will not be required on Sterling Ranch Road approaching Dines Boulevard per TIS dated June 23, 2021 (SF-20-015 and SP-19-001)."

### Final Drainage Report / Drainage Plans

1. See FDR redlines.  
**JR Response: Noted**
2. Grading is proposed in the floodplain at the northeast corner of the site (and would be required to protect lots east of Dines Blvd. Provide bank stabilization in this area and along the proposed access road next to Sand Creek. An alternative would be not to plat lots or grade next to Sand Creek east of Dines Blvd. until bridge and channel construction has begun.  
**JR Response: Grading along the floodplain was revised .**
3. Address drainage over or along the retaining wall along the rear lot lines of Lots 31 and 38-43 (drainage from these lots and upstream areas). Provide detailed grading and retaining wall details.  
**JR Response: Wall removed**
4. Provide drainage easements over the proposed storm drain system on the southeast side of the plat.  
**JR Response: Added**
5. Provide a Water Quality treatment plan (map) highlighting the areas contributing to each water quality facility.  
**JR Response : Map provided in Appendix E**
6. Provide discussion of maintenance access to the channel.  
**JR Response: See BMP step 4**
7. The drainage fee narrative will need additional information regarding improvements that have been constructed or collateralized with other filings to offset drainage fees, if applicable.  
**JR Response: Addressed**

### Construction Plans / Geotechnical Issues / Grading and Erosion Control Plan / SWMP

1. Clearly show and label all required offsite easements. Provide permission/easement documentation or reception numbers.  
**JR Response: Addressed**
2. Revise pipe size/slope or provide a deviation request with adequate justification and specifications for watertight pressure pipe (ECM 3.3.1.D - exceeding short runs with a pressure head) where applicable.  
**JR Response: Pipe size enlarged**
3. Clearly show and label all maintenance access roads and trails on the plans.  
**JR Response: Addressed**

4. Geotechnical issues:
  - a. Provide the necessary additional geotechnical study for final design.
  - b. Address channel improvements and fill along the creek.
  - c. Note: a pavement design will be required once roads have been rough graded.  
**JR Response: Addressed, latest geotech study referenced.**
5. If there will be USPS mail kiosk/cluster(s) in this subdivision provide location(s) and details.  
**JR Response: Addressed, mail kiosk added to street signage plan.**
6. Provide easements and details for proposed retaining walls.  
**JR Response: Addressed**
7. Provide cross-sections for the trails/maintenance access roads along Sand Creek  
**JR Response: Addressed**
8. Ensure that road design and grades will meet ECM Chapter 6 criteria at pedestrian crossings at stop conditions. At least one location of concern has been redlined on the CDs.  
**JR Response: Addressed**
9. See CD and GEC Plan redlines.  
**JR Response: Addressed**
10. Note: Per the Marksheffel Road IGA: The District shall construct the Marksheffel Road Segment M2 between Sterling Ranch Road and the City boundary within three (3) years of recording of the final plat for Sterling Ranch Filing No. 2 or within twelve (12) months of recording of a final plat for the property adjacent to that portion of the Marksheffel Road Segment, whichever occurs sooner. It is recommended that construction plans for that segment of Marksheffel Road be submitted for review to allow time for the review process prior to the required construction date.  
**JR Response: Noted**
11. Provide an informational profile along the gas main through the plat area showing cover and crossings.
12. **JR Response: Addressed, gas profile added**

#### Forms / SIA / Surety Estimate Form

1. Note: FAE quantities and costs will be reviewed in detail with the next submittal. Cursory comments:
  - a. Provide temporary sediment basins (at least one appears to be needed).
  - b. Provide channel bank stabilization in Section 1 (per GEC plan)
  - c. Provide trails, open space sidewalk (4" if not used for traffic), and maintenance roads.
  - d. Provide grass-lined channel quantity for the temporary swale.  
**JR Response: Noted, a temporary sediment basin should not be needed as it drains to pond W-5, erosion control blanket added, FAE updated.**
2. See attached Engineering Final Submittal Checklist for reference.  
**JR Response: Addressed**

#### Attachments/Electronic Files

1. Letter of Intent redlines
2. Final Plat redlines
3. Final Drainage Report redlines
4. CD redlines
5. GEC Plan redlines
6. ESQCP redlines
7. Engineering Final Submittal Checklist

Engineering Final Submittal Checklist	
Check Box	Item: Report/Form
<input type="checkbox"/>	Drainage Report (signed)
<input type="checkbox"/>	PBMP Applicability Form
<input type="checkbox"/>	Traffic Impact Study (signed)
<input type="checkbox"/>	Grading & Erosion Control Plan <b>and checklist</b> (signed)
<input type="checkbox"/>	Street Construction Plans (signed)
<input checked="" type="checkbox"/>	Deviation Request (signed)
<input checked="" type="checkbox"/>	MS4 Post Construction Form and SDI worksheet
<input checked="" type="checkbox"/>	Proof of embankment/pond submittal to State Engineer
<input type="checkbox"/>	ESQCP (signed)
<input type="checkbox"/>	* Financial Assurance Estimate, SIA (signed)
<input checked="" type="checkbox"/>	* Pond/BMP <b>and Channel</b> Maint. Agreements and Easement (signed)
<input checked="" type="checkbox"/>	* Operation & Maintenance Manual
<input type="checkbox"/>	AutoCAD base drawing (submitted to DPW)
<input type="checkbox"/>	Pre-Development Site Grading Acknowledgement and Right of Access Form (signed)
<input type="checkbox"/>	Other: <u>Offsite Easements, Other Permits (FEMA LOMR, USACE, Floodplain...), Conditions of Approval, <b>Street light license agreement</b>, etc.</u>
Pre-Construction Checklist:	
<input type="checkbox"/>	Driveway/Access Permit (Temporary access permits to be obtained from EPC DPW)
<input type="checkbox"/>	Work Within the ROW Permit (DPW or CDOT)
<input type="checkbox"/>	* Stormwater Management Plan (SWMP) <b>and checklist</b> Submit to PCD-Inspections 2 weeks prior to precon.
<input type="checkbox"/>	* Colorado Discharge Permit (COR: _____ )
<input type="checkbox"/>	* County Construction Activity Permit
<input type="checkbox"/>	* CDPHE APEN – (if over 25 ac. or 6 mos.)
<input type="checkbox"/>	* Financial Surety (Letter of Credit/Bond/Collateral/Check)
<input type="checkbox"/>	Construction Permit Fee: <i>Major Final Plat (CO and/or PBMPs and/or offsite impvts.)</i> \$ _____ (Verify fees with Inspections Supervisor at time of scheduling)
<input type="checkbox"/>	Other: <u>Dewatering Permit,</u> _____

\* - required items to obtain an ESQCP

Permit Fee and Collateral must be separate checks

Post Construction Submittal Checklist: (ECM 5.10.6)	
<input type="checkbox"/>	As-Built Drawings
<input type="checkbox"/>	Pond Certification Letter
<input type="checkbox"/>	Acceptance Letter for wet utilities

-  = Need final / signed version

-  = complete, in file

-  = PCD Staff to provide

-  = Undetermined at this time

-  = Need later

**FINAL DRAINAGE REPORT  
FOR  
STERLING RANCH FILING 3**

**Engineering Review**

11/24/2021 2:17:29 PM

*dsdrice*

JeffRice@elpasoco.com

(719) 520-7877

**EPC Planning & Community  
Development Department**

[See comment letter also](#)

**Prepared For:**

**SR Land, LLC  
20 Boulder Crescent, Suite 200  
Colorado Springs, CO 80903  
(719) 491-3024**

**June 2021**

**Project No. 25188.02**

**SP-20-003**

**Prepared By:**

**JR Engineering, LLC  
5475 Tech Center Drive, Suite 235  
Colorado Springs, CO 80919  
719-593-2593**

**ENGINEER'S STATEMENT:**

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

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Mike Bramlett, Colorado P.E. 38861  
For and On Behalf of JR Engineering, LLC

**DEVELOPER'S STATEMENT:**

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

Business Name: SR Land, LLC

By: \_\_\_\_\_

Title: \_\_\_\_\_

Address: 20 Boulder Crescent, Suite 200  
Colorado Springs, CO 80903

**El Paso County:**

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

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Jennifer Irvine, P.E.  
County Engineer/ ECM Administrator

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Date

Conditions:



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### APPENDIX

- Appendix A – Vicinity Map, Soil Descriptions, FEMA Floodplain Map
- Appendix B – Hydrologic and Hydraulic Calculations
- Appendix C – Reference Material
- Appendix D – Drainage Maps

## PURPOSE

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This document is the Final Drainage Report for Sterling Ranch Filing 3. The purpose of this report is to identify on-site and off-site drainage patterns, storm sewer, culvert and inlet locations, areas tributary to the site, and to safely route developed storm water to adequate outfall facilities.

## GENERAL SITE DESCRIPTION

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### GENERAL LOCATION

Sterling Ranch Filing 3 (hereby referred to as the “site”) is a proposed development within the Sterling Ranch master planned community with a total area of approximately 19.5 acres that are presently undeveloped.

The site is located in portions of the southwest quarter of Section 33, Township 12 South, Range 65 West of the Sixth Principal Meridian in El Paso County, State of Colorado. The site is bounded by Un-platted land to the south and west, Sterling Ranch Road to the north, and Sand Creek borders the site to east. Refer to the vicinity map in Appendix A for additional information.

### DESCRIPTION OF PROPERTY

The property will be primarily be single-family residential development (approximately 12 acres), as well as open space and drainage tracts (approximately 7.5 acres). The site is comprised of variable sloping grasslands that generally slope(s) downward to the southeast at 3 to 8% towards the Sand Creek tributary basin.

Pawnee  
Rancheros Filing 2  
and southwest toward existing Pond W-5  
(constructed with Sterling Ranch Filing No. 2)

JR Response: Updated

Soil characteristics are comprised of Type A and B hydrologic Soil groups. Refer to the soil survey map in Appendix A for additional information.

JR Response: Text added

There are no major drainage ways running through the site, although a tributary to the Sand Creek basin is immediately to the east of the site. Currently, JR Engineering is performing studies and plans to address Sand Creek stabilization.

There are no known irrigation facilities located on the project site.

### FLOODPLAIN STATEMENT

Based on the FEMA FIRM Maps number 08041C0533G, dated December 7, 2018, the far eastern portion of the project site that is adjacent to the existing drainage way lies within Zone AE. Zone AE is defined as area subject to inundation by the 1-percent-annual-chance flood event. The majority of the proposed development lies within Zone X. Zone X is defined as area outside the Special Flood Hazard Area (SFHA) and higher than the elevation of the 0.2-percent-annual-chance (or 500-year)



flood. No grading operations are proposed within the Zone AE at this time. FIRM Maps have been presented in Appendix A.

GEC Plan shows grading

JR Response: Text added "Grading is proposed in the floodplain at the northeast corner of the site to protect lots east of Dines Blvd". Lots within tract C will be platted after construction of the bridge and channel are complete

## EXISTING DRAINAGE CONDI

### MAJOR BASIN DESCRIPTIONS

The site lies within the Sand Creek Drainage Basin based on the "Sand Creek Drainage Basin Planning Study" (DBPS) completed by Kiowa Engineering Corporation in January 1993, revised March 1996. The Sand Creek Drainage Basin covers approximately 54 square miles and is divided into major sub-basins. The site is within the respective sub-basin is shown in Appendix E.

The Sand Creek DBPS assumed the Sterling Ranch Phase 2 property to have a "large lot residential" use for the majority of the site. The Sterling Ranch MDDP assumed a mix of commercial and single family residential lots ranging in size from 0.2 to 0.3 acres for the Sterling Ranch Phase 2 site. The proposed Sterling Ranch master plan is a mix of; school, multi-family, single-family, and commercial land uses, resulting in higher runoff. Any additional runoff will be provided for with the extended detention basin located at the southern edge of the site. The site generally drains from north to south consisting of rolling hills. Currently, the site is used as pasture land for cattle. Sand Creek is located east of the site running north to south. This reach of drainage conveyance is not currently improved. There are a few stock ponds within the creek channel used for cattle watering. Currently, JR Engineering is performing studies and plans to address Sand Creek stabilization adjacent to the site.

The proposed drainage on the site closely follows the approved "Master Development Drainage Plan for Sterling Ranch", (MDDP) prepared by M&S Civil Consultants, Inc., dated October 24, 2018. The site is tributary to Pond W5 and full-spectrum detention for the site was previously analyzed and can be found in the Final Drainage Report for Sterling Ranch Filing 2.

### EXISTING SUB-BASIN DRAINAGE

The existing / predeveloped condition of the site was broken into two major basins: Basin A (western portion) and Basin B (Eastern Portion), as well as an offsite basin. The basin and sub-basin delineation is shown in the existing drainage map in Appendix E and is described as follows:

Sub-basin A1(Q<sub>5</sub>= 1.1cfs, Q<sub>100</sub>=8.0cfs) is 5.17 acres and 0 percent impervious consists of the eastern portion of Sterling Ranch phase 2. Runoff from the existing storm sewer built with Filing 2 just east of the site is collected and piped south to the existing detention pond built with Filing 2 and outfalls to Sand Creek.

JR Response: "this basin is east of the Sterling Ranch Filing 3 site"



Sub-basin A2 ( $Q_5= 4.6\text{cfs}$ ,  $Q_{100}=33.6\text{cfs}$ ) is 27.48 acres and 0 percent impervious and consists the central portion of Sterling Ranch Phase 2. Runoff from this basin drains south onsite into the assumed existing storm sewer built with Filing 2 located at design point 2. Collected runoff is piped south to the existing detention pond built with Filing 2 and outfalls to Sand Creek.

Sub-basin B1 ( $Q_5= 2.6\text{cfs}$ ,  $Q_{100}=19.0\text{cfs}$ ) is 11.78 and is 0 percent impervious and is located on the eastern portion of the site portion of the site. Runoff from this basin drains to the southeast into Sand Creek at design point 4.

Sub-basin OS1 ( $Q_5= 13.4\text{cfs}$ ,  $Q_{100}=29.8\text{cfs}$ ) is 9.27 acres is 30.7 percent impervious and is located to the east of the site. Runoff from this basin drains into the Sterling Ranch Filing 2 detention Pond in confluence with upstream flows from the eastern portion of Sub-basin A2. Collected runoff is piped south to the

JR Response: "This basin is located south of the Sterling Ranch Filing 3 site"

and outfalls to Sand Creek.

## PROPOSED DRAINAGE CONDITIONS

### PROPOSED SUB-BASIN DRAINAGE

The proposed site was broken into three major basins: Basin A and I (western-portion), Basin B (eastern-portion) and Basin D (offsite eastern-portion) of the site. The proposed basin (and sub-basin) delineation is shown on the drainage basin map within Appendix E and is described as follows.

**Basin A1** ( $Q_5= 8.1\text{cfs}$ ,  $Q_{100}=17.4\text{cfs}$ ) is 4.31 acres and 63 percent impervious and is comprised of single-family residential lots, and a local road. Runoff from this basin drains to design point 15, a type R on grade inlet at the southwest corner of the basin.

JR Response: Text updated

**Basin A5** ( $Q_5= 1.4\text{cfs}$ ,  $Q_{100}=2.9\text{cfs}$ ) is 0.45 acres and 78 percent impervious is comprised of single-family residential lots and a local road. Runoff from this basin drains to design point 16, a type R on grade inlet at design point 16.

JR Response: Inlet sizes provided

provide sizes of all inlets

future

**Basin B1** ( $Q_5= 6.2\text{cfs}$ ,  $Q_{100}=12.0\text{cfs}$ ) is 2.44 acres and 80 percent impervious is comprised of single-family residential lots, local roads, two urban knuckles, and a cul-de-sac. The runoff from basin B1 drains to a type R sump inlet located at design point 13.

**Basin B2** ( $Q_5= 9.1\text{cfs}$ ,  $Q_{100}=18.7\text{cfs}$ ) is 4.33 acres and 73 percent impervious is comprised of single family residential lots. Runoff from basin B2 drains to a type R sump inlet located at design point 12.

**Basin B3** ( $Q_5= 1.4\text{cfs}$ ,  $Q_{100}=2.8\text{cfs}$ ) is 0.66 acres and 63 percent impervious is comprised of open space and sidewalk. Runoff from basin B3 drains to a 15' type R on grade inlet located at design



Discuss here or in the Water Quality section the acreage of disturbed areas that will not be captured by the PBMP (the existing pond) and which exclusions apply to these two basins and others that may be applicable. Complete a PBMP Form to further document.

point 9 in existing Sterling Ranch Road. All of the runoff is captured in the 100 year event. Runoff from this sump inlet is piped and outfalls into pond W-5.

**Basin B4** ( $Q_5= 2.1\text{cfs}$ ,  $Q_{100}=5.0\text{cfs}$ ) is 1.55 acres and 57 percent impervious is comprised of single family residential lots and open space. Runoff from basin B4 drains to a rear lot area inlet at DP 10.

JR Response:  
Text Updated

more than 1?

**Basin B5** ( $Q_5=0.7\text{cfs}$ ,  $Q_{100}=1.7\text{cfs}$ ) is 0.45 acres and 51 percent impervious is comprised of single family residential lots and open space. Runoff from basin B4 drains to a rear lot area inlet at DP 11.

**Basin B6** ( $Q_5=0.8\text{cfs}$ ,  $Q_{100}=$  JR Response: Size provided) percent impervious is comprised of single family residential lots and open space. Runoff from basin B4 drains to a rear lot area inlet at DP 14.

provide inlet sizes

**Basin D1** ( $Q_5= 0.3\text{cfs}$ ,  $Q_{100}=1.9\text{cfs}$ ) is 0.77 acres and 0 percent impervious is comprised of open space area. Runoff from basin D1 sheet flow to the, so JR Response: Impervious values updated to Sandcreek as per the historic condition. Flows generated from this JR Response: Text added " the runoff is not treated and drains directly into Sand Creek" gn point 28

address outfall design

**Basin D2** ( $Q_5= 1.4\text{cfs}$ ,  $Q_{100}=10.2\text{ cfs}$ ) is 3.92 acres and 0 percent impervious is comprised space area. Runoff from basin D1 sheet flow to the JR Response: Impervious values updated the condition. Flows generated from this basin have been

and trail/access roads

**Basin I1** ( $Q_5= 4.4\text{ cfs}$ ,  $Q_{100}$  JR Response: Text updated) percent impervious is comprised of open space. The runoff from this basin sheet flows generally to the south and east into a temporary drainage channel where it is conveyed to an existing storm stub at design point I1.

**Basin I2** ( $Q_5= 0.7\text{cfs}$ ,  $Q_{100}=4.9\text{cfs}$ ) 3.47 acres and 0 percent impervious is comprised of open space. The runoff from this basin sheet flows to the south and east into an existing drainage swale where it eventually enters an existing storm stub provided from the Sterling Ranch Filing No 2. Project.

## DRAINAGE DESIGN CRITERIA

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### DEVELOPMENT CRITERIA REFERENCE

Storm drainage analysis and design criteria for this project were taken from the “*City of Colorado Springs/El Paso County Drainage Criteria Manual*” Volumes 1 and 2 (EPCDCM), dated October 12, 1994, the “*Urban Storm Drainage Criteria Manual*” Volumes 1 to 3 (USDCM) and Chapter 6 and Section 3.2.1 of Chapter 13 of the “*Colorado Springs Drainage Criteria Manual*” (CSDCM), dated May 2014, as adopted by El Paso County.

**HYDROLOGIC CRITERIA**

All hydrologic data was obtained from the “*El Paso Drainage Criteria Manual*” Volumes 1 and 2, and the “*Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual*” Volumes 1, 2, and 3. Onsite drainage improvements were designed based on the 5 year (minor) storm event and the 100-year (major) storm event. Runoff was calculated using the Rational Method, and rainfall intensities for the 5-year and the 100-year storm return frequencies were obtained from Table 6-2 of the EPCSDCM. One hour point rainfall data for the storm events is identified in the chart below. Runoff coefficients were determined based on proposed land use and from data in Table 6-6 from the EPCSDCM. Time of concentrations were developed using equations from EPCSDCM. All runoff calculations and applicable charts and graphs are included in the Appendices.

**Table 2 - 1-hr Point Rainfall Data**

Storm	Rainfall (in.)
5-year	1.50
100-year	2.52

**HYDRAULIC CRITERIA**

JR Response: Calculation added see Appendix C

The Rational Method and USDCM’s SF-2 and SF-3 forms were used for the minor and major storms on the site. Sump and on-grade inlets were sized using UDFCD UD-Inlet v4.05. Autodesk Hydraflow express was used to size the overflow channel and an interim swale. Using Storm StormCAD V8i, a modeling program for stormwater drainage, the hydraulic grade lines and energy grade lines were determined for the storm sewer network. Manhole and pipe losses for the model were obtained from the *Modeling Hydraulic and Energy Gradients in Storm Sewers: A Comparison of Computation Methods*, by AMEC Earth & Environmental, Inc. The manhole loss coefficients used in the model can be seen in Table 2. StormCAD results along with street and inlet capacities are presented in Appendix C.

**Table 2 - StormCAD Standard Method Conversions**

StormCAD Conversion Table			
Bend Loss	Bend Angle	K coefficient Conversion	
	0	0.05	
	22.5	0.1	
	45	0.4	
	60	0.64	
	90	1.32	
Lateral Loss	1 Lateral K coefficient Conversion		
	Bend Angle	Non Surcharged	Surcharged
	45	0.27	0.47
	60	0.52	0.9
	90	1.02	1.77
	2 Laterals K coefficient Conversion		
	45	0.96	
60	1.16		
	90	1.52	

See comment  
letter.

## DRAINAGE FACILITY DESIGN

### GENERAL CONCEPT

The proposed stormwater conveyance system was designed to convey the developed Sterling Ranch Filing 3 runoff to an existing (Filing 2) full spectrum water quality and detention pond via storm sewer and swale. The proposed pond was designed to release at less than historic rates to minimize adverse impacts downstream. Treated water will outfall directly into the Sand Creek Drainage way, where it will eventually outfall into Fountain Creek. A proposed drainage map is presented in Appendix E showing locations of the pond. JR Engineering is working on a separate plan to stabilize Sand Creek directly adjacent to the site.

Revise section headings and subsequent headings per ECM Section I.7.2 BMP Selection)

### FOUR STEP PROCESS TO MINIMIZE ADVERSE IMPACTS OF URBANIZATION

In accordance with the El Paso County Drainage Criteria Manual Volume 2, this site has implemented the four step process to minimize adverse impacts of urbanization. The four step process includes reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainage ways, and implementing long-term source controls.

Step 1 – Reducing Runoff Volumes: The site consists of single-family homes with open spaces and areas that which helps disconnect impervious areas and reduces runoff. Measures will discharge to lawn areas, where feasible, to allow for infiltration and runoff volume reduction.

JR Response: The text has been updated with the current heading within the Engineering Manual County of El Paso, Colorado Appendix I, Section 7.2

Step 2 – Stabilize Drainageways: The site lies within the Sand Creek Drainage Basin. Basin and bridge fees will be due at time of platting. These funds will be used for the channel stabilization being designed by JR Engineering adjacent to the site and on future projects within the basin to stabilize drainageways. The site does not discharge directly into the open drainageway of Sand Creek, therefore no downstream stabilization will be accomplished with this project.

Step 3 – Treat the WQCV: Water Quality treatment for this site is provided in an existing full spectrum water quality detention pond (W5). The runoff from this site will be collected within inlets and conveyed to the proposed ponds via storm sewer and swale. Upon entrance to the ponds, flows will be captured in a forebay designed to promote settlement of suspended solids. A trickle channel is also incorporated into the ponds to minimize the amount of standing water. The outlet structure has been designed to detain the water quality capture volume (WQCV) for 40 hours, and the extended urban runoff volume (EURV) for 72 hours. All flows released from the ponds will be reduced to less than historic rates.

Step 4 –BMPs will be utilized to minimize off-site contaminants and to protect the downstream receiving waters. The permanent erosion control BMPs include asphalt drives and parking, storm



inlets and storm pipe, the full spectrum detention pond W-5 and permanent vegetation. Maintenance responsibilities and plans will be defined at the time of final platting.

for Pond W5 were provided with Filing 2. A channel maintenance

**WATER QUALITY** agreement for Sand Creek will be provided with Filing 3.

In accordance with Section 13.3.2.1 of the CCS/EPCDCM, full JR Response: Text updated tion are provided for all developed basins. This site will drain into an existing Full Spectrum Drainage Pond W5 developed during the Sterling Ranch Filing No. 2 Project. Further details as well as all pond volume, water quality, and outfall calculations are included in the Sterling Ranch Filing 2 Final Drainage Report. Pond W5 corresponds to pond FSD6 from the Master Development Drainage Plan for Sterling Ranch", (MMDP) prepared by M&S Civil Consultants, Inc., dated October 24, 2018. (Q<sub>5</sub>=7.6 cfs, Q<sub>100</sub>=149.7 cfs) and is releasing less than the MDDP values in the proposed design. A summary of Pond W-5 has been included below for reference.

**Table 3. Pond Volumes & Release Rates**

	REQUIRED VOLUME (AC-FT)	VOLUME PROVIDED (AC-FT)	WQCV (AC-FT)	EURV (AC-FT)	5-YEAR RELEASE (CFS)	100-YEAR RELEASE (CFS)
POND W5	18.217	18.441	3.29	11.71	2.7	137.1

**EROSION CONTROL PLAN**

We respectfully request that the Erosion Control Plan and Cost Estimate be submitted in conjunction with the grading and erosion control plan and construction assurances posted prior to obtaining a grading permit.

**OPERATION & MAINTENANCE**

State that these have been submitted

In order to ensure the function and effectiveness of the JR Response: Text updated ntenance activities such as inspection, routine maintenance, restorative maintenance, rehabilitation and repair, are required. The district shall be responsible for the inspection, maintenance, rehabilitation and repair of stormwater and erosion control facilities located on the property unless another party accepts such responsibility in writing and responsibility is properly assigned through legal documentation. Access is provided from onsite facilities and easements for proposed infrastructure located offsite. We respectfully request that the Operation & Maintenance Manual be submitted in conjunction with the construction documents, prior to obtaining a grading permit. A maintenance road was provided for the existing pond W5 and information on the road can be found in the Final Drainage Report for Sterling Ranch Filing No. 2. The maintenance road access is off of Marksheffel Road and wraps around the top of the pond providing access to the inflow pipe wingwalls and outlet structure for the pond.

delete?

JR Response: Text deleted

**DRAINAGE AND BRIDGE FEES**

The site lies within the Sand Creek Drainage Basin. Anticipated drainage and bridge fees are presented below and will be due at time of platting (depending on date of plat submittal):.

2021 DRAINAGE AND BRIDGE FEES – STERLING RANCH FILING 3				
Impervious Acres (ac)	Drainage Fee (Per Imp. Acre)	Bridge Fee (Per Imp. Acre)	Sterling Ranch Drainage Fee	Sterling Ranch Bridge Fee
10	\$20,387	\$8,339	\$203,870	\$83,390

**SUMMARY**

JR Response: Text added " The developed condition of tract C was used to calculate the overall impervious area. The total area used was 19.7 Acres and the net impervious value is 53.1.%"

The proposed Sterling Ranch ... or exceed the El Paso County Drainage Criteria. The proposed development will not adversely affect the offsite drainageways or surrounding development. This report is in conformance and meets the latest El Paso County Storm Drainage Criteria requirements for this site.

Please state whether or not Tract C is being included as developed or not. Provide the overall imperviousness used for the calculation.

## REFERENCES

---

1. "El Paso County and City of Colorado Springs Drainage Criteria Manual, Vol I & II".
2. Sand Creek Channel Design Report, prepared by JR Engineering, May 19, 2021 (not yet approved)
3. "Master Development Drainage Plan for Sterling Ranch", (MMDP) prepared by M&S Civil Consultants, Inc., dated October 24, 2018.
4. Sand Creek Drainage Basin Planning Study, prepared Kiowa Engineering Corporation, January 1993, revised March 1996.
5. "Sterling Ranch Filing 2 Final Drainage Report", prepared by JR Engineering, dated May 2020 (not yet approved)
6. Urban Storm Drainage Criteria Manual (Volumes 1, 2, and 3), Urban Drainage and Flood Control District, June 2001.
7. Sand Creek Stabilization at Aspen Meadows Subdivision Filing No. 1 – 100% Design Plans, April 2020

← Updated MDDP (under review)

JR Response: Updated

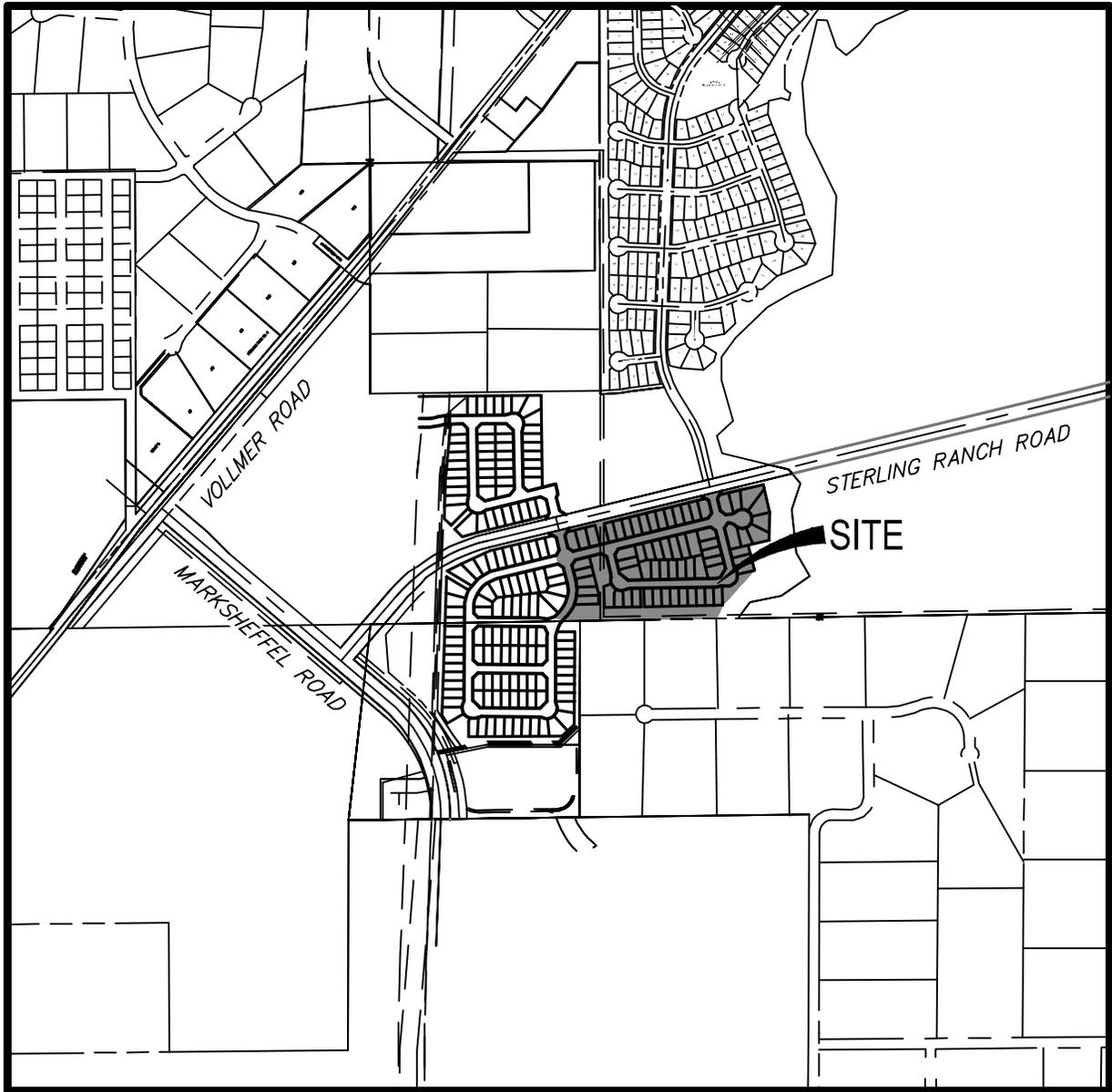
and DCM Update

JR Response: Updated

---



**Appendix A**  
**Vicinity Map, Soil Descriptions, FEMA Floodplain Map**



## VICINITY MAP

SCALE: 1" = 1000'

VICINITY MAP  
STERLING RANCH FILING 3  
JOB NO. 25188.02  
06/09/21  
SHEET 1 OF 1

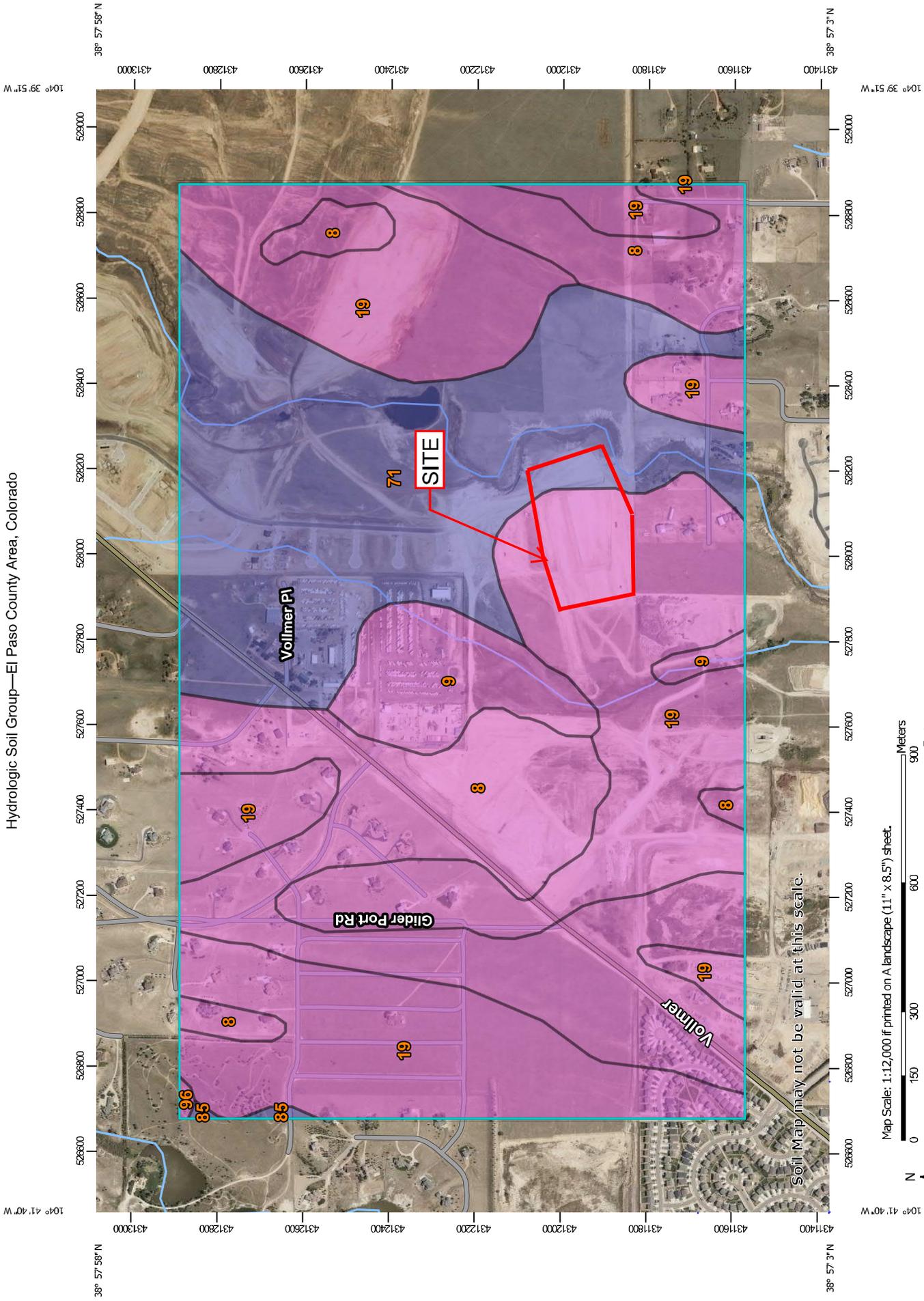


**J·R ENGINEERING**

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Fort Collins 970-491-9888 • [www.jrengineering.com](http://www.jrengineering.com)

Hydrologic Soil Group—El Paso County Area, Colorado

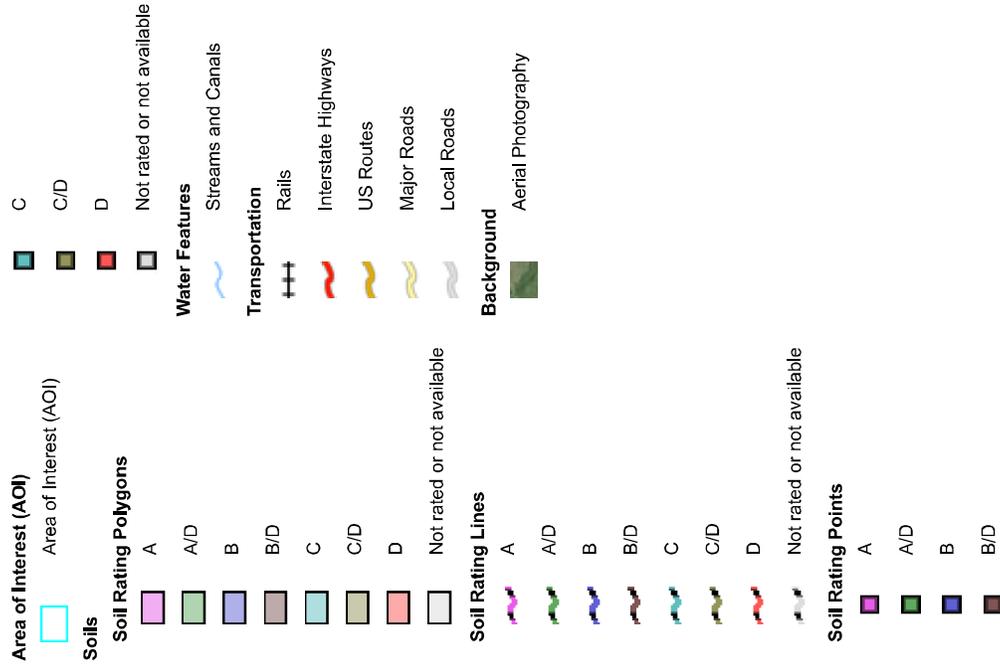


Map Scale: 1:12,000 if printed on A landscape (11" x 8.5") sheet.



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

## MAP LEGEND



## 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 17, Sep 13, 2019

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

Date(s) aerial images were photographed: Aug 19, 2018—May 26, 2019

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	182.3	25.4%
9	Blakeland-Fluvaquentic Haplaquolls	A	36.8	5.1%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	A	307.5	42.9%
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	188.4	26.3%
85	Stapleton-Bernal sandy loams, 3 to 20 percent slopes	B	1.2	0.2%
96	Truckton sandy loam, 0 to 3 percent slopes	A	0.6	0.1%
<b>Totals for Area of Interest</b>			<b>716.9</b>	<b>100.0%</b>

## 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



## **Appendix B**

# **Hydrologic Calculations**

## COMPOSITE % IMPERVIOUS & COMPOSITE EXISTING RUNOFF COEFFICIENT CALCULATIONS

Subdivision: Sterling Ranch Subdivision- Existing  
 Location: El Paso County

Project Name: Sterling Ranch Filing 3  
 Project No.: 25188.02  
 Calculated By: CJD  
 Checked By: \_\_\_\_\_  
 Date: 6/9/21

Basin ID	Total Area (ac)	Streets (100% Impervious)			Residential (65% Impervious) Neighborhood Area (70% Impervious)			1 Acre lot Residential (20% Impervious) Light Commercial (80% Impervious)			Lawns (0% Impervious) (55% Impervious)			School		Basins Total Weighted C Values		Basins Total Weighted % Imp.			
		C <sub>5</sub>	C <sub>100</sub>	Area (ac)	Weighted % Imp.	C <sub>5</sub>	C <sub>100</sub>	Area (ac)	Weighted % Imp.	C <sub>5</sub>	C <sub>100</sub>	Area (ac)	Weighted % Imp.	C <sub>5</sub>	C <sub>100</sub>	Weighted % Imp.	C <sub>5</sub>		C <sub>100</sub>		
A1	5.17	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.59	0.70	0.00	0.0%	0.08	0.35	5.17	2.0%	0.08	0.35	2.0%	
A2	27.48	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.59	0.70	0.00	0.0%	0.08	0.35	27.48	0.0%	0.08	0.35	0.0%	
B1	11.78	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.59	0.70	0.00	0.0%	0.08	0.35	11.78	0.0%	0.08	0.35	0.0%	
OS1	9.27	0.90	0.96	2.85	30.7%	0.45	0.59	0.00	0.0%	0.30	0.40	2.85	6.1%	0.08	0.35	3.57	0.0%	0.40	0.55	36.9%	
<b>TOTAL (A1-B1)</b>	<b>44.43</b>																				<b>0.2%</b>
<b>TOTAL</b>	<b>53.70</b>																				<b>6.6%</b>

**EXISTING  
STANDARD FORM SF-2  
TIME OF CONCENTRATION**

Subdivision: Sterling Ranch Subdivision- Existing  
Location: El Paso County

Project Name: Sterling Ranch Filing 3  
Project No.: 25188.02  
Calculated By: CJD  
Checked By:           
Date: 6/9/21

BASIN ID	SUB-BASIN DATA				INITIAL/OVERLAND (T <sub>i</sub> )				TRAVEL TIME (T <sub>t</sub> )				tc CHECK (URBANIZED BASINS)			FINAL t <sub>c</sub> (min)	
	D.A. (ac)	Hydrologic Soils Group	Impervious (%)	C <sub>5</sub>	C <sub>100</sub>	L (ft)	S <sub>o</sub> (%)	t <sub>i</sub> (min)	L <sub>t</sub> (ft)	S <sub>t</sub> (%)	K	VEL. (ft/s)	t <sub>t</sub> (min)	COMP. t <sub>c</sub> (min)	TOTAL LENGTH (ft)		Urbanized t <sub>c</sub> (min)
A1	5.17	A	2%	0.08	0.35	212	2.0%	21.4	517	2.1%	10.0	1.4	6.0	27.4	729.0	32.1	27.4
A2	27.48	A	0%	0.08	0.35	297	2.5%	23.4	1475	2.4%	10.0	1.6	15.7	39.1	1772.0	43.5	39.1
B1	11.78	A	0%	0.08	0.35	297	2.9%	22.4	380	5.2%	10.0	2.3	2.8	25.2	677.0	29.1	25.2
OS1	9.27	A	37%	0.40	0.55	298	2.7%	15.7	737	2.4%	10.0	1.5	8.0	23.7	1035.0	25.4	23.7

**NOTES:**

$$t_c = t_i + t_t$$

Where:

t<sub>c</sub> = computed time of concentration (minutes)

t<sub>i</sub> = overland (initial) flow time (minutes)

t<sub>t</sub> = channelized flow time (minutes).

$$t_i = \frac{0.395(L^{0.77} - C_s \sqrt{L})}{S_o^{0.33}}$$

Equation 6-2

Where:

t<sub>i</sub> = overland (initial) flow time (minutes)

C<sub>s</sub> = runoff coefficient for 5-year frequency (from Table 6-4)

L<sub>t</sub> = length of overland flow (ft)

S<sub>o</sub> = average slope along the overland flow path (ft/ft).

$$t_t = \frac{L_t}{K \sqrt{S_o}}$$

Equation 6-3

Where:

t<sub>t</sub> = channelized flow time (minutes)

L<sub>t</sub> = length of channelized flow path (ft)

K = NRCS conveyance factor (see Table 6-2).

Use a minimum t<sub>c</sub> value of 5 minutes for urbanized areas and a minimum t<sub>c</sub> value of 10 minutes for areas that are not considered urban. Use minimum values even when calculations result in a lesser time of concentration.

$$t_t = \frac{L_t}{60 K \sqrt{S_o}} = \frac{L_t}{60 F_t}$$

Where:

t<sub>t</sub> = channelized flow time (travel time, min)

L<sub>t</sub> = waterway length (ft)

S<sub>o</sub> = waterway slope (ft/ft)

F<sub>t</sub> = travel time velocity (ft/sec) = K' / S<sub>o</sub>

K = NRCS conveyance factor (see Table 6-2).

$$t_c = (2.6 - 1.7t) + \frac{L_t}{60(1.47 + 9\sqrt{S_o})}$$

Where:

t<sub>c</sub> = minimum time of concentration for first design point when less than t<sub>c</sub> from Equation 6-1.

L<sub>t</sub> = length of channelized flow path (ft)

t = imperviousness (expressed as a decimal)

S<sub>o</sub> = slope of the channelized flow path (ft/ft).

Table 6-2. NRCS Conveyance factors, K

Type of Land Surface	Conveyance Factor, K
Heavy meadow	2.5
Tillage/field	5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

$$t_c = \frac{L_t}{K \sqrt{S_o}}$$

Equation 6-5

Where:

t<sub>c</sub> = minimum time of concentration for first design point when less than t<sub>c</sub> from Equation 6-1.

L<sub>t</sub> = length of channelized flow path (ft)

S<sub>o</sub> = slope of the channelized flow path (ft/ft).

**STANDARD FORM SF-3 - EXISTING  
STORM DRAINAGE SYSTEM DESIGN**  
(RATIONAL METHOD PROCEDURE)

Subdivision: Sterling Ranch Subdivision- Existing  
 Location: El Paso County  
 Design Storm: 5-Year  
 Project Name: Sterling Ranch Filing 3  
 Project No.: ZS1886.02  
 Calculated By: CID  
 Checked By:  
 Date: 6/9/21

STREET	Design Point	DIRECT RUNOFF						TOTAL RUNOFF				STREET/SWALE				PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	$t_c$ (min)	$C^*A$ (Ac)	$I$ (in/hr)	$Q$ (cfs)	$t_c$ (min)	$C^*A$ (ac)	$I$ (in/hr)	$Q$ (cfs)	$Q_{street/swale}$ (cfs)	$C^*A$ (ac)	Slope (%)	$Q_{pipe}$ (cfs)	$C^*A$ (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	$t_t$ (min)	
	1	A1	5.17	0.08	27.4	0.41	2.62	1.1															
	2	A2	27.48	0.08	39.1	2.20	2.08	4.6															Basin A2
	3	OS1	9.27	0.40	23.7	3.71	2.83	10.5															Basin A1
	4	B1	11.76	0.08	25.2	0.94	2.74	2.6															Basin OS1

Notes:  
 Street and Pipe  $C^*A$  values are determined by  $Q/I$  using the catchment's intensity value.  
 All pipes are private and RCP unless otherwise noted. Pipe size shown in table column.

**STANDARD FORM SF-3 - EXISTING  
STORM DRAINAGE SYSTEM DESIGN**  
(RATIONAL METHOD PROCEDURE)

**Subdivision:** Sterling Ranch Subdivision- Existing  
**Location:** El Paso County  
**Design Storm:** 100 Year  
**Project Name:** Sterling Ranch Filing 3  
**Project No.:** ZS188.02  
**Calculated By:** CID  
**Checked By:**  
**Date:** 6/9/21

Description	Design Point	DIRECT RUNOFF				TOTAL RUNOFF			STREET/SWALE			PIPE				TRAVEL TIME			REMARKS	
		Basin ID	Area (ac)	Runoff Coeff.	$t_c$ (min)	$C^*A$ (ac)	$I$ (in/hr)	$Q$ (cfs)	$t_c$ (min)	$C^*A$ (ac)	$Q_{street/swale}$ (cfs)	$C^*A$ (ac)	Slope (%)	$Q_{pipe}$ (cfs)	$C^*A$ (ac)	Slope (%)	Pipe Size (inches)	Length (ft)		Velocity (fps)
	1	A1	5.17	0.35	27.4	1.81	4.39	8.0												Basin A2
	2	A2	27.48	0.35	39.1	9.62	3.49	33.6												Basin A1
	3	OS1	9.27	0.55	23.7	5.13	4.76	24.4												Basin OS1
	4	B1	11.78	0.35	25.2	4.12	4.60	19.0												

**Notes:**  
 Street and Pipe  $C^*A$  values are determined by  $Q/I$  using the catchment's intensity value.  
 All pipes are private and RCP unless otherwise noted. Pipe size shown in table column.

## COMPOSITE % IMPERVIOUS & COMPOSITE PROPOSED RUNOFF COEFFICIENT CALCULATIONS

Subdivision: Sterling Ranch Subdivision  
 Location: El Paso County

Project Name: Sterling Ranch Filing 3  
 Project No.: 25188.02  
 Calculated By: CID  
 Checked By: \_\_\_\_\_  
 Date: 6/9/21

Basin ID	Total Area (ac)	Streets (100% Impervious)			Residential (65% Impervious)			Light Industrial (80% Impervious) Commercial (95% Impervious)			Lawns (0% Impervious) (55% Impervious)			School		Basins Total Weighted C Values		Basins Total Weighted % Imp.			
		C <sub>5</sub>	C <sub>100</sub>	Area (ac)	Weighted % Imp.	C <sub>5</sub>	C <sub>100</sub>	Area (ac)	Weighted % Imp.	C <sub>5</sub>	C <sub>100</sub>	Area (ac)	Weighted % Imp.	C <sub>5</sub>	C <sub>100</sub>	C <sub>5</sub>	C <sub>100</sub>				
A1	4.31	0.90	0.96	0.92	21.3%	0.45	0.59	2.79	42.1%	0.59	0.70	0.00	0.0%	0.08	0.35	0.60	0.0%	0.49	0.64	63.4%	
A5	0.45	0.90	0.96	0.17	37.8%	0.45	0.59	0.28	40.4%	0.59	0.70	0.00	0.0%	0.08	0.35	0.00	0.0%	0.62	0.73	78.2%	
I1	21.99	0.90	0.96	0.12	0.5%	0.45	0.59	0.00	0.0%	0.59	0.70	0.00	0.0%	0.08	0.35	21.87	0.0%	0.08	0.35	0.5%	
I2	3.47	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.59	0.70	0.00	0.0%	0.08	0.35	3.47	0.0%	0.08	0.35	0.0%	
B1	2.44	0.90	0.96	1.04	42.6%	0.45	0.59	1.40	37.3%	0.59	0.70	0.00	0.0%	0.08	0.35	0.00	0.0%	0.64	0.75	79.9%	
B2	4.33	0.90	0.96	0.94	21.7%	0.45	0.59	3.39	50.9%	0.59	0.70	0.00	0.0%	0.08	0.35	0.00	0.0%	0.55	0.67	72.6%	
B6	0.78	0.90	0.96	0.00	0.0%	0.45	0.59	0.53	44.2%	0.59	0.70	0.00	0.0%	0.08	0.35	0.25	0.0%	0.33	0.51	44.2%	
B5	0.45	0.90	0.96	0.00	0.0%	0.45	0.59	0.35	50.6%	0.59	0.70	0.00	0.0%	0.08	0.35	0.10	0.0%	0.37	0.54	50.6%	
B4	1.55	0.90	0.96	0.00	0.0%	0.45	0.59	1.35	56.6%	0.59	0.70	0.00	0.0%	0.08	0.35	0.20	0.0%	0.40	0.56	56.6%	
B3	0.66	0.90	0.96	0.34	51.5%	0.45	0.59	0.12	11.8%	0.59	0.70	0.00	0.0%	0.08	0.35	0.20	0.0%	0.57	0.71	63.3%	
D1	0.77	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.59	0.70	0.00	0.0%	0.08	0.35	0.77	0.0%	0.08	0.35	0.0%	
D2	3.92	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.59	0.70	0.00	0.0%	0.08	0.35	3.92	0.0%	0.08	0.35	0.0%	
<b>Basin A&amp;B TOTAL</b>	<b>14.97</b>																			<b>67.1%</b>	
<b>TOTAL</b>	<b>45.12</b>																				<b>22.5%</b>

**PROPOSED  
STANDARD FORM SF-2  
TIME OF CONCENTRATION**

Subdivision: Sterling Ranch Subdivision  
Location: El Paso County

Project Name: Sterling Ranch Filing 3  
Project No.: 25188.02  
Calculated By: CID  
Checked By:  
Date: 6/9/21

BASIN ID	SUB-BASIN DATA				INITIAL/OVERLAND (T <sub>i</sub> )				TRAVEL TIME (T <sub>t</sub> )				t <sub>c</sub> CHECK (URBANIZED BASINS)		FINAL t <sub>c</sub> (min)	
	D.A. (ac)	Hydrologic Soils Group	Imperious (%)	C <sub>100</sub>	L (ft)	S <sub>0</sub> (%)	t <sub>i</sub> (min)	L <sub>i</sub> (ft)	S <sub>i</sub> (%)	K	VEL. (ft/s)	t <sub>t</sub> (min)	COMP. t <sub>c</sub> (min)	TOTAL LENGTH (ft)		Urbanized t <sub>c</sub> (min)
A1	4.31	A	63%	0.64	79	1.7%	8.2	1007	3.7%	20.0	3.8	4.4	12.5	1086.0	20.1	12.5
A5	0.45	A	78%	0.62	54	3.7%	4.1	217	3.9%	20.0	4.0	0.9	5.0	271.0	13.6	5.0
I1	21.99	A	1%	0.08	793	3.1%	35.5	627	3.7%	10.0	1.9	5.4	41.0	1420.0	31.9	31.9
I2	3.47	A	0%	0.08	383	3.2%	24.6	394	1.0%	10.0	1.0	6.6	31.1	777.0	33.3	31.1
B1	2.44	A	80%	0.64	50	2.5%	4.3	1066	1.6%	20.0	2.5	7.1	11.4	1116.0	19.4	11.4
B2	4.33	A	73%	0.55	67	4.9%	8.8	346	0.7%	20.0	1.7	3.4	12.2	572.0	17.2	12.2
B6	0.78	A	44%	0.33	51	1.5%	19.1	0	1.0%	20.0	2.0	0.0	19.1	246.0	18.5	18.5
B5	0.45	A	51%	0.37	54	1.2%	8.8	0	1.0%	20.0	2.0	0.0	8.8	129.0	17.4	8.8
B4	1.55	B	57%	0.40	222	11.0%	8.5	914	1.1%	20.0	2.1	7.4	15.9	1136.0	25.1	15.9
B3	0.86	A	63%	0.57	165	3.4%	8.2	612	2.7%	10.0	1.8	6.2	14.4	777.0	18.7	14.4
D1	0.77	A	0%	0.08	16	2.0%	5.9	570	6.0%	10.0	2.4	3.9	9.7	586.0	30.3	9.7
D2	3.92	A	0%	0.08	105	25.0%	6.5	975	50.0%	15.0	10.6	1.5	8.1	1080.0	28.6	8.1

**NOTES:**

$t_c = t_i + t_t$

Where:

$t_i$  = computed time of concentration (minutes)

$t_t$  = overland (initial) flow time (minutes)

$t_c$  = channelized flow time (minutes)

$t_t = \frac{L_i}{60K\sqrt{S_i}} = \frac{L_i}{60V}$

Where:

$L_i$  = channelized flow time (travel time, min)

$V$  = travel time velocity (ft/sec)

$K$  = NRCS conveyance factor (see Table 6-2)

$L$  = travel time velocity (ft/sec)

$S_i$  = watershed slope (ft/ft)

$S_0$  = watershed slope (ft/ft)

$C_1$  = runoff coefficient for 2-year frequency (from Table 6-4)

$C_2$  = runoff coefficient for 2-year frequency (from Table 6-4)

$S_0$  = average slope along the overland flow path (ft/ft)

$Z$  = minimum time of concentration for first design point when less than  $t_c$  from Equation 6-1

$t_c$  = imperviousness (expressed as a decimal)

$S_0$  = slope of the channelized flow path (ft/ft)

Equation 6-3

$$t_i = \frac{0.48S_0^{0.1}L_i^{0.77}C_1^{0.57}}{S_0^{0.0044}}$$

Where:

$t_i$  = overland (initial) flow time (minutes)

$C_1$  = runoff coefficient for 2-year frequency (from Table 6-4)

$S_0$  = average slope along the overland flow path (ft/ft)

$Z$  = minimum time of concentration for first design point when less than  $t_c$  from Equation 6-1

$t_c$  = imperviousness (expressed as a decimal)

$S_0$  = slope of the channelized flow path (ft/ft)

Equation 6-4

$$t_t = \frac{L_i}{60K\sqrt{S_i}} = \frac{L_i}{60V}$$

Where:

$L_i$  = channelized flow time (travel time, min)

$V$  = travel time velocity (ft/sec)

$K$  = NRCS conveyance factor (see Table 6-2)

$L$  = travel time velocity (ft/sec)

$S_i$  = watershed slope (ft/ft)

$S_0$  = watershed slope (ft/ft)

$C_1$  = runoff coefficient for 2-year frequency (from Table 6-4)

$C_2$  = runoff coefficient for 2-year frequency (from Table 6-4)

$S_0$  = average slope along the overland flow path (ft/ft)

$Z$  = minimum time of concentration for first design point when less than  $t_c$  from Equation 6-1

$t_c$  = imperviousness (expressed as a decimal)

$S_0$  = slope of the channelized flow path (ft/ft)

Equation 6-5

Type of Land Surface	Conveyance Factor, K
Heavy meadow	2-5
Tillage/field	5
Shrub pasture and lawns	7
Woody bare ground	10
Grass	15
Paved areas and shallow paved swales	20

Equation 6-5

$$t = (26 - 17t) + \frac{Z}{600.4H + 9\sqrt{S_0}}$$

Where:

$t$  = minimum time of concentration for first design point when less than  $t_c$  from Equation 6-1

$Z$  = runoff coefficient for 2-year frequency (from Table 6-4)

$H$  = imperviousness (expressed as a decimal)

$S_0$  = slope of the channelized flow path (ft/ft)

**STANDARD FORM SF-3 - PROPOSED  
STORM DRAINAGE SYSTEM DESIGN**  
(RATIONAL METHOD PROCEDURE)

Subdivision: Sterling Ranch Subdivision  
 Location: El Paso County  
 Design Storm: 5-Year

Project Name: Sterling Ranch Filing 3  
 Project No.: 25188.02  
 Calculated By: CJD  
 Checked By: \_\_\_\_\_  
 Date: 6/9/21

STREET	Design Point	DIRECT RUNOFF						TOTAL RUNOFF			STREET/SWALE			PIPE			TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	$t_c$ (min)	$C^*A$ (Ac)	$Q$ (cfs)	$t_c$ (min)	$C^*A$ (ac)	$Q$ (cfs)	$Q_{street/swale}$ (cfs)	$C^*A$ (ac)	Slope (%)	$Q_{pipe}$ (cfs)	$C^*A$ (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	
	9	B3	0.66	0.57	14.4	0.38	3.58	1.4												Offsite flow to existing inlet in Sterling Ranch Road Piped to existing storm sewer in Sterling Ranch Road
	10	B4	1.55	0.40	15.9	0.62	3.43	2.1						2.1	0.62	1.0	12	380	4.7	1.3 Rear lot and area inlets Piped to DP 11.1
	11	B5	0.45	0.37	8.8	0.17	4.31	0.7												Area Inlet Piped to DP 14.1
	11.1													2.6	0.79	1.0	18	357	4.9	1.2 Piped to DP 14.1
	12	B2	4.33	0.55	12.2	2.37	3.83	9.1						9.1	2.37	1.0	18	38	6.7	0.1 Sump Inlet Piped to DP 13.1
	13	B1	2.44	0.64	11.4	1.57	3.93	6.2												Sump Inlet Piped to DP 13.1
	13.1													15.0	3.94	1.0	24	125	7.7	0.3 Piped to DP 14.1
	14	B6	0.78	0.33	18.5	0.26	3.21	0.8												Area Inlet Piped to DP 14.1
	14.1													16.0	4.99	1.0	24	415	7.8	0.9 Piped to DP 15.1
	15	A1	4.31	0.49	12.5	2.13	3.79	8.1					0.7	7.4	0.18	1.6	230	2.5	1.5 On-grade Inlet Captured Flows piped to DP 15.1, Bypass flow to DP 17	
	15.1													22.3	7.12	1.0	24	45	8.2	0.1 On-grade Inlet Captured Flows piped to DP 16.1
	16	A5	0.45	0.62	5.0	0.28	5.16	1.4												On-grade Inlet Captured Flows piped to DP 16.1
	16.1													23.2	7.40	1.0	24	125	8.2	0.3 FES release to drainage channel FES
	I1	I1	21.99	0.08	31.9	1.86	2.39	4.4												
	11.1													22.1	9.26	0.4	42	62	6.1	0.2 Combined flow from DPHI & DP16.1 Piped to Existing 84" RCP
	I2	I2	3.47	0.08	31.1	0.28	2.43	0.7												
	28	D1	0.77	0.08	9.7	0.06	4.17	0.3												
	29	D2	3.92	0.08	8.1	0.31	4.45	1.4												

Notes:  
 Street and Pipe C\*A values are determined by  $Q/I$  using the catchment's intensity value.

**STANDARD FORM SF-3 - PROPOSED  
STORM DRAINAGE SYSTEM DESIGN**  
(RATIONAL METHOD PROCEDURE)

Subdivision: Sterling Ranch Subdivision  
 Location: El Paso County  
 Design Storm: 100-Year

Project Name: Sterling Ranch Filing 3  
 Project No.: 25188.02  
 Calculated By: CID  
 Checked By:  
 Date: 6/9/21

Description	Design Point	DIRECT RUNOFF					TOTAL RUNOFF			STREET/SWALE			PIPE			TRAVEL TIME			REMARKS			
		Basin ID	Area (ac)	Runoff Coeff.	t <sub>c</sub> (min)	C*A (ac)	V (in/hr)	Q (cfs)	t <sub>c</sub> (min)	C*A (ac)	Q (cfs)	Q <sub>street/swale</sub> (cfs)	C*A (ac)	Slope (%)	Q <sub>pipe</sub> (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)		Length (ft)	Velocity (fps)	t (min)
	9	B3	0.66	0.71	14.4	0.47	6.01	2.8													Offsite flow to existing inlet in Sterling Ranch Road Piped to existing storm sewer in Sterling Ranch Road	
	10	B4	1.55	0.56	15.9	0.87	5.76	5.0						5.0	0.87	1.0	12	380	6.4	1.0	Rear lot and area inlets Piped to DP 11.1	
	11	B5	0.45	0.54	8.8	0.24	7.24	1.7													Area Inlet Piped to DP 14.1	
	11.1								16.9	1.11	5.61	6.2			6.2	1.11	1.0	18	357	6.2	1.0	Piped to DP 14.1
	12	B2	4.33	0.67	12.2	2.90	6.43	18.7							18.7	2.90	1.0	18	38	10.6	0.1	Sump Inlet Piped to DP 13.1
	13	B1	2.44	0.75	11.4	1.82	6.60	12.0													Sump Inlet Piped to DP 13.1	
	13.1								12.3	4.72	6.42	30.3			30.3	4.72	1.0	24	125	9.7	0.2	Piped to DP 14.1
	14	B6	0.78	0.51	18.5	0.40	5.38	2.2													Area Inlet Piped to DP 14.1	
	14.1								18.5	6.23	5.38	33.5			33.5	6.23	1.0	24	415	10.7	0.6	Piped to DP 15.1
	15	A1	4.31	0.64	12.5	2.74	6.37	17.4			10.0	1.5777	1.6		7.4			230	2.5	1.5	On-grade Inlet Captured Flows piped to DP 15.1, Bypass flow to DP 17	
	15.1								19.1	8.97	5.30	47.5			47.5	8.97	1.0	24	45	15.1	0.0	On-grade Inlet Captured Flows piped to DP 16.1
	16	A5	0.45	0.73	5.0	0.33	8.66	2.9													On-grade Inlet Captured Flows piped to DP 16.1	
	16.1								19.2	9.30	5.29	49.2			49.2	9.30	1.0	24	125	15.7	0.1	FES release to drainage channel FES
	11	I1	21.99	0.35	31.9	7.77	4.01	31.2													Combined flow from DP11 & DP16.1 Piped to Existing 84" RCP	
	11.1								31.9	17.07	4.01	68.4			68.4	17.07	0.4	42	62	7.7	0.1	Piped to Existing 84" RCP
	12	I2	3.47	0.35	31.1	1.21	4.07	4.9													Piped to Existing 84" RCP	
	28	D1	0.77	0.35	9.7	0.27	7.00	1.9													Sheet flow to Sand Creek	
	29	D2	3.92	0.35	8.1	1.37	7.48	10.2													Sheet flow to Sand Creek	

Notes:  
 Street and Pipe C\*A values are determined by Q/i using the catchment's intensity value.  
 All pipes are private and RCP unless otherwise noted. Pipe size shown in table column.

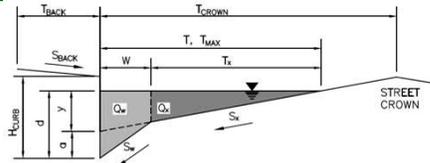
## **Appendix C**

### **Hydraulic Calculations**

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

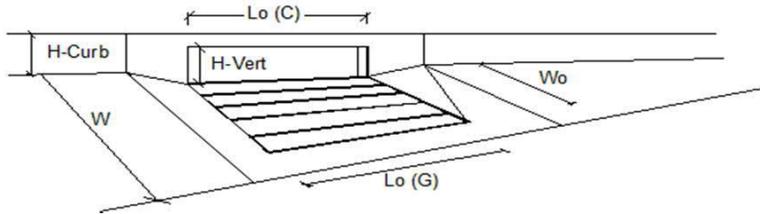
Project:  Sterling Ranch Phase 2   
 Inlet ID:  A1 - DP15



Gutter Geometry (Enter data in the blue cells)	
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 5.5$ ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020) <input type="checkbox"/>	$n_{BACK} = 0.013$
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches
Distance from Curb Face to Street Crown	$T_{CROWN} = 17.0$ ft
Gutter Width	$W = 2.00$ ft
Street Transverse Slope	$S_x = 0.020$ ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	$S_o = 0.033$ ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.013$
Max. Allowable Spread for Minor & Major Storm	$T_{MAX} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 17.0 & 17.0 \end{matrix}$ ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	$d_{MAX} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 6.0 & 7.8 \end{matrix}$ inches
Allow Flow Depth at Street Crown (leave blank for no) <input type="checkbox"/>	check = yes
<b>MINOR STORM Allowable Capacity is based on Depth Criterion</b>	
<b>MAJOR STORM Allowable Capacity is based on Spread Criterion</b>	
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	$Q_{allow} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 21.2 & 24.3 \end{matrix}$ cfs
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	

## INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017

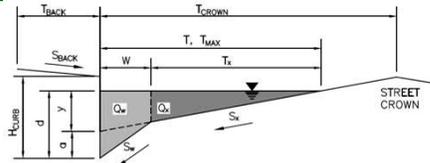


Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	7.8	12.4	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.3	5.0	cfs
Capture Percentage = $Q_c/Q_o =$	96	71	%

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

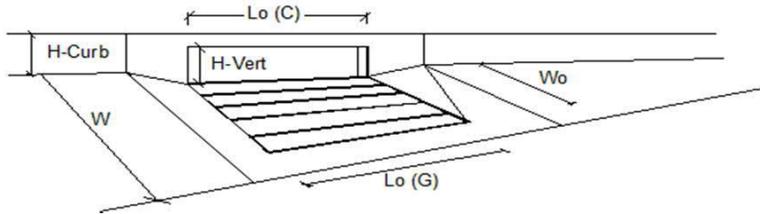
Project: Sterling Ranch Phase 2  
 Inlet ID: A5 - DP16



Gutter Geometry (Enter data in the blue cells)													
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 8.0$ ft												
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = 0.020$ ft/ft												
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.016$												
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches												
Distance from Curb Face to Street Crown	$T_{CROWN} = 17.0$ ft												
Gutter Width	$W = 1.17$ ft												
Street Transverse Slope	$S_x = 0.020$ ft/ft												
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_w = 0.083$ ft/ft												
Street Longitudinal Slope - Enter 0 for sump condition	$S_o = 0.029$ ft/ft												
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.016$												
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <thead> <tr> <th></th> <th>Minor Storm</th> <th>Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td><math>T_{MAX} =</math></td> <td>15.8</td> <td>17.0</td> <td>ft</td> </tr> <tr> <td><math>d_{MAX} =</math></td> <td>4.6</td> <td>7.8</td> <td>inches</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$T_{MAX} =$	15.8	17.0	ft	$d_{MAX} =$	4.6	7.8	inches
	Minor Storm	Major Storm											
$T_{MAX} =$	15.8	17.0	ft										
$d_{MAX} =$	4.6	7.8	inches										
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm													
Allow Flow Depth at Street Crown (leave blank for no)	check = yes												
<b>MINOR STORM Allowable Capacity is based on Depth Criterion</b>													
<b>MAJOR STORM Allowable Capacity is based on Depth Criterion</b>													
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	$Q_{flow} = 13.6$ cfs												
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	$Q_{flow} = 40.2$ cfs												

## INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017

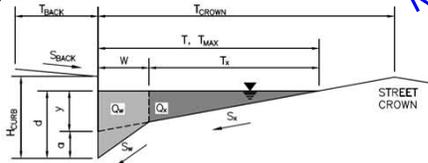


Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	1.4	2.9	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.0	cfs
Capture Percentage = $Q_c/Q_o =$	100	100	%

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Sterling Ranch Phase 2  
 Inlet ID: B1- DP13



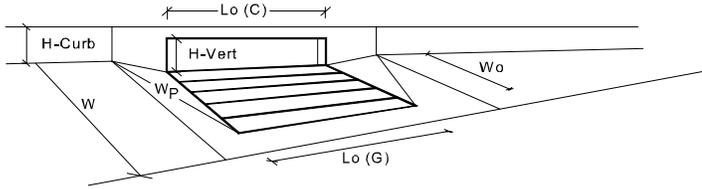
DP13?

JR Response:  
Text Updated

Gutter Geometry (Enter data in the blue cells)													
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = $ <input style="width: 50px;" type="text" value="17.0"/> ft												
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = $ <input style="width: 50px;" type="text" value="0.020"/> ft/ft												
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = $ <input style="width: 50px;" type="text" value="0.016"/>												
Height of Curb at Gutter Flow Line	$H_{CURB} = $ <input style="width: 50px;" type="text" value="6.00"/> inches												
Distance from Curb Face to Street Crown	$T_{CROWN} = $ <input style="width: 50px;" type="text" value="17.0"/> ft												
Gutter Width	$W = $ <input style="width: 50px;" type="text" value="1.17"/> ft												
Street Transverse Slope	$S_X = $ <input style="width: 50px;" type="text" value="0.020"/> ft/ft												
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_W = $ <input style="width: 50px;" type="text" value="0.083"/> ft/ft												
Street Longitudinal Slope - Enter 0 for sump condition	$S_O = $ <input style="width: 50px;" type="text" value="0.000"/> ft/ft												
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = $ <input style="width: 50px;" type="text" value="0.016"/>												
Max. Allowable Spread for Minor & Major Storm	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Minor Storm</th> <th style="text-align: center;">Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td><math>T_{MAX} = </math></td> <td style="text-align: center;"><input style="width: 50px;" type="text" value="17.0"/></td> <td style="text-align: center;"><input style="width: 50px;" type="text" value="17.0"/></td> <td style="text-align: right;">ft</td> </tr> <tr> <td><math>d_{MAX} = </math></td> <td style="text-align: center;"><input style="width: 50px;" type="text" value="6.0"/></td> <td style="text-align: center;"><input style="width: 50px;" type="text" value="12.0"/></td> <td style="text-align: right;">inches</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$T_{MAX} = $	<input style="width: 50px;" type="text" value="17.0"/>	<input style="width: 50px;" type="text" value="17.0"/>	ft	$d_{MAX} = $	<input style="width: 50px;" type="text" value="6.0"/>	<input style="width: 50px;" type="text" value="12.0"/>	inches
	Minor Storm	Major Storm											
$T_{MAX} = $	<input style="width: 50px;" type="text" value="17.0"/>	<input style="width: 50px;" type="text" value="17.0"/>	ft										
$d_{MAX} = $	<input style="width: 50px;" type="text" value="6.0"/>	<input style="width: 50px;" type="text" value="12.0"/>	inches										
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm													
Check boxes are not applicable in SUMP conditions													
<b>MINOR STORM Allowable Capacity is based on Depth Criterion</b>													
<b>MAJOR STORM Allowable Capacity is based on Depth Criterion</b>													
$Q_{allow} = $	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Minor Storm</th> <th style="text-align: center;">Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;"><input style="width: 50px;" type="text" value="SUMP"/></td> <td style="text-align: center;"><input style="width: 50px;" type="text" value="SUMP"/></td> <td style="text-align: right;">cfs</td> </tr> </tbody> </table>		Minor Storm	Major Storm			<input style="width: 50px;" type="text" value="SUMP"/>	<input style="width: 50px;" type="text" value="SUMP"/>	cfs				
	Minor Storm	Major Storm											
	<input style="width: 50px;" type="text" value="SUMP"/>	<input style="width: 50px;" type="text" value="SUMP"/>	cfs										

## INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



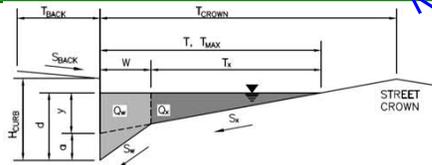
Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	1	1	
Water Depth at Flowline (outside of local depression)	5.0	12.0	inches
<b>Grate Information</b>	MINOR	MAJOR	
Length of a Unit Grate	N/A	N/A	feet
Width of a Unit Grate	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	N/A	N/A	
<b>Curb Opening Information</b>	MINOR	MAJOR	
Length of a Unit Curb Opening	15.00	15.00	feet
Height of Vertical Curb Opening in Inches	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	1.17	1.17	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>	MINOR	MAJOR	
Depth for Grate Midwidth	N/A	N/A	ft
Depth for Curb Opening Weir Equation	0.32	0.90	ft
Combination Inlet Performance Reduction Factor for Long Inlets	0.47	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	0.72	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>	MINOR	MAJOR	
<b>Q<sub>a</sub></b>	7.5	39.1	cfs
<b>Q<sub>PEAK REQUIRED</sub></b>	6.2	12.0	cfs

**Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)**

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Sterling Ranch Phase 2  
 Inlet ID: B2 - DP13



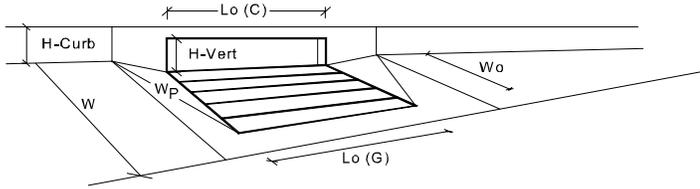
DP12?

JR Response: Text Updated

<b>Gutter Geometry (Enter data in the blue cells)</b>													
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = $ <input style="width: 50px;" type="text" value="17.0"/> ft												
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} = $ <input style="width: 50px;" type="text" value="0.020"/> ft/ft												
Manning's Roughness Behind Curb (typically between 0.012 and 0.020) <input type="checkbox"/> <input type="checkbox"/>	$n_{BACK} = $ <input style="width: 50px;" type="text" value="0.016"/>												
Height of Curb at Gutter Flow Line	$H_{CURB} = $ <input style="width: 50px;" type="text" value="6.00"/> inches												
Distance from Curb Face to Street Crown	$T_{CROWN} = $ <input style="width: 50px;" type="text" value="17.0"/> ft												
Gutter Width	$W = $ <input style="width: 50px;" type="text" value="1.17"/> ft												
Street Transverse Slope	$S_X = $ <input style="width: 50px;" type="text" value="0.020"/> ft/ft												
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	$S_W = $ <input style="width: 50px;" type="text" value="0.083"/> ft/ft												
Street Longitudinal Slope - Enter 0 for sump condition	$S_O = $ <input style="width: 50px;" type="text" value="0.000"/> ft/ft												
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = $ <input style="width: 50px;" type="text" value="0.016"/>												
Max. Allowable Spread for Minor & Major Storm	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;">Minor Storm</th> <th style="width: 25%; text-align: center;">Major Storm</th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td><math>T_{MAX} = </math></td> <td style="text-align: center;"><input style="width: 40px;" type="text" value="17.0"/></td> <td style="text-align: center;"><input style="width: 40px;" type="text" value="17.0"/></td> <td style="text-align: right;">ft</td> </tr> <tr> <td><math>d_{MAX} = </math></td> <td style="text-align: center;"><input style="width: 40px;" type="text" value="6.0"/></td> <td style="text-align: center;"><input style="width: 40px;" type="text" value="12.0"/></td> <td style="text-align: right;">inches</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$T_{MAX} = $	<input style="width: 40px;" type="text" value="17.0"/>	<input style="width: 40px;" type="text" value="17.0"/>	ft	$d_{MAX} = $	<input style="width: 40px;" type="text" value="6.0"/>	<input style="width: 40px;" type="text" value="12.0"/>	inches
	Minor Storm	Major Storm											
$T_{MAX} = $	<input style="width: 40px;" type="text" value="17.0"/>	<input style="width: 40px;" type="text" value="17.0"/>	ft										
$d_{MAX} = $	<input style="width: 40px;" type="text" value="6.0"/>	<input style="width: 40px;" type="text" value="12.0"/>	inches										
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm													
Check boxes are not applicable in SUMP conditions													
<b>MINOR STORM Allowable Capacity is based on Depth Criterion</b>													
<b>MAJOR STORM Allowable Capacity is based on Depth Criterion</b>													
$Q_{allow} = $	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;">Minor Storm</th> <th style="width: 25%; text-align: center;">Major Storm</th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;"><input style="width: 40px;" type="text" value="SUMP"/></td> <td style="text-align: center;"><input style="width: 40px;" type="text" value="SUMP"/></td> <td style="text-align: right;">cfs</td> </tr> </tbody> </table>		Minor Storm	Major Storm			<input style="width: 40px;" type="text" value="SUMP"/>	<input style="width: 40px;" type="text" value="SUMP"/>	cfs				
	Minor Storm	Major Storm											
	<input style="width: 40px;" type="text" value="SUMP"/>	<input style="width: 40px;" type="text" value="SUMP"/>	cfs										

## INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



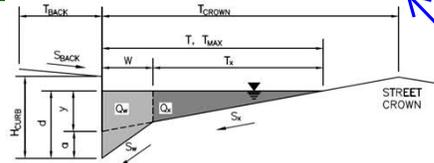
Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	1	1	
Water Depth at Flowline (outside of local depression)	5.6	12.0	inches
<b>Grate Information</b>	MINOR	MAJOR	<input checked="" type="checkbox"/> Override
Length of a Unit Grate	N/A	N/A	feet
Width of a Unit Grate	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	N/A	N/A	
<b>Curb Opening Information</b>	MINOR	MAJOR	
Length of a Unit Curb Opening	20.00	20.00	feet
Height of Vertical Curb Opening in Inches	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	1.17	1.17	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>	MINOR	MAJOR	
Depth for Grate Midwidth	N/A	N/A	ft
Depth for Curb Opening Weir Equation	0.37	0.90	ft
Combination Inlet Performance Reduction Factor for Long Inlets	0.53	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	0.76	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>	MINOR	MAJOR	
<b>Q<sub>a</sub></b>	13.1	52.7	cfs
<b>Q<sub>PEAK REQUIRED</sub></b>	9.1	18.7	cfs

**Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)**

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Sterling Ranch Phase 2**  
 Inlet ID: **B3 - DP9**



is this correct?  
 DP15?

Gutter Geometry (Enter data in the blue cells)	
Maximum Allowable Width for Spread Behind Curb	
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	
Height of Curb at Gutter Flow Line	
Distance from Curb Face to Street Crown	
Gutter Width	
Street Transverse Slope	
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	
Street Longitudinal Slope - Enter 0 for sump condition	
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	
Max. Allowable Spread for Minor & Major Storm	
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	
Allow Flow Depth at Street Crown (leave blank for no)	
<b>MINOR STORM Allowable Capacity is based on Spread Criterion</b>	
<b>MAJOR STORM Allowable Capacity is based on Depth Criterion</b>	
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	

**JR Response:** The Sterling ranch road Inlet calculation has been provided in the filling 2 drainage report. Removed

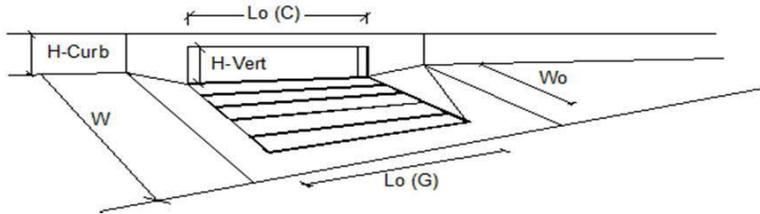
$S_x$ =	0.020	ft/ft
$S_w$ =	0.083	ft/ft
$S_o$ =	0.015	ft/ft
$n_{STREET}$ =	0.016	

	Minor Storm	Major Storm	
$T_{MAX}$ =	15.0	30.0	ft
$d_{MAX}$ =	6.0	6.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	check = yes

	Minor Storm	Major Storm	
$Q_{allow}$ =	9,8	16,9	cfs

## INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	3	3	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	3.5	7.3	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.0	cfs
Capture Percentage = $Q_c/Q_o$ =	100	100	%

are 3 units needed? Is future flow higher?

JR Response: The Sterling ranch road Inlet calculation has been provided in the filling 2 drainage report. Removed

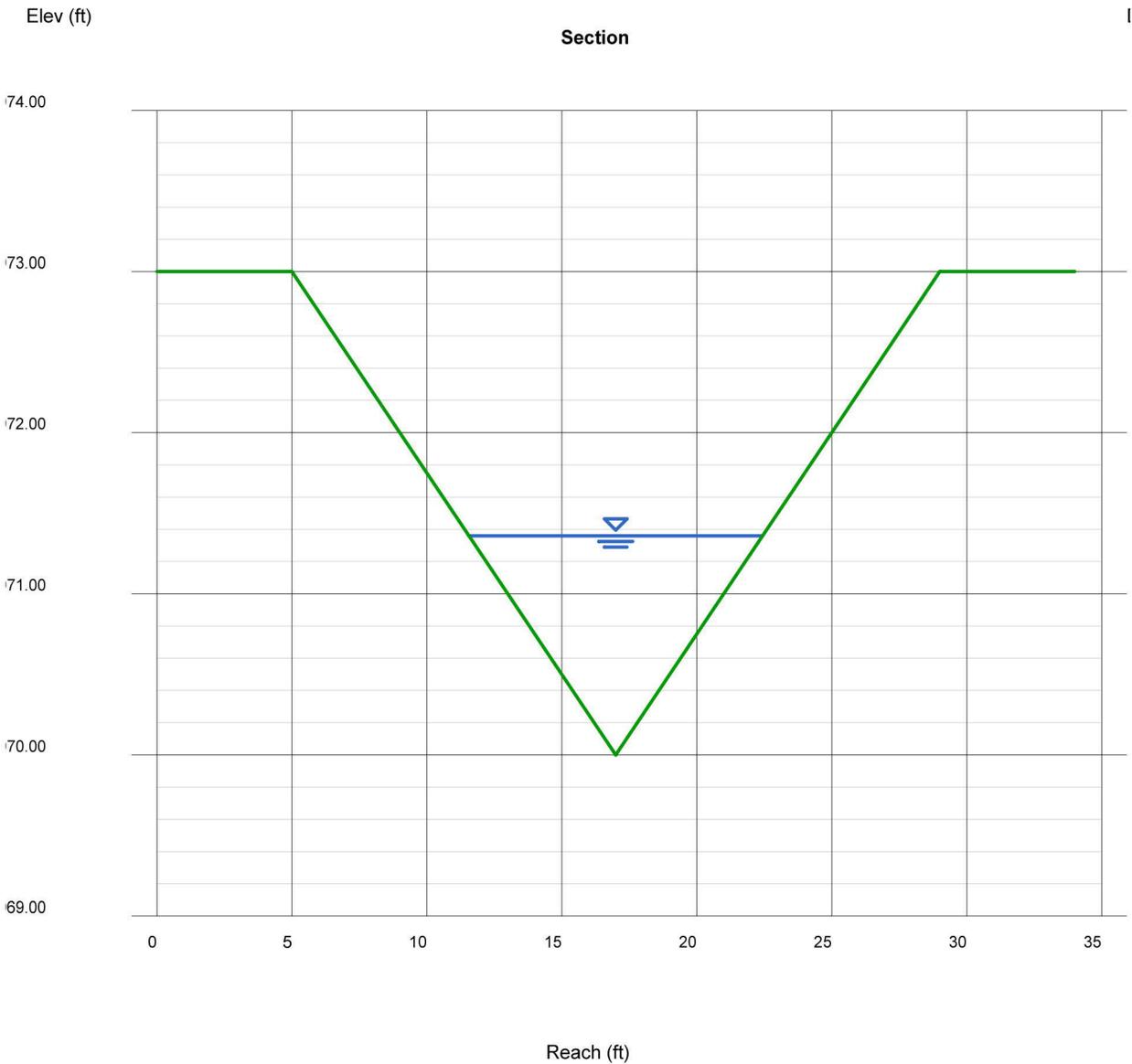
# Channel Report

## Interim Channel - DP I1

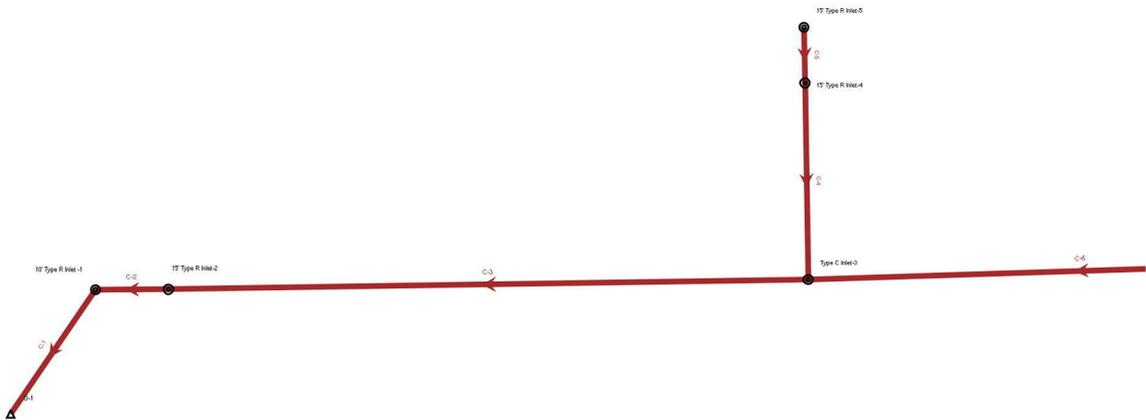
**Triangular**  
Side Slopes (z:1) = 4.00, 4.00  
Total Depth (ft) = 3.00  
  
Invert Elev (ft) = 6970.00  
Slope (%) = 0.88  
N-Value = 0.025

**Calculations**  
Compute by: Known Q  
Known Q (cfs) = 31.20

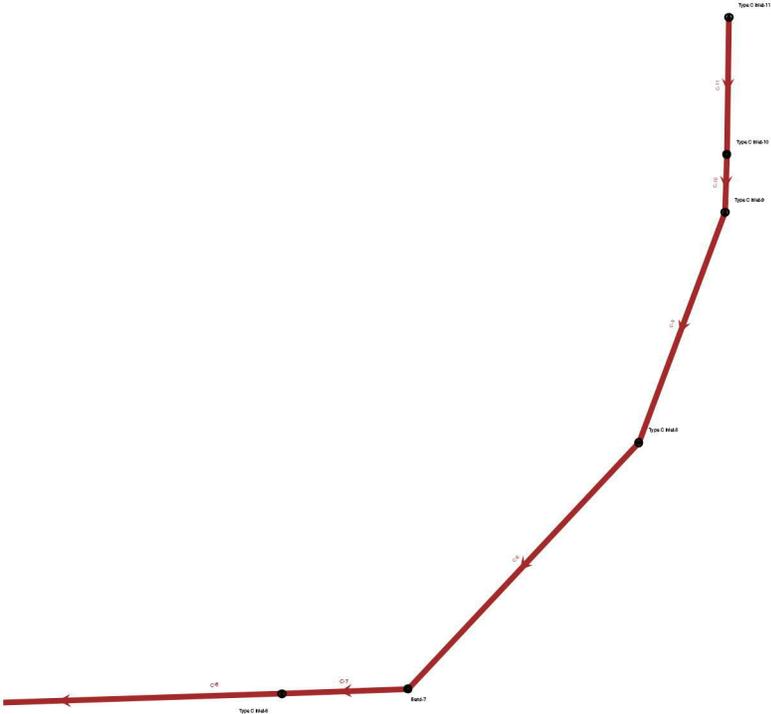
**Highlighted**  
Depth (ft) = 1.36  
Q (cfs) = 31.20  
Area (sqft) = 7.40  
Velocity (ft/s) = 4.22  
Wetted Perim (ft) = 11.21  
Crit Depth, Yc (ft) = 1.31  
Top Width (ft) = 10.88  
EGL (ft) = 1.64



# Scenario: 100 Year



# Scenario: 100 Year



**Scenario: 100 Year**  
**Current Time Step: 0.000 h**  
**FlexTable: Conduit Table**

Label	Flow (cfs)	Diameter (in)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Manning's n	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
C-11	1.40	18.0	109.7	0.027	0.013	5.84	17.13	7,013.59	7,010.88	12' RCP
C-10	2.80	18.0	45.0	0.016	0.013	5.99	13.38	7,010.87	7,009.97	12' RCP
C-9	4.20	18.0	199.1	0.015	0.013	6.50	12.83	7,005.26	7,002.09	12' RCP
C-5	18.70	18.0	34.0	0.010	0.013	10.58	10.66	7,003.46	7,002.36	18' RCP
C-4	30.30	24.0	126.1	0.019	0.013	11.20	30.88	7,002.17	6,999.57	24' RCP
C-8	5.60	18.0	275.2	0.010	0.013	3.17	10.65	6,999.20	6,998.41	12' RCP
C-3	34.10	30.0	416.6	0.003	0.013	6.95	22.47	6,995.28	6,992.40	24' RCP
C-6	6.80	18.0	355.0	0.003	0.013	3.85	5.77	6,998.10	6,996.61	18' RCP
C-7	5.60	18.0	101.9	0.011	0.013	3.17	11.16	6,998.40	6,998.11	12' RCP
C-2	43.90	30.0	45.6	0.003	0.013	8.94	22.73	6,992.34	6,991.82	24' RCP
C-1	45.60	30.0	93.8	0.003	0.013	9.29	22.46	6,991.19	6,989.88	30' RCP

X:\2510000.all\2518800\StormCAD\Sterling Ranch PH 2\Sterling Ranch PH-2.stsw

This needs to be  
larger or steeper  
based on HGL

JR Response: Conduit has been upsized to a  
36" diameter

**Scenario: 5 Year**  
**Current Time Step: 0.000 h**  
**FlexTable: Conduit Table**

Label	Flow (cfs)	Diameter (in)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Manning's n	Velocity (ft/s)	Capacity (Full Flow) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
C-11	0.57	18.0	109.7	0.027	0.013	4.49	17.13	7,013.43	7,010.64	12' RCP
C-10	1.15	18.0	45.0	0.016	0.013	4.63	13.38	7,010.63	7,009.80	12' RCP
C-9	1.73	18.0	199.1	0.015	0.013	5.06	12.83	7,004.96	7,001.87	12' RCP
C-5	9.10	18.0	34.0	0.010	0.013	6.78	10.66	7,002.42	7,001.97	18' RCP
C-4	15.00	24.0	126.1	0.019	0.013	9.76	30.88	7,001.70	6,998.93	24' RCP
C-8	2.30	18.0	275.2	0.010	0.013	4.81	10.65	6,997.07	6,994.26	12' RCP
C-3	16.10	30.0	416.6	0.003	0.013	4.98	22.47	6,992.02	6,990.93	24' RCP
C-6	2.80	18.0	355.0	0.003	0.013	3.24	5.77	6,993.26	6,992.70	18' RCP
C-7	2.30	18.0	101.9	0.011	0.013	4.97	11.16	6,994.24	6,993.27	12' RCP
C-2	21.80	30.0	45.6	0.003	0.013	5.27	22.73	6,990.91	6,990.55	24' RCP
C-1	22.70	30.0	93.8	0.003	0.013	5.22	22.46	6,989.85	6,989.26	30' RCP

X:\2510000.a\2518800\StormCAD\Sterling Ranch PH 2\Sterling Ranch PH-2.stsw

these notes don't  
match the  
Diameter column.

JR Response: Table has been updated

## **Appendix D**

### **Reference Material**

**SAND CREEK DRAINAGE BASIN PLANNING STUDY**

**PRELIMINARY DESIGN REPORT**

**CITY OF COLORADO SPRINGS, EL PASO COUNTY, COLORADO**



**PREPARED FOR:**

City of Colorado Springs  
Department of Comprehensive Planning, Development and Finance  
Engineering Division  
30 S. Nevada  
Colorado Springs, Colorado 80903

**PREPARED BY:**

Kiowa Engineering Corporation  
1011 North Weber  
Colorado Springs, CO 80903

## II. STUDY AREA DESCRIPTION

The Sand Creek drainage basin is a left-bank tributary to the Fountain Creek lying in the west-central portions of El Paso County. Sand Creek's drainage area at Fountain Creek is approximately 54 square miles of which approximately 18.8 square miles are inside the City of Colorado Springs corporate limits. The basin is divided into five major sub-basins, the Sand Creek mainstem, the East Fork Sand Creek, the Central Tributary to East Fork, the West Fork, and the East Fork Subtributary. Figure II-1 shows the location of the Sand Creek basin.

### Basin Description

The Sand Creek basin covers a total of 54 square miles in unincorporated El Paso County and Colorado Springs, Colorado. Of this total, approximately 28 square miles is encompassed by the Sand Creek basin, and 26 square miles for the East Fork Sand Creek basin. The basin trends in generally a south to southwesterly direction, entering the Fountain Creek approximately two miles upstream of the Academy Boulevard bridge over Fountain Creek. Two main tributaries drain the basin, those being the mainstem of Sand Creek and East Fork Sand Creek. Development presence is most evident along the mainstem. At this time, approximately 25 percent of the basin is developed. This alternative evaluation focuses upon the Sand Creek basin only.

The maximum basin elevation is approximately 7,620 feet above mean sea level, and falls to approximately 5,790 feet at the confluence with Fountain Creek. The headwaters of the basin originate in the conifer covered areas of The Black Forest. The middle eastern portions of the basin are typified by rolling range land with fair to good vegetative cover associated with semi-arid climates.

### Climate

This area of El Paso County can be described, in general as high plains, with total precipitation amounts typical of a semi-arid region. Winters are generally cold and dry. Precipitation ranges from 14 to 16 inches per year, with the majority of this precipitation occurring in spring and summer in the form of rainfall. Thunderstorms are common during the summer months, and are typified by quick-moving low pressure cells which draw moisture from the Gulf of Mexico into the region. Average temperatures range from about 30°F in the winter

to 75° in the summer. The relative humidity ranges from about 25 percent in the summer to 45 percent in the winter.

### Soils and Geology

Soils within the Sand Creek basin vary between soil types A through D, as identified by the U. S. Department of Agriculture, Soil Conservation Service. The predominant soil groupings are in the Truckton and Bresser soil associations. The soils consist of deep, well drained soils that formed in alluvium and residuum, derived from sedimentary rock. The soils have high to moderate infiltration rates, and are extremely susceptible to wind and water erosion where poor vegetation cover exists. In undeveloped areas, the predominance of Type A and B soils give this basin a lower runoff per unit area as compared to basins with soils dominated by Types C and D. Presented on Figure II-2 is the Hydrologic Soil distribution map for the Sand Creek basin.

### Property Ownership and Impervious Land Densities

Property ownership along the major drainage way within the Sand Creek basin vary from public to private. Along the developed reaches, drainage right-of-ways and greenbelts have been dedicated during the development of the adjacent residential and commercial land. Where development has not occurred, the drainageways remain under private ownership with no delineated drainage right-of-way or easements. There are several public parks which abut the mainstem of Sand Creek. Roadway and utility easements abutting or crossing the major drainageways occur most frequently in the developed portions of the basin.

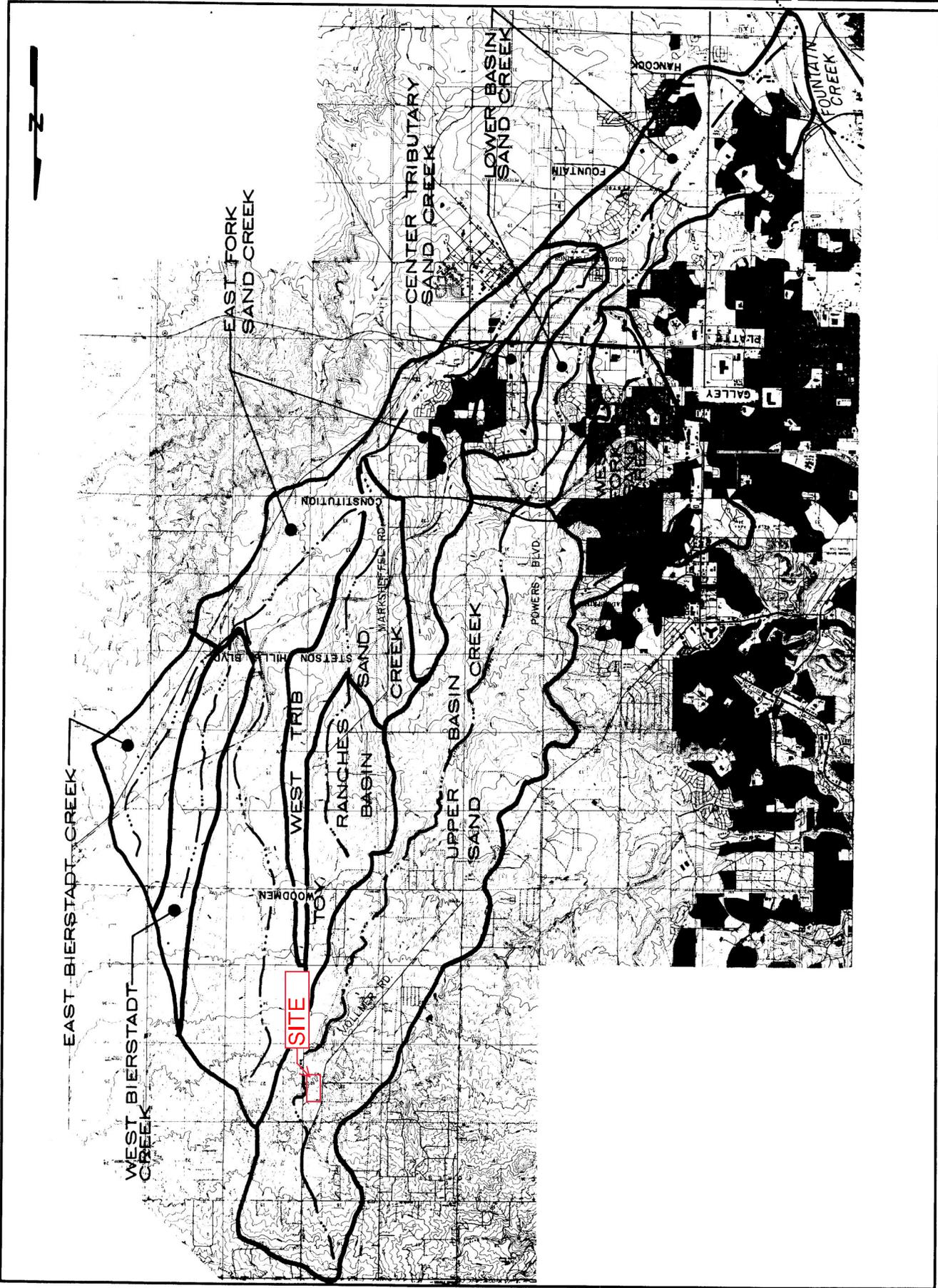
Land use information for the existing and future conditions were reviewed as part of the planning effort. This information is used in the hydrologic analysis to predict runoff rates and volumes for the purposes of facility evaluation. The identification of land uses abutting the drainageways is also useful in the identification of feasible plans for stabilization and aesthetic treatment of the creek. Presented on Figure II-3 is the proposed land use map used in the evaluation of impervious land densities discussed in the hydrologic section of this report. Figure II-3 is not intended to reflect the future zoning or land use policies of the City or the County.

The land use information within the Banning-Lewis Ranch property was obtained from Aries Properties during the time the draft East Fork Sand Creek Drainage Basin Planning Study was being prepared. The land use information was again reviewed with the City of Colorado Springs Department of Planning and was found to be appropriate for use in the estimation of hydrology for the East Fork Basin. The location of future arterial streets and roadways within

Kiowa Engineering Corporation  
 419 W. Bijou Street  
 Colorado Springs, Colorado  
 80905-1308

**SAND CREEK DRAINAGE  
 BASIN PLANNING STUDY  
 REGIONAL SUB-BASINS**

PROJECT No. 90-04-03  
 DATE: 11/80  
 Design: EAK  
 Drawn: EAK  
 Check: [ ]  
 Approved: [ ]







## Worksheet for FSD Overflow - Pass

### Project Description

Solve For Discharge

### Input Data

Headwater Elevation	0.90	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Crest Surface Type	Gravel	
Crest Breadth	12.00	ft
Crest Length	36.00	ft

### Results

Discharge	86.22	ft <sup>3</sup> /s
Headwater Height Above Crest	0.90	ft
Tailwater Height Above Crest	0.00	ft
Weir Coefficient	2.80	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	2.80	US
Flow Area	32.40	ft <sup>2</sup>
Velocity	2.66	ft/s
Wetted Perimeter	37.80	ft
Top Width	36.00	ft

$$(55 \text{ D}) + 29.4 \text{ pucc} = 84.4 \text{ (ft)}$$

## Worksheet for FSD Overflow - Pass

### Project Description

Solve For Discharge

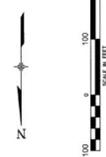
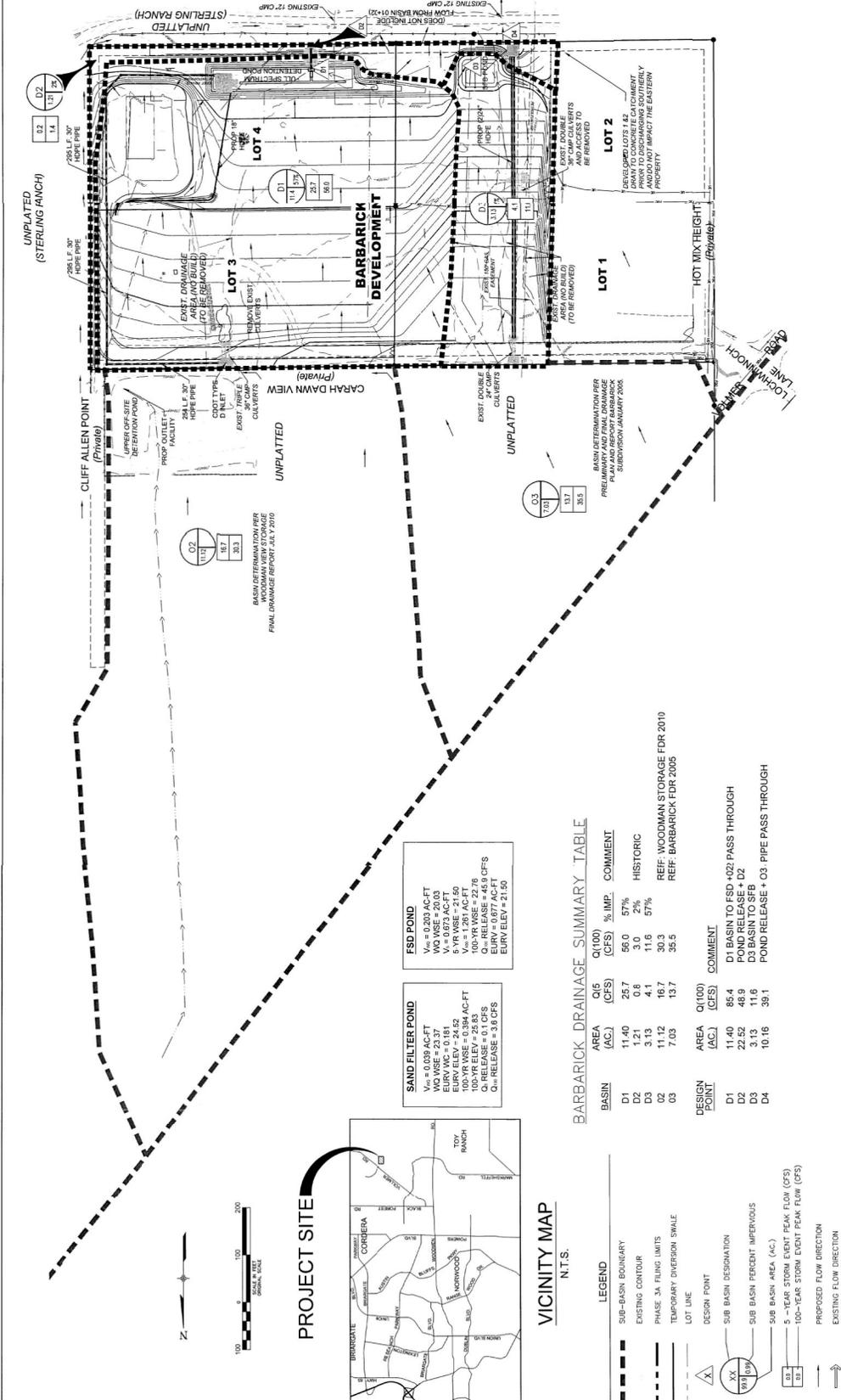
### Input Data

Headwater Elevation	0.90	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Crest Surface Type	Gravel	
Crest Breadth	12.00	ft
Crest Length	36.00	ft

### Results

Discharge	86.22	ft <sup>3</sup> /s
Headwater Height Above Crest	0.90	ft
Tailwater Height Above Crest	0.00	ft
Weir Coefficient	2.80	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	2.80	US
Flow Area	32.40	ft <sup>2</sup>
Velocity	2.66	ft/s
Wetted Perimeter	37.80	ft
Top Width	36.00	ft

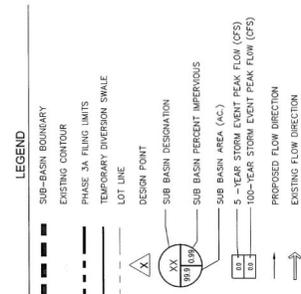
$$(55 \text{ DU}) + 29.4 \text{ p.u.c.} = 84.4 \text{ (c.f.)}$$



**PROJECT SITE**



**VICINITY MAP**  
N.T.S.



**BARBARICK DRAINAGE SUMMARY TABLE**

BASIN	AREA (AC.)	Q15 (CFS)	Q100 (CFS)	% IMP.	COMMENT
D1	11.40	25.7	56.0	57%	HISTORIC
D2	1.21	0.8	3.0	2%	
D3	3.13	4.1	11.6	57%	REF: WOODMAN STORAGE FOR 2010
D4	11.12	16.7	30.3		REF: BARBARICK FOR 2005
D5	7.03	13.7	35.3		

DESIGN POINT	AREA (AC.)	Q100 (CFS)	COMMENT
D1	11.40	85.4	D1 BASIN TO FSD +002 PASS THROUGH
D2	22.52	48.9	D2 BASIN TO SEE D2
D3	10.16	38.1	POND RELEASE + 03 PIPE PASS THROUGH

SAND FILTER POND	
V <sub>in</sub>	= 0.039 AC-FIT
WQ WSE	= 23.37
EURV WQ	= 0.19 AC
100-YR WSE	= 0.394 AC-FIT
100-YR WSE	= 22.76
EURV WSE	= 26.83
Q <sub>in</sub> RELEASE	= 3.6 CFS

FSD POND	
V <sub>in</sub>	= 0.293 AC-FIT
WQ WSE	= 20.03
V <sub>in</sub>	= 0.673 AC-FIT
V <sub>in</sub>	= 1.261 AC-FIT
100-YR WSE	= 22.76
EURV WSE	= 26.83
Q <sub>in</sub> RELEASE	= 3.6 CFS

NO.	DATE	DESCRIPTION	BY
REVISIONS			
		(BENCHMARK DATA/ELEV.)	
		(DATE)	
		(DESCRIPTION/LOCATION)	

**VERTICAL BENCHMARK**  
THE VERTICAL INFORMATION ON THIS MAP IS BASED ON THE NATIONAL GEODETIC REFERENCE FRAME (NGR) AS A BASIS FOR COORDINATE SYSTEMS (NAD 83) AND THE NATIONAL GEODETIC REFERENCE FRAME (NGR) AS A BASIS FOR COORDINATE SYSTEMS (NAD 83). THE BENCHMARK IS LOCATED ON THE WEST SIDE OF BLACK HAWK DRIVE, NEAR THE INTERSECTION OF BLACK HAWK DRIVE AND THE NORTH LINE OF BARBARICK DEVELOPMENT. THE BENCHMARK IS A CONCRETE PIPER PILE SET TO THE SURFACE, WITH A BENCH MARK ON THE TOP SURFACE. THE BENCHMARK IS SET TO THE SURFACE OF THE BENCH MARK.

**Matrix DESIGN GROUP**  
2435 Research Parkway, Suite 100  
Denver, CO 80250  
Phone: 719-575-0080  
Fax: 719-575-0088

PREPARED UNDER THE DIRECT SUPERVISION OF AND ON BEHALF OF MATRIX DESIGN GROUP, INC.

BARBARICK SUBDIVISION LOTS 1-4	
PROPOSED DRAINAGE PLAN	
DATE PLOTTED	DATE REVISION
NO. 1	NO. 1
OF 2 SHEETS	OF 2 SHEETS
DP02	

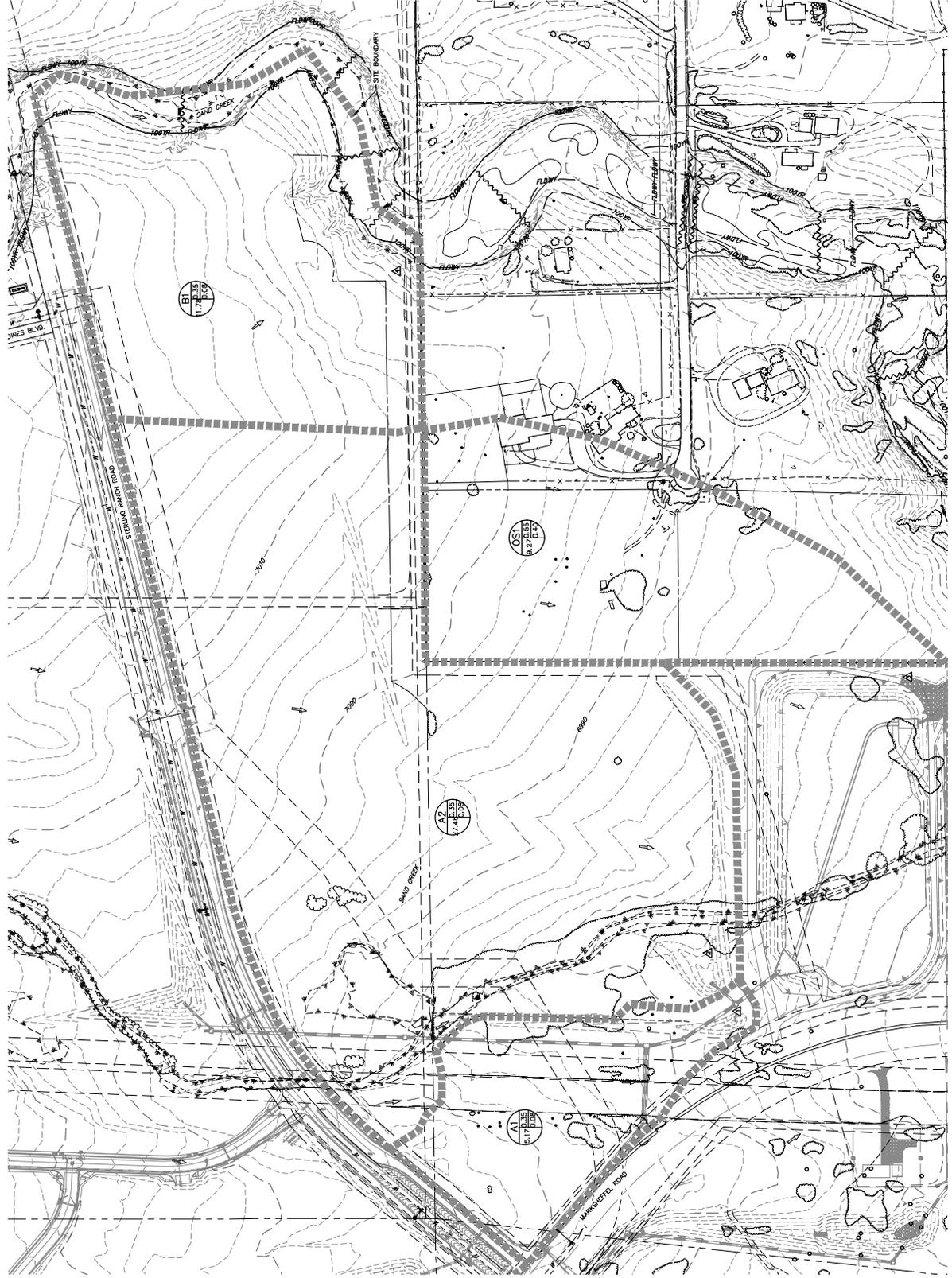


## Appendix E Drainage Maps

Provide a water quality  
treatment area map.

JR Response: Map has been added to this Appendix

# STERLING RANCH FILING 3 EXISTING DRAINAGE MAP



### LEGEND

- BASIN OR SUB-BASIN LABEL
  - A: 100-YR
  - B: 5-10-YR
  - C: 1-5-YR
  - D: 1-5-YR
- DESIGN POINT
- EXISTING FLOW DIRECTION
- BASIN DRAINAGE AREA
- EXISTING STORM SEWER
- SITE BOUNDARY
- PROPERTY LINE
- ROW EXISTING
- FL EXISTING
- SIDWALK EXISTING
- DRAINAGE ACCESS & MAINTENANCE CASHEM



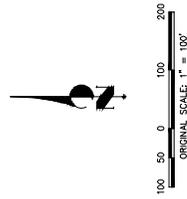
### BASIN SUMMARY TABLE

Trietary Sub-basin	Area (acres)	Percent Impervious	C <sub>1</sub>	C <sub>2</sub>	L <sub>1</sub> (min)	L <sub>2</sub> (min)	Q <sub>1</sub> (cfs)	Q <sub>2</sub> (cfs)
A1	5.17	28%	0.08	0.35	27.4	1.1	6.5	8.0
A2	7.17	6%	0.08	0.35	25.3	2.6	19.5	24.4
B1	11.78	6%	0.08	0.35	25.3	2.6	19.5	24.4
B2	9.27	37%	0.40	0.55	23.7	10.5	24.4	24.4

### DESIGN POINT

DP	OS	CSD	Total Area
1	1	1	4.6
2	4.6	31.5	36.1
3	10.5	24.4	34.9
4	2.6	10.0	12.6

**NOTE**  
 THIS DRAINAGE MAP ASSUMES FILING 2, STERLING RANCH ROAD, & MARGISSETTE ROAD WERE BUILT.



STERLING RANCH FILING 3  
 EXISTING DRAINAGE MAP  
 JOB NO. 25188.02  
 06/09/21 OF 1

**JR ENGINEERING**  
 A Wetzel Company  
 CONTACT: 303.750.8200 • 6 Columbia Center, Suite 750, Denver, CO 80202  
 FOR DATA: 303.495.8888 • www.jr-engineering.com



# STERLING RANCH FILING 3

## COUNTY OF EL PASO, STATE OF COLORADO

### STREET IMPROVEMENT PLAN

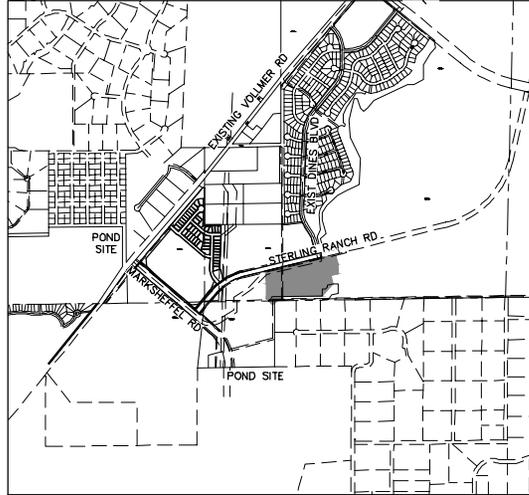
JUNE 2021

#### AGENCIES

OWNER/DEVELOPER:	SR LAND, LLC 20 BOULDER CRESCENT, SUITE 201 COLORADO SPRINGS, CO 80903 JAMES F. MORLEY (719) 471-1742
CIVIL ENGINEER:	JR ENGINEERING, LLC 5475 TECH CENTER DRIVE COLORADO SPRINGS, CO 80919 MIKE BRAMLETT P.E. (303) 267-6240
COUNTY ENGINEERING:	EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT 2880 INTERNATIONAL CIRCLE, SUITE 110 COLORADO SPRINGS, CO 80903 JEFF RICE, P.E. (719) 520-6300
TRAFFIC ENGINEERING:	EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS COLORADO SPRINGS, CO 80922 JENNIFER IRVINE, P.E. (719) 520-6460
WATER RESOURCES:	STERLING RANCH METRO DISTRICT ENGINEERS JES-HIERO CONSULTANTS 845 E. PIKES PEAK AVE., SUITE 300 COLORADO SPRINGS, CO 80903 JOHN MCGINN (719) 688-8769
FIRE DISTRICT:	BLACK FOREST FIRE PROTECTION DISTRICT 1345 TEAGHOUT ROAD COLORADO SPRINGS, CO 80908 CHIEF BRYAN JACK (719) 495-4300
ELECTRIC DEPARTMENT:	MOUNTAIN VIEW ELECTRIC 11140 E. WOODMEN ROAD FALCON, CO 80831 (719) 496-2283
COMMUNICATIONS:	QWEST COMMUNICATIONS (U.N.C.C. LOCATORS) (800) 922-1987 AT&T (LOCATORS) (719) 635-3674
GAS DEPARTMENT:	COLORADO SPRINGS UTILITIES 7710 DURANT DR. COLORADO SPRINGS, CO 80947 TIM WENDT (719) 688-3556
STORMWATER:	STORMWATER ENTERPRISE 30 S. NEVADA AVENUE, SUITE 401 COLORADO SPRINGS, CO 80903 (719)-385-5918
ELECTRIC DEPARTMENT:	MOUNTAIN VIEW ELECTRIC 11140 E. WOODMEN ROAD FALCON, CO 80831 (719)-496-2283
COMMUNICATIONS:	QWEST COMMUNICATIONS (U.N.C.C. LOCATORS) (800) 922-1987 AT&T (LOCATORS) (719) 635-3674
STORMWATER:	STORMWATER ENTERPRISE 30 S. NEVADA AVENUE, SUITE 401 COLORADO SPRINGS, CO 80903 (719)-385-5900
TRAFFIC:	TRAFFIC AND TRANSPORTATION ENGINEERING 30 S. NEVADA AVE. COLORADO SPRINGS, CO 80903 (719)-385-5908
GAS:	STEPHEN BACON SR. ROW AGENT II COLORADO INTERSTATE GAS CO. (HONOR MORGAN) 2 N. NEVADA AVE. COLORADO SPRINGS, CO 80903 (719)-659-3536
GAS:	CRMC KERSEY REAL ESTATE   MACELLAN MOSTREAM PARTNERS, L.P. ONE WILLIAM CENTER, OTC-B, TULSA, OK 74172 (918)-574-7886

#### BENCHMARKS

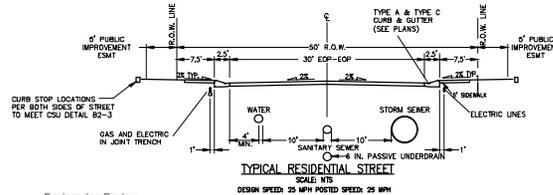
1. THE TOP OF AN ALUMINUM SURVEYORS CAP, STAMPED "8037", AT THE SOUTHEAST BOUNDARY CORNER OF BOMBARDK SUBDIVISION  
NORTHING = 411416.273  
EASTING = 235167.071  
ELEVATION = 7023.42
2. THE TOP OF A RED PLASTIC SURVEYORS CAP, LLEGBLE, AT THE NORTHWEST BOUNDARY CORNER OF PARKER RANCHEROS SUBDIVISION  
NORTHING = 410095.404  
EASTING = 235052.131  
ELEVATION = 7000.40
3. THE TOP OF A RED PLASTIC SURVEYORS CAP, STAMPED "8041", AT THE SOUTHWEST BOUNDARY CORNER OF BOMBARDK SUBDIVISION  
NORTHING = 411399.962  
EASTING = 233848.817  
ELEVATION = 7030.82



**VICINITY MAP**  
SCALE: 1"=1,000'

#### SHEET INDEX

- 1 COVER SHEET
- 2 GENERAL NOTES
- 3 HORIZONTAL CONTROL
- 4-10 STREET IMPROVEMENT PLAN
- 12 STREET SIGNAGE
- 13 DETAILS



**TYPICAL RESIDENTIAL STREET**  
SCALE: NTS  
DESIGN SPEED: 25 MPH POSTED SPEED: 25 MPH

#### Engineering Review

11/24/2021 2:18:42 PM  
Audric  
jr@jr-engineering.com  
(719) 538-7677  
EPC Planning & Community  
Development Department

See comment letter also

#### OWNER/DEVELOPER STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

JAMES F. MORLEY \_\_\_\_\_ DATE \_\_\_\_\_

SR LAND, LLC  
20 BOULDER CRESCENT, SUITE 201  
COLORADO SPRINGS, CO 80903

#### EL PASO COUNTY STATEMENT

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

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.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES, AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JENNIFER IRVINE, P.E. \_\_\_\_\_ DATE \_\_\_\_\_

COUNTY ENGINEER/ECM ADMINISTRATOR

#### ENGINEER'S STATEMENT

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECT SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLAN AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.



MIKE A. BRAMLETT, P.E. \_\_\_\_\_ DATE \_\_\_\_\_  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING, LLC

#### DISTRICT APPROVALS

THESE DOCUMENTS HAVE BEEN REVIEWED AND APPROVED FOR STORM DRAIN AND ASSOCIATED UTILITY SERVICE CONSTRUCTION.

FOR AND ON BEHALF OF THE STERLING RANCH METRO DISTRICT \_\_\_\_\_ DATE \_\_\_\_\_



Know what's below.  
Call before you dig.

FILE NO. SF-21-XXX

UNTIL SUCH TIME AS THE APPROVED BY THE APPROPRIATE REVIEWING APPROVES THEIR USE. COLORADO LICENSE NUMBERS ASSIGNED BY THE STATE AUTHORIZATION.

PREPARED FOR  
SR LAND, LLC  
20 BOULDER CRESCENT  
SUITE 201  
COLORADO SPRINGS, CO 80903  
JAMES F. MORLEY  
(719) 471-1742

**JR ENGINEERING**  
A Merit Company  
Central 303-740-6338 • Colorado State Reg. No. 990-2560  
For Calls 970-697-8888 • www.jr-engineering.com

DATE	BY	REVISION	NO.	SCALE	N/A	DESIGNED BY	DRAWN BY	CHECKED BY
						6/17/21	RAB	RAB

STERLING RANCH FILING 3

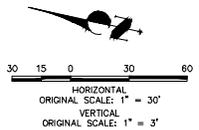
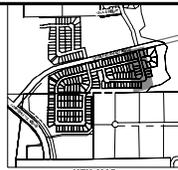
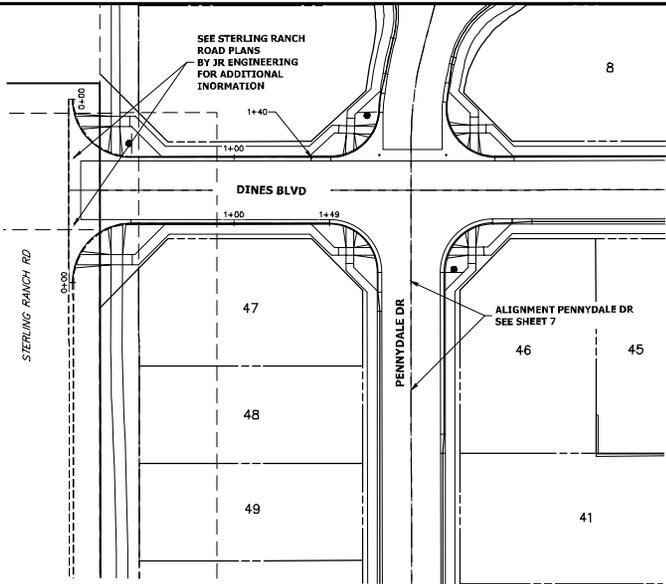
COVER SHEET

SHEET 1 OF 13  
JOB NO. 25188.00







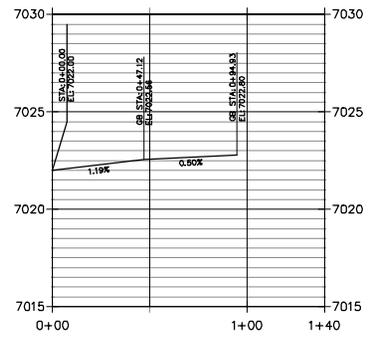


UNLESS SHOWN OTHERWISE, ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.

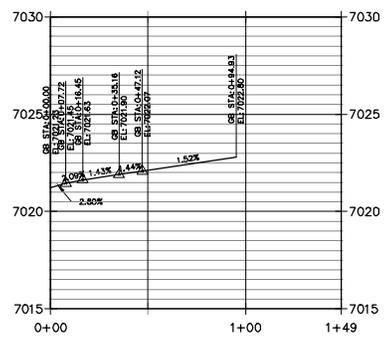
PREPARED FOR  
 SR LAND, LLC  
 20 BOULDER CRESCENT  
 SUITE 201  
 COLORADO SPRINGS, CO 80903  
 JAMES F. MORLEY  
 (719) 471-1742

**JR ENGINEERING**  
 A Whittier Company  
 Central 303-740-8338 • Colorado Springs 719-596-2593  
 Fort Collins 970-699-8888 • www.jrengineering.com

**EAST FL DINES PROFILE  
 STA 0+00.00 TO 1+39.87**



**WEST FL DINES PROFILE  
 STA 0+00.00 TO 1+49.12**



BY	DATE	REVISION

H-SCALE	V-SCALE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY
1"=30'	1"=3'	6/17/21	JRM	JRM	

SHEET 5 OF 13  
 JOB NO. 25188-00

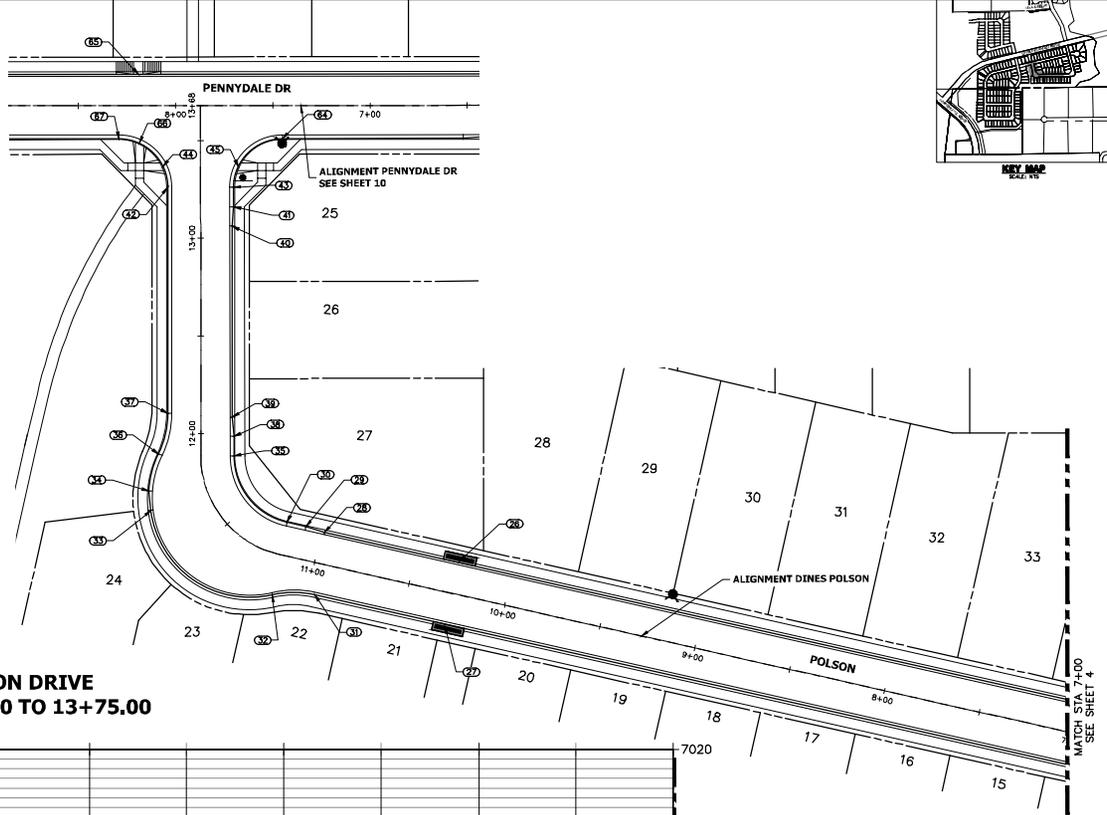
**ENGINEER'S STATEMENT**  
 PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING.



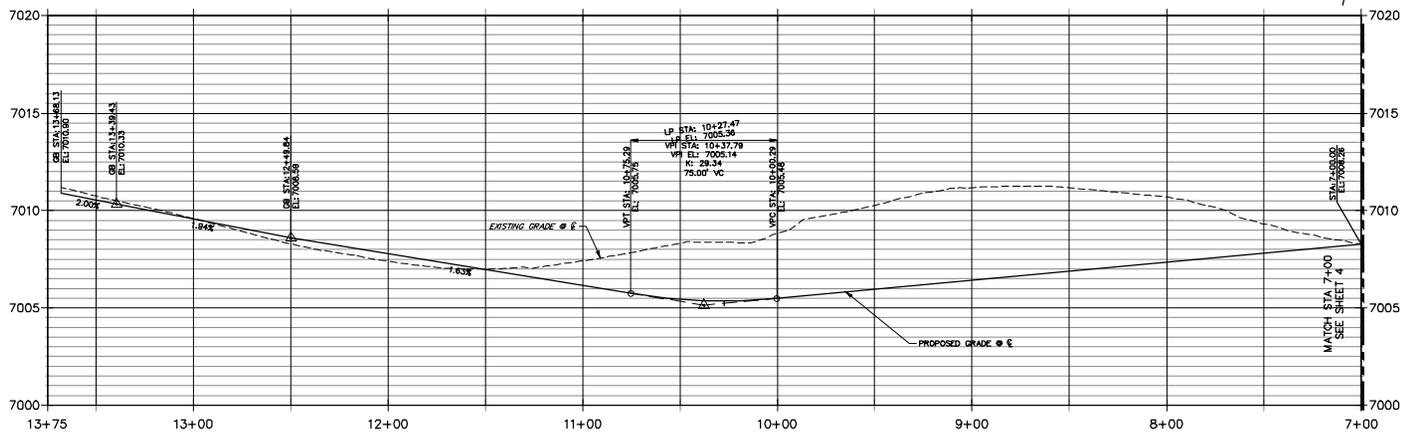
FILE NO. SF-21-XXX

MIKE A. BRAMLETT, P.E.  
 COLORADO P.E. 32314  
 FOR AND ON BEHALF OF JR ENGINEERING, INC.

POINT TABULATION					
POINT NUMBER	STATION	OFFSET	ALIGNMENT	ELEVATION	DESCRIPTION
26	10+27.53	16.83' (RT)	DINES POLSON	7005.36	LOW POINT
27	10+27.51	16.99' (LT)	DINES POLSON	7005.45	LOW POINT
28	10+98.31	16.17' (RT)	DINES POLSON	7006.01	CURB TRANSITION
29	11+08.31	17.00' (RT)	DINES POLSON	7005.82	CURB TRANSITION
30	11+18.31	17.00' (RT)	DINES POLSON	7005.98	PCR
31	10+96.29	16.17' (LT)	DINES POLSON	7005.69	PCR
32	11+17.57	21.05' (LT)	DINES POLSON	7005.95	PCR
33	11+70.46	30.64' (LT)	DINES POLSON	7006.95	CURB TRANSITION
34	11+76.79	28.89' (LT)	DINES POLSON	7007.07	CURB TRANSITION
35	11+88.41	17.00' (RT)	DINES POLSON	7007.12	PCR
36	11+89.51	21.80' (LT)	DINES POLSON	7007.30	PCR
37	12+10.43	17.00' (LT)	DINES POLSON	7007.57	PCR
38	11+98.41	17.00' (RT)	DINES POLSON	7007.29	CURB TRANSITION
39	12+08.41	16.17' (RT)	DINES POLSON	7007.52	CURB TRANSITION
40	13+06.13	16.25' (RT)	DINES POLSON	7009.33	CURB TRANSITION
41	13+16.13	17.00' (RT)	DINES POLSON	7009.44	CURB TRANSITION
42	13+26.13	17.00' (LT)	DINES POLSON	7009.41	PCR
43	13+26.13	17.00' (RT)	DINES POLSON	7009.66	PCR
44	13+36.72	19.36' (LT)	DINES POLSON	7009.55	HC RAMP MID PT
45	13+36.72	19.36' (RT)	DINES POLSON	7009.88	HC RAMP MID PT



**POLSON DRIVE  
STA 7+00.00 TO 13+75.00**



811  
Know what's below.  
Call before you dig.

ENGINEER'S STATEMENT  
PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING.

FILE NO. SF-21-XXX

MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING

UNLESS SHOWN OTHERWISE, ALL DIMENSIONS ARE IN FEET AND DECIMALS THEREOF. APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, THEIR USE IS GUARANTEED BY THE ENGINEER'S AUTHORIZATION.

PREPARED FOR  
SR LAND, LLC  
20 BOULDER CRESCENT  
SUITE 201  
COLORADO SPRINGS, CO 80903  
JAMES E. MORLEY  
(719) 471-1742

**JR ENGINEERING**  
A Whiting Company  
Central 303-740-8338 • Colorado Springs 719-596-2530  
Fort Collins 970-699-8888 • www.jrengineering.com

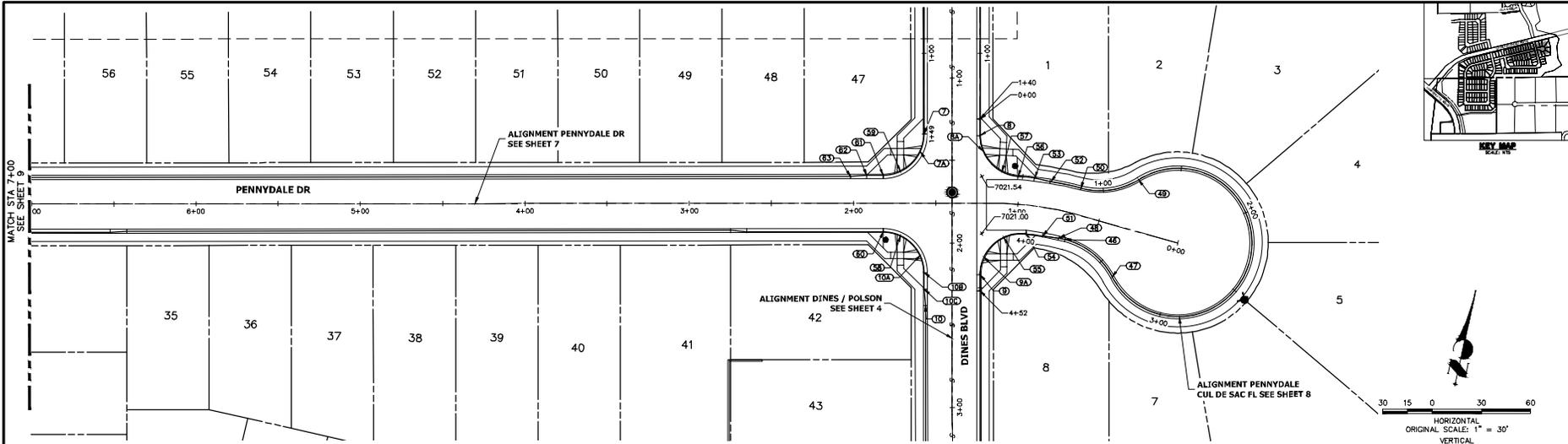
BY	DATE	NO.	REVISION

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V-SCALE 1"=3'

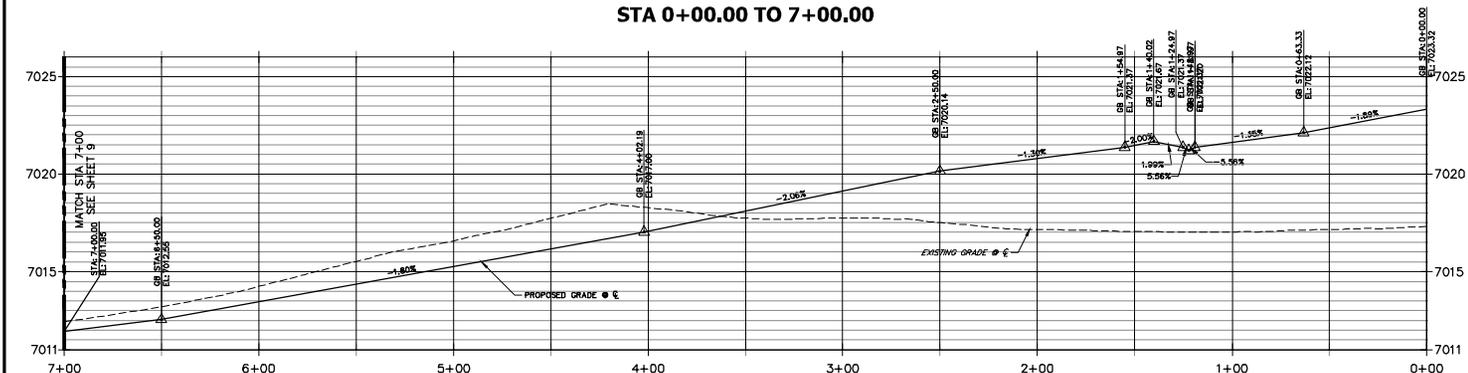
DESIGNED BY JRM  
DRAWN BY CJD  
CHECKED BY

STERLING RANCH  
FLING 3  
STREET IMPROVEMENT PLAN

SHEET 6 OF 13  
JOB NO. 25188.00



**PENNYDALE DRIVE  
STA 0+00.00 TO 7+00.00**



POINT TABULATION					
POINT NUMBER	STATION	OFFSET	ALIGNMENT	ELEVATION	DESCRIPTION
46	0+67.17	16.17' (LT)	PENNYDALE-MOORE	7021.56	PCR
47	0+33.00	30.80' (LT)	PENNYDALE-MOORE	7022.02	PCR
48	0+71.15	16.17' (LT)	PENNYDALE-MOORE	7021.51	CURB TRANSITION
49	0+33.02	30.80' (RT)	PENNYDALE-MOORE	7022.57	PCR
50	0+65.40	16.17' (RT)	PENNYDALE-MOORE	7022.30	PCR
51	0+82.03	17.00' (LT)	PENNYDALE-MOORE	7021.36	CURB TRANSITION
52	0+82.83	16.00' (RT)	PENNYDALE-MOORE	7022.13	CURB TRANSITION
53	0+92.08	17.00' (RT)	PENNYDALE-MOORE	7022.03	CURB TRANSITION
54	0+92.91	17.00' (LT)	PENNYDALE-MOORE	7021.22	PCR
55	1+07.66	20.31' (LT)	PENNYDALE-MOORE	7021.00	HC RAMP MID PT
56	1+01.30	17.00' (RT)	PENNYDALE-MOORE	7021.93	PCR
57	1+10.15	19.17' (RT)	PENNYDALE-MOORE	7021.94	HC RAMP MID PT
58	1+71.42	19.36' (LT)	PENNYDALE-MOORE	7020.83	HC RAMP MID PT
59	1+71.42	19.36' (RT)	PENNYDALE-MOORE	7021.01	HC RAMP MID PT
60	1+82.02	17.00' (LT)	PENNYDALE-MOORE	7020.66	PCR
61	1+82.02	17.00' (RT)	PENNYDALE-MOORE	7020.73	PCR
62	1+82.02	17.00' (RT)	PENNYDALE-MOORE	7020.57	CURB TRANSITION
63	2+02.02	16.17' (RT)	PENNYDALE-MOORE	7020.36	CURB TRANSITION



**ENGINEER'S STATEMENT**  
PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING.



MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING

FILE NO. SF-21-XXX

PREPARED FOR  
SR LAND, LLC  
20 BOULDER CREST  
SUITE 201  
COLORADO SPRINGS, CO 80903  
JAMES E. MORLEY  
(719) 471-1742

**JR ENGINEERING**  
A Merit Company  
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For Color 970-691-8888 • www.jrengineering.com

BY	DATE	No.	REVISION

H-SCALE 1"=30'  
V-SCALE 1"=3'

DESIGNED BY JRM  
DRAWN BY JRM  
CHECKED BY JRM

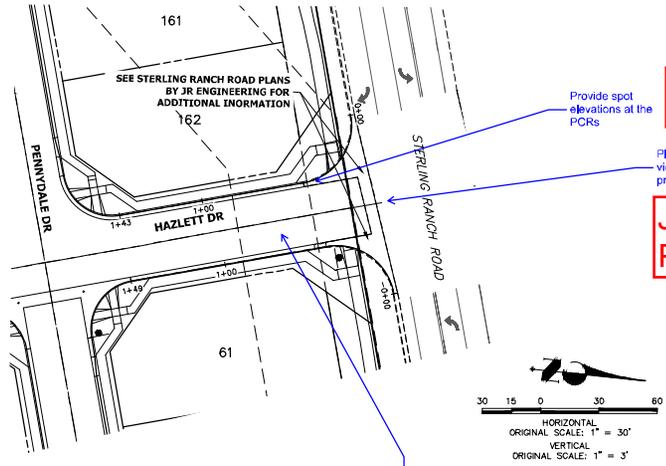
STERLING RANCH  
FLING 3  
STREET IMPROVEMENT PLAN

SHEET 7 OF 13  
JOB NO. 25188.00







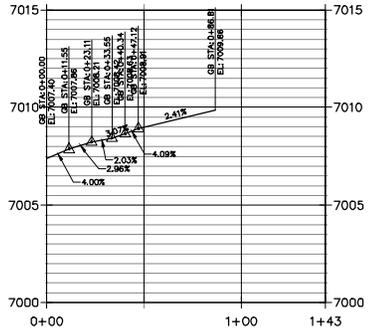


JR Response: Added

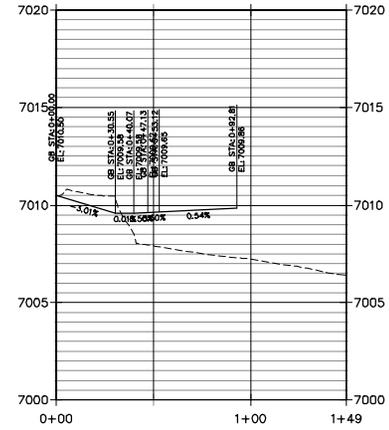
JR Response: Moved Profiles

JR Response: Updated

WEST FL HAZLETT DRIVE PROFILE PROFILE  
STA 0+00.00 TO 1+43.12



EAST FL HAZLETT DRIVE PROFILE  
STA 0+00.00 TO 1+49.12



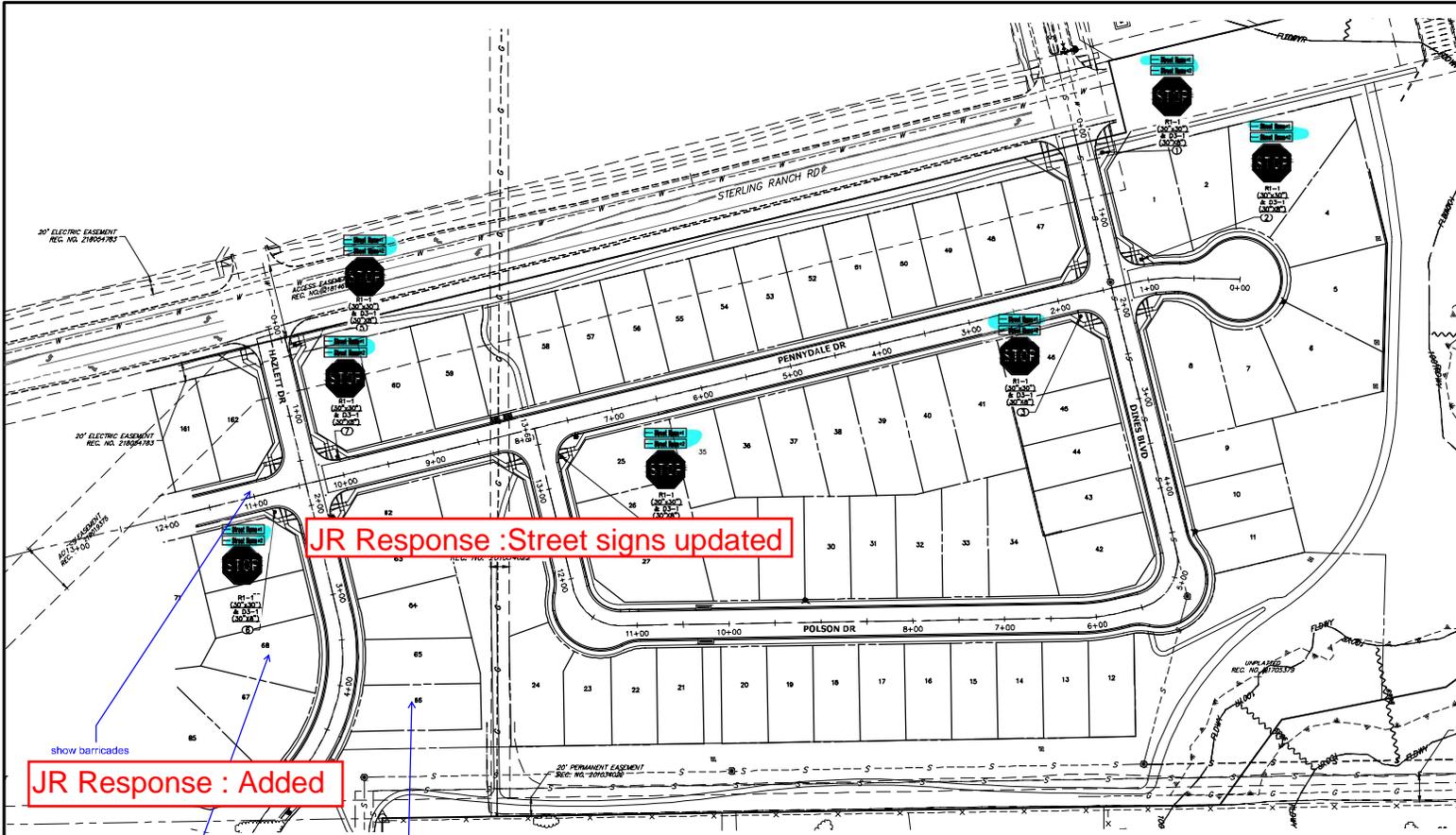
**ENGINEER'S STATEMENT**  
PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING.



MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING, INC.

FILE NO. SF-21-XXX

UNTIL SUCH TIME AS APPROPRIATE REVIEWING APPROVES THEIR USE COLORADO LICENSE NO. 100000000 JAMES F. MORLEY (719) 471-1742	
PREPARED FOR SR LAND, LLC 20 BOULDER CRESCENT SUITE 201 CO. 80903 COLORADO JAMES F. MORLEY (719) 471-1742	
<b>JR ENGINEERING</b> A Whiting Company Central 303-740-8338 • Central Street 719-596-2530 Fort Collins 979-691-8888 • www.jrengineering.com	
BY	DATE
No.	REVISION
H-SCALE 1"=30'	V-SCALE 1"=3'
DESIGNED BY JRM	DRAWN BY JRM
CHECKED BY	
STERLING RANCH FILING 3 STREET IMPROVEMENT PLAN	
SHEET 11 OF 13	JOB NO. 25188.00



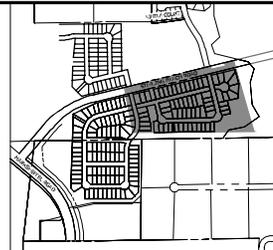
JR Response : Street signs updated

JR Response : Added

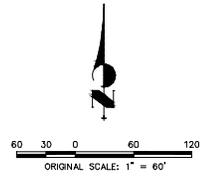
JR Response: Updated

JR Response: Lots updated

POINT TABULATION				
POINT NUMBER	STATION	OFFSET	ALIGNMENT	DESCRIPTION
			DINES POLSON	STOP SIGN AND STREET SIGNS
			PENNYDALE-MOORE	STOP SIGN AND STREET SIGNS
3	1+80.51	21.96' (LT)	PENNYDALE-MOORE	STOP SIGN AND STREET SIGNS
4	13+31.09	21.71' (RT)	DINES POLSON	STOP SIGN AND STREET SIGNS
5	0+28.55	23.75' (LT)	HAZLETT DR	STOP SIGN AND STREET SIGNS
6	10+82.64	21.47' (LT)	PENNYDALE-MOORE	STOP SIGN AND STREET SIGNS
7	10+01.78	20.89' (RT)	PENNYDALE-MOORE	STOP SIGN AND STREET SIGNS



KEY MAP  
SCALE: NTS



UNTIL SUCH TIME AS APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, THEIR USE IS LIMITED TO THE PURPOSES INDICATED BY THIS AUTHORIZATION.

PREPARED FOR  
SR LAND, LLC  
20 BOULDER CRESCENT  
SUITE 201, CO. 80903  
COLORADO, USA  
JAMES F. MORLEY  
(719) 471-1742

**JR ENGINEERING**  
A Wharton Company  
Central 303-740-8338 • Central Street 719-596-2530  
For Calls 970-691-8888 • www.jrengineering.com

BY	DATE	NO.	REVISION
		1	"1"=60'
		2	V-SCALE N/A
		3	DATE 6/17/21
		4	DESIGNED BY ARJ
		5	DRAWN BY ARJ
		6	CHECKED BY

STERLING RANCH FILING 3  
STREET SIGNAGE

SHEET 12 OF 13  
JOB NO. 25188.00



Know what's below.  
Call before you dig.



# STERLING RANCH FILING 3

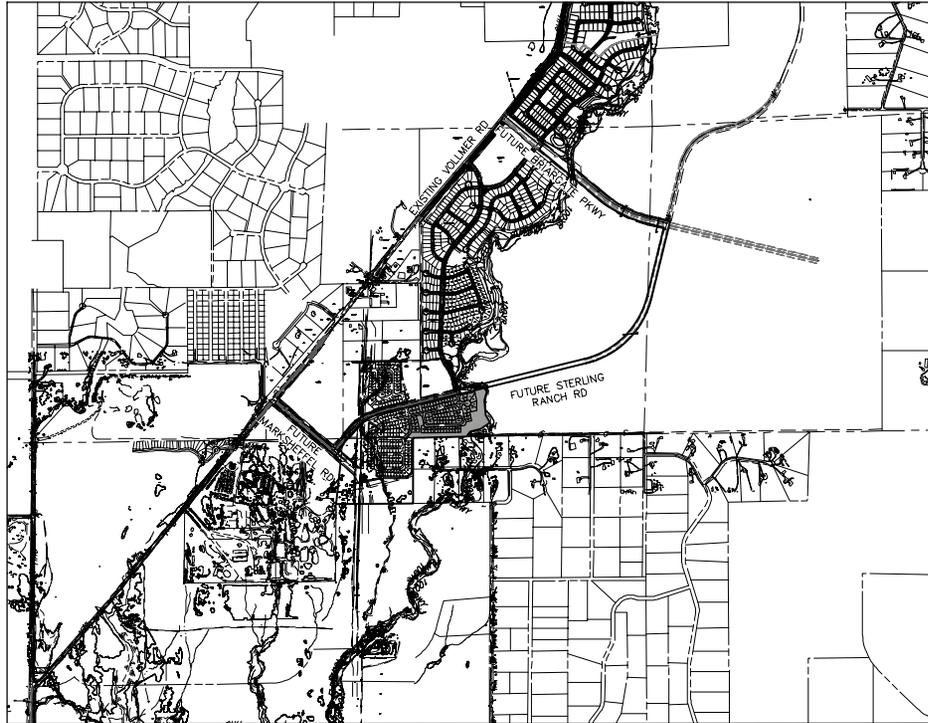
## COUNTY OF EL PASO, STATE OF COLORADO

### JUNE 2021

## STORM SEWER PLANS

### AGENCIES

OWNER/DEVELOPER:	SR LAND, LLC 20 BOULDER CRESCENT, SUITE 201 COLORADO SPRINGS, CO 80903 JAMES F. MORLEY (719) 471-1742
CIVIL ENGINEER:	JR ENGINEERING, LLC 5475 TECH CENTER DRIVE COLORADO SPRINGS, CO 80919 MIKE BRAMLETT P.E. (303) 267-6240
COUNTY ENGINEERING:	EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT 2880 INTERNATIONAL CIRCLE, SUITE 110 COLORADO SPRINGS, CO 80901 JEFF RICE, P.E. (719) 520-6300
TRAFFIC ENGINEERING:	EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS 3275 ANDERS DRIVE COLORADO SPRINGS, CO 80922 JENNIFER IRVINE, P.E. (719) 520-6460
WATER RESOURCES:	STERLING RANCH METRO DISTRICT ENGINEERS 405-HYDRO CONSULTANTS 545 E. PINE PEAK AVE., SUITE 300 COLORADO SPRINGS, CO 80903 JOHN MCGINN (719) 666-8769
FIRE DISTRICT:	BLACK FOREST FIRE PROTECTION DISTRICT 11445 TEACOUT ROAD COLORADO SPRINGS, CO 80908 CHIEF BRYAN JACK (719) 495-4300
GAS DEPARTMENT:	COLORADO SPRINGS UTILITIES 7710 DURANT DR COLORADO SPRINGS, CO 80947 TIM WENDT (719) 666-3556
ELECTRIC DEPARTMENT:	MOUNTAIN VIEW ELECTRIC 11140 E. HANSEN ROAD FALCON, CO 80831 (719) 495-2283
COMMUNICATIONS:	QUEST COMMUNICATIONS (U.N.C.C. LOCATORS) (800) 922-1987 AT&T (LOCATORS) (719) 635-3674
STORMWATER:	STORMWATER ENTERPRISE 30 S. NEVADA AVENUE, SUITE 401 COLORADO SPRINGS, CO 80903
COMMUNICATIONS:	QUEST COMMUNICATIONS (U.N.C. LOCATORS) (800) 922-1987 AT&T (LOCATORS) (719) 635-3674
STORMWATER:	STORMWATER ENTERPRISE 30 S. NEVADA AVENUE, SUITE 401 COLORADO SPRINGS, CO 80903 (719) 385-5980
TRAFFIC:	TRAFFIC AND TRANSPORTATION ENGINEERING 30 S. NEVADA AVE. COLORADO SPRINGS, CO 80903 (719)-385-5980
GAS:	STEPHEN BACON 98. 808 ACRES II COLORADO INTERSTATE GAS CO. (KINDER MORGAN) 2 N. NEVADA AVE. COLORADO SPRINGS, CO 80903 719-659-6936
GAS:	DRAG KEIRSEY REAL ESTATE   MAGELLAN MIDSTREAM PARTNERS, L.P. ONE WILLIAMS CENTER, 01C-8, TULSA, OK 74172 918-274-7996



**VICINITY MAP**  
SCALE: 1"=1,000'

### SHEET INDEX

1	COVER SHEET
2	NOTES
3-4	STORM SEWER PLANS
6-7	DETAIL SHEET

### BENCHMARKS

1. THE TOP OF AN ALUMINUM SURVEYORS CAP, STAMPED "9851", AT THE SOUTHEAST BOUNDARY CORNER OF BARBARICK SUBDIVISION  
NORTHING = 411616.273  
EASTING = 235167.071  
ELEVATION = 7023.42
2. THE TOP OF A RED PLASTIC SURVEYORS CAP, ILLISIBLE, AT THE NORTHWEST BOUNDARY CORNER OF PAWNEE RANCHEROS SUBDIVISION  
NORTHING = 410095.454  
EASTING = 235052.131  
ELEVATION = 7000.40
3. THE TOP OF A RED PLASTIC SURVEYORS CAP, STAMPED "58141", AT THE SOUTHWEST BOUNDARY CORNER OF BARBARICK SUBDIVISION  
NORTHING = 411399.962  
EASTING = 233249.817  
ELEVATION = 7030.82

### OWNER/DEVELOPER STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

JAMES F. MORLEY \_\_\_\_\_ DATE \_\_\_\_\_

SR LAND, LLC  
20 BOULDER CRESCENT, SUITE 201  
COLORADO SPRINGS, CO 80903

### EL PASO COUNTY STATEMENT

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

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.

IN ACCORDANCE WITH EGM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JENNIFER IRVINE, P.E. \_\_\_\_\_ DATE \_\_\_\_\_

COUNTY ENGINEER/ECM ADMINISTRATOR

### ENGINEER'S STATEMENT

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECT SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLAN AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.



MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING

### DISTRICT APPROVALS

THESE DOCUMENTS HAVE BEEN REVIEWED AND APPROVED FOR STORM DRAIN AND ASSOCIATED UTILITY SERVICE CONSTRUCTION.

FOR AND ON BEHALF OF THE STERLING RANCH METRO DISTRICT \_\_\_\_\_ DATE \_\_\_\_\_

PREPARED FOR SR LAND, LLC 20 BOULDER CRESCENT SUITE 201 COLORADO SPRINGS, CO 80903 JAMES F. MORLEY (719) 471-1742	UNTIL SUCH TIME AS APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, THEIR USE, DISSEMINATION, OR REPRODUCTION WITHOUT AUTHORIZATION.	JR ENGINEERING A Member Company Central 303-740-6388 • Colorado Springs 719-596-2560 Fort Collins 970-697-6868 • www.jrengineering.com	H-SCALE 1"=1000' V-SCALE N/A DATE 06/19/21 DESIGNED BY XXX DRAWN BY XXX CHECKED BY XXX	NO. REVISION 1 2 3 4 5 6 7	STERLING RANCH FILING 3 COVER SHEET	SHEET 1 OF 7 JOB NO. 25188.00
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Know what's below.  
Call before you dig.

**STANDARD CONSTRUCTION NOTES:**

- ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCO).
- CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIME INCLUDING THE FOLLOWING:
  - EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
  - CITY OF COLORADO SPRINGS/EL PASO COUNTY ENGINEERING CRITERIA MANUAL VOLUMES 1 AND 2.
  - COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARDS SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION.
  - CDOT M&S STANDARDS.
- IT IS THE DESIGN ENGINEERS RESPONSIBILITY TO ACCURACY SHOW EXISTING CONDITION BOTH ONSITE AND OFFSITE ON THE CONSTRUCTION PLANS. ANY MODIFICATION NECESSARY DUE TO CONFLICT OMISSIONS OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPERS RESPONSIBILITY TO RECTIFY.
- IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORM WATER QUALITY CONTROL PERMIT (ESQWCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, US ARMY CORPS OF ENGINEER ISSUED 401 AND/OR 404 PERMITS AND COUNTY AND STATE FUGITIVE DUST PERMITS.
- ANY TEMPORARY SIGNAGE AND STRIPING SHALL COMPLY WITH EL PASO COUNTY PCO AND MUTCD CRITERIA.
- CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
- THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFFSITE DISTURBANCE GRADING, OR CONSTRUCTION.

**STORM SEWER GENERAL NOTES**

- ALL STATIONING IS ALONG STORM SEWER CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE INVERT UNLESS OTHERWISE INDICATED.
- ALL STORM SEWER BENDS AND WYES SHOWN ON THE PLAN SHALL BE PREFABRICATED.
- HORIZONTAL AND VERTICAL BENDS ARE INDICATED ON THE PLANS.
- JOINTS SHALL BE IN ACCORDANCE WITH ASTM C643 "STANDARD SPECIFICATIONS FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKET." IN NO CASE SHALL THE MAXIMUM JOINT OPENING FOR STRAIGHT ALIGNMENT EXCEED 1 INCH OR ONE AND ONE-HALF INCH ON CURVED ALIGNMENT.
- INLET DIMENSIONS SHOWN ON PLANS REFER TO DISTANCES FROM INSIDE FACES OF BOX BETWEEN THE WIDTHS AND LENGTHS.
- MANHOLE WIDTHS AND LENGTHS SHOWN ON PLAN REFER TO THE EXTERIOR WALL DIMENSIONS.
- ALL STORM SEWER SHALL BE A MINIMUM OF CLASS III REINFORCED CONCRETE PIPE. SPECIFIC SEGMENTS OF STORM SEWER SHALL BE REQUIRED TO BE CONSTRUCTED OF A MINIMUM OF 5000 PSI CONCRETE DUE TO EXCESSIVE VELOCITIES. REFER TO ADDITIONAL NOTES WITHIN CONSTRUCTION PLANS.
- SINCE ALL PIPE ENTRIES INTO THE BASE ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK.
- THE MH RING (FRAME) SHALL BE SET IN A BED OF GROUT. THE FRAME SHALL BE SURROUNDED WITH A GROUT IN UNPAVED AREA, OR A CONCRETE COLLAR IN PAVED AREA.
- PRECAST MANHOLES AND REINFORCEMENT SHALL CONFORM TO ASTM C 478 (AASHTO M 199).
- CAST IN PLACE MANHOLES SHALL BE CLASS B CONCRETE.
- STEPS SHALL BE REQUIRED WHEN THE MANHOLE DEPTH EXCEEDS 3'-6" AND SHALL BE IN ACCORDANCE WITH AASHTO M 199.
- ALL REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI. VERTICAL STEEL SHALL BE PLACED AT 6" OF WALL. ALL BARS SHALL HAVE A 2" MINIMUM CLEARANCE.
- FLOW CHANNELS AND INVERTS SHALL BE FORMED BY SHAPING WITH CLASS B CONCRETE OR APPROVED GROUT.
- STUB-OUTS SHALL EXTEND 4 FT MINIMUM BEYOND OUTSIDE WALL SURFACE OF MANHOLE AND BE SATISFACTORILY PLUGGED.
- CHECK WITH THE LOCAL GOVERNMENT AUTHORITY FOR ANY ADDITIONAL STORM SEWER SPECIFICATIONS, DETAILS, OR REGULATIONS.
- THE SLOPE OF THE MANHOLE COVER SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
- THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ALL PREFABRICATED STRUCTURES TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION.

**SOIL RIPRAP NOTES:**

- THE SOIL MATERIAL SHALL BE NATIVE OR TOPSOIL AND MIXED WITH SIXTY FIVE PERCENT (65%) RIPRAP AND THIRTY FIVE PERCENT (35%) SOIL BY VOLUME.
- SOIL RIPRAP SHALL CONSIST OF A UNIFORM MIXTURE OF SOIL AND RIPRAP WITHOUT VOIDS.
- CONTRACTOR SHALL COOPERATE WITH ENGINEER IN OBTAINING AND PROVIDED SAMPLES OF ALL SPECIFIED MATERIALS.
- CONTRACTOR SHALL SUBMIT CERTIFIED LABORATORY TEST CERTIFICATES FOR ALL ITEMS REQUIRED FOR SOIL RIPRAP.
- RIPRAP USED SHALL BE THE TYPE DESIGNATED ON THE DRAWINGS AND SHALL CONFORM TO TABLE SHOWN TO THE RIGHT.
- THE RIPRAP DESIGNATION AND TOTAL THICKNESS OF RIPRAP SHALL BE AS SHOWN ON THE DRAWINGS, THE MAXIMUM STONE SIZE SHALL NOT LARGER THAN THE THICKNESS OF THE RIPRAP.
- NEITHER WIDTH NOR THICKNESS OF A SINGLE STONE OF RIPRAP SHALL BE LESS THAN ONE-THIRD (1/3) OF ITS LENGTH.
- THE SPECIFIC GRAVITY OF THE RIPRAP SHALL BE TWO AND ONE-HALF (2.5) OR GREATER.
- MINIMUM DENSITY FOR ACCEPTABLE RIPRAP SHALL BE ONE HUNDRED AND SIXTY FIVE (165) POUNDS PER CUBIC FOOT.
- RIPRAP SPECIFIC GRAVITY SHALL BE ACCORDING TO THE BULK-SATURATED, SURFACE-DRY BASIS, IN ACCORDANCE WITH AASHTO T85.
- BROKEN CONCRETE OR ASPHALT PAVEMENT SHALL NOT BE ACCEPTABLE FOR USE IN THE WORK.
- ROUNDED RIPRAP (RIVER ROCK) IS NOT ACCEPTABLE, UNLESS SPECIFICALLY DESIGNATED ON THE DRAWINGS.

**STRUCTURAL CONCRETE NOTES:**

- ALL CONSTRUCTION INVOLVING THE PLACEMENT OF STRUCTURAL CONCRETE SHALL BE COMPLETED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, AND AS SUPPLEMENTED BY THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION.
- STEEL REINFORCING SHALL BE GRADE 60 FOR ALL REINFORCING STEEL GREATER THAN #4. SPlicing, LAP SPlicing SHALL BE MINIMUM IN THE FOLLOWING TABLE UNLESS OTHERWISE SPECIFIED:  

BAR SIZE	#4	#5	#6	#7	#8
SPlice LENGTH	12"	18"	24"	36"	48"

 ALL REINFORCING SHALL HAVE A 2-INCH MINIMUM COVER UNLESS OTHERWISE SPECIFIED. ALL REINFORCED STEEL TO BE EPOXY COATED.
- CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f<sub>c</sub>) OF 4,000 PSI AT 28 DAYS. ALL CONCRETE PLACED AGAINST SOIL SHALL BE TYPE II PORTLAND CEMENT. ALL EXPOSED CORNERS SHALL BE FORMED WITH A 3/4" CHAMFER UNLESS OTHERWISE SPECIFIED.
- EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-21.3.
- BACKFILL AGAINST STRUCTURES SHALL NOT COMMENCE UNTIL ALL SUPPORTING DIAPHRAGMS ARE IN PLACE AND CONCRETE HAS OBTAINED ITS FULL SEVEN DAY STRENGTH. BACKFILL SHALL BE PLACED EQUALLY ON EACH SIDE OF RETAINING WALL STRUCTURES AND CUTOFF WALLS UNTIL THE FINAL GRADE IS REACHED.
- FOOTING EXCAVATIONS SHALL BE EXAMINED BY THE GEOTECHNICAL ENGINEER WITH A 24-HOUR MINIMUM NOTIFICATION FOR SOIL AND/OR CONCRETE TESTING. PLACEMENT OF CONCRETE IN THE ABSENCE OF TESTING SHALL BE COMPLETED AT THE SOLE RISK OF THE CONTRACTOR.
- PRIOR TO THE PLACEMENT OF CONCRETE IN AREAS WHERE SOIL IS PRESENT, THE SOIL SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 6-INCHES. THE MOISTURE CONTENT SHALL BE ADJUSTED TO WITHIN PLUS OR MINUS 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AND RECOMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION (AASHTO-T-180).

**ABBREVIATIONS**

EC -- EPOXY COATED. O.F. -- OUTSIDE FACE. E.F. -- EACH FACE. E.W. -- EACH WAY. I.F. -- INSIDE FACE. N.F. -- NEAR FACE  
 T.O.C. -- TOP OF CONCRETE. B.O.C. -- BOTTOM OF CONCRETE. CONT. -- CONTINUOUS

UNLIT SUCH TIME AS APPROVED BY THE APPROPRIATE REVIEWING AGENCIES. THEIR USE IS SUBJECT TO THE AUTHORITY OF THE AUTHORIZING AGENCY.

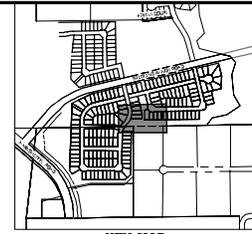
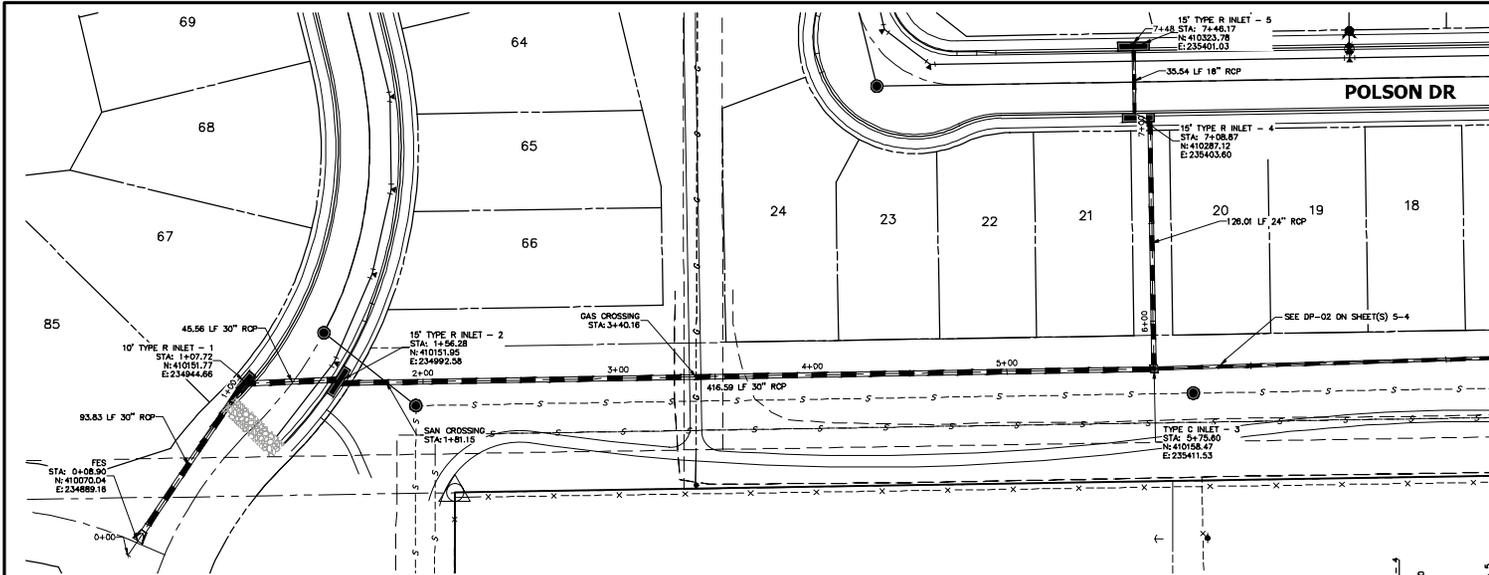
PREPARED FOR  
 SR LAND, LLC  
 20 BOULDER CRESCENT  
 SUITE 201  
 COLORADO SPRINGS, CO 80903  
 JAMES F. MURLEY  
 (719) 471-1742

**JR ENGINEERING**  
 A Merit Company  
 Central 303-740-6388 • Colorado Springs 719-596-2580  
 Fort Collins 970-697-6868 • www.jrengineering.com

H-SCALE	V-SCALE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	No. REVISION	
						1"=XX'	1"=X'
		06/19/21	XXX	XXX			

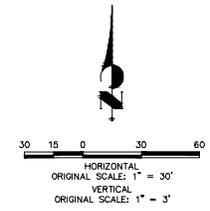
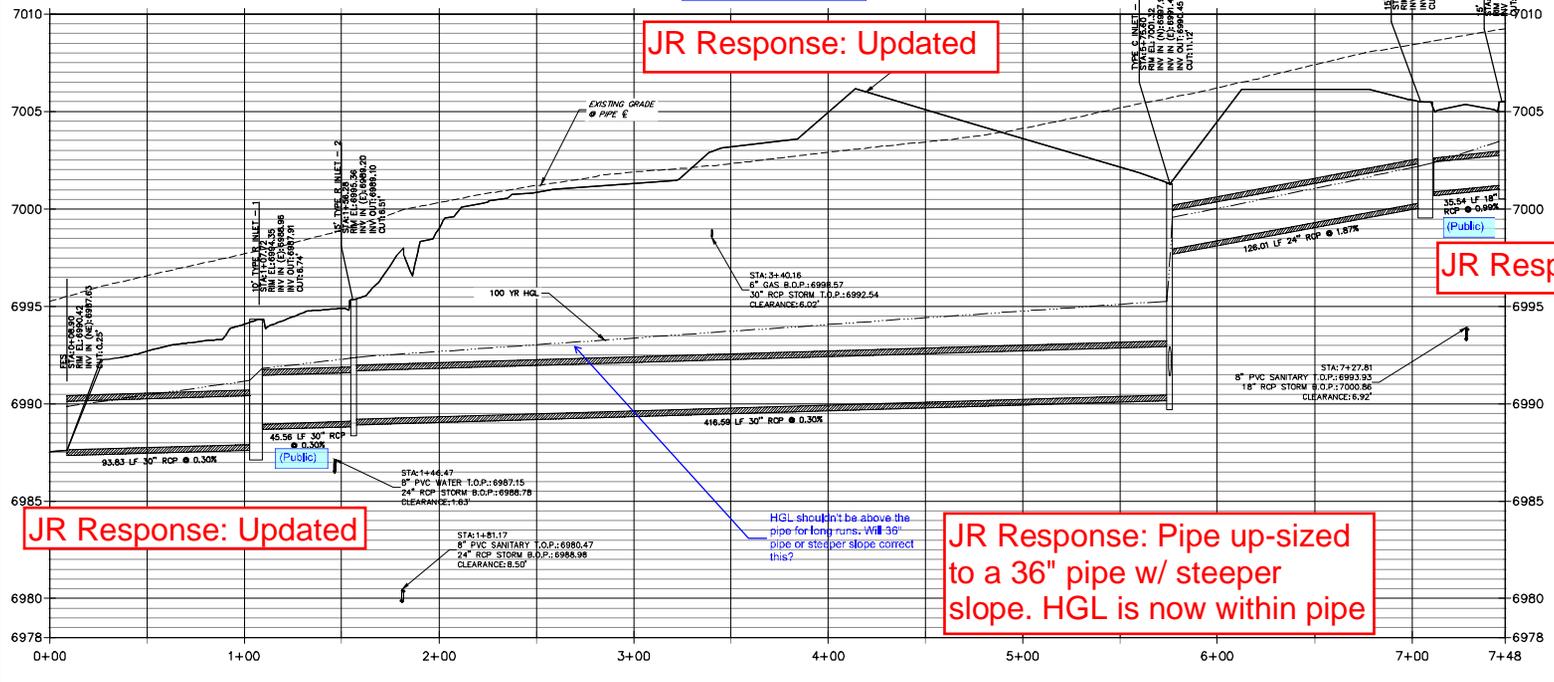
STERLING RANCH FILING 3  
 GENERAL NOTES

**ENGINEER'S STATEMENT**  
 STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT  
 Mike A. Bramlett, P.E.  
 COLORADO P.E. 32314  
 FOR AND ON BEHALF OF JR ENGINEERING, INC.  
 DATE: 4/20/2021

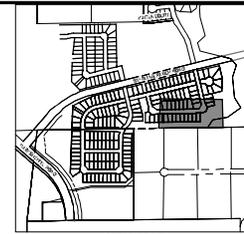
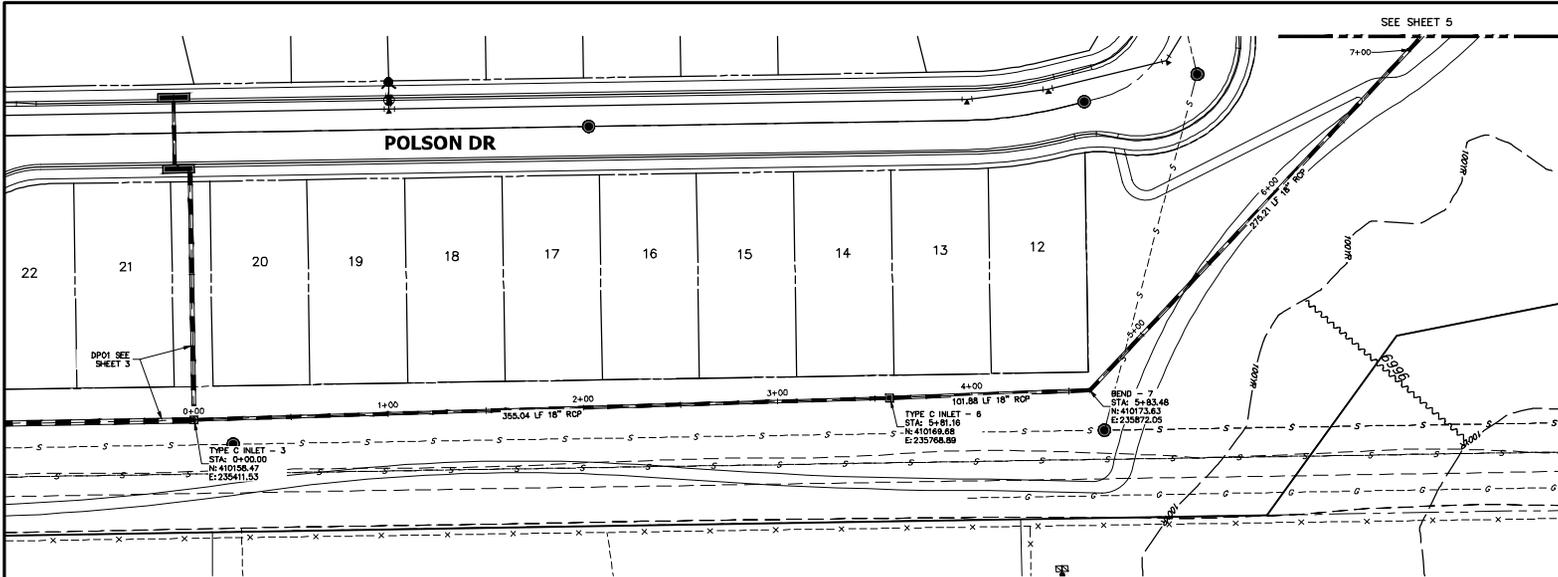


**ENGINEER'S STATEMENT**  
 PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING  
 MIKE A. BRAMLETT, P.E.  
 COLORADO P.E. 32314  
 FOR AND ON BEHALF OF JR ENGINEERING, LOCAL OFFICE

**DP-01 PROFILE**  
**STA 0+00.00 TO 7+47.67**  
 SRMD=downed except where noted



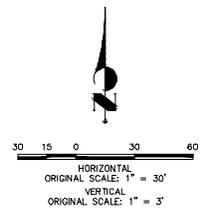
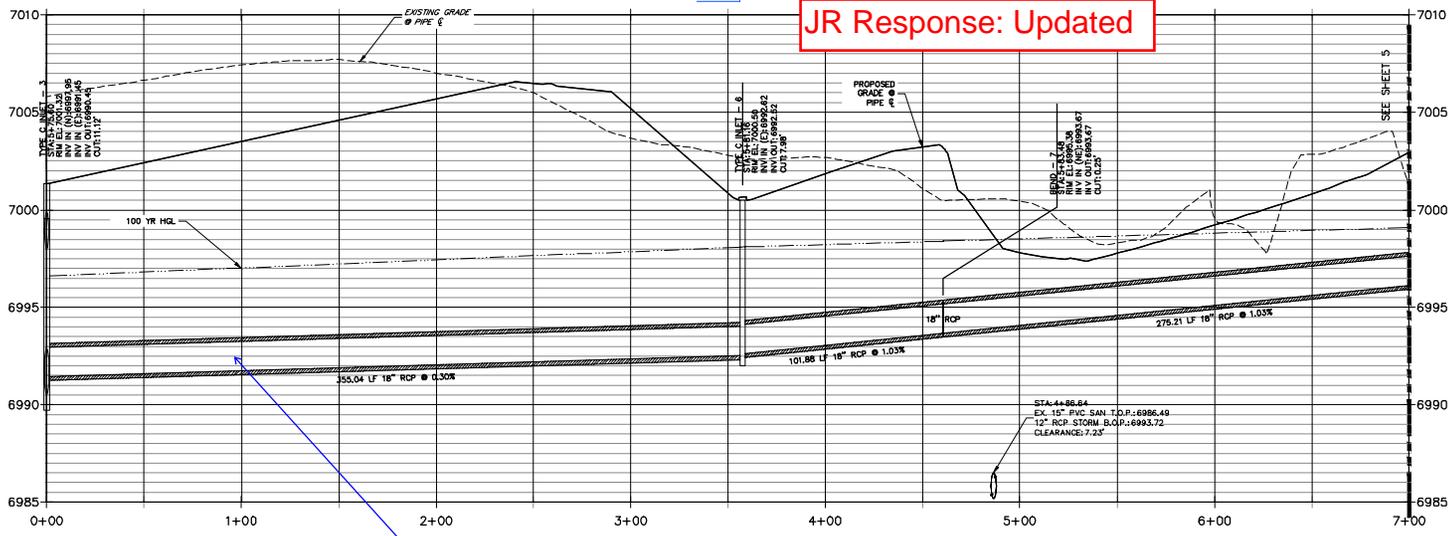
PREPARED FOR <b>SR LAND, LLC</b> 20 BOULDER CRESCENT SUITE 201 CO. 80903 COLORADO, U.S.A. JAMES F. MORLEY (719) 471-1742	811 Know what's Below. Call before you dig.	<b>ENGINEERING</b> A Merrimac Company Central 303-740-8338 • Central Staff 781-596-2593 Fax 303-740-8988 • www.jr-engineering.com	BY	DATE
			H-SCALE 1"=30' V-SCALE 1"=3' DATE 06/19/21 DESIGNED BY ARJ DRAWN BY ARJ CHECKED BY	NO. REVISION 1 2 3
STERLING RANCH FILING 3		STORM SEWER PLAN		SHEET 3 OF 7 JOB NO. 25188.00



PREPARED FOR  
 SR LAND, LLC  
 20 BOULDER CRESCENT  
 SUITE 201  
 COLORADO SPRING, CO 80903  
 JAMES F. MORLEY  
 (719) 471-1742

**JR ENGINEERING**  
 A Wharton Company  
 Central 303-740-8338 • Colorado Springs 719-596-2530  
 Fort Collins 970-699-8888 • www.jrengineering.com

**DP-02 PROFILE (1)  
 STA 0+00.00 TO 7+00.00**



BY	DATE	NO.	REVISION

H-Scale 1" = 30'  
 V-Scale 1" = 3'

DATE: 06/19/21  
 DESIGNED BY: ARJ  
 DRAWN BY: ARJ  
 CHECKED BY:

STERLING RANCH FILING 3  
 STORM SEWER PLAN

SHEET 4 OF 7  
 JOB NO. 25188.00



Add watertight joints specification note

**JR Response: Updated**

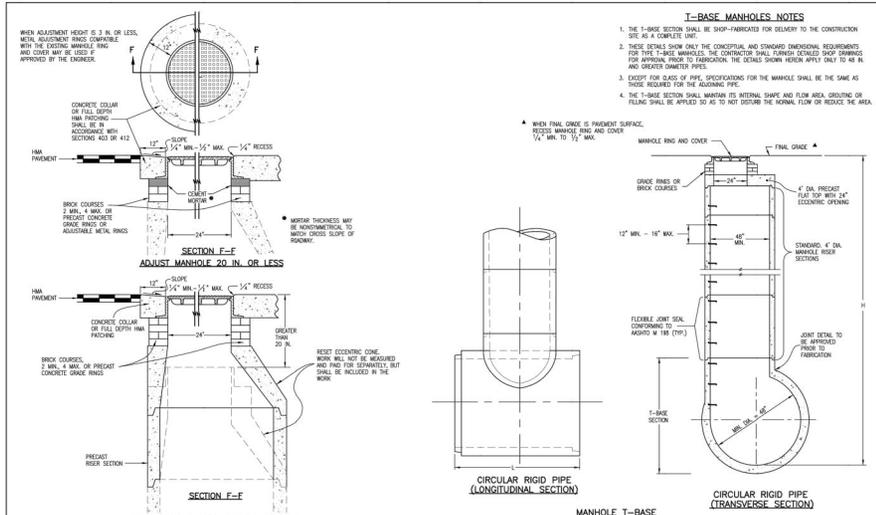
**ENGINEER'S STATEMENT**  
 PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING

MIKE A. BRAMLETT, P.E.  
 COLORADO P.E. 32314  
 FOR AND ON BEHALF OF JR ENGINEERING, LEAD ENGINEER

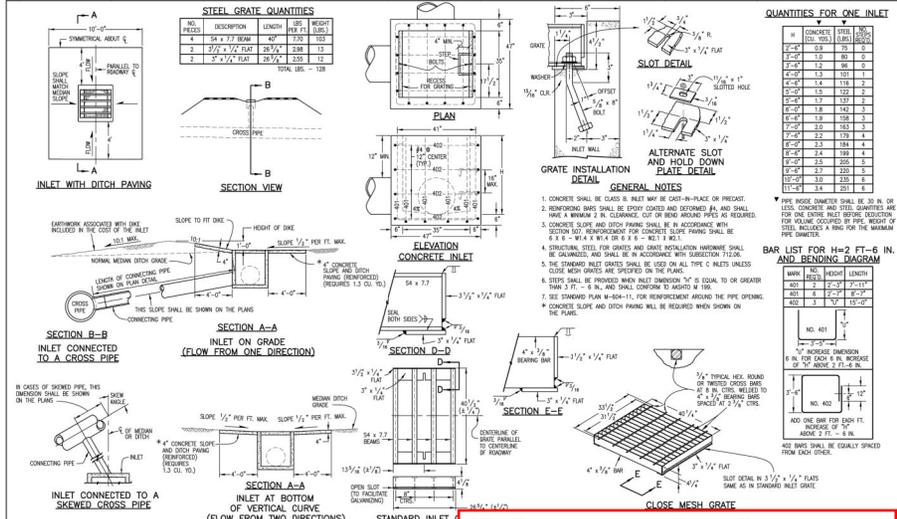
FILE NO. SF-21-XXX







Computer File Information		Sheet Revisions		Colorado Department of Transportation		STANDARD PLAN NO.	
Creation Date: 07/04/06	Initiated By: SRJ	Date:	Comments:	4201 East Arkansas Avenue Denver, Colorado, 80222 Phone: (303) 757-9083 Fax: (303) 757-8900		M-604-20	
Last Modification Date: 07/04/06	Initiated By: LTA			Project Development Branch SRJ/LTA		Issued By: Project Development Branch on July 04, 2006	
Full Path: www.dot.state.co.us/eng/Support/						Sheet No. 3 of 3	
Drawing File Name: 604020010.dwg							
CD User: Modification: V8 Scale: Not to Scale Units: English							













# STERLING RANCH FILING 3

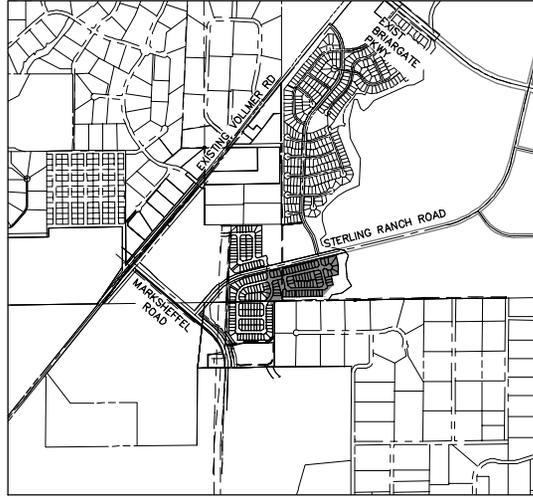
## COUNTY OF EL PASO, STATE OF COLORADO

### WATER SYSTEM PLANS

#### JUNE 2021

#### GENERAL NOTES

- ALL UTILITY CONSTRUCTION TO BE CONDUCTED IN CONFORMANCE WITH THE CURRENT STERLING RANCH METROPOLITAN DISTRICT (SRMD, THE DISTRICT) SPECIFICATIONS.
- ALL PLANS ON THE JOB SITE SHALL BE SIGNED BY THE DISTRICT AND THE DISTRICT'S ENGINEER. ANY REVISION TO THE PLANS SHALL BE SO NOTED WITH THE OLD DRAWING MARKED NOT VALID.
- ALL STARTING IS CENTERLINE UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE CENTERLINE UNLESS OTHERWISE NOTED.
- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DISTRICT. THE DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
- ALL WATER AND SEWER SERVICE LOCATIONS SHALL BE CLEARLY MARKED ON EITHER THE CURB HEAD OR THE FACE OF THE CURB, WITH AN "S" FOR SEWER AND A "W" FOR WATER.
- DUCTILE IRON PIPES, INCLUDING FITTINGS, VALVES AND PIPE HYDRANTS, SHALL BE WRAPPED WITH POLYETHYLENE TUBING, DOUBLE COATED AT EACH JOINT AND ELECTRICALLY ISOLATED. BONDING AND ANODE CONNECTIONS SHALL BE THOROUGHLY COATED WITH BITUMINOUS COATING.
- ALL DUCTILE IRON PIPE LESS THAN 12 INCHES AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WRRES WITH 17 LB MAGNESIUM ANODES EVERY 400 FEET AND 9 LB MAGNESIUM ANODES AT EACH FITTING. ALL DUCTILE IRON PIPE 12 INCHES AND GREATER AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WRRES WITH 17 LB MAGNESIUM ANODES EVERY 300 FEET AND 9 LB MAGNESIUM ANODES AT EACH FITTING.
- ALL PIPE MATERIAL, BACKFILL AND INSTALLATION SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS, COLORADO DEPARTMENT OF TRANSPORTATION, EL PASO COUNTY DEPARTMENT OF TRANSPORTATION, COLORADO SPRINGS UTILITIES AND THE GEOTECHNICAL ENGINEER.
- CONSTRUCTION TESTS SHALL BE ASSESS STANDARD PRACTICE AS DETERMINED BY ASTM D688 UNLESS OTHERWISE APPROVED BY THE DISTRICT OR HIGHER STANDARD AS IMPOSED BY OTHER AGENCIES HAVING RIGHT-OF-WAY JURISDICTION. THIS SHALL INCLUDE ALL VALVES, FIRE HYDRANT RUNS, WATER & SEWER SERVICE LINES AND MANHOLES. ALL REPORTS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.
- THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE LOCATION OF ALL UTILITIES SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE DISTRICT SHALL BE NOTIFIED OF ANY DEVIATIONS TO THE LINE AND/OR GRADE AS SHOWN ON THE PLANS. CONTRACTOR SHALL SUBMIT TO THE DISTRICT AND THE ENGINEER OF RECORD A REPORT OF THE FIELD VERIFIED INFORMATION PRIOR TO THE START OF CONSTRUCTION.
- ALL BENDS SHALL BE FIELD STAKED PRIOR TO THE START OF CONSTRUCTION.
- BENDS, DEFLECTION & CUT PIPE LENGTHS SHALL BE USED TO HOLD HORIZONTAL ALIGNMENT OF SEWER AND WATER LINES TO NO MORE THAN 0.2 FROM THE DESIRED ALIGNMENT. CONSTRUCTION STAKES TO BE AT 25' INTERVALS ALONG CURVES TO ASSURE LOCATION OF PIPE LINE CONSTRUCTION.
- AT ALL LOCATIONS WHERE CAP AND STUB IS NOTED ON DRAWINGS, PROVIDE A PLUG AT THE END OF THE PIPE JOINT NEAREST THE SPECIFIED STATION. PROVIDE A REVERSE ANCHOR AT ALL WATER LINE PLUGS.
- ALL UNUSED SALVAGED WATER UTILITY MATERIAL SHALL BE RETURNED TO THE METROPOLITAN DISTRICT AS REQUESTED.
- AT THE CONTRACTOR'S EXPENSE, ALL UTILITY MAINS SHALL BE SUPPORTED AND PROTECTED SUCH THAT THEY SHALL FUNCTION CONTINUOUSLY DURING CONSTRUCTION OPERATIONS. SHOULD A UTILITY MAIN FAIL AS A RESULT OF THE CONTRACTOR'S OPERATION, IT SHALL BE REPLACED IMMEDIATELY BY THE CONTRACTOR OR BY THE DISTRICT AT FULL COST OF LABOR AND MATERIALS TO THE CONTRACTOR/DEVELOPER.
- PUMPING OR BYPASS OPERATIONS SHALL BE REVIEWED AND APPROVED BY BOTH THE DISTRICT AND THE DISTRICT ENGINEER PRIOR TO EXECUTION.
- THE CONTRACTOR SHALL REPLACE OR REPAIR DAMAGE TO ALL SURFACE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO FENCES, LANDSCAPING, CURB AND OUTTER AND/OR ASPHALT THAT MAY BE CAUSED DURING CONSTRUCTION.
- ALL CONTRACTORS WORKING ON OR NEAR A WATER OR SEWER FACILITY (TO INCLUDE SERVICE LINE) SHALL HAVE LIABILITY INSURANCE NAMING THE DISTRICT AS AN ADDITIONAL INSURED AND SHALL PROVIDE A CURRENT COPY OF WORKERS COMPENSATION INSURANCE ON FILE WITH THE DISTRICT. NO WORK CAN PROCEED WITHOUT CURRENT CERTIFICATES ON FILE AT THE DISTRICT'S OFFICE.
- THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND ALL AFFECTED UTILITY COMPANIES ADJACENT TO THE PROPOSED UTILITY CONSTRUCTION A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. A WEEKLY CONSTRUCTION MEETING SHALL BE REQUIRED WITH THE CONTRACTOR, DISTRICT ENGINEER AND ALL OTHER PARTIES AS DEEMED NECESSARY BY THE DISTRICT.
- COMMENCEMENT OF CONSTRUCTION OF WATER/SEWER SYSTEMS WITHIN THE METROPOLITAN DISTRICT:
  - PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING IS REQUIRED. A MINIMUM OF 48 HOURS IN ADVANCE OF COMMENCEMENT OF WORK, A REPRESENTATIVE OF THE OWNER OR DEVELOPER, A REPRESENTATIVE OF THE CONTRACTOR AND DESIGN ENGINEER ARE REQUIRED TO ATTEND. CONTACT THE DISTRICT TO SCHEDULE THE PRE-CONSTRUCTION MEETING. NO PRE-CONSTRUCTION MEETING CAN BE SCHEDULED PRIOR TO FOUR (4) SIGNED/ APPROVED PLAN SETS ARE RECEIVED BY THE DISTRICT.
  - THE CONTRACTOR IS REQUIRED TO NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 2 WEEKS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY AFFECTED UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION ADJACENT TO THE KNOWN UTILITIES LINES.
- TESTING OF FACILITIES
  - THE CONTRACTOR SHALL NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF ANY TESTING.
  - ALL SECTIONS OF WATER LINE ARE TO MEET THE FOLLOWING PRESSURE TESTING REQUIREMENTS:
    - TEST 100% OF ALL LINES.
    - MUST PASS PRESSURE TEST TO 200 PSI FOR TWO HOURS (UNLESS OTHERWISE APPROVED ON THE PLANS).
    - ALL SANITARY SEWER FACILITIES ARE TO MEET THE FOLLOWING TESTING REQUIREMENTS:
      - ALL LINES SHALL BE JET CLEANED PRIOR TO VACUUM OR PRESSURE TESTING.
      - ALL MANHOLES SHALL BE VACUUM TESTED WITH DISTRICT STAFF PRESENT PRIOR TO CCTV INSPECTION.
      - SEWER MAINS TO BE PRESSURE TEST PRIOR TO CCTV INSPECTION.
      - ALL LINES SHALL BE CCTV INSPECTED AND VIDEO SHALL TO BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.
- PRELIMINARY ACCEPTANCE SHALL BE DEFINED AS THE POINT IN TIME THAT THE DISTRICT ACCEPTS THE FACILITY FOR USE. ALL SURFACE IMPROVEMENTS AND RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS OF COMMENCEMENT. SHOULD THE CONTRACTOR FAIL TO COMPLETE ALL SURFACE IMPROVEMENTS AND RESTORATION WITHIN 30 DAYS OF COMMENCEMENT OF SERVICE, THE DISTRICT, AT THEIR DISCRETION, MAY ELECT TO COMPLETE THE IMPROVEMENTS AT THE CONTRACTORS COST.
- FINAL ACCEPTANCE BY THE DISTRICT OF ANY LINE OR SYSTEM SHALL NOT OCCUR UNTIL COMPLETION OF FINAL ASPHALT LAYERS AND/OR FINAL COMPLETION AND/OR RESTORATION OF ALL SURFACE IMPROVEMENTS. THE WARRANTY PERIOD FOR ALL FACILITIES PRIOR TO FINAL ACCEPTANCE SHALL BE 24 MONTHS COMMENCING AFTER PRELIMINARY ACCEPTANCE.
- ACCEPTANCE:
  - THE DISTRICT MAY GIVE PRELIMINARY ACCEPTANCE ONCE ALL OF THE TESTS ON ALL THE LINES HAVE BEEN COMPLETED AND A WALK-THRU HAS OCCURRED.
  - A SECOND ACCEPTANCE MAY OCCUR ONCE FIRST LIFT OF ASPHALT GOES DOWN AND A SECOND WALK-THRU OF THE SYSTEM OCCURS. IF ALL FACILITIES ARE CLEAN AND ACCESSIBLE, A FINAL ACCEPTANCE MAY OCCUR (THE DISTRICT MAY REQUIRE CLEANING AND RE-VIDEO OF THE SYSTEM, DEPENDING ON THE SEVERITY OF THE CONTAMINATION).
- ALL WATER AND SEWER MAINS, INCLUDING SERVICE LINES, SHALL HAVE "AS-BUILT" DRAWINGS PREPARED AND APPROVED PRIOR TO PRELIMINARY ACCEPTANCE BY THE DISTRICT.
- ALL COMMERCIAL/BUSINESS DEVELOPMENTS SHALL HAVE AN EIGHT INCH (MIN.) WATER MAIN LOOPED THROUGH THE PROPOSED PROPERTY WITH GATE VALVES LOCATED WHERE THE MAIN ENTERS THE PROPERTY LINE. AN EIGHT INCH SEWER MAIN SHALL BE INSTALLED FOR SERVICE TO COMMERCIAL/BUSINESS DEVELOPMENTS, AND A MANHOLE SHALL BE LOCATED WHERE THE MAIN ENTERS THE PROPERTY. THE END OF THE MAINS SHALL BE MARKED WITH THE APPROPRIATE COLORED CARBONITE MARKER ALONG WITH TRACER WIRE.
- AFTER REVIEW AND APPROVAL OF PLANS FOR THE EXTENSION OF LINES, FACILITIES AND/OR SERVICES, CONSTRUCTION MUST BE COMMENCED WITHIN 18 MONTHS FOR RESIDENTIAL SUBDIVISIONS AND 12 MONTHS FOR ANY COMMERCIAL INSTALLATIONS.
- INSPECTION FEES: CALL THE DISTRICT (719-495-2500) FOR FEE SCHEDULE.



#### SHEET INDEX

- COVER SHEET
- WATER PLANS
- WATER LOWERING PROFILES
- WATER SERVICE PLAN

#### BENCHMARKS

- THE TOP OF AN ALUMINUM SURVEYORS CAP, STAMPED "98037", AT THE SOUTHEAST BOUNDARY CORNER OF BARBARICK SUBDIVISION  
 NORTHING = 411416.273  
 EASTING = 235167.071  
 ELEVATION = 7023.42
- THE TOP OF A RED PLASTIC SURVEYORS CAP, ILLEGIBLE, AT THE SOUTHWEST BOUNDARY CORNER OF FANNES RANCHERS SUBDIVISION  
 NORTHING = 410095.404  
 EASTING = 235002.131  
 ELEVATION = 7000.40
- THE TOP OF A RED PLASTIC SURVEYORS CAP, STAMPED "38147", AT THE SOUTHWEST BOUNDARY CORNER OF BARBARICK SUBDIVISION  
 NORTHING = 411399.862  
 EASTING = 233849.817  
 ELEVATION = 7033.82

#### WATER SYSTEM INSTALLATION NOTES

- ALL WATER AND FORCE MAIN PIPE SHALL BE AWWA C900 PVC, OR EQUAL, PRESSURE CLASS 200. ALL WATER AND FORCE MAIN FITTINGS SHALL HAVE MECHANICAL RESTRAINTS AND THRUST BLOCKS. ALL WATER AND FORCE MAIN PIPE SHALL HAVE A MINIMUM COVER DEPT OF FIVE AND ONE-HALF (5.5) FEET.
- ALL WATER VALVES ASSOCIATED WITH THE POTABLE WATER SYSTEM SHALL BE OPEN CLOCKWISE. ALL VALVES INSTALLED IN LANDSCAPED AREAS AND/OR NOT WITHIN PAVED STREETS SHALL BE MARKED WITH CARBONITE MARKERS. ALL VALVES ASSOCIATED WITH THE RAW WATER SYSTEM SHALL BE OPEN COUNTERCLOCKWISE AND MARKED WITH CARBONITE MARKERS AS APPLICABLE.
- THE DEVELOPER OR HIS ENGINEER SHALL LOCATE ALL FIRE HYDRANTS AND SERVICE STUB-OUTS FOR FUTURE DEVELOPMENT. ANY REQUIRED REALIGNMENT, (HORIZONTAL OR VERTICAL), SHALL BE AT THE EXPENSE OF THE DEVELOPER. FIRE HYDRANT LOCATION SHALL BE REVIEWED AND APPROVED BY THE APPLICABLE FIRE AUTHORITY.
- FIRE HYDRANTS SHALL BE OPEN RIGHT WITH 1/8" x 7/8" SQUARE MARKED ALONG WITH SERVICE CAPS. LUBRICATION TYPE: (GREASE). ACCEPTABLE BRANDS ARE AMERICAN A-W SERIES 2700 (MODERN) AND MULLER SUPER CENTURION 250.
- ALL MAIN LINES (PVC & DUCTILE IRON) SHALL BE INSTALLED WITH COATED #12 TRACER WIRE WITH TEST STATIONS AT INTERVALS NO GREATER THAN 500 FT (VALVE BOXES CAN BE USED AT INTERSECTIONS AND SERVICE STUBS).
- CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING WATER LINE WITHOUT SHUTDOWN, OR ELSE NOTIFY THE DISTRICT OF ANY SERVICE SHUTDOWNS NECESSARY TO CONNECT TO EXISTING LINES.
- IRRIGATION SERVICES SHALL HAVE A STOP AND WASTE CURB STOP VALVE INSTALLED ALONG WITH TRACER WIRE EXTENDING BACK TO THE MAIN LINE.
- COMMENCEMENT OF USE OF WATER LINES AND/OR SYSTEMS:
  - NO WATER FACILITY SHALL BE PLACED IN SERVICE UNTIL AFTER THE COMPLETION OF ALL PRESSURE TESTING, FLUSHING, BAC-T TESTING, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
  - NO WATER FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SERVICE LINES ARE COMPLETED AND THE FIRST LIFT OF ASPHALT IS COMPLETED OVER THE LINE. IN THE CASE WHERE NO ASPHALT IS TO BE PLACED OVER THE LINE, SURFACE IMPROVEMENTS SHALL BE COMPLETED PRIOR TO USE OF THE FACILITY.
  - ALL EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.

#### AGENCIES

OWNER/DEVELOPER:	SR LAND, LLC 20 BOULDER CRESCENT, SUITE 201 COLORADO SPRINGS, CO 80903 JAMES F. MORLEY (719) 471-1742	FIRE DISTRICT:	BLACK FOREST FIRE PROTECTION DISTRICT 11445 TEAGHOUT ROAD COLORADO SPRINGS, CO 80908 CHIEF BRYAN JACK (719) 495-4300
CIVIL ENGINEER:	JR ENGINEERING, LLC 5475 TECH CENTER DR. COLORADO SPRINGS, CO 80919 MIKE BRAMLETT P.E. (303) 267-6240	GAS DEPARTMENT:	COLORADO SPRINGS UTILITIES 7710 DURANT DR. COLORADO SPRINGS, CO 80547 TIM MENOT (719) 688-3556
COUNTY ENGINEERING:	EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT 5980 INTERNATIONAL CIRCLE, SUITE 110 COLORADO SPRINGS, CO 80910 JEFF RICE, P.E. (719) 520-6300	ELECTRIC DEPARTMENT:	MOUNTAIN VIEW ELECTRIC 11140 E. WOODMEN ROAD FALCON, CO 80831 495-2283
TRAFFIC ENGINEERING:	EL PASO COUNTY DEPT. OF PUBLIC WORKS COLORADO SPRINGS, CO 80922 JENNIFER IRVINE, P.E. (719) 520-5460	COMMUNICATIONS:	QUEST COMMUNICATIONS LOCATIONS (800) 922-1987 A1&T (LOCATIONS) (719) 435-3674
WATER RESOURCES:	STERLING RANCH METRO DISTRICT ENGINEERS JOS-HYRO CONSULTANTS 545 E. Pikes Peak Ave., Suite 300 COLORADO SPRINGS, CO 80903 JOHN MCGINN (719) 668-8769		

#### EL PASO COUNTY STATEMENT

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

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.

IN ACCORDANCE WITH SEW SECTION 11.02, THESE CONSTRUCTION AGREEMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JENNIFER IRVINE, P.E. \_\_\_\_\_ DATE \_\_\_\_\_  
 COUNTY ENGINEER/ECM ADMINISTRATOR

#### WATER & SEWER MAIN EXTENSIONS

ANY CHANGES OR ALTERATIONS AFFECTING THE GRADE, ALIGNMENT, ELEVATION AND/OR DEPTH OF COVER OF ANY WATER OR SEWER MAINS OR OTHER APPURTENANCE SHOWN ON THIS DRAWING SHALL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ALL OPERATIONAL DAMAGES AND DEFECTS IN INSTALLATION AND MATERIAL FOR MAINS AND SERVICES FROM THE DATE OF APPROVAL UNTIL FINAL ACCEPTANCE IS ISSUED.

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_  
 JAMES F. MORLEY

SR LAND, LLC  
20 BOULDER CRESCENT, SUITE 201  
COLORADO SPRINGS, CO 80903  
(719) 471-1742

#### DISTRICT APPROVALS

THE STERLING RANCH METROPOLITAN DISTRICT RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN AND HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

STERLING RANCH METROPOLITAN DISTRICT  
 WASTEWATER DESIGN APPROVAL

DATE: \_\_\_\_\_ BY: \_\_\_\_\_

PROJECT NO. \_\_\_\_\_

IN CASE OF ERRORS OR OMISSIONS WITH THE WATER DESIGN AS SHOWN ON THIS DOCUMENT THE STANDARDS AS DEFINED IN THE RULES AND REGULATIONS FOR INSTALLATION OF WASTEWATER MAINS AND SERVICES SHALL RULE.

APPROVAL EXPIRES 180 DAYS FROM DESIGN APPROVAL.

#### FIRE AUTHORITY APPROVAL

THE NUMBER OF FIRE HYDRANTS AND HYDRANT LOCATIONS SHOWN ON THIS WATER INSTALLATION PLAN ARE CORRECT AND ADEQUATE TO SATISFY THE FIRE PROTECTION REQUIREMENTS AS SPECIFIED BY THE FIRE DISTRICT SERVING THE PROPERTY NOTED ON THE PLANS.

FIRE PROTECTION DISTRICT \_\_\_\_\_

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_  
 FIRE PROTECTION DISTRICT

#### ENGINEER'S STATEMENT

THIS WATER SYSTEM PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR WASTEWATER SYSTEM PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLANS.



MIKE A. BRAMLETT, P.E. \_\_\_\_\_ DATE \_\_\_\_\_  
 COLORADO P.E. #23314  
 FOR AND ON BEHALF OF JR ENGINEERING, LLC

UNTIL SUCH TIME AS APPROVED BY THE ENGINEER, THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION WITHOUT THE AUTHORIZATION OF THE ENGINEER.

PREPARED FOR:  
 SR LAND, LLC  
 20 BOULDER CRESCENT  
 SUITE 201  
 COLORADO SPRINGS, CO 80903  
 JAMES F. MORLEY  
 (719) 471-1742

EL PASO COUNTY ENGINEER  
 Jennifer Irvine, P.E.  
 A Member in Good Standing  
 License No. 10003  
 For Color. Exp. 08/31/2023  
 www.jr-engineering.com

DATE: \_\_\_\_\_

NO.	REVISION	DATE	BY
1			
2			
3			
4			

H-SCALE 1"=1000'  
 V-SCALE 1/8"=10'

DESIGNED BY: JMF  
 DRAWN BY: JRM  
 CHECKED BY: \_\_\_\_\_

STERLING RANCH FILING 3  
 COVER SHEET

SHEET 1 OF 4  
 JOB NO. 25188.00





