

**PRELIMINARY DRAINAGE REPORT AND MDDP ADDENDUM
FOR
STERLING RANCH PHASE 2 PRELIMINARY PLAN**

Prepared For:

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**June, 2020
Project No. 25188.00**

**Prepared By:
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ENGINEER'S STATEMENT:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by 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.

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.

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

Date

Conditions:

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APPENDIX

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

Appendix B – Hydrologic and Hydraulic Calculations

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Appendix D – Drainage Maps



PURPOSE

This document is the Preliminary Drainage Report for Sterling Ranch Phase 2. 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

GENERAL LOCATION

Sterling Ranch Phase 2 (hereby referred to as the “site”) is a proposed development within the Sterling Ranch master planned community with a total area of approximately 75 acres that are presently undeveloped.

The site is located in portions of Section 4, 5 & 33, Township 12 & 13 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 southwest, the Barbarick Subdivision to the north, Sterling Ranch Road cuts through the site, and Sand Creek borders the site to east. The parcels are planned to be platted after approval of the Development Plan. 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 42 acres), Open space and drainage tracts (approximately 28 acres, and an approximate 5 acre tract in the southwest corner where the Sterling Ranch Lift Station is located. 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.

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

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, Kiowa Engineering Corp. 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.

EXISTING DRAINAGE CONDITIONS

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 Filing No. 2 property to have a "large lot residential" use for the majority of the site. However, the proposed Sterling Ranch master plan is a mix of; school, multi-family, single-family, and commercial land uses, resulting in higher runoff. 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, Kiowa 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", (MMDP) 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 several offsite basins. The basin and sub-basin delineation is shown in the existing drainage map in Appendix E and is described as follows:

Sub-basin A1 is 5.17 acres and 0 percent impervious consists of the eastern portion of Sterling Ranch phase 2 Runoff from this basin drains to the south west into the existing storm sewer just west of Marksheffel Road located at design point 1.



Sub-basin A2 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 existing storm sewer located at design point 2.

Sub-basin A3 is 11.68 acres and 0 percent impervious and is located onsite in the northern part of Sterling Ranch Phase 2. Runoff from this basin drains to existing storm sewer just north of Sterling Ranch Road located at design point 5.1 in confluence from flows from basins OS6 and OS7.

Sub-basin B1 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 south into Sand Creek at design point 6.

Sub-basin OS1 is 9.27 acres is 37 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 Subbasin A3.

Sub-basin OS2 is 5.00 acres and 100 percent impervious and is comprised of the southern half street of Sterling Ranch road. Runoff from this basin drains into existing storm sewer located at design point 7.

Sub-basin OS3 is 2.36 acres and 100 percent impervious and is comprised of the northern half street of Sterling Ranch road. Runoff from this basin drains into existing storm sewer located at design point 8.

Sub-basin OS4 is 40.30 acres and 17.2 percent impervious and is located immediately north of the eastern portion of the site. Runoff from this basin drains south into existing storm sewer located at design point 9.

Sub-basin OS5 is 3.46 acres and 0 percent impervious and is located to the east of the northern portion of the site. Runoff from this basin drains to a low point just north of Sterling Ranch Road located at Design Point 4.

Sub-basin OS6 is 3.98 acres and 6.8 percent impervious as is located north of the eastern portion of the site. Historic runoff from this basins drains south onto the site at design point 10.

Sub-basin OS7 is 18.52 Acres and 39.2 percent impervious and is located directly north of the site. Historic runoff from this site drains south onto the site at design point 11.

PROPOSED DRAINAGE CONDITIONS

PROPOSED SUB-BASIN DRAINAGE

The proposed site was broken into three major basins: Basin A (lower-portion), Basin B (mid and eastern –portion) and Basin C (upper-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 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 1, a type R on grade inlet at the southwest corner of the site.

Basin A2 is 1.37 acres and 32 percent impervious is comprised of single-family residential lots, open space, several trails, and a local road. Runoff from this basin drains to design point 2, a type R on grade inlet on the southwest corner of the site, in confluence with upstream flows from basin A1.

Basin A3 is 3.68 acres and 65 percent impervious is comprised of single-family residential lots and a local road. Runoff from this basin drains to an on grade inlet located at design point 3 in confluence with upstream flows from basin A9.

Basin A4 is 2.72 acres and 73 percent impervious is comprised of single-family residential lots, open space a local road and two urban knuckles. Runoff from this basin drains to a sump type R inlet located at design point 4 in confluence with upstream flows from basins A1, A2, A3, and A9.

Basin A5 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 an on grade inlet at design point 5.

Basin A6 is 7.60 acres and 73 percent impervious is comprised of single-family residential lots, local roads. Runoff from this basin drains to an on grade type inlet at design point 6 in confluence with upstream flows from basins A5, A10, and A6.1

Basin A7 is 1.43 acres and 75 percent impervious is comprised of single family residential lots and local roads. The Runoff from this basin drains to a sump type R inlet located at design point 7 in confluence with upstream flows from basins A5, A10, A6.1 and A6.1.

Basin A8 4.22 acres and 13 percent impervious is comprised of a single family residential lots and open space The runoff from this basin drains to a swale on western side of the site and into an area inlet located at design point 8.



Basin B1 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 1B.

Basin B2 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 2B.

Basin C1 is 3.29 acres and 55 percent impervious is comprised of single family residential lots, local roads, and an urban knuckle. Runoff from basin C1 drains to a sump type R inlet located at design point 14.

Basin C2 is 6.74 acres and 63 percent impervious is comprised of local roads, single-family residential lots, an urban knuckle, open space, and paved walks. Runoff from basin C2 drains to a type R sump inlet located at design point 13.

Basin C3 is 3.02 acres and 11 percent impervious is comprised of single family residential lots, open space, and paved walks. Runoff from basin C3 drains to a swale on the western side of the site and into an area inlet located at design point 12.

Basin OS1 is 2.02 acres and 8 percent impervious is comprised of single family lots, open space, and paved trails. The Runoff from basin OS1 drains to an existing FES located at design point 11.

Basin OS2 is 2.18 acres and 36 percent impervious is comprised of single family lots, open space, and paved trails. Runoff from basin OS2 drains into the detention pond south of the site (see Sterling Ranch Filing 2 drainage report).

Basin OS3 is 0.95 acres and 36 percent impervious is comprised of single family lots, open space, and paved trails. The runoff from basin OS3 drains south offsite to design point 16.

Basin OS4 is 0.82 acres and 29 percent impervious is comprised of single family lots, open space, and paved trails. The runoff from basin OS4 drains south offsite to design point 17.

Basin OS5 is 5.86 acres and 21 percent impervious is comprised of the rear of single family lots, open space, and paved trails. The runoff from basin OS5 drains south offsite to design point 18.

Basin OS6 is 1.24 acres and 34 percent impervious is comprised of the rear of single family lots, walks, and landscaping. The runoff from basin OS6 drains east to design point 19.

Basin OS7 is 1.34 acres and 53 percent impervious is comprised of the rear of single family lots, walks, and landscaping. The runoff from basin OS7 drains west to design point 20.