

**DRAINAGE LETTER**  
for  
**LOT 6 FALCON MARKETPLACE**

7565 Falcon Market Place  
Falcon, Colorado

**December 8, 2022**

**PCD File No: PPR-22-049**

Prepared for:

**Evergreen-Meridian & Woodmen LLC**  
2390 E Camelback Road, #410  
Phoenix, AZ 85016  
Contact: Russell Perkins

Prepared by:

**Drexel, Barrell & Co.**  
3 South Seventh Street  
Colorado Springs, CO 80905  
Contact: Tim McConnell, P.E.  
(719) 260-0887

## TABLE OF CONTENTS

1.0	CERTIFICATION STATEMENTS .....	1
2.0	PURPOSE .....	1
3.0	GENERAL SITE DESCRIPTION .....	1
4.0	DRAINAGE CRITERIA.....	2
5.0	EXISTING CONDITION.....	2
6.0	DEVELOPED CONDITION .....	2
7.0	FOUR STEP PROCESS .....	3
8.0	DRAINAGE & BRIDGE FEES .....	4
9.0	SUMMARY.....	4
10.0	REFERENCES .....	4

### APPENDICES

VICINITY MAP  
SOILS MAP  
FLOODPLAIN MAP  
HYDROLOGY CALCULATIONS  
DRAINAGE MAP

**DRAINAGE LETTER**  
for  
**LOT 6, FALCON MARKETPLACE**

**1.0 CERTIFICATION STATEMENTS**

**Engineer's Statement**

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

SIGNATURE (Affix Seal): \_\_\_\_\_  
For and on behalf of Drexel, Barrell & Co. Date  
Katherine Varnum, P.E. #53459

**Developer's Statement**

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

\_\_\_\_\_  
Authorized Signature Date  
Evergreen-Meridian & Woodmen LLC  
2390 E Camelback Road, #410  
Phoenix, AZ 85016

**El Paso County**

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

\_\_\_\_\_  
Joshua Palmer, P.E. Date  
County Engineer / ECM Administrator

Conditions:

**DRAINAGE LETTER**  
for  
**LOT 6, FALCON MARKETPLACE**

**2.0 PURPOSE**

The purpose of this letter is to supplement the Final Drainage Report for Falcon Marketplace (approved December 19, 2019) with regards to the development of Lot 6 in order to establish that the development is in conformance with the approved drainage design.

Runoff patterns, drainage facilities and the ability to safely pass developed runoff to historic downstream facilities shall be presented.

**3.0 GENERAL SITE DESCRIPTION**

Location

Lot 6 Falcon Marketplace is located in Falcon, El Paso County, Colorado, within the Southeast Quarter of Section 1, Township 13 South, Range 65 West of the 6<sup>th</sup> P.M. The property is bounded by Lot 5 of Falcon Marketplace to the north, Lot 7 of Falcon Marketplace to the south, Meridian Road to the east and Falcon Market Place to the west.

An ALTA and topographical field survey was completed by Drexel, Barrell & Co. dated March 10, 2022 and is used as the basis of design for the drainage improvements.

Proposed Development

The proposed development of Lot 6 is the construction of a fast-food restaurant, with associated parking and landscaping. The proposed disturbed area consists of 0.85 acres. The imperviousness of the site ( $C_5=0.66$  and  $C_{100}=0.77$  – reference rational calculations in the appendix) is very similar to that assumed in the approved Final Drainage Report ( $C_5=0.68$  and  $C_{100}=0.79$ ) for the overall Falcon Marketplace development, as described above.

Soils

According to the Soil Survey of El Paso County Area, Colorado, prepared by the U.S. Department of Agriculture Soil Conservation Service, the site is underlain by the Columbine gravelly sandy loam (Soil No. 19), a hydrologic type A soil. See appendix for Soils map.

Climate

This area of El Paso County can be described as the foothills, with total precipitation amounts typical of a semi-arid region. Winters are generally cold and dry, and summers relatively warm and dry. Precipitation ranges from 12 to 14 inches per year, with the majority of this moisture occurring in the spring and summer in the form of rainfall. Thunderstorms are common during the summer months.



## Floodplain Statement

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 08041CO553G (December 7, 2018), no portion of the site lies within Zone A for the Unnamed Tributary to Black Squirrel Creek.

A LOMR to modify the floodplain was approved by FEMA, Case No. 21-08-0534P (October 7, 2021) with an effective date of February 22, 2022.

### **4.0 DRAINAGE CRITERIA**

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

### **5.0 EXISTING CONDITION**

The existing condition is as described in the aforementioned approved Final Drainage Report for the overall Falcon Marketplace development, as part of Basins B8 and B19 (see appendix for drainage map excerpt). Overlot grading has been completed and access roadway, detention facilities and utility infrastructure have been installed. The site generally follows a 1%-2% grade from north to south and currently drains directly to the south towards the existing detention facility Pond 2. An 18" RCP storm sewer stub has been provided to the lot for connection to the onsite storm sewer system in Falcon Market Place when development takes place.

### **6.0 DEVELOPED CONDITION**

The proposed development consists of a fast-food restaurant and associated parking and landscaping. The proposed grading and storm system will route the majority of flows to the west where they will enter the existing 18" RCP storm sewer. All flows generated by Lot 6 will be directed towards the existing Falcon Marketplace water quality facility Pond 2 to the south. (See routing exhibit on drainage map in appendix).

A portion of this site will drain via curb and gutter flow to the south on Lot 7. This flow was anticipated with the development of Lot 7 and is further described below.

See below for basin/design point table and description:

<b>BASIN</b>	<b>DP</b>	<b>AREA (AC)</b>	<b>Q5 (cfs)</b>	<b>Q100 (cfs)</b>
A		0.41	1.9	3.3
B		0.17	0.1	0.4
A+B	1	0.58	1.6	3.2
C	2	0.33	1.3	2.4
D	3	0.10	0.1	0.4

Basin A covers the northwestern portion of Lot 6, including the building and the western portions of the parking lot. A crown in the drive aisle ensures that flows generated by the adjacent Lot 5 will remain offsite and be captured by the storm system design for that lot. Flows generated by this onsite basin A will travel along the curb lines to the south and west and be captured by a Type 16 combination inlet, located at a low point along the western curb line (DP-1). Flows captured by this inlet and roof drain connections from the building will continue to the north to tie into the existing storm manhole.

Basin B covers the western portion of Lot 6 adjacent to Falcon Market Place as well as the southern portion of Lot 6 that separates the Lot 6 and Lot 7 parking spaces. This area primarily drains to the north into the Lot 6 parking area where it will be captured by a Type 16 combination inlet, located at a low point along the western curb line (DP-1).

Both basins A and B channel their flows to design point 1 (DP-1), a type 16 combo inlet. These flows combine at the inlet before being directed north through a 12" PVC pipe where they then discharge to the west via existing private 18" storm sewer. This location is referenced on the existing conditions map at DP8, flows anticipated at this location were  $Q_5=3.5$  cfs and  $Q_{100}=6.9$ cfs, discharge flows actually reaching this location are  $Q_5=1.6$  cfs and  $Q_{100}=3.2$ cfs at DP1 for Lot 6, and  $Q_5=2.3$  cfs and  $Q_{100}=4.5$ cfs from Lot 5. The existing 18" storm sewer is sufficient to accommodate the additional minor flows. Flows ultimately discharge into the existing water quality facility (Pond 2) to the south.

Basin C (DP-2) covers the eastern portion of the Lot 6 parking lot. Flows will follow the curb line on either side of the roadway and travel south into Lot 7. Per the approved Final Drainage Letter for Lot 7 Falcon Marketplace, anticipated flow from this lot was  $Q_5=2.4$  cfs and  $Q_{100}=4.3$ cfs. The actual flow entering Lot 7 as a result of Lot 6 grading will be reduced to  $Q_5=1.3$  cfs and  $Q_{100}=2.4$ cfs. These flows will be captured by the onsite storm system installed with the development of Lot 7, and will be directed towards the existing water quality facility (Pond 2) to the south.

Basin D (DP-3) covers the eastern portion of Lot 6 adjacent to Meridian Road. This area drains directly towards Meridian Road, but is captured downstream by a curb chase where is it directed towards the onsite Pond 2 for water quality treatment. This area, with the exception of the existing sidewalk will remain impervious.

## 7.0 FOUR STEP PROCESS

This project conforms to the El Paso County Four Step Process. The process for this site focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainage ways, and implementing long-term source controls.

1. **Employ Runoff Reduction Practices:** Proposed impervious areas on this site (roofs, asphalt/sidewalk) will sheet flow across landscaped ground as much as possible to slow runoff and increase time of concentration prior to being conveyed to the proposed public streets and storm sewer system. This will minimize directly connected impervious areas within the project site.

2. **Implement BMP's that provide a Water Quality Capture Volume with slow release:** Runoff from this project will be routed through onsite storm sewer to an existing water quality basin located along the southern boundary of the Falcon Marketplace development. This will allow for the runoff to be treated for water quality before discharging into the offsite storm system.
3. **Stabilize Drainage Ways:** No drainage ways exist within the project boundaries. Runoff will enter the storm sewer system, and be directed towards the existing water quality basin along the southern boundary of the Falcon Marketplace development, this will allow for flow rate reduction and protection of downstream facilities.
4. **Implement Site Specific and Other Source Control BMP's:** Standard commercial source control will be utilized in order to minimize potential pollutants entering the storm system. Example source control measures consist of: indoor storage of household chemicals; and trash receptacles in common areas.

## 8.0 DRAINAGE & BRIDGE FEES

Drainage and bridge fees are not required as the site has been previously platted.

## 9.0 SUMMARY

Development of Lot 6 Falcon Marketplace will not adversely affect surrounding or downstream developments. The runoff coefficients established by Final Drainage Report for Falcon Marketplace for Basin B8 were  $C_5=0.68$  and  $C_{100}=0.79$ , the combined runoff coefficients for Basins A-D for this development are slightly lower at  $C_5=0.66$  and  $C_{100}=0.77$ , therefore, it is acceptable to state that the drainage design for Lot 6 is in conformance with the Final Drainage Report for the overall Falcon Marketplace development.

The downstream existing water quality facility is functioning as intended and was designed to treat flows generated by this property.

## 10.0 REFERENCES

The sources of information used in the development of this study are listed below:

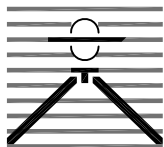
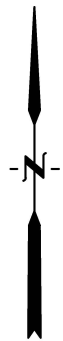
1. El Paso County Drainage Criteria Manual, 10-31-2018.
2. Final Drainage Report for Falcon Marketplace (Drexel, Barrell & Co.) 12-19-2019.
3. Drainage Letter for Lot 7, Falcon Marketplace (Drexel, Barrell & Co.) 10-17-2021.
4. El Paso County Engineering Criteria Manual, 10-14-2020

## Appendix



# Vicinity Map

NTS



## FALCON MARKETPLACE VICINITY MAP

Drexel, Barrell & Co.  
Engineers • Surveyors

DATE:  
8/18/16

JOB NO:  
20988-00

DWG. NO.

**VMAP**

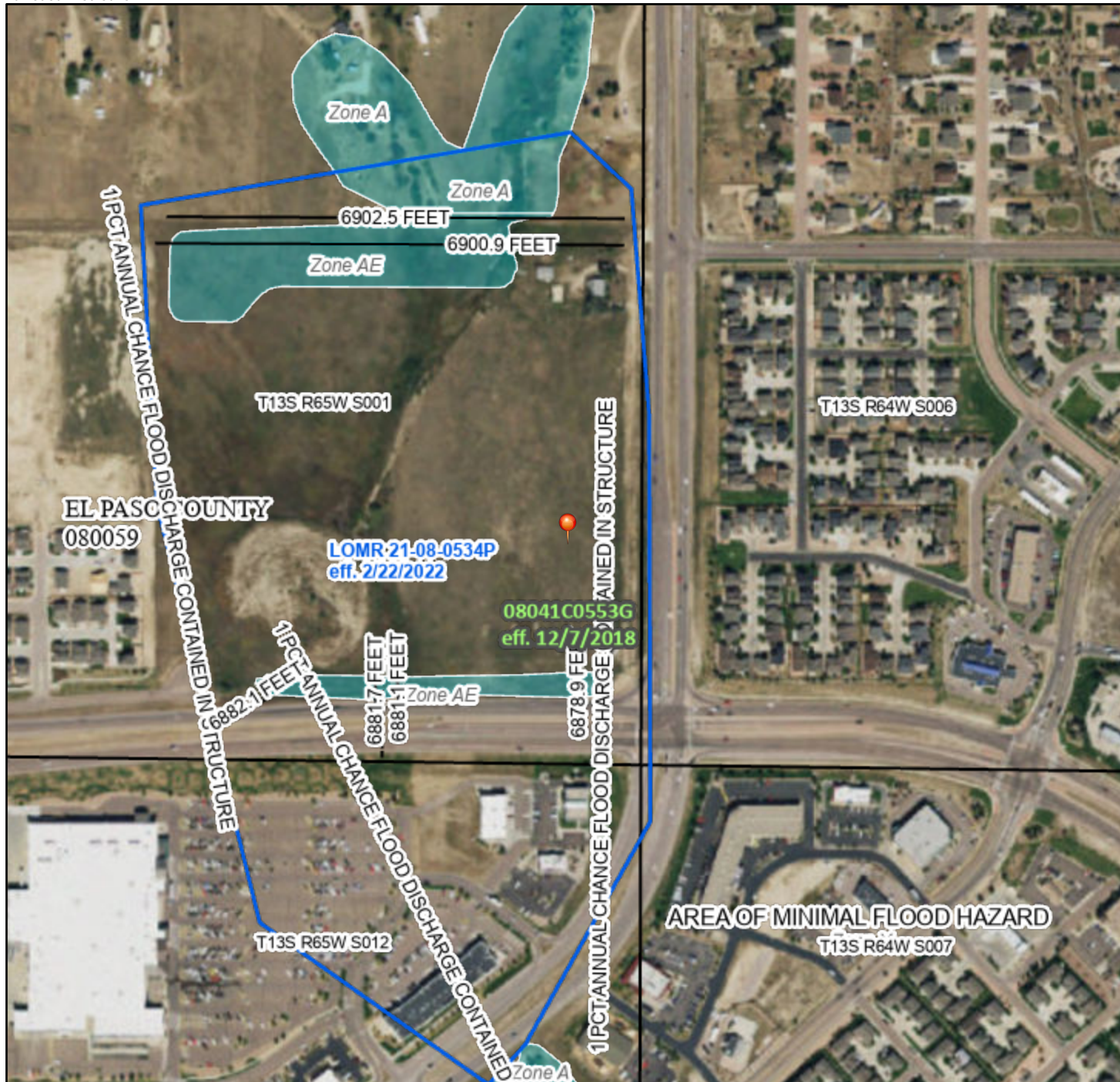
SHEET 1 OF 1



# National Flood Hazard Layer FIRMette



104°36'50"W 38°56'45"N



## Legend

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

- |                                    |  |   |
|------------------------------------|--|---|
| <b>SPECIAL FLOOD HAZARD AREAS</b>  |  | Without Base Flood Elevation (BFE)<br>Zone A, V, A99  |
|                                    |  | With BFE or Depth Zone AE, AO, AH, VE, AR   |
|                                    |  | Regulatory Floodway   |
| <b>OTHER AREAS OF FLOOD HAZARD</b> |  | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
|                                    |  | Future Conditions 1% Annual Chance Flood Hazard Zone X  |
|                                    |  | Area with Reduced Flood Risk due to Levee. See Notes. Zone X  |
|                                    |  | Area with Flood Risk due to Levee Zone D  |
| <b>OTHER AREAS</b>                 |  | NO SCREEN Area of Minimal Flood Hazard Zone X   |
|                                    |  | Effective LOMRs   |
|                                    |  | Area of Undetermined Flood Hazard Zone D  |
| <b>GENERAL STRUCTURES</b>          |  | Channel, Culvert, or Storm Sewer  |
|                                    |  | Levee, Dike, or Floodwall   |
| <b>OTHER FEATURES</b>              |  | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation   |
|                                    |  | 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation   |
|                                    |  | Coastal Transect  |
|                                    |  | Base Flood Elevation Line (BFE)   |
|                                    |  | Limit of Study  |
|                                    |  | Jurisdiction Boundary   |
|                                    |  | Coastal Transect Baseline   |
|                                    |  | Profile Baseline  |
|                                    |  | Hydrographic Feature  |
| <b>MAP PANELS</b>                  |  | Digital Data Available  |
|                                    |  | No Digital Data Available   |
|                                    |  | Unmapped  |

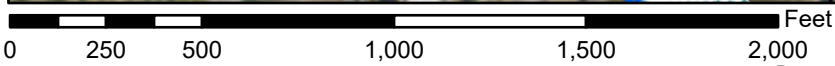


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/14/2022 at 11:30 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

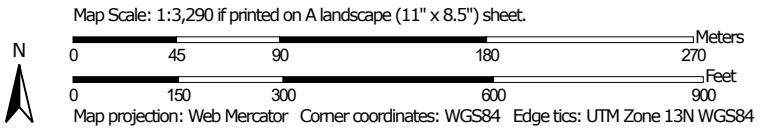


1:6,000

104°36'12"W 38°56'17"N



# Custom Soil Resource Report Soil Map



### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)

**Soils**

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

**Special Point Features**

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	1.2	3.4%
9	Blakeland-Fluvaquentic Haplaquolls	16.2	44.1%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	19.2	52.5%
<b>Totals for Area of Interest</b>		<b>36.6</b>	<b>100.0%</b>

## Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

## Custom Soil Resource Report

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

## El Paso County Area, Colorado

### 8—Blakeland loamy sand, 1 to 9 percent slopes

#### Map Unit Setting

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

#### Map Unit Composition

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

#### Description of Blakeland

##### Setting

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

##### Typical profile

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

##### Properties and qualities

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

##### Interpretive groups

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

#### Minor Components

##### Other soils

*Percent of map unit:* 1 percent

*Hydric soil rating:* No

**Pleasant**

*Percent of map unit:* 1 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

**9—Blakeland-Fluvaquentic Haplaquolls**

**Map Unit Setting**

*National map unit symbol:* 36b6

*Elevation:* 3,500 to 5,800 feet

*Mean annual precipitation:* 13 to 17 inches

*Mean annual air temperature:* 46 to 55 degrees F

*Frost-free period:* 110 to 165 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Blakeland and similar soils:* 60 percent

*Fluvaquentic haplaquolls and similar soils:* 38 percent

*Minor components:* 2 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Blakeland**

**Setting**

*Landform:* Hills, flats

*Landform position (three-dimensional):* Side slope, talf

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy alluvium derived from arkose and/or eolian deposits  
derived from arkose

**Typical profile**

*A - 0 to 11 inches:* loamy sand

*AC - 11 to 27 inches:* loamy sand

*C - 27 to 60 inches:* sand

**Properties and qualities**

*Slope:* 1 to 9 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Somewhat excessively drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (5.95  
to 19.98 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 5 percent

*Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

**Interpretive groups**

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

**Description of Fluvaquentic Haplaquolls**

**Setting**

*Landform: Swales*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Parent material: Alluvium*

**Typical profile**

*H1 - 0 to 12 inches: variable*  
*H2 - 12 to 60 inches: stratified very gravelly sand to loam*

**Properties and qualities**

*Slope: 1 to 2 percent*  
*Depth to restrictive feature: More than 80 inches*  
*Drainage class: Poorly drained*  
*Runoff class: Very high*  
*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high*  
*(0.20 to 6.00 in/hr)*  
*Depth to water table: About 0 to 24 inches*  
*Frequency of flooding: Occasional*  
*Frequency of ponding: None*  
*Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)*  
*Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)*

**Interpretive groups**

*Land capability classification (irrigated): 6w*  
*Land capability classification (nonirrigated): 6w*  
*Hydrologic Soil Group: D*  
*Ecological site: R048AY241CO - Mountain Meadow*  
*Hydric soil rating: Yes*

**Minor Components**

**Pleasant**

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

**Other soils**

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

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

### Map Unit Setting

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

### Map Unit Composition

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

### Description of Columbine

#### Setting

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

#### Typical profile

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

#### Properties and qualities

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

#### Interpretive groups

*Land capability classification (irrigated):* 4e  
*Land capability classification (nonirrigated):* 6e  
*Hydrologic Soil Group:* A  
*Ecological site:* R049XY214CO - Gravelly Foothill  
*Hydric soil rating:* No

**Minor Components**

**Fluvaquentic haplaquolls**

*Percent of map unit: 1 percent*

*Landform: Swales*

*Hydric soil rating: Yes*

**Other soils**

*Percent of map unit: 1 percent*

*Hydric soil rating: No*

**Pleasant**

*Percent of map unit: 1 percent*

*Landform: Depressions*

*Hydric soil rating: Yes*

PROJECT INFORMATION								
PROJECT:	Lot 6 Falcon Marketplace							
PROJECT NO:	20988-12							
DESIGN BY:	KGV							
REV. BY:	TDM							
AGENCY:	El Paso County							
REPORT TYPE:	Final							
DATE:	11/14/2022							
Soil Type: A								
				<b>C2*</b>	<b>C5*</b>	<b>C10*</b>	<b>C100*</b>	<b>% IMPERV</b>
<b>Open Space</b>					0.08		0.35	0
<b>Commercial Development</b>					0.81		0.88	90
<b>Asphalt/Sidewalk/Roof</b>					0.90		0.95	100
*C-Values and Basin Imperviousness based on Table 5-1, El Paso County Drainage Criteria Manual Vol 1								
<b>PROPOSED</b>								
SUB-BASIN	SURFACE DESIGNATION	AREA	COMPOSITE RUNOFF COEFFICIENTS				% IMPERV	
			ACRE	C2	C5	C10		C100
<b>A</b>	Open Space	0.01		0.08		0.35	0	
	Commercial Development	0.00		0.81		0.88	90	
	Asphalt/Sidewalk/Roof	0.40		0.90		0.95	100	
	WEIGHTED AVERAGE			0.88		0.94	98%	
<b>TOTAL A</b>		0.41						
<b>B</b>	Open Space	0.17		0.08		0.35	0	
	Commercial Development	0.00		0.81		0.88	90	
	Asphalt/Sidewalk/Roof	0.00		0.90		0.95	100	
	WEIGHTED AVERAGE			0.08		0.35	0%	
<b>TOTAL B</b>		0.17						
<b>C</b>	Open Space	0.04		0.08		0.35	0	
	Commercial Development	0.00		0.81		0.88	90	
	Asphalt/Sidewalk/Roof	0.29		0.90		0.95	100	
	WEIGHTED AVERAGE			0.80		0.88	88%	
<b>TOTAL C</b>		0.33						
<b>D</b>	Open Space	0.08		0.08		0.35	0	
	Commercial Development	0.00		0.81		0.88	90	
	Asphalt/Sidewalk/Roof	0.02		0.90		0.95	100	
	WEIGHTED AVERAGE			0.27		0.49	23%	
<b>TOTAL D</b>		0.10						
<b>Overall Site</b>		1.01		0.66		0.77	71%	



Drexel, Barrell & Co.



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 REPORT TYPE: Final  
 DATE: 11/14/2022



**RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF**

PROPOSED TIME OF CONCENTRATION STANDARD FORM SF-2

SUB-BASIN DATA					INITIAL/OVERLAND TIME (t <sub>i</sub> )				TRAVEL TIME (t <sub>t</sub> )					TIME OF CONC. t <sub>c</sub>		FINAL t <sub>c</sub>
BASIN	DESIGN PT.	C <sub>s</sub>	C <sub>100</sub>	AREA	LENGTH	HT	SLOPE	t <sub>i</sub>	LENGTH	HT	SLOPE	VEL.	t <sub>t</sub>	COMP.	MINIMUM	
				Ac	Ft	FT	%	Min	Ft	FT	%	FPS	Min	t <sub>c</sub>	t <sub>c</sub>	Min
A		0.88	0.94	0.41	50	1	3.5	1.9	214	1.5	1.9	5.9	0.6	2.5	5	<b>5.0</b>
B		0.08	0.35	0.17	50	1	4.0	8.5	105	1	1.5	4.2	0.4	8.9	5	<b>8.9</b>
A+B	1	0.65	0.76	0.58					120	1	1.5	5.9	0.3	9.3	5	<b>9.3</b>
C	2	0.80	0.88	0.33	50	1	2.9	2.8	180		2.9	5.6	0.5	3.3	5	<b>5.0</b>
D	3	0.27	0.49	0.10	20	0.2	5.2	4.0	70		5.9	3.8	0.3	4.3	5	<b>5.0</b>

**PROJECT INFORMATION**

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 REPORT TYPE: Final  
 DATE: 11/14/2022



**RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF**

PROPOSED RUNOFF 5 YR STORM P1= 1.50

BASIN (S)	DESIGN POINT	AREA (AC)	DIRECT RUNOFF		C * A	I (IN/HR)	Q (CFS)
			RUNOFF COEFF	t <sub>c</sub> (MIN)			
A		0.41	0.88	5.0	0.36	5.10	1.9
B		0.17	0.08	8.9	0.01	4.28	0.1
A+B	1	0.58	0.65	9.3	0.38	4.22	1.6
C	2	0.33	0.80	5.0	0.26	5.10	1.3
D	3	0.10	0.27	5.0	0.03	5.10	0.1

**PROJECT INFORMATION**

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 PROJECT NO: 20988-12  
 DESIGN BY: KGV  
 REV. BY: TDM  
 AGENCY: El Paso County  
 REPORT TYPE: Final  
 DATE: 11/14/2022

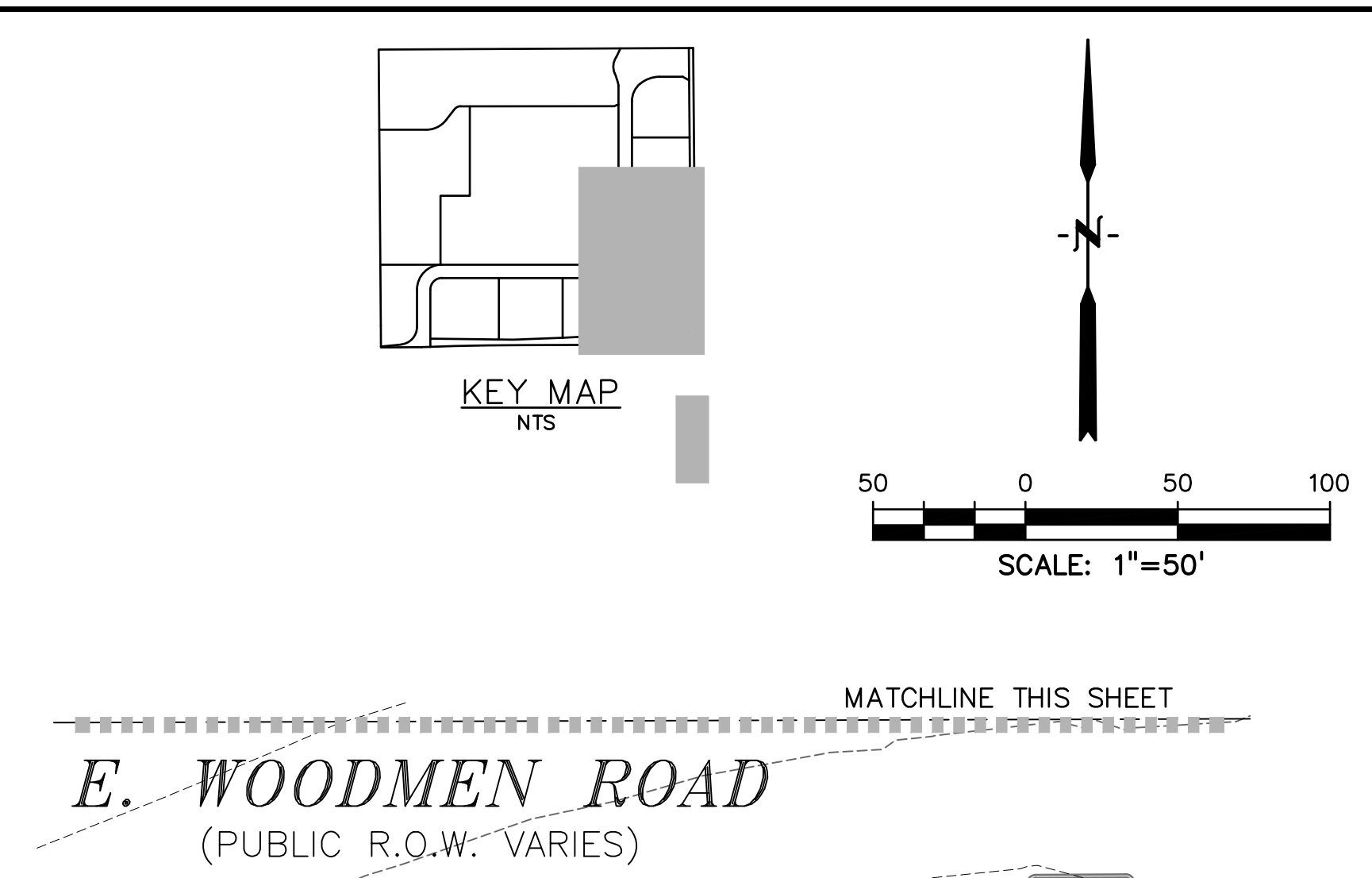
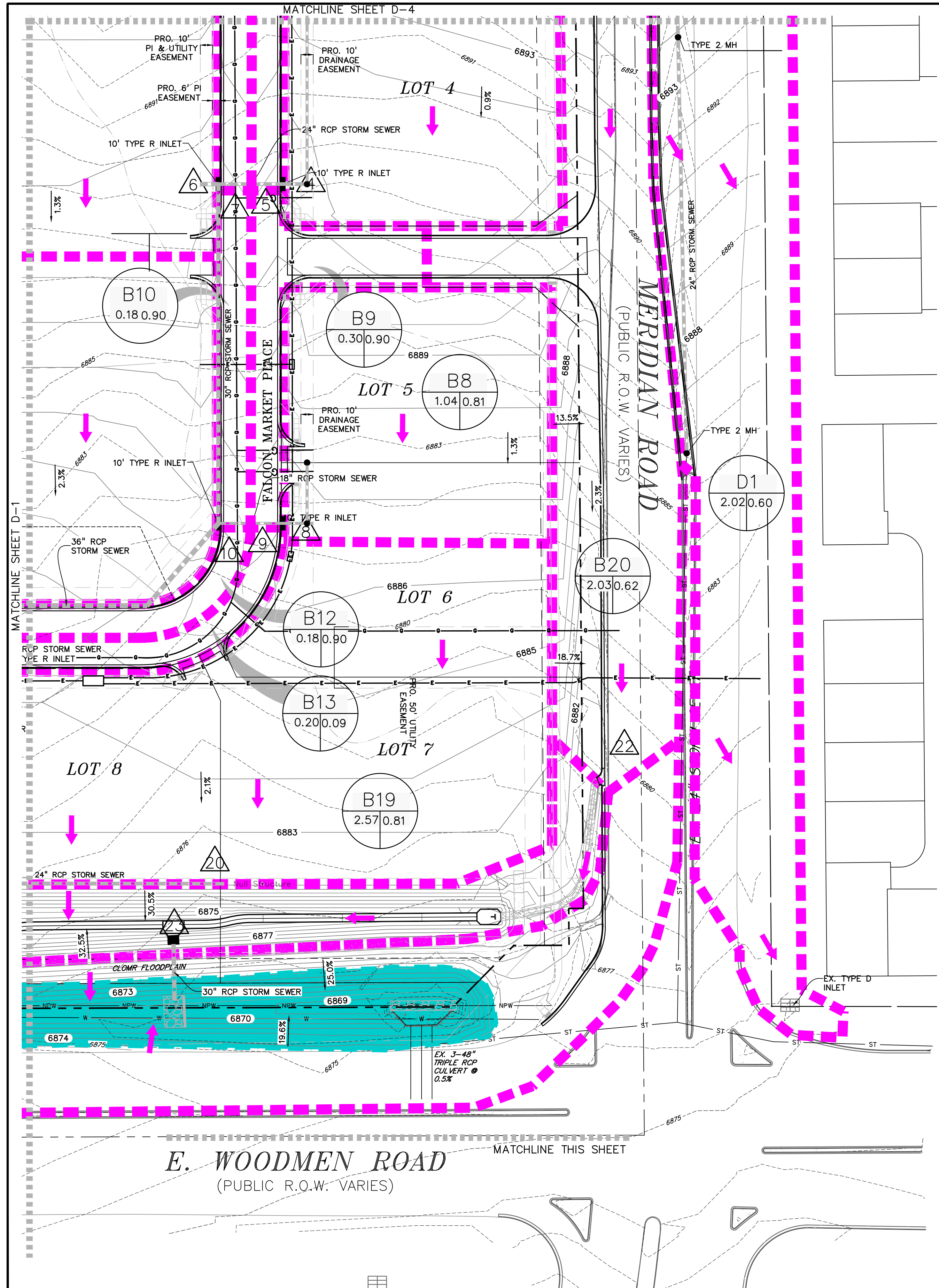


**RATIONAL METHOD CALCULATIONS FOR STORM WATER RUNOFF**

PROPOSED RUNOFF 100 YR STORM P1= 2.52

BASIN (S)	DESIGN POINT	AREA (AC)	DIRECT RUNOFF		C * A	I (IN/HR)	Q (CFS)
			RUNOFF COEFF	t <sub>c</sub> (MIN)			
A		0.41	0.94	5.0	0.38	8.58	3.3
B		0.17	0.35	8.9	0.06	7.19	0.4
A+B	1	0.58	0.76	9.3	0.44	7.09	3.2
C	2	0.33	0.88	5.0	0.29	8.58	2.4
D	3	0.10	0.49	5.0	0.05	8.58	0.4





**RUNOFF SUMMARY**

BASIN	DP	Area (Ac.)	Q <sub>5</sub> (CFS)	Q <sub>100</sub> (CFS)
A1	DP1	1.81	3.4	7.7
	DP2	1.81	3.4	7.7
A2		4.82	1.4	10.2
	DP3	6.63	4.6	17.3
B4	DP4	2.35	7.5	14.6
B5		0.63	2.8	5.1
	DP5	2.99	10.0	19.3
B6	DP6	3.19	12.8	23.6
B7		0.46	2.0	3.7
	DP7	6.63	23.8	28.0
B8	DP8	1.04	3.5	6.9
B9		0.30	1.4	2.5
	DP9	1.35	4.9	9.3
B10		0.18	0.8	1.4
	DP10	8.16	29.2	38.1
B11	DP11	2.01	7.8	14.6
B12		0.18	0.8	1.5
	DP12	10.35	36.4	51.9
B13		0.20	0.9	1.6
	DP13	10.55	37.1	53.2
B14	DP14	2.49	9.1	17.0
B15	DP15	5.73	20.3	38.0
B16		0.35	1.6	2.9
	DP16	8.56	30.6	57.1
B17		0.33	1.5	2.7

BASIN	DP	Area (Ac.)	Q <sub>5</sub> (CFS)	Q <sub>100</sub> (CFS)
DP17		8.89	31.9	59.3
DP18		19.44	52.1	88.2
B18	DP19	2.18	7.8	15.0
B19	DP20	2.57	10.1	18.8
	DP21	24.19	67.6	117.5
B20	DP22	2.03	5.6	11.4
B21		1.62	0.5	4.0
	DP23	27.85	67.4	121.8
C1	DP24	0.35	1.3	2.6
C2		0.23	0.8	1.5
	DP25	0.59	2.0	3.8
C3		1.88	0.6	4.2
C4		2.19	6.9	13.8
	DP26	4.08	5.4	13.7
C5	DP27	0.64	0.5	1.9
C6		0.45	0.2	1.2
	DP28	5.31	7.4	18.3
C7	DP29	0.19	0.7	1.3
C8		1.14	2.5	5.5
	DP30	1.33	3.1	6.6
C9		3.43	7.3	16.2
D1		2.62	4.1	8.8
D2		0.07	0.3	0.6
D3		0.07	0.3	0.6
DPO1		32.50	10.3	30.2

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

**CLIENT:**  
**HUMMEL INVESTMENTS, LLC**  
 8117 PRESTON ROAD, SUITE 120  
 DALLAS, TEXAS 75225  
 (214) 416-9820

DRAINAGE PLAN FOR

**FALCON MARKETPLACE**  
FALCON, COLORADO

ISSUE	DATE
INITIAL ISSUE	6-28-19
REVISED	7-19-19

**DESIGNED BY:** TDM  
**DRAWN BY:** KGV  
**CHECKED BY:** TDM



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

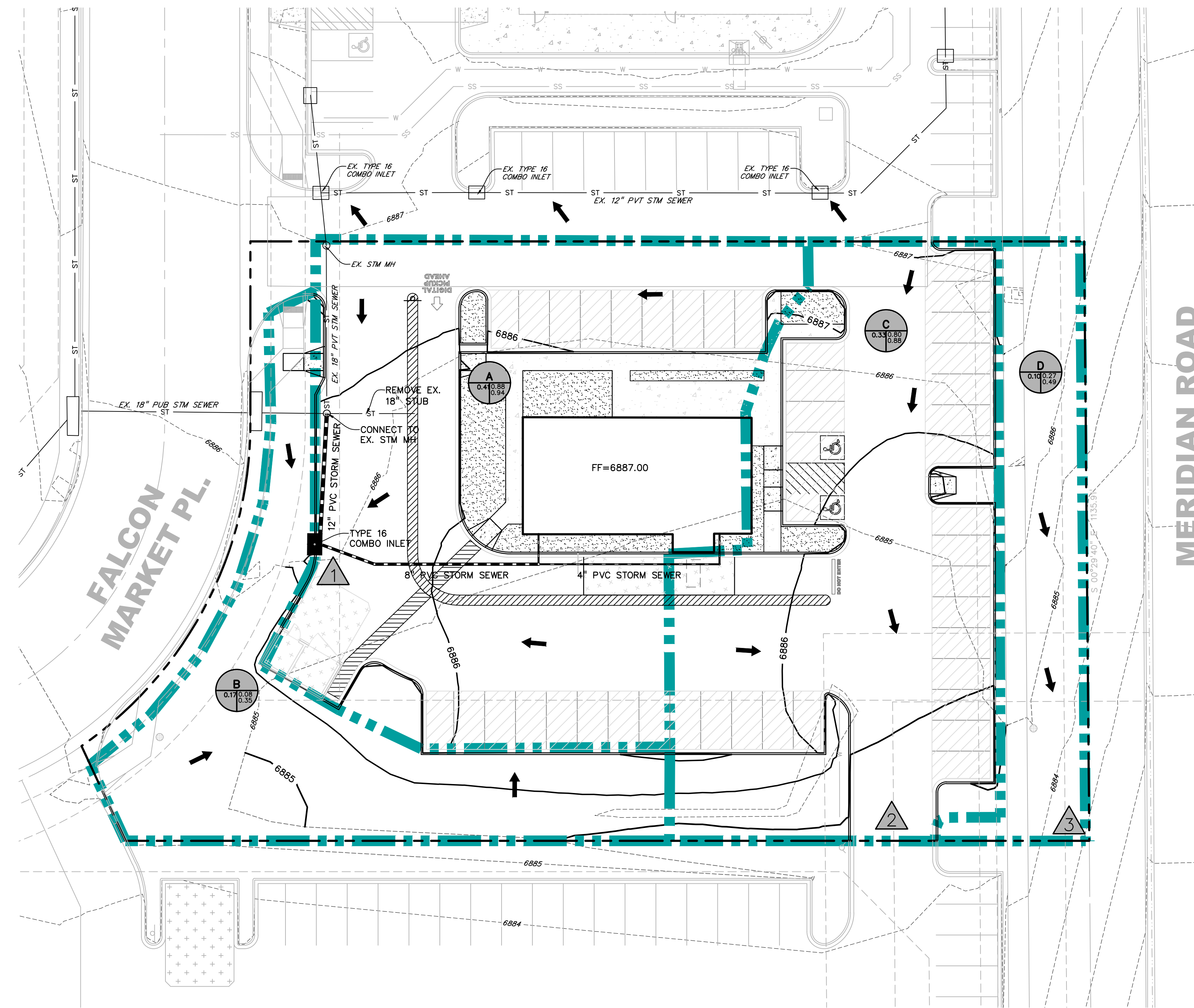
**DRAWING SCALE:**  
 HORIZONTAL: 1"=50'  
 VERTICAL: N/A

**PROPOSED DRAINAGE CONDITIONS**

**PROJECT NO. 20988-00CSCV**  
**DRAWING NO.**

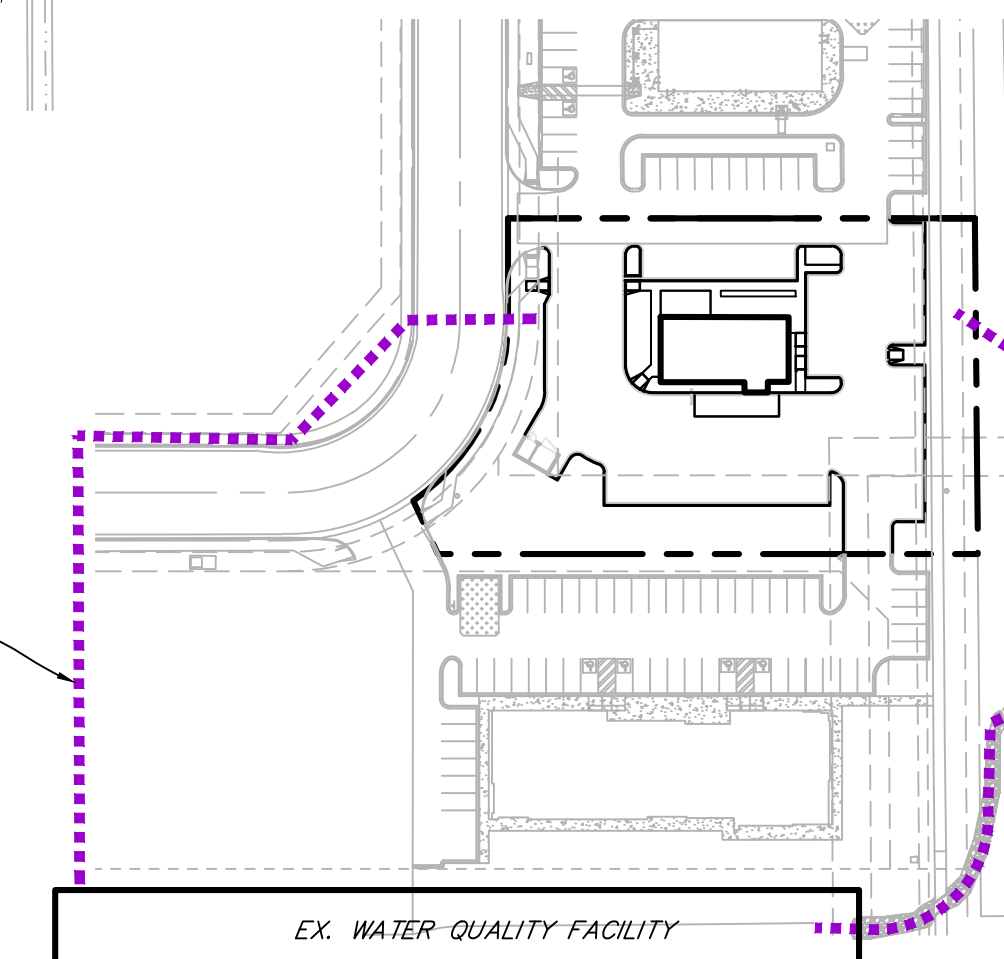
**D-2**  
 SHEET: 2 OF 5





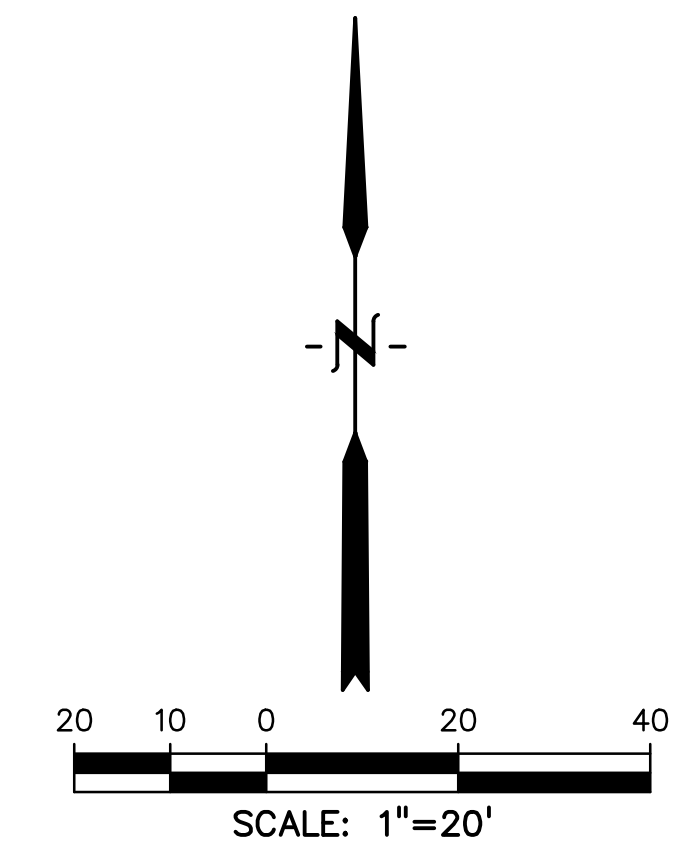
**SITE DRAINAGE PLAN**

STORM SEWER ROUTING FOR FLOWS FROM LOT 6 TO THE EXISTING ONSITE WATER QUALITY FACILITY



**FLOW ROUTING**  
SCALE: 1"=100'

FLOW ROUTING FOR FLOWS FROM LOT 6 (UNDEVELOPED BASIN D) TO THE EXISTING ONSITE WATER QUALITY FACILITY



**LEGEND**

PROPOSED INTERMEDIATE CONTOUR	.....	5522
PROPOSED INDEX CONTOUR	.....	5520
EX. INTERMEDIATE CONTOUR	.....	5364
EX. INDEX CONTOUR	.....	5365
DIRECTION OF FLOW	.....	↑
HIGH POINT	.....	HP
LOW POINT	.....	LP
PROPOSED INLET	.....	■
PROPOSED MANHOLE	.....	●
<b>BASIN BOUNDARY</b> (dashed green line)		
<b>FLOW DIRECTION</b> (black arrow)		
<b>DESIGN POINT</b> (triangle with X)		
<b>BASIN</b> (circle with X)		
AREA (ACRE)	C5	C100

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

CLIENT:

DRAINAGE MAPPING PLANS FOR:  
**LOT 6, FALCON MARKETPLACE**  
EL PASO COUNTY, COLORADO

ISSUE	DATE
INITIAL ISSUE	09/02/2022
LATEST ISSUE	11/14/2022
DESIGNED BY:	KGV
DRAWN BY:	SDM
CHECKED BY:	TDM
FILE NAME:	20988-12-DRN

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF DREXEL, BARRELL & CO.  
DRAWING SCALE:  
HORIZONTAL: 1" = 20"  
VERTICAL: N/A

**PROPOSED DRAINAGE PLAN**  
PROJECT NO. 20988-12CSCV  
DRAWING NO.

**DRN**  
SHEET: 1 OF 1