



**PRELIMINARY DRAINAGE REPORT  
BLACK ROCK COFFEE OF PARKER  
(UPDATE TO FINAL DRAINAGE  
REPORT PARKER POINTE)**

*for*

**BRC OF PARKER, COLORADO  
SOUTH PARKER ROAD & STROH ROAD,  
PARKER, CO 80134**

*Prepared for*

**BLACK ROCK  
DEVELOPMENT  
COMPANY, LLC  
PARKER, CO**

***Submitted by: Atwell, LLC***

**Project Number: 24003198**



Preliminary Drainage Report  
Black Rock Coffee of Parker  
Parker, Colorado

This report for the preliminary design of The Black Rock Coffee of Parker was prepared by me or under my direct supervision in accordance with the provisions of the Town of Parker Storm Drainage and Environmental Criteria Manual. I understand that the Town of Parker and its designated town authority do not and will not assume liability for drainage facilities designed by others.

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Signature

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Colorado P.E. License No.

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Seal and Date

Respectfully,  
Carlos Casas  
**ATWELL, LLC**

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## INTRODUCTION

This report includes a hydrologic and hydraulic analysis for the proposed improvements for a future Premium Coffee Shop with drive-thru and walk-up window. The project will include a one-story drive-thru building and associated pavement, utilities, and appurtenances, now referred to as The Subject Property. The one-story drive-thru building resides at the corner of South Parker Road & Stroh Road. Total disturbed area is 0.67 acres. This report provides calculations for stormwater runoff for the 100-year storm events. The requirements included in the Storm Drainage and Environmental Criteria Manual (Revised and Adopted February 2014) were used as the basis for this study.

This site was previously addressed by that *Final Drainage Report for Parker Pointe Parker, Colorado*, Perception Design Group, INC. Job#2015-015, now called the Master Drainage Plan.

## SOIL STUDY DESCRIPTION

The entire site is split 60/40 with Bresser-Truckton sandy loams and Sampson Loam, these soils both have a hydrologic rating of Class B. A full breakdown can be found in Figure 2 of this report. Soil ratings are consistent with those found in the master report and no change has occurred.

## FEMA FLOOD ZONE

The project falls within the Flood Insurance Rate Map (FIRM) Community Panel Number 08035C0182G, effective date; March 16<sup>th</sup>, 2016. The site is located within an area designated as Zone "X" (un-shaded). Zone "X" (un-shaded) is described by FEMA as areas outside of the 0.2% annual chance flood plain. Please find attached the FIRMette found as Figure 3.

## HYDROLOGY

The site's proposed drainage pattern is consistent with the approved master drainage study. Our site falls within the same basin (L14) found in the Drainage Plan West of *Final Drainage Report for Parker Pointe Parker, Colorado, Perception Design Group, INC. Job#2015-015*. The Existing drainage pattern moves east to west, with the intention that the developed drainage pattern will move west to east. The Master Drainage Plan allows for and accommodates the subject properties flows via a stub out on the eastern property line. This stub-out connects to the overall drainage system and has an ultimate outfall to a detention pond in the far east of the overall development. The Subject Properties peak runoff rates are below those found in the report. This is due to an increased amount of pervious area than was allowed for in the master report. Also, hydraulic analysis has been included in this report using the latest NOAA 14-point rainfall values. Also using the latest MHFD Table 6-2 for recommended imperviousness by land use value of "open space, undisturbed Native Grasses and Commercial – Medium – to – High -density" and utilizing the MHFD Inlet capacity workbook to provide inlet capacity/spread calculation showing the allowable uses and depth of flow for the initial and major runoff per Section 2.5.1 of SDECM for Town of Parker found in Figure 6, 7 and 8. However, Interim and Post Runoff Rates can be found in Figures 4 and 5, along with their respective drainage areas.

## Interim Conditions Peak Flows

PRE-DEVELOPED DRAINAGE SUMMARY								
BRC - PARKER, COLORADO								
DRAINAGE AREA	AREA (AC)	Tc (MIN)	C-VALUE	I (2 yr) (in/hr)	Q (2yr) (cfs)	I (100 yr) (in/hr)	Q (100 yr) (cfs)	REMARKS
E1	0.73	5.00	0.05	3.41	0.12	9.53	0.35	TO INTERIM SYSTEM
TOTALS	0.73						0.35	

## Developed Conditions Peak Flow

PRE-DEVELOPED DRAINAGE SUMMARY										
BRC - PARKER, COLORADO										
DRAINAGE AREA	AREA (AC)	Tc (MIN)	C-VALUE	P (2 yr) One-hour point	I (2 yr) (in/hr)	Q (2 yr) (cfs)	P (100yr) One-hour point	I (100 yr) (in/hr)	Q (100 yr) (cfs)	REMARKS
D1	0.33	5.00	0.80	0.99	3.36	0.89	2.60	8.82	2.33	TO WEST CURB INLET
D2	0.11	5.00	0.80	0.99	3.36	0.30	2.60	8.82	0.78	TO EAST INLET
D3	0.12	5.00	0.05	0.99	3.36	0.02	2.60	8.82	0.05	BYPASS
D4	0.27	5.00	0.88	0.99	3.36	0.80	2.60	8.82	2.10	BYPASS ADJOINER
TOTALS	0.83					2.00			5.25	

The Subject Property has a reduction in post run-off flows as an increase to pervious area has been allowed for. This increase in pervious is shown above as D3. Area D4 represents off property developable area that is still within the L14 basin found in the Master Study. The engineer believes the developed flows should have no impact on the Maser Drainage System and that it should operate as designed in the Master Study.

### PIPE FLOW & CAPACITY

The hydraulic calculations conducted for pipe sizing are detailed in the following sections of this report. Each pipe segment has been analyzed to determine its total flow capacity and the respective outfall location. The analysis also includes the total design flow conveyed through each pipe.

These calculations confirm that the total flow within each pipe is within the allowable capacity, ensuring compliance with hydraulic design standards. This assessment supports the adequacy of the proposed system to handle the expected flow conditions under the specified design criteria.

Please refer to the subsequent calculation table Figure 9.

### FFE (FINISHED FLOOR ELEVATION) CONSIDERATIONS

The finished floor elevation is currently set 8.7 feet (5977.5) above the perpendicular elevation of South Parker Road (5968.8'). The proposed pad for the site has been designed such that a minimum of 2-feet has been provided above adjacent hydraulic grade lines of overland flow across the site.

## **WATER QUALITY CONSIDERATIONS**

Water quality has been considered in the downstream portion of the Master Study. “Water Quality is achieved in an extended detention facility designed to EURV specifications using UDFCD ver 3.07 UD-Detention Spreadsheet.” Final Drainage Report for Parker Pointe Parker, Colorado, Perception Design Group, INC. Job#2015-015.

## **CONCLUSION**

The proposed development’s grading and hydrology adhere to previous studies and calculations. It establishes the appropriate elevation of proposed pad and accommodates for all other criteria asked of the Final Drainage Report for Parker Pointe Parker, Colorado, Perception Design Group, INC. Job#2015-015.

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### **APPENDIX**

APPENDIX A – Approved Plans

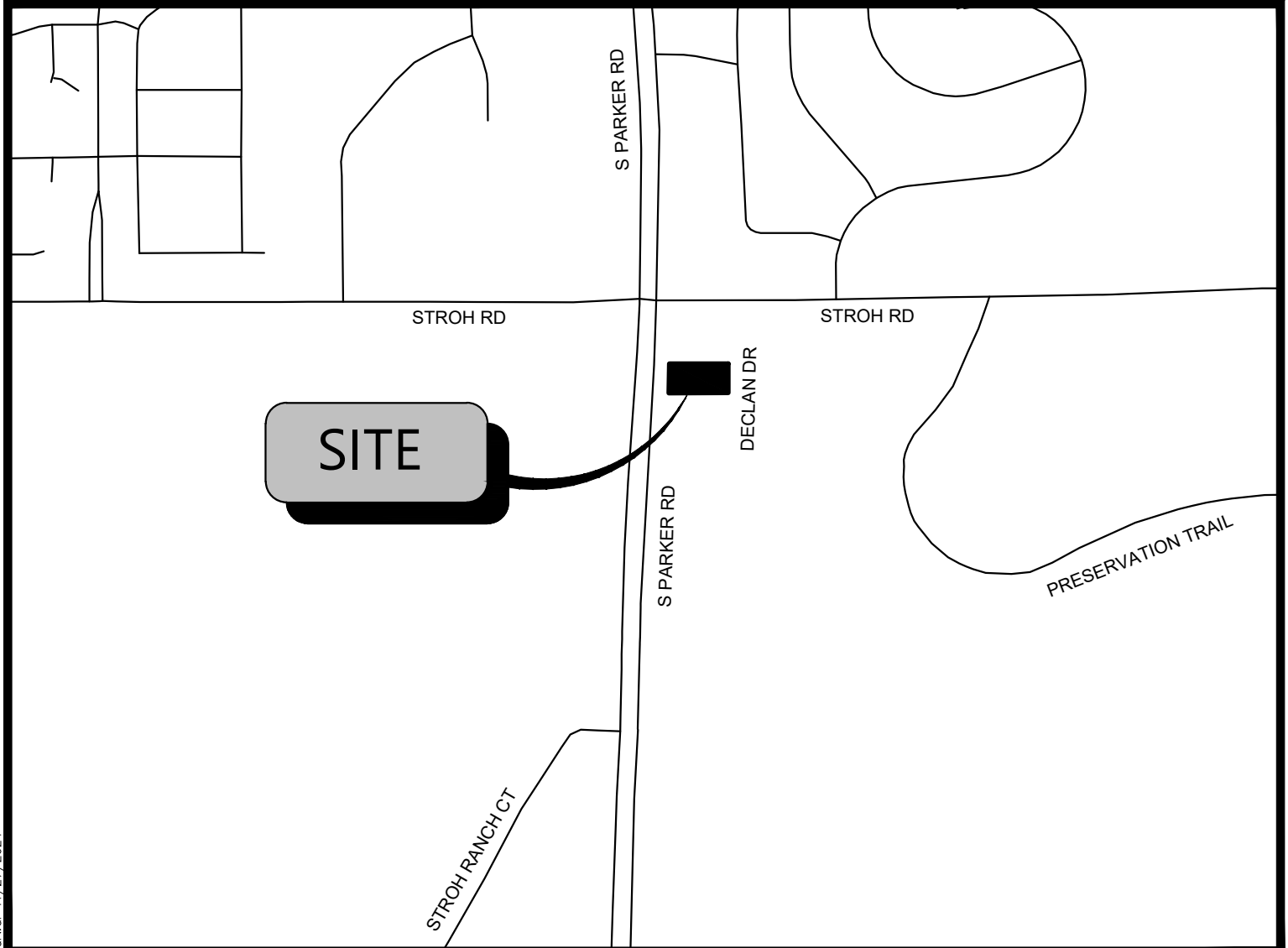
APPENDIX B – Previous Studies

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## FIGURES

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FILE NAME: \\TXDAL\Civil\24003198 - BRC - Parker & Stroh - Parker CO\_LD\0 REFERENCE\VICINITY MAP - EXHIBIT.dwg LAST SAVED BY: ksarwar 11/27/2024 1:51 AM PLOTTED BY: Khadejja Sarwar 11/27/2024



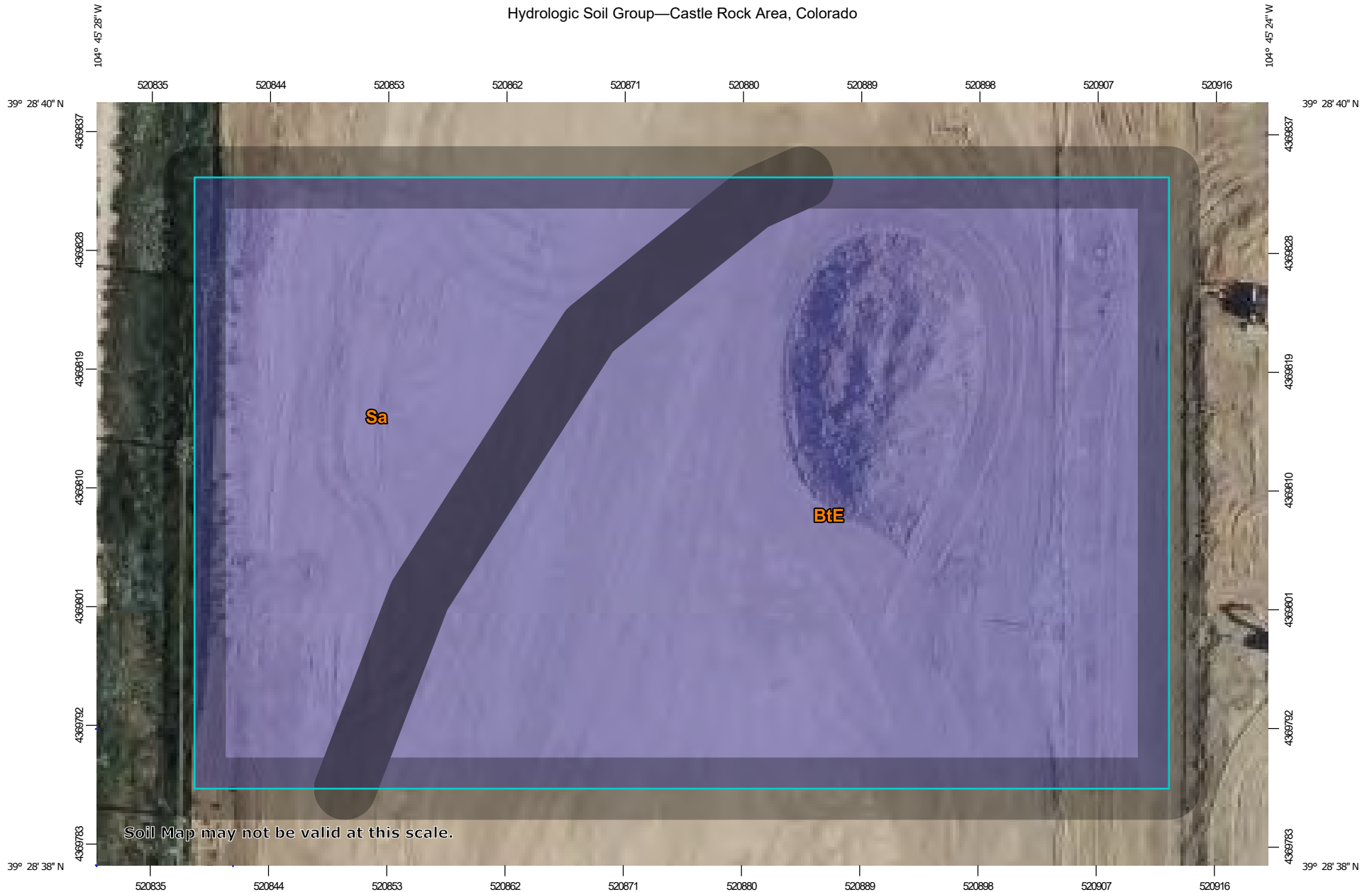
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866.850.4200 [www.atwell-group.com](http://www.atwell-group.com)

9001 AIRPORT FREEWAY, SUITE 660  
NORTH RICHLAND HILLS, TX 76180  
972.638.8860

VICINITY MAP

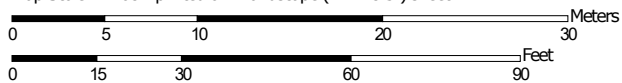


Hydrologic Soil Group—Castle Rock Area, Colorado



Soil Map may not be valid at this scale.


Map Scale: 1:408 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

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





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

#### Soil Rating Lines


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

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

**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: Castle Rock Area, Colorado  
 Survey Area Data: Version 17, Aug 29, 2024

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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
BtE	Bresser-Truckton sandy loams, 5 to 25 percent slopes	B	0.6	67.5%
Sa	Sampson loam	B	0.3	32.5%
<b>Totals for Area of Interest</b>			<b>0.9</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

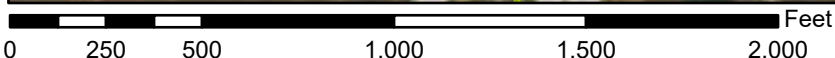
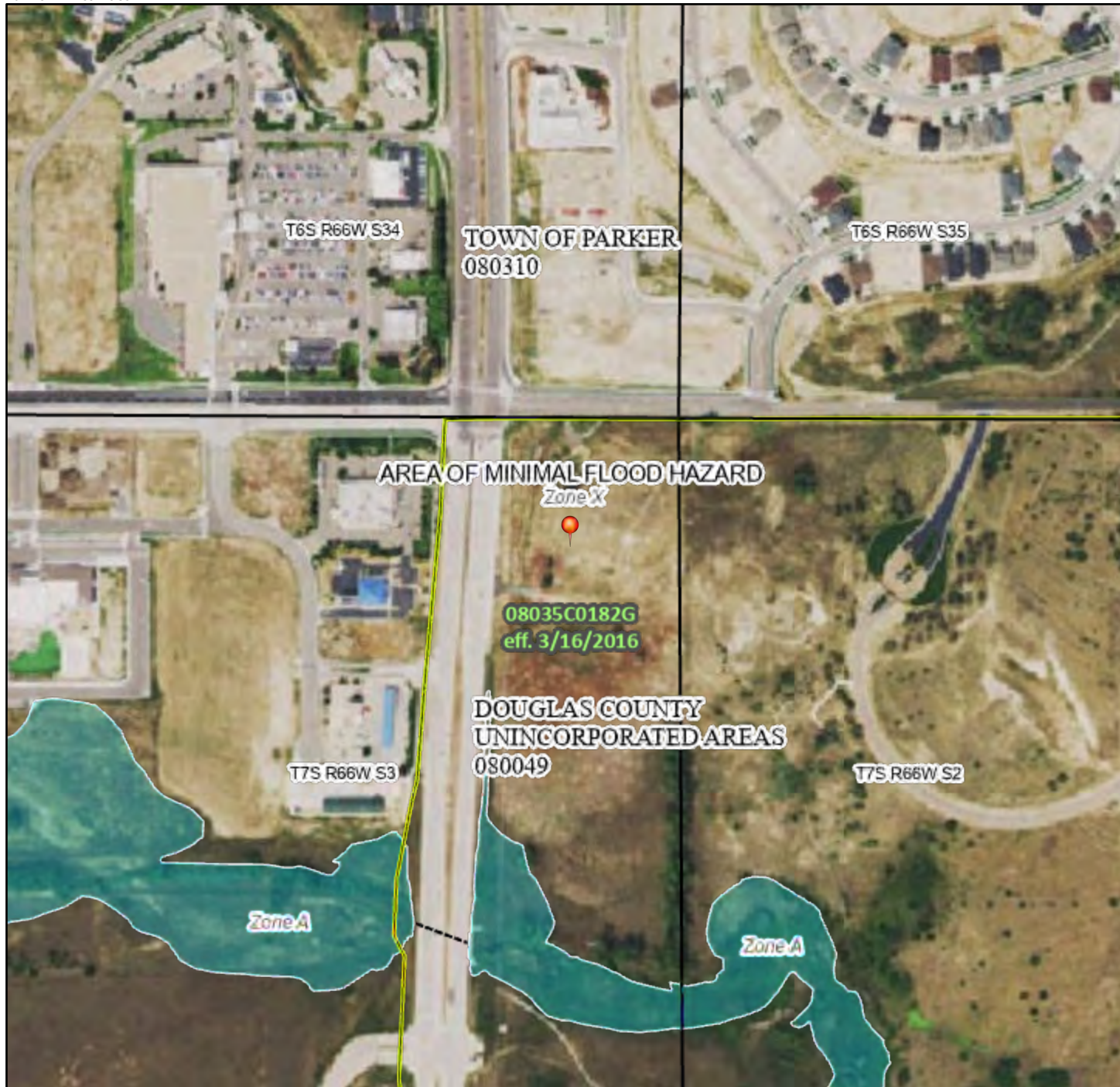
*Component Percent Cutoff: None Specified*

*Tie-break Rule: Higher*

# National Flood Hazard Layer FIRMMette



104°45'44"W 39°28'53"N



1:6,000 104°45'7"W 39°28'25"N

Basemap Imagery Source: USGS National Map 2023

## Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		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 <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		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 **11/21/2024 at 8:47 PM** 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.







NOAA Atlas 14, Volume 8, Version 2  
 Location name: Parker, Colorado, USA\*  
 Latitude: 39.4785°, Longitude: -104.7582°  
 Elevation: 5965 ft\*\*  
 \* source: ESRI Maps  
 \*\* source: USGS



**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

**PF tabular**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)<sup>1</sup></b>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	2.70 (2.23-3.31)	3.41 (2.81-4.18)	4.61 (3.78-5.65)	5.63 (4.60-6.95)	7.12 (5.62-9.11)	8.30 (6.38-10.8)	9.53 (7.06-12.6)	10.8 (7.66-14.7)	12.6 (8.54-17.5)	14.0 (9.22-19.7)
10-min	1.98 (1.63-2.42)	2.50 (2.06-3.05)	3.37 (2.77-4.13)	4.12 (3.37-5.08)	5.21 (4.11-6.67)	6.08 (4.67-7.87)	6.98 (5.17-9.24)	7.93 (5.60-10.8)	9.22 (6.26-12.8)	10.2 (6.75-14.4)
15-min	1.61 (1.33-1.97)	2.03 (1.67-2.48)	2.74 (2.25-3.36)	3.35 (2.74-4.13)	4.24 (3.34-5.42)	4.94 (3.80-6.40)	5.68 (4.20-7.51)	6.44 (4.56-8.74)	7.50 (5.09-10.4)	8.32 (5.48-11.7)
30-min	1.06 (0.874-1.30)	1.34 (1.10-1.64)	1.81 (1.49-2.22)	2.21 (1.81-2.73)	2.80 (2.20-3.58)	3.26 (2.50-4.22)	3.74 (2.77-4.95)	4.25 (3.00-5.76)	4.94 (3.35-6.87)	5.48 (3.61-7.71)
60-min	0.667 (0.551-0.816)	0.827 (0.682-1.01)	1.10 (0.907-1.36)	1.35 (1.10-1.66)	1.71 (1.35-2.20)	2.00 (1.54-2.60)	2.31 (1.71-3.06)	2.64 (1.87-3.58)	3.09 (2.10-4.31)	3.45 (2.28-4.86)
2-hr	0.402 (0.333-0.488)	0.492 (0.408-0.599)	0.652 (0.539-0.795)	0.795 (0.653-0.974)	1.01 (0.804-1.29)	1.18 (0.919-1.53)	1.37 (1.02-1.81)	1.57 (1.12-2.13)	1.86 (1.27-2.57)	2.08 (1.38-2.91)
3-hr	0.300 (0.250-0.363)	0.362 (0.301-0.439)	0.475 (0.393-0.576)	0.577 (0.475-0.703)	0.732 (0.587-0.936)	0.862 (0.672-1.11)	1.00 (0.752-1.32)	1.15 (0.828-1.56)	1.37 (0.942-1.89)	1.54 (1.03-2.14)
6-hr	0.183 (0.153-0.220)	0.219 (0.183-0.263)	0.283 (0.236-0.341)	0.342 (0.283-0.414)	0.432 (0.349-0.548)	0.508 (0.398-0.650)	0.589 (0.445-0.771)	0.678 (0.490-0.908)	0.804 (0.557-1.10)	0.907 (0.608-1.25)
12-hr	0.111 (0.093-0.132)	0.133 (0.111-0.159)	0.171 (0.143-0.205)	0.205 (0.171-0.247)	0.256 (0.207-0.322)	0.299 (0.235-0.378)	0.343 (0.261-0.444)	0.391 (0.284-0.519)	0.459 (0.320-0.623)	0.513 (0.347-0.702)
24-hr	0.067 (0.057-0.080)	0.080 (0.068-0.095)	0.102 (0.086-0.122)	0.122 (0.102-0.145)	0.150 (0.121-0.186)	0.173 (0.136-0.216)	0.196 (0.150-0.251)	0.222 (0.162-0.291)	0.257 (0.180-0.345)	0.284 (0.193-0.386)
2-day	0.040 (0.034-0.047)	0.047 (0.040-0.055)	0.059 (0.050-0.069)	0.069 (0.058-0.082)	0.084 (0.068-0.103)	0.096 (0.076-0.119)	0.108 (0.083-0.137)	0.121 (0.089-0.158)	0.139 (0.098-0.185)	0.153 (0.105-0.207)
3-day	0.029 (0.024-0.034)	0.034 (0.029-0.040)	0.042 (0.036-0.050)	0.050 (0.042-0.059)	0.060 (0.049-0.073)	0.069 (0.055-0.085)	0.077 (0.059-0.097)	0.086 (0.063-0.111)	0.098 (0.069-0.130)	0.108 (0.074-0.145)
4-day	0.023 (0.019-0.027)	0.027 (0.023-0.031)	0.034 (0.028-0.039)	0.039 (0.033-0.046)	0.048 (0.039-0.058)	0.054 (0.043-0.067)	0.061 (0.047-0.076)	0.068 (0.050-0.087)	0.077 (0.055-0.102)	0.084 (0.058-0.113)
7-day	0.015 (0.013-0.017)	0.017 (0.015-0.020)	0.021 (0.018-0.025)	0.025 (0.021-0.029)	0.030 (0.025-0.036)	0.034 (0.027-0.042)	0.038 (0.030-0.048)	0.043 (0.032-0.055)	0.048 (0.034-0.064)	0.053 (0.037-0.070)
10-day	0.011 (0.010-0.013)	0.013 (0.011-0.015)	0.016 (0.014-0.019)	0.019 (0.016-0.022)	0.023 (0.019-0.027)	0.026 (0.021-0.031)	0.029 (0.022-0.036)	0.032 (0.024-0.041)	0.036 (0.026-0.047)	0.040 (0.027-0.052)
20-day	0.007 (0.006-0.008)	0.008 (0.007-0.010)	0.010 (0.009-0.012)	0.012 (0.010-0.013)	0.014 (0.011-0.016)	0.015 (0.012-0.019)	0.017 (0.013-0.021)	0.019 (0.014-0.024)	0.021 (0.015-0.027)	0.023 (0.016-0.030)
30-day	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.011 (0.009-0.013)	0.012 (0.009-0.014)	0.013 (0.010-0.016)	0.014 (0.011-0.018)	0.016 (0.011-0.021)	0.017 (0.012-0.022)
45-day	0.005 (0.004-0.005)	0.005 (0.004-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.010)	0.009 (0.008-0.011)	0.010 (0.008-0.013)	0.011 (0.008-0.014)	0.012 (0.009-0.016)	0.013 (0.009-0.017)
60-day	0.004 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.009)	0.008 (0.007-0.010)	0.009 (0.007-0.011)	0.010 (0.007-0.012)	0.010 (0.007-0.013)	0.011 (0.008-0.015)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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**PF graphical**

Site-specific conditions may vary from the representative values presented in this chapter. The engineer is responsible for assuring that the selected imperviousness values represent the imperviousness of the catchment or the proposed development. During master planning or in early stages of design, select imperviousness values that are unlikely to be exceeded as final design plans are developed to avoid the need to increase the size of infrastructure during later design stages.

TABLE 6-2. RECOMMENDED IMPERVIOUSNESS BY LAND USE

LAND USE/DENSITY	IMPERVIOUSNESS
<b>Residential</b>	
Single-family Housing (SFH) – Rural (0 – 3 du/ac)	35%
SFH – Low & Medium-density (3 – 5 du/ac)	55%
SFH – High-density (5 - 20 du/ac)	65%
Manufactured Housing ( $\geq 10$ du/ac)	65%
Multi-family Housing (MFH) – Medium-density (5 – 20 du/ac)	65%
MFH – High-density MFH ( $>20$ du/ac)	70%
<b>Commercial</b>	
Commercial – Low-density	65%
Commercial – Medium- to High-density	80%
Commercial – Urban Core	90%
<b>Industrial/Institutional</b>	
Schools	55%
Office/institutional	65%
Industrial Areas	75%
Solar Fields, Gravel Cover <sup>1,2</sup>	60%
Solar Fields, Grass Cover <sup>1,2</sup>	45%
<b>Parks and Open Space</b>	
Open Space, Undisturbed Native Grasses	5%
Community Parks	25%
Neighborhood Parks	15%
Golf Courses	30%
Cemeteries	25%

Note: Recommended imperviousness values shown in the table are the minimum imperviousness values for a specific land use. It is the engineer's responsibility to select imperviousness values that appropriately reflect the actual density of the proposed development.

<sup>1</sup> Use these values at the master planning scale or when the specific layout of panels is not known. Use values from the surface type (Table 6-3) at the site planning and design stage when panel width, panel spacing, and panel orientation relative to contours are known.

<sup>2</sup> Assumes 1:1 ratio of panels to aisles. See MHFD's technical memorandum regarding *Determination of Solar Panel Field Runoff Coefficients and Imperviousness Values* for additional information on procedures to reflect other impervious areas such as roads and pads that may be part of a solar field and layouts with wider inter-panel spacing.

# INLET MANAGEMENT

Worksheet Protected

<b>INLET NAME</b>	<a href="#">D1 Inlet</a>	<a href="#">D2 Inlet</a>
Site Type (Urban or Rural)		
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening

## USER-DEFINED INPUT

**User-Defined Design Flows**

Minor $Q_{known}$ (cfs)	0.9	0.3
Major $Q_{known}$ (cfs)	2.3	0.8

**Bypass (Carry-Over) Flow from Upstream** Inlets must be organized from upstream (left) to downstream (right) in order for bypass

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0
Major Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0

**Watershed Characteristics**

Subcatchment Area (acres)		
Percent Impervious		
NRCS Soil Type		

**Watershed Profile**

Overland Slope (ft/ft)		
Overland Length (ft)		
Channel Slope (ft/ft)		
Channel Length (ft)		

**Minor Storm Rainfall Input**

Design Storm Return Period, $T_r$ (years)		
One-Hour Precipitation, $P_1$ (inches)		

**Major Storm Rainfall Input**

Design Storm Return Period, $T_r$ (years)		
One-Hour Precipitation, $P_1$ (inches)		

## CALCULATED OUTPUT

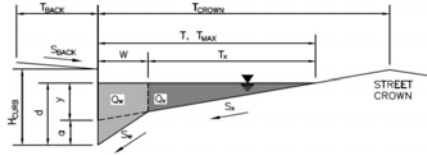
<b>Minor Total Design Peak Flow, Q (cfs)</b>	<b>0.9</b>	<b>0.3</b>
<b>Major Total Design Peak Flow, Q (cfs)</b>	<b>2.3</b>	<b>0.8</b>
Minor Flow Bypassed Downstream, $Q_b$ (cfs)	N/A	N/A
Major Flow Bypassed Downstream, $Q_b$ (cfs)	N/A	N/A

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

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

Project:

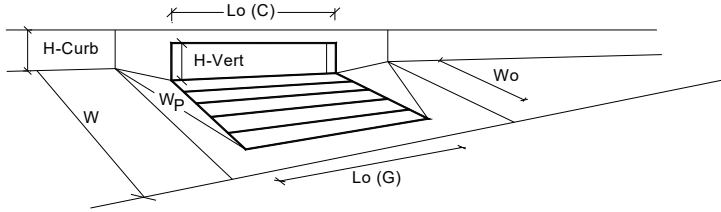
Inlet ID: **D1 Inlet**



Gutter Geometry:							
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 0.0$ ft						
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	$S_{BACK} =$ ft/ft						
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	$n_{BACK} = 0.012$						
Height of Curb at Gutter Flow Line	$H_{CURB} = 6.00$ inches						
Distance from Curb Face to Street Crown	$T_{CROWN} = 25.0$ ft						
Gutter Width	$W = 0.00$ ft						
Street Transverse Slope	$S_x = 0.040$ 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	$S_D = 0.000$ 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" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Minor Storm</th> <th style="padding: 2px;">Major Storm</th> <th style="padding: 2px;">ft</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 2px;">6.0</td> <td style="text-align: center; padding: 2px;">7.0</td> <td></td> </tr> </tbody> </table>	Minor Storm	Major Storm	ft	6.0	7.0	
Minor Storm	Major Storm	ft					
6.0	7.0						
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Minor Storm</th> <th style="padding: 2px;">Major Storm</th> <th style="padding: 2px;">inches</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 2px;">6.0</td> <td style="text-align: center; padding: 2px;">6.0</td> <td></td> </tr> </tbody> </table>	Minor Storm	Major Storm	inches	6.0	6.0	
Minor Storm	Major Storm	inches					
6.0	6.0						
Check boxes are not applicable in SUMP conditions	<input type="checkbox"/> <input type="checkbox"/>						
MINOR STORM Allowable Capacity is not applicable to Sump Condition							
MAJOR STORM Allowable Capacity is not applicable to Sump Condition							
$Q_{allow} =$	<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Minor Storm</th> <th style="padding: 2px;">Major Storm</th> <th style="padding: 2px;">cfs</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 2px;"><b>SUMP</b></td> <td style="text-align: center; padding: 2px;"><b>SUMP</b></td> <td></td> </tr> </tbody> </table>	Minor Storm	Major Storm	cfs	<b>SUMP</b>	<b>SUMP</b>	
Minor Storm	Major Storm	cfs					
<b>SUMP</b>	<b>SUMP</b>						

# INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



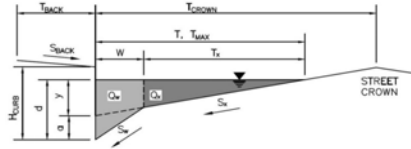
		MINOR	MAJOR	
CDOT Type R Curb Opening				
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	$a_{local}$ =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	2.9	3.4	Override Depths
<b>Grate Information</b>				
Length of a Unit Grate	$L_o (G)$ =	N/A	N/A	feet
Width of a Unit Grate	$W_o$ =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	$A_{ratio}$ =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	$C_f (G)$ =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	$C_w (G)$ =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	$C_o (G)$ =	N/A	N/A	
<b>Curb Opening Information</b>				
Length of a Unit Curb Opening	$L_o (C)$ =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	$H_{vert}$ =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	$H_{throat}$ =	6.00	6.00	inches
Angle of Throat	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	$W_p$ =	0.00	0.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	$C_f (C)$ =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	$C_w (C)$ =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	$C_o (C)$ =	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>				
Depth for Grate Midwidth	$d_{Grate}$ =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	$d_{Curb}$ =	0.24	0.28	ft
Grated Inlet Performance Reduction Factor for Long Inlets	$RF_{Grate}$ =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	$RF_{Curb}$ =	0.92	0.97	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>				
	$Q_a$ =	1.8	2.3	cfs
	$Q_{PEAK REQUIRED}$ =	0.9	2.3	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:**  
**Inlet ID:** D2 Inlet



**Gutter Geometry:**

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)

$T_{BACK} =$   ft  
 $S_{BACK} =$   ft/ft  
 $n_{BACK} =$

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)

$H_{CURB} =$   inches  
 $T_{CROWN} =$   ft  
 $W =$   ft  
 $S_x =$   ft/ft  
 $S_w =$   ft/ft  
 $S_o =$   ft/ft  
 $n_{STREET} =$

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Check boxes are not applicable in SUMP conditions

	Minor Storm	Major Storm	
$T_{MAX} =$	<input type="text" value="6.0"/>	<input type="text" value="6.0"/>	ft
$d_{MAX} =$	<input type="text" value="6.0"/>	<input type="text" value="6.0"/>	inches
	<input type="checkbox"/>	<input type="checkbox"/>	

MINOR STORM Allowable Capacity is not applicable to Sump Condition  
 MAJOR STORM Allowable Capacity is not applicable to Sump Condition

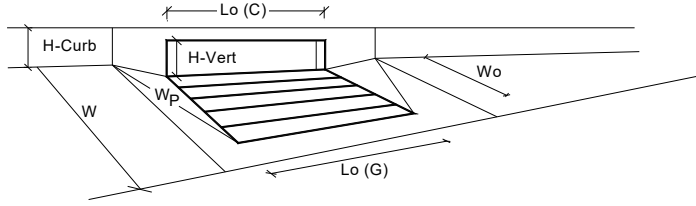
$Q_{allow} =$ 

Minor Storm	Major Storm
<input type="text" value="SUMP"/>	<input type="text" value="SUMP"/>

 cfs

# INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



			MINOR	MAJOR	
<div style="border: 1px solid black; display: inline-block; padding: 2px;">                     CDOT Type R Curb Opening                 </div>					
<b>Design Information (Input)</b>	Type =		CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	$a_{local}$ =	3.00	3.00		inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1		
Water Depth at Flowline (outside of local depression)	Ponding Depth =	2.2	2.2		<input type="checkbox"/> Override Depths
<b>Grate Information</b>			MINOR	MAJOR	
Length of a Unit Grate	$L_o (G)$ =	N/A	N/A		feet
Width of a Unit Grate	$W_o$ =	N/A	N/A		feet
Open Area Ratio for a Grate (typical values 0.15-0.90)	$A_{ratio}$ =	N/A	N/A		
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	$C_f (G)$ =	N/A	N/A		
Grate Weir Coefficient (typical value 2.15 - 3.60)	$C_w (G)$ =	N/A	N/A		
Grate Orifice Coefficient (typical value 0.60 - 0.80)	$C_o (G)$ =	N/A	N/A		
<b>Curb Opening Information</b>			MINOR	MAJOR	
Length of a Unit Curb Opening	$L_o (C)$ =	5.00	5.00		feet
Height of Vertical Curb Opening in Inches	$H_{vert}$ =	6.00	6.00		inches
Height of Curb Orifice Throat in Inches	$H_{throat}$ =	6.00	6.00		inches
Angle of Throat	Theta =	63.40	63.40		degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	$W_p$ =	0.00	0.00		feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	$C_f (C)$ =	0.10	0.10		
Curb Opening Weir Coefficient (typical value 2.3-3.7)	$C_w (C)$ =	3.60	3.60		
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	$C_o (C)$ =	0.67	0.67		
<b>Low Head Performance Reduction (Calculated)</b>			MINOR	MAJOR	
Depth for Grate Midwidth	$d_{grate}$ =	N/A	N/A		ft
Depth for Curb Opening Weir Equation	$d_{curb}$ =	0.18	0.18		ft
Grated Inlet Performance Reduction Factor for Long Inlets	$RF_{grate}$ =	N/A	N/A		
Curb Opening Performance Reduction Factor for Long Inlets	$RF_{curb}$ =	0.82	0.82		
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{combination}$ =	N/A	N/A		
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>			MINOR	MAJOR	
<b>Inlet Capacity IS GOOD for Minor and Major Storms (&gt;0 Peak)</b>	$Q_a$ =	1.0	1.0		cfs
	$Q_{PEAK REQUIRED}$ =	0.3	0.8		cfs





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## APPENDIX A – APPROVED PLANS

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# LOT 4A, PARKER POINT SUBDIVISION FILING NO. 1, AMENDMENT NO. 1

## SITE PLAN FOR



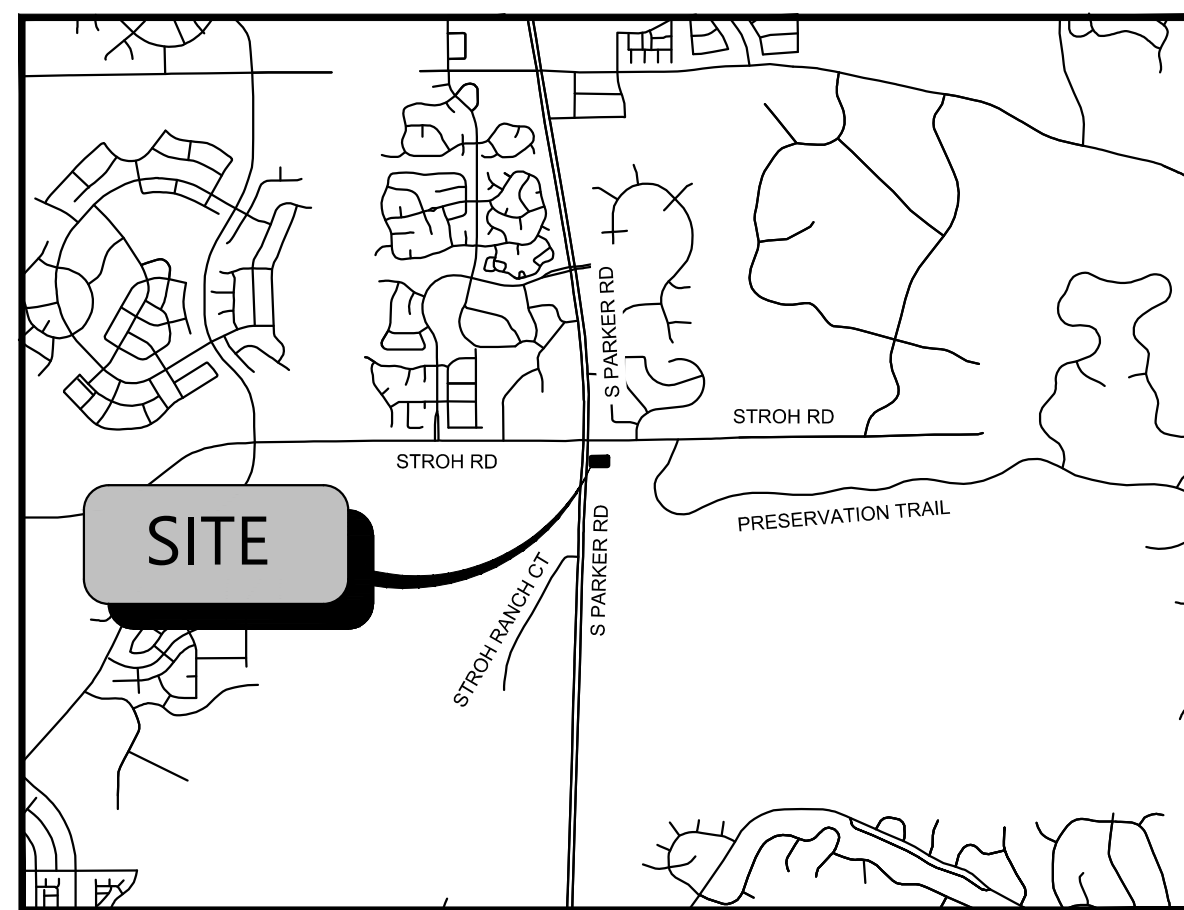
LOCATED AT S. PARKER RD & STROH RD  
CITY OF PARKER, DOUGLAS COUNTY, STATE OF COLORADO  
TOTAL SITE ACREAGE: 0.60 AC

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

THE TYPE, SIZE, LOCATION, AND NUMBER OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ON THE SITE, AND OFFSITE IN WORK AREAS. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY CONTRACTOR PRIOR TO DATE OF CONSTRUCTION. FOR INFORMATION CONTACT: UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) - 1-800-922-1987. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY SIZE AND HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING IMPROVEMENTS AND UTILITIES AND SHALL REPAIR ANY DAMAGE AT HIS EXPENSE.

<b>SITE AREA</b>	
TOTAL PROPERTY AREA:	0.60 AC. / 25,933 SF.
DISTURBED AREA:	0.67 AC. / 29,406 SF.
IMPERVIOUS AREA:	0.40 AC. / 17,639 SF.
LANDSCAPED AREA:	0.19 AC. / 8,294 SF.
<b>ZONING CLASSIFICATION</b>	
JURISDICTION:	CITY OF PARKER
ZONING:	MIXED-USE COMMUNITY
ADJACENT ZONING:	PLANNED DEVELOPMENT
PROPOSED USE:	COMMERCIAL RESTAURANT WITH DRIVE THRU
<b>BUILDING SETBACKS</b>	
MIN BUILDING SETBACK:	25'
MAX BUILDING SETBACK:	0'
SIDE BUILDING SETBACK:	5' MIN.
REAR BUILDING SETBACK:	10' MIN. ADJACENT TO STREET
REAR BUILDING SETBACK:	5' MIN. WITH ALLEY
REAR BUILDING SETBACK:	8' MIN. WITHOUT ALLEY
<b>BUILDING SUMMARY</b>	
PROPOSED BUILDING AREA:	1,495 SF
BUILDING HEIGHT LIMIT:	45'
PROPOSED NUMBER OF BUILDINGS:	1
<b>PARKING SUMMARY</b>	
PARKING REQUIREMENTS:	1 SPACE PER EACH 4 PERSONS OF RATED CAPACITY (EXCLUDING OUTDOOR SEATING)
TOTAL PARKING REQUIRED:	6 SPACES
PARKING PROVIDED:	12 SPACES (INCLUDING 1 ADA SPACE AND 10 STACKING SPACES)
BIKE SPACES REQUIREMENTS:	4 SPACES
TOTAL BIKE PARKING PROVIDED:	4 SPACES



VICINITY MAP  
N.T.S.



FEMA MAP  
N.T.S.

NOTE: BASED ON GRAPHIC DETERMINATION, THIS PROPERTY DOES NOT LIE IN A F.E.M.A./F.I.R.M SPECIAL FLOOD HAZARD AREA PER COMMUNITY PANEL NO. 08035C0182G DATED MARCH, 16 2016.



AERIAL MAP  
N.T.S.

TOWN OF PARKER PLAN SET	
Sheet Number	Sheet Title
C0.00	COVER SHEET
C1.20	GENERAL NOTES
C2.00	SITE PLAN
SF-9	BICYCLE RACK
L1.01	LANDSCAPE PLAN
L1.02	LANDSCAPE SPECIFICATION AND NOTES
L1.03	LANDSCAPE DETAILS
L2.01	IRRIGATION PLAN
L2.02	IRRIGATION SPECIFICATIONS AND DETAILS
P1	PHOTOMETRIC PLAN
P2	PHOTOMETRIC PLAN
P3	PHOTOMETRIC PLAN
A1.0	DUMPSTER ENCLOSURE PLAN AND ELEVATIONS
A6.0	EXTERIOR ELEVATION (B&W)
A6.0	EXTERIOR ELEVATION (COLOR)
A6.1	EXTERIOR ELEVATION (B&W)
A6.1	EXTERIOR ELEVATION (COLOR)

**BLACK ROCK COFFEE BAR**  
TOTAL SITE AREA: 0.60 AC. / 25,933 SF.  
DISTURBED AREA: 0.67 AC. / 29,406 SF.  
ZONING: MIXED-USE COMMUNITY (MC)

### DEVELOPMENT TEAM

<b>OWNER</b> DOUBLETREE VENTURES, LLC P.O. BOX 40326 DENVER, CO 80204 CONTACT: BRIAN ZUREK EMAIL: BRIAN@DOUBLETREEVENTURES.COM	<b>CIVIL ENGINEER</b> ATWELL, LLC 9001 AIRPORT FREEWAY, SUITE 660 NORTH RICHLAND HILLS, TX 76180 PHONE: (###) ###-#### CONTACT: NICHOLAS SALAZAR EMAIL: NSALAZAR@ATWELL.COM	<b>SURVEYOR</b> BARRON LAND 2790 N. ACADEMY BLVD., SUITE 311 COLORADO SPRINGS, CO 80917 PHONE: (719) 360-6827 CONTACT: SPENCER BARRON	<b>DEVELOPER</b> BLACK ROCK COFFEE BAR 16307 NE CAMERON BLVD PORTLAND, OR 97230 PHONE: (541) 531-2149 CONTACT: TONY POLLOTTA
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### GOVERNING AGENCIES AND UTILITY CONTACTS

<b>WATER &amp; WASTEWATER</b> PARKER WATER AND SANITATION DISTRICT 13939 ANCESTRY DRIVE PARKER, CO 80134 PHONE: (303) 841-4627 EMAIL: RRAMSEY@PWSD.ORG CONTACT: ROBERT RAMSEY	<b>FIRE PROTECTION</b> TOWN OF PARKER FIRE AND LIFE SAFETY 20120 E. MAINSTREET PARKER, CO 80138 PHONE: (303) 805-3169 CONTACT: RANDY CAPRA EMAIL: RCAPRA@PARKERONLINE.ORG	<b>GAS PROVIDER</b> XCEL ENERGY 1123 WEST 3RD AVE. DENVER, CO 80223 PHONE: (303) 571-3927 CONTACT: BUILDER'S CALL LINE (800) 628-1212 X3
<b>ENGINEERING DEPARTMENT</b> TOWN OF PARKER ENGINEERING & PUBLIC WORKS 20120 E. MAINSTREET PARKER, CO 80134 PHONE: (303) 840-9546 EMAIL: CKUDLAUSKAS@PARKERCO.GOV CONTACT: CHARLES KUDLAUSKAS	<b>BUILDING PERMIT</b> TOWN OR PARKING BUILDING DIVISION 20120 E. MAINSTREET PARKER, CO 80138 PHONE: (303) 841-1970 CONTACT: RANDY SALE EMAIL: RSALE@PARKERONLINE.ORG	<b>PHONE PROVIDER</b> CENTURYLINK 9750 EAST COSTILLA AVE. ENGLEWOOD, CO 80112 PHONE: (720) 578-5142
	<b>ELECTRIC PROVIDER</b> CORE ELECTRIC COOPERATIVE 5496 NORTH U.S. HIGHWAY 85 SEDALIA, CO 80135 PHONE: (303) 332-9540 CONTACT: BRUFF SHEA	

### PROJECT NARRATIVE

BLACK ROCK COFFEE BAR IS OWNED BY BLACK ROCK DEVELOPMENT COMPANY, LLC. THEY ARE A PREMIUM CRAFT COFFEE SHOP WITH MULTIPLE LOCATIONS ACROSS THE COUNTRY. THEY CONSIDER THEMSELVES A "PART OF LOCAL COMMUNITIES, EACH BLACK ROCK COFFEE BAR TEAM FINDS WAYS TO SERVE THEIR NEIGHBORHOODS, AND BY DOING SO WE HELP RAISE THE BAR FOR RELATIONSHIP AND COMPASSION." THEIR PROTOTYPE BUILDING IS ROUGHLY 600-700 SQUARE FEET IN SIZE, WITH STATE-OF-THE-ART DESIGN AND IDENTIFIABLE BRANDING ELEMENTS. THEY OFFER PATIO AND INDOOR SEATING WITH THE OPTION OF DRIVE-THRU AVAILABILITY.

A BUILDING WITH THE STANDARD DUAL-LANE ORDERING SINGLE LANE PICKUP IS BEING PROPOSED FOR THIS LOCATION. THIS PROJECT WOULD UTILIZE A PROPOSED ACCESS POINT TO DECLAN DRIVE.

### LEGAL DESCRIPTION

LOT 4A, PARKER POINT SUBDIVISION FILING NO. 1, AMENDMENT NO. 1 ACCORDING TO THE PLAT AS RECORDED JULY 31, 2024 AT RECEPTION NO. 2024031650, COUNTY OF DOUGLAS, STATE OF COLORADO

ADDRESS OF RECORD:  
6940 STROH ROAD, PARKER, CO

### BENCHMARK

ELEVATIONS ARE BASED UPON DOUGLAS COUNTY GIS SECONDARY CONTROL MONUMENT "1.060032" (ELEVATION - 5903.17 NAVD88)

### BASIS OF BEARINGS

BEARINGS ARE BASED UPON THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 3, T7S, R66W OF THE 6TH PRINCIPAL MERIDIAN, MONUMENTED ON THE EAST WITH A #6 REBAR WITH 2" ALUMINUM CAP IN MONUMENT BOX STAMPED "PLS 22561" AND ON THE WEST WITH A #6 REBAR WITH A 3.25" ALUMINUM CAP IN MONUMENT BOX STAMPED "PLS 29761", AND IS ASSUMED TO BEAR S 89°59'29" W, A FIELD MEASURED DISTANCE OF 2648.43 FEET.



**Know what's Below. Call before you dig.**  
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR HIS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

**NOTICE:**  
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE HELD TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK OR PERSONS ENGAGED IN THE WORK OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.  
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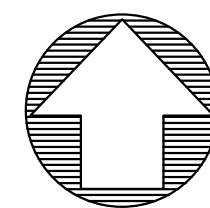
LOT 4A, PARKER POINT SUBD. FILING NO. 1, AMEND. NO. 1  
S. PARKER RD & STROH RD  
PARKER  
DOUGLAS COUNTY, COLORADO

BLACK ROCK COFFEE BAR  
13135 DECLAN DRIVE  
BLACK ROCK COFFEE BAR  
COVER SHEET

DATE 2025-06-04

REVISIONS

DRAWN BY: K. SARWAR  
CHECKED BY: N. SALAZAR  
PROJECT MANAGER: N. SALAZAR  
JOB #: 24003198  
FILE CODE: ##  
SHEET NO. C0.00



**Know what's below. Call before you dig.**  
 THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER AND HAVE NOT BEEN REPRESENTATIVE. THE CONTRACTOR SHALL INDEPENDENTLY VERIFY THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY BE OCCURRED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

**NOTICE:**  
 CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE HELD RESPONSIBLE FOR ANY ACCIDENTS OR INJURIES TO PERSONS OR PROPERTY THAT MAY OCCUR AS A RESULT OF THE WORK OF ANY MEMBER STRUCTURE, OR OF ANY OTHER PERSONS.

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**ATWELL**  
 866.850.4200 [www.atwell-group.com](http://www.atwell-group.com)  
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 NORTH RICHLAND HILLS, TX 76180  
 972.326.9560

LOT 4A, PARKER POINT SUBD. FILING NO. 1, AMEND. NO. 1

BLACK ROCK COFFEE BAR

DATE

REVISIONS

DRAWN BY: K. SARWAR

CHECKED BY: N. SALAZAR

PROJECT MANAGER: N. SALAZAR

JOB #: 24003198

FILE CODE: ##

SHEET NO.

C2.00

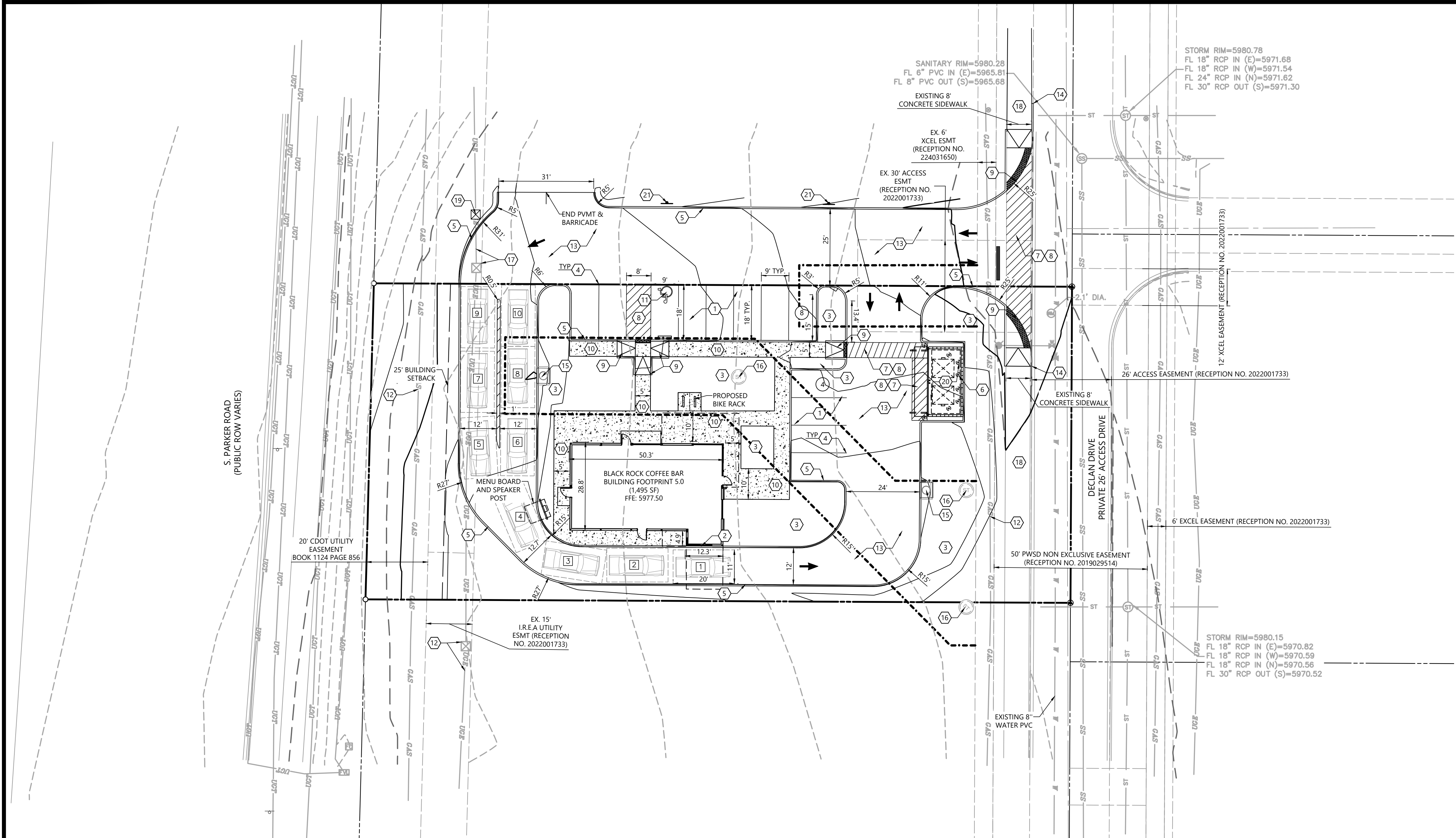
**SITE LEGEND**

- EXISTING PROPERTY LINE
- EXISTING ROAD CENTERLINE
- EXISTING EASEMENT LINE
- 6" CURB
- ♿ HANDICAP STALL
- ⊠ A.D.A. STD HANDICAP RAMP
- ⊡ PARKING SPACE COUNT
- ⊞ # OF STACKING
- ▭ VEHICLE STACKING SPACE
- ⊞ SIGN

**CORRESPONDING DETAIL NUMBER (SEE DETAIL SHEETS)**

**NOTE NUMBER**

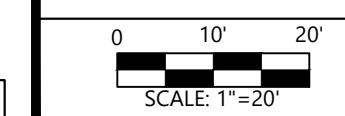
1	INSTALL 2" AC PAVEMENT OVER 10" AGGREGATE BASE (PER GEOTECH REPORT)	C700
2	PROPOSED PICK-UP WINDOW WITH COUNTER	SEE ARCHITECTURAL PLANS FOR DETAILS
3	PROPOSED LANDSCAPE	SEE LANDSCAPE PLANS FOR DETAILS
4	4" WIDE PAINTED WHITE TRAFFIC STRIPE (SEE LENGTH THIS SHEET)	-
5	CONSTRUCT 6" SINGLE CURB	-
6	DUMPSTER ENCLOSURE	-
7	INSTALL ADA CROSSWALK	-
8	4" WIDE PAINTED STRIPE @ 2' O.C. AND 45 DEGREES	-
9	CONSTRUCT DIRECTIONAL CURB RAMP PER PARKER STANDARD DETAIL #18.	C700
10	CONSTRUCT SIDEWALK PER PARKER STANDARD DETAIL #4	C700
11	ADA PARKING STALL WITH ADA SYMBOL AND REQUIRED PAINT.	-
12	PROTECT EXISTING UTILITIES IN PLACE.	-
13	INSTALL 3 1/2" AC OVER 10" AGGREGATE BASE (PER GEOTECH REPORT)	C700
14	MATCH EXISTING ASPHALT ALONG DECLAN DRIVE PER PARKER STANDARD DETAIL #26	C700
15	INSTALL 5" CURB INLET	C700
16	PROPOSED STORM MANHOLE	C700
17	EXISTING UTILITIES TO BE RELOCATED	-
18	EXISTING 8" CONCRETE SIDEWALK	-
19	RELOCATED TRANSFORMER	-
20	7" PORTLAND CEMENT CONCRETE OVER 8" AGGREGATE BASE (PER GEOTECH REPORT)	C700
21	PROPOSED SIGN "NO PARKING - FIRE LANE"	-



**SITE GENERAL NOTES:**

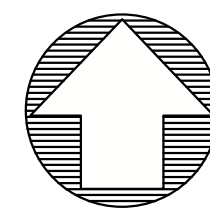
1. DIMENSIONS SHOWN ARE TO THE FACE OF CURB, UNLESS OTHERWISE INDICATED.
2. USE 3' RADIUS, UNLESS SHOWN OTHERWISE.
3. THE INFORMATION PERTAINING TO EXISTING CONDITIONS WAS TAKEN FROM A SURVEY PROVIDED BY: BARRON LAND. THE LOCATION OF ALL EXISTING UTILITIES WERE OBTAINED FROM AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY EXACT LOCATION AND DEPTH OF UTILITY PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
4. ALL ACCESSIBLE PARKING SPACES AND TRAVEL ROUTES SHALL BE CONSTRUCTED IN ACCORDANCE WITH A.D.A. AND/OR STATE REQUIREMENTS.
5. ANY DISCREPANCIES IN THIS PLAN AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER AND ENGINEER PRIOR TO THE START OF CONSTRUCTION.
6. PRIOR TO STARTING CONSTRUCTION, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION SHALL BEGIN UNTIL ALL PERMITS HAVE BEEN RECEIVED.
7. CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKERS AND PUBLIC SHALL BE PROTECTED FROM INJURY, AND ADJOINING PROPERTY PROTECTED FROM DAMAGE. CONTRACTOR SHALL REPAIR ANY DAMAGE DONE TO PRIVATE OR PUBLIC PROPERTY.
8. ACCESS TO UTILITIES, FIRE HYDRANTS, ETC. SHALL REMAIN UNDISTURBED AT ALL TIMES, UNLESS COORDINATED OTHERWISE.
9. THE GENERAL CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE UPON COMPLETION OF THE PROJECT.
10. ALL SUBGRADE PREPARATION, PAVING, AND UTILITY TRENCHING MUST BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SOILS INVESTIGATION. IF THERE IS A CONFLICT BETWEEN THE SOILS REPORT AND THE PLANS, THE MORE PROHIBITIVE OF THE TWO SHALL TAKE PRECEDENCE.
11. CONTRACTOR TO ENSURE COMPLIANCE WITH ANY AND ALL LAND DISTURBANCE NOTIFICATIONS REQUIREMENTS, AND THAT ALL REQUIRED EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
12. FOR WORK IN, OR ADJACENT TO, STREET RIGHT OF WAYS, CONTRACTOR SHALL ENSURE APPROPRIATE PERMITS ARE OBTAINED PRIOR TO CONSTRUCTION. CONTRACTOR TO ERECT AND MAINTAIN TRAFFIC CONTROL SIGNS AND DEVICES IN CONFORMANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
13. ALL PARKING LOT LIGHTING MUST BE INSTALLED AND OPERATE SO AS NOT TO PRODUCE GLARE OR CAST DIRECT ILLUMINATION ACROSS THE BOUNDING PROPERTY LINE. LOW PRESSURE SODIUM LIGHTING IS PROHIBITED. ALL LIGHTING FIXTURES MUST BE RESTRICTED TO DOWN-LIGHT OR CUT-OFF TYPES.

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



SCALE: 1"=20'

CAD FILE: 24003198 - C200 SITE PLAN



**Know what's below. Call before you dig.**  
 THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY AND HAVE NOT BEEN REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY BE OCCURRED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

**NOTICE:**  
 CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE HELD RESPONSIBLE FOR ANY INJURY OR DAMAGE TO PERSONS OR PROPERTY ARISING FROM THE WORK OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.  
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LOT 4A PARKER POINT SUBD. FILING NO. 1, AMEND. NO. 1  
 S. PARKER RD & STROH RD  
 PARKER  
 DOUGLAS COUNTY, COLORADO

BLACK ROCK COFFEE BAR  
 13135 DECLAN DRIVE  
 BLACK ROCK COFFEE BAR  
 GRADING PLAN

DATE 2025-06-04

REVISIONS

SCALE: 1"=20'

DRAWN BY: K. SARWAR  
 CHECKED BY: N. SALAZAR  
 PROJECT MANAGER: N. SALAZAR  
 JOB #: 24003198  
 FILE CODE: ##  
 SHEET NO. C3.00

**GRADING LEGEND**

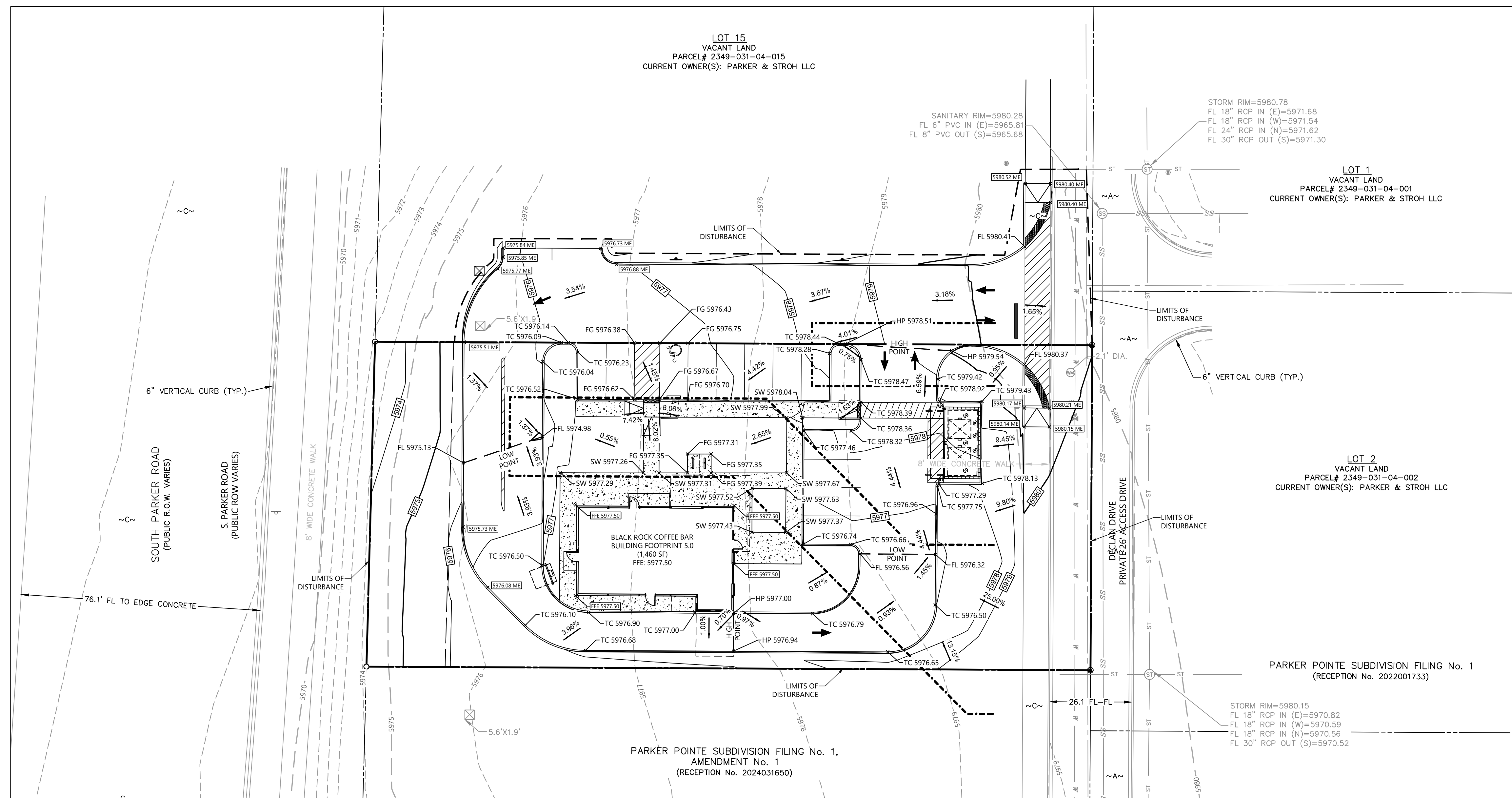
- EXISTING PROPERTY LINE
- EXISTING ROAD CENTERLINE
- PROPOSED SETBACK LINE
- 119 --- EXISTING MINOR CONTOURS
- 120 --- EXISTING MAJOR CONTOURS
- 119 --- PROPOSED MINOR CONTOUR
- 120 --- PROPOSED MAJOR CONTOUR
- ST --- EXISTING STORM LINE
- W --- EXISTING WATER LINE
- SS --- EXISTING SANITARY SEWER LINE
- ME 123.45 PROPOSED (PR) SPOT ELEV
- ME 123.45 PR. SPOT ELEV - MATCH EX. GRADE
- TC 123.45 PR. SPOT ELEV - TOP OF CURB  
 GUTTER/BOTTOM OF CURB = TC - 0.5'
- SW 123.45 PR. SPOT ELEV - SIDEWALK
- FL 123.45 PR. SPOT ELEV - FLOWLINE
- ME 123.45 FINISHED FLOOR ELEVATION
- HP 123.45 PR. SPOT ELEV - HIGH POINT
- 2% PROPOSED SLOPE ARROW
- ST EXISTING STORM MANHOLE
- SS EXISTING SANITARY SEWER MANHOLE
- WM EXISTING WATER METER
- WV EXISTING WATER VALVE
- WHD EXISTING FIRE HYDRANT

**EARTHWORK QUANTITIES**

CUT	585
FILL	89
BALANCE (IMPORT)	495

**ABBREVIATION LIST**

- EG EXISTING GRADE
- TC TOP OF CURB
- FL FLOW LINE
- SW SIDEWALK
- ME MATCH EXISTING
- FG FINISH GRADE
- FFE FINISH FLOOR ELEVATION
- HP HIGH POINT

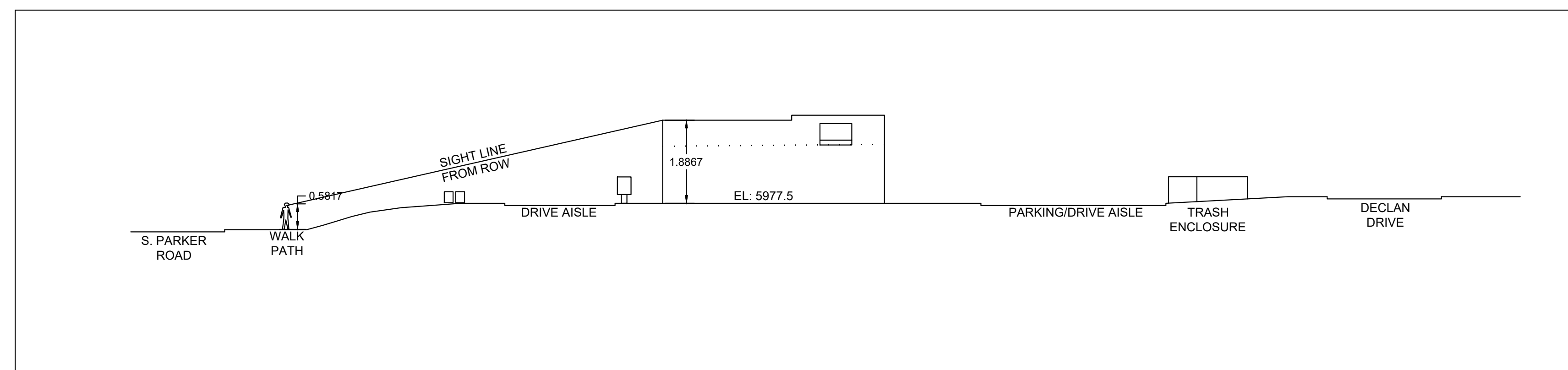


**GRADING NOTES:**

- GRADES SHOWN ARE PROPOSED FINISHED GRADES.
- ALL PROPOSED GRADES AND SPOT ELEVATIONS INDICATE TOP OF PAVEMENT OR FACE/FLOWLINE OF CURB UNLESS OTHERWISE NOTED.
- THE INFORMATION PERTAINING TO EXISTING CONDITIONS WAS TAKEN FROM A SURVEY PROVIDED BY BARRON LAND.
- THE LOCATION OF ALL EXISTING UTILITIES WERE OBTAINED FROM AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY EXACT LOCATION AND DEPTH OF UTILITY PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- ANY DISCREPANCIES IN THIS PLAN AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER AND ENGINEER PRIOR TO THE START OF CONSTRUCTION.
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- THE GENERAL CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE UPON COMPLETION OF THE PROJECT.
- ALL SUBGRADE PREPARATION, PAVING, AND UTILITY TRENCHING MUST BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SOILS INVESTIGATION. IF THERE IS A CONFLICT BETWEEN THE SOILS REPORT AND THE PLANS, THE MORE PROHIBITIVE OF THE TWO SHALL TAKE PRECEDENCE.
- CONTRACTOR TO ENSURE COMPLIANCE WITH ANY AND ALL LAND DISTURBANCE NOTIFICATIONS REQUIREMENTS, AND THAT ALL REQUIRED EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE STATE, LOCAL, OR FEDERAL REQUIREMENTS.
- REMOVE EXISTING TOPSOIL IN ACCORDANCE WITH THE GEOTECHNICAL REPORT, PRIOR TO PLACEMENT OF ANY FILL MATERIAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY STANDARDS, NEVADA STATE LAW, AND O.S.H.A. STANDARDS FOR ALL EXCAVATION IN EXCESS OF FIVE FEET IN DEPTH.
- DRAINAGE SHOULD BE MAINTAINED AWAY FROM THE FOUNDATIONS, BOTH DURING AND AFTER CONSTRUCTION.

**BENCHMARK**

ELEVATIONS ARE BASED UPON DOUGLAS COUNTY GIS SECONDARY CONTROL MONUMENT "1.060032" (ELEVATION - 5903.17 NAD08)



**SITE SECTION**

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

CAUTION: NOTICE TO CONTRACTOR THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE LOCAL UTILITY LOCATION CENTER AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

CAD FILE: 24003198 - C30 GRADING PLAN

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## APPENDIX B – PREVIOUS STUDIES

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**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

**PREPARED FOR:  
PARKER & STROH, LLC  
975 LINCOLN STREET, SUITE 204  
DENVER, CO 80203**

**CONTACT: DAN YACOVETTA  
303-699-3368**



**6901 SOUTH PIERCE STREET, SUITE 315  
LITTLETON, CO 80128  
CONTACT: JERRY DAVIDSON, P.E.  
(303) 232-5255**

**JOB #2015-015**

**NOVEMBER 28, 2018**

**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

**I. CERTIFICATION PAGE**

This report for the final design of (Name of Development) was prepared by me or under my direct supervision in accordance with the provisions of the Town of Parker Storm Drainage and Environmental Criteria Manual. I understand that the Town of Parker and its designated town authority do not and will not assume liability for drainage facilities designed by others.

\_\_\_\_\_  
Jerry W. Davidson, P.E.  
Colorado P.E. License No. 30226  
For and on Behalf of  
Perception Design Group, Inc.



\_\_\_\_\_  
Seal and Date

**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

## **II GENERAL LOCATION AND DESCRIPTION**

### A. Site Location:

This Final Drainage Report is prepared by Perception Design Group, Inc. as part of the Construction Plan / Final Plat submittal process for the Parker Pointe project proposed in Parker, Colorado. Parker Pointe, (Project / Site) is located on an unplatted parcel of land situated at the southeast corner of South Parker Road and Stroh Road. See appendix for vicinity map. The Site lies within the southwest quarter of Section 3, Township 7 South, Range 66 West of the 6th Prime Meridian, Douglas County, State of Colorado. The site is bounded by South Parker Road to the west, and Stroh Road to the north. Adjacent developments include the Colorado Golf club in Douglas County to the east, new commercial and residential development in the Town of Parker on the north side of Stroh Road, Commercial development in Parker on the west side of Parker Road, and undeveloped open space in Douglas County south of the property.

### B. Site Location:

The Site occupies approximately 14.7 acres. Ground cover consists of pasture grasses. Site topography generally slopes from a tall mound in the northerly portion of the site down to the southwest towards Kinney Creek. Runoff north of the mound flows northwesterly towards the intersection of Stroh Road and Parker Road. Slopes vary widely from 3:1 on the mound to 6% over flatter portions of the site.

Site soils as shown by the USDA Web Soil Survey indicate that primarily Sampson Loam and Bresser Truckton Sandy Loam soil is present. This soil is sandy clay loam in nature. It is a type B hydrologic soil. Additionally Loamy Alluvial Land soils are present to a lesser extent. This soil is also clay loam in nature. It is a type C hydrologic soil.

The site falls within the Cherry Creek basin. The Kinney Creek tributary lies along the southern border of the site. This tributary has a delineated floodplain which encroaches on the extreme southwest corner of the site.

There are no irrigation canals or ditches on site. Additionally, there are no significant geologic features on site.

The site is presently partially developed with a house and barns. These structures are to be removed as a part of the proposed development. As a part of this application, the site will be developed with graded pad sites for commercial and retail businesses, drives, and utilities.

**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

### **III DRAINAGE BASINS AND SUB-BASINS**

#### A. Major Drainage Basins:

The site falls within two major drainage basins. The southerly portion of the site is tributary to Kinney Creek. Areas from the peak of the aforementioned mound and to the north are tributary to Stroh Gulch. The southerly line of basin H1 defines the historic break between the two basins. Per the Town of Parker, the majority of this runoff to Stroh Gulch is captured and conveyed via storm sewer to the new detention pond and ultimately to Kinney Creek. A final drainage report was prepared for Stroh Crossing Filing No. 1 by Calibre Engineering. This is the development on the north side of Stroh Road. This report anticipated runoff from the Parker Pointe property and made allowance to handle the flow. Basin ST-2b from the Calibre report quantifies 18.9 cfs for the basin. Basin SR2 in this report indicates 4.1 cfs tributary to Stroh Road downstream of the newly placed inlet on Stroh Road for Basin SR1 plus carryover from Inlet SR1 of 3.2 cfs for a total tributary to Stroh Gulch of 7.3 cfs.

Kinney Creek was studied by WRC Engineering Inc. in a report entitled “Flood Hazard Area Delineation for Kinney Creek Fonder Draw and Tributaries” date April 2004. Floodplain was determined along the southwest corner of the site. Minor grading is proposed in the floodplain along Parker Road. Roadway widening encroaches upon and places fill in the floodplain. To mitigate this the shoulder borrow ditch is shifted east in similar size to replace filled floodplain with like volume and shape.

#### B. Minor Drainage Basins:

To facilitate design, the site is divided into multiple sub-basins described as follows:

Basins L1 thru L15 are used to represent each of the proposed lots. As development conditions are not yet determined, an assumed 95% imperviousness is established for each basin. A storm sewer stub is provided for each lot to convey developed runoff to the extended detention basin at the southeast corner of the site providing both detention and water quality facilities. While Basins L10 thru L15 drain towards Parker road in the overlot condition, it is required that these lots convey site runoff to the mainline storm sewer down the center access drive. Due to the presence of the Magellan gas pipeline and it's limited cover requirements as well as site visibility lines to the easterly lots, The west side of lots 10 thru 15 will remain below the center access drive. The storm sewer has been placed at maximum depth to accommodate these lots “bucking” grade with the storm sewer system.

Basins L1A thru L5A represents the easterly portion of Lots 1 thru 5. Runoff from these

**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

basins flow overland to the east to the drainage swale along the east property line thence into the extended detention facility. As development conditions are not yet determined, an assumed 95% imperviousness is established for each basin.

Basins IN1 thru IN3 are established to quantify runoff collected in a series of inlets along the central north-south access drive. This runoff is piped to the extended detention basin at the southeast corner of the site providing both detention and water quality facilities.

Basin SR1 is used to quantify runoff to Stroh Road from the road itself as well as offsite areas to the east. Detention and water quality are provided for this basin. See additional discussion under Major Basins above.

Basin SR2 (along with basin U4) is used to quantify runoff to the new inlet at the intersection of Stroh Road and Parker Road. Detention and water quality are not provided for this basin.

Basin PR1 combines with Basins U2 and PR2 to define runoff to the new pair of inlets located at the low point of Parker Road. Basin PR1 is separated to quantify new paved area requiring water quality treatment. Treatment for Basin PR1 combined with Basin U2 is provided in a grass swale in the ROW of Parker Road leading down to Kinney Creek.

Basin PR2 is used to quantify runoff from existing Parker Road improvements to the new pair of inlets located at the low point of Parker Road. Water quality is not provided for this basin. Total flow to the inlets is a combination of Basins PR1, PR2, and U2.

Basin PR3 is not illustrated on the plan. This basin is used to quantify new paved areas in Parker Road north of Stroh Road. This basin encompasses the new left turn bay on Parker Road to Stroh Road. Runoff from this basin is treated for water quality in the existing grass buffer along the west side of Parker Road.

Basin U1 is on-site area that is not tributary to the detention / water quality facility. This basin encompasses Tracts A and B which are floodplain and mouse habitat areas. Detention and water quality are not provided for this basin.

Basin U2 is on-site area that is not tributary to the detention / water quality facility. This basin quantifies runoff escaping the site down the access road to Parker Road. Detention is not provided for this basin, however, water quality is provided in the grass swale referenced above in the PR1 basin description.

Basin U3 is on-site area that is not tributary to the detention / water quality facility. Runoff from this basin adjacent to Parker Road flows overland into Parker Road.

**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

Detention and water quality are not provided for this basin.

Basin U4 is on-site area that is not tributary to the detention / water quality facility. Runoff from this basin enters Stroh Road and is collected in inlet SR2.

Basin H1 is a historic basin quantifying historic runoff to Stroh Road. It is used as a check for Calibre basin ST-2b. Basin H1 indicates runoff of 17.0 cfs while basin ST2-b indicates 18.9 cfs. Variance is due to more accurate topography available for the Parker Pointe site and better defined drainage basin as well as differences in time of concentration.

Basin OS1 quantifies flows entering the extended detention pond from offsite flows from the Colorado Golf Club property east of the Parker Pointe property. Detention and water quality are provided for this offsite flow area in its present condition.

#### **IV DRAINAGE DESIGN CRITERIA**

##### A. Regulations:

Design calculations and methodologies are based upon the Town of Parker Storm Drainage and Environmental Criteria Manual. Additionally, the Urban Drainage Storm Drainage Criteria Manual Volumes 1 thru 3 are utilized.

##### B. Drainage Studies, Outfall System Plans:

The Final Drainage Report for Stroh Crossing Filing No. 1 by Calibre Engineering is used to identify allowable site discharge to Stroh Gulch. The WRC Engineering Inc. report entitled "Flood Hazard Area Delineation for Kinney Creek Fonder Draw and Tributaries" date April 2004 was utilized to map the floodplain elevations along the south property line. This study has negligible impact on the design presented.

##### C. Hydrology:

Runoff is calculated for both the 5 year and 100 year storms using the rational method. On-site basins utilize a 5 minute time of concentration with 5 year intensity of 4.7 in/hr and 100 year at 8.85 in/hr. Detention storage volumes are calculated using the UDFCD ver 3.07 UD-Detention spreadsheet. This spreadsheet is also utilized to calculate allowable release rates.

##### D. Hydraulics:

**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

Storm sewer capacities are calculated using Hydraflow Storm Sewers extension for AutoCAD Civil 3D ver 2017. The system is designed such to provide minimal surcharge for the 100 year event, and no surcharge for the 5 year event. The Hydraflow software is also used to calculate hydraulic grade lines for the storm sewer.

E. Water Quality Enhancement:

Water quality is achieved in an extended detention facility designed to EURV specifications using UDFCD ver 3.07 UD-Detention spreadsheet.

**V STORMWATER MANAGEMENT FACILITY DESIGN**

A. Stormwater Conveyance Facilities:

Developed stormwater is generally conveyed towards the central north south driveway where stubs are provided that connect to a storm sewer mainline. The storm main runs in a southerly then easterly direction to the proposed EDB detention facility. Total developed site runoff tributary to the EDB is 146.51 cfs. Storm sewer outfall into the EDB occurs at a concrete forebay. Outfall from the EDB is controlled to code levels and discharged via storm sewer pipe to Kinney Creek where riprap is provided to control erosion. Storm sewer is placed in an easement for perpetual maintenance. Do to the depth of the pond and invert of the adjacent Kinney Creek, outfall is piped westerly to discharge near the box culvert under Parker Road where more favorable elevations exist.

B. Stormwater Storage Facilities:

Stormwater storage on site is accomplished in an extended detention basin located offsite near the southeast corner of the site. Required pond design elements are summarized below:

<u>Volume Element</u>	<u>Volume</u>	<u>Elevation</u>	<u>Release Rate</u>
WQCV	0.566 Ac-Ft	5966.12	41 hours
EURV + WQCV	1.472 Ac-Ft	5968.03	70 hours
100 year	2.753 Ac-Ft	5970.05	36.7 cfs
Storage Provided	2.753 Ac-Ft	5970.05	

Outflow metering is accomplished in a concrete outlet structure. 2 orifices are used. One for WQ and EURV while a second is used covering the outfall pipe to limit the 100 year flow. A double type D inlet is proposed to provide sufficient weir flow to accommodate

**FINAL DRAINAGE REPORT  
PARKER POINTE  
PARKER, COLORADO**

the 100 year release rate. Micropool and trash racks are provided. Emergency overflow occurs directly into Kinney Creek via overflow weir and riprap embankment.

Allowable 100 year discharge must be reduced to allow for uncaptured basin U1 thru U4 and PR1. The combined 100 year un-detained flow from basins U1 thru U4 is 4.4 cfs. Basin PR1 is 3.2 cfs. Combined reduction in allowable discharge is 7.6 cfs. Allowable detention discharge as shown on the UDFCD spreadsheet is 44.5 cfs. The outlet structure design limits discharge to 36.7 cfs. Calculating the allowable discharge results in  $44.5 - 7.6 = 36.9$  cfs. The design discharge is less than allowable therefore this provides adequate compensation for the uncaptured flows.

A maintenance access is provided entering at the northwest corner of the pond. Roadbase surfacing is provided and slopes not exceeding 10% are employed to enhance access for maintenance. An easement is provided over the pond should Town access, inspection, or repairs be required.

C. Water quality Enhancement Best Management Practices:

The EDB pond design includes water quality capture volume. Developed flows are conveyed via underground storm sewer to a single discharge point into the pond. At this point, a concrete forebay is provided to capture heavier particulate material.

Water quality treatment is also provided for the new paved areas of Parker Road. Basin PR1 is treated in a grass swale with discharge to Kinney Creek. Basin PR3 is treated in the existing grass buffer along the west side of Parker Road north of Stroh Road. UDFCD spreadsheets are provided for each treatment facility in the appendix.

D. Floodplain Modification:

Minor grading is proposed in the floodplain along Parker Road. Roadway widening encroaches upon and places fill in the floodplain. To mitigate this the shoulder borrow ditch is shifted east in similar size to replace filled floodplain with like volume and shape. A floodplain development permit will be required for this work as well as disturbances due to outfall construction. A no rise analysis has been performed and the results indicating compliance are included in the appendix.

E. Additional Permitting Requirements:

State stormwater permit for discharges during construction.  
Town of Parker permits.  
Douglas County permits.