



BARGHAUSEN

FINAL DRAINAGE LETTER

Dutch Bros. Coffee

Falcon Marketplace – Lot 11
7510 Falcon Market Place
Falcon, CO 80831

Prepared for:
Dutch Bros. Coffee
110 S.W. 4th Street
Grants Pass, OR 97526

Prepared by:
Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032



02/08/22

Contractor: TBD

PCD File No. PPR-21-46

Our Job No. 21917
PCD Project Number: PPR-21-046

Design 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 County for drainage reports and said report is in conformity with the applicable 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.



Hal P. Grubb, CO P.E. #0054994

02/08/2022
Date

Owner/Developer's Statement:

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



Russel Perkins
Evergreen-Meridian & Woodman, L.L.C.
2390 E Camelback Road, Suite 410
Phoenix, AZ 85016

5/12/22
Date

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.

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

Date

Conditions:

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SITE DESCRIPTION AND ACTIVITIES

Description of Construction Activities

The proposed development consists of a 950 square-foot coffee shop with associated parking, sidewalks, drive-through lanes, and landscaping. It is located along a proposed roadway called Falcon Market Place, to be constructed as part of the larger development of a series of properties. The overall development is approximately 36.4 acres of vacant land in Falcon, Colorado. The various developments are all commercial in nature but will vary in purpose and function. The proposed lot for the Dutch Bros. Coffee is currently listed as lot number eleven, with a parcel area of 0.921 acres. The southern end of the lot has been dedicated for the construction of a shared stormwater detention pond.

The overall development will be served by a three different community detention ponds, constructed, and operated by a private party. All overland precipitation within Lot 11 is collected via a system of curb and gutter, catch basins, and conveyance pipes to the private connection at the southern end of the lot. The overall development is to provide a 24-inch RCP storm sewer pipe to the property. Visual depictions of existing and proposed conditions have been included in the appendix.

Existing Site Conditions

The project is located within the Southeast $\frac{1}{4}$ of the Southeast $\frac{1}{4}$ of Section 1, Township 13 South, Range 65 West of the Sixth Principal Meridian, City of Falcon, County of El Paso, State of Colorado. The property lies in the northwest corner of the intersection of E. Woodmen Road and Meridian Road. To the west of the development lies a newly constructed medium-density residential neighborhood and to the north is an existing low-density residential area. To the south lies an existing Walmart Supercenter and to the east lies more medium-density residential properties. Three proposed community stormwater detention ponds, constructed and maintained by developer will meet the developmental stormwater runoff requirements as laid out in the Colorado Springs Drainage Criteria Manual. Survey data, including an ALTA survey and topographic information was provided to Barghausen Consulting Engineers by the developer. This survey data has been used as the basis for the property line locations and existing ground cover and elevations.

The existing site is covered with native shrub grasses and other insignificant vegetation. Pre-construction activities, the site appears to have completely covered (100 percent) with native grasses and other small shrubs. Infrastructure to support the overall development, like streets, sidewalks, stormwater or other underground infrastructure has already been installed; therefore, the native cover has been reduced through those activities. This determination has been made based on visual inspection and supporting documents as submitted as part of the greater development stormwater drainage report. Existing grasses and shrubs will be removed as part of site clearing and grubbing. Topsoil will be retained on site and re-used as applicable for landscaped areas after initial grading is complete. Existing site topography indicates the overland flow current flows from north to south and slightly from west to east. There are no significant grade changes present on the site that would modify the natural overland flow.

Existing Soils

There are three predominant soil types across the site, bounded into three distinct areas. In the southwest corner, NRCS Soil Type 8: Blakeland Loamy Sand covers approximately 1.2 acres. Secondly, shaped into a bell curve, NRCS Soil Type 9: Blakeland-Fluvaquentic Haplaquolls makes up 16.3 acres in the middle of the site. Lastly, along the north half and the east side, NRCS Soil Type 19: Columbine Gravelly Sandy Loam makes up the last 19.6 acres of the site. All soils on site are classified as Hydrologic Soil Group A, as defined by the NRCS.

For the development of the site, approximately 0.77 acres of area will be disturbed. The overall development has indicated that a shared access driveway will serve Lots 1 and 11. As such, the proposed Dutch Bros. Coffee will provide the pavement surfaces for the entire driveway, not just the segment that is within Lot 11. Due to existing soil conditions, significant site grading and over-excavation will be required. Preliminary calculations indicate that up to 900 cubic yards of soil may need to be disturbed to meet the over-excavation recommendation.

PROPOSED DRAINAGE CONDITIONS

Since the start of the overall development, a series of underground utilities, roadways and associated curbs, gutters, and sidewalks have been implemented. At the conclusion of the construction, the proposed Dutch Bros. Coffee stand will route all site waters, outside those mentioned above, into a series of gutter and underground collection pipes to the provided stub at the southern end of the site. Additional information about pre- and post-development conditions can be seen in the appendices.

HYDROLOGIC ANALYSIS AND CALCULATIONS

In accordance with the Master Development Drainage Plan as prepared by Drexel, Barrell & Co. dated November 4, 2019, for the Falcon Marketplace overall development, the proposed development creates less than the maximum peak flow from the site during the 100-year design storm. The following analysis and calculations further support that statement.

Based on the final drainage report mentioned above, Lot 11 and the western portion of Lot 1 fall within Basin C4. Basin C4 encompasses 2.43 acres and has an assumed impervious value of 81%. The 5- and 100-year recurrence interval design storms are estimated to create 6.9 and 13.8 cubic feet per second, respectively. The proposed development contains 40,100 square feet or 0.92 acres. This equates to approximately 37.89% of Basin C4. As such, Lot 11 is entitled to 2.61 and 5.22 cubic feet per second of contribution to the privately-owner storm sewer system for the 5- and 100-year storm events.

Based on current surface cover conditions, further analysis of surface cover conditions included in the appendix, the proposed Dutch Bros. Coffee will have a site imperviousness rating of 69.9%. Calculated peak flows are 2.219 and 5.022cfs for the 5- and 100-year storm events, respectively. The pre-existing driveway approach shown at the southern end of the Lot 11 will drain to Falcon Market Place due to proposed grades and some portion of the east end of Lot 11, where it becomes Lot 1, approximately five-hundred square feet will be directed away from the collective storm sewer and is routed into the gutters along Falcon Market Place. On-site stormwater runoff is collected via a system of gutters and storm structures and then conveyed to the existing 24-inch RCP storm sewer stub as provided by the greater Falcon Marketplace development. The location of the storm sewer can be seen within the Proposed Utility Plan, designed by Drexel, Barrell & Co, and signed on August 20, 2020. Proposed stormwater flows are less than the assumed design flows; therefore, no additional detention or treatment is required for design.

REFERENCES

- 1) City of Colorado Springs– Drainage Criteria Manual, Volumes 1 and 2, 2014.
- 2) NRCS Web Soil Survey, www.websoilsurvey.nrcs.usda.gov
- 3) “Final Drainage Report for Falcon Marketplace” prepared by Drexel, Barrell & Co. on November 4, 2019 (Project Number SF-19-001).
- 4) Construction Documents as prepared by Barghausen Consulting Engineers, Inc. as submitted on December 20, 2021 (BCE Project Number 21917).

APPENDICES

- Runoff Calculations
- Proposed Conditions Map

APPENDIX A

Stormwater Runoff Calculations

Drainage Management Calculations
7520 Falcon Market Place - Peyton, CO 80831

Intensity-Duration-Frequency Equations:

$$I(100) = -2.52 \ln(D) + 12.735$$

$$I(50) = -2.25 \ln(D) + 11.375$$

$$I(25) = -2.00 \ln(D) + 10.111$$

$$I(10) = -1.75 \ln(D) + 8.847$$

$$I(5) = -1.50 \ln(D) + 7.583$$

$$I(2) = -1.19 \ln(D) + 6.035$$

Where:

I= Rainfall Intensity (inches per hour)

D= Storm Duration (minutes)

	2-Year	5-Year	10-Year	100-Year
P₁=	1.19	1.5	1.75	2.52

Time-Intensity-Frequency Table (Inches per Hour)

		Recurrence Interval (Years)					
		2	5	10	25	50	100
Time (Minutes)	5	4.120	5.169	6.030	6.892	7.754	8.679
	10	3.295	4.129	4.817	5.506	6.194	6.932
	15	2.812	3.521	4.108	4.695	5.282	5.911
	30	1.988	2.481	2.895	3.309	3.722	4.164
	60	1.163	1.441	1.682	1.922	2.163	2.417
	120	0.338	0.402	0.469	0.536	0.603	0.671

*The Design Point Rainfall Values and Intensity-Duration-Frequency Tabulation are found in Table 6-2 and Figure 6-5, respectively, of the Colorado Springs Drainage Criteria Manual, Volume 1.

Drainage Management Calculations
7520 Falcon Market Place - Peyton, CO 80831

Drainage Management Area Surface Cover Summary

	Area (sq. ft.)	Area (ac)	Landscape Cover Area (sq ft.)	Landscape Cover Area (ac)	Landscape Imperviousness	C2	C5	C10	C100
DMA #1	22,512.80	0.51682	7,967.51	0.18291	2%	0.02	0.08	0.15	0.35
DMA #2	6,700.74	0.15383	2,156.02	0.04950	2%	0.02	0.08	0.15	0.35
DMA #3	3,411.38	0.07831	52.00	0.00119	2%	0.02	0.08	0.15	0.35
DMA #4	950.00	0.02181	0.00	0.00000	2%	0.02	0.08	0.15	0.35

	Pavement Area (sq. ft.)	Pavement Area (ac)	Pavement Imperviousness	C2	C5	C10	C100
	14,545.29	0.33391	100%	0.89	0.90	0.94	0.96
	4,544.72	0.10433	100%	0.89	0.90	0.94	0.96
	3,359.38	0.07712	100%	0.89	0.90	0.94	0.96
	0.00	0.00000	100%	0.89	0.90	0.94	0.96

	Roof Area (sq. ft.)	Roof Area (ac)	Roof Imperviousness	C2	C5	C10	C100
	0.00	0.00000	90%	0.71	0.73	0.75	0.81
	0.00	0.00000	90%	0.71	0.73	0.75	0.81
	0.00	0.00000	90%	0.71	0.73	0.75	0.81
	950.00	0.02181	90%	0.71	0.73	0.75	0.81

**Note: Values for runoff coefficients based on material and storm recurrence are derived from the City of Colorado Springs Drainage Criteria Manual, Table 6-6.

	Composite Imperviousness	C2	C5	C10	C100
	65%	0.58	0.61	0.66	0.74
	68%	0.61	0.64	0.69	0.76
	99%	0.88	0.89	0.93	0.95
	90%	0.71	0.73	0.75	0.81

Site Imperviousness: 70.02%

Drainage Management Calculations
7520 Falcon Market Place - Peyton, CO 80831

Drainage Management Area Characteristics

DMA Characteristics

	Overland Time						Travel Time					
	Area (sq. ft.)	Area (ac)	C(5)	Length (ft)	Slope (%)	T(i) (min.)	Length (ft)	Slope	Coeff.	Velocity (fps)	T(t) (min.)	Tc (min)
1	22512.80	0.52	0.61	30	0.50%	6.09	300	0.50%	20	1.414	3.54	9.63
2	6700.74	0.15	0.64	20	1.50%	3.28	45	0.50%	20	1.414	0.53	3.81
3	3411.38	0.08	0.89	50	0.50%	3.41	25	0.50%	20	1.414	0.29	3.70
4	950.00	0.02	0.73	0	0.00%	0.00	0	0.00%	20	0.063	0.00	0.00

T(c) Check (Urbanized Basins) for 5-Year Storm

	Comp. T(c)	Total Length	L/180+10
1	9.63	330	11.83
2	5.00	65	10.36
3	5.00	75	10.42
4	5.00	0	10.00

Final T(c)

Min.
9.63
5.00
5.00
5.00

Surface Coefficient Values

Forest & Meadow	2.50
Fallow or Cultivation	5.00
Short Grass Pasture & Lawns	7.00
Nearly Bare Ground	10.00
Grassed Waterway	15.00
Paved Area & Shallow Gutter	20.00

Drainage Management Calculations
7520 Falcon Market Place - Peyton, CO 80831

Dutch Bros Coffee - Drainage Report
Proposed Runoff Calculations
(Rational Method)

Design Storm: 5 Year

Basin Information				Direct Runoff		
Basin	Area (ac)	C ₅	T(c) Min	C x A	I (in/hr)	Q (cfs)
1	0.517	0.61	9.63	0.315	4.186	1.319
2	0.154	0.64	5.00	0.098	5.169	0.506
3	0.078	0.89	5.00	0.070	5.169	0.359
4	0.022	0.73	5.00	0.016	5.169	0.082
Total:						2.184

Design Storm: 100 Year

Basin Information				Direct Runoff		
Basin	Area (ac)	C ₁₀₀	T(c) Min	C x A	I (in/hr)	Q (cfs)
1	0.517	0.74	9.63	0.385	7.028	2.703
2	0.154	0.76	5.00	0.117	8.679	1.020
3	0.078	0.95	5.00	0.074	8.679	0.646
4	0.022	0.81	5.00	0.018	8.679	0.153
Total:						4.369

	Area (sq. ft.)	Area (ac)	Inperviousness (%)	Runoff Coefficient (5-Year)	Runoff Coefficient (100-Year)	5-Year Peak Flow (cfs)	100-Year Peak Flow (cfs)
DMA #1	22512.80	0.517	65%	0.61	0.74	1.319	2.703
DMA #2	6700.74	0.154	68%	0.64	0.76	0.506	1.020
DMA #3	3411.38	0.078	99%	0.89	0.95	0.359	0.646
DMA #4	950.00	0.022	90%	0.73	0.81	0.082	0.153
Total:						2.184	4.369

APPENDIX B

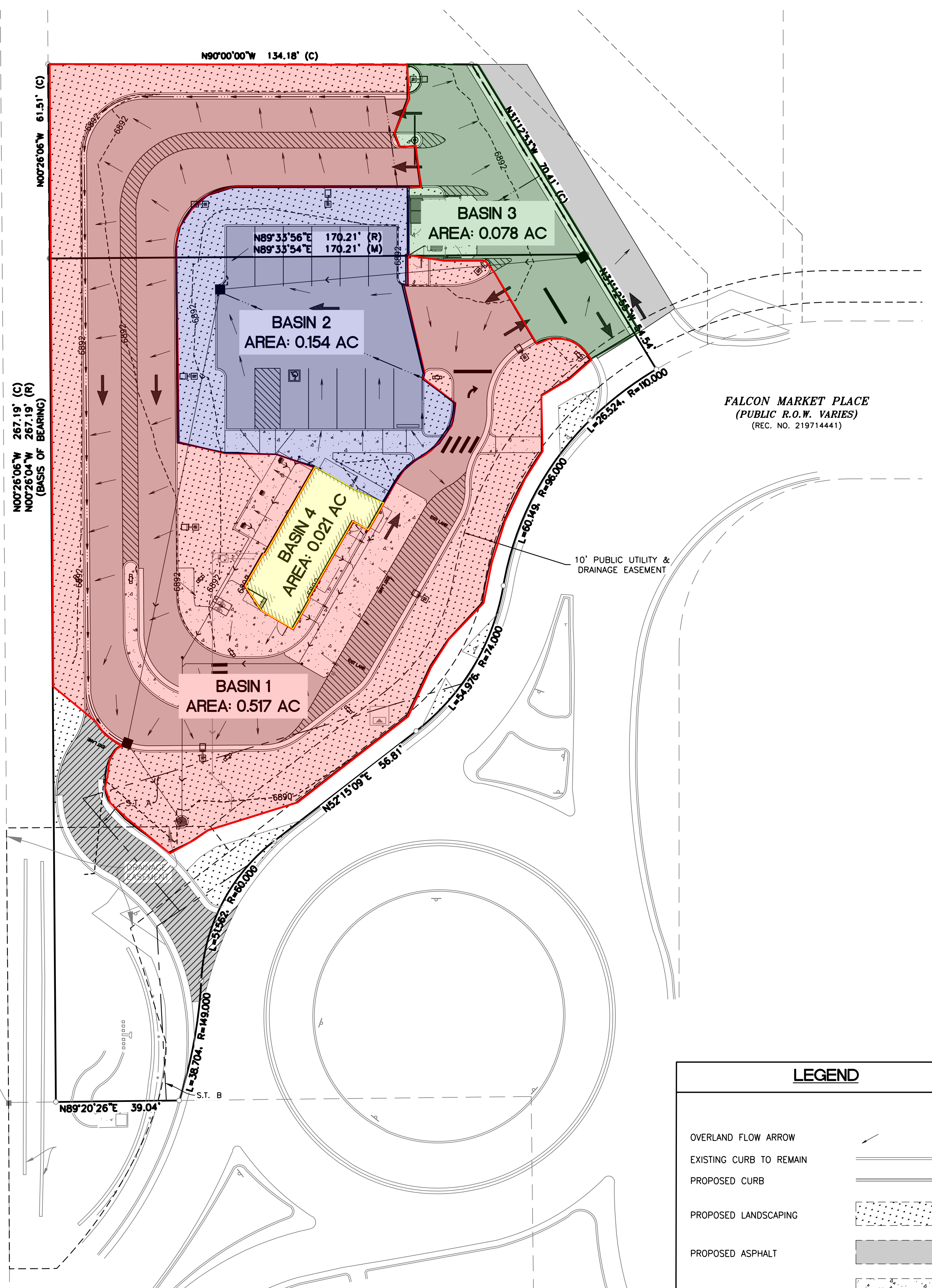
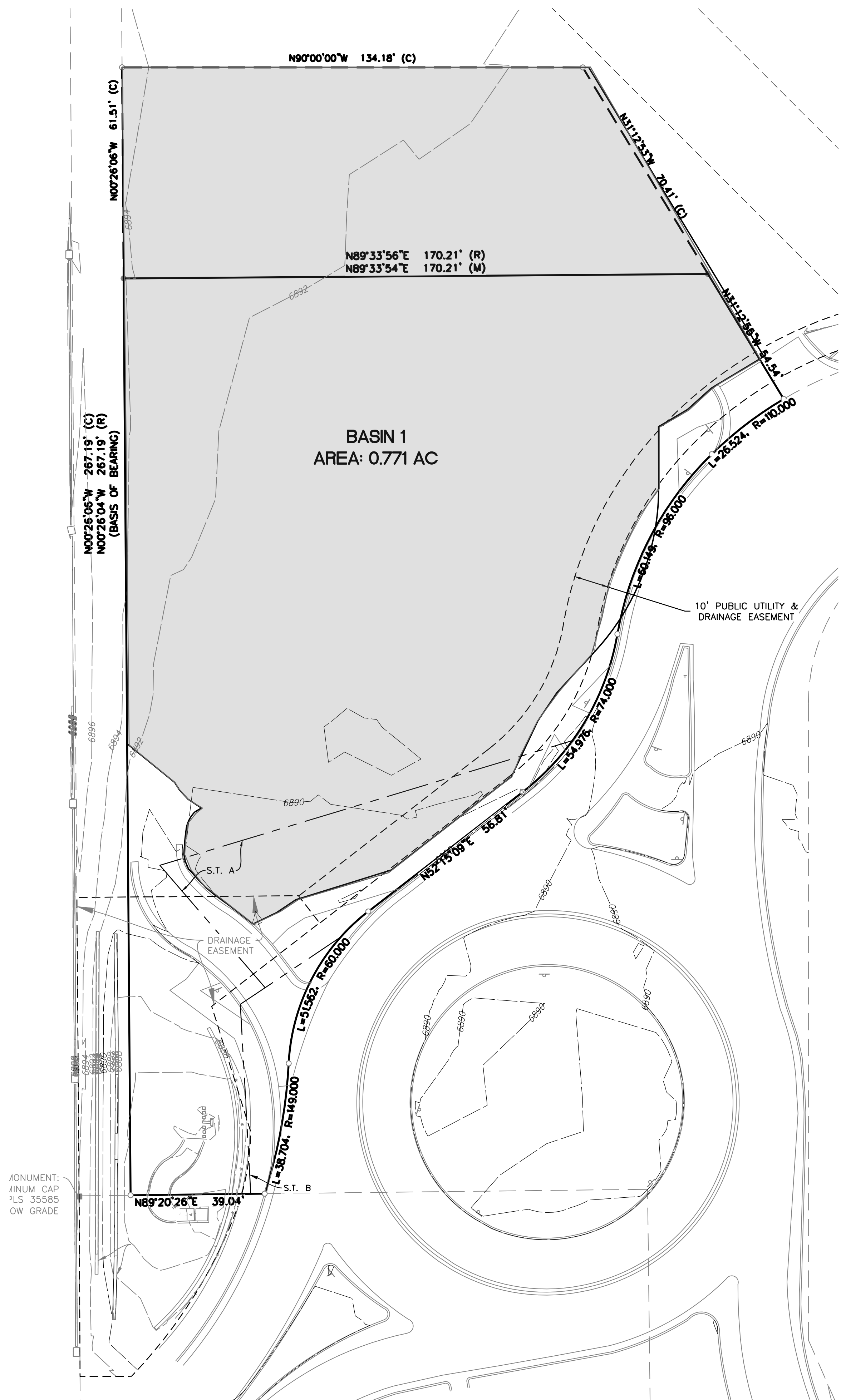
Proposed Conditions Map



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

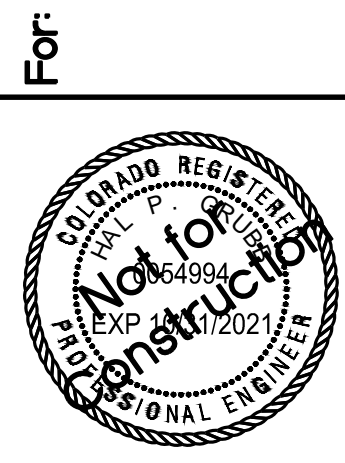
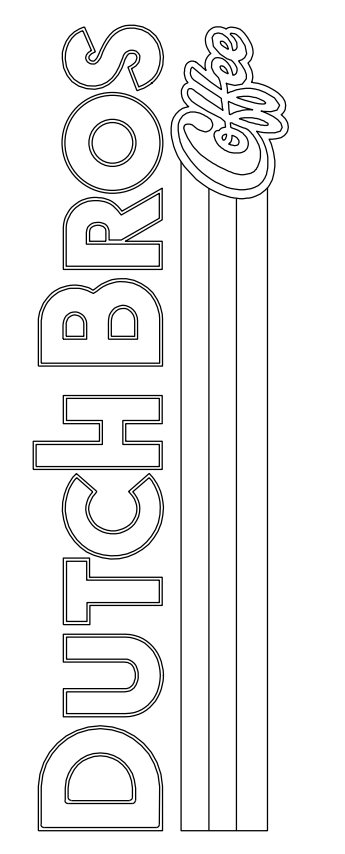
DUTCH BROS. COFFEE - CO0707 - PEYTON, CO PROPOSED CONDITIONS MAP

The name DUTCH BROS. and all associated logos, distinctive designs, content, information, and other materials featured, displayed, contained herein, and made available by Dutch Bros., including but not limited to, the 'look and feel' of the establishments and products, all text, images, colors, configurations, graphics, designs, illustrations, photographs, and pictures (collectively, the 'Materials') are owned by and/or licensed by DB Franchising USA, LLC and are protected by copyright, trademark, trade dress, patent, and/or other intellectual property rights and unfair competition laws under the United States and foreign laws.



LEGEND	
OVERLAND FLOW ARROW	
EXISTING CURB TO REMAIN	
PROPOSED CURB	
PROPOSED LANDSCAPING	
PROPOSED ASPHALT	
PROPOSED CONCRETE	

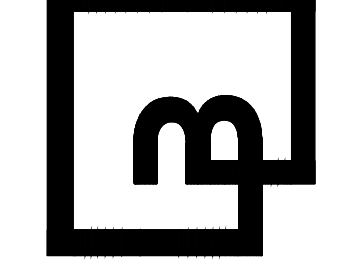
Title:
PROPOSED CONDITIONS MAP
7510 FALCON MARKET PLACE
PEYTON, CO 80831



Scale:
Horizontal 1" = 20'
Vertical N/A

Designed: CCK
Drawn: JAH
Checked: JAH
Approved: HFS
Date: 12/20/21

For:
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Job Number: 21917
Sheet: 1 OF 1
2019 DB
Franchising USA, LLC