



**BARGHAUSEN**



05/29/2024

## Drainage Report

City/County File No. PPR2413

Dutch Bros Coffee (CO0907)

### PREPARED BY

Barghausen Consulting  
Engineers, Inc.

### PREPARED FOR

Dutch Bros Coffee

### CLIENT ADDRESS

110 S.W. 4th Street, Grants Pass, OR 97526

### SITE ADDRESS

5810 Omaha Boulevard,  
Colorado Springs,  
Colorado 80915

### PROJECT NO.

23098

### DATE

May 29, 2024

### JURISDICTION

County of El Paso

**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.



\_\_\_\_\_  
Anthony E. Merlino, P.E. #60820

05/29/2024  
\_\_\_\_\_  
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.

\_\_\_\_\_  
Tom Souza  
Eastbound & Down, LLC  
c/o Sansome Pacific  
221 Pine Street, 4th Floor  
San Francisco, CA 94104

\_\_\_\_\_  
Date

**EI PASO COUNTY:**

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

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

\_\_\_\_\_  
Date

Conditions:

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## **INTRODUCTION**

### ***PURPOSE OF STUDY***

This document is the Drainage Report for 5810 Omaha Boulevard, Colorado Springs, Colorado 80915. The proposed development includes a building footprint of 950 square feet and a 272-square-foot trash enclosure. The planned site improvements include paved asphalt driving area, reinforced concrete driving area, on-site sidewalk area, and landscaping. This report is to summarize the drainage improvements for the Dutch Bros Coffee and is intended to demonstrate that the drainage improvements for the proposed project are in conformance with El Paso County and will not negatively impact downstream drainage facilities, surrounding development, and receiving water course.

### ***LOCATION***

This project is located on the northwest corner of Powers Boulevard and Omaha Boulevard, Colorado Springs, Colorado and is currently an existing gas station. The parcel is bounded by Powers Boulevard to the west, existing commercial development on the east and north, and Omaha Boulevard to the south. The site is within the El Paso County jurisdiction. Refer to Appendix A for a Vicinity Map.

### ***DESCRIPTION OF SITE***

The property is zoned as Commercial Regional. The parcel is approximately 0.62 acres. The disturbed area consists of approximately 0.62 acres. The existing site is currently an existing gas station. The site has an existing drainage system with existing drainage inlets near the south side of the site. There is an existing storm drain system located near the south end of the site. Overall, the site slopes from the northeast to the southwest.

### ***SOILS***

Per the Natural Resources Conservation Service web soils survey, soils for this project, delineated on the soils map within Appendix B of this report, are classified as Blendon Sandy Loam. Blendon Sandy Loam has been classified as Hydrologic Soil Type "B". The study area consists of undeveloped land with sparse, grassy vegetation.

### ***FLOODPLAIN STATEMENT***

Subject property is located in Zone "X" (Area determined to be outside the 0.2% annual chance floodplain) per the flood insurance rate map for County of El Paso, Colorado map number 08041C0751G, revised December 7, 2018.



## **PROJECT BACKGROUND**

### ***EXISTING DRAINAGE***

In existing conditions, Basin A-1 is approximately 0.55 acres and approximately 89% impervious. The site generally sheet flows from the northeast to the southwest. The runoff currently sheet flows towards curb and gutter along the south side and is conveyed to and collected by dual inlets located near the parking area. The runoff is then conveyed via an existing 18-inch storm drain.

The composite runoff coefficient for the 10-year and 100-year is 0.83 and 0.88 respectively for Hydrologic Soil Type B per Table 5-1 of the El Paso County Drainage Criteria Manual (EPCDM). A minimum time of concentration of 5 minutes was utilized to calculate the flow rate. The rainfall intensity is approximately 6 in/hr for the 10-year storm event and 9 in/hr for the 100-year storm event per Figure 5-1 of the EPCDM. The runoff is approximately 2.75 cfs for the 10-year and 4.40 cfs for the 100-year storm event. Refer to Appendix D for Table 5-1 and Figure 5-1.

Refer to Appendix B for Existing Conditions Drainage Map and Appendix C for Hydrology Calculations.

### ***PROPOSED DRAINAGE***

In proposed conditions, the Dutch Bros site proposes more landscaping than existing conditions, which reduces the amount of runoff than existing conditions. The site is approximately 70% impervious, which is less than existing conditions at 89% impervious. Therefore, it is anticipated that the discharge and impact to the existing storm infrastructure will be negligible and even less than the existing condition.

## **HYDROLOGIC AND HYDRAULIC DESIGN**

### ***BASINS***

#### **Basin A-1**

Basin A-1 is approximately 0.47 acres and approximately 74% impervious. The runoff maintains a similar drainage pattern as existing conditions and sheet flows northeast to the southwest. Runoff sheet flows towards curb and gutter and is conveyed towards curb cuts along the south curb and gutter. Runoff will then flow through the curb cuts and along graded swale and collected by a proposed drainage inlet that will convey the runoff via storm drain and connect to an existing 30-inch storm drain.

The composite runoff coefficient for the 10-year and 100-year storm event is 0.73 and 0.79 respectively for Hydrologic Soil Type B per Table 5-1 of the EPCDM. A minimum time of concentration of 5 minutes was utilized to calculate the flow rate. The rain fall intensity is 6 in/hr for the 10-year storm event and 9 in/hr for the 100-year storm event per Figure 5-1 of the EPCDM. The runoff is approximately 2.06 cfs for the 10-year and 3.36 cfs for the 100-year event.

#### **Basin A-2**

Basin A-2 is approximately 0.10 acres and approximately 53% impervious. The runoff maintains a similar drainage pattern as the existing conditions and sheet flows towards the south. Runoff sheet flows towards curb and gutter and is conveyed towards a curb cut along the eastern property line. Runoff will then flow through the curb cut and is conveyed along graded swale and collected by the existing dual drainage inlets. The runoff is then conveyed via an existing 18-inch storm drain.

The composite runoff coefficient for the 10-year and 100-year storm event is 0.59 and 0.67 respectively for Hydrologic Soil Type B per Table 5-1 of the EPCDM. A minimum time of concentration of 5 minutes was utilized to calculate the flow rate. The rain fall intensity is 6 in/hr for the 10-year storm event and 9 in/hr for the 100-yr storm event per Figure 5-1 of the EPCDM. The runoff is approximately 0.34 cfs for the 10-year and 0.57 cfs for the 100-year event.

The total area between Basin A-1 and A-2 is 0.57 acres. The total flow between Basin A-1 and A-2 is about 2.4 cfs for the 10-year and 3.93 cfs for the 100-year storm events. Refer to Appendix B for the Proposed Conditions Drainage Map and Appendix C for the Hydrology Calculations.

Calculations are missing from Appendix C

### ***WATER QUALITY EXEMPTION***

The proposed site is disturbing approximately 0.62 acres. Storm water quality is not required for any project disturbing activity less than 1 acre per the El Paso County Drainage Criteria Manual.

### ***HYDRAULIC DESIGN***

The proposed drainage inlet and storm drain were sized based on the 100-year design storm using the Hydraflow Express. A Manning's n of 0.011 was used for the PVC storm drain and 0.035 for a graded swale. Refer to Appendix C for the Hydraulic Calculations.

### ***MAINTENANCE***

All drainage facilities within the public right-of-way shall be the responsibility of El Paso County.

### **SUMMARY**

It has been concluded that the proposed project and the constructed improvements will maintain the thresholds of the existing conditions. The proposed project is less than an acre; therefore, the site is exempt from water quality requirements. The site maintains existing drainage patterns to the maximum extent possible. The site also reduces the amount of existing impervious area from 89% impervious in existing conditions to 70% impervious in proposed conditions. The total runoff of 2.40 cfs for the 10-year and 3.93 cfs for the 100-year storm event is less than the existing flow rates of 2.75 cfs for the 10-year and 4.40 cfs for the 100-year storm event. Therefore, the proposed site is in conformance with the El Paso County standards and requirements and does not negatively impact downstream facilities, surrounding areas, and receiving water courses.

# APPENDIX A

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## VICINITY MAP



SITE PLAN

# APPENDIX B

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- EXISTING CONDITIONS DRAINAGE MAP
- PROPOSED CONDITIONS DRAINAGE MAP



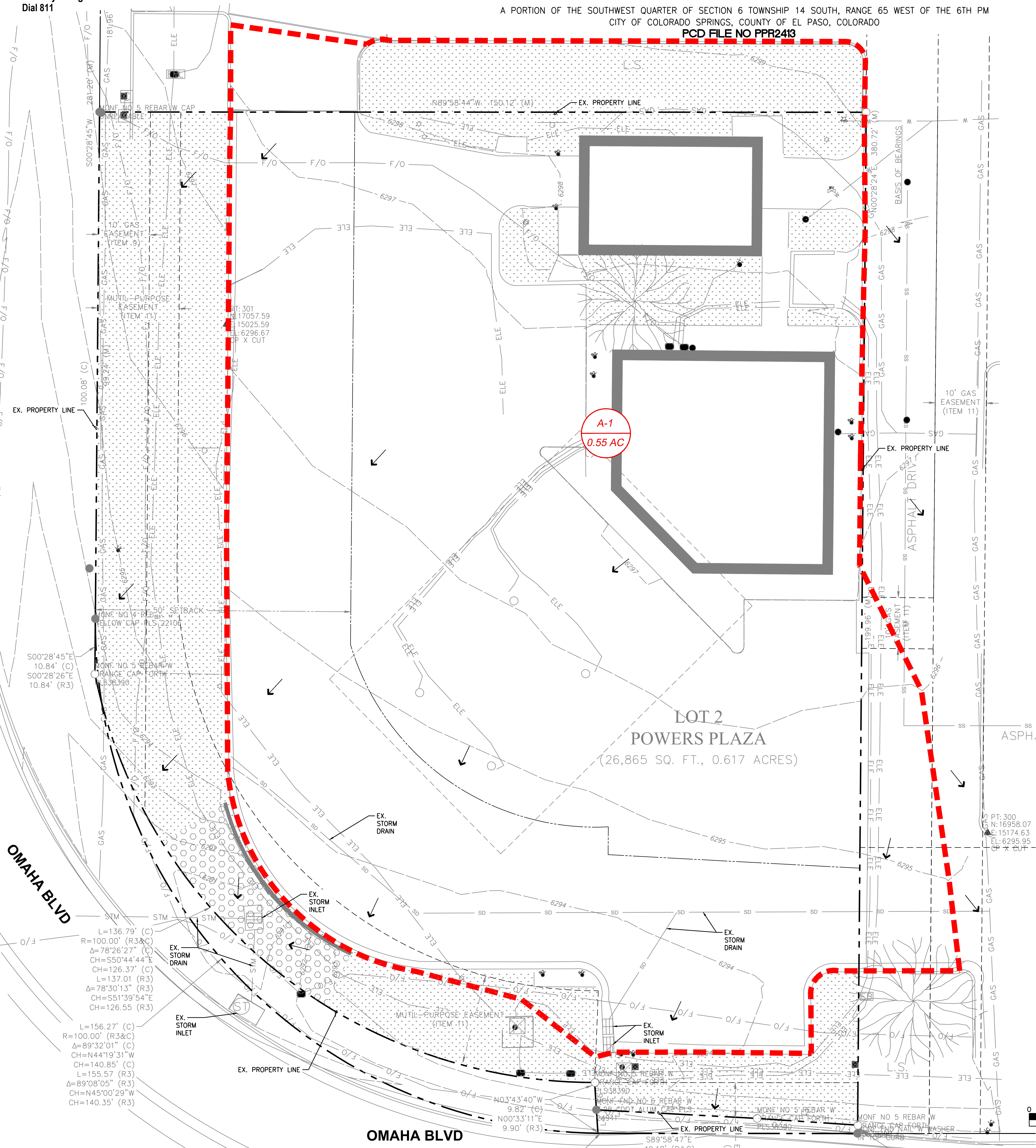


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# DUTCH BROS. COFFEE - CO0907, COLORADO SPRINGS, CO

A PORTION OF THE SOUTHWEST QUARTER OF SECTION 6 TOWNSHIP 14 SOUTH, RANGE 65 WEST OF THE 6TH PM  
CITY OF COLORADO SPRINGS, COUNTY OF EL PASO, COLORADO  
PCD FILE NO PPR2413

POWERS BLVD

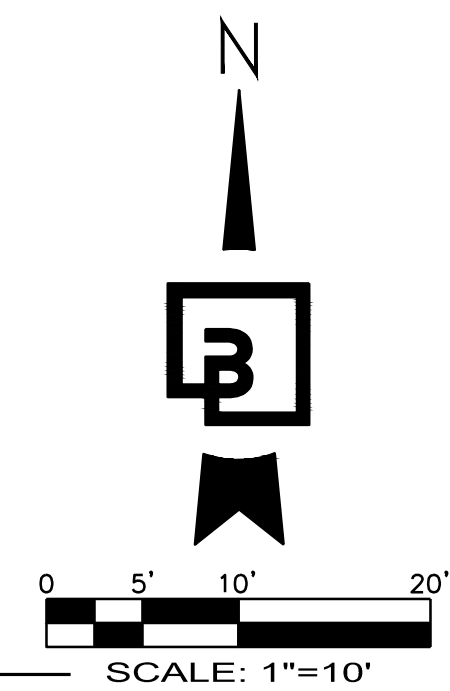
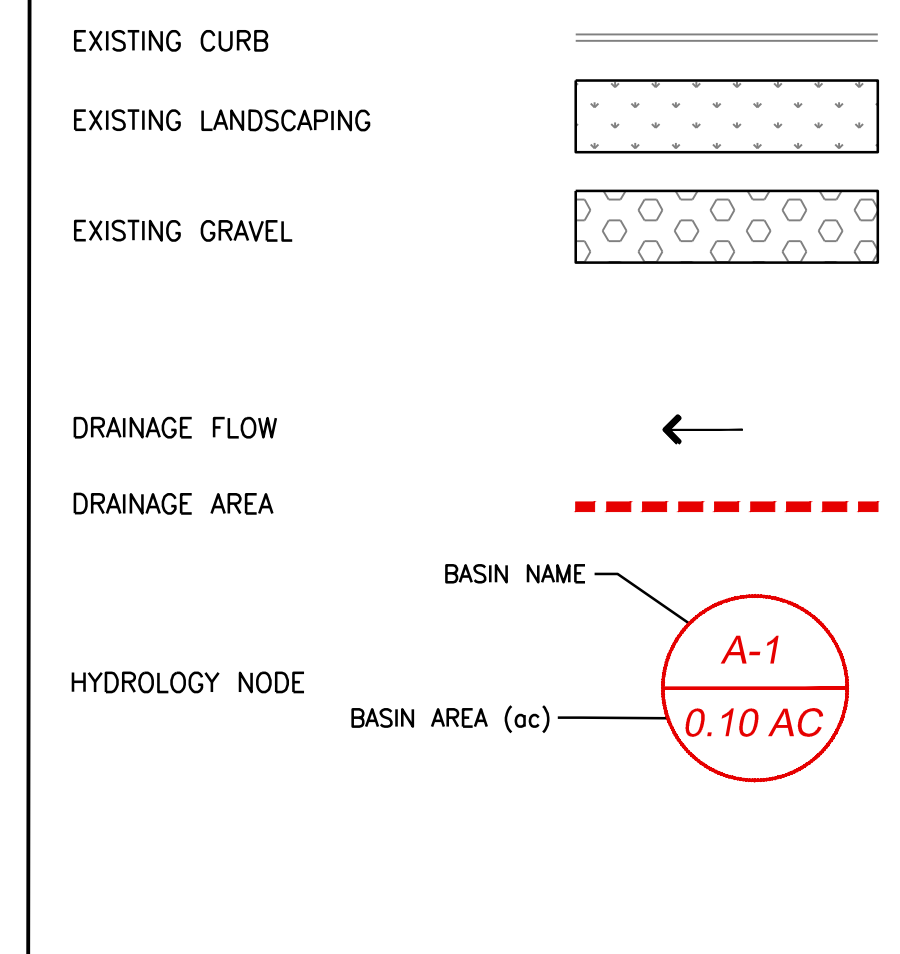


A-1  
0.55 AC

**DRAINAGE SUMMARY TABLE**

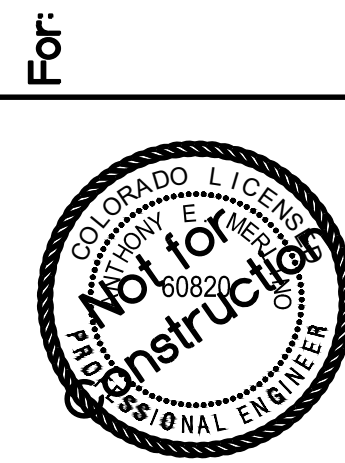
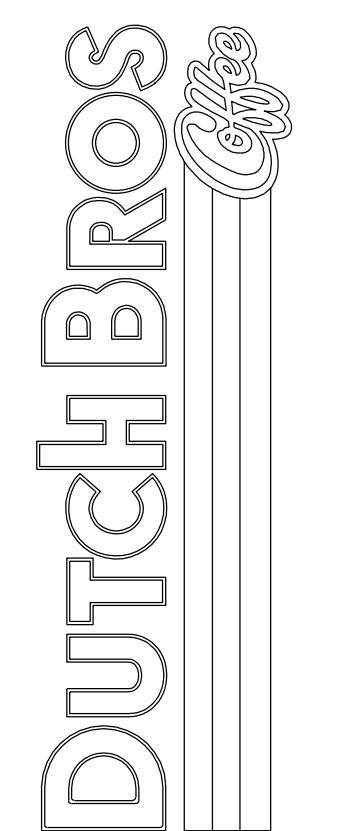
| EXISTING CONDITIONS |                     |            |          |                    |                             |
|---------------------|---------------------|------------|----------|--------------------|-----------------------------|
| BASIN               | AREA                | RUNOFF (c) | TC (min) | i (10-YR) (in/hr)  | PEAK Q <sub>100</sub> (cfs) |
| A-1                 | 24,160 SF (0.55 AC) | 0.83       | 5        | 6.00               | 2.75                        |
| BASIN               | AREA                | RUNOFF (c) | TC (min) | i (100-YR) (in/hr) | PEAK Q <sub>100</sub> (cfs) |
| A-1                 | 24,160 SF (0.55 AC) | 0.88       | 5        | 9.00               | 4.40                        |

**LEGEND**



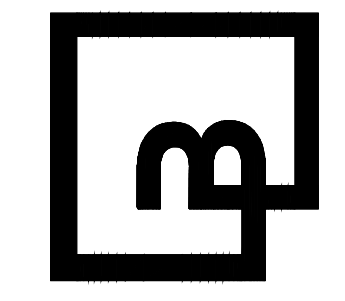
| No. | Date | By | Chd. | Appr. |
|-----|------|----|------|-------|
|     |      |    |      |       |

Title:  
**PROPOSED DRAINAGE PLAN**  
5810 OMAHA BLVD  
COLORADO SPRINGS, CO 80915



Scale:  
Horizontal 1" = 10'  
Vertical N/A

Designed: EMM  
Drawn: EMM  
Checked: AEM  
Approved: AEM  
Date: 05/24/24



Job Number  
**23098**

Sheet  
**1 OF 1**

PPR2413

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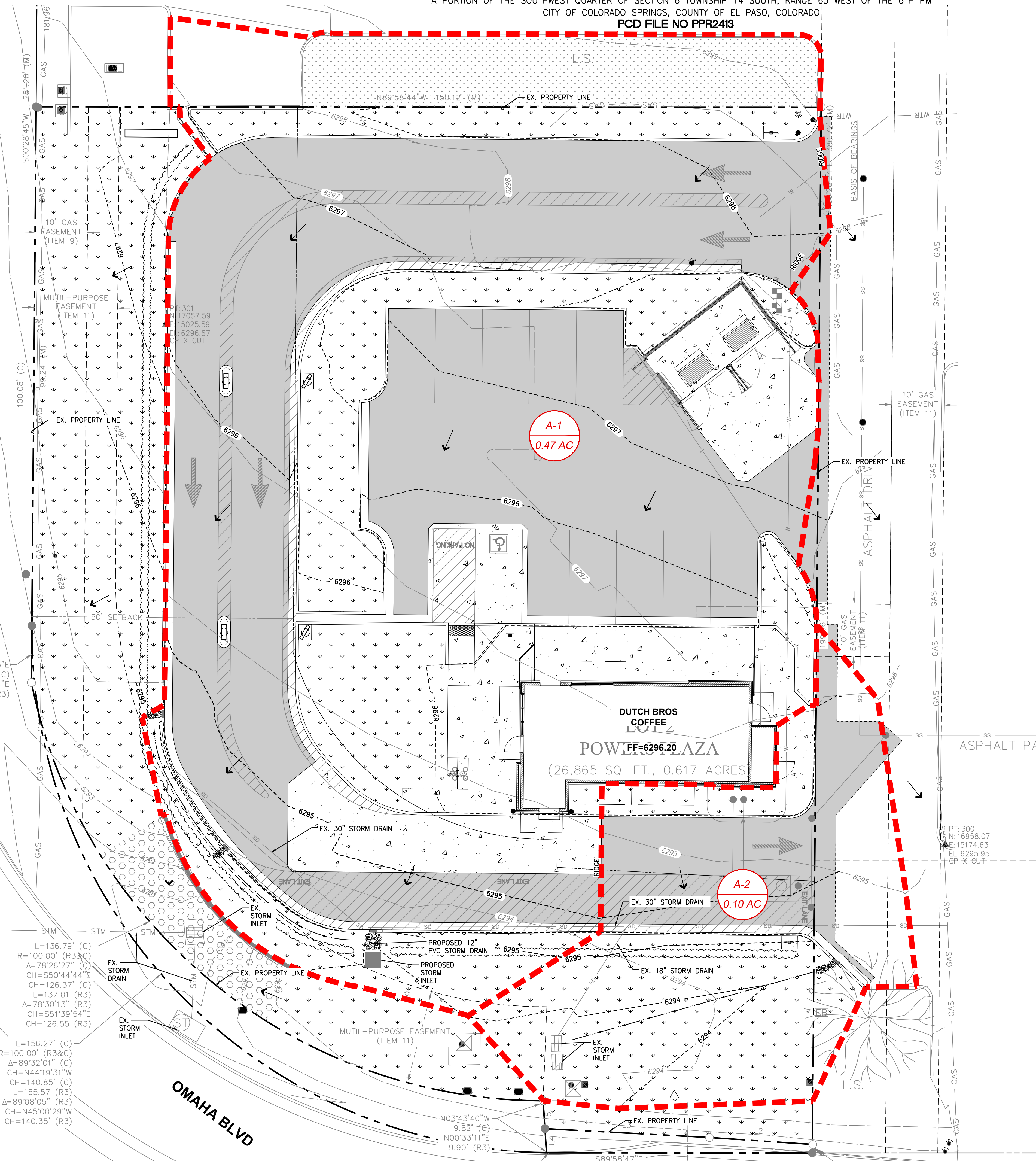


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PCD FILE NO PPR2413

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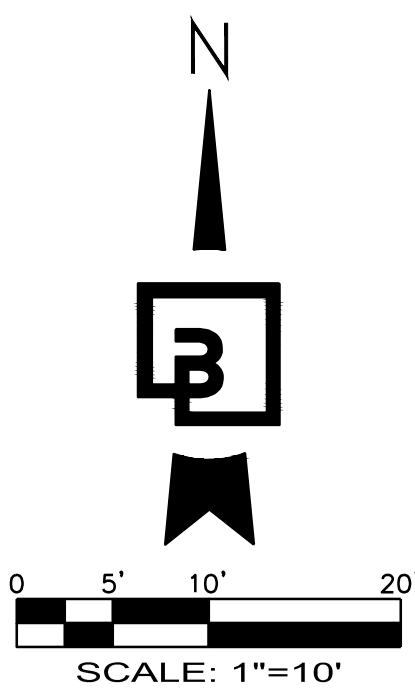
**DRAINAGE SUMMARY TABLE**

| PROPOSED CONDITIONS |                            |            |          |                    |                             |
|---------------------|----------------------------|------------|----------|--------------------|-----------------------------|
| BASIN               | AREA                       | RUNOFF (c) | TC (min) | i (10-YR) (in/hr)  | PEAK Q <sub>100</sub> (cfs) |
| A-1                 | 20,555 SF (0.47 AC)        | 0.73       | 5        | 6.00               | 2.06                        |
| A-2                 | 4,170 SF (0.10 AC)         | 0.59       | 5        | 6.00               | 0.34                        |
| <b>TOTAL</b>        | <b>24,725 SF (0.57 AC)</b> |            |          |                    | <b>2.40</b>                 |
| BASIN               | AREA                       | RUNOFF (c) | TC (min) | i (100-YR) (in/hr) | PEAK Q <sub>100</sub> (cfs) |
| A-1                 | 20,555 SF (0.47 AC)        | 0.79       | 5        | 9.00               | 3.36                        |
| A-2                 | 4,170 SF (0.10 AC)         | 0.67       | 5        | 9.00               | 0.57                        |
| <b>TOTAL</b>        | <b>24,725 SF (0.57 AC)</b> |            |          |                    | <b>3.93</b>                 |

**LEGEND**

- EXISTING CURB TO REMAIN
- EXISTING LANDSCAPING
- EXISTING GRAVEL
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- DRAINAGE FLOW
- DRAINAGE AREA
- HYDROLOGY NODE

BASIN NAME: A-1  
BASIN AREA (ac): 0.10 AC

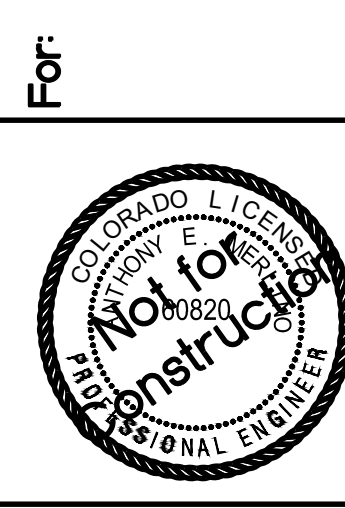
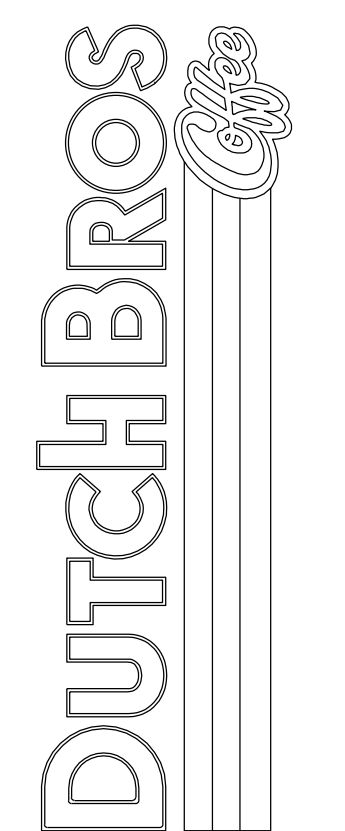


L=136.79' (C)  
R=100.00' (R3&C)  
Δ=78°26'27" (C)  
CH=550°44'44" E  
CH=126.37' (C)  
L=137.01' (R3)  
Δ=78°30'13" (R3)  
CH=S51°39'54" E  
CH=126.55' (R3)

L=156.27' (C)  
R=100.00' (R3&C)  
Δ=89°32'01" (C)  
CH=N44°19'31" W  
CH=140.85' (C)  
L=155.57' (R3)  
Δ=89°08'05" (R3)  
CH=N45°00'29" W  
CH=140.35' (R3)

| No. | Date | By | Chd. | Appr. | Revision |
|-----|------|----|------|-------|----------|
|     |      |    |      |       |          |

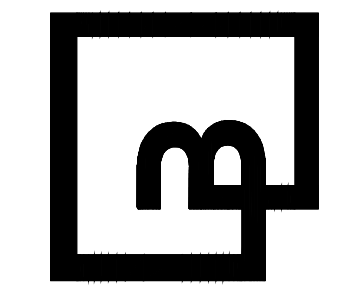
Title: **PROPOSED DRAINAGE PLAN**  
5810 OMAHA BLVD  
COLORADO SPRINGS, CO 80915



Scale: Horizontal 1" = 10' Vertical N/A

Designed: EMM  
Drawn: EMM  
Checked: AEM  
Approved: AEM  
Date: 05/24/24

For: **Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222 [barghausen.com](http://barghausen.com)



Job Number: **23098**  
Sheet: **1 OF 1**  
2019 D&A  
Franchising USA, LLC

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# APPENDIX C

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- HYDROLOGY CALCULATIONS
- HYDRAULIC CALCULATIONS



Project: Dutch Bros - CO0907  
 Location: 5810 Omaha Blvd, Colorado Springs, CO  
 BCE#: 23098

**Rational Method**

Please include the calculations for the proposed basins. They appear to be missing.

**EXISTING**

|                      |        |
|----------------------|--------|
| Basin:               | A-1    |
| Total Area (sf)      | 24,160 |
| Total Area (ac)      | 0.55   |
| Roof (sf)            | 2,605  |
| Impervious Area (sf) | 18,780 |
| Pervious Area (sf)   | 2,775  |
| Total Area (sf)      | 24,160 |

%Impervious (i) 0.89

Runoff Coefficient, c (per Table 5-1 Runoff Coefficient - Commercial)  
 Soil Type (per NRCS Web Soil Survey)

| Soil Type           | B     |        |
|---------------------|-------|--------|
|                     | 10 YR | 100 YR |
| Roof                | 0.9   | 0.95   |
| Paved, Drive & Walk | 0.9   | 0.95   |
| Lawns               | 0.25  | 0.35   |
|                     | A-1   |        |
| C10 =               | 0.83  |        |
| C100 =              | 0.88  |        |

Rainfall Intensity, i (in/hr) (per Figure 5-1 - Colorado Springs Rainfall Intensity Duration Frequency)

|                | 5 (min) |
|----------------|---------|
| i10 (in/hr) =  | 6.00    |
| i100 (in/hr) = | 9.00    |

Runoff, Q (cfs), assume min Tc = 5 min Q = C \* i \* A

|              | A-1  |
|--------------|------|
| Q10 (cfs) =  | 2.75 |
| Q100 (cfs) = | 4.40 |





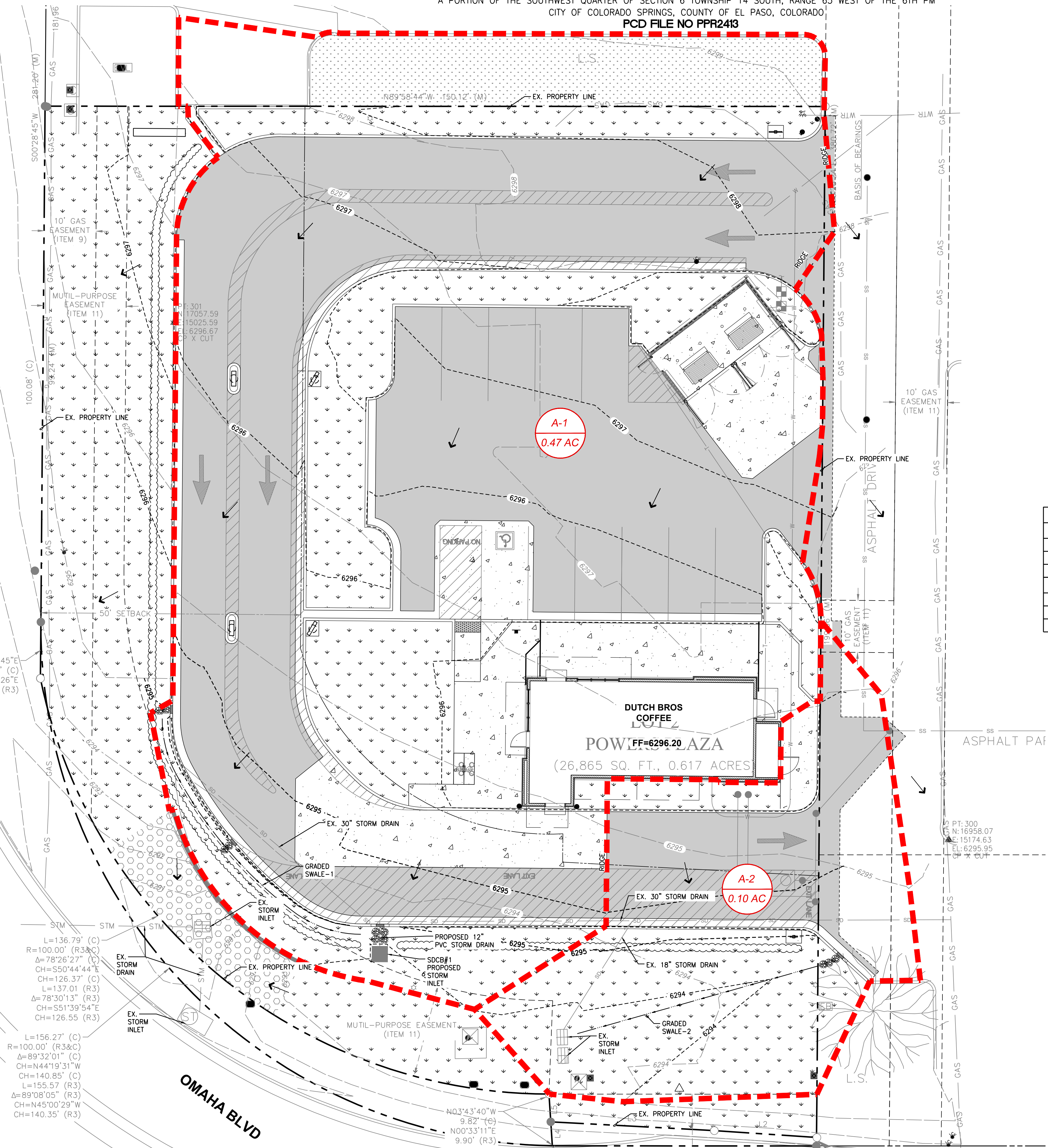
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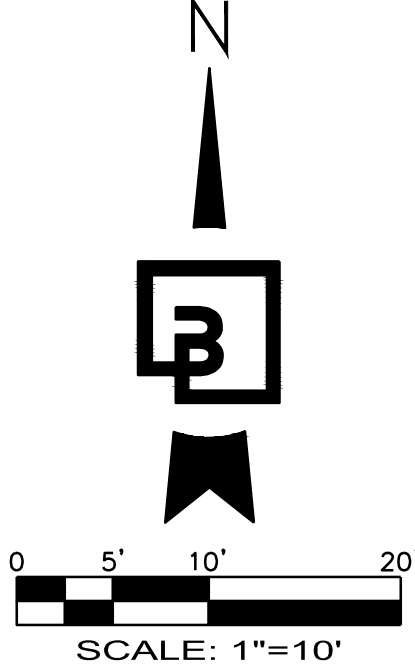


DRAINAGE SUMMARY TABLE

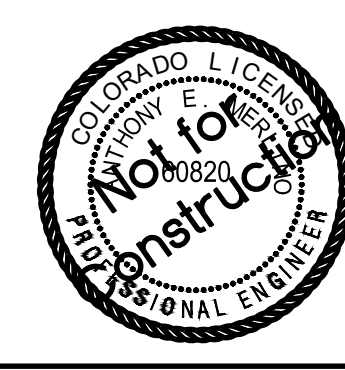
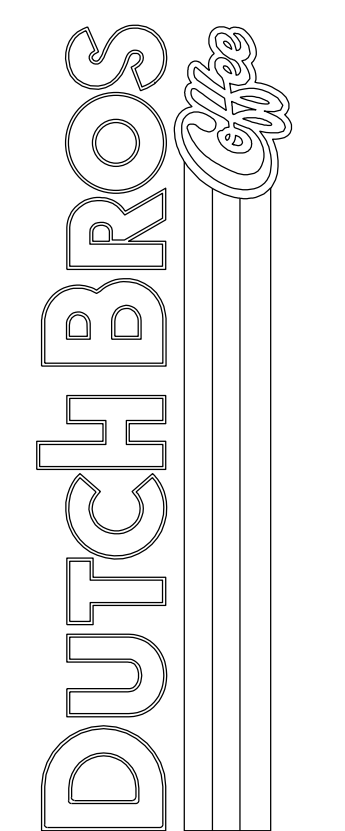
| PROPOSED CONDITIONS |                     |            |          |                    |                             |
|---------------------|---------------------|------------|----------|--------------------|-----------------------------|
| BASIN               | AREA                | RUNOFF (c) | TC (min) | i (10-YR) (in/hr)  | PEAK Q <sub>100</sub> (cfs) |
| A-1                 | 20,555 SF (0.47 AC) | 0.73       | 5        | 6.00               | 2.06                        |
| A-2                 | 4,170 SF (0.10 AC)  | 0.59       | 5        | 6.00               | 0.34                        |
| TOTAL               | 24,725 SF (0.57 AC) |            |          |                    | 2.40                        |
| BASIN               | AREA                | RUNOFF (c) | TC (min) | i (100-YR) (in/hr) | PEAK Q <sub>100</sub> (cfs) |
| A-1                 | 20,555 SF (0.47 AC) | 0.79       | 5        | 9.00               | 3.36                        |
| A-2                 | 4,170 SF (0.10 AC)  | 0.67       | 5        | 9.00               | 0.57                        |
| TOTAL               | 24,725 SF (0.57 AC) |            |          |                    | 3.93                        |

LEGEND

- EXISTING CURB TO REMAIN
- EXISTING LANDSCAPING
- EXISTING GRAVEL
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- DRAINAGE FLOW
- DRAINAGE AREA
- HYDROLOGY NODE



**PROPOSED DRAINAGE PLAN**  
5810 OMAHA BLVD  
COLORADO SPRINGS, CO 80915



**Barchausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222 [barchausen.com](http://barchausen.com)

Job Number: **23098**  
Sheet: **1 OF 1**

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Date: 05/24/24  
Designed: EMM  
Drawn: EMM  
Checked: AEM  
Approved: AEM  
Date: 05/24/24  
EMG/EL



# Channel Report

## Graded Swale - 1

### Triangular

Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 1.00

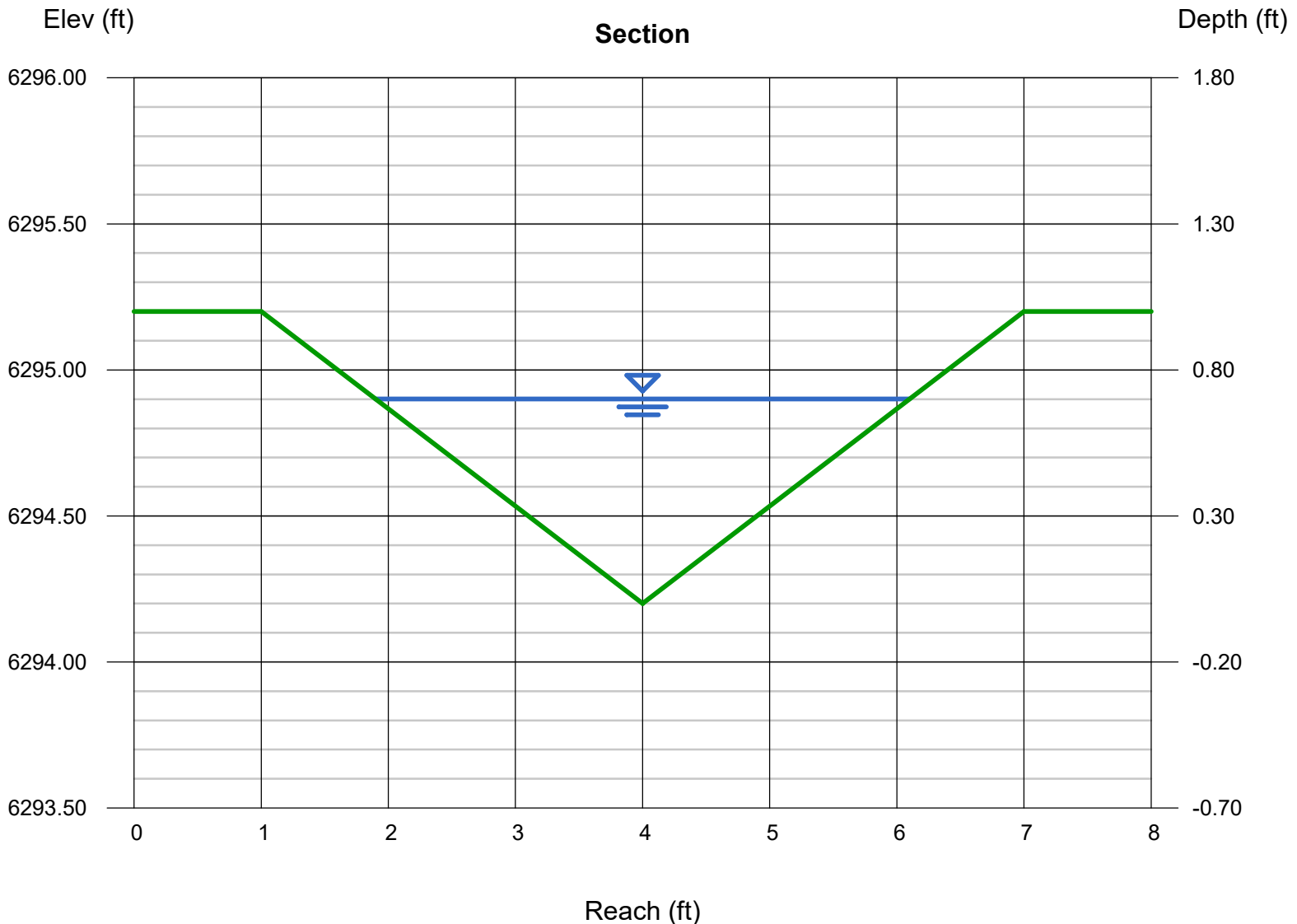
Invert Elev (ft) = 6294.20  
Slope (%) = 1.00  
N-Value = 0.030

### Calculations

Compute by: Known Q  
Known Q (cfs) = 3.36

### Highlighted

Depth (ft) = 0.70  
Q (cfs) = 3.360  
Area (sqft) = 1.47  
Velocity (ft/s) = 2.29  
Wetted Perim (ft) = 4.43  
Crit Depth, Yc (ft) = 0.61  
Top Width (ft) = 4.20  
EGL (ft) = 0.78



# Channel Report

## Graded Swale - 2

### Triangular

Side Slopes (z:1) = 3.00, 3.00  
Total Depth (ft) = 1.00

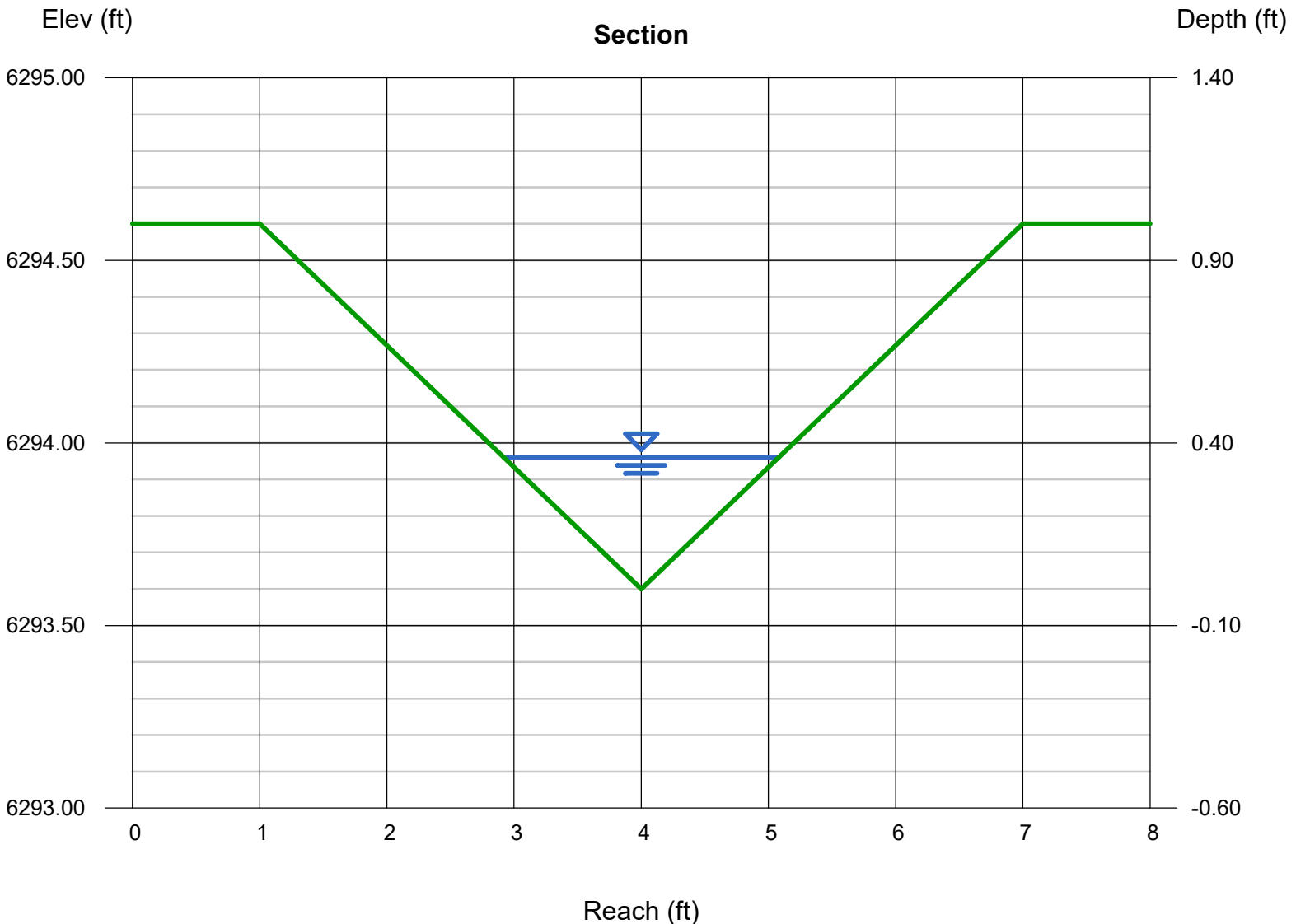
Invert Elev (ft) = 6293.60  
Slope (%) = 1.00  
N-Value = 0.030

### Calculations

Compute by: Known Q  
Known Q (cfs) = 0.57

### Highlighted

Depth (ft) = 0.36  
Q (cfs) = 0.570  
Area (sqft) = 0.39  
Velocity (ft/s) = 1.47  
Wetted Perim (ft) = 2.28  
Crit Depth, Yc (ft) = 0.30  
Top Width (ft) = 2.16  
EGL (ft) = 0.39



# Channel Report

## 12-in PVC SD

### Circular

Diameter (ft) = 1.00

Invert Elev (ft) = 6290.83

Slope (%) = 1.00

N-Value = 0.011

### Calculations

Compute by: Known Q

Known Q (cfs) = 3.36

### Highlighted

Depth (ft) = 0.68

Q (cfs) = 3.360

Area (sqft) = 0.57

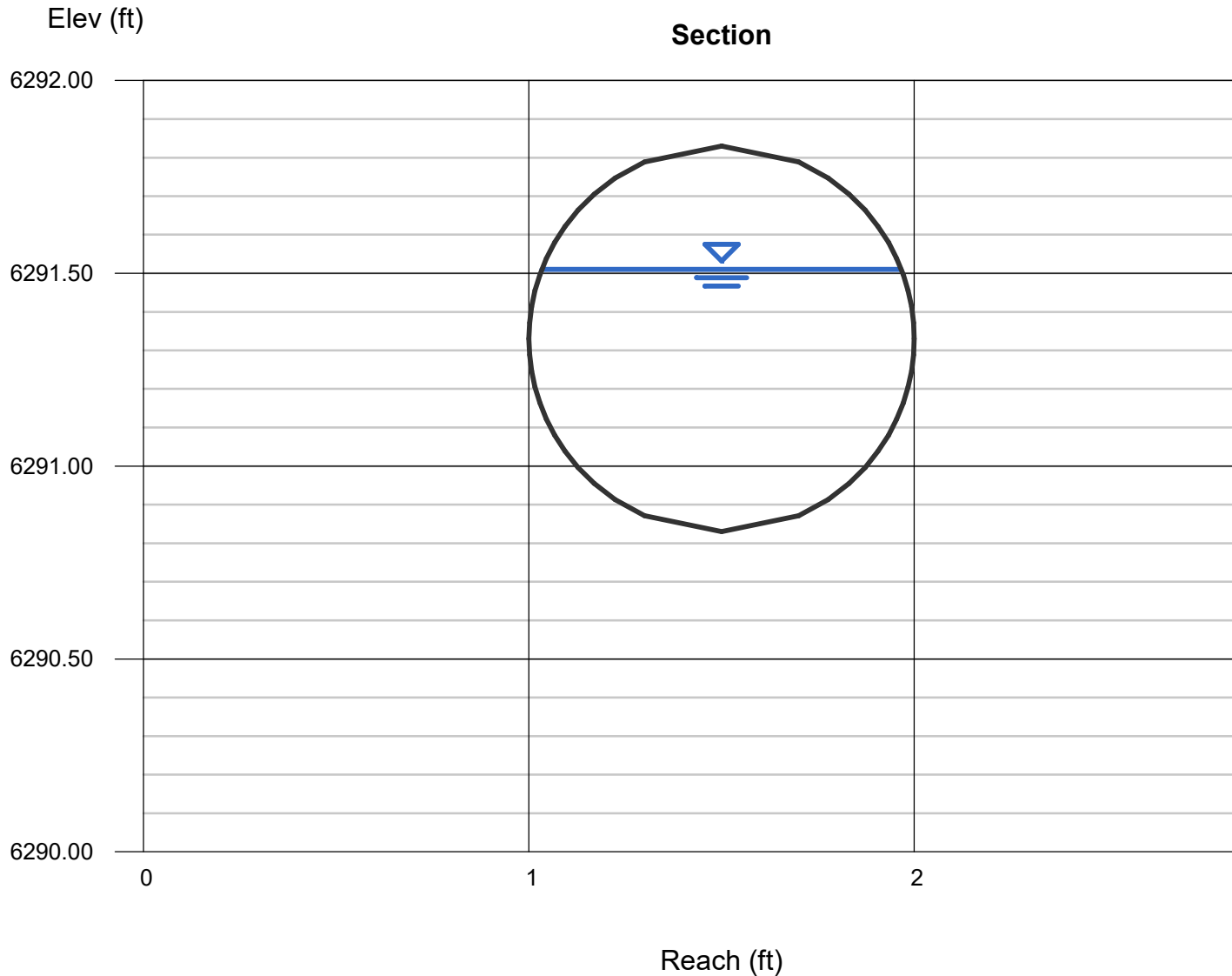
Velocity (ft/s) = 5.90

Wetted Perim (ft) = 1.94

Crit Depth, Yc (ft) = 0.79

Top Width (ft) = 0.93

EGL (ft) = 1.22



# Inlet Report

## SDCB#1

### Drop Grate Inlet

|                    |        |
|--------------------|--------|
| Location           | = Sag  |
| Curb Length (ft)   | = -0-  |
| Throat Height (in) | = -0-  |
| Grate Area (sqft)  | = 4.00 |
| Grate Width (ft)   | = 2.00 |
| Grate Length (ft)  | = 2.00 |

### Gutter

|                   |         |
|-------------------|---------|
| Slope, Sw (ft/ft) | = 0.083 |
| Slope, Sx (ft/ft) | = 0.083 |
| Local Depr (in)   | = -0-   |
| Gutter Width (ft) | = 1.50  |
| Gutter Slope (%)  | = -0-   |
| Gutter n-value    | = -0-   |

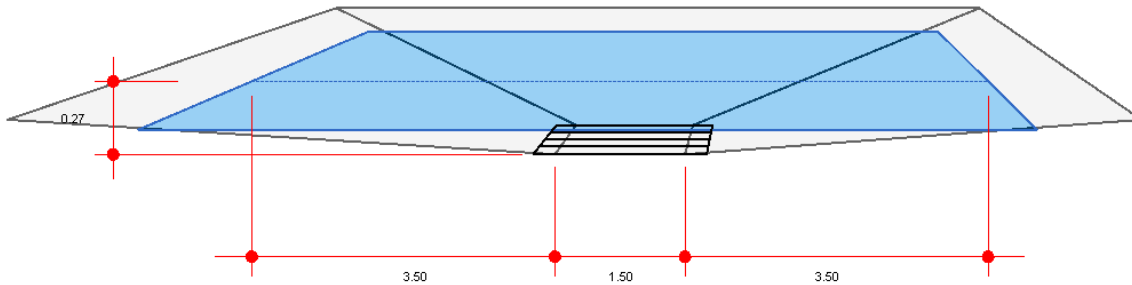
### Calculations

|             |         |
|-------------|---------|
| Compute by: | Known Q |
| Q (cfs)     | = 3.36  |

### Highlighted

|                     |        |
|---------------------|--------|
| Q Total (cfs)       | = 3.36 |
| Q Capt (cfs)        | = 3.36 |
| Q Bypass (cfs)      | = -0-  |
| Depth at Inlet (in) | = 3.23 |
| Efficiency (%)      | = 100  |
| Gutter Spread (ft)  | = 8.49 |
| Gutter Vel (ft/s)   | = -0-  |
| Bypass Spread (ft)  | = -0-  |
| Bypass Depth (in)   | = -0-  |

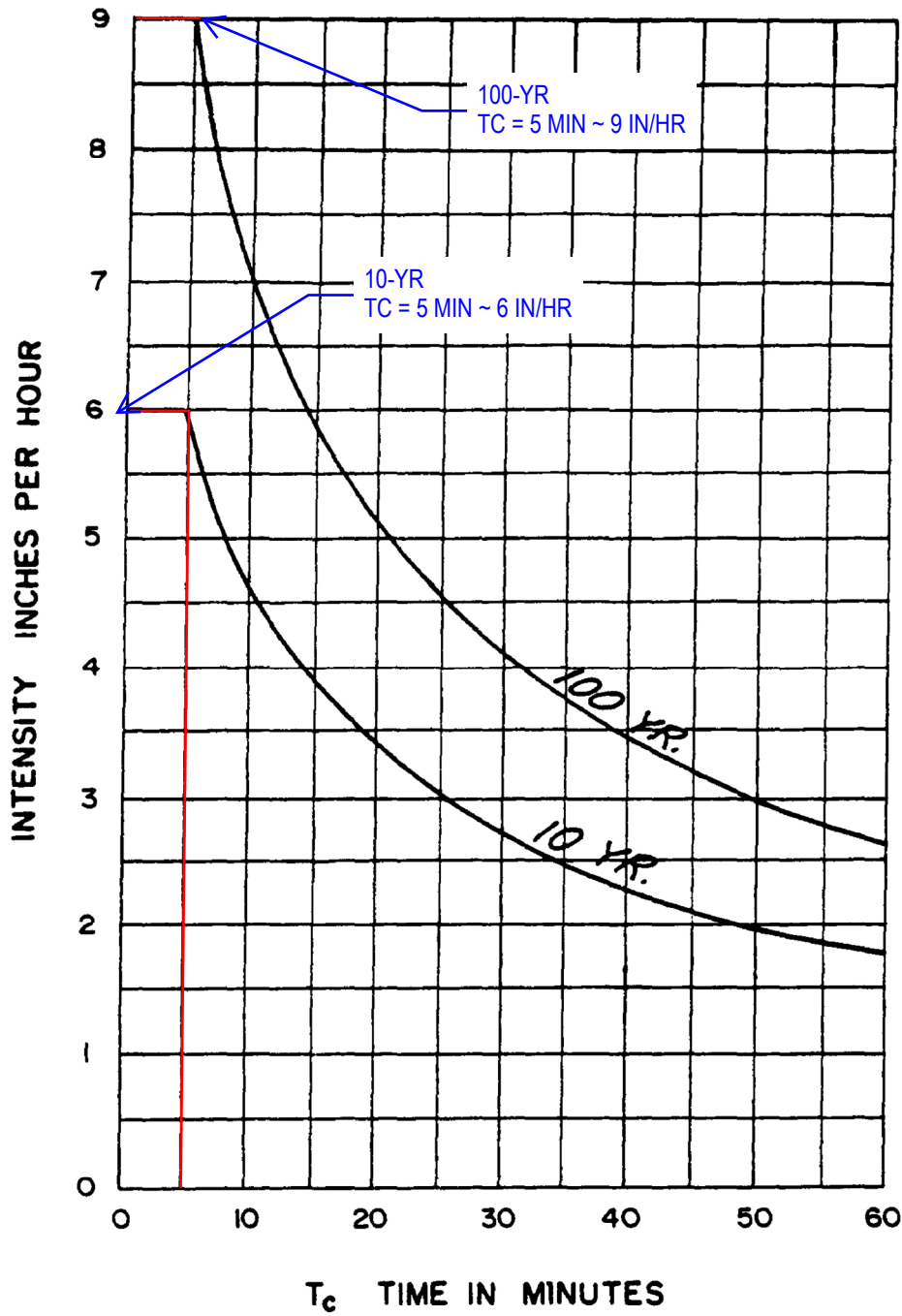
All dimensions in feet



# APPENDIX D

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## REFERENCES



RE: Based upon Pikes Peak area council of governments/  
areawide urban runoff control manual.



HDR Infrastructure, Inc.  
A Centerra Company

The City of Colorado Springs / El Paso County  
Drainage Criteria Manual

Storm Rainfall  
Time Intensity-Frequency Curves

Date

OCT. 1987

Figure

5 - 1



TABLE 5-1 RECOMMENDED AVERAGE RUNOFF COEFFICIENTS AND PERCENT IMPERVIOUS

EXPAND

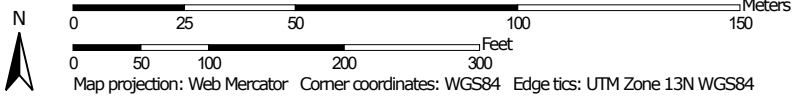
| LAND USE OR SURFACE CHARACTERISTICS               | PERCENT IMPERVIOUS | "C" FREQUENCY |      |      |      |
|---|--------------------|---------------|------|------|------|
|   |                    | 10            |      | 100  |      |
|   |                    | A&B*          | C&D* | A&B* | C&D* |
| <b>Business</b>                                   |                    |               |      |      |      |
| Commercial Areas                                  | 95                 | 0.90          | 0.90 | 0.90 | 0.90 |
| Neighborhood Areas                                | 70                 | 0.75          | 0.75 | 0.80 | 0.80 |
| <b>Residential</b>                                |                    |               |      |      |      |
| ¼ Acre or less                                    | 65                 | 0.60          | 0.70 | 0.70 | 0.80 |
| ¼ Acre  | 40                 | 0.50          | 0.60 | 0.60 | 0.70 |
| ½ Acre  | 30                 | 0.40          | 0.50 | 0.55 | 0.60 |
| ¾ Acre  | 25                 | 0.35          | 0.45 | 0.45 | 0.55 |
| 1 Acre  | 20                 | 0.30          | 0.40 | 0.40 | 0.50 |
| <b>Industrial</b>                                 |                    |               |      |      |      |
| Light Areas                                       | 80                 | 0.70          | 0.70 | 0.80 | 0.80 |
| Heavy Areas                                       | 90                 | 0.80          | 0.80 | 0.90 | 0.90 |
| Parks and Cemeteries                              | 7                  | 0.30          | 0.35 | 0.55 | 0.60 |
| Playgrounds                                       | 13                 | 0.30          | 0.35 | 0.60 | 0.65 |
| Railroad Yard Areas                               | 40                 | 0.50          | 0.55 | 0.60 | 0.65 |
| <b>Undeveloped Areas</b>                          |                    |               |      |      |      |
| Historic Flow Analysis-Greenbelts, Agricultural   | 2                  | 0.15          | 0.25 | 0.20 | 0.30 |
| Pasture/Meadow                                    | 0                  | 0.25          | 0.30 | 0.35 | 0.45 |
| Forest  | 0                  | 0.10          | 0.15 | 0.15 | 0.20 |
| Exposed Rock                                      | 100                | 0.90          | 0.90 | 0.95 | 0.95 |
| Offsite Flow Analysis (when land use not defined) | 45                 | 0.55          | 0.60 | 0.65 | 0.70 |
| <b>Streets</b>                                    |                    |               |      |      |      |
| Paved   | 100                | 0.90          | 0.90 | 0.95 | 0.95 |
| Gravel  | 80                 | 0.80          | 0.80 | 0.85 | 0.85 |
| Drive and Walks                                   | 100                | 0.90          | 0.90 | 0.95 | 0.95 |
| Roofs   | 90                 | 0.90          | 0.90 | 0.95 | 0.95 |
| Lawns   | 0                  | 0.25          | 0.30 | 0.35 | 0.45 |
| *Hydrologic Soil Group                            |                    |               |      |      |      |

Hydrologic Soil Group—El Paso County Area, Colorado




Soil Map may not be valid at this scale.

Map Scale: 1:1,700 if printed on A landscape (11" x 8.5") sheet.



### 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 1:24,000.

**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 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Aug 19, 2018—Sep 23, 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.

## Hydrologic Soil Group

| Map unit symbol                    | Map unit name                             | Rating | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------|--------------|----------------|
| 10                                 | Blendon sandy loam, 0 to 3 percent slopes | B      | 10.9         | 100.0%         |
| <b>Totals for Area of Interest</b> |   |        | <b>10.9</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.

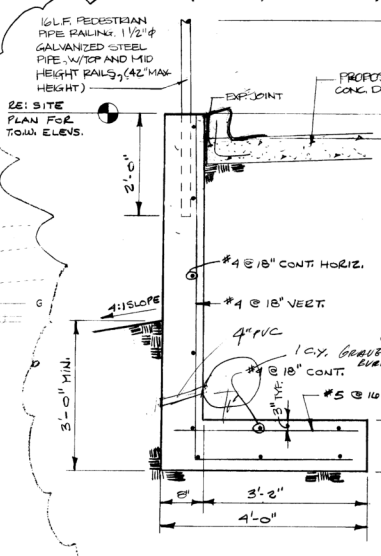
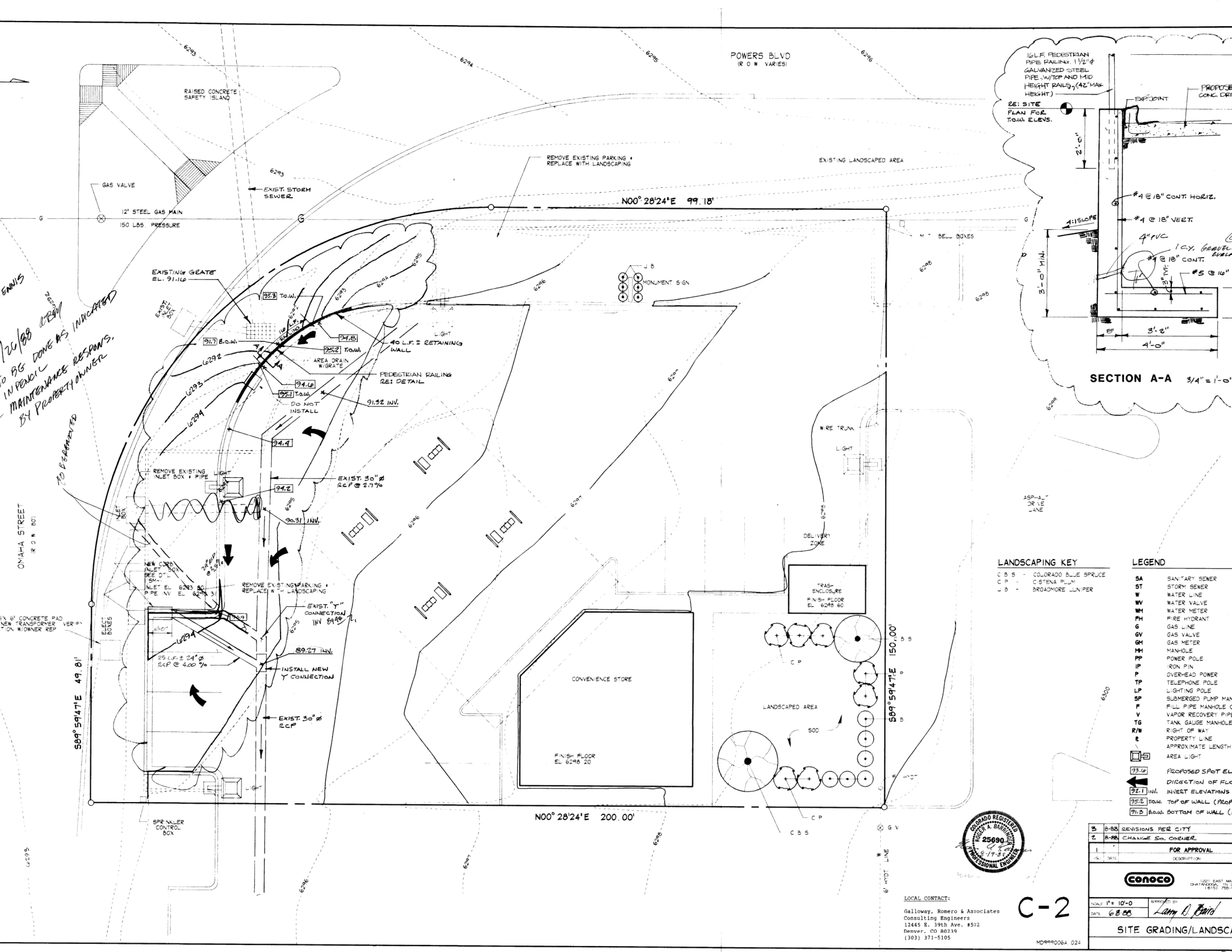
### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified







- LANDSCAPING KEY**
- C.B.S. - COLORADO BLUE SPRUCE
  - C.P. - CISTENA PLUM
  - L.B. - BROADMORRE JUNIPER
- LEGEND**
- SA - SANITARY SEWER
  - ST - STORM SEWER
  - W - WATER LINE
  - WW - WATER VALVE
  - WM - WATER METER
  - PH - FIRE HYDRANT
  - G - GAS LINE
  - GV - GAS VALVE
  - GM - GAS METER
  - MH - MANHOLE
  - PP - POWER POLE
  - IP - IRON PIN
  - P - OVERHEAD POWER
  - TP - TELEPHONE POLE
  - LP - LIGHTING POLE
  - SP - SUBMERGED PUMP MANHOLE
  - F - FILL PIPE MANHOLE
  - V - VAPOR RECOVERY PIPE
  - TG - TANK GAUGE MANHOLE
  - R/W - RIGHT OF WAY
  - E - PROPERTY LINE
  - Y - APPROXIMATE LENGTH
  - - AREA LIGHT
  - 93.1P - PROPOSED SPOT ELEV.
  - 92.1 - DIRECTION OF FLOW
  - 91.1 INV. - INVERT ELEVATIONS
  - 95.2 TOW. - TOP OF WALL (PROP)
  - 91.5 BOW. - BOTTOM OF WALL (PROP)



|                                 |                       |                    |
|---------------------------------|-----------------------|--------------------|
| 3                               | 8-88                  | REVISIONS PER CITY |
| 2                               | 8-88                  | CHANGE S.C. CORNER |
| FOR APPROVAL                    |                       |                    |
| 1                               | DATE                  | DESCRIPTION        |
| <b>CONOCO</b>                   |                       |                    |
| SCALE 1" = 10'-0"               | APPROVED BY           |                    |
| DATE 6-8-88                     | <i>Larry A. Baird</i> |                    |
| <b>SITE GRADING/LANDSCAPING</b> |                       |                    |

LOCAL CONTACT:  
 Galloway, Romero & Associates  
 Consulting Engineers  
 12445 B. 39th Ave. #502  
 Denver, CO 80239  
 (303) 371-5105

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