



## Phase II Drainage Report

### KEYBANK DAWSON TRAILS

Lot 4 Dawson Trails Filing No. 2 Amendment No. 4  
Dawson Trails Blvd & Gambel Ridge Blvd.  
Castle Rock, CO

**OWNER:**

**ACM Dawson Trails VII JV LLC**  
**4100 E Mississippi Ave, Suite 500**  
**Denver, Co 80246**  
**Tel: (303) 984-9800**  
**Attn: Larry Jacobson**

**Developer:**

**KeyBank**  
**Contact: Stacie\_Flaisman@KeyBank.com**  
**Attn: Stacie Flaisman**

**PREPARED BY:**

**Galloway & Company, LLC**  
**5500 Greenwood Plaza Blvd., Suite 200**  
**Greenwood Village, CO 80111**  
**Tel: (303) 770-8884**  
**Attn: Casey Volt**

**DATE:**

**January 30, 2026**

**REVISED:**

**March 19, 2026**



**ENGINEER'S STATEMENT**

*I affirm that this report and plan for the Final drainage design for KeyBank Dawson Trails was prepared by me (or under my direct supervision) in accordance with the provisions of the Drainage Criteria Manual for the owners thereof. I understand that the Town of Castle Rock does not and will not assume liability for drainage facilities designed by others.*

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Casey Volt, PE #61071  
For and on behalf of Galloway & Company, LLC

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Prepared By  
Hailey Reynolds

**DEVELOPER'S CERTIFICATION**

*"KeyBank hereby certifies that the drainage facilities for KeyBank Dawson Trails shall be constructed according to the design presented in this report. I understand that the Town of Castle Rock does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that the Town of Castle Rock reviews drainage plans pursuant to the Municipal Code; but cannot, on behalf of KeyBank Dawson Trails, guarantee that final drainage design review will absolve KeyBank and/or their successors and/or assigns of future liability for improper design."*

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Authorized Signature  
KeyBank

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Date

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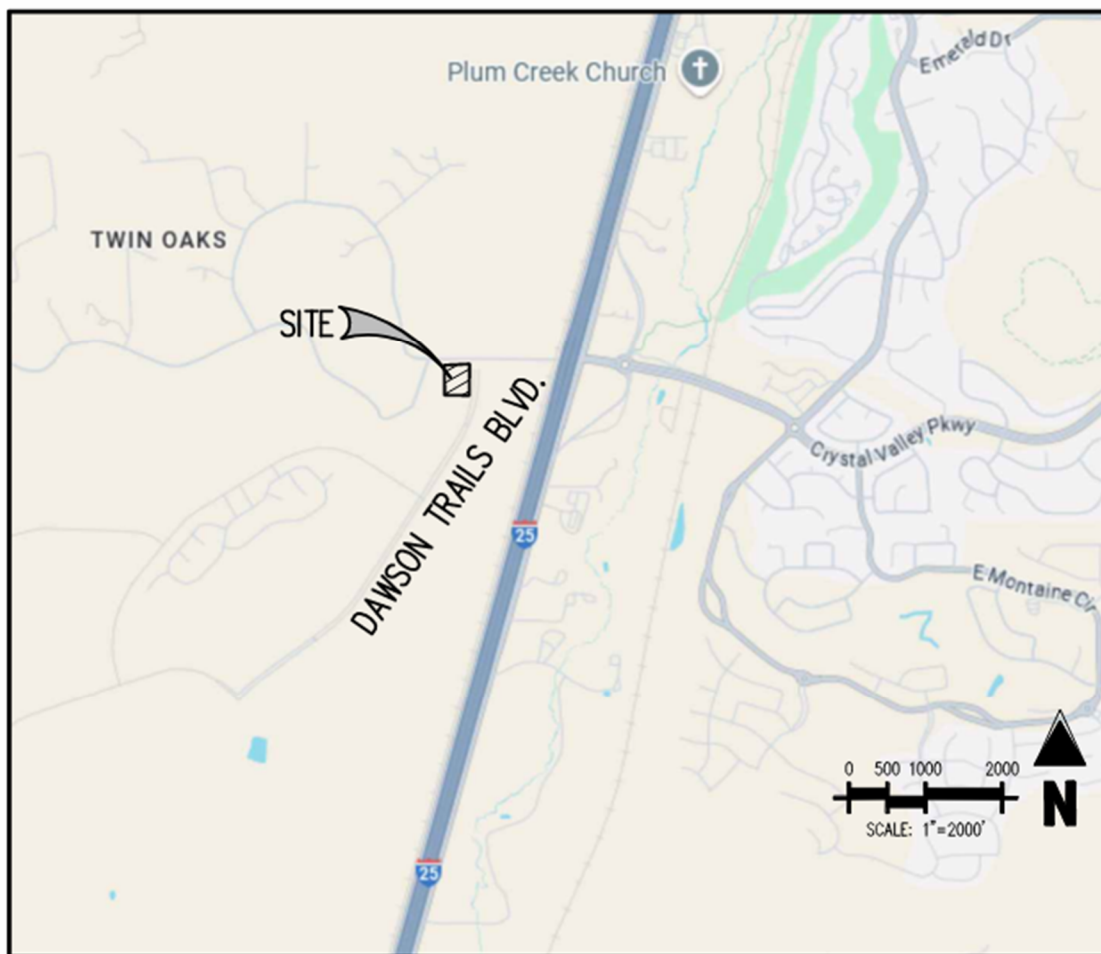
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- B. Water Quality Computations
- C. Reference Information
- D. Drainage Map

## I. INTRODUCTION

The intent of this report is to demonstrate that the proposed development, KeyBank Dawson Trails, complies with the regulatory requirements outlined in the Town of Castle Rock Storm Drainage Design and Technical Manual. This report provides drainage analysis for the build out of the entire site. This report will also demonstrate compliance with the King Soopers Store #165 Lot 1, Dawson Trails No. 2, Amendment 5 Phase III Drainage Report compiled by Galloway & Company in December 2025 and revised in January 2026.

### SITE LOCATION

The site is located in the southwest quarter of section 22, township 8 South, range 67 west of the 6<sup>th</sup> principal meridian, in the Town of Castle Rock, Douglas County, State of Colorado. The site is bound by Dawson Trails Blvd. on the east, by Gambel Ridge Blvd on the north, by vacant land to the south that is proposed by others to be developed into a King Soopers grocery store and fueling station, and to the east by vacant land that is proposed by others to be developed into a commercial unit.



VICINITY MAP  
SCALE: 1" = 2000'

## DESCRIPTION OF PROPERTY AND LAND USE

The project site covers  $\pm 0.91$  acres. The proposed improvements include a commercial KeyBank building, internal roadways, wet/dry utilities and landscaping in common areas.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the project site consists of one of soil type and Hydrologic Soil Group (HSG):

- Loamy alluvial land, HSG 'C'

The predominant on-site hydrologic soil group is "C". Group C soils have 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. Refer to Appendix A for soil survey information.

The project site is not impacted by a FEMA designated floodplain (refer to Appendix C for FEMA FIRMet map).

## II. DRAINAGE BASINS AND SUB-BASINS

### MAJOR DRAINAGE BASINS

Drainage for this site has been accounted for and is part of Basin D7b in the King Soopers Store #165, Lot 1, Dawson Trails No. 2, Amendment 5 Phase III Drainage Report. This basin ultimately drains to the existing Regional C1 Pond, located immediately south of Crystal Valley Parkway, between Dawson Trails Boulevard and Interstate 25. This pond provides both detention and water quality for the site. In the King Soopers Store #165, Lot 1, Dawson Trails No. 2, Amendment 5 Phase III Drainage Report, basin D7b had an assumed imperviousness of 65%. Since the proposed development has a reduced imperviousness of 62.8%, there will be no negative impacts of the development on the existing downstream infrastructure or detention facility. Additionally, the reduced imperviousness demonstrates compliance with the King Soopers Report.

### MINOR DRAINAGE BASINS

In the developed condition, the existing Regional C1 pond will provide Full Spectrum Detention that the majority of developed runoff from the site will be conveyed to. The onsite runoff will be conveyed through the site via roadway curb and gutter, swales, and storm sewer to the detention pond.

**Sub-basin D7b-1** is approximately 0.25 acres comprised of landscape and parking area along the western side of the site with a 72.2% impervious surface area. Runoff from this basin will result in peak flows of 0.6 cfs and 1.8 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed via overland flow and curb and gutter to the 5' sump CDOT Type R inlet located at Design Point 1.

**Sub-basin D7b-2** is approximately 0.03 acres comprised of landscaped area on the south side of the proposed KeyBank building with a 20% impervious surface area. Runoff from this basin will result in peak flows of 0 cfs and 0.2 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed with overland flow and a swale to the Nyloplast drain inlet located at Design Point 6.

**Sub-basin D7b-3** is approximately 0.07 acres comprised of a roof area with a 95% impervious surface area. Runoff from this basin will result in peak flows of 0.2 cfs and 0.5 cfs in the minor and major storm events respectively. Runoff from this basin via roof drains to the storm sewer system at Design Point 4.

**Sub-basin D7b-4** is approximately 0.20 acres comprised of landscape, swale, and parking area along the south eastern side of the site with a 60.7% impervious surface area. Runoff from this basin will result in peak flows of 0.3 cfs and 1.1 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed with curb and gutter, overland flow, and a swale to the sump inlet located at Design Point 9.

**Sub-basin D7b-5** is approximately 0.19 acres comprised of landscape, swale, and parking area along the northeastern side of the site with a 71.2% impervious surface area. Runoff from this basin will result in peak flows of 0.4 cfs and 1.3 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed with curb and gutter, overland flow, and a grass swale to the sump inlet located at Design Point 2.

**Sub-basin D7b-6** is approximately 0.10 acres comprised of landscaped and sidewalk area along the north side of the site with a 37.4% impervious surface area. Runoff from this basin will result in peak flows of 0.1 cfs and 0.4 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed via overland flow to design point A, where it reaches the existing inlet in Dawson Trails Blvd. and ultimately drains to the offsite C1 Regional Pond.

**Sub-basin D7b-7** is approximately 0.06 acres comprised of landscaped and sidewalk area along the east side of the site with a 34.8% impervious surface area. Runoff from this basin will result in peak flows of 0.1 cfs and 0.5 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed via overland flow to design point B, where it reaches the proposed by others inlet in Gambel Ridge Blvd. and ultimately drains to the offsite C1 Regional Pond.

**Sub-basin OS1** is approximately 0.04 acres comprised of landscaped area along the southern side of the site with a 21.9% impervious surface area. Runoff from this basin will result in peak flows of 0 cfs and 0.2 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed via overland flow to Design Point 8, and eventually to the sump inlet at Design Point 9.

**Sub-basin OS2** is approximately 0.11 acres comprised of landscaped and paved area along the western side of the site with a 32.4% impervious surface area. Runoff from this basin will result in peak flows of 0.1 cfs and 0.6 cfs in the minor and major storm events respectively. Runoff from this basin be conveyed via overland flow to the sump inlet at Design Point 1.

### III. DRAINAGE DESIGN CRITERIA

#### REGULATIONS

The final drainage design presented herein was prepared in accordance with:

- *Town of Castle Rock Storm Drainage Design and Technical Manual* [Criteria];
- *Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manuals Volumes 1, 2 and 3* [Manual];

#### DRAINAGE STUDIES, MASTER PLANS, SITE CONSTRAINTS

This project will conform to the Phase III Drainage Report for the King Soopers Store #165 Lot 1, Dawson Trails No. 2, Amendment 5 site, and all addendums to said report. The project will also conform to the Phase III Drainage Report for Dawson Trails Filing No.2, Project No. CD23-0045, and all addendums to said report.

## HYDROLOGY

The drainage calculations are based on the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual. The design point rainfall values listed below were obtained from Table 6-1 of the SDDTCM for the 60-minute storm duration.

**Table 1 – Precipitation Data**

| <b>1-Hour Point Rainfall Values for the Town of<br/>Castle Rock (inches)</b> |          |           |           |            |
|------------------------------------------------------------------------------|----------|-----------|-----------|------------|
| <b>2</b>                                                                     | <b>5</b> | <b>10</b> | <b>50</b> | <b>100</b> |
| 1.06                                                                         | 1.43     | 1.66      | 2.26      | 2.60       |

The time of concentration for each basin was calculated using the SF-2 form, which is based on the Section 6.3.2 of the SDDTCM and the Mile High Flood District Urban Storm Drainage Criteria Manual, Chapter 6 (refer to Appendix B for  $t_c$  calculations).

The Rational Method is based on the Rational Formula:

$$Q = CiA$$

Where:

$Q$  = the maximum rate of runoff, cfs

$C$  = a runoff coefficient that is the ratio between the runoff volume from an area and the average rate of rainfall depth over a given duration for that area

$i$  = average intensity of rainfall in inches per hour for a duration equal to the Time of Concentration ( $T_c$ )

$A$  = area, acres

The 2-year and 100-year storm events are the basis for the preliminary drainage system design. The 2-year storm is considered the minor storm event. It has a fifty percent probability of exceedance during any given year. The 100-year storm is considered the major storm event. It has a one percent probability of exceedance during any given year.

The 2-year drainage system, at a minimum, must be designed to transport runoff from the 2-year recurrence interval storm event with minimal disruption to the urban environment. The 100-year drainage system, as a minimum, must be designed to convey runoff from the 100-year recurrence interval flood to minimize life hazards and health, damage to structures, and interruption to traffic and services.

## HYDRAULICS

Inlets will be sized using the MHFD spreadsheet for inlet capacity, and pipes will be sized using manning's equation.

## WATER QUALITY ENHANCEMENT

The Four Step Process is used to minimize the adverse impacts of urbanization and is a vital component of developing a balanced, sustainable project. Below identifies the approach to the four-step process:

### 1. Employ Runoff Reduction Practices

The proposed development uses Low Impact Development (LID) practices to reduce runoff at the source. Rather than creating point discharges that are directly connected to impervious areas, runoff is routed through pervious areas to promote infiltration and minimize directly connected impervious areas (MDCIA). Grass buffers and swales are used where practical.

**2. Treat and Slowly Release Water Quality Capture Volume (WQCV)**

This step utilizes formalized water quality capture volume to slow the release of runoff from the site. The existing regional full spectrum detention pond will contain WQCV which will be released in no less than 40 hours.

**3. Stabilize Stream Channels**

This step implements stabilization to channels to accommodate developed flows while protecting infrastructure and controlling sediment loading from erosion in the drainageways. No proposed outfalls or connections to drainageways are proposed with this development, so this step is not used.

**4. Implement Source Controls**

The biggest source control BMP is public education which can be found on the Town of Castle Rock website and discusses topics such as: pet waste, car washing, lawn care, fall leaves, and snow melt and deicer. The landscaping and snow removal is handled completely by the property management to ensure proper lawn mowing and grassing clipping disposal, lawn aeration, and fertilizer application is being followed. Snow removal will also be handled by the property manager to ensure proper consideration of snow pile placement and use of deicing chemicals.

The site features a water quality swale which allows flows to drain through before entering the stormwater sewer system. Water quality calculations for these swales are included in Appendix B.

## **IV. STORMWATER MANAGEMENT FACILITY DESIGN**

### **STORMWATER CONVEYANCE FACILITIES**

Runoff from the project site will be conveyed through the site via overland flow to curb and gutter and swales where the flows will be intercepted by proposed storm sewer inlets and conveyed to the existing Regional C1 full spectrum detention pond by the storm sewer pipe system.

Storm sewers will be sized to convey the 100-year storm runoff per Town of Castle Rock Criteria. Storm and inlet calculations will be provided with the Phase III Drainage Report.

### **STORMWATER STORAGE FACILITIES**

There will be no onsite stormwater storage facilities for this project. The site drainage will be conveyed to the existing Regional C1 Pond located immediately south of Crystal Valley Parkway, between Dawson Trails Blvd and Interstate 25. This pond provides both detention and water quality for the site.

### **WATER QUALITY ENHANCEMENT BEST MANAGEMENT PRACTICES**

Non-structural best management practices (BMP's) will include grass buffers, swales, and permanent seeding. Landscaping around the impervious area will also be provided to provide water quality benefit for any water running through those areas. Water quality calculations for the proposed swale on the east side of the site have been included in Appendix B.

The existing C1 Regional Pond is a structural BMP that will be utilized for this project. This pond has been designed to accommodate water quality and detention storage volume for the site.

## **FLOODPLAIN MODIFICATION**

The site lies within FEMA Flood Zone X which is described as an area of minimal flood hazard, containing an elevation higher than the 0.2 percent annual chance flood. The project is under FEMA FIRM map number 08035C0284G dated 3/16/2016.

## **ADDITIONAL PERMITTING REQUIREMENTS**

No additional permitting is required for this project.

## **V. CONCLUSIONS**

### **COMPLIANCE WITH STANDARDS**

The design presented in this final drainage report for KeyBank Castle Rock complies with both the Town of Castle Rock and Mile High Flood District standard criteria manuals.

### **VARIANCES**

No variances are requested at this time.

### **DRAINAGE CONCEPT**

Minor basins were developed on the lot based on adjacent infrastructure and the developed site plan. Each minor basin was evaluated based on the Rational Method for peak runoff for the 2-year and 100-year storm events. The peak runoff will then be used to design the inlets and pipes for the storm network. The peak runoff was used to evaluate the adequacy of the existing regional detention pond to treat the proposed runoff.

Overall, there are no changes to the existing drainage patterns of the development or impacts to the downstream storm facilities.

## **VI. REFERENCES**

1. Urban Storm Drainage Criteria Manual, Urban Drainage and Flood Control District, January 2016 (with current revisions).
2. Flood Insurance Rate Map – Jefferson County, Colorado and Incorporated Areas Community Panel No. 08035C0284G, Effective March 16, 2016.
3. Soil Map – Douglas County Area, Colorado as available through the Natural Resources Conservation Service National Cooperative Soil Survey web site via Web Soil Survey 2.0.
4. Town of Castle Rock Storm Drainage and Technical Criteria, February 18, 2025
5. King Soopers Store #165, Lot 1, Dawson Trails No. 2, Amendment 5 Phase III Drainage Report
6. Phase III Drainage Report, Dawson Trails Filing No. 2, Town of Castle Rock, Colorado, Project No. CD23-0045

## **VII. Appendices**

- A. Hydrologic Computations
- B. Water Quality Computations
- C. Reference Information
- D. Drainage Map

# **APPENDIX A**

## **Hydrologic Computations**

## COMPOSITE % IMPERVIOUS CALCULATIONS

**Subdivision:** Lot 4 Dawson Trails Filing No. 2 Amendment No. 4  
**Location:** CO, Castle Rock

**Project Name:** Keybank Castle Rock  
**Project No.:** HSB02  
**Calculated By:** HMR  
**Checked By:** CMV  
**Date:** 2026.01.22

| Basin ID   | Total Area (ac) | Hardscape & Roof |           |                 | Landscaping and Ponds |           |                 | Gravel & Misc. |           |                 | Basins Total<br>Weighted % Imp. |
|------------|-----------------|------------------|-----------|-----------------|-----------------------|-----------|-----------------|----------------|-----------|-----------------|---------------------------------|
|            |                 | % Imp.           | Area (ac) | Weighted % Imp. | % Imp.                | Area (ac) | Weighted % Imp. | % Imp.         | Area (ac) | Weighted % Imp. |                                 |
| D7b-1      | 0.25            | 95               | 0.18      | 66.1            | 20                    | 0.08      | 6.1             | 80             | 0.00      | 0.00            | 72.2                            |
| D7b-2      | 0.03            | 95               | 0.00      | 0.0             | 20                    | 0.03      | 20.0            | 80             | 0.00      | 0.00            | 20.0                            |
| D7b-3      | 0.07            | 95               | 0.07      | 95.0            | 20                    | 0.00      | 0.0             | 80             | 0.00      | 0.00            | 95.0                            |
| D7b-4      | 0.20            | 95               | 0.11      | 51.6            | 20                    | 0.09      | 9.1             | 80             | 0.00      | 0.00            | 60.7                            |
| D7b-5      | 0.19            | 95               | 0.13      | 63.5            | 20                    | 0.06      | 6.6             | 80             | 0.00      | 0.00            | 70.1                            |
| D7b-6      | 0.06            | 95               | 0.01      | 22.1            | 20                    | 0.04      | 15.3            | 80             | 0.00      | 0.00            | 37.4                            |
| D7b-7      | 0.10            | 95               | 0.02      | 18.8            | 20                    | 0.08      | 16.0            | 80             | 0.00      | 0.00            | 34.8                            |
| OS1        | 0.04            | 95               | 0.00      | 2.4             | 20                    | 0.03      | 19.5            | 80             | 0.00      | 0.00            | 21.9                            |
| OS2        | 0.11            | 95               | 0.02      | 14.6            | 21                    | 0.09      | 17.8            | 80             | 0.00      | 0.00            | 32.4                            |
|            |                 |                  |           |                 |                       |           |                 |                |           |                 |                                 |
| Total Site | 0.90            | 95               | 0.52      | 54.2            | 20                    | 0.39      | 8.6             | 80             | 0.00      | 0.00            | 62.8                            |
| Total Area | 1.05            | 95               | 0.53      | 48.3            | 20                    | 0.52      | 9.8             | 80             | 0.00      | 0.00            | 58.1                            |
|            |                 |                  |           |                 |                       |           |                 |                |           |                 |                                 |
|            |                 |                  |           |                 |                       |           |                 |                |           |                 |                                 |
|            |                 |                  |           |                 |                       |           |                 |                |           |                 |                                 |
|            |                 |                  |           |                 |                       |           |                 |                |           |                 |                                 |

## STANDARD FORM SF-2

### TIME OF CONCENTRATION

**Subdivision:** Lot 4 Dawson Trails Filing No. 2 Amendment No. 4  
**Location:** CO, Castle Rock

Project Name: Keybank Castle Rock  
Project No.: HSB02  
Calculated By: HMR  
Checked By: CMV  
Date: 2026.01.22

[illegible]

**NOTES:**

$$T_i = (0.395 * (1.1 - C_5) * (L)^{0.5}) / ((S)^{0.33}), \text{ S in ft/ft}$$

$$T_t = L/60V \text{ (Velocity From Fig. 501)}$$

Velocity  $V = C_v \cdot S^{0.5}$ ,  $S$  in ft/ft

$$T_c \text{ Regional} = (26-17i) + (L / (60(14i+9)S^{0.5})), S \text{ in ft/ft, } i = \text{Imperviousness expressed as decimal}$$

For Urbanized basins a minimum  $T_c$  of 5.0 minutes is required.

For non-urbanized basins a minimum  $T_c$  of 10.0 minutes is required

STANDARD FORM SF-3  
STORM DRAINAGE SYSTEM DESIGN  
(RATIONAL METHOD PROCEDURE)

Subdivision: Lot 4 Dawson Trails Filing No. 2 Amendment No. 4  
Location: CO, Castle Rock  
Design Storm: 2-Year

Project Name: Keybank Castle Rock  
Project No.: HSB02  
Calculated By: HMR  
Checked By: CMV  
Date: 2026.01.22

| STREET | Design Point | DIRECT RUNOFF |           |               |          |          |           |         | TOTAL RUNOFF |          |           |         | STREET    |                   | PIPE              |           |                    | TRAVEL TIME |                |                 | REMARKS |
|--------|--------------|---------------|-----------|---------------|----------|----------|-----------|---------|--------------|----------|-----------|---------|-----------|-------------------|-------------------|-----------|--------------------|-------------|----------------|-----------------|---------|
|        |              | Basin ID      | Area (Ac) | Runoff Coeff. | Tc (min) | C*A (Ac) | I (in/hr) | Q (cfs) | Tc (min)     | C*A (Ac) | I (in/hr) | Q (cfs) | Slope (%) | Street Flow (cfs) | Design Flow (cfs) | Slope (%) | Pipe Size (inches) | Length (ft) | Velocity (fps) | Tt (min)        |         |
|        | 0            | OS2           | 0.11      | 0.30          | 5.0      | 0.03     | 3.60      | 0.1     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 1            | D7b-1         | 0.25      | 0.62          | 5.0      | 0.16     | 3.59      | 0.6     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 2            | D7b-5         | 0.19      | 0.61          | 6.1      | 0.12     | 3.41      | 0.4     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 3            |               |           |               |          |          |           |         | 6.1          | 0.31     | 3.41      | 1.1     |           |                   |                   |           |                    |             |                |                 |         |
|        | 4            | D7b-3         | 0.07      | 0.81          | 5.0      | 0.06     | 3.60      | 0.2     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 5            |               |           |               |          |          |           |         | 6.1          | 0.37     | 3.41      | 1.3     |           |                   |                   |           |                    |             |                |                 |         |
|        | 6            | D7b-2         | 0.03      | 0.20          | 5.0      | 0.01     | 3.60      | 0.0     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 7            |               |           |               |          |          |           |         | 6.1          | 0.38     | 3.41      | 1.3     |           |                   |                   |           |                    |             |                |                 |         |
|        | 8            | OS1           | 0.04      | 0.21          | 5.0      | 0.01     | 3.60      | 0.0     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 9            | D7b-4         | 0.20      | 0.53          | 8.4      | 0.10     | 3.07      | 0.3     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 10           |               |           |               |          |          |           |         | 8.4          | 0.49     | 3.41      | 1.7     |           |                   |                   |           |                    |             |                | Total Site flow |         |
|        | A            | D7b-6         | 0.06      | 0.34          | 5.0      | 0.02     | 3.60      | 0.1     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | B            | D7b-7         | 0.10      | 0.32          | 5.0      | 0.03     | 3.60      | 0.1     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |

STANDARD FORM SF-3  
STORM DRAINAGE SYSTEM DESIGN  
(RATIONAL METHOD PROCEDURE)

Subdivision: Lot 4 Dawson Trails Filing No. 2 Amendment No. 4  
Location: CO, Castle Rock  
Design Storm: 100-Year

Project Name: Keybank Castle Rock  
Project No.: HSB02  
Calculated By: HMR  
Checked By: CMV  
Date: 2026.01.22

| STREET | Design Point | DIRECT RUNOFF |           |               |          |          |           |         | TOTAL RUNOFF |          |           |         | STREET    |                   | PIPE              |           |                    | TRAVEL TIME |                |                 | REMARKS |
|--------|--------------|---------------|-----------|---------------|----------|----------|-----------|---------|--------------|----------|-----------|---------|-----------|-------------------|-------------------|-----------|--------------------|-------------|----------------|-----------------|---------|
|        |              | Basin ID      | Area (Ac) | Runoff Coeff. | Tc (min) | C*A (Ac) | I (in/hr) | Q (cfs) | Tc (min)     | C*A (Ac) | I (in/hr) | Q (cfs) | Slope (%) | Street Flow (cfs) | Design Flow (cfs) | Slope (%) | Pipe Size (inches) | Length (ft) | Velocity (fps) | Tt (min)        |         |
|        | 0            | OS2           | 0.11      | 0.62          | 5.0      | 0.07     | 8.82      | 0.6     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 1            | D7b-1         | 0.25      | 0.78          | 5.0      | 0.20     | 8.81      | 1.8     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 2            | D7b-5         | 0.19      | 0.77          | 6.1      | 0.15     | 8.36      | 1.3     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 3            |               |           |               |          |          |           |         | 6.1          | 0.42     | 8.36      | 3.5     |           |                   |                   |           |                    |             |                |                 |         |
|        | 4            | D7b-3         | 0.07      | 0.87          | 5.0      | 0.06     | 8.82      | 0.5     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 5            |               |           |               |          |          |           |         | 6.1          | 0.48     | 8.36      | 4.0     |           |                   |                   |           |                    |             |                |                 |         |
|        | 6            | D7b-2         | 0.03      | 0.57          | 5.0      | 0.02     | 8.82      | 0.2     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 7            |               |           |               |          |          |           |         | 6.1          | 0.50     | 8.36      | 4.2     |           |                   |                   |           |                    |             |                |                 |         |
|        | 8            | OS1           | 0.04      | 0.57          | 5.0      | 0.02     | 8.82      | 0.2     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 9            | D7b-4         | 0.20      | 0.73          | 8.4      | 0.14     | 7.53      | 1.1     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | 10           |               |           |               |          |          |           |         | 8.4          | 0.66     | 8.36      | 5.5     |           |                   |                   |           |                    |             |                | Total Site flow |         |
|        | A            | D7b-6         | 0.06      | 0.64          | 5.0      | 0.04     | 8.82      | 0.4     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        | B            | D7b-7         | 0.10      | 0.63          | 5.0      | 0.06     | 8.82      | 0.5     |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |
|        |              |               |           |               |          |          |           |         |              |          |           |         |           |                   |                   |           |                    |             |                |                 |         |

**APPENDIX B**

**Water Quality Computations**

## Site Layout

SCM Design, Version 4.02 (June 2025)

**Designer:** HMR

**Company:** Galloway

**Date:** January 26, 2026

**Project:** HSB02

**Location:** Castle Rock, CO

### SITE LAYOUT INFO (User Input in Blue Cells)

Water Quality Event (WQE) 0.60 inches

|                                         |          |          |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------------|----------|----------|--|--|--|--|--|--|--|--|--|--|
| Outfall ID                              | RPA1 - N | RPA2 - S |  |  |  |  |  |  |  |  |  |  |
| Total Tributary Area (ft <sup>2</sup> ) | 8,382    | 8,599    |  |  |  |  |  |  |  |  |  |  |
| Total Tributary Area (ac)               | 0.19     | 0.20     |  |  |  |  |  |  |  |  |  |  |
| Imperviousness (%)                      | 71.2%    | 60.7%    |  |  |  |  |  |  |  |  |  |  |
| MS4 Design Standard                     | Runoff   | Runoff   |  |  |  |  |  |  |  |  |  |  |
| SCM Type                                | RPA      | RPA      |  |  |  |  |  |  |  |  |  |  |

Notes:

### OUTFALL RESULTS

|                                           |              |              |  |  |  |  |  |  |  |  |  |  |
|-------------------------------------------|--------------|--------------|--|--|--|--|--|--|--|--|--|--|
| SCM Worksheet Name                        | RPA_RPA1 - N | RPA_RPA2 - S |  |  |  |  |  |  |  |  |  |  |
| Untreated Area (ft <sup>3</sup> )         | 0            | 0            |  |  |  |  |  |  |  |  |  |  |
| Default WQCV (ft <sup>3</sup> )           | 196          | 171          |  |  |  |  |  |  |  |  |  |  |
| Optional Override WQCV (ft <sup>3</sup> ) |              |              |  |  |  |  |  |  |  |  |  |  |
| WQCV Reduction (ft <sup>3</sup> )         | 104          | 77           |  |  |  |  |  |  |  |  |  |  |
| Remaining WQCV (ft <sup>3</sup> )         | 92           | 94           |  |  |  |  |  |  |  |  |  |  |
| WQCV Reduction (%)                        | 53%          | 45%          |  |  |  |  |  |  |  |  |  |  |
| Design WQCV of SCM (ft <sup>3</sup> )     | 0            | 0            |  |  |  |  |  |  |  |  |  |  |
| Pollutant Removal (ft <sup>3</sup> )      | 0            | 0            |  |  |  |  |  |  |  |  |  |  |
| Untreated WQCV (ft <sup>3</sup> )         | 92           | 94           |  |  |  |  |  |  |  |  |  |  |

### TOTAL SITE RESULTS (Sums results from all Outfalls)

|                            |        |                 |       |           |
|----------------------------|--------|-----------------|-------|-----------|
| Total Site Area            | 16,981 | ft <sup>2</sup> | 0.39  | acres     |
| Treated Area               | 16,981 | ft <sup>2</sup> | 0.39  | acres     |
| Untreated Area             | 0      | ft <sup>2</sup> | 0.00  | acres     |
| Total Site Imperviousness  | 65.9%  | %               |       |           |
| Default (or Override) WQCV | 367    | ft <sup>3</sup> | 0.008 | acre-feet |
| Remaining WQCV             | 186    | ft <sup>3</sup> | 0.004 | acre-feet |
| WQCV Reduction             | 49%    | %               |       |           |
| Design WQCV                | 0      | ft <sup>3</sup> | 0.000 | acre-feet |
| Untreated WQCV             | 186    | ft <sup>3</sup> | 0.004 | acre-feet |

Confirm with local jurisdiction whether design meets Runoff Reduction Standard

## Receiving Pervious Areas (Including Grass Buffers and Grass Swales)

SCM Design, Version 4.02 (June 2025)

**Designer:** HMR  
**Company:** Galloway  
**Date:** January 26, 2026  
**Project:** HSB02  
**Location:** Castle Rock, CO  
**Outfall ID:** RPA1 - N

### DESIGN PROCEDURE AND CRITERIA FOR ALL RPAs (User Input in Blue Cells)

#### 1. Apply Four-Cover Land Use Model to Site Layout

|                            |          |          |          |           |  |  |  |  |  |  |  |
|----------------------------|----------|----------|----------|-----------|--|--|--|--|--|--|--|
| Design Point ID            | RPA1 - N | SPA      | UIARPA   | Treated   |  |  |  |  |  |  |  |
| Area Type                  | RPA      | SPA      | UIA      | RPA_Swale |  |  |  |  |  |  |  |
| Downstream Design Point ID | --       | RPA1 - N | RPA1 - N | RPA1 - N  |  |  |  |  |  |  |  |
| DCIA (ft <sup>2</sup> )    | --       | --       | --       | --        |  |  |  |  |  |  |  |
| UIA (ft <sup>2</sup> )     | --       | --       | 4,671    | --        |  |  |  |  |  |  |  |
| RPA (ft <sup>2</sup> )     | --       | --       | --       | 2,082     |  |  |  |  |  |  |  |
| SPA (ft <sup>2</sup> )     | --       | 1,828    | --       | --        |  |  |  |  |  |  |  |

#### 2. Protect the RPA from Traffic

|                     |    |    |    |              |  |  |  |  |  |  |  |
|---------------------|----|----|----|--------------|--|--|--|--|--|--|--|
| RPA Protection Type | -- | -- | -- | Slotted Curb |  |  |  |  |  |  |  |
|---------------------|----|----|----|--------------|--|--|--|--|--|--|--|

#### 3. Characterize On-site Topsoil and Determine Suitability for the RPA

|             |    |    |    |        |  |  |  |  |  |  |  |
|-------------|----|----|----|--------|--|--|--|--|--|--|--|
| HSG A (%)   | -- | -- | -- | 0.0%   |  |  |  |  |  |  |  |
| HSG B (%)   | -- | -- | -- | 0.0%   |  |  |  |  |  |  |  |
| HSG C/D (%) | -- | -- | -- | 100.0% |  |  |  |  |  |  |  |

#### 4. Select Appropriate Vegetation

|                     |    |    |    |           |  |  |  |  |  |  |  |
|---------------------|----|----|----|-----------|--|--|--|--|--|--|--|
| RPA Vegetation Type | -- | -- | -- | Sod       |  |  |  |  |  |  |  |
| Irrigation Type     | -- | -- | -- | Permanent |  |  |  |  |  |  |  |

**Notes:**

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### GRASS BUFFER ADDITIONAL DESIGN PROCEDURE AND CRITERIA (User Input in Blue Cells)

#### 1. Define the UIA:RPA pair, Ratio, and Interface Width

|                                          |    |    |    |    |  |  |  |  |  |  |  |
|------------------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Sheet Flow Inflow Feature                | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Is Concrete Edger used?                  | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Spacing between slots (ft)               | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Slot Opening Length (in)                 | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Blind Swale Type                         | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Spreader Energy Dissipation              | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Total Area of UIA:RPA (ft <sup>2</sup> ) | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Ratio                            | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Interface Width (ft)             | -- | -- | -- | -- |  |  |  |  |  |  |  |
| L / W Ratio of UIA:RPA                   | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 2. Buffer Length

|                            |    |    |    |    |  |  |  |  |  |  |  |
|----------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Average Buffer Length (ft) | -- | -- | -- | -- |  |  |  |  |  |  |  |
|----------------------------|----|----|----|----|--|--|--|--|--|--|--|

#### 3. Buffer Slope

|                              |    |    |    |    |  |  |  |  |  |  |  |
|------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Average Buffer Slope (ft/ft) | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Effective Distance (ft)      | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Number of Level Spreaders    | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 4. Provide a Vertical Drop

|                        |    |    |    |    |  |  |  |  |  |  |  |
|------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Vertical Drop (in)     | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Mowing Strip Provided? | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 5. Calculate Runoff for UIA and RPA Pair

|                                   |    |    |    |    |  |  |  |  |  |  |  |
|-----------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Imperviousness (%)                | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Runoff (in)               | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Runoff (ft <sup>3</sup> ) | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 6. Compare Runoff from UIA:RPA Pair to Runoff from UIA Only

|                                     |    |    |    |    |  |  |  |  |  |  |  |
|-------------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| UIA Runoff (ft <sup>3</sup> )       | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Runoff Reduction (ft <sup>3</sup> ) | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Runoff Reduction (%)                | -- | -- | -- | -- |  |  |  |  |  |  |  |

**Notes:**

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**GRASS SWALE ADDITIONAL DESIGN PROCEDURE AND CRITERIA (User Input in Blue Cells)**
**1. Delineate Areas Tributary to Swale**

|                                         |    |    |    |       |  |  |  |  |  |  |  |
|-----------------------------------------|----|----|----|-------|--|--|--|--|--|--|--|
| Total Tributary Area (ft <sup>2</sup> ) | -- | -- | -- | 2,082 |  |  |  |  |  |  |  |
| Imperviousness (%)                      | -- | -- | -- | 0.0%  |  |  |  |  |  |  |  |

**2. Swale Inflows**

|                                          |    |    |    |            |  |  |  |  |  |  |  |
|------------------------------------------|----|----|----|------------|--|--|--|--|--|--|--|
| Concentrated Flow Type                   | -- | -- | -- | Swale      |  |  |  |  |  |  |  |
| Blind Swale Type                         | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Spreader Energy Dissipation              | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Vertical Drop (in)                       | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Gutter Depression (in)                   | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Curb Opening Length (ft)                 | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Concrete Sediment Pad                    | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Min. Forebay Volume (ft <sup>3</sup> )   | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Design Forebay Volume (ft <sup>3</sup> ) | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Max. Forebay Depth (in)                  | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Design Forebay Depth (in)                | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Calculated Notch Width (in)              | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Design Notch Width (in)                  | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Drain Time (minutes)                     | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Energy Dissipation Type                  | -- | -- | -- | Vegetation |  |  |  |  |  |  |  |

**3. Swale Cross Section**

|                                |    |    |    |       |  |  |  |  |  |  |  |
|--------------------------------|----|----|----|-------|--|--|--|--|--|--|--|
| Length of Swale (ft)           | -- | -- | -- | 36.51 |  |  |  |  |  |  |  |
| Bottom Width (ft)              | -- | -- | -- | 1.00  |  |  |  |  |  |  |  |
| Bottom Area (ft <sup>2</sup> ) | -- | -- | -- | 37    |  |  |  |  |  |  |  |
| Side Slopes (horiz/vert)       | -- | -- | -- | 4.00  |  |  |  |  |  |  |  |

**4. Longitudinal Slope**

|                         |    |    |    |       |  |  |  |  |  |  |  |
|-------------------------|----|----|----|-------|--|--|--|--|--|--|--|
| Available Slope (ft/ft) | -- | -- | -- | 2.000 |  |  |  |  |  |  |  |
| Design Slope (ft/ft)    | -- | -- | -- | 2.000 |  |  |  |  |  |  |  |
| Total Drop Height (ft)  | -- | -- | -- | 0.00  |  |  |  |  |  |  |  |
| Underdrains Provided?   | -- | -- | -- | NO    |  |  |  |  |  |  |  |

**5. Calculate Runoff from Tributary Area**

|                                         |    |    |    |     |  |  |  |  |  |  |  |
|-----------------------------------------|----|----|----|-----|--|--|--|--|--|--|--|
| Tributary Runoff (ft <sup>3</sup> )     | -- | -- | -- | 104 |  |  |  |  |  |  |  |
| Reduced Trib. Runoff (ft <sup>3</sup> ) | -- | -- | -- | 104 |  |  |  |  |  |  |  |

**6. Calculate Runoff Reduction through Swale Bottom**

|                                       |    |    |    |        |  |  |  |  |  |  |  |
|---------------------------------------|----|----|----|--------|--|--|--|--|--|--|--|
| Volume Infiltrated (ft <sup>3</sup> ) | -- | -- | -- | 104    |  |  |  |  |  |  |  |
| Swale Discharge (ft <sup>3</sup> )    | -- | -- | -- | 0      |  |  |  |  |  |  |  |
| Runoff Reduction (%)                  | -- | -- | -- | 100.0% |  |  |  |  |  |  |  |

**7. Design Discharge**

|                            |    |    |    |     |  |  |  |  |  |  |  |
|----------------------------|----|----|----|-----|--|--|--|--|--|--|--|
| 2-year Discharge, Q2 (cfs) | -- | -- | -- | 0.3 |  |  |  |  |  |  |  |
|----------------------------|----|----|----|-----|--|--|--|--|--|--|--|

**8. Design Velocity**

|                          |    |    |    |     |  |  |  |  |  |  |  |
|--------------------------|----|----|----|-----|--|--|--|--|--|--|--|
| Vegetal Retardance Curve | -- | -- | -- | D   |  |  |  |  |  |  |  |
| Velocity, V2 (fps)       | -- | -- | -- | 2.5 |  |  |  |  |  |  |  |

**9. Design Flow Depth**

|                                   |    |    |    |       |  |  |  |  |  |  |  |
|-----------------------------------|----|----|----|-------|--|--|--|--|--|--|--|
| Flow Depth, D2 (ft)               | -- | -- | -- | 0.09  |  |  |  |  |  |  |  |
| Flow Area, A (ft <sup>2</sup> )   | -- | -- | -- | 0.1   |  |  |  |  |  |  |  |
| Wetted Perimeter, P (ft)          | -- | -- | -- | 1.7   |  |  |  |  |  |  |  |
| Top Width, T (ft)                 | -- | -- | -- | 1.7   |  |  |  |  |  |  |  |
| Hydraulic Radius, Rh (ft)         | -- | -- | -- | 0.07  |  |  |  |  |  |  |  |
| VR Product (ft <sup>2</sup> /sec) | -- | -- | -- | 0.17  |  |  |  |  |  |  |  |
| Manning's n value                 | -- | -- | -- | 0.143 |  |  |  |  |  |  |  |
| Hydraulic Depth, Dh (ft)          | -- | -- | -- | 0.07  |  |  |  |  |  |  |  |
| Froude Number                     | -- | -- | -- | 0.29  |  |  |  |  |  |  |  |

**10. Swale Outflows**

|                      |    |    |    |    |  |  |  |  |  |  |  |
|----------------------|----|----|----|----|--|--|--|--|--|--|--|
| Outflows Considered? | -- | -- | -- | NO |  |  |  |  |  |  |  |
|----------------------|----|----|----|----|--|--|--|--|--|--|--|

Notes:

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**DESIGN POINT RESULT (Sums results for current column and all upstream design point columns.)**

|                                     |          |       |        |           |  |  |  |  |  |  |  |
|-------------------------------------|----------|-------|--------|-----------|--|--|--|--|--|--|--|
| Design Point ID                     | RPA1 - N | SPA   | UIARPA | Treated   |  |  |  |  |  |  |  |
| Area Type                           | RPA      | SPA   | UIA    | RPA Swale |  |  |  |  |  |  |  |
| Total Area (ft <sup>2</sup> )       | 8,581    | 1,828 | 4,671  | 2,082     |  |  |  |  |  |  |  |
| Imperviousness (%)                  |          | 0.0%  | 100.0% | 0.0%      |  |  |  |  |  |  |  |
| Tributary Runoff (ft <sup>3</sup> ) |          | 0     | 195    | 104       |  |  |  |  |  |  |  |
| Runoff Reduction (ft <sup>3</sup> ) | 104      | 0     | 0      | 104       |  |  |  |  |  |  |  |
| Runoff Remaining (ft <sup>3</sup> ) | 195      | 0     | 195    | 0         |  |  |  |  |  |  |  |

Total Tributary Area entered on Site Layout Worksheet is: 8,382 square feet

## Receiving Pervious Areas (Including Grass Buffers and Grass Swales)

SCM Design, Version 4.02 (June 2025)

**Designer:** HMR  
**Company:** Galloway  
**Date:** January 26, 2026  
**Project:** HSB02  
**Location:** Castle Rock, CO  
**Outfall ID:** RPA2 - S

### DESIGN PROCEDURE AND CRITERIA FOR ALL RPAs (User Input in Blue Cells)

#### 1. Apply Four-Cover Land Use Model to Site Layout

|                            |          |          |          |           |  |  |  |  |  |  |  |
|----------------------------|----------|----------|----------|-----------|--|--|--|--|--|--|--|
| Design Point ID            | RPA2 - S | SPA      | UIARPA   | Treated   |  |  |  |  |  |  |  |
| Area Type                  | RPA      | SPA      | UIA      | RPA_Swale |  |  |  |  |  |  |  |
| Downstream Design Point ID | --       | RPA2 - S | RPA2 - S | RPA2 - S  |  |  |  |  |  |  |  |
| DCIA (ft <sup>2</sup> )    | --       | --       | --       | --        |  |  |  |  |  |  |  |
| UIA (ft <sup>2</sup> )     | --       | --       | 5,601    | --        |  |  |  |  |  |  |  |
| RPA (ft <sup>2</sup> )     | --       | --       | --       | 1,544     |  |  |  |  |  |  |  |
| SPA (ft <sup>2</sup> )     | --       | 1,237    | --       | --        |  |  |  |  |  |  |  |

#### 2. Protect the RPA from Traffic

|                     |    |    |    |              |  |  |  |  |  |  |  |
|---------------------|----|----|----|--------------|--|--|--|--|--|--|--|
| RPA Protection Type | -- | -- | -- | Slotted Curb |  |  |  |  |  |  |  |
|---------------------|----|----|----|--------------|--|--|--|--|--|--|--|

#### 3. Characterize On-site Topsoil and Determine Suitability for the RPA

|             |    |    |    |        |  |  |  |  |  |  |  |
|-------------|----|----|----|--------|--|--|--|--|--|--|--|
| HSG A (%)   | -- | -- | -- | 0.0%   |  |  |  |  |  |  |  |
| HSG B (%)   | -- | -- | -- | 0.0%   |  |  |  |  |  |  |  |
| HSG C/D (%) | -- | -- | -- | 100.0% |  |  |  |  |  |  |  |

#### 4. Select Appropriate Vegetation

|                     |    |    |    |           |  |  |  |  |  |  |  |
|---------------------|----|----|----|-----------|--|--|--|--|--|--|--|
| RPA Vegetation Type | -- | -- | -- | Sod       |  |  |  |  |  |  |  |
| Irrigation Type     | -- | -- | -- | Permanent |  |  |  |  |  |  |  |

**Notes:**

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### GRASS BUFFER ADDITIONAL DESIGN PROCEDURE AND CRITERIA (User Input in Blue Cells)

#### 1. Define the UIA:RPA pair, Ratio, and Interface Width

|                                          |    |    |    |    |  |  |  |  |  |  |  |
|------------------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Sheet Flow Inflow Feature                | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Is Concrete Edger used?                  | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Spacing between slots (ft)               | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Slot Opening Length (in)                 | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Blind Swale Type                         | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Spreader Energy Dissipation              | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Total Area of UIA:RPA (ft <sup>2</sup> ) | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Ratio                            | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Interface Width (ft)             | -- | -- | -- | -- |  |  |  |  |  |  |  |
| L / W Ratio of UIA:RPA                   | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 2. Buffer Length

|                            |    |    |    |    |  |  |  |  |  |  |  |
|----------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Average Buffer Length (ft) | -- | -- | -- | -- |  |  |  |  |  |  |  |
|----------------------------|----|----|----|----|--|--|--|--|--|--|--|

#### 3. Buffer Slope

|                              |    |    |    |    |  |  |  |  |  |  |  |
|------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Average Buffer Slope (ft/ft) | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Effective Distance (ft)      | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Number of Level Spreaders    | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 4. Provide a Vertical Drop

|                        |    |    |    |    |  |  |  |  |  |  |  |
|------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Vertical Drop (in)     | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Mowing Strip Provided? | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 5. Calculate Runoff for UIA and RPA Pair

|                                   |    |    |    |    |  |  |  |  |  |  |  |
|-----------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Imperviousness (%)                | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Runoff (in)               | -- | -- | -- | -- |  |  |  |  |  |  |  |
| UIA:RPA Runoff (ft <sup>3</sup> ) | -- | -- | -- | -- |  |  |  |  |  |  |  |

#### 6. Compare Runoff from UIA:RPA Pair to Runoff from UIA Only

|                                     |    |    |    |    |  |  |  |  |  |  |  |
|-------------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| UIA Runoff (ft <sup>3</sup> )       | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Runoff Reduction (ft <sup>3</sup> ) | -- | -- | -- | -- |  |  |  |  |  |  |  |
| Runoff Reduction (%)                | -- | -- | -- | -- |  |  |  |  |  |  |  |

**Notes:**

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**GRASS SWALE ADDITIONAL DESIGN PROCEDURE AND CRITERIA (User Input in Blue Cells)**
**1. Delineate Areas Tributary to Swale**

|                                         |    |    |    |       |  |  |  |  |  |  |  |
|-----------------------------------------|----|----|----|-------|--|--|--|--|--|--|--|
| Total Tributary Area (ft <sup>2</sup> ) | -- | -- | -- | 1,544 |  |  |  |  |  |  |  |
| Imperviousness (%)                      | -- | -- | -- | 0.0%  |  |  |  |  |  |  |  |

**2. Swale Inflows**

|                                          |    |    |    |            |  |  |  |  |  |  |  |
|------------------------------------------|----|----|----|------------|--|--|--|--|--|--|--|
| Concentrated Flow Type                   | -- | -- | -- | Swale      |  |  |  |  |  |  |  |
| Blind Swale Type                         | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Spreader Energy Dissipation              | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Vertical Drop (in)                       | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Gutter Depression (in)                   | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Curb Opening Length (ft)                 | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Concrete Sediment Pad                    | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Min. Forebay Volume (ft <sup>3</sup> )   | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Design Forebay Volume (ft <sup>3</sup> ) | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Max. Forebay Depth (in)                  | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Design Forebay Depth (in)                | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Calculated Notch Width (in)              | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Design Notch Width (in)                  | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Drain Time (minutes)                     | -- | -- | -- | --         |  |  |  |  |  |  |  |
| Energy Dissipation Type                  | -- | -- | -- | Vegetation |  |  |  |  |  |  |  |

**3. Swale Cross Section**

|                                |    |    |    |        |  |  |  |  |  |  |  |
|--------------------------------|----|----|----|--------|--|--|--|--|--|--|--|
| Length of Swale (ft)           | -- | -- | -- | 115.00 |  |  |  |  |  |  |  |
| Bottom Width (ft)              | -- | -- | -- | 1.00   |  |  |  |  |  |  |  |
| Bottom Area (ft <sup>2</sup> ) | -- | -- | -- | 115    |  |  |  |  |  |  |  |
| Side Slopes (horiz/vert)       | -- | -- | -- | 4.00   |  |  |  |  |  |  |  |

**4. Longitudinal Slope**

|                         |    |    |    |       |  |  |  |  |  |  |  |
|-------------------------|----|----|----|-------|--|--|--|--|--|--|--|
| Available Slope (ft/ft) | -- | -- | -- | 2.000 |  |  |  |  |  |  |  |
| Design Slope (ft/ft)    | -- | -- | -- | 2.000 |  |  |  |  |  |  |  |
| Total Drop Height (ft)  | -- | -- | -- | 0.00  |  |  |  |  |  |  |  |
| Underdrains Provided?   | -- | -- | -- | NO    |  |  |  |  |  |  |  |

**5. Calculate Runoff from Tributary Area**

|                                         |    |    |    |    |  |  |  |  |  |  |  |
|-----------------------------------------|----|----|----|----|--|--|--|--|--|--|--|
| Tributary Runoff (ft <sup>3</sup> )     | -- | -- | -- | 77 |  |  |  |  |  |  |  |
| Reduced Trib. Runoff (ft <sup>3</sup> ) | -- | -- | -- | 77 |  |  |  |  |  |  |  |

**6. Calculate Runoff Reduction through Swale Bottom**

|                                       |    |    |    |        |  |  |  |  |  |  |  |
|---------------------------------------|----|----|----|--------|--|--|--|--|--|--|--|
| Volume Infiltrated (ft <sup>3</sup> ) | -- | -- | -- | 77     |  |  |  |  |  |  |  |
| Swale Discharge (ft <sup>3</sup> )    | -- | -- | -- | 0      |  |  |  |  |  |  |  |
| Runoff Reduction (%)                  | -- | -- | -- | 100.0% |  |  |  |  |  |  |  |

**7. Design Discharge**

|                            |    |    |    |     |  |  |  |  |  |  |  |
|----------------------------|----|----|----|-----|--|--|--|--|--|--|--|
| 2-year Discharge, Q2 (cfs) | -- | -- | -- | 0.4 |  |  |  |  |  |  |  |
|----------------------------|----|----|----|-----|--|--|--|--|--|--|--|

**8. Design Velocity**

|                          |    |    |    |     |  |  |  |  |  |  |  |
|--------------------------|----|----|----|-----|--|--|--|--|--|--|--|
| Vegetal Retardance Curve | -- | -- | -- | D   |  |  |  |  |  |  |  |
| Velocity, V2 (fps)       | -- | -- | -- | 2.9 |  |  |  |  |  |  |  |

**9. Design Flow Depth**

|                                   |    |    |    |       |  |  |  |  |  |  |  |
|-----------------------------------|----|----|----|-------|--|--|--|--|--|--|--|
| Flow Depth, D2 (ft)               | -- | -- | -- | 0.10  |  |  |  |  |  |  |  |
| Flow Area, A (ft <sup>2</sup> )   | -- | -- | -- | 0.1   |  |  |  |  |  |  |  |
| Wetted Perimeter, P (ft)          | -- | -- | -- | 1.8   |  |  |  |  |  |  |  |
| Top Width, T (ft)                 | -- | -- | -- | 1.8   |  |  |  |  |  |  |  |
| Hydraulic Radius, Rh (ft)         | -- | -- | -- | 0.08  |  |  |  |  |  |  |  |
| VR Product (ft <sup>2</sup> /sec) | -- | -- | -- | 0.22  |  |  |  |  |  |  |  |
| Manning's n value                 | -- | -- | -- | 0.125 |  |  |  |  |  |  |  |
| Hydraulic Depth, Dh (ft)          | -- | -- | -- | 0.08  |  |  |  |  |  |  |  |
| Froude Number                     | -- | -- | -- | 0.32  |  |  |  |  |  |  |  |

**10. Swale Outflows**

|                      |    |    |    |    |  |  |  |  |  |  |  |
|----------------------|----|----|----|----|--|--|--|--|--|--|--|
| Outflows Considered? | -- | -- | -- | NO |  |  |  |  |  |  |  |
|----------------------|----|----|----|----|--|--|--|--|--|--|--|

Notes:

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**DESIGN POINT RESULT (Sums results for current column and all upstream design point columns.)**

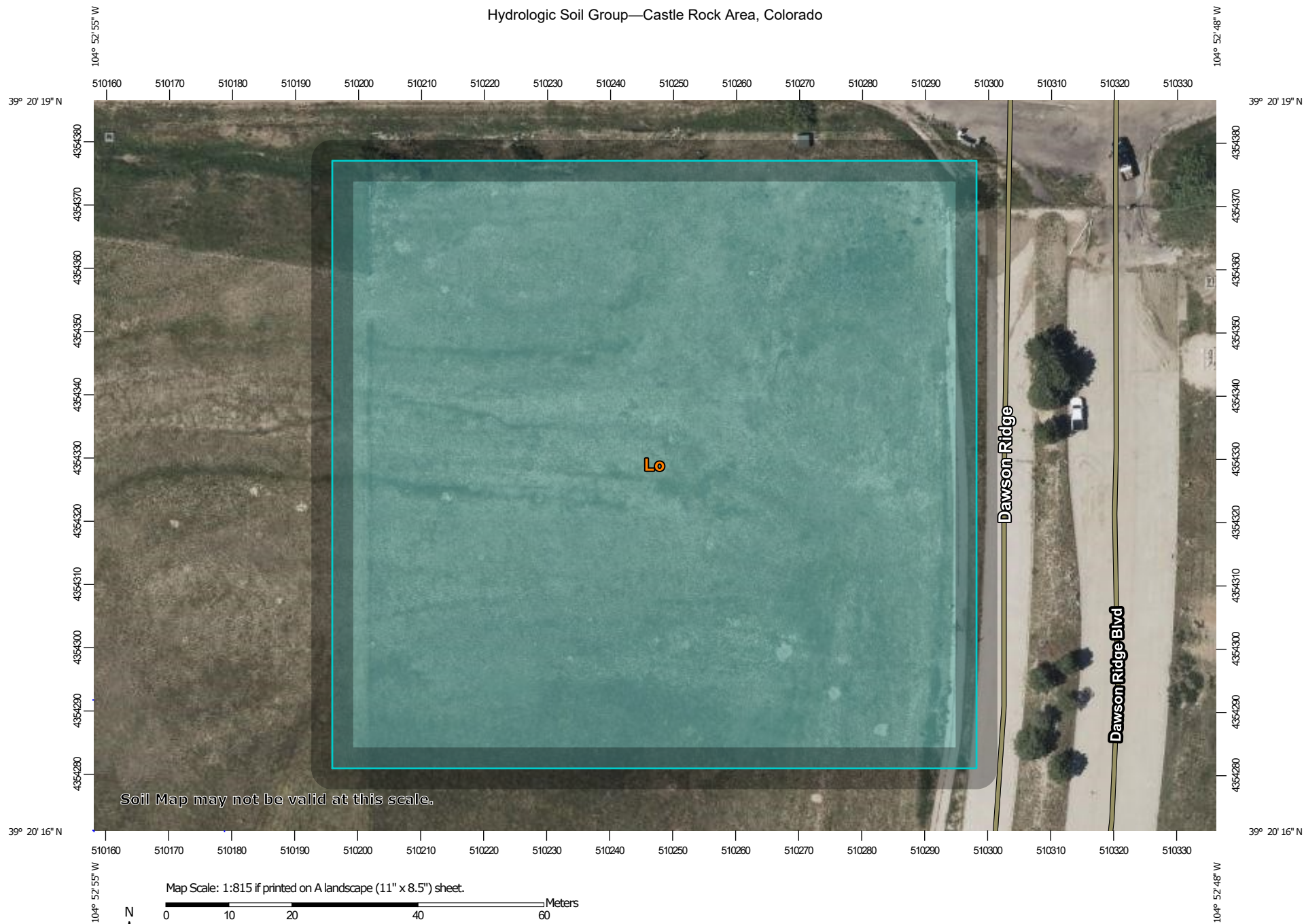
|                                     |          |       |        |           |  |  |  |  |  |  |  |
|-------------------------------------|----------|-------|--------|-----------|--|--|--|--|--|--|--|
| Design Point ID                     | RPA2 - S | SPA   | UIARPA | Treated   |  |  |  |  |  |  |  |
| Area Type                           | RPA      | SPA   | UIA    | RPA Swale |  |  |  |  |  |  |  |
| Total Area (ft <sup>2</sup> )       | 8,382    | 1,237 | 5,601  | 1,544     |  |  |  |  |  |  |  |
| Imperviousness (%)                  |          | 0.0%  | 100.0% | 0.0%      |  |  |  |  |  |  |  |
| Tributary Runoff (ft <sup>3</sup> ) |          | 0     | 233    | 77        |  |  |  |  |  |  |  |
| Runoff Reduction (ft <sup>3</sup> ) | 77       | 0     | 0      | 77        |  |  |  |  |  |  |  |
| Runoff Remaining (ft <sup>3</sup> ) | 233      | 0     | 233    | 0         |  |  |  |  |  |  |  |

Total Tributary Area entered on Site Layout Worksheet is: 8,599 square feet

## **APPENDIX C**

### **Reference Information**

# Hydrologic Soil Group—Castle Rock Area, Colorado



## 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 18, Aug 29, 2025

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 |
|------------------------------------|---------------------|--------|--------------|----------------|
| Lo                                 | Loamy alluvial land | C      | 2.4          | 100.0%         |
| <b>Totals for Area of Interest</b> |                     |        | <b>2.4</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



## Phase III Drainage Report

**KING SOOPERS STORE #165**

**Lot 1, Dawson Trails Filing No. 2, Amendment 5**

**Castle Rock, CO**

**PREPARED FOR:**

**King Soopers, Inc.**

**65 Tejon Street**

**Denver, CO 80223**

**Tel: (720) 563-9374**

**Attn: Kevin McKenzie**

**PREPARED BY:**

**Galloway & Company, LLC**

**5500 Greenwood Plaza Blvd., Suite 200**

**Greenwood Village, CO 80111**

**Tel: (303) 770-8884**

**Attn: Jennifer Romano, PE**

**DATE:**

**December 12, 2025**

**REVISED:**



## COMPOSITE % IMPERVIOUS CALCULATIONS

Subdivision: Dawson Trails Filing No. 2, Amd 5

Location: CO, Castle Rock

Project Name: King Soopers Store #165

Project No.: KSS165.20

Calculated By: JKG

Checked By: JRR

Date: 1/20/26

| Basin ID      | Total Area (ac) | Hardscape & Roof |           |                 | Landscaping |           |                 | Bioretention & RPAs |           |                 | Basins Total Weighted % Imp. |
|---------------|-----------------|------------------|-----------|-----------------|-------------|-----------|-----------------|---------------------|-----------|-----------------|------------------------------|
|               |                 | % Imp.           | Area (ac) | Weighted % Imp. | % Imp.      | Area (ac) | Weighted % Imp. | % Imp.              | Area (ac) | Weighted % Imp. |                              |
| A1            | 1.07            | 95               | 0.70      | 62.0            | 20          | 0.37      | 6.9             |                     |           | 0.00            | 68.9                         |
| A2            | 0.48            | 95               | 0.32      | 62.0            | 20          | 0.17      | 7.0             |                     |           | 0.00            | 69.0                         |
| A3            | 0.35            | 95               | 0.20      | 53.9            | 20          | 0.01      | 0.8             | 10                  | 0.14      | 3.90            | 58.6                         |
| B1            | 2.46            | 95               | 1.62      | 62.7            | 20          | 0.84      | 6.8             |                     |           | 0.00            | 69.5                         |
| B2            | 1.04            | 95               | 0.69      | 62.7            | 20          | 0.35      | 6.8             |                     |           | 0.00            | 69.5                         |
| B3            | 0.41            | 95               | 0.41      | 95.0            | 20          | 0.00      | 0.0             |                     |           | 0.00            | 95.0                         |
| B4            | 2.86            | 95               | 1.89      | 62.7            | 20          | 0.97      | 6.8             |                     |           | 0.00            | 69.5                         |
| B5            | 0.23            | 95               | 0.23      | 95.0            | 20          | 0.00      | 0.0             |                     |           | 0.00            | 95.0                         |
| B6            | 0.21            | 95               | 0.21      | 95.0            | 20          | 0.00      | 0.0             |                     |           | 0.00            | 95.0                         |
| B7            | 1.45            | 95               | 1.33      | 87.3            | 20          | 0.12      | 1.6             |                     |           | 0.00            | 88.9                         |
| B8            | 1.20            | 95               | 1.09      | 86.9            | 20          | 0.10      | 1.7             |                     |           | 0.00            | 88.6                         |
| C1            | 1.04            | 95               | 0.63      | 57.4            | 20          | 0.41      | 7.9             |                     |           | 0.00            | 65.3                         |
| C2            | 1.20            | 95               | 0.80      | 63.0            | 20          | 0.03      | 0.5             | 20                  | 0.37      | 6.20            | 69.7                         |
| D1            | 2.30            | 95               | 2.30      | 95.0            | 20          | 0.00      | 0.0             |                     |           | 0.00            | 95.0                         |
| D2            | 1.01            | 95               | 0.91      | 85.4            | 20          | 0.10      | 2.0             | 20                  | 0.20      | 4.00            | 91.4                         |
| D3            | 0.25            | 95               | 0.00      | 0.0             | 20          | 0.25      | 20.0            |                     |           | 0.00            | 20.0                         |
| D4a           | 0.73            | 95               | 0.48      | 62.7            | 20          | 0.25      | 6.8             |                     |           | 0.00            | 69.5                         |
| D4b           | 0.61            | 95               | 0.40      | 62.7            | 20          | 0.21      | 6.8             |                     |           | 0.00            | 69.5                         |
| D5            | 0.70            | 95               | 0.65      | 87.0            | 20          | 0.06      | 1.7             |                     |           | 0.00            | 88.7                         |
| D6a           | 0.41            | 95               | 0.32      | 74.0            | 20          | 0.09      | 4.4             |                     |           | 0.00            | 78.4                         |
| D6b           | 0.24            | 95               | 0.18      | 72.3            | 20          | 0.06      | 4.8             |                     |           | 0.00            | 77.1                         |
| D7b           | 0.91            | 95               | 0.50      | 52.4            | 20          | 0.41      | 9.0             |                     |           | 0.00            | 61.4                         |
| D7            | 0.14            | 95               | 0.00      | 0.0             | 20          | 0.14      | 20.0            |                     |           | 0.00            | 20.0                         |
| E1            | 0.19            | 95               | 0.00      | 0.0             | 20          | 0.19      | 20.0            |                     |           | 0.00            | 20.0                         |
| Total On-Site | 21.50           | 95               | 15.86     | 70.1            | 20          | 5.13      | 4.8             |                     | 0.71      | 0.00            | 74.9                         |
| OS-1          | 1.51            | 95               | 1.27      | 79.8            | 20          | 0.24      | 3.2             |                     |           | 0.00            | 83.0                         |
| OS-2          | 0.60            | 95               | 0.48      | 76.1            | 20          | 0.12      | 4.0             |                     |           | 0.00            | 80.1                         |
| OS-3          | 1.94            | 95               | 1.60      | 78.6            | 20          | 0.34      | 3.5             |                     |           | 0.00            | 82.1                         |
| OS-4          | 0.38            | 95               | 0.38      | 95.0            | 21          | 0.00      | 0.0             |                     |           | 0.00            | 95.0                         |

STANDARD FORM SF-2  
TIME OF CONCENTRATION

Subdivision: Dawson Trails Filing No. 2, Amd 5  
Location: CO, Castle Rock

Project Name: King Soopers Store #165  
Project No.: KSS165.20  
Calculated By: JKG  
Checked By: JRR  
Date: 1/20/26

| SUB-BASIN |           |                        |                |      |      |      | INITIAL/OVERLAND (Sheet Flow) |       |          | Shallow Concentrated Flows |       |      |            |          | Tc CHECK       |                   | FINAL    |
|-----------|-----------|------------------------|----------------|------|------|------|-------------------------------|-------|----------|----------------------------|-------|------|------------|----------|----------------|-------------------|----------|
| DATA      |           |                        |                |      |      |      | (Ti)                          |       |          | (Tt)                       |       |      |            |          |                |                   |          |
| BASIN ID  | D.A. (AC) | Hydrologic Soils Group | Impervious (%) | C100 | C5   | C2   | L (FT)                        | S (%) | Ti (MIN) | L (FT)                     | S (%) | Cv   | VEL. (FPS) | Tt (MIN) | COMP. Tc (MIN) | Regional Tc (MIN) | Tc (MIN) |
| A1        | 1.07      | C                      | 68.9           | 0.77 | 0.60 | 0.55 | 45                            | 1.4   | 5.5      | 430                        | 0.5   | 20.0 | 1.4        | 5.1      | 10.6           | 19.7              | 10.6     |
| A2        | 0.48      | C                      | 69.0           | 0.77 | 0.60 | 0.55 | 45                            | 1.2   | 5.8      | 70                         | 2.2   | 20.0 | 2.9        | 0.4      | 6.2            | 14.7              | 6.2      |
| A3        | 0.35      | C                      | 58.6           | 0.72 | 0.51 | 0.46 | 25                            | 2.0   | 4.3      | 85                         | 2.1   | 15.0 | 2.2        | 0.7      | 4.9            | 16.6              | 5.0      |
| B1        | 2.46      | C                      | 69.5           | 0.77 | 0.60 | 0.55 |                               |       |          |                            |       |      |            |          |                |                   | 5.0      |
| B2        | 1.04      | C                      | 69.5           | 0.77 | 0.60 | 0.55 |                               |       |          |                            |       |      |            |          |                |                   | 5.0      |
| B3        | 0.41      | C                      | 95.0           | 0.87 | 0.81 | 0.79 | 30                            | 2.5   | 2.1      | 610                        | 3.2   | 20.0 | 3.6        | 2.8      | 5.0            | 12.4              | 5.0      |
| B4        | 2.86      | C                      | 69.5           | 0.77 | 0.60 | 0.55 |                               |       |          |                            |       |      |            |          |                |                   | 5.0      |
| B5        | 0.23      | C                      | 95.0           | 0.87 | 0.81 | 0.79 | 14                            | 2.0   | 1.6      | 500                        | 0.8   | 20.0 | 1.8        | 4.7      | 6.2            | 14.0              | 6.2      |
| B6        | 0.21      | C                      | 95.0           | 0.87 | 0.81 | 0.79 | 14                            | 2.0   | 1.6      | 500                        | 0.8   | 20.0 | 1.8        | 4.7      | 6.2            | 14.0              | 6.2      |
| B7        | 1.45      | C                      | 88.9           | 0.85 | 0.76 | 0.73 | 220                           | 1.7   | 7.8      | 250                        | 2.6   | 20.0 | 3.2        | 1.3      | 9.1            | 12.1              | 9.1      |
| B8        | 1.20      | C                      | 88.6           | 0.85 | 0.76 | 0.73 | 250                           | 2.8   | 7.0      | 140                        | 0.7   | 20.0 | 1.6        | 1.4      | 8.4            | 12.3              | 8.4      |
| C1        | 1.04      | C                      | 65.3           | 0.75 | 0.57 | 0.52 | 65                            | 2.2   | 6.0      | 260                        | 0.7   | 20.0 | 1.6        | 2.7      | 8.7            | 17.9              | 8.7      |
| C2        | 1.20      | C                      | 69.7           | 0.77 | 0.60 | 0.56 | 130                           | 1.6   | 8.9      | 195                        | 2.1   | 15.0 | 2.2        | 1.5      | 10.4           | 15.3              | 10.4     |
| D1        | 2.30      | C                      | 95.0           | 0.87 | 0.81 | 0.79 | 280                           | 2.0   | 7.1      | 370                        | 1.0   | 20.0 | 2.0        | 3.1      | 10.1           | 12.6              | 10.1     |
| D2        | 1.01      | C                      | 91.4           | 0.86 | 0.78 | 0.75 | 140                           | 2.7   | 5.0      | 150                        | 2.1   | 15.0 | 2.2        | 1.2      | 6.1            | 11.3              | 6.1      |
| D3        | 0.25      | C                      | 20.0           | 0.57 | 0.20 | 0.14 | 30                            | 23.0  | 3.2      | 300                        | 2.3   | 20.0 | 3.0        | 1.6      | 4.8            | 25.4              | 5.0      |
| D4a       | 0.73      | C                      | 69.5           | 0.77 | 0.60 | 0.55 |                               |       |          |                            |       |      |            |          |                |                   | 5.0      |
| D4b       | 0.61      | C                      | 69.5           | 0.77 | 0.60 | 0.55 |                               |       |          |                            |       |      |            |          |                |                   | 5.0      |
| D5        | 0.70      | C                      | 88.7           | 0.85 | 0.76 | 0.73 | 50                            | 0.9   | 4.6      | 195                        | 1.0   | 20.0 | 2.0        | 1.6      | 6.2            | 12.4              | 6.2      |
| D6a       | 0.41      | C                      | 78.4           | 0.80 | 0.67 | 0.63 | 14                            | 2.3   | 2.2      | 500                        | 3.5   | 20.0 | 3.7        | 2.2      | 4.5            | 14.9              | 5.0      |
| D6b       | 0.24      | C                      | 77.1           | 0.80 | 0.66 | 0.62 | 14                            | 2.3   | 2.3      | 500                        | 3.5   | 20.0 | 3.7        | 2.2      | 4.5            | 15.1              | 5.0      |
| D7b       | 0.91      | C                      | 61.4           | 0.73 | 0.54 | 0.48 |                               |       |          |                            |       |      |            |          |                |                   | 5.0      |
| D7        | 0.14      | C                      | 20.0           | 0.57 | 0.20 | 0.14 | 16                            | 5.0   | 3.9      | 115                        | 1.0   | 20.0 | 2.0        | 1.0      | 4.8            | 24.2              | 5.0      |
| E1        | 0.19      | C                      | 20.0           | 0.57 | 0.20 | 0.14 | 11                            | 7.0   | 2.9      | 235                        | 2.0   | 20.0 | 2.8        | 1.4      | 4.2            | 24.9              | 5.0      |
| OS-1      | 1.51      | C                      | 83.0           | 0.82 | 0.71 | 0.68 | 40                            | 2.0   | 3.6      | 880                        | 2.0   | 20.0 | 2.8        | 5.2      | 8.8            | 16.9              | 8.8      |
| OS-2      | 0.60      | C                      | 80.1           | 0.81 | 0.69 | 0.65 | 34                            | 2.0   | 3.5      | 380                        | 2.3   | 20.0 | 3.0        | 2.1      | 5.6            | 14.5              | 5.6      |
| OS-3      | 1.94      | C                      | 82.1           | 0.82 | 0.70 | 0.67 | 40                            | 2.0   | 3.7      | 870                        | 2.5   | 20.0 | 3.2        | 4.6      | 8.3            | 16.5              | 8.3      |
| OS-4      | 0.38      | C                      | 95.0           | 0.87 | 0.81 | 0.79 | 30                            | 2.0   | 2.3      | 410                        | 2.5   | 20.0 | 3.2        | 2.2      | 4.5            | 11.8              | 5.0      |

NOTES:

$T_i = (0.395 * (1.1 - C_2) * (L)^{0.5}) / ((S)^{0.33})$ , S in ft/ft

$T_t = L / 60V$  (Velocity From Fig. 501)

Velocity  $V = C_v * S^{0.5}$ , S in ft/ft

$T_c \text{ Regional} = (26 - 17i) + (L / (60(14i + 9)S^{0.5}))$ , S in ft/ft, i= Imperviousness expressed as decimal

For Urbanized basins a minimum T<sub>c</sub> of 5.0 minutes is required.

For non-urbanized basins a minimum T<sub>c</sub> of 10.0 minutes is required

# PHASE III DRAINAGE REPORT FOR

DAWSON TRAILS FILING NO. 2  
TOWN OF CASTLE ROCK, COLORADO  
PROJECT NO. CD23-0045



## Prepared for:

ACM Dawson Trails JV LLC  
4100 Mississippi Ave, Ste 500  
Glendale, CO 80246  
Contact: Lawrence Jacobson  
Phone: 303-984-9800

## Prepared by:



EMK Consultants, Inc.  
7006 S. Alton Way, Bldg F  
Centennial, CO 80112  
Contact: Eric R. McDaniel  
Phone: 303-694-1520  
EMK Job No 13466

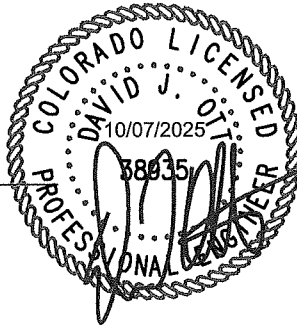
September 9, 2025



## Engineer's Statement:

I affirm that this report and plan for the Phase III drainage design of Dawson Trails Filing No. 2 was prepared by me (or under my direct supervision) in accordance with the provisions of the Town of Castle Rock Drainage Design and Technical Criteria for the owners thereof. I understand that the Town of Castle Rock does not and will not assume liability for drainage facilities designed by others.

David J. Ott, P.E.  
Colorado Professional Engineer  
License #38935



DEVELOPMENT SERVICES  
**APPROVED**

By tkucewesky  
on 10/21/2025  
Approved-CD23-0045 Ph III Drn Rpt.pdf  
Record Document on File

## Developer's Statement:

ACM Dawson Trails JV LLC hereby certifies that the drainage facilities for Dawson Trails Filing No. 2 shall be constructed according to the design presented in this report. I understand that the Town of Castle Rock does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that the Town of Castle Rock reviews drainage plans pursuant to the Municipal Code; but cannot, on behalf of Dawson Trails Filing No. 2, guarantee that final drainage design review will absolve ACM Dawson Trails JV LLC and/or their successors and/or assigns of future liability for improper design.

  
Lawrence Jacobson  
Owner/Developer



oriented use. The area is assigned a build-out imperviousness of 71.4% for hydrologic analysis. This basin is tributary to the Regional Pond C1 and has been accounted for in its sizing. Release rates from Pond C1 have been coordinated with the design of the Gambel Ridge Tributary as to release at acceptable rates. This avoids any capacity issues in crossing the railroad in following historic drainage patterns. No impacts to wetlands or water rights are anticipated as a result of this inter-watershed transfer. Interim discharge from this basin continues east to culverts under I-25 and the railroad via sheet flow.

**Basin C-3 (19.6 acres | 70% Impervious | Q100 = 57.9 cfs)**

Major Basin C-3 is bounded by Dawson Trails Boulevard on the west, Crystal Valley Parkway on the north, Ike Street on the east, and Quandary Peak Drive on the South. It is designated within Planning area F3 in the development plan. Non-residential and residential uses are permitted within the development parcel, with a specific anticipation of commercial oriented use. The area is assigned a build-out imperviousness of 70% for hydrologic analysis. This basin is tributary to the Regional Pond C1 and has been accounted for in its sizing.

**Basin C-4 (20.6 acres | 75% Impervious | Q100 = 43.8 cfs)**

Major Basin C-4 is bounded by Dawson Trails Boulevard on the east, Arterial A on the north and west, and Quandary Peak Drive on the south. It is designated within Planning area E2 in the development plan. Non-residential and residential uses are permitted within the development parcel, with a specific anticipation of commercial oriented use. The area is assigned a build-out imperviousness of 75% for hydrologic analysis. This basin is tributary to the Regional Pond C1 and has been accounted for in its sizing.

**Basin C-5 (24.2 acres | 80% Impervious | Q100 = 50 cfs)**

Major Basin C-5 includes the road rights-of-way for Arterial A, Dawson Trails Boulevard, Crystal Valley Parkway and the western segment of Quandary Peak Drive. Specific sub-areas of Basin C-5 are further detailed in Section II.B of this report, along with the proposed drainage improvements for the included roadways. The area is assigned a build-out imperviousness of 80% for hydrologic analysis. This basin is tributary to the Regional Pond C1 and has been accounted for in its sizing.

**Basin C-6 (8.4 acres | 80% Impervious | Q100 = 15 cfs)**

Major Basin C-6 includes the road rights-of-way for Ike Street and the eastern segment of Quandary Peak Drive. Specific sub-areas of Basin C6 are further detailed in Section II.B of this report, along with the proposed drainage improvements for the included roadways. The area is assigned a build-out imperviousness of 80% for hydrologic analysis. This basin is tributary to the Regional Pond C1 and has been accounted for in its sizing.

North Dawson Tributary Watershed: On-site Basins used in CUHP/SWMM Analysis:  
[Proposed Overall SWMM Map 1]

**Basin A-1 (13.4 acre | 12% Impervious | Q100 = 27.0 cfs)**

Major Basin A-1 is bounded by development parcels to the north, Dawson Trails Boulevard to the west, The CORE Electric substation to the south, and the BNSF Railroad to the east. Major Basin A-1 contains the Regional Flood Control Pond A1 and associated open space. Basin A-1 is located within the planning area OSP-4 in the development plan. This area has an anticipated use of open space and landscape features. The area is assigned a build out imperviousness of 12% for hydrologic analysis. Flows from this basin



all flow can be released via the main stem of the North Dawson Tributary or the main stem of the Gambel Ridge tributary. Impacts to water rights or wetlands are not anticipated with this basin transfer.

5. Mile High Flood District drainage policy states that the maximum allowable 100-year release rate from detention ponds is 0.9 of the pre-development peak 100-year flows. However, to account for upstream drainageway flows while meeting the constraint described in (4) above, 100-year detention release rates will need to be further restricted beyond 0.9 of pre-development peak to ensure existing capacities downstream are not exceeded. The railway crossings and I-25 culverts are the governing restriction for the detention ponds in this project.

Drainage components specifically integrated with the Crystal Valley Interchange:

Two components of the Crystal Valley Interchange are key elements of the Gambel Ridge Watershed as it relates Filing 2 drainage design. These elements—the Gambel Ridge Channel Improvements and Regional Pond C1—are explained as follows:

Gambel Ridge Channel Improvements (by others)

The runoff analysis in the Gambel Ridge and Douglas Lane Tributary Master Plan [Ref. G] indicates that Gambel Ridge Tributary will see an increase of flow under developed conditions, and that channel stabilization improvements will be warranted.

The design of the Gambel Ridge Tributary improvements is not within the scope of the Filing 2 project or within the scope of this drainage report.

Improvements to the 1,000-foot segment of Gambel Ridge Tributary between the BNSF right-of-way and Dawson Trails Boulevard are included in the design of the Crystal Valley Interchange by Jacobs Engineering Group. The appendices contain design calculations from the Crystal Valley Interchange project relevant to this project.

Regional Pond C1 (by others)

Pond C1 is located immediately south of Crystal Valley Parkway, between Dawson Trails Boulevard and Interstate 25. Because Pond C1 is responsible for detention and water quality treatment of the segment of Crystal Valley Parkway between Dawson Trails Boulevard and Interstate 25, its design is programmed with the Crystal Valley Interchange project, by Jacobs Engineering Group. However, Pond C1 also plays an important role in the Dawson Trails Filing No. 2 drainage design because it provides detention and water quality treatment for development parcels in the lower part of the Gambel Ridge watershed. Land use assumptions for basins tributary to Pond C1 within Filing 2 fit within the assumptions of the Pond C1 design in the CVI project.



## **APPENDIX A**

# **PROJECT INFORMATION & HYDROLOGIC COMPUTATIONS**

**VICINITY MAP  
HYDROLOGIC SOIL GROUP  
FLOODPLAIN MAPS  
EXISTING CUHP CALCULATIONS  
PROPOSED CUHP CALCULATIONS  
PROPOSED SWMM ANALYSIS  
RATIONAL METHOD CALCULATIONS**

**GAMBEL RIDGE TRIBUTARY  
CUHP MODEL RESULTS**

# INTERIM BUILDOUT CONDITION

## CUHP SUBCATCHMENTS

Columns with this color heading are for required user-input  
 Columns with this color heading are for optional override values  
 Columns with this color heading are for program-calculated values

|                      |                         |          |                            |                            |                |               |                           | Maximum Depression Storage<br>(Watershed inches) |            | Horton's Infiltration<br>Parameters |                                     |                          | DCIA                   |
|----------------------|-------------------------|----------|----------------------------|----------------------------|----------------|---------------|---------------------------|--------------------------------------------------|------------|-------------------------------------|-------------------------------------|--------------------------|------------------------|
| Subcatchment<br>Name | EPA SWMM Target<br>Node | Raingage | Area<br>(mi <sup>2</sup> ) | Length to<br>Centroid (mi) | Length<br>(mi) | Slope (ft/ft) | Percent<br>Imperviousness | Pervious                                         | Impervious | Initial<br>Rate<br>(in/hr)          | Decay<br>Coefficient<br>(1/seconds) | Final<br>Rate<br>(in/hr) | Level 0,<br>1, or<br>2 |
| H-1                  | J_H1                    | 100-year | 0.0725514                  | 0.221212121                | 0.5210227      | 0.058         | 2                         | 0.4                                              | 0.1        | 3.7                                 | 0.0018                              | 0.5                      | 0                      |
| H-2                  | J_H2                    | 100-year | 0.1187964                  | 0.357386364                | 0.7441288      | 0.045         | 2                         | 0.35                                             | 0.05       | 3.5                                 | 0.0018                              | 0.5                      | 0                      |
| H-3                  | J_H3                    | 100-year | 0.0086165                  | 0.098863636                | 0.1977273      | 0.033         | 45                        | 0.35                                             | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| H-4                  | J_H4                    | 100-year | 0.0126001                  | 0.131439394                | 0.2606061      | 0.045         | 45                        | 0.35                                             | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| H-5                  | J_H5                    | 100-year | 0.0614924                  | 0.2                        | 0.4005682      | 0.036         | 45                        | 0.35                                             | 0.05       | 3.1                                 | 0.0018                              | 0.5                      | 0                      |
| H-6                  | J_H6                    | 100-year | 0.0394709                  | 0.359469697                | 0.7189394      | 0.045         | 32.6                      | 0.35                                             | 0.1        | 3                                   | 0.0018                              | 0.5                      | 0                      |
| H-7                  | J_H7                    | 100-year | 0.0100076                  | 0.052840909                | 0.1988636      | 0.031         | 51.5                      | 0.35                                             | 0.05       | 4.2                                 | 0.0018                              | 0.6                      | 0                      |
| H-8                  | J_H8                    | 100-year | 0.0165493                  | 0.225776932                | 0.4346471      | 0.0533        | 2                         | 0.4                                              | 0.01       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| C-1                  | J_C1                    | 100-year | 0.0570767                  | 0.16969697                 | 0.4077652      | 0.06321412    | 75                        | 0.35                                             | 0.1        | 4                                   | 0.0018                              | 0.6                      | 0                      |
| C-2                  | J_C2                    | 100-year | 0.0760191                  | 0.226704545                | 0.4401515      | 0.022934596   | 75                        | 0.35                                             | 0.1        | 3.3                                 | 0.001745                            | 0.5                      | 0                      |
| C-3                  | J_C3                    | 100-year | 0.0508346                  | 0.219128788                | 0.4765152      | 0.019475358   | 75                        | 0.35                                             | 0.1        | 3.4                                 | 0.0018                              | 0.5                      | 0                      |
| C-4                  | J_C4                    | 100-year | 0.033502                   | 0.130681818                | 0.3314394      | 0.024257143   | 75                        | 0.35                                             | 0.1        | 3.7                                 | 0.0018                              | 0.5                      | 0                      |
| C-5                  | J_C5                    | 100-year | 0.0377594                  | 0.358522727                | 0.7168561      | 0.018124174   | 80.4                      | 0.35                                             | 0.1        | 3.7                                 | 0.0018                              | 0.5                      | 0                      |
| C-6                  | J_C6                    | 100-year | 0.0130523                  | 0.21969697                 | 0.5893939      | 0.01722365    | 80.4                      | 0.35                                             | 0.1        | 4.2                                 | 0.001714589                         | 0.6                      | 0                      |
| C-7                  | J_C7                    | 100-year | 0.0210999                  | 0.148674242                | 0.2666667      | 0.011576705   | 88.6                      | 0.35                                             | 0.1        | 4.4                                 | 0.001010314                         | 0.9                      | 0                      |
| C-8                  | J_C8                    | 100-year | 0.030106                   | 0.130492424                | 0.2907197      | 0.015         | 95                        | 0.35                                             | 0.1        | 4.5                                 | 0.001                               | 0.9                      | 0                      |
| C-9                  | J_C9                    | 100-year | 0.0066354                  | 0.131439394                | 0.2712121      | 0.02          | 2                         | 0.35                                             | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| OS-1                 | J_O1                    | 100-year | 0.1084434                  | 0.422916667                | 0.7518939      | 0.066         | 8.7                       | 0.4                                              | 0.05       | 4.1                                 | 0.0018                              | 0.6                      | 0                      |
| OS-2                 | J_O2                    | 100-year | 0.1579448                  | 0.522727273                | 0.9541667      | 0.059         | 3.9                       | 0.4                                              | 0.05       | 4.2                                 | 0.0018                              | 0.6                      | 0                      |
| OS-3                 | J_O3                    | 100-year | 0.1543167                  | 0.297727273                | 0.8047348      | 0.059         | 10.4                      | 0.4                                              | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| OS-4                 | J_O4                    | 100-year | 0.0394811                  | 0.148106061                | 0.4035985      | 0.057         | 11.5                      | 0.4                                              | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |

# INTERIM BUILDOUT CONDITION - 100 YEAR STORM EVENT

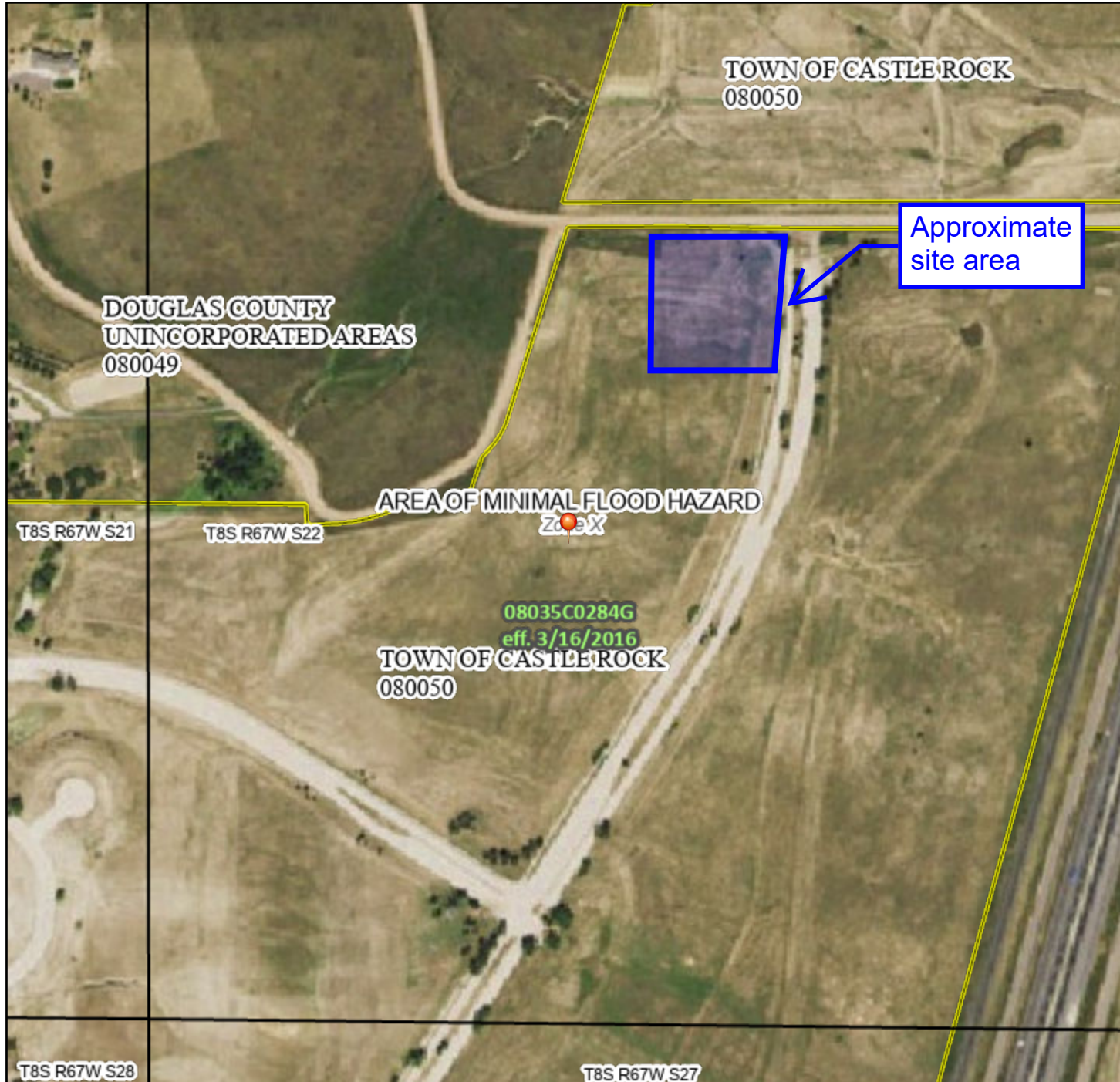
Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

| Catchment Name/ID | User Comment for Catchment | Unit Hydrograph Parameters and Results |       |               |                       |               |                       |                           |            |                 | Excess Precip.     |                  | Storm Hydrograph          |                    |                           |                                       |
|-------------------|----------------------------|----------------------------------------|-------|---------------|-----------------------|---------------|-----------------------|---------------------------|------------|-----------------|--------------------|------------------|---------------------------|--------------------|---------------------------|---------------------------------------|
|                   |                            | CT                                     | Cp    | W50<br>(min.) | W50<br>Before<br>Peak | W75<br>(min.) | W75<br>Before<br>Peak | Time to<br>Peak<br>(min.) | Peak (cfs) | Volume<br>(c.f) | Excess<br>(inches) | Excess<br>(c.f.) | Time to<br>Peak<br>(min.) | Peak Flow<br>(cfs) | Total<br>Volume<br>(c.f.) | Runoff per<br>Unit Area<br>(cfs/acre) |
| H-1               |                            | 0.156                                  | 0.144 | 35.8          | 5.45                  | 18.6          | 3.85                  | 9.1                       | 61         | 168,551         | 1.53               | 257,995          | 45.0                      | 66                 | 257,577                   | 1.43                                  |
| H-2               |                            | 0.156                                  | 0.179 | 45.5          | 7.77                  | 23.7          | 5.49                  | 13.0                      | 78         | 275,988         | 1.59               | 438,879          | 50.0                      | 96                 | 438,634                   | 1.26                                  |
| H-3               |                            | 0.091                                  | 0.060 | 24.3          | 2.63                  | 12.7          | 1.86                  | 4.4                       | 11         | 20,018          | 2.13               | 42,550           | 40.0                      | 12                 | 41,629                    | 2.24                                  |
| H-4               |                            | 0.091                                  | 0.071 | 24.9          | 2.87                  | 13.0          | 2.03                  | 4.8                       | 15         | 29,273          | 2.13               | 62,222           | 40.0                      | 18                 | 61,250                    | 2.23                                  |
| H-5               |                            | 0.091                                  | 0.146 | 19.4          | 3.67                  | 10.1          | 2.59                  | 6.1                       | 95         | 142,859         | 2.12               | 303,242          | 35.0                      | 106                | 301,391                   | 2.69                                  |
| H-6               |                            | 0.098                                  | 0.098 | 51.8          | 5.39                  | 27.0          | 3.81                  | 9.0                       | 23         | 91,699          | 1.96               | 180,024          | 50.0                      | 33                 | 179,860                   | 1.30                                  |
| H-7               |                            | 0.088                                  | 0.069 | 15.5          | 2.32                  | 8.1           | 1.64                  | 3.9                       | 19         | 23,250          | 2.12               | 49,276           | 35.0                      | 19                 | 47,053                    | 2.95                                  |
| H-8               |                            | 0.156                                  | 0.074 | 65.8          | 5.23                  | 34.2          | 3.70                  | 8.7                       | 8          | 38,447          | 1.57               | 60,277           | 55.0                      | 10                 | 60,204                    | 0.92                                  |
| C-1               |                            | 0.079                                  | 0.174 | 11.4          | 3.03                  | 6.0           | 2.14                  | 5.0                       | 150        | 132,601         | 2.42               | 320,554          | 35.0                      | 141                | 312,291                   | 3.86                                  |
| C-2               |                            | 0.079                                  | 0.198 | 15.3          | 3.82                  | 7.9           | 2.70                  | 6.4                       | 149        | 176,608         | 2.45               | 433,560          | 35.0                      | 168                | 431,561                   | 3.46                                  |
| C-3               |                            | 0.079                                  | 0.165 | 19.5          | 3.96                  | 10.1          | 2.80                  | 6.6                       | 78         | 118,099         | 2.46               | 290,053          | 35.0                      | 95                 | 288,347                   | 2.93                                  |
| C-4               |                            | 0.079                                  | 0.137 | 14.6          | 3.03                  | 7.6           | 2.14                  | 5.1                       | 69         | 77,832          | 2.45               | 190,843          | 35.0                      | 74                 | 186,479                   | 3.45                                  |
| C-5               |                            | 0.077                                  | 0.147 | 33.6          | 5.29                  | 17.5          | 3.74                  | 8.8                       | 34         | 87,723          | 2.52               | 220,908          | 45.0                      | 50                 | 220,635                   | 2.08                                  |
| C-6               |                            | 0.077                                  | 0.091 | 39.5          | 4.26                  | 20.5          | 3.01                  | 7.1                       | 10         | 30,323          | 2.49               | 75,389           | 45.0                      | 15                 | 75,187                    | 1.83                                  |
| C-7               |                            | 0.075                                  | 0.115 | 19.0          | 3.17                  | 9.9           | 2.24                  | 5.3                       | 33         | 49,019          | 2.53               | 124,250          | 35.0                      | 41                 | 122,947                   | 3.01                                  |
| C-8               |                            | 0.074                                  | 0.136 | 14.4          | 3.01                  | 7.5           | 2.13                  | 5.0                       | 63         | 69,942          | 2.66               | 186,018          | 35.0                      | 70                 | 181,518                   | 3.61                                  |
| C-9               |                            | 0.156                                  | 0.049 | 77.2          | 4.40                  | 40.2          | 3.11                  | 7.3                       | 3          | 15,415          | 1.62               | 24,918           | 60.0                      | 4                  | 24,888                    | 0.83                                  |
| OS-1              |                            | 0.134                                  | 0.150 | 46.5          | 6.86                  | 24.2          | 4.84                  | 11.4                      | 70         | 251,936         | 1.50               | 377,209          | 50.0                      | 81                 | 377,215                   | 1.17                                  |
| OS-2              |                            | 0.150                                  | 0.196 | 50.7          | 9.14                  | 26.3          | 6.46                  | 15.2                      | 94         | 366,937         | 1.44               | 526,741          | 55.0                      | 108                | 526,352                   | 1.07                                  |
| OS-3              |                            | 0.128                                  | 0.169 | 35.3          | 6.07                  | 18.3          | 4.29                  | 10.1                      | 131        | 358,509         | 1.66               | 596,421          | 45.0                      | 153                | 596,044                   | 1.55                                  |
| OS-4              |                            | 0.125                                  | 0.090 | 33.6          | 3.81                  | 17.4          | 2.69                  | 6.4                       | 35         | 91,722          | 1.68               | 153,820          | 45.0                      | 40                 | 153,345                   | 1.58                                  |

# National Flood Hazard Layer FIRMette



104°53'16"W 39°20'26"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

104°52'38"W 39°19'58"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)<br>Zone A, V, A99                                                                                                              |
|                             |  | With BFE or Depth Zone AE, AO, AH, VE, AR                                                                                                                         |
|                             |  | 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 Zone X |
|                             |  | Future Conditions 1% Annual Chance Flood Hazard Zone X                                                                                                            |
|                             |  | Area with Reduced Flood Risk due to Levee. See Notes. Zone X                                                                                                      |
|                             |  | Area with Flood Risk due to Levee Zone D                                                                                                                          |
| OTHER AREAS                 |  | NO SCREEN Area of Minimal Flood Hazard Zone X                                                                                                                     |
|                             |  | Effective LOMRs                                                                                                                                                   |
| GENERAL STRUCTURES          |  | Area of Undetermined Flood Hazard Zone D                                                                                                                          |
|                             |  | Channel, Culvert, or Storm Sewer                                                                                                                                  |
| OTHER FEATURES              |  | Levee, Dike, or Floodwall                                                                                                                                         |
|                             |  | Cross Sections with 1% Annual Chance Water Surface Elevation                                                                                                      |
| OTHER FEATURES              |  | Coastal Transect                                                                                                                                                  |
|                             |  | Base Flood Elevation Line (BFE)                                                                                                                                   |
| OTHER FEATURES              |  | Limit of Study                                                                                                                                                    |
|                             |  | Jurisdiction Boundary                                                                                                                                             |
| OTHER FEATURES              |  | Coastal Transect Baseline                                                                                                                                         |
|                             |  | Profile Baseline                                                                                                                                                  |
| OTHER FEATURES              |  | Hydrographic Feature                                                                                                                                              |
|                             |  | Digital Data Available                                                                                                                                            |
| MAP PANELS                  |  | 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 **12/1/2025 at 9:20 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.

# ULTIMATE BUILDOUT CONDITION

## CUHP SUBCATCHMENTS

Columns with this color heading are for required user-input  
 Columns with this color heading are for optional override values  
 Columns with this color heading are for program-calculated values

|                      |                         |          |                |                            |                |               |                           | Maximum Depression Storage<br>(Watershed inches) |            | Horton's Infiltration<br>Parameters |                                     |                          | DCIA                   |
|----------------------|-------------------------|----------|----------------|----------------------------|----------------|---------------|---------------------------|--------------------------------------------------|------------|-------------------------------------|-------------------------------------|--------------------------|------------------------|
| Subcatchment<br>Name | EPA SWMM Target<br>Node | Raingage | Area<br>(acre) | Length to<br>Centroid (ft) | Length<br>(ft) | Slope (ft/ft) | Percent<br>Imperviousness | Pervious                                         | Impervious | Initial<br>Rate<br>(in/hr)          | Decay<br>Coefficient<br>(1/seconds) | Final<br>Rate<br>(in/hr) | Level 0,<br>1, or<br>2 |
| H-1                  | J_H1                    | 2-year   | 46.432874      | 1168                       | 2751           | 0.058         | 7.8                       | 0.4                                              | 0.1        | 3.7                                 | 0.0018                              | 0.5                      | 0                      |
| H-2                  | J_H2                    | 2-year   | 76.029706      | 1887                       | 3929           | 0.045         | 28.2                      | 0.35                                             | 0.05       | 3.5                                 | 0.0018                              | 0.5                      | 0                      |
| H-3                  | J_H3                    | 2-year   | 5.5145776      | 522                        | 1044           | 0.033         | 45                        | 0.35                                             | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| H-4                  | J_H4                    | 2-year   | 8.0640496      | 694                        | 1376           | 0.045         | 45                        | 0.35                                             | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| H-5                  | J_H5                    | 2-year   | 39.355119      | 1056                       | 2115           | 0.036         | 45                        | 0.35                                             | 0.05       | 3.1                                 | 0.0018                              | 0.5                      | 0                      |
| H-6                  | J_H6                    | 2-year   | 25.261364      | 1898                       | 3796           | 0.045         | 32.6                      | 0.35                                             | 0.1        | 3                                   | 0.0018                              | 0.5                      | 0                      |
| H-7                  | J_H7                    | 2-year   | 6.4048898      | 279                        | 1050           | 0.031         | 51.5                      | 0.35                                             | 0.05       | 4.2                                 | 0.0018                              | 0.6                      | 0                      |
| H-8                  | J_H8                    | 2-year   | 10.591578      | 1192                       | 2295           | 0.053         | 2                         | 0.4                                              | 0.01       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| C-1                  | J_C1                    | 2-year   | 36.529109      | 896                        | 2153           | 0.063         | 75                        | 0.35                                             | 0.1        | 4                                   | 0.0018                              | 0.6                      | 0                      |
| C-2                  | J_C2                    | 2-year   | 48.652227      | 1197                       | 2324           | 0.023         | 75                        | 0.35                                             | 0.1        | 3.3                                 | 0.001745                            | 0.5                      | 0                      |
| C-3                  | J_C3                    | 2-year   | 32.53416       | 1157                       | 2516           | 0.019         | 75                        | 0.35                                             | 0.1        | 3.4                                 | 0.0018                              | 0.5                      | 0                      |
| C-4                  | J_C4                    | 2-year   | 21.441253      | 690                        | 1750           | 0.024         | 75                        | 0.35                                             | 0.1        | 3.7                                 | 0.0018                              | 0.5                      | 0                      |
| C-5                  | J_C5                    | 2-year   | 24.166001      | 1893                       | 3785           | 0.018         | 80.4                      | 0.35                                             | 0.1        | 3.7                                 | 0.0018                              | 0.5                      | 0                      |
| C-6                  | J_C6                    | 2-year   | 8.3534605      | 1160                       | 3112           | 0.017         | 80.4                      | 0.35                                             | 0.1        | 4.2                                 | 0.001714589                         | 0.6                      | 0                      |
| C-7                  | J_C7                    | 2-year   | 13.503926      | 785                        | 1408           | 0.012         | 88.6                      | 0.35                                             | 0.1        | 4.4                                 | 0.001010314                         | 0.9                      | 0                      |
| C-8                  | J_C8                    | 2-year   | 19.267837      | 689                        | 1535           | 0.015         | 95                        | 0.35                                             | 0.1        | 4.5                                 | 0.001                               | 0.9                      | 0                      |
| C-9                  | J_C9                    | 2-year   | 4.2466253      | 694                        | 1432           | 0.020         | 2                         | 0.35                                             | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| OS-1                 | J_O1                    | 2-year   | 69.403792      | 2233                       | 3970           | 0.066         | 8.7                       | 0.4                                              | 0.05       | 4.1                                 | 0.0018                              | 0.6                      | 0                      |
| OS-2                 | J_O2                    | 2-year   | 101.08469      | 2760                       | 5038           | 0.059         | 3.9                       | 0.4                                              | 0.05       | 4.2                                 | 0.0018                              | 0.6                      | 0                      |
| OS-3                 | J_O3                    | 2-year   | 98.762718      | 1572                       | 4249           | 0.059         | 10.4                      | 0.4                                              | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |
| OS-4                 | J_O4                    | 2-year   | 25.267883      | 782                        | 2131           | 0.057         | 11.5                      | 0.4                                              | 0.05       | 3                                   | 0.0018                              | 0.5                      | 0                      |

# ULTIMATE BUILDOUT CONDITION - 2 YEAR STORM EVENT

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

| Catchment Name/ID | User Comment for Catchment | Unit Hydrograph Parameters and Results |       |               |                       |               |                       |                           |            |                 | Excess Precip.     |                  | Storm Hydrograph          |                    |                           |                                       |
|-------------------|----------------------------|----------------------------------------|-------|---------------|-----------------------|---------------|-----------------------|---------------------------|------------|-----------------|--------------------|------------------|---------------------------|--------------------|---------------------------|---------------------------------------|
|                   |                            | CT                                     | Cp    | W50<br>(min.) | W50<br>Before<br>Peak | W75<br>(min.) | W75<br>Before<br>Peak | Time to<br>Peak<br>(min.) | Peak (cfs) | Volume<br>(c.f) | Excess<br>(inches) | Excess<br>(c.f.) | Time to<br>Peak<br>(min.) | Peak Flow<br>(cfs) | Total<br>Volume<br>(c.f.) | Runoff per<br>Unit Area<br>(cfs/acre) |
| H-1               |                            | 0.140                                  | 0.130 | 35.5          | 5.05                  | 18.5          | 3.57                  | 8.4                       | 61         | 168,551         | 0.07               | 11,034           | 40.0                      | 3                  | 11,009                    | 0.06                                  |
| H-2               |                            | 0.104                                  | 0.141 | 38.7          | 5.68                  | 20.1          | 4.01                  | 9.5                       | 92         | 275,988         | 0.32               | 88,762           | 40.0                      | 21                 | 88,680                    | 0.27                                  |
| H-3               |                            | 0.092                                  | 0.059 | 24.8          | 2.63                  | 12.9          | 1.86                  | 4.4                       | 10         | 20,018          | 0.52               | 10,368           | 35.0                      | 3                  | 10,151                    | 0.53                                  |
| H-4               |                            | 0.092                                  | 0.070 | 25.4          | 2.88                  | 13.2          | 2.03                  | 4.8                       | 15         | 29,273          | 0.52               | 15,161           | 35.0                      | 4                  | 14,940                    | 0.53                                  |
| H-5               |                            | 0.092                                  | 0.144 | 19.8          | 3.68                  | 10.3          | 2.60                  | 6.1                       | 93         | 142,859         | 0.52               | 73,722           | 30.0                      | 25                 | 73,175                    | 0.64                                  |
| H-6               |                            | 0.100                                  | 0.095 | 54.0          | 5.44                  | 28.1          | 3.85                  | 9.1                       | 22         | 91,699          | 0.37               | 33,623           | 40.0                      | 6                  | 33,596                    | 0.23                                  |
| H-7               |                            | 0.089                                  | 0.068 | 15.8          | 2.32                  | 8.2           | 1.64                  | 3.9                       | 19         | 23,250          | 0.54               | 12,647           | 30.0                      | 5                  | 12,098                    | 0.73                                  |
| H-8               |                            | 0.157                                  | 0.074 | 65.8          | 5.25                  | 34.2          | 3.71                  | 8.8                       | 8          | 38,447          | 0.04               | 1,465            | 45.0                      | 0                  | 1,464                     | 0.03                                  |
| C-1               |                            | 0.079                                  | 0.173 | 11.5          | 3.03                  | 6.0           | 2.14                  | 5.1                       | 149        | 132,601         | 0.78               | 103,829          | 30.0                      | 45                 | 101,107                   | 1.24                                  |
| C-2               |                            | 0.079                                  | 0.197 | 15.4          | 3.83                  | 8.0           | 2.70                  | 6.4                       | 148        | 176,608         | 0.80               | 141,348          | 30.0                      | 54                 | 140,725                   | 1.12                                  |
| C-3               |                            | 0.079                                  | 0.164 | 19.6          | 3.97                  | 10.2          | 2.81                  | 6.6                       | 78         | 118,099         | 0.80               | 94,626           | 30.0                      | 31                 | 94,031                    | 0.94                                  |
| C-4               |                            | 0.079                                  | 0.136 | 14.7          | 3.04                  | 7.6           | 2.15                  | 5.1                       | 68         | 77,832          | 0.80               | 62,147           | 30.0                      | 24                 | 60,766                    | 1.12                                  |
| C-5               |                            | 0.077                                  | 0.146 | 33.8          | 5.29                  | 17.6          | 3.74                  | 8.8                       | 34         | 87,723          | 0.86               | 75,055           | 35.0                      | 16                 | 74,963                    | 0.68                                  |
| C-6               |                            | 0.077                                  | 0.091 | 39.7          | 4.27                  | 20.7          | 3.02                  | 7.1                       | 10         | 30,323          | 0.84               | 25,500           | 40.0                      | 5                  | 25,432                    | 0.58                                  |
| C-7               |                            | 0.075                                  | 0.115 | 19.0          | 3.18                  | 9.9           | 2.25                  | 5.3                       | 33         | 49,019          | 0.92               | 45,075           | 30.0                      | 15                 | 44,607                    | 1.08                                  |
| C-8               |                            | 0.074                                  | 0.136 | 14.5          | 3.01                  | 7.5           | 2.13                  | 5.0                       | 62         | 69,942          | 1.00               | 70,115           | 30.0                      | 27                 | 68,423                    | 1.38                                  |
| C-9               |                            | 0.157                                  | 0.049 | 77.2          | 4.42                  | 40.2          | 3.13                  | 7.4                       | 3          | 15,415          | 0.09               | 1,340            | 45.0                      | 0                  | 1,338                     | 0.05                                  |
| OS-1              |                            | 0.139                                  | 0.154 | 46.7          | 7.03                  | 24.3          | 4.96                  | 11.7                      | 70         | 251,936         | 0.07               | 16,883           | 40.0                      | 4                  | 16,884                    | 0.05                                  |
| OS-2              |                            | 0.152                                  | 0.199 | 50.7          | 9.25                  | 26.4          | 6.54                  | 15.4                      | 93         | 366,937         | 0.03               | 10,527           | 45.0                      | 2                  | 10,520                    | 0.02                                  |
| OS-3              |                            | 0.132                                  | 0.173 | 35.5          | 6.21                  | 18.4          | 4.39                  | 10.4                      | 131        | 358,509         | 0.11               | 40,206           | 40.0                      | 11                 | 40,179                    | 0.11                                  |
| OS-4              |                            | 0.128                                  | 0.092 | 33.8          | 3.87                  | 17.6          | 2.74                  | 6.5                       | 35         | 91,722          | 0.12               | 11,260           | 40.0                      | 3                  | 11,229                    | 0.13                                  |

# ULTIMATE BUILDOUT CONDITION - 5 YEAR STORM EVENT

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

| Catchment Name/ID | User Comment for Catchment | Unit Hydrograph Parameters and Results |       |               |                       |               |                       |                           |            |                 | Excess Precip.     |                  | Storm Hydrograph          |                    |                           |                                       |
|-------------------|----------------------------|----------------------------------------|-------|---------------|-----------------------|---------------|-----------------------|---------------------------|------------|-----------------|--------------------|------------------|---------------------------|--------------------|---------------------------|---------------------------------------|
|                   |                            | CT                                     | Cp    | W50<br>(min.) | W50<br>Before<br>Peak | W75<br>(min.) | W75<br>Before<br>Peak | Time to<br>Peak<br>(min.) | Peak (cfs) | Volume<br>(c.f) | Excess<br>(inches) | Excess<br>(c.f.) | Time to<br>Peak<br>(min.) | Peak Flow<br>(cfs) | Total<br>Volume<br>(c.f.) | Runoff per<br>Unit Area<br>(cfs/acre) |
| H-1               |                            | 0.139                                  | 0.129 | 35.4          | 5.01                  | 18.4          | 3.54                  | 8.4                       | 61         | 168,551         | 0.32               | 54,347           | 40.0                      | 15                 | 54,227                    | 0.33                                  |
| H-2               |                            | 0.103                                  | 0.143 | 37.8          | 5.65                  | 19.7          | 3.99                  | 9.4                       | 94         | 275,988         | 0.62               | 171,597          | 40.0                      | 40                 | 171,306                   | 0.53                                  |
| H-3               |                            | 0.091                                  | 0.060 | 24.6          | 2.63                  | 12.8          | 1.86                  | 4.4                       | 10         | 20,018          | 0.85               | 16,973           | 30.0                      | 5                  | 16,614                    | 0.90                                  |
| H-4               |                            | 0.091                                  | 0.071 | 25.2          | 2.87                  | 13.1          | 2.03                  | 4.8                       | 15         | 29,273          | 0.85               | 24,820           | 30.0                      | 7                  | 24,439                    | 0.89                                  |
| H-5               |                            | 0.091                                  | 0.145 | 19.6          | 3.68                  | 10.2          | 2.60                  | 6.1                       | 94         | 142,859         | 0.84               | 120,707          | 30.0                      | 43                 | 119,890                   | 1.09                                  |
| H-6               |                            | 0.099                                  | 0.096 | 53.1          | 5.42                  | 27.6          | 3.83                  | 9.0                       | 22         | 91,699          | 0.68               | 62,565           | 40.0                      | 11                 | 62,507                    | 0.43                                  |
| H-7               |                            | 0.088                                  | 0.068 | 15.7          | 2.32                  | 8.1           | 1.64                  | 3.9                       | 19         | 23,250          | 0.86               | 19,981           | 30.0                      | 8                  | 19,101                    | 1.20                                  |
| H-8               |                            | 0.157                                  | 0.074 | 65.8          | 5.25                  | 34.2          | 3.71                  | 8.7                       | 8          | 38,447          | 0.29               | 11,330           | 45.0                      | 2                  | 11,317                    | 0.19                                  |
| C-1               |                            | 0.079                                  | 0.173 | 11.5          | 3.03                  | 6.0           | 2.14                  | 5.0                       | 149        | 132,601         | 1.14               | 151,819          | 30.0                      | 67                 | 147,868                   | 1.82                                  |
| C-2               |                            | 0.079                                  | 0.197 | 15.3          | 3.82                  | 8.0           | 2.70                  | 6.4                       | 149        | 176,608         | 1.17               | 207,162          | 30.0                      | 80                 | 206,234                   | 1.64                                  |
| C-3               |                            | 0.079                                  | 0.165 | 19.5          | 3.97                  | 10.2          | 2.80                  | 6.6                       | 78         | 118,099         | 1.17               | 138,658          | 30.0                      | 45                 | 137,811                   | 1.38                                  |
| C-4               |                            | 0.079                                  | 0.136 | 14.7          | 3.04                  | 7.6           | 2.15                  | 5.1                       | 69         | 77,832          | 1.17               | 91,068           | 30.0                      | 35                 | 89,021                    | 1.63                                  |
| C-5               |                            | 0.077                                  | 0.146 | 33.7          | 5.29                  | 17.5          | 3.74                  | 8.8                       | 34         | 87,723          | 1.24               | 108,383          | 35.0                      | 23                 | 108,251                   | 0.96                                  |
| C-6               |                            | 0.077                                  | 0.091 | 39.6          | 4.26                  | 20.6          | 3.01                  | 7.1                       | 10         | 30,323          | 1.21               | 36,726           | 35.0                      | 7                  | 36,629                    | 0.82                                  |
| C-7               |                            | 0.075                                  | 0.115 | 19.0          | 3.18                  | 9.9           | 2.25                  | 5.3                       | 33         | 49,019          | 1.28               | 62,765           | 30.0                      | 20                 | 62,111                    | 1.48                                  |
| C-8               |                            | 0.074                                  | 0.136 | 14.5          | 3.01                  | 7.5           | 2.13                  | 5.0                       | 62         | 69,942          | 1.39               | 97,150           | 30.0                      | 36                 | 94,804                    | 1.85                                  |
| C-9               |                            | 0.157                                  | 0.049 | 77.2          | 4.42                  | 40.2          | 3.12                  | 7.4                       | 3          | 15,415          | 0.34               | 5,297            | 45.0                      | 1                  | 5,290                     | 0.19                                  |
| OS-1              |                            | 0.137                                  | 0.152 | 46.6          | 6.95                  | 24.2          | 4.91                  | 11.6                      | 70         | 251,936         | 0.26               | 64,435           | 40.0                      | 15                 | 64,438                    | 0.22                                  |
| OS-2              |                            | 0.152                                  | 0.198 | 50.7          | 9.21                  | 26.4          | 6.51                  | 15.3                      | 93         | 366,937         | 0.20               | 72,312           | 45.0                      | 17                 | 72,264                    | 0.17                                  |
| OS-3              |                            | 0.130                                  | 0.171 | 35.4          | 6.15                  | 18.4          | 4.35                  | 10.3                      | 131        | 358,509         | 0.39               | 139,202          | 40.0                      | 39                 | 139,114                   | 0.40                                  |
| OS-4              |                            | 0.126                                  | 0.090 | 33.7          | 3.84                  | 17.5          | 2.71                  | 6.4                       | 35         | 91,722          | 0.40               | 36,795           | 35.0                      | 10                 | 36,688                    | 0.41                                  |

# ULTIMATE BUILDOUT CONDITION - 100 YEAR STORM EVENT

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

|                   |                            | Unit Hydrograph Parameters and Results |       |            |                 |            |                 |                     |            |              | Excess Precip.  |               | Storm Hydrograph    |                 |                     |                                 |
|-------------------|----------------------------|----------------------------------------|-------|------------|-----------------|------------|-----------------|---------------------|------------|--------------|-----------------|---------------|---------------------|-----------------|---------------------|---------------------------------|
| Catchment Name/ID | User Comment for Catchment | CT                                     | Cp    | W50 (min.) | W50 Before Peak | W75 (min.) | W75 Before Peak | Time to Peak (min.) | Peak (cfs) | Volume (c.f) | Excess (inches) | Excess (c.f.) | Time to Peak (min.) | Peak Flow (cfs) | Total Volume (c.f.) | Runoff per Unit Area (cfs/acre) |
| H-1               |                            | 0.137                                  | 0.127 | 35.4       | 4.96            | 18.4       | 3.50            | 8.3                 | 62         | 168,551      | 1.60            | 269,381       | 45.0                | 69              | 268,785             | 1.48                            |
| H-2               |                            | 0.102                                  | 0.146 | 36.6       | 5.61            | 19.0       | 3.96            | 9.3                 | 97         | 275,988      | 1.90            | 524,509       | 45.0                | 125             | 523,680             | 1.64                            |
| H-3               |                            | 0.091                                  | 0.060 | 24.3       | 2.63            | 12.7       | 1.86            | 4.4                 | 11         | 20,018       | 2.13            | 42,550        | 40.0                | 12              | 41,629              | 2.24                            |
| H-4               |                            | 0.091                                  | 0.071 | 24.9       | 2.87            | 13.0       | 2.03            | 4.8                 | 15         | 29,273       | 2.13            | 62,222        | 40.0                | 18              | 61,250              | 2.23                            |
| H-5               |                            | 0.091                                  | 0.146 | 19.4       | 3.67            | 10.1       | 2.59            | 6.1                 | 95         | 142,859      | 2.12            | 303,242       | 35.0                | 106             | 301,391             | 2.69                            |
| H-6               |                            | 0.098                                  | 0.098 | 51.8       | 5.39            | 27.0       | 3.81            | 9.0                 | 23         | 91,699       | 1.96            | 180,024       | 50.0                | 33              | 179,860             | 1.30                            |
| H-7               |                            | 0.088                                  | 0.069 | 15.5       | 2.32            | 8.1        | 1.64            | 3.9                 | 19         | 23,250       | 2.12            | 49,276        | 35.0                | 19              | 47,053              | 2.95                            |
| H-8               |                            | 0.156                                  | 0.074 | 65.8       | 5.23            | 34.2       | 3.70            | 8.7                 | 8          | 38,447       | 1.57            | 60,277        | 55.0                | 10              | 60,204              | 0.92                            |
| C-1               |                            | 0.079                                  | 0.174 | 11.4       | 3.03            | 6.0        | 2.14            | 5.0                 | 150        | 132,601      | 2.42            | 320,554       | 35.0                | 141             | 312,291             | 3.86                            |
| C-2               |                            | 0.079                                  | 0.198 | 15.3       | 3.82            | 7.9        | 2.70            | 6.4                 | 149        | 176,608      | 2.45            | 433,560       | 35.0                | 168             | 431,561             | 3.46                            |
| C-3               |                            | 0.079                                  | 0.165 | 19.5       | 3.96            | 10.1       | 2.80            | 6.6                 | 78         | 118,099      | 2.46            | 290,053       | 35.0                | 95              | 288,347             | 2.93                            |
| C-4               |                            | 0.079                                  | 0.137 | 14.6       | 3.03            | 7.6        | 2.14            | 5.1                 | 69         | 77,832       | 2.45            | 190,843       | 35.0                | 74              | 186,479             | 3.45                            |
| C-5               |                            | 0.077                                  | 0.147 | 33.6       | 5.29            | 17.5       | 3.74            | 8.8                 | 34         | 87,723       | 2.52            | 220,908       | 45.0                | 50              | 220,635             | 2.08                            |
| C-6               |                            | 0.077                                  | 0.091 | 39.5       | 4.26            | 20.5       | 3.01            | 7.1                 | 10         | 30,323       | 2.49            | 75,389        | 45.0                | 15              | 75,187              | 1.83                            |
| C-7               |                            | 0.075                                  | 0.115 | 19.0       | 3.17            | 9.9        | 2.24            | 5.3                 | 33         | 49,019       | 2.53            | 124,250       | 35.0                | 41              | 122,947             | 3.01                            |
| C-8               |                            | 0.074                                  | 0.136 | 14.4       | 3.01            | 7.5        | 2.13            | 5.0                 | 63         | 69,942       | 2.66            | 186,018       | 35.0                | 70              | 181,518             | 3.61                            |
| C-9               |                            | 0.156                                  | 0.049 | 77.2       | 4.40            | 40.2       | 3.11            | 7.3                 | 3          | 15,415       | 1.62            | 24,918        | 60.0                | 4               | 24,888              | 0.83                            |
| OS-1              |                            | 0.134                                  | 0.150 | 46.5       | 6.86            | 24.2       | 4.84            | 11.4                | 70         | 251,936      | 1.50            | 377,209       | 50.0                | 81              | 377,215             | 1.17                            |
| OS-2              |                            | 0.150                                  | 0.196 | 50.7       | 9.14            | 26.3       | 6.46            | 15.2                | 94         | 366,937      | 1.44            | 526,741       | 55.0                | 108             | 526,352             | 1.07                            |
| OS-3              |                            | 0.128                                  | 0.169 | 35.3       | 6.07            | 18.3       | 4.29            | 10.1                | 131        | 358,509      | 1.66            | 596,421       | 45.0                | 153             | 596,044             | 1.55                            |
| OS-4              |                            | 0.125                                  | 0.090 | 33.6       | 3.81            | 17.4       | 2.69            | 6.4                 | 35         | 91,722       | 1.68            | 153,820       | 45.0                | 40              | 153,345             | 1.58                            |



## **Appendix D - Referenced Material**

**Gambel Ridge and Douglas Lane FHAD**

**Gambel Ridge and Douglas Lane Master Plan**

**North and South Dawson Watershed Master Plan**

DAWSON TRAILS

PLANNED DEVELOPMENT PLAN AND ZONING REGULATIONS

(AN AMENDMENT TO THE DAWSON RIDGE PRELIMINARY P.U.D SITE PLAN AND A PORTION OF THE WESTFIELD TRADE CENTER PRELIMINARY P.U.D. SITE PLAN)  
TWO PARCELS OF LAND BEING ALL OF SECTION 28 AND PORTIONS OF SECTIONS 15, 21, 22, 27, 29, 32, 33 & 34, TOWNSHIP 8 SOUTH, RANGE 67 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO

PLANNER/LANDSCAPE ARCHITECT  
NORRIS DESIGN  
1101 Bannock Street  
Denver, Colorado 80204  
P 303.892.1166  
www.norris-design.com

APPLICANT:  
WESTSIDE INVESTMENT PARTNERS  
4100 E. MISSISSIPPI AVE  
SUITE 500  
DENVER, CO 80246  
303-984-9800  
ENGINEER & SURVEYOR:  
CORE CONSULTANTS, INC.  
CORE CONSULTANTS  
3473 S. BROADWAY  
ENGLEWOOD, CO 80113  
303-730-5960



DAWSON TRAILS  
PLANNED DEVELOPMENT PLAN AND ZONING REGULATIONS  
(AN AMENDMENT TO THE DAWSON RIDGE PRELIMINARY P.U.D SITE PLAN AND A PORTION OF THE WESTFIELD TRADE CENTER PRELIMINARY P.U.D. SITE PLAN)

DATE:  
PDP-01 07/08/2021  
PDP-02 12/03/2021  
PDP-03 04/13/2022  
PDP-04 05/27/2022  
PDP-05 06/09/2022

SHEET TITLE:  
OVERALL PD PLAN

SHEET  
3 OF 20

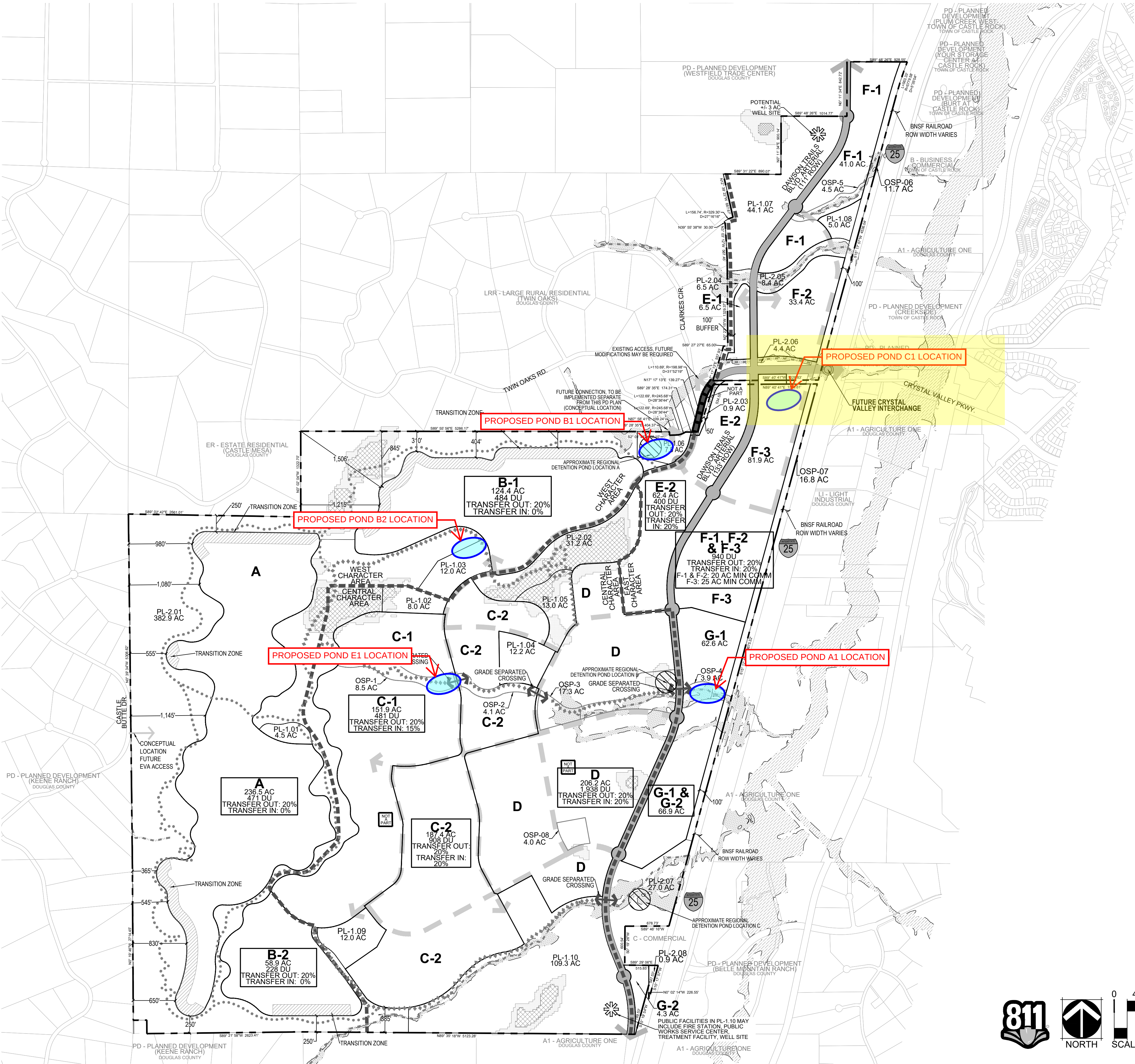
OPEN SPACE AND PUBLIC LAND SUMMARY

|                                  | ACREAGE | % OF TOTAL |
|----------------------------------|---------|------------|
| PUBLIC LAND                      |         |            |
| PL-1 (DEDICATED TO TOWN)         | 227.6   | 11.0%      |
| OPEN SPACE                       |         |            |
| PL-2 (DEDICATED TO TOWN)         | 462.2   | 22.4%      |
| OSP (PRIVATE)                    | 70.8    | 3.4%       |
| SUBTOTAL                         | 533.0   | 25.8%      |
| FUTURE OPEN SPACE (1)            | 215.0   | 10.4%      |
| OPEN SPACE TOTAL                 | 748.0   | 36.2%      |
| OPEN SPACE AND PUBLIC LAND TOTAL | 975.6   | 47.3%      |

NOTE: (1) FUTURE OPEN SPACE DESIGNATION (PL-1, PL-2, OSP) TO BE DETERMINED AT TIME OF PLAT.

LEGEND

- PROPERTY BOUNDARY
- PLANNING AREA BOUNDARY
- CHARACTER AREA BOUNDARY
- MAJOR DRAINAGEWAY
- TRANSITION ZONE
- MODERATE SKYLINE
- MINOR SKYLINE
- 100 YEAR FLOODPLAIN (TOWN OF CASTLE ROCK)
- PROPOSED ARTERIAL RIGHT OF WAY
- FUTURE COLLECTOR RIGHT OF WAY
- 5' NATURAL SURFACE TRAIL
- 10' HARD SURFACE TRAIL
- 100 YEAR FLOODPLAIN (FEMA)



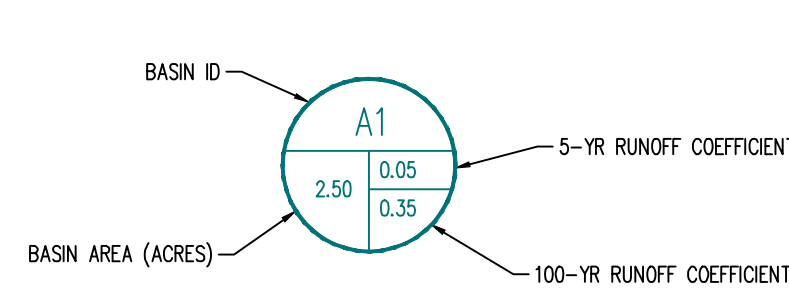
## **APPENDIX D**

### **Drainage Map**

LEGEND

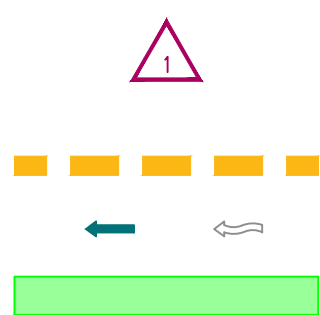
- PROPERTY BOUNDARY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED BY OTHERS MAJOR CONTOUR - KING SCOOPERS
- PROPOSED BY OTHERS MINOR CONTOUR - KING SCOOPERS
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING STORM SEWER
- EXISTING STORM MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE

DRAINAGE SYMBOLS



DESIGN POINT

- SUB-BASIN BOUNDARY (I.E. RATIONAL METHOD)
- DRAINAGE ARROW (PROPOSED & EXISTING)
- PLANNED INFILTRATION AREA



BASIN SUMMARY TABLE

| Tributary Sub-basin | Area (acres) | C <sub>2</sub> | C <sub>100</sub> | t <sub>c</sub> (min) | Q <sub>2</sub> (cfs) | Q <sub>100</sub> (cfs) |
|---------------------|--------------|----------------|------------------|----------------------|----------------------|------------------------|
| D7b-1               | 0.25         | 0.62           | 0.78             | 5.02                 | 0.6                  | 1.8                    |
| D7b-2               | 0.03         | 0.20           | 0.57             | 5.00                 | 0.0                  | 0.2                    |
| D7b-3               | 0.07         | 0.81           | 0.87             | 5.00                 | 0.2                  | 0.5                    |
| D7b-4               | 0.20         | 0.53           | 0.73             | 8.35                 | 0.3                  | 1.1                    |
| D7b-5               | 0.19         | 0.61           | 0.77             | 6.06                 | 0.4                  | 1.3                    |
| D7b-6               | 0.06         | 0.34           | 0.64             | 5.00                 | 0.1                  | 0.4                    |
| D7b-7               | 0.10         | 0.32           | 0.63             | 5.00                 | 0.1                  | 0.5                    |
| OS1                 | 0.04         | 0.21           | 0.57             | 5.00                 | 0.0                  | 0.2                    |
| OS2                 | 0.11         | 0.30           | 0.62             | 5.00                 | 0.1                  | 0.6                    |

DESIGN POINT SUMMARY

| Design Point | Q <sub>2</sub> (cfs) | Q <sub>100</sub> (cfs) |
|--------------|----------------------|------------------------|
| 0            | 0.1                  | 0.6                    |
| 1            | 0.6                  | 1.8                    |
| 2            | 0.4                  | 1.3                    |
| 3            | 1.1                  | 3.5                    |
| 4            | 0.2                  | 0.5                    |
| 5            | 1.3                  | 4.0                    |
| 6            | 0.0                  | 0.2                    |
| 7            | 1.3                  | 4.2                    |
| 8            | 0.0                  | 0.2                    |
| 9            | 0.3                  | 1.1                    |
| 10           | 1.7                  | 5.5                    |
| A            | 0.1                  | 0.4                    |
| B            | 0.1                  | 0.5                    |

Galloway

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Greenwood Village, CO 80111  
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DRAINAGE MAP  
LOT 4 DAWSON TRAILS FILING NO. 2 AMENDMENT 4.

KEYBANK

DAWSON TRAILS BLVD. & GAMBEL RIDGE BLVD.  
CASTLE ROCK CO.

| #  | Date | Issue / Description | Init. |
|----|------|---------------------|-------|
| 1  |      |                     |       |
| 2  |      |                     |       |
| 3  |      |                     |       |
| 4  |      |                     |       |
| 5  |      |                     |       |
| 6  |      |                     |       |
| 7  |      |                     |       |
| 8  |      |                     |       |
| 9  |      |                     |       |
| 10 |      |                     |       |
| 11 |      |                     |       |
| 12 |      |                     |       |
| 13 |      |                     |       |
| 14 |      |                     |       |
| 15 |      |                     |       |
| 16 |      |                     |       |
| 17 |      |                     |       |
| 18 |      |                     |       |
| 19 |      |                     |       |
| 20 |      |                     |       |

Project No: HSB02  
Drawn By: HMR  
Checked By: CMV  
Date: JANUARY 2026

PROPOSED DRAINAGE MAP