Phase II Drainage Report

Bella Mesa South
SDP25-0014

Prepared for:

Cardel Homes
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Contact: Bryan Conway

Prepared by:

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WHERE GREAT PLACES BEGIN
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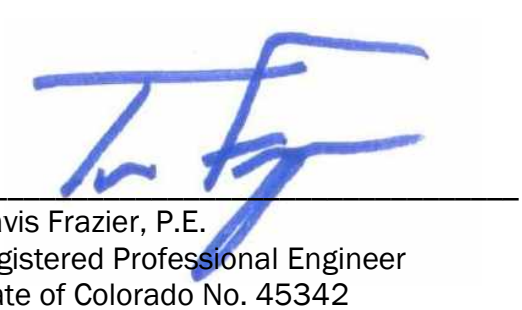
REDLAND.COM

Revised January 15, 2026
Project No. 17026.007

ENGINEER'S CERTIFICATION

"I affirm that this report and plan for the Phase II drainage design of Bella Mesa South, 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."



Travis Frazier, P.E.
Registered Professional Engineer
State of Colorado No. 45342

Owner Approval:
Cardel Homes hereby certifies that the drainage facilities for Bella Mesa South will 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 Bella Mesa North guarantee that final drainage design review will absolve Cardel Homes and/or their successors and/or assigns of future liability for improper design."

Bryan Conway - Director of Land Development
Name of Developer


Authorized Signature

Town of Castle Rock Approvals:

Castle Rock Water Department Date

Development Services Date

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Introduction – General Location and Description

INTRODUCTION

This Phase II Drainage Report presents an analysis for the proposed drainage patterns and requirements for the proposed Bella Mesa South, hereafter referred to as the Site.

Site Location

The Site consists of 8.9 acres, more or less. Native grasses and weeds currently cover the Site. There is an existing floodplain to the north and to the west of the Site. The southern portion of the Site generally drains to the south and west towards Mitchell Gulch at slopes between 1% and 33%. The northern portion of the Site generally drains to the north and to the west towards Mitchell Gulch and Tract B of Founders Village Filing No. 24.

Site Description

Bella Mesa South is located in the Town of Castle Rock. More specifically, the project is located in the southeast quarter of section 8, Township 8 South, Range 66 West of the Sixth Principal Meridian, Douglas County, Colorado. The project is bound by Mitchell Gulch to the west, Mitchell Street to the East, Mikelson Boulevard to the south, and Tract B of Founders Village Filing No. 24 to the north. Please see the vicinity map in Appendix A for further reference.

There is an existing sub-regional detention pond to the north of the Site that was designed and constructed as a part of the Public Improvement Construction Plans for Founders Village Filing 24 – Phase 1A by Core Consultants dated December 28, 2018. A majority of the runoff from the Site will flow north to the existing sub-regional detention pond. The remaining runoff will flow west to Mitchell Gulch and south to Mickelson Boulevard. There are no active irrigation facilities on or across the limits of the Site.

Proposed Project Description

The proposed development will include 93 single family attached units as well as landscaping, associated roadways, and site infrastructure.

Flood Hazard and Drainage Studies Relevant to the Site

Based on the FEMA FIRM, Map 08035C0306G, effective date March 16, 2016, and, effective, which can be found in Appendix A, the Site is located within Zone X (Area of Minimal Flood Hazard) and is not located within a 100-year floodplain. The proposed site will not encroach into Mitchell Gulch or the regulated FEMA floodplain.

Soil Type

The Natural Resource Conservation Service (NRCS) soil survey map indicates that the soil on site is primarily Coni rocky loam (90.9%), whose hydrologic soil group is Type D, having a very

slow infiltration rate, and Fondis clay loam (9.1%), whose hydrologic soil group is Type C, having a slow infiltration rate. Surfacing bedrock is also preset throughout the Site, this will not have a significant impact on runoff and storm drainage infrastructure because rock excavation and sub-excavation will take place prior to construction. Furthermore, no infiltration facilities are proposed with the development. Portions of the Site that will not be excavated will maintain their historical runoff conditions and drainage patterns, having very slow infiltration rates. A soil map has been included in Appendix A for reference. For the purposes of this report, the entire site was assumed to be Type D soil coverage.

Drainage Basin and Sub-Basins

Existing Basins

Based on the Phase III Drainage Report Founders Village Filing 24 – 1st Amendment by Redland dated May 28, 2021, the Site lies within major basins A1 and B1. Basin A1 generally flows northwest to Mitchell Gulch on the west side of the property. It includes the northern portion of the site, is comprised of 5.08 acres, and has an imperviousness of 2%. Basin B1 generally flows southwest to Mitchell Gulch on the west side of the property. It includes the southern portion of the site, is comprised of 3.78 acres, and has an imperviousness of 2%. Mitchell Gulch drains to Cherry Creek approximately two miles downstream from the property. It was anticipated that in the fully developed condition, Basin A1 and Basin B1 would have an overall imperviousness of 70%.

Major Basins

The proposed site has been divided into four basins: Basin A, Basin B, Basin C, and Offsite Basin OS.

Basin A includes the northern portion of the site and is comprised of 5.05 acres with an imperviousness of 70%. Basin A generally flows north and is collected by proposed storm sewer. The proposed storm sewer connects to the existing storm sewer at the northern edge of the Site and ultimately conveys flows towards Existing Detention Pond A constructed as a part of the Public Improvement Construction Plans for Founders Village Filing 24 – Phase 1A by Core Consultants dated December 28, 2018. Basin A will produce approximately 11.9 cfs in the 5-year event and 27.5 cfs in the 100-year event. The minor and major runoff are below the anticipated values described in the Phase III Drainage Report Founders Village Filing 24 – 1st Amendment by Redland dated May 28, 2021.

Basin B includes the southeastern portion of the site and is comprised of 2.14 acres with an imperviousness of 70%. The runoff from Basin B will flow north towards existing storm sewer and ultimately towards Existing Detention Pond A. Basin B will produce approximately 5.5 cfs in the 5-year event and 12.6 cfs in the 100-year event, both of which are below the anticipated values described in the Redland Report.

Basin C includes parts of the northern, western, and southern portions of the site, most of which was previously included in the Existing Basin B1. As anticipated by the Redland Report, the runoff from Basin C will generally flow west to Mitchell Gulch and south to Mikelson Boulevard. Basin C is comprised of 1.76 acres with an imperviousness of 40%. Basin C will produce approximately 2.8 cfs in the 5-year event and 9.1 cfs in the 100-year event. The combined minor and major runoff of Basin C and Basin B encompassed in Existing Basin B1, which both flow to Mitchell Gulch, are below the anticipated values described in the Redland Report. The remainder of Basin C will remain as undisturbed land that continues to flow to Mitchell Gulch at the historic rate.

Offsite Basin OS includes parts of the western half of Mitchell Street along the eastern property boundary. It is comprised of 0.2 acres with an imperviousness of 95%. Offsite Basin OS will produce 0.5 cfs in the 5-year event and 1.5 cfs in the 100-year event. These basins will flow into the site and be collected by on-site storm sewer. The minor and major runoff contributed to Basin A and Basin B are below the anticipated values from the Redland Report.

Sub Basins

Basin A1 (0.38 Acres)

Basin A1 includes attached townhome units, sidewalk, and open space. Runoff from the basin generally sheet flows to swale 1 where it is conveyed to a Type C Inlet located in a sump condition at Design Point A1. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, flows will overtop the sidewalk to the southeast and be conveyed to existing storm sewer within Mitchell Street. The basin is approximately 0.38 acres with an imperviousness of 57%.

$C_5 = 0.50$ $C_{100} = 0.72$

$Q_5 = 0.7$ CFS $Q_{100} = 1.7$ CFS

Basin A2 (0.74 Acres)

Basin A2 includes attached townhome units, sidewalk, and open space. Runoff from the basin generally sheet flows to swale 2 where it is conveyed to a Type C Inlet located in a sump condition at Design Point A2. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, flows will enter Basin A1 where they overtop the sidewalk to the southeast and be conveyed to existing storm sewer within Mitchell Street. The basin is approximately 0.74 acres with an imperviousness of 51%.

$C_5 = 0.45$ $C_{100} = 0.69$

$Q_5 = 1.2$ CFS $Q_{100} = 3.5$ CFS

Basin A3 (0.33 Acres)

Basin A3 includes attached townhome units, roadway, and open space. Runoff from the basin generally sheet flows to the eastern flowline of Private Street A where it is collected in an on-grade Triple Type 16 Combination Inlet at Design Point A3. The flow is then conveyed to proposed storm sewer. The basin is approximately 0.33 acres and has an imperviousness of 76%.

$C_5 = 0.66$ $C_{100} = 0.80$

$Q_5 = 0.9$ CFS $Q_{100} = 2.1$ CFS

Basin A4 (0.35 Acres)

Basin A4 includes attached townhome units, roadway, and open space. Runoff from the basin generally sheet flows to the eastern flowline of Private Street A where it is collected in an on-grade Triple Type 16 Combination Inlet at Design Point A4. The flow is then conveyed to proposed storm sewer. The basin is approximately 0.35 acres and has an imperviousness of 78%.

$C_5 = 0.67$ $C_{100} = 0.80$

$Q_5 = 1.0$ CFS $Q_{100} = 2.2$ CFS

Basin A5 (0.35 Acres)

Basin A5 includes attached townhome units, roadway, sidewalk, and open space. Runoff from the basin generally sheet flows to the eastern flowline of Private Street A where it is collected in a Type 16 Combination Inlet located in a sump condition at Design Point A4. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, emergency flows will overtop the roadway crown to the northwest and enter Basin A5 where it will be conveyed to proposed storm sewer. The basin is approximately 0.35 acres and has an imperviousness of 70%.

$C_5 = 0.61$ $C_{100} = 0.77$

$Q_5 = 1.0$ CFS $Q_{100} = 2.3$ CFS

Basin A6 (0.75 Acres)

Basin A6 includes attached townhome units, roadway, sidewalk, and open space. Runoff from the basin generally sheet flows to the western flowline of Private Street A where it is collected in an on-grade Type 16 Combination Inlet at Design Point A6. The flow is then conveyed to proposed storm sewer. The basin is approximately 0.75 acres and has an imperviousness of 78%.

C_5 = 0.67 C_{100} = 0.80

Q_5 = 2.0 CFS Q_{100} = 4.3 CFS

Basin A7 (0.10 Acres)

Basin A7 includes attached townhome units, roadway, sidewalk, and open space. Runoff from the basin generally sheet flows to the western flowline of Private Street A where it is collected in a Triple Type 16 Combination Inlet located in a sump condition at Design Point A7. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, flows will overtop the curb to the north. The basin is approximately 0.10 acres and has an imperviousness of 83%.

C_5 = 0.71 C_{100} = 0.82

Q_5 = 0.3 CFS Q_{100} = 0.7 CFS

Basin A8 (2.05 Acres)

Basin A6 includes attached townhome units, roadway, sidewalk, and open space. Runoff from the basin generally sheet flows to the centerline of Private Alley C where it is collected in a Type 16 Valley Inlet located in a sump condition at Design Point A6. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, emergency flows will be collected by the redundant Type 16 Valley inlets to the northeast and southwest along the centerline of Private Alley C. If all inlets clog, flows will overtop the alley west of Design Point A8 into Basin C1. The basin is approximately 2.05 acres and has an imperviousness of 74%.

C_5 = 0.64 C_{100} = 0.79

Q_5 = 4.8 CFS Q_{100} = 10.7 CFS

Basin B

Basin B1 (0.37 Acres)

Basin B1 includes attached townhome units, roadway, sidewalk, and open space. Runoff from the basin generally sheet flows to the northern flowline of Private Street A where it is collected in a Double Type 16 Combination Inlet located in a sump condition at Design Point B1. The flow is then conveyed to proposed storm sewer. In case of clogging, emergency flows will overtop the roadway crown to the southwest and enter Basin B2 where it will be conveyed to proposed storm sewer. The basin is approximately 0.44 acres and has an imperviousness of 61%.

C_5 = 0.54 C_{100} = 0.74

Q_5 = 0.9 CFS Q_{100} = 2.2 CFS

Basin B2 (0.80 Acres)

Basin B2 includes attached townhome units, roadway, sidewalk, and open space. Runoff from the basin generally sheet flows to the southern flowline of Private Street A where it is collected in a Triple Tyle 16 Combination Inlet located in a sump condition at Design Point B2. The flow is then conveyed to proposed storm sewer. In case of clogging, emergency flows will overtop the sidewalk to the south and enter Basin B3 where it will be conveyed to proposed storm sewer. The basin is approximately 0.81 acres and has an imperviousness of 72%.

C_5 = 0.63 C_{100} = 0.78

Q_5 = 2.0 CFS Q_{100} = 4.5 CFS

Basin B3 (0.97 Acres)

Basin B3 includes attached townhome units, roadway, sidewalk, and open space. Runoff from the basin generally sheet flows to the centerline of Private Alley C and Private Alley D where it is collected in a Double Type 16 Combination Inlet located in a sump condition at Design Point B3. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, emergency flows will overtop the edge of alley to the west and leave the site where it will flow into Mitchell Gulch. The basin is approximately 0.97 acres and has an imperviousness of 72%.

C_5 = 0.62 C_{100} = 0.78

Q_5 = 2.6 CFS Q_{100} = 5.9 CFS

Basin C

Basin C1 (1.14 Acres)

Basin C1 consists of attached townhome units, sidewalk, and open space. The basin is approximately 1.14 acres with an imperviousness of 46%. Capturing runoff from this subbasin was considered impractical from a grading perspective; therefore, runoff from the basin generally sheet flows west towards Mitchell Gulch along 870 linear feet of the property boundary. There is no flow concentration; therefore, the runoff from this basin does not propose any erosion concerns. The runoff from this subbasin will be treated by a grass buffer on site and further by the undeveloped land and native grasses to the west. See Water Quality Enhancement for further details.

C_5 = 0.42 C_{100} = 0.68

Q_5 = 2.3 CFS Q_{100} = 6.8 CFS

Basin C2 (0.49 Acres)

Basin C2 consists of attached townhome units, sidewalk, and open space. Capturing runoff from this subbasin was considered impractical from a grading perspective; therefore, runoff from the basin generally sheet flows to the northern flowline of Mikelson Blvd where it is conveyed to an existing Type R Inlet and existing storm sewer. The basin is approximately 0.49 acres and has an imperviousness of 34%. Basin C2 will produce 0.4 cfs in the 5-year event and 1.7 cfs in the 100-year event. Per the Mikelson Boulevard Phase III Drainage and Erosion Control Report for Castlewood Ranch LLC. By Nolte Associates, Inc. dated May 2000, the existing flow conveyed to the existing inlet is 7.6 cfs for the 5-year event and 16.2 cfs for the 100-year event. The combined flow is within the capacity of the existing inlet; therefore, the additional flow conveyed to the existing inlet from Basin C2 will have no negative impact on the existing storm sewer. The flow is then conveyed to existing Mikelson Boulevard Detention Pond.

$C_5 = 0.31$ $C_{100} = 0.62$

$Q_5 = 0.5$ CFS $Q_{100} = 1.9$ CFS

Basin C3 (0.13 Acres)

Basin C3 consists of undisturbed soil. Runoff from the basin generally sheet flows west towards Mitchell Gulch. The basin is approximately 0.13 acres with an imperviousness of 5%. This subbasin is excluded from permanent water quality treatment per section 3.3.2 of the Permanent Water Quality Determination Worksheet. See attached worksheet.

$C_5 = 0.08$ $C_{100} = 0.50$

$Q_5 = 0.03$ CFS $Q_{100} = 0.4$ CFS

Offsite Basin OS

Basin OSA5 (0.01 Acres)

Basin OSA5 includes roadway and sidewalk. Runoff from the basin generally sheet flows to the southern flowline of Private Street A where it is collected in a Type 16 Combination Inlet located in a sump condition at Design Point A5. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, emergency flows will overtop the roadway crown to the northwest and enter Basin A7 where it will be conveyed to existing storm sewer. The basin is approximately 0.01 acres with an imperviousness of 95%.

$C_5 = 0.81$ $C_{100} = 0.87$

$Q_5 = 0.04$ CFS $Q_{100} = 0.1$ CFS

Basin OSA7 (0.11 Acres)

Basin OSA7 includes roadway and sidewalk. Runoff from the basin generally sheet flows to the northern flowline of Private Street A where it is collected in a Type 16 Combination Inlet located in a sump condition at Design Point A7. The flow is then conveyed to proposed storm sewer. In case of inlet clogging, emergency flows will overtop the curb to the north. The basin is approximately 0.11 acres with an imperviousness of 95%.

$C_5 = 0.81$ $C_{100} = 0.87$

$Q_5 = 0.4$ CFS $Q_{100} = 0.8$ CFS

Basin OSB1 (0.06 Acres)

Basin OSA5 includes roadway and sidewalk. Runoff from the basin generally sheet flows to the northern flowline of Private Street A where it is collected in a Type 16 Combination Inlet located in a sump condition at Design Point B1. The flow is then conveyed to existing storm sewer. In case of clogging, emergency flows will overtop the roadway crown to the southwest and enter Basin B2 where it will be conveyed to proposed storm sewer. The basin is approximately 0.06 acres with an imperviousness of 95%.

$C_5 = 0.81$ $C_{100} = 0.87$

$Q_5 = 0.2$ CFS $Q_{100} = 0.5$ CFS

Basin OSB2 (0.02 Acres)

Basin OSB2 includes roadway and sidewalk. Runoff from the basin generally sheet flows to the southern flowline of Private Street A where it is collected in a Type 16 Combination Inlet located in a sump condition at Design Point B2. The flow is then conveyed to existing storm sewer. In case of clogging, emergency flows will overtop the sidewalk to the south and enter Basin B3 where it will be conveyed to proposed storm sewer. The basin is approximately 0.02 acres with an imperviousness of 95%.

$C_5 = 0.81$ $C_{100} = 0.87$

$Q_5 = 0.1$ CFS $Q_{100} = 0.1$ CFS

Drainage Design Criteria

Regulations, Drainage Studies, Development Criteria Reference and Constraints

This Phase II Drainage Report is in accordance with the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual dated February 2025, and the Mile High Flood District (MHFD) Storm Drainage Criteria Manual Volumes 1, 2, and 3 dated March 2024. These manuals were used as a basis of design for the Site.

This Site is within the Cherry Creek Basin and is subject to the Department of Public Health and Environment Water Quality Control Commission Cherry Creek Reservoir Control Regulation 5 CCR 1002-72.

The Site is shown within two existing drainage reports. The Site is a part of Major Basin FU-4 within Public Improvement Construction Plans for Founders Village Filing 24 – Phase 1A by Core Consultants dated December 28, 2018, hereby referred to as the *Core Report*. The Site is also a part of Basins A1 and B1 within the Phase III Drainage Report for Founders Village Filing 24 – 1st Amendment, prepared by Redland, dated May 28, 2021 (CD21-0011), hereby referred to as the *Redland Report*.

The constraints for the site include the steep grades falling away from Mitchell Street and Mikelson Blvd. towards Mitchell Gulch as well as shallow bedrock.

Hydrological Criteria

The hydrologic design was computed using the Rational Method as defined by the Mile High Flood District. The 5-year storm was used as the minor storm event, while the 100-year storm was used as the major event. The one-hour point rainfall depth used for the 5-year storm was 1.43 inches and 2.60 inches for the 100-year event. Impervious values are based on Tables 6-2 and 6-3 of Chapter 6 of the MHFD Criteria Manual Volume 1. The areas of concrete driveways and walks, disturbed soil, and roof along with their associated impervious values from Tables 6-2 and 6-3 of Chapter 6 of the MHFD Criteria Manual Volume 1 were used to calculate a product specific impervious value for the townhome lot. This calculated value was then used throughout the calculations. The Rational Method was used to analyze the proposed condition, and calculations can be found in Appendix B and D.

Hydraulic Criteria

Preliminary street and inlet capacity calculations were completed using MHFD_Inlet, Version 5.03.

Channel Hydraulics are evaluated using the Hydraflow Express Extension for Autodesk Civil 3D, version 2020 modeling software. This method utilizes Manning's equation to compute flow rates at varying depths of flow.

$$Q = \frac{1.49}{n} A R^{2/3} \sqrt{S}$$

Where:

Q = Flow rate in cfs
n = Roughness coefficient
A = Cross-sectional area in sqft
R = Hydraulic radius
S = Channel slope in ft/ft

Water Quality Enhancement

Based on the Filing 24 Report, the existing regional extended detention basin has been designed to include water quality capacity for Basin A. The existing pond will be analyzed to determine if it can accept the full site runoff. If not, pond modifications will be proposed. The existing regional pond includes structures that release flows for the water quality capture volume (WQCV), excess urban runoff volume (EURV) and the 100-year storm event. Basin C1 will be treated through by a grass buffer on-site and further by the undeveloped open space and native grasses to the west of the Site. The land is designated as Town Open Space; therefore, it will remain undeveloped. The on-site grass buffer achieves 97.1% runoff reduction. An exhibit and calculations can be found in Appendix A. Basin C3 has been determined to be excluded from requirements for water quality enhancement and full-spectrum detention. See Variances and Appendix F for further details.

Stormwater Management and Facility Design

Stormwater Conveyance Facilities

Stormwater conveyance for the Site will rely on runoff sheet flowing to the curb and gutter and will be collected into stormwater inlets at necessary intervals. Swales will also be used to collect runoff generated from the Site improvements. The storm sewer will then convey the runoff to the existing sub-regional detention pond to the north. The existing sub-regional detention pond discharges to Mitchell Gulch.

Existing Stormwater Storage Facilities

The existing sub-regional pond is located north of the Site. As stated in the Core Report, "…the future development to the west of Mitchell Street will be included in the detention pond sizing," and "water quality measures have been included in the design of the proposed extended detention basins". With the Bella Mesa Filing No. 1, Tract A, which encompasses the existing sub-regional detention pond, is dedicated for open space, utilities, and detention. A permanent stormwater drainage easement for Tract A was dedicated on July 30, 2025, at Rec No. 2025040051. Additionally, due to the proximity to Mesa Middel School, a fence will

need to be installed around the entire perimeter of the pond and associated structures including the emergency spillway and outlet pipe.

As previously stated, the Site is within basin FU-4 as described in the Core Report. The Core Report states that the "Detention Pond A has been sized to include the assumed future flow from this basin of 36.0 cfs which accounts for future multifamily residential as zoned".

Water Quality Enhancement Best Management Practices

The existing pond will be analyzed to determine if it can accept the full site runoff for water quality. If not, pond modifications will be proposed.

Floodplain Modification

The applicable FEMA floodplain maps show that the floodplain for Mitchell Gulch lies outside the Site boundary. No floodplain modification or channel improvements are proposed with the Site. Adjacent to the Site, there is a 500-Year floodplain without base flood elevations. To the northwest of the Site, there is a 100-Year floodplain with a maximum base elevation of 6530' per Flood Insurance Rate Map (FIRM) Panel 08035C0306G with effective date March 16, 2016. The minimum lot elevation adjacent to the floodplains is 6571'. All adjacent structures, including crawlspaces, are a minimum of two feet above the adjacent floodplain base flood elevation. Floodplain maps can be found in Appendix A.

Geotechnical Investigation and Sub-surface Collection System Design

A Geologic and Preliminary Geotechnical Investigation for the Site was completed by A.G. Wassenaar Inc. dated October 10, 2018. Conclusions summarized within the report include the presence of expansive soils, shallow bedrock, and groundwater at depths between 12 to 32 feet encountered. Foundation subsurface drainage systems were determined to be necessary for all below grade areas. These drainage systems will daylight to grade or to proposed storm sewer.

Additional Permitting Requirements

No additional permits are anticipated with the proposed development.

Conclusion

Compliance with the Town of Castle Rock Code

The drainage design for Bella Mesa South conforms to the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual, with supplemental information developed from the Mile High Flood District Storm Drainage Criteria Manuals. This analysis demonstrates that the proposed facilities are developed in compliance with the appropriate criteria and constraints for the relevant development needs for the project.

Variances

This drainage report requests a variance to section 13.1.5-7 of the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual which states "Sites with Land Disturbance to Undeveloped Land that will Remain Undeveloped: This exclusion applies to sites with land disturbance to undeveloped land (land with no human-made structures such as buildings or pavement) that will remain undeveloped after the site." Basin C3, which has an area of 0.13 acres, will remain undeveloped after construction. Per the Permanent Water Quality Determination Worksheet taken from 2019 SDDTCM Sections 13.1.4 and 13.1.5, this basin is excluded from requirements for water quality enhancement and full-spectrum detention.

Drainage Concept

This analysis demonstrates that the Site conforms to assumptions made in the existing drainage reports and the Site will have no negative impacts to existing downstream drainage facilities. The existing pond will be analyzed to determine if it can accept the full site runoff for water quality. If not, pond modifications will be proposed.

The Redland Report established Existing Basin A1 and Existing Basin B1. Existing Basin A1 had an area of 5.08 acres and an anticipated imperviousness of 70%. Major Basin A has an area of 5.09 acres and has an imperviousness of 70%. The proposed basin is 0.01 acre larger than originally assumed, which is 0.2% of the original basin. This increase in area is negligible. The Site will have no negative impact on the existing storm sewer system. Existing Basin B1 had an area of 3.76 acres and an anticipated imperviousness of 70%. This area now consists of Major Basin B and Minor Basins C1 and C2. The basins have a combined area of 3.74 and imperviousness of 59%. Both the area and the imperviousness are below the anticipated values: therefore, there should be no negative impact of Mitchell Gulch or the existing storm sewer system.

References

REFERENCES

1. Town of Castle Rock, Storm Drainage Design and Technical Criteria Manual, February 18, 2025.

2. Mile High Flood District, Denver, Colorado, Urban Storm Drainage Criteria Manual, Volume 1-3, latest online addition.

3. Public Improvement Construction Plans for Founders Village Filing 24 – Phase 1A, Core Consultants dated December 28, 2018

4. Phase III Drainage Report for Founders Village Filing 24 – 1st Amendment, Redland dated May 28, 2021.

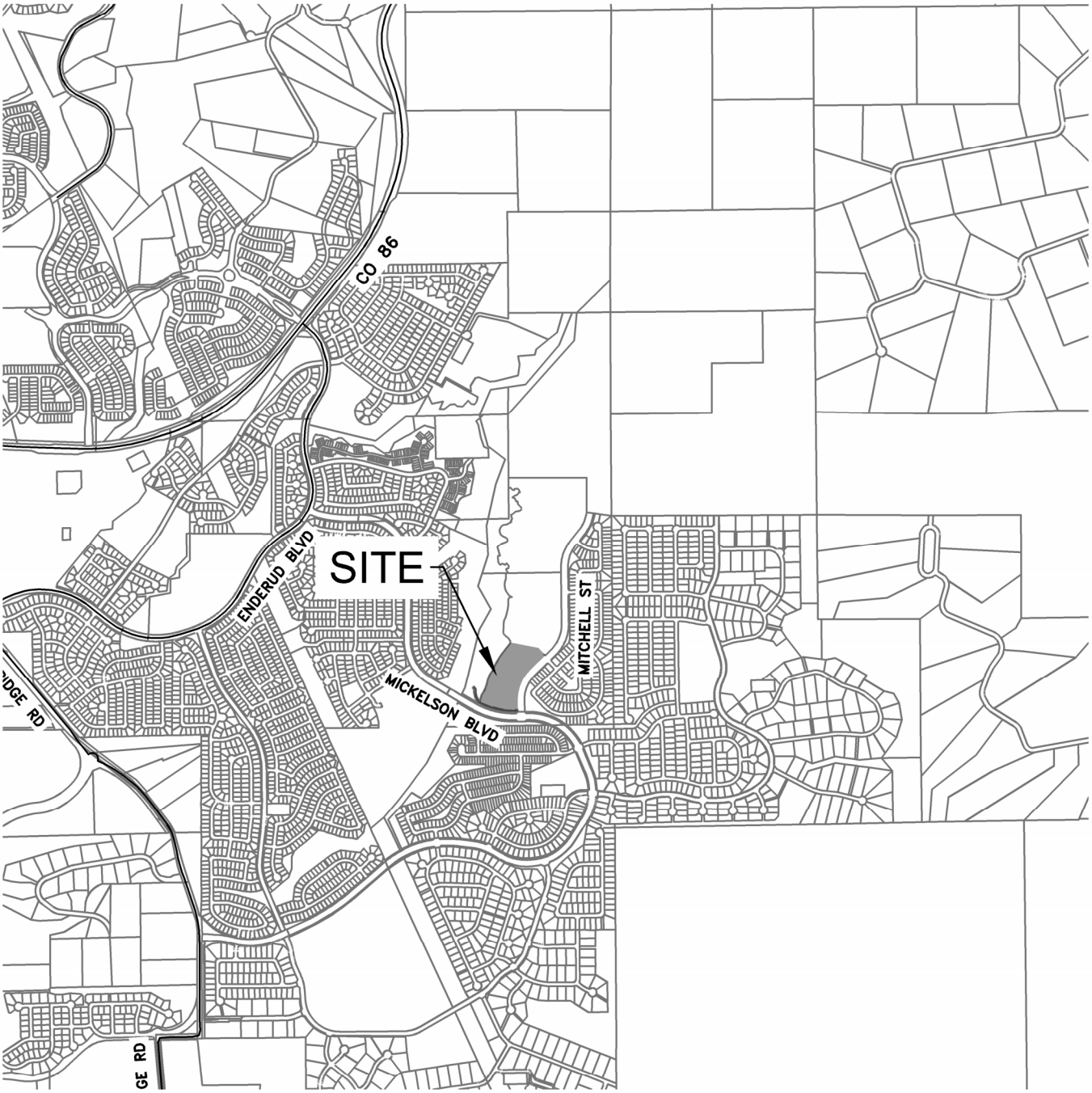
5. Stormwater Management Facility Operation and Maintenance (O&M) General Guidelines, Castle Rock Water, Stormwater Division dated December 12, 2012.

6. Geotechnical Site Development Study for Founders Village, Filing 24 West (Bella Mesa Duplexes), A.G. Wassenaar Inc., October 10, 2018.

7. Mikelson Boulevard Phase III Drainage and Erosion Control Report for Castlewood Ranch LLC., Nolte Associates Inc., November 1999, revised May 2000.

8. Department of Public Health and Environment Water Quality Control Commission Cherry Creek Reservoir Control Regulation 5 CCR 1002-72.

Appendix A - Vicinity Map, FIRM Map, Soils Map



0 1000 2000

SCALE : 1" = 2000'

BELLA MESA SOUTH

VICINITY MAP

Redland
WHERE GREAT PLACES BEGIN
720.283.6783
REDLAND.COM
▪ Land Planning ▪ Landscape Architecture
▪ Civil Engineering ▪ Construction Management

PROJECT NO: 17026.007

DATE: 05/08/2025

DRAWING NO: VIC

National Flood Hazard Layer FIRMette

FEMA

104°48'14"W 39°22'17"N

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

1:6,000

104°47'37"W 39°21'49"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) *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
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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 5/12/2025 at 5:26 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.

Hydrologic Soil Group—Castle Rock Area, Colorado
(Bella Mesa South)

Map Scale: 1:1,840 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CoG	Coni rocky loam, 3 to 100 percent slopes	D	7.8	90.9%
FoD	Fondis clay loam, 3 to 9 percent slopes	C	0.8	9.1%
Totals for Area of Interest			**8.5**	**100.0%**

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

Receiving Pervious Areas (Including Grass Buffers and Grass Swales)

SCM Design, Version 4.02 (June 2025)

Designer: Travis Frazier
Company: Redland Consulting Group
Date: September 12, 2025
Project: 17026.007 - Bella Mesa South
Location: Castle Rock
Outfall ID: C1

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	C1	Point A	Point B								
Area Type	RPA	UIA	RPA_Buffer								
Downstream Design Point ID	--	Point B									
DCIA (ft^2)	--	--	--								
UIA (ft^2)	--	17,551	--								
RPA (ft^2)	--	--	14,276								
SPA (ft^2)	--	--	--								

2. Protect the RPA from Traffic

RPA Protection Type	--	--									

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:

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	--	--	Curbless								
Is Concrete Edger used?	--	--									
Spacing between slots (ft)	--	--	--								
Slot Opening Length (in)	--	--	--								
Blind Swale Type	--	--	--								
Spreader Energy Dissipation	--	--	--								
Total Area of UIA:RPA (ft^2)	--	--	31,827								
UIA:RPA Ratio	--	--	1.2								
UIA:RPA Interface Width (ft)	--	--	700								
L / W Ratio of UIA:RPA	--	--	0.06								

2. Buffer Length

Average Buffer Length (ft)	--	--	20								

3. Buffer Slope

Average Buffer Slope (ft/ft)	--	--	0.100								
Effective Distance (ft)	--	--	25								
Number of Level Spreaders	--	--	1								

4. Provide a Vertical Drop

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

5. Calculate Runoff for UIA and RPA Pair

Imperviousness (%)	--	--	55.1%								
UIA:RPA Runoff (in)	--	--	0.01								
UIA:RPA Runoff (ft^3)	--	--	21								

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

UIA Runoff (ft^3)	--	--	731								
Runoff Reduction (ft^3)	--	--	710								
Runoff Reduction (%)	--	--	97.1%								

Notes: Grass Buffer is achieving 60% runoff reduction

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

1. Delineate Areas Tributary to Swale											
Total Tributary Area (ft^2)	--	--	--								
Imperviousness (%)	--	--	--								
2. Swale Inflows											
Concentrated Flow Type	--	--	--								
Blind Swale Type	--	--	--								
Spreader Energy Dissipation	--	--	--								
Vertical Drop (in)	--	--	--								
Gutter Depression (in)	--	--	--								
Curb Opening Length (ft)	--	--	--								
Concrete Sediment Pad	--	--	--								
Min. Forebay Volume (ft^3)	--	--	--								
Design Forebay Volume (ft^3)	--	--	--								
Max. Forebay Depth (in)	--	--	--								
Design Forebay Depth (in)	--	--	--								
Calculated Notch Width (in)	--	--	--								
Design Notch Width (in)	--	--	--								
Drain Time (minutes)	--	--	--								
Energy Dissipation Type	--	--	--								
3. Swale Cross Section											
Length of Swale (ft)	--	--	--								
Bottom Width (ft)	--	--	--								
Bottom Area (ft^2)	--	--	--								
Side Slopes (horiz/vert)	--	--	--								
4. Longitudinal Slope											
Available Slope (ft/ft)	--	--	--								
Design Slope (ft/ft)	--	--	--								
Total Drop Height (ft)	--	--	--								
Underdrains Provided?	--	--	--								
5. Calculate Runoff from Tributary Area											
Tributary Runoff (ft^3)	--	--	--								
Reduced Trib. Runoff (ft^3)	--	--	--								
6. Calculate Runoff Reduction through Swale Bottom											
Volume Infiltrated (ft^3)	--	--	--								
Swale Discharge (ft^3)	--	--	--								
Runoff Reduction (%)	--	--	--								
7. Design Discharge											
2-year Discharge, Q2 (cfs)	--	--	--								
8. Design Velocity											
Vegetal Retardance Curve	--	--	--								
Velocity, V2 (fps)	--	--	--								
9. Design Flow Depth											
Flow Depth, D2 (ft)	--	--	--								
Flow Area, A (ft^2)	--	--	--								
Wetted Perimeter, P (ft)	--	--	--								
Top Width, T (ft)	--	--	--								
Hydraulic Radius, Rh (ft)	--	--	--								
VR Product (ft^2/sec)	--	--	--								
Manning's n value	--	--	--								
Hydraulic Depth, Dh (ft)	--	--	--								
Froude Number	--	--	--								
10. Swale Outflows											
Outflows Considered?	--	--	--								

Notes: _____

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

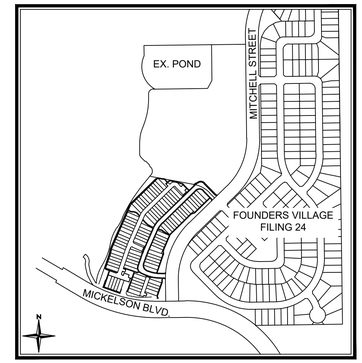
Design Point ID	C1	Point A	Point B								
Area Type	RPA	UIA	RPA_Buffer								
Total Area (ft^2)	0	17,551	31,827								
Imperviousness (%)		100.0%	55.1%								
Tributary Runoff (ft^3)		731	731								
Runoff Reduction (ft^3)	0	0	710								
Runoff Remaining (ft^3)	0	731	21								

Total Tributary Area entered on Site Layout Worksheet is: 49,658 square feet

SITE DEVELOPMENT PLAN

BELLA MESA SOUTH

LOCATED IN THE SOUTHEAST QUARTER SECTION 8,TOWNSHIP 8 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO.
TOWN OF CASTLE ROCK PROJECT NUMBER SDP25-0014



KEY MAP
N.T.S

LEGEND

- GRASS BUFFER
- UNCONNECTED IMPERVIOUS AREA
- SEPARATE PERVIOUS AREA
- UIA: RPA INTERFACE WIDTH
- BASIN BOUNDARY

N

0 25 50 100
SCALE: 1" = 50'

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NOT FOR CONSTRUCTION

NO.	DATE	NOTES

PROJECT NO.	17026.007	
DATE	NO	NOTES
05/30/2025	1	FIRST SUBMITTAL
09/12/2025	2	SECOND SUBMITTAL

BELLA MESA SOUTH
SITE DEVELOPMENT PLAN
GRASS BUFFER EXHIBIT

SHEET
DRN

L:\2017\17026 - Bella Mesa\CADD\Exhibits\17026.007 - Bella Mesa South\17026.007 - Grass Buffer Exhibit.dwg tab: Layout1 Sep 12, 2025 - 11:33am iwells

Appendix B - Hydrologic Calculations

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STANDARD FORM SF-1 - DEVELOPED RUNOFF COEFFICIENTS

PROJECT NAME: Bella Mesa South
PROJECT NUMBER: 17026.007
CALCULATED BY: IKW
CHECKED BY: RAO

DATE: 9/12/2025
JURISDICTION: Castle Rock

LAND USE:	Roadways and Paved Streets	Concrete Driveways and Walks	Disturbed Soil	Townhome Lot	Undisturbed Soil
IMPERVIOUSNESS	95%	95%	20%	74%	5%
C_2	0.78	0.78	0.14	0.59	0.03
C_5	0.81	0.81	0.20	0.64	0.08
C_{10}	0.84	0.84	0.28	0.68	0.17
C_{100}	0.87	0.87	0.57	0.79	0.50

NRCS SOIL TYPE: TYPE D

OVERALL SITE STUDY AREA

DESIGN BASIN	DESIGN POINT	Roadways and Paved Streets (AC)	Concrete Driveways and Walks (AC)	Disturbed Soil (AC)	Townhome Lot (AC)	Undisturbed Soil (AC)	TOTAL AREA (AC)	$C_d(2)$	$C_d(5)$	$C_d(10)$	$C_d(100)$	Imp (%)
A1	A1	0	0.02	0.13	0.23	0	0.38	0.44	0.50	0.55	0.72	57%
A2	A2	0	0.05	0.34	0.35	0	0.74	0.39	0.45	0.51	0.69	51%
A3	A3	0.09	0	0.02	0.22	0	0.33	0.61	0.66	0.70	0.80	76%
A4	A4	0.09	0	0.01	0.25	0	0.35	0.63	0.67	0.71	0.80	78%
A5	A5	0.12	0.02	0.08	0.13	0	0.35	0.56	0.61	0.65	0.77	70%
A6	A6	0.20	0.06	0.05	0.44	0	0.75	0.63	0.67	0.71	0.80	78%
A7	A7	0.05	0.02	0.01	0.02	0	0.10	0.67	0.71	0.75	0.82	83%
A8	A8	0.54	0.04	0.22	1.25	0	2.05	0.59	0.64	0.68	0.79	74%
BASIN A		**1.09**	**0.21**	**0.86**	**2.89**		**5.05**	0.56	0.61	0.65	0.77	**70%**
		21.6%	**4.1%**	**17.0%**	**57.2%**		**100.0%**					
B1	B1	0.08	0.03	0.13	0.13	0	0.37	0.48	0.54	0.59	0.74	61%
B2	B2	0.20	0.05	0.12	0.43	0	0.80	0.58	0.63	0.67	0.78	72%
B3	B3	0.25	0.03	0.15	0.54	0	0.97	0.57	0.62	0.66	0.78	72%
BASIN B		**0.53**	**0.11**	**0.40**	**1.10**		**2.14**	0.56	0.61	0.65	0.77	**70%**
		24.8%	**5.1%**	**18.7%**	**51.4%**		**100.0%**					
C1	C1	0	0.12	0.63	0.39	0	1.14	0.35	0.42	0.48	0.67	46%
C2	C2	0	0.01	0.37	0.11	0	0.49	0.24	0.31	0.38	0.62	34%
C3	C3	0	0	0	0	0.13	0.13	0.03	0.08	0.17	0.50	5%
BASIN C			**0.13**	**1.00**	**0.50**	**0.13**	**1.76**	0.29	0.36	0.43	0.65	**40%**
			7.4%	**56.8%**	**28.4%**	**7.4%**	**100.0%**					
ON SITE STUDY AREA		**1.62**	**0.45**	**2.26**	**4.49**	**0.13**	**8.95**	0.50	0.56	0.61	0.75	**64%**
		18.1%	**5.0%**	**25.3%**	**50.2%**	**1.5%**	**100.0%**					
OSA5	A5	0.01	0.0	0	0	0	0.01	0.78	0.81	0.84	0.87	95%
OSA7	A7	0.09	0.02	0	0	0	0.11	0.78	0.81	0.84	0.87	95%
OSB1	B1	0.05	0.01	0	0	0	0.06	0.78	0.81	0.84	0.87	95%
OSB2	B2	0.01	0.01	0	0	0	0.02	0.78	0.81	0.84	0.87	95%
OFF SITE BASINS		**0.16**	**0.04**				**0.20**	0.78	0.81	0.84	0.87	**95%**
		82.1%	**17.9%**				**100.0%**					
OVERALL STUDY AREA		**1.78**	**0.48**	**2.26**	**4.49**	**0.13**	**9.14**	0.51	0.57	0.61	0.75	**65%**
		19.5%	**5.3%**	**24.7%**	**49.1%**	**1.4%**	**100.0%**					

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STANDARD FORM SF-2 - DEVELOPED TIME OF CONCENTRATION

PROJECT NAME: Bella Mesa South
PROJECT NUMBER: 17026.007
CALCULATED BY: IKW
CHECKED BY: RAO

DATE: 9/12/2025
JURISDICTION: Castle Rock

SUB-BASIN DATA			INITIAL TIME (T_i)			TRAVEL TIME (T_t)						tc CHECK (URBANIZED BASINS)			FINAL Tc	RUNOFF COEFFICIENT	
DESIGN BASIN (1)	AREA (AC) (2)	C_5 (3)	LENGTH* (FT) (4)	SLOPE (%) (5)	T_i (MINUTES) (6)	LENGTH (FT) (7)	SLOPE (%) (8)	C_v (9)	Land Surface (10)	VEL (FPS) (11)	T_t (MINUTES) (12)	COMP. t_c (13)	TOTAL LENGTH (14)	REGIONAL tc (15)	Min. t_c	C_5	C_{100}
A1	0.38	0.50	60	2.0%	7	170	0.5%	7.0	Short Pasture/Lawn	0.5	5.7	12.4	230	16.7	12.4	0.50	0.72
A2	0.74	0.45	70	2.0%	7.9	200	2.4%	7.0	Short Pasture/Lawn	1.1	3.1	11.0	270	17.6	11.0	0.45	0.69
A3	0.33	0.66	60	2.0%	4.9	240	0.6%	20.0	Paved Areas	1.6	2.5	7.4	300	13.4	7.4	0.66	0.80
A4	0.35	0.67	60	2.0%	4.8	250	0.8%	20.0	Paved Areas	1.8	2.3	7.1	310	13.1	7.1	0.67	0.80
A5	0.35	0.61	50	2.0%	5.0	90	0.7%	20.0	Paved Areas	1.7	0.9	5.9	140	14.2	5.9	0.61	0.77
A6	0.75	0.67	50	2.0%	4.4	500	0.7%	20.0	Paved Areas	1.7	5.0	9.4	550	13.5	9.4	0.67	0.80
A7	0.10	0.71	50	2.0%	4.0	90	0.2%	20.0	Paved Areas	0.9	1.7	5.6	140	12.1	5.6	0.71	0.82
A8	2.05	0.64	90	2.0%	6.3	410	0.4%	20.0	Paved Areas	1.3	5.4	11.7	500	14.2	11.7	0.64	0.79
B1	0.37	0.54	95	2.0%	6.1	110	0.8%	20.0	Paved Areas	1.8	1.0	7.1	205	15.7	7.1	0.54	0.74
B2	0.80	0.63	100	2.0%	8.2	140	1.4%	20.0	Paved Areas	2.4	1.0	9.2	240	13.8	9.2	0.63	0.78
B3	0.97	0.62	70	2.0%	5.7	240	1.6%	20.0	Paved Areas	2.5	1.6	7.3	310	14.0	7.3	0.62	0.78
C1	1.14	0.42	40	15.0%	3.2	20	20.0%	7.0	Short Pasture/Lawn	3.1	0.1	3.3	60	18.1	5.0	0.42	0.67
C2	0.49	0.31	120	3.4%	10.5	400	2.3%	20.0	Paved Areas	3.0	2.2	12.7	520	20.6	12.7	0.31	0.62
C3	0.13	0.08	170	16.2%	9.7	170	2.1%	7.0	Short Pasture/Lawn	1.0	2.8	12.5	340	25.3	12.5	0.08	0.50
OSA5	0.01	0.81	30	2.0%	2.3	180	1.6%	20.0	Paved Areas	2.5	1.2	3.5	210	10.0	5.0	0.81	0.87
OSA7	0.11	0.81	20	2.0%	1.9	240	2.3%	20.0	Paved Areas	3.0	1.3	3.2	260	10.0	5.0	0.81	0.87
OSB1	0.06	0.81	31	2.0%	2.3	170	1.7%	20.0	Paved Areas	2.6	1.1	3.4	201	10.0	5.0	0.81	0.87
OSB2	0.02	0.81	40	16.2%	1.3	170	2.1%	20.0	Paved Areas	2.9	1.0	2.3	210	10.0	5.0	0.81	0.87

* L = 500' max for non-urban land uses and 300' max for urban land uses

$$T_i = \frac{0.395(1.1-C)L^{1/2}}{S^{1/3}}$$

$$T_t = \frac{L}{60V}$$

$$V = C_v S_w^{0.5}$$

$$t_c = \frac{L}{180} + 10$$

$$t_c = (26-17i) + \frac{L_t}{60(14i+9)\sqrt{S_t}}$$

Table RO-2—Conveyance Coefficient, C_v

Type of Land Surface	Conveyance Coefficient, C_v
Heavy meadow	2.5
Tillage/field	5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

Redland

STANDARD FORM SF-3 - DEVELOPED
STORM DRAINAGE DESIGN - RATIONAL METHOD 5 YEAR EVENT

PROJECT NAME: Bella Mesa South
PROJECT NUMBER: 17026.007
CALCULATED BY: IKW
CHECKED BY: RAO

P_1 (1-Hour Rainfall) = 1.43

DATE: 9/12/2025
JURISDICTION: Castle Rock

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF C_5	t_c (minutes)	C*A(AC)	I (in/hr)	Q (cfs)	t_c(minutes)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	t_t (Minutes)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	A1	A1	0.4	0.50	12.4	0.2	3.53	0.7													
	A2	A2	0.7	0.45	11.0	0.3	3.73	1.2													
	A3	A3	0.3	0.66	7.4	0.2	4.31	0.9													
	A4	A4	0.4	0.67	7.1	0.2	4.37	1.0													
	A5	A5	0.4	0.61	5.9	0.2	4.62	1.0													
	A6	A6	0.7	0.67	9.4	0.5	3.97	2.0													
	A7	A7	0.1	0.71	5.6	0.1	4.69	0.3													
	A8	A8	2.1	0.64	11.7	1.3	3.63	4.8													
	B1	B1	0.4	0.54	7.1	0.2	4.38	0.9													
	B2	B2	0.8	0.63	9.2	0.5	4.00	2.0													
	B3	B3	1.0	0.62	7.3	0.6	4.33	2.6													
	C1	C1	1.1	0.42	5.0	0.5	4.85	2.3													
	C2	C2	0.5	0.31	12.7	0.2	3.50	0.5													
	C3	C3	0.1	0.08	12.5	0.0	3.53	0.0													
	A5	OSA5	0.0	0.81	5.0	0.0	4.85	0.0	5.94	0.22	4.62	1.0									
	A7	OSA7	0.1	0.81	5.0	0.1	4.85	0.4	5.64	0.16	4.69	0.7									
	B1	OSB1	0.1	0.81	5.0	0.0	4.85	0.2	7.08	0.45	4.38	2.0									
	B2	OSB2	0.0	0.81	5.0	0.0	4.85	0.1	9.17	1.02	4.00	4.1									

Redland

STANDARD FORM SF-3 - DEVELOPED
STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Bella Mesa South
PROJECT NUMBER: 17026.007
CALCULATED BY: IKW
CHECKED BY: RAO

P_1 (1-Hour Rainfall) = 2.60

DATE: 9/12/2025
JURISDICTION: Castle Rock

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF C_{100}	t_c (minutes)	C*A(ac)	I (in/hr)	Q (cfs)	t_c(minutes)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	t_t (minutes)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	A1	A1	0.4	0.72	12.4	0.3	6.43	1.7													
	A2	A2	0.7	0.69	11.0	0.5	6.77	3.5													
	A3	A3	0.3	0.80	7.4	0.3	7.83	2.1													
	A4	A4	0.4	0.80	7.1	0.3	7.94	2.2													
	A5	A5	0.4	0.77	5.9	0.3	8.41	2.3													
	A6	A6	0.7	0.80	9.4	0.6	7.21	4.3													
	A7	A7	0.1	0.82	5.6	0.1	8.53	0.7													
	A8	A8	2.1	0.79	11.7	1.6	6.59	10.7													
	B1	B1	0.4	0.74	7.1	0.3	7.96	2.2													
	B2	B2	0.8	0.78	9.2	0.6	7.27	4.5													
	B3	B3	1.0	0.78	7.3	0.8	7.88	5.9													
	C1	C1	1.1	0.67	5.0	0.8	8.82	6.8													
	C2	C2	0.5	0.62	12.7	0.3	6.36	1.9													
	C3	C3	0.1	0.50	12.5	0.1	6.42	0.4													
	A5	OSA5	0.0	0.87	5.0	0.0	8.82	0.1	5.94	0.28	8.41	2.3									
	A7	OSA7	0.1	0.87	5.0	0.1	8.82	0.8	5.64	0.17	8.53	1.5									
	B1	OSB1	0.1	0.87	5.0	0.1	8.82	0.5	7.08	0.60	7.96	4.7									
	B2	OSB2	0.0	0.87	5.0	0.0	8.82	0.1	9.17	1.26	7.27	9.2									

Redland

PROJECT NAME:	Bella Mesa South	DATE:	9/12/2025
PROJECT NUMBER:	17026	JURISDICTION:	Castle Rock
CALCULATED BY:	IKW		
CHECKED BY:	RAO		

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
A1	0.38	0.50	0.72	57%	0.7	1.7
A2	0.74	0.45	0.69	51%	1.2	3.5
A3	0.33	0.66	0.80	76%	0.9	2.1
A4	0.35	0.67	0.80	78%	1.0	2.2
A5	0.35	0.61	0.77	70%	1.0	2.3
A6	0.75	0.67	0.80	78%	2.0	4.3
A7	0.10	0.71	0.82	83%	0.3	0.7
A8	2.05	0.64	0.79	74%	4.8	10.7

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
B1	0.37	0.54	0.74	61%	0.9	2.2
B2	0.80	0.63	0.78	72%	2.0	4.5
B3	0.97	0.62	0.78	72%	2.6	5.9

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
C1	1.14	0.42	0.67	46%	2.3	6.8
C2	0.49	0.31	0.62	34%	0.5	1.9
C3	0.13	0.08	0.50	5%	0.03	0.4

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
OSA5	0.01	0.81	0.87	95%	0.0	0.1
OSA7	0.11	0.81	0.87	95%	0.4	0.8
OSB1	0.06	0.81	0.87	95%	0.2	0.5
OSB2	0.02	0.81	0.87	95%	0.1	0.1

Appendix C - Hydraulic Calculations

Appendix D - Reference Documents

PHASE III DRAINAGE REPORT
FOR
FOUNDERS VILLAGE FILING 24 – PHASE 1A CONSTRUCTION
TOWN OF CASTLE ROCK, CO
PROJECT NO. CD18-0015

PREPARED FOR:

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4350 S. MONACO STREET
DENVER, CO 80237
PHONE: 720-977-3862
CONTACT: ERIC KUBLY

PREPARED BY:

CORE CONSULTANTS, INC.
1950 W. LITTLETON BOULEVARD, SUITE 109
LITTLETON, CO 80120
PHONE: 303-703-4444
CONTACT: BLAKE CALVERT
CORE PROJECT NUMBER: 18-007

DECEMBER 28, 2018

II. DRAINAGE BASINS AND SUB-BASINS

A. MAJOR DRAINAGE BASINS

The drainage patterns for the major basins will generally follow the historic patterns. The property generally drains northwest to Mitchell Gulch on the west side of the property. Mitchell Gulch drains to Cherry Creek approximately two miles downstream of the property. The site falls within Zone X, as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel 08035C0306G (revised March 16, 2016). A copy of this map is included in the appendix.

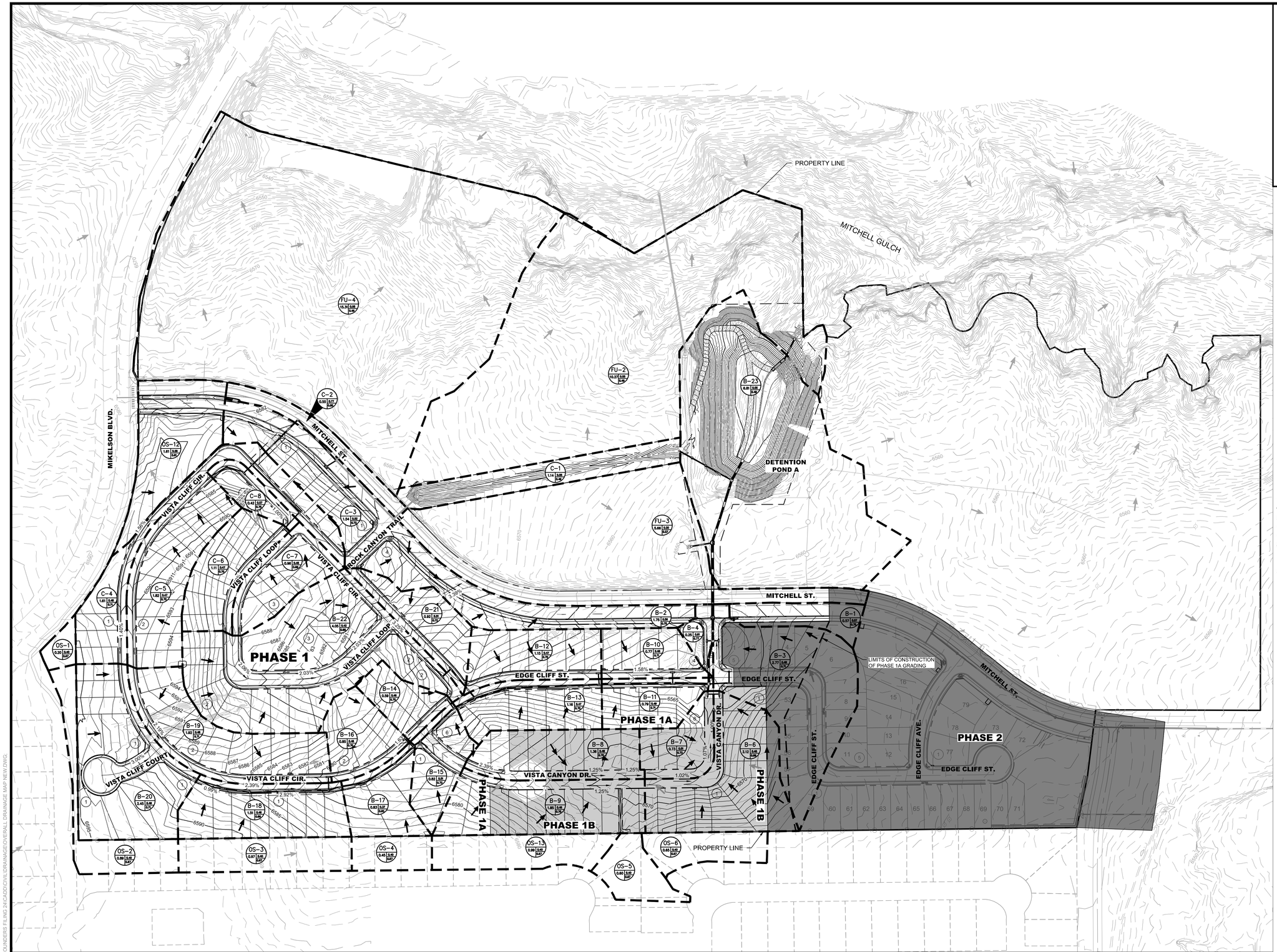
B. MINOR DRAINAGE BASINS

Minor Drainage Basins have been delineated using the proposed site plan and grading, as well as the lot layout for future development. In addition, the portion of Mitchell Street that has already been constructed and the future development to the west of Mitchell Street will be included in the detention pond sizing. Overall, the proposed drainage patterns for the sub-basins will generally follow the historic patterns prior to development. Although Mitchell Street has been partially constructed, the existing condition for the site will be considered fully undeveloped and the roadway will be included as part of the proposed drainage design in the total amount of detention and water quality. For sub-basins within the site, runoff will drain towards low points in the roadways. The developed minor basins will include overland flow and storm sewer collection systems which will direct stormwater to the extended detention basins at the north edge of the site and west of Mitchell Street. The site drainage will not be impacted by any irrigation facilities. The Site is to be constructed in three phases, Phase 1A, Phase 1B, and Phase 2. During grading of Phase 1A, the area for Phase 1B will be overlot graded. The storm system has been designed for the ultimate runoff from Phase 1A and Phase 1B. Minor basins have been established for the site for Phase 1A and Phase 1B, and are described below:

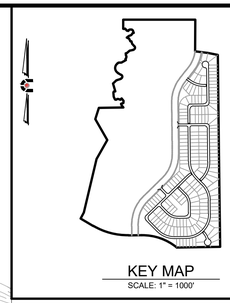
On-Site Basins:

Basin B-1
Basin B-1 is a 0.57-acre area with a peak flow of 3.5 cfs, comprised of roadway and landscaping. Runoff generated within this basin will drain to a type-R inlet at DP50. The flow that is captured by the inlet at DP50 combines with the flow from DP48 and DP49 at the manhole at DP51 for a cumulative flow of 136.7 cfs and is conveyed west to Detention Pond B via the proposed storm sewer system.

Basin B-2
Basin B-2 is a 1.75-acre area with a peak flow of 9.7 cfs, comprised of roadway and landscaping. Runoff generated within this basin will drain to a type-R inlet at at DP49. The flow that is captured by the inlet at DP50 combines with the flow from



OVERALL PROPOSED DRAINAGE MAP



0 120' 240'

1 inch = 120 ft.

LEGEND

- BASIN DESIGNATION
- 5 YEAR COEFFICIENTS
- 100 YEAR COEFFICIENTS
- DESIGN POINT *FLOWS ARE NOT CONCENTRATED BUT SHEET FLOWS
- DIRECTIONAL FLOW AROW
- PROPOSED EASEMENT
- PROPOSED R.O.W.
- EXISTING LOT LINE
- PROPOSED PROPERTY BOUNDARY
- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- PROPOSED MANHOLE AND PIPE
- PROPOSED INLETS
- PROPOSED FLARED END SECTION
- EXISTING MANHOLE AND PIPE
- EXISTING INLETS
- EXISTING FLARED END SECTION
- RIPRAP

CIVIL ENGINEERING
DEVELOPMENT CONSULTING
NATURAL RESOURCES CONSULTING
LAND SURVEYING
303.703.4444
1950 W. Littleton Blvd., Ste. 109
Littleton, CO 80120

CORE CONSULTANTS

#	REVISION DESCRIPTION	DATE	BY
1	2ND SUBMITTAL	09/04/18	RCY
2	3RD SUBMITTAL	10/26/18	RCY
3	4TH SUBMITTAL	12/10/18	RCY
4	5TH SUBMITTAL	12/21/18	RCY
5	ISSUED FOR CONSTRUCTION	XX/XX/XX	RCY

FOUNDERS VILLAGE FILING 24
TOWN OF CASTLE ROCK, DOUGLAS COUNTY

DRAINAGE PLANS - PHASE I
OVERALL PROPOSED DRAINAGE MAP

DESIGNED BY: RCY
DRAWN BY: BB
CHECKED BY: BC

JOB NO. 18-007

SHEET 2 OF 6

12/21/2018 3:26 PM X:\18-007 FOUNDERS FILING 24\CAD\CIVIL\DRAINAGE\OVERALL DRAINAGE MAP NEW DWG

Phase III Drainage Report

Founders Village Filing 24 – 1st Amendment
CD21-0011

Prepared for:

Fourth Investments, LLC
PO Box 5127
Gypsum, Colorado 81637
(970) 470.2087 voice
Contact: John V. Hill

Prepared by:

Redland
WHERE GREAT PLACES BEGIN

720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

May 28, 2021
Project No. 17026.002

in a proposed storm sewer main to the west then north before out falling into the existing detention pond. By routing these flows further west before conveying it to the pond Tract B will become a more efficient parcel to develop in the future. The proposed storm sewer will be sized to not only accommodate the flows from the 'C' Basins of Founders Village Filing 24 but also future developed flows from Lot 1 and Tract B. This application does not propose an increase in the current impervious area but will approximate the future impervious values in order to ensure the storm sewer is being designed for future developed use.

Flood Hazard and Drainage Studies Relevant to the Site

Based on the FEMA FIRM, Map 08035C0306G, effective date March 16, 2016, which can be found in Appendix A, the PLD parcel and the future multi-family parcel are located within Zone X (Area of Minimal Flood Hazard) and are not located within a 100-year floodplain. Located in the existing Tract S of Founders Village Filing 24 is Mitchell Gulch which contains a FEMA designated Zone AE floodway. Proposed Tracts A, B, and Lot 1 will not encroach into Mitchell Gulch or the regulated FEMA floodplain.

Soil Type

The Natural Resource Conservation Service (NRCS) soil survey site map indicates that the soil on site is primarily Coni rocky loam (79.9%), whose hydrologic soil group is Type D, having a very slow infiltration rate and Fondis clay loam (20.1%), whose hydrologic soil group is Type C, having a slow infiltration rate. A soil map has been included in Appendix A for reference.

Drainage Basin and Sub-Basins

Major Basins

Based on the Founders Village Filing 24 Rock Canyon Phase III Drainage Report by TCB dated April 2006, the Site lies within major Basins H-1 and H-3. These basins generally flowed northwest to Mitchell Gulch on the west side of the property. Mitchell Gulch outfalls to Cherry Creek approximately two miles downstream of the property. These major Basins were divided into sub-basins in the Approved Report by Core Consultants. The intent of this application is to remain in conformance with the Approved Report and modify the sub-basins west of Mitchell Street to better route runoff around Tract B and ultimately to the existing detention pond.

Sub Basins

Basin A1 (5.08 Acres)

Basin A1 is undeveloped land located within Lot 1 on the west side of Mitchell Street. Generally, runoff from this basin sheet flows to the west and is collected in various ravines that outfall into

Mitchell Gulch. The current overall imperviousness is 2%. This condition will remain until future development will be required to treat and detain the runoff. It is anticipated that the future development will have an overall imperviousness of 70% and the runoff will flow northwest to Design Point 1 where it will be collected and enter the proposed storm sewer. Runoff will then be conveyed north in the storm sewer to the existing detention pond. Basin A1 is anticipated to produce approximately 13.0 cfs in the 5-year event and 29.9 cfs in the 100-year event in the fully developed condition.

$C_5 = 0.61$ $C_{100} = 0.77$

$Q_5 = 13.0$ CFS $Q_{100} = 29.9$ CFS

Basin A2 (8.06 Acres)

Basin A2 is undeveloped land located in Tract B on the west side of Mitchell Street just south of the existing detention pond and Mesa Middle School. Generally, runoff from this basin sheet flows to the north and west. The basin currently contains a swale running from the southeast end of the basin up to the northwestern corner. This swale conveys runoff from the Founders Village Filing 24 development on the east side of Mitchell Street to the existing detention pond.

The current overall imperviousness is 2%. This condition will remain until future development will be required to treat and detain the runoff. It is anticipated that the future development will have an overall imperviousness of 70% and the runoff will flow northwest to Design Point 2 where it will be collected and enter the proposed storm sewer. The anticipated impervious value was provided by the Douglas County School District engineer, the correspondence with the School District engineer can be found in Appendix D. Runoff will then be conveyed north in the storm sewer to the existing detention pond. Basin A2 is anticipated to produce approximately 19.9 cfs in the 5-year event and 45.8 cfs in the 100-year event in the fully developed condition.

$C_5 = 0.61$ $C_{100} = 0.77$

$Q_5 = 19.9$ CFS $Q_{100} = 45.8$ CFS

Basin A3 (2.60 Acres)

Basin A3 is undeveloped land located in Tract B on the west side of Mitchell Street, just east of the existing detention pond and south of Mesa Middle School. Generally, runoff from this basin sheet flows to the west and is collected in the existing detention pond. The current overall imperviousness is 2%. This condition will remain until future development will be required to treat and detain the runoff. It is anticipated that the future development will have an overall imperviousness of 70% and the runoff will flow west to Design Point 3 where it will enter the

existing detention pond. Basin A3 is anticipated to produce approximately 7.8 cfs in the 5-year event and 17.9 cfs in the 100-year event in the fully developed condition.

$C_5 = 0.61$ $C_{100} = 0.77$

$Q_5 = 7.8$ CFS $Q_{100} = 17.9$ CFS

Basin B1 (3.76 Acres)

Basin B1 is undeveloped land located in Lot 1 at the northwest corner of Mitchell Street and Mickelson Boulevard. Generally, runoff from this basin sheet flows to the southwest and into Mitchell Gulch. The current overall imperviousness is 2%. This condition will remain until future development will be required to treat and detain the runoff. Since this basin currently flows away from the existing detention pond, it is anticipated that the future development will provide water quality for this runoff and will over-detain in the existing detention pond so the site as a whole remains at historical release rates. It is also anticipated the overall imperviousness of the site will be 70% and the runoff will flow west to Mitchell Gulch at Design Point 4. Basin B1 is anticipated to produce approximately 8.1 cfs in the 5-year event and 18.6 cfs in the 100-year event in the fully developed condition.

$C_2 = 0.61$ $C_{100} = 0.77$

$Q_2 = 8.1$ CFS $Q_{100} = 18.6$ CFS

Basin B2 (1.46 Acres)

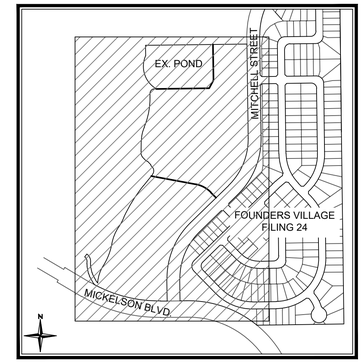
Basin B2 is undeveloped land located in Tract B at the northwest corner of the Site, directly south of the existing detention pond. Generally, runoff from this basin sheet flows to the west and into Mitchell Gulch at Design Point 5. The current overall imperviousness is 2%. This condition will remain, since it is highly unlikely that this basin is developed due to the proximity to Mitchell Gulch and the prevailing existing grades. Basin B2 is anticipated to produce approximately 0.2 cfs in the 5-year event and 4.0 cfs in the 100-year event.

$C_5 = 0.05$ $C_{100} = 0.49$

$Q_5 = 0.2$ CFS $Q_{100} = 4.0$ CFS

Basin C1 (3.32 Acres)

Basin C1 is undeveloped land located in Tract A at the northwest corner of the Site. Generally, runoff from this basin sheet flows into the existing detention pond and outfalls to Mitchell Gulch at Design Point 6. The current overall imperviousness is 2%. This condition will remain, since it is



KEY MAP

LEGEND:

- EXISTING MINOR CONTOUR (2FT)
- EXISTING MAJOR CONTOUR (10 FT)
- PROPOSED MINOR CONTOUR (2FT)
- PROPOSED MAJOR CONTOUR (10 FT)
- EXISTING STORM SEWER
- FIRM — EXISTING FLOODPLAIN
- JW — EXISTING JURISDICTIONAL WETLAND
- NJ — EXISTING NON-JURISDICTIONAL WETLAND
- 100 YR — EXISTING 100 YEAR WATER SURFACE ELEVATION
- PROPOSED DRAINAGE BASIN
- PROPOSED STORM SEWER
- EXISTING FLOW DIRECTION
- ANTICIPATED FUTURE FLOW DIRECTION
- 1 — DESIGN POINT

DRAINAGE BASIN ID — A
BASIN ACREAGE (AC) — 2.30 | 0.18 | 0.52 (C_5 / C_{100})

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

LICENSED PROFESSIONAL ENGINEER — 54401 — 05/28/19

DRAWN	EBR
CHECKED	MTP
APPROVED	EBR
PROJECT NO.	17026.002
HORZ. SCALE	1" = 50'
VERT. SCALE	N/A

NOTES

NO.	DATE

FOUNDERS VILLAGE FILING 24 WEST

DRAINAGE MAP

SHEET

DRG-1

I:\2017\17026 — Bella Mesa\CADD\Sheet Sets\17026.002 — Bella Mesa PLD\Drainage\17026.002 — Bella Mesa PLD — SDP Drainage Map_recover.dwg tab: Layout1 Apr 13, 2021 – 7:56am erumney

MIKELSON BOULEVARD PHASE III DRAINAGE AND EROSION CONTROL REPORT

for

Castlewood Ranch LLC.

David J. Erb
Orchard Pointe, Suite 5550
8480 East Orchard Road
Englewood, Colorado 80111
(303) 740-7557

prepared by

Nolte Associates, Inc.
7000 S. Yosemite Street, Suite 200
Englewood, Colorado 80112
(303) 220-1001

November 1999
Revised May 2000

STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)
DESIGN STORM: 5-YEAR DEVELOPED

Calc. by: RBM
Chk'd by: TAJ
Date: 10/11/99

LOCATION: CASTLEWOOD RANCH PHASE III DESIGN TOWN OF CASTLE ROCK

STATION	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF					REMARKS Rev 4/24/00
		BASIN	AREA (AC)	COEFF. (C)	Tc (Min.)	C*A	I (in./ hr.)	Q (cfs)	Sum AREA	Sum Tc (min.)	I (in./hr.)	Sum CA	Total Q (cfs)	
	M13	M-10.2A	7.51	0.50	16	3.76	3.18	12.0						
	M14	M-10.2B	17.03	0.50	21	8.52	2.75	23.5	24.54	21	2.75	12.27	33.8	Total runoff includes DP M13
	M15	M-10.2C1	5.92	0.35	14	2.07	3.32	6.9						
	M16	M-10.2C2	29.38	0.50	24	14.69	2.53	37.2	59.84	24	2.53	29.03	73.5	Total runoff includes DP M14 and M15
	M20	M-9A	59.48	0.40	19	23.91	2.88	68.8	119.32	24	2.53	52.94	134.0	Total into 2-60" Culvert (DP M17+M16)
	M21	M-9B	5.27	0.60	15	3.18	3.26	10.4						
	M22	M-9C	1.67	0.88	12	1.47	3.64	5.4	6.94	15	3.26	4.65	15.2	Total into inlet and pipe at DP M22
	M23	M-9D	2.99	0.74	14	2.20	3.31	7.3	6.47	14	3.31	4.40	14.6	Total into inlet at DP M24
	M24	M-9E	3.48	0.63	14	2.20	3.34	7.3	13.40	15	3.26	9.05	29.5	Total in pipe at DP M24
			2.88			1.30		4.3						
	W20A	W-3A4A	2.66	0.45	14	1.20	3.32	4.0						15' on-grade inlet
	W21A	W-3A4B	0.43	0.70	5	0.30	4.91	1.5		1.5+	16 co.	=	3.1	Flows down Mitchell Dr.
	M29	M-7C1	1.36	0.69	9	0.94	3.95	3.7						Flows down Milbridge Ave.
	M30	M-7C2	6.55	0.45	15	2.95	3.29	9.7	7.91	15	3.29	3.88	12.8	Total runoff includes DP M29
	M31	M-7C3	20.13	0.59	13	11.84	3.42	40.5	28.04	20	2.85	15.72	44.7	Total runoff includes DP M30
	M32	M-7C4	2.37	0.63	11	1.48	3.66	5.4	30.40	20	2.85	17.20	48.9	Total runoff includes DP M31
	M33	M-7C5	5.31	0.56	16	2.97	3.12	9.3	35.71	21	2.77	20.17	55.9	Total in 48" (DP M33+M32)
	M34	M-7C6	1.13	0.65	10	0.74	3.94	2.9	2.98	10	3.87	1.96	7.6	Total into inlet (DP M34 and M35)
	M35	M-7C7	1.85	0.66	10	1.22	3.87	4.7	38.69	23	2.64	22.13	58.4	Total in pipe from center of road to DP M36
	M36	M-7C8	3.79	0.39	14	1.47	3.41	5.0	5.32	14	3.41	2.36	8.0	Total into inlet (DP M36 and M37)
	M37	M-7C9	1.53	0.58	10	0.89	3.87	3.4	44.00	23	2.64	24.49	64.6	Total into Mikelson Pond (DP M29-M37)

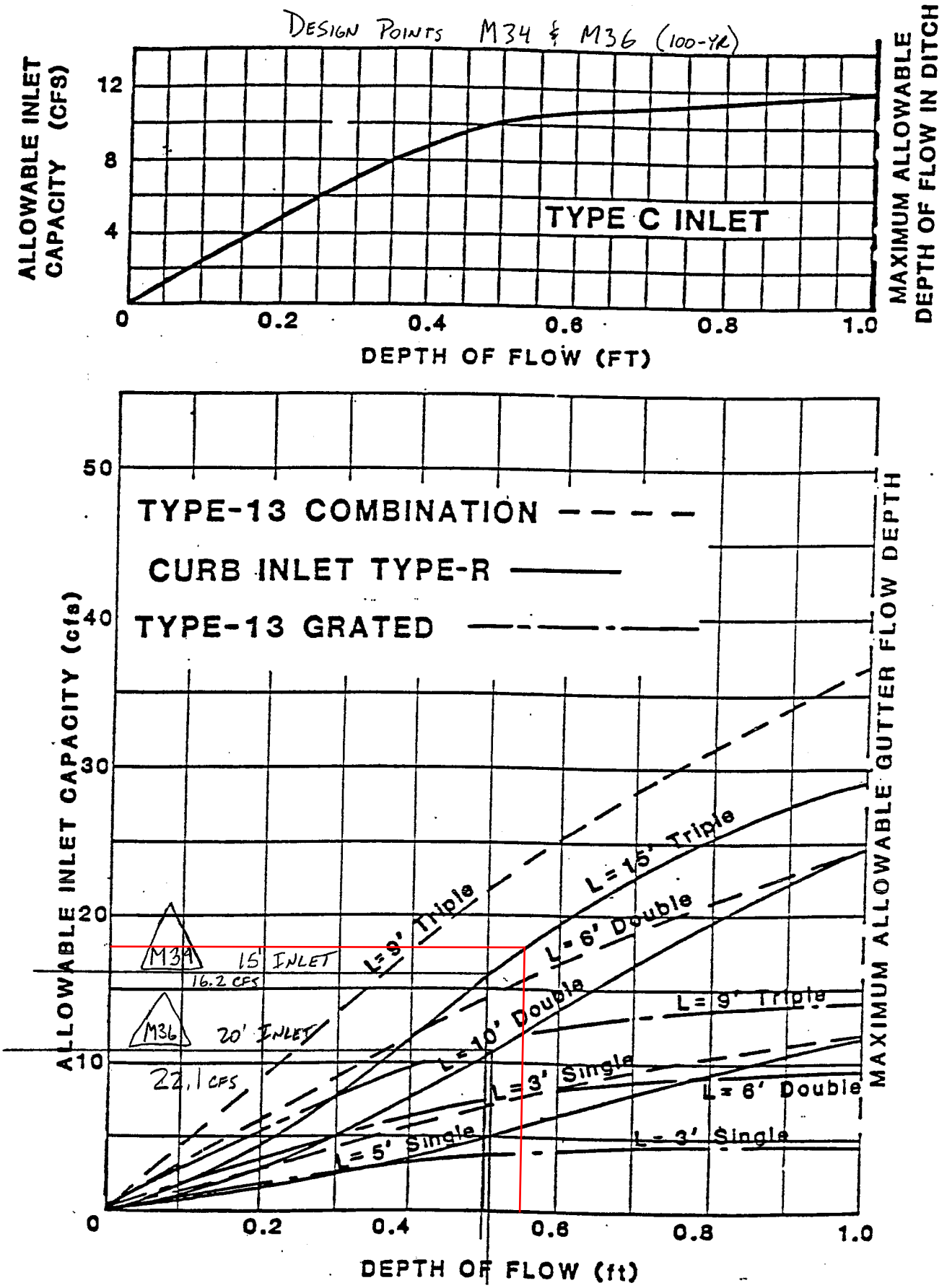
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)
DESIGN STORM: 100-YEAR DEVELOPED

Calc. by: RBM
Chk'd by: TAN
Date: 10/11/99

LOCATION: CASTLEWOOD RANCH PHASE III DESIGN TOWN OF CASTLE ROCK

STATION	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF					REMARKS
		BASIN	AREA (AC)	COEFF. (C)	Tc (Min.)	C*A	I (in./ hr.)	Q (cfs)	Sum AREA	Sum Tc (min.)	I (in./hr.)	Sum CA	Total Q (cfs)	
	M13	M-10.2A	7.51	0.70	16	5.26	5.79	30.4						
	M14	M-10.2B	17.03	0.70	21	11.92	5.01	59.7	24.54	21	5.01	17.18	86.0	Total runoff includes DP M13
	M15	M-10.2C1	5.92	0.60	14	3.55	6.04	21.4						
	M16	M-10.2C2	29.38	0.70	24	20.57	4.60	94.7	59.84	24	4.60	41.30	190.1	Total runoff includes DP M14 and M15
	M20	M-9A	59.48	0.60	19	35.47	5.23	185.6	119.32	24	4.60	76.76	353.3	Total into 2-60" Culvert (DP M17+M16)
	M21	M-9B	5.27	0.72	15	3.78	5.94	22.4						
	M22	M-9C	1.67	0.93	12	1.56	6.62	10.3	6.94	15	5.94	5.34	31.7	Total into inlet and pipe at DP M22
	M23	M-9D	2.99	0.82	14	2.45	6.02	14.7	6.47	14	6.02	5.02	30.2	Total into inlet at DP M24
	M24	M-9E	3.48	0.74	14	2.57	6.06	15.6	13.40	15	5.94	10.36	61.5	Total in pipe at DP M24
			2.88			1.73		10.4						
	W20A	W-3A4A	2.66	0.60	14	1.60	6.04	9.6						15' on-grade inlet
	W21A	W-3A4B	0.43	0.83	5	0.36	8.93	3.2	3.2 +	3.7 c.o.	=		6.9	Flows down Mitchell Dr.
	M29	M-7C1	1.36	0.82	9	1.11	7.18	8.0						Flows down Milbridge Ave.
	M30	M-7C2	6.55	0.60	15	3.93	5.98	23.5	7.91	15	5.98	5.04	30.2	Total runoff includes DP M29
	M31	M-7C3	20.13	0.75	13	15.15	6.22	94.2	28.04	20	5.17	20.19	104.4	Total runoff includes DP M30
	M32	M-7C4	2.37	0.78	11	1.85	6.66	12.3	30.40	20	5.17	22.03	114.0	Total runoff includes DP M31
	M33	M-7C5	5.31	0.68	16	3.63	5.68	20.6	35.71	21	5.04	25.66	129.3	Total in 48" (DP M33+M32)
	M34	M-7C6	1.13	0.80	10	0.90	7.15	6.4	2.98	10	7.03	2.31	16.2	Total into inlet (DP M34 and M35)
	M35	M-7C7	1.85	0.76	10	1.41	7.03	9.9	38.69	23	4.79	27.97	134.1	Total in pipe from center of road to DP M36
	M36	M-7C8	3.79	0.64	14	2.42	6.20	15.0	5.32	14	6.20	3.57	22.1	Total into inlet (DP M36 and M37)
	M37	M-7C9	1.53	0.75	10	1.15	7.03	8.1	44.00	23	4.79	31.54	151.2	Total into Mikelson Pond (DP M29-M37)

A8



BY: RBD	TOWN OF CASTLE ROCK PUBLIC WORKS	STD. DWG NO.	
APPROVED BY:	ALLOWABLE INLET CAPACITY - SUMP CONDITIONS – ALL INLETS	FIGURE 803	A20
DATE: 4/11/98			

SUMMARY RUNOFF TABLE

DESIGN PT.	TOTAL AREA (ACRES)	TOTAL Q_5 (CFS)	TOTAL Q_{100} (CFS)	DESIGN PT.	TOTAL AREA (ACRES)	TOTAL Q_5 (CFS)	TOTAL Q_{100} (CFS)
M13	7.51	12.0	30.4	W21A	0.43	3.1	6.9
M14	24.54	33.8	86.0	M29	1.36	3.7	8.0
M15	5.92	6.9	21.4	M30	7.91	12.8	30.2
M16	59.84	73.5	190.1	M31	28.04	44.7	104.4
M20	119.32	134.0	353.3	M32	30.40	48.9	114.0
M21 & M22	6.94	15.2	31.7	M33	35.71	55.9	129.3
M23 & M24	13.4	29.5	61.5	M34 & M35	38.69	58.4	134.1
W20A	2.88	4.3	10.3	M36 & M37	44.00	64.6	151.2

LEGEND:

- BASIN BOUNDARY
- REVISED BASIN BOUNDARY
- M-10L (112.3 | 0.33 | 0.78) — BASIN DESIGNATION; BASIN AREA; 5 YEAR RUNOFF COEFFICIENT; 100 YEAR RUNOFF COEFFICIENT
- W-3A4A (2.88 | 0.45 | 0.80) — REVISED BASIN
- 11 — DESIGN POINT
- FLOW ARROW

NOLTE

0 100 200 400

1 inch = 200 ft.

BK.1309 PG.577
REC. NO. 9561922

BK.1087 PG.396
REC. NO. 9233629

MIKELSON BOULEVARD DETENTION POND

M-7C7 (1.85 | 0.66 | 0.76) — SDIN # 1, 15' TYPE "R" INLET
M-7C9 (1.53 | 0.58 | 0.75) — SDIN # 2, 20' TYPE "R" INLET
M-7C6 (1.13 | 0.65 | 0.80)
M-7C8 (3.79 | 0.39 | 0.64)
M-7C4 (2.37 | 0.63 | 0.78)
M-7C5 (5.31 | 0.56 | 0.68)
M-7C3 (20.13 | 0.59 | 0.75)
M-7C2 (6.55 | 0.45 | 0.60)
M-7C1 (1.36 | 0.69 | 0.82)
M-9D (2.99 | 0.74 | 0.82)
M-9B (5.27 | 0.60 | 0.72)
M-9A (59.48 | 0.40 | 0.60)
M-9E (3.48 | 0.63 | 0.74)
M-9C (1.67 | 0.88 | 0.93)
M-10.2C2 (29.38 | 0.50 | 0.70)
M-10.2B (17.03 | 0.50 | 0.70)
M-10.2A (7.51 | 0.50 | 0.70)
W-3A4B (0.43 | 0.70 | 0.83)
W-3A4A (2.88 | 0.45 | 0.80)
W-3A4A (2.66 | 0.45 | 0.68)

48" RCP; 24" PLUG; 12" MIN. DIA. UNIFORM GROUTED BOULDERS; TYPE "L" RIP-RAP; 6" MIN. DIA. UNIFORM GROUTED BOULDERS; 2-60" CMP CULVERT C-M1; 30" RCP; 18" RCP; SEDIMENT TRAP

SDIN # 3, 15' TYPE "R" INLET

SDIN # 5, 30' TYPE "R" INLET

SDIN # 4, 30' TYPE "R" INLET

1' FREEBOARD; 0.6'-1.16'; CHANNEL CH-M2, SLOPE = 1.5%-1.8%

SECTION A-A
N.T.S.

MITCHELL GULCH

MIKELSON BOULEVARD

TURNSTONE AVE.

MITCHELL DR.

BRANTLY AVENUE

MILL BRIDGE COURT

MILL BRIDGE AVENUE

FUTURE PA 28

FUTURE PA 38A

FUTURE PA 39

FUTURE PA 44A

FUTURE SCHOOL SITE

FOUNDERS VILLAGE FILING NO. 7

A-1

W. RULE

SUFFOLK CIRCLE

ROSEDALE CIRCLE

KINGSFIELD STREET

BONNESS STREET

REGENCY COURT

MEDFORD COURT

RANDOLPH AVENUE

TEABERRY AVENUE

LANTERN TRAIL

SEE SHEET A2 OF THE APPENDIX FOR OFFSITE AREAS.

DATE PRINTED
APR 27 2000
NOLTE & ASSOC.

1	RBM	04-26-00	Basin W-3A4A increased in size

CAUTION: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

XREFS: BASE.dwg...1EXCN.dwg...1EXPN.dwg...11PRUT.dwg...11EXUT.dwg...11PRPN.dwg...11TB.dwg...11PRCN.dwg...

NOLTE
BEYOND ENGINEERING
7000 S. YOSEMITE ST., SUITE 200 ENGLEWOOD, CO. 80112
303.220.1001 TEL 303.220.9001 FAX WWW.NOLTE.COM

CASTLEWOOD RANCH
MIKELSON BOULEVARD
DRAINAGE EXHIBIT

PREPARED FOR: CASTLEWOOD RANCH LLC

HORIZONTAL SCALE	VERTICAL SCALE
1" = 200'	N.T.S

DESIGNER	DRAFTER	CHECKED
RBM	HQD	GVM

DRAWING NAME	PLOTTING DATE
11DR1.DWG	04/25/00

PATH: N:\Dv1600\CIVIL\Cadd\PH 11\

SHEET DR1 OF 1 SHEETS

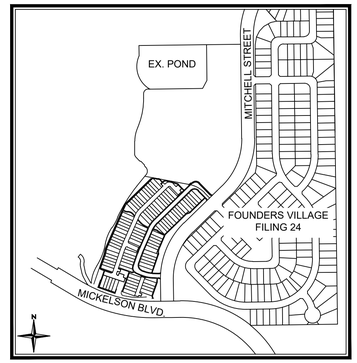
JOB NUMBER DV1611

Appendix E - Drainage Maps

SITE DEVELOPMENT PLAN

BELLA MESA SOUTH

LOCATED IN THE SOUTHEAST QUARTER SECTION 8,TOWNSHIP 8 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO.
TOWN OF CASTLE ROCK PROJECT NUMBER SDP25-0014



KEY MAP
N.T.S

DRAINAGE LEGEND

- EXISTING MINOR CONTOUR (5281)
- EXISTING MAJOR CONTOUR (5280)
- PROPOSED MINOR CONTOUR (5281)
- PROPOSED MAJOR CONTOUR (5280)
- PROPOSED STORM SEWER LINE
- PROPOSED OPEN CHANNEL
- FEMA 100-YEAR FLOOD PLAIN (FEMA)
- PROPOSED BASIN BOUNDARY
- EXISTING BASIN BOUNDARY
- CURB AND GUTTER
- A1 / 00.00 / 0.00 / 0.00 — BASIN ID; 5 YEAR RUNOFF; 100 YEAR RUNOFF; BASIN AREA (ACRES)
- 00 — PROPOSED DESIGN POINT
- E1 / 00.00 / 0.00 / 0.00 — EXISTING BASIN ID; 5 YEAR RUNOFF; 100 YEAR RUNOFF; BASIN AREA (ACRES)
- FLOW ARROW
- EMERGENCY OVERFLOW PATH ARROW

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
A1	0.38	0.50	0.72	57%	0.7	1.7
A2	0.74	0.45	0.69	51%	1.2	3.5
A3	0.33	0.66	0.80	76%	0.9	2.1
A4	0.35	0.67	0.80	78%	1.0	2.2
A5	0.35	0.61	0.77	70%	1.0	2.3
A6	0.75	0.67	0.80	78%	2.0	4.3
A7	0.10	0.71	0.82	83%	0.3	0.7
A8	2.05	0.64	0.79	74%	4.8	10.7

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
B1	0.37	0.54	0.74	61%	0.9	2.2
B2	0.80	0.63	0.78	72%	2.0	4.5
B3	0.97	0.62	0.78	72%	2.6	5.9

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
C1	1.14	0.42	0.67	46%	2.3	6.8
C2	0.49	0.31	0.62	34%	0.5	1.9
C3	0.13	0.08	0.50	5%	0.03	0.4

Basin Summary Table

Basin	Area (AC)	Runoff Coefficients C_5	Runoff Coefficients C_{100}	I (%)	Peak Flows (cfs) Q_5	Peak Flows (cfs) Q_{100}
OSA5	0.01	0.81	0.87	95%	0.0	0.1
OSA7	0.11	0.81	0.87	95%	0.4	0.8
OSB1	0.06	0.81	0.87	95%	0.2	0.5
OSB2	0.02	0.81	0.87	95%	0.1	0.1

N

0 25 50 100

SCALE: 1" = 50'

Redland
WHERE GREAT PLACES BEGIN
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▪ Land Planning ▪ Civil Engineering ▪ Landscape Architecture ▪ Construction Management

NOT FOR CONSTRUCTION

NO.	DATE	NOTES

PROJECT NO. 17026.007

NO.	DATE	NOTES
1	05/30/2025	FIRST SUBMITTAL
2	09/17/2025	SECOND SUBMITTAL
3	11/26/2025	THIRD SUBMITTAL
4	1/13/2026	FOURTH SUBMITTAL

BELLA MESA SOUTH
SITE DEVELOPMENT PLAN
DRAINAGE PLAN

SHEET
DRN

I:\2017\17026 – Bella Mesa\CADD\Sheet Sets\17026.007 – SDP\17026.007 – Drainage Map.dwg tdb: Layout1 jon 15, 2026 – 11:37am bsmetanka

Appendix F - MS4 Permit and Water Quality Determination Worksheet

Permanent Water Quality Determination Worksheet (Taken from 2019 SDDTCM Sections 13.1.4 and 13.1.5)

Project:	Bella Mesa South	**Project#**	SDP25-0014	**Applicant:** Cardel Homes
Section	**Questions**	**Response**	**Check those that apply**	**Instructions**
1	**Non-applicable Sites**			
1.1	Will the project result in a temporary disturbance of greater than one acre?	No	☐	Proceed to section 1.2.
		Yes	☒	Proceed to section 2.
1.2	Is the project part of a larger common plan of development or sale where multiple separate and distinct construction activities may be taking place at different times on different schedules, but remain related and are within 1/4 mile of each other? (A common plan of development will generally be documented on a site development plan, master plan, or equivalent, for the property/project)	No	☐	Proceed to section 1.3.
		Yes	☐	Proceed to section 2.
1.3	Is the project within the Cherry Creek Watershed?	Yes	☐	Permanent water quality control measures may be required. Refer to Water Qualtiy Control Regulation 72.7 for details and allowable exclusions.
		No	☐	Permanent water quality control measures are not required.
2	**Applicable Site Types and Exclusions by Variance**			
2.1	Does the project have more than 35% impervious area on the existing site?	No	☒	Project is an applicable Development Site. Proceed to section 3.
		Yes	☐	Proceed to 2.2.
2.2	Does the project have greater than 75% impervious area on the existing site?	No	☐	Project is an applicable Redevelopment Site. Proceed to section 3.
		Yes	☐	Project is an applicable Constrainted Redevelopment Site. Proceed to 2.3.
2.3	Will 100% of the runoff from the existing and proposed site be captured and treated using one or more of the allowable design standards for permanent water quality?	Yes	☐	No further action required.
		No	☐	Proceed to 2.4.
2.4	Do any other water quality exclusions apply to the site?	No	☐	Portions of the project are excluded. Proceed with design in accordance with Constrained Redevelopment standards and apply for **variance** for Constrained Redevelopment Sites.
		Yes	☐	Proceed to section 3. Following approval of other exclusions, design remaining site in accordance with Constrained Redevelopment standards and apply for **variance** for Constrained Redevelopment Sites.
3	**Applicable Sites with Other Exclusions by Variance**			
3.1	**Category 1: Roadways, bridges and trails only**			
3.1.1	Is the project a bike or pedestrian trail?	Yes	☐	Proceed to next line.
		No	☒	Proceed to 3.1.2.
	Is the trail for a roadway?	Yes	☐	Proceed to 3.1.2.
		No	☐	Project is excluded. Submit **variance** for Trails Excluded from Permanent Water Quality Requirements.
3.1.2	Is the project primarily used for parking or access to parking?	Yes	☐	This exclusion does not apply. Permanent water quality is required.
		No	☒	Proceed to 3.1.3.
3.1.3	Does the project add impervious area?	No	☐	Project is excluded. Submit **variance** for Pavement Management Sites Excluded from Permanent Water Quality Requirements.
		Yes	☒	Proceed to 3.1.4.

Section	Questions	Response	Check those that apply	Instructions
3.1.4	Does the project add more than 8.25 feet of paved width at any location to the existing roadway?	No	☒	Project is excluded. Submit **variance** for Roadway Redevelopment Sites Excluded from Permanent Water Quality Requirements.
		Yes	☐	Proceed to next line.
	Does the project add more than one acre of paved area per mile to an existing roadway?	No	☒	Project is excluded. Submit **variance** for Roadway Redevelopment Sites Excluded from Permanent Water Quality Requirements.
		Yes	☐	Proceed to next line.
	Does the project increase the width by two times or more, on average, of the original roadway area?	No	☒	Existing areas of site are excluded only. Submit **variance** for Existing Roadway Surfaces Only Excluded from Permanent Water Quality Requirements.
		Yes	☐	This exclusion does not apply. Permanent water quality is required.
3.2	**Category 2: Non-residential and non-commercial projects only**			
3.2.1	Is the project associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities, including activities necessary to prepare a site for drilling and the movement and placement of drilling equipment?	Yes	☐	Project is excluded. Submit **variance** for Oil and Gas Exploration Sites Excluded from Permanent Water Quality Requirements.
		No	☒	Proceed to 3.2.2.
3.2.2	Is the project for stream stabilization?	Yes	☐	Project is excluded. Submit **variance** for Stream Stabilization Sites Excluded from Permanent Water Quality Requirements.
		No	☒	Proceed to 3.2.3.
3.2.3	Is the project for installation or maintenance of aboveground or underground utilities or infrastructure that does not permanently alter the terrain, ground cover, or drainage patterns from those present prior to the construction activity including activities to install, replace or maintain utilities under roadways or other paved areas that return the surface to the same condition?	Yes	☐	Project is excluded. Submit **variance** for Aboveground and Underground Utilities Excluded from Permanent Water Quality Requirements.
		No	☒	Proceed to 3.2.4.
3.2.4	Is the project on undeveloped land (land with no human-made structures such as buildings or pavement) that will remain undeveloped after the project?	Yes	☐	Project is excluded. Submit **variance** for Sites with Land Disturbances to Undeveloped Land that will Remain Undeveloped Excluded from Permanent Water Quality Requirements.
		No	☒	Proceed to 3.2.5.
3.2.5	Will the post-project condition result in surface water discharge during the 80th percentile storm runoff event?	No	☐	Project is excluded. Submit **study** along with **variance** for Non-residential and Non-commercial Infiltration Conditions Excluded from Permanent Water Quality Requirements.
		Yes	☒	This exclusion does not apply. Permanent water quality is required.
3.3	**Category 3: Residential, Agricultural and Commercial projects**			
3.3.1	Is the project a single-family residential lot, or agricultural zoned lands, greater than or equal to 2.5 acres in size per dwelling unit?	Yes	☐	Proceed to next line.
		No	☒	Proceed to 3.3.2.
	Is the project site greater than 10% impervious?	No	☐	Project is excluded. Submit **variance** for Large Lot Single Family Sites Excluded from Permanent Water Quality Requirements.
		Yes	☐	Proceed to next line.
	Is the project site greater than 20% impervious?	Yes	☐	This exclusion does not apply. Permanent water quality is required.
		No	☐	Proceed to next line.
	Will the post-project condition result in surface water discharge during the 80th percentile storm runoff event?	No	☐	Project is excluded. Submit **study** along with **variance** for Large Lot Single Family Sites Excluded from Permanent Water Quality Requirements.
		Yes	☐	This exclusion does not apply. Permanent water quality is required.

Section	Questions	Response	Check those that apply	Instructions
3.3.2	Will 100% of the runoff from the residential or commercial site be captured?	Yes	☐	This exclusion does not apply. Permanent water quality is required.
		No	☒	Proceed to next line.
	Is all or a portion of the site undeveloped or will it remain undeveloped after construction?	Yes	☒	This portion of the project is excluded. Submit **variance** for Sites with Land Disturbance to Undeveloped Land that will Remain Undeveloped Excluded from Permanent Water Quality Requirements. Proceed to next line.
		No	☐	Proceed to next line.
	Is the remaining untreated impervious area greater than 20% of the site?	Yes	☐	This exclusion does not apply. Permanent water quality is required.
		No	☒	Proceed to next line.
	Is the remaining untreated impervious area greater than one acre?	Yes	☒	This exclusion does not apply. Permanent water quality is required.
		No	☐	Proceed to next line.
	Is it practicable to capture runoff from portions of the site that will not drain to a control measure?	No	☒	Document justification demonstrating that it is not practicable to capture runoff from this portion of the site in the **drainage report**. No further action is needed.
		Yes	☐	This exclusion does not apply. Permanent water quality is required.

Summary of Water Quality Conformance to MS4 Permit

The purpose of this worksheet is to document conformance with the Town of Castle Rock's MS4 permit with regard to permanent water quality on land disturbance projects.

Project Name Bella Mesa South

Project Owner Cardel Homes

Project Location Northwest corner of Mikelson Blvd. and Mitchell St

ToCR Project Number SDP25-0014

Total Site Area 8.941 **acres**

Total Size of Common Plan of Development _____ **acres**

Check all that apply:

- ☐ **Project within Plum Creek Basin**
- ☑ **Project within Cherry Creek Basin**

Estimated construction completion date _____

---

1. The water quality control measure(s) for applicable development sites shall meet one of the following base design standards as per the SDDTCM Section 14.4. Please select all design standards that were applied to meet conformance with the MS4 on this site.

   - ❒ WQCV standard
   - ❒ Pollutant removal standard
   - ☑ Runoff reduction standard
   - ☑ Applicable site draining to regional WQVC control measure (accepts drainage prior to discharging to WOTS)
   - ❒ Applicable site draining to regional WQVC control facility (with receiving pervious area control measure upstream of WOTS)
   - ❒ Constrained redevelopment sites standard
     - Imperviousness of existing site _____/_____(Imp. Ac/Site Ac) =____%
     - Variance required TCV No. _____
   - ❒ Existing control measure with WQCV per previous criteria standards
     - Reference Construction Permit No. _____
   - ❒ Cherry Creek Basin only, choose one: ☐ Tier 1 ☐ Tier 2 ☐ Tier 3
   - ❒ No control measures provided (See Permanent WQ Worksheet for applicability)

Summary of Water Quality Conformance to MS4 Permit

2. Was an exclusion to water quality applied as per SDDTCM Section 13.1.5? ☑ Yes ☐ No

   i. If yes, please select all that apply, provide total excluded impervious area(s) and submit variance, as applicable: TCV No. _____

   ☐ Pavement management site

   Excluded impervious area: _____ acres

   ☐ Excluded roadway redevelopment

   Excluded impervious area: _____ acres

   ☐ Excluded existing roadway areas

   Excluded impervious area: _____ acres

   ☐ Above ground and below ground utilities

   ☐ Large lot single family home

   ☐ Non-residential and non-commercial infiltration

   Excluded impervious area: _____ acres

   ☑ Land disturbance for land to remain undeveloped

   Excluded impervious area: 0.13 acres

   ☐ Stream Stabilization Sites

   Excluded impervious area: _____ acres

   ☐ Trails

   Excluded impervious area: _____ acres

   ☐ Oil and Gas Exploration

3. For Development and Redevelopment sites, following any exclusions claimed above, was any portion of the site excluded up to 20% of the site and not to exceed one acre? ☐ Yes ☑ No

   If yes, complete the following:

   Excluded area: _____ acres

   Total Site area: _____ acres, _____ % site excluded

4. For Constrained sites, was any portion of the site excluded up to 50% of the site and not to exceed 50% of the impervious area? ☐ Yes ☑ No

   If yes, complete the following:

   Excluded area: _____ acres

   Excluded impervious area: _____ acres

   Total Site area: _____ acres, _____ % site excluded

   Total Impervious area: _____ acres, _____ % impervious excluded