



Phase II Drainage Report
for
Whataburger
Lot 3A-1, Block 4, Promenade At Castle Rock Filing No. 1

January 2026

Prepared For:

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File No. 1-SDP25-0026



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Engineer's Statement

I affirm that this report and plan for the Phase II drainage design of **Lot 3A-1, Block 4, Promenade at Castle Rock Filing No. 1 (Whataburger)**, 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.

SIGNATURE: _____

Registered Professional Engineer

State Of Colorado No. _____

Owner's Statement

Burgerworks, LLC hereby certifies that the drainage facilities for **Lot 3A-1, Block 4, Promenade at Castle Rock Filing No. 1 (Whataburger)** 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 **Lot 3A-1, Block 4, Promenade at Castle Rock Filing No. 1 (Whataburger)**, guarantee that final drainage design review will absolve **Burgerworks, LLC** and/or their successors and/or assigns of future liability for improper design.

NAME OF DEVELOPER: _____

AUTHORIZED SIGNATURE: _____

I. General Location and Description

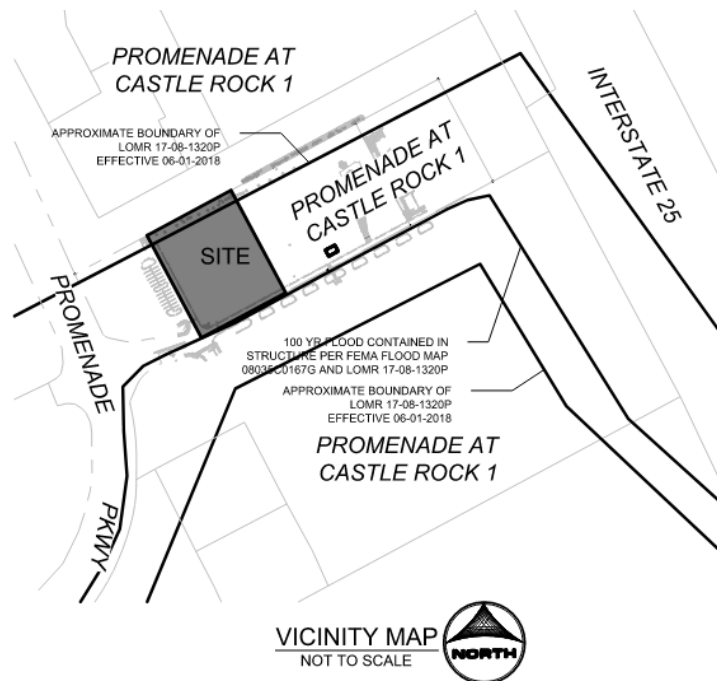
a. Introduction

The purpose of this Phase II Drainage Report is to identify specific solutions to drainage concerns for onsite and offsite tributary areas resulting from the development of a portion of Lot 3A-1, Block 4 of the Promenade at Castle Rock Filing No. 1 (Whataburger). This FDR will describe the onsite and offsite drainage patterns, existing and proposed storm infrastructure as it relates to water quality and stormwater detention for any proposed or existing facilities, and planned storm water management for the Whataburger development.

The items discussed in this drainage report include improvements, land uses, and drainage patterns for the Lot 3A-1, Block 4 of the Promenade at Castle Rock (Whataburger) development, herein referred to as the 'Site'. Included in this report are final hydrologic and hydraulic drainage calculations and design as required for the final design of the development. This report references the aforementioned reports to compare and contrast findings in the final design to ensure that existing infrastructure and facilities are not negatively impacted by this development.

b. Location and Property Description

The Lot 3A-1, Block 4, Promenade at Castle Rock Filing No. 1 Whataburger development is located in the Douglas County jurisdiction within a portion of the platted subdivision, The Promenade at Castle Rock Filing No. 1. The site is bordered by a Chipotle restaurant to the west, vacant commercial property to the east, paved private access to the south, and vacant tract to the north. The project contains approximately 1.529 acres within the northeast quarter of the northwest quarter, and northwest quarter of the northeast quarter of Section 27, Township 7 South, Range 67 West of the Sixth Principal Meridian. The Vicinity Map below provides a visual reference of the site location.



The existing site conditions exhibit 80% vegetative cover as evidenced by a field survey and aerial imagery. The existing vegetation includes native grasses weeds and shrubs. A portion of the shared drive aisle to the west encroaches into the subject site's boundary.

Drainage patterns of the site generally slope from northeast to southwest at approximately 3-9% slopes. Existing slopes near the norther perimeter reach up to 3:1 slopes. There is an existing private 18" RCP storm sewer stub located near the southwest corner of the site. This system conveys flows south then west in 24" then 60", respectively, private to public RCP storm sewer. Flows ultimately culminate in the existing detention and water quality facility as outlined in the *Phase III Drainage Report for Promenade at Castle Rock Filing No. 1*, herein referred to as the 'Master Drainage Report'.

c. Data Sources

Listed Below are the technical resources reviewed in the preparation of this FDR:

Storm Drainage and Technical Criteria Manual (SDTCM)

Mile High Flood District

NOAA Atlas 14

NRCS Soil Survey for Douglas County Area, Colorado

Douglas County Assessor Property Records

Per FEMA FIRM 08041C0315G (eff. 12/7/2018), there are no FEMA Floodplains within this Filing
Phase III Drainage Report for Promenade at Castle Filing No. 1, prepared by Bowman
Consulting, approved July 22, 2015

Drainage Conformance Letter for Woodspring Suites – Castle Rock, prepared by K2 Civil
Consultants

Phase III Drainage Report for Chipotle Promenade at Castle Rock – Castle Rock, prepared by
Elevation Consulting Group, LTD.

Listed below are the jurisdictions that this project will conform to:

Town of Castle Rock

Federal Emergency Management Agency

II. Project Characteristics

a. Site Characteristics

The proposed Whataburger site is located within a 1.53-acre parcel of commercially zoned vacant parcel. Proposed conditions for the site include a paved parking lot, 3,454 square foot single-story restaurant building, landscaped medians, and utility service extensions, as typical for a commercial development. The project site lies within Basin 53 of the Master Drainage Report. Per the Master Drainage Report the existing pond and surrounding storm infrastructure has been designed based on the below commercial values which results in an allowed imperviousness for the development of 80% for Basin 53. Cumulative imperviousness of the analyzed drainage areas including the proposed development that are within Basin 53 are 36.2%. Runoff from the site is expected to be collected onsite

with proposed storm infrastructure and conveyed via storm sewer to existing 18" storm sewer stub located on the southern side of the site.

Detention and water quality for this proposed development is provided in the existing Regional Pond as outlined in the Master Drainage Report. The site is located within the East Plum Creek Tributary B watershed, which includes a reach through the Promenade project that is contained within an underground conduit. The conduits outfalls to an open channel on the east side of State Highway 85 just north of Promenade Parkway. The open channel outfalls to the existing online Regional Pond before crossing State Highway 85 near the Castle Rock Parkway and State Highway 85 interchange before outfalling to East Plum Creek.

b. Soil Characteristics

Per the NRCS Soil Survey, the subsurface characteristics consist of primarily of Kutch sandy loam and a small portion of Stony rough land. The soils onsite have a very slow infiltration rate when thoroughly wet and are defined as hydrological soil group D. These soils 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. Refer to the Appendix for the NRCS Soil Survey Map.

Current ground cover is predominantly covered by pavement while the remaining portions of the site exhibit sparse pine trees among native weeds and grasses. This portion of the site has very few, if any, trees and a minimal number of shrubs are found on the site.

c. Floodplain and Major Drainageways

No major drainage ways exist within the development. The site is located within Zone "X", areas determined to be outside 0.2% annual chance floodplain, as designated on the Flood Insurance Rate Map (FIRM) 08035C0167G, map effective date 03/16/2016. Refer to the Appendix for the FIRMette. LOMR 17-08-1320 describes the 1 (one) percent annual chance flood discharge as being contained in the storm sewer system to the south of the site.

III. Hydrologic Analysis

a. Major Drainage Basins

The site is located within the East Plum Creek Tributary B watershed, which includes a reach through the Promenade project that is contained within an underground conduit. The conduits outfalls to an open channel on the east side of State Highway 85 just north of Promenade Parkway. The open channel outfalls to the existing online Regional Pond before crossing State Highway 85 near the Castle Rock Parkway and State Highway 85 interchange before outfalling to East Plum Creek.

b. Existing Minor Drainage Basin Descriptions

Design Point 0 (Q5=0.5 cfs, Q100=7.2 cfs)

Basin OS1 is comprised of 2.49 undeveloped acres of Tract A – Promenade at Castle Rock filing No. 1 to the north of the site. Runoff sheet flows at 3:1 slopes into an existing swale at the south end of the basin that continues per the Chipotle Report and Woodspring Suites Drainage Conformance Letter. Culminated flows are directed west and ultimately outfall to an existing private inlet on the Chipotle site.

Design Point 1 (Q5=0.8 cfs, Q100=6.8 cfs)

Basin OS2 is comprised of 2.09 undeveloped acres of the central area of the site, and a portion of the roadway to the west and south. Runoff sheet flows in a southwesterly direction to the curb and gutter at the roadway intersection. Flows are ultimately conveyed west across a concrete cross pan into Design Point 3.

Design Point 2 (Q5=1.3 cfs, Q100=3.5 cfs)

Basin C2 is comprised of 0.46 undeveloped acres of the northern area of the site, and a portion of the Chipotle parking lot to the west. Runoff sheet flows in a southwesterly direction into Basin C4.

Basin C4 is comprised of 0.39 acres of the Chipotle parking lot west of the site. Flows combine with Basin C2 and are conveyed south to an existing private at-grade Double Type 16 Inlet. This inlet intercepts all minor event flows, while 0.8 cfs in the major event is bypassed and conveyed south around the curb return to Design Point 3.

Design Point 3 (Q5=1.7 cfs, Q100=10.7 cfs)

Basin OS3 is comprised of 0.26 acres of the roadway area to the south of the site. Flows are conveyed west via curb and gutter to the design point, culminating with runoff from Design Point 1 and bypass flows from Design Point 2. An existing public 5' CDOT Type R sump inlet is located in the roundabout west of the Chipotle site. In the existing condition, flows overtop the inlet in the major event and are ultimately conveyed south through the roundabout into Promenade Parkway.

c. Proposed Minor Drainage Basin Descriptions

Design Point 0 (Q5=0.5 cfs, Q100=7.2 cfs)

Basin OS1 is comprised of 2.49 undeveloped acres of Tract A – Promenade at Castle Rock filing No. 1 to the north of the site. Runoff sheet flows at 3:1 slopes into an existing swale at the south end of the basin that continues per the Chipotle Report and Woodspring Suites Drainage Conformance Letter. Culminated flows are directed west and ultimately outfall to an existing private inlet on the Chipotle site per the Chipotle Report. A berm has been graded in at the north end of the Whataburger site to delineate this swale.

Design Point 1 (Q5=0.9 cfs, Q100=2.1 cfs)

Basin A-6 is comprised of 0.38 acres that was not captured by infrastructure with the Woodspring Suites development to the east. Runoff sheet flows into the curb and gutter of the private access drive at the southwest corner of the basin, where culminated flows are directed west into Design Point 2.

Design Point 2 (Q5=0.4 cfs, Q100=0.8 cfs)

Basin OS3 is comprised of 0.12 acres at the southern end of the Whataburger site that is not captured by proposed drainage infrastructure. Runoff sheet flows into the curb and gutter of the private access drive, combining with flows from DP1, and are conveyed west to Design Point 5.

Design Point 3 (Q5=3.2 cfs, Q100=5.9 cfs)

Basin B1 is comprised of 0.80 acres of the proposed parking lot area. Runoff sheet flows to a proposed private 6' Type 16 sump inlet at the design point, where intercepted flows are directed west via private 18" RCP storm sewer.

Design Point 4 (Q5=1.9 cfs, Q100=3.9 cfs)

Basin C2 is comprised of 0.42 acres of the proposed rooftop and drive through north of the high point. Rooftop drains are conveyed into the drive through access. Runoff is then conveyed west via curb and gutter into Basin C4 on the Chipotle site. The Chipotle report assumed a portion of this site analyzed at 95% imperviousness would be captured by their storm system at 5 and 100 year rates of 1.0 and 2.0 cfs, respectively. A larger acreage is being released onto the Chipotle site per this report, however, lower runoff coefficients determined the actual flowrates are Q5=0.8 cfs, and Q100=1.8 cfs, which conform to the Chipotle Report assumptions.

Basin C4 is comprised of 0.39 acres of the existing shared drive access with the Chipotle site. Flows combine with runoff from Basin C2 and are conveyed south to the existing private Double Type 16 at-grade inlet. 0.3 cfs are bypassed in the minor event, while 1.3 cfs in the 100 year event is bypassed south to Design Point 5. Intercepted flows are conveyed east to a junction manhole via existing private 24" RCP storm sewer. Captured flow from Design Point 3 also joins here, and are directed south via existing 24" RCP storm sewer into the public system.

Design Point 5 (Q5=1.8 cfs, Q100=6.2 cfs)

Basin C3 is comprised of the western portion of the proposed parking lot and existing shared access drive. Flows are conveyed south via curb and gutter to the Design Point.

Basin C5 is an existing basin delineated in the Chipotle Phase 3 Final Drainage Report. This basin is comprised of the southern portion of the Chipotle Site that is conveyed to the existing public 5' Type R sump inlet located in the roundabout. Flows from the above tributary areas culminate at this low point at a depth of 4.8 inches. Flows have been reduced from the existing condition.

Rational Calc spreadsheets can be viewed in Appendix B, while hydraulic calculations for street and inlet capacity can be found in Appendix C.

d. Methodology

The 5 year recurrence interval storm was used for the minor event, while the 100 year recurrence interval storm was utilized for the major event to be consistent with the previous studies. The Rational Method was utilized to determine peak runoff discharges of the subbasins within the development. Runoff coefficients were determined for the minor basins using values from the MHFD Tables 6-3.

Rainfall intensities for each of the basins was determined from Figure 6-1 of the 2025 Storm Drainage and Technical Criteria Manual for the Town of Castle Rock. The initial overland flow time was calculated using MHFD's equation 6-3, and travel times were calculated using MHFD's Equation 6-4. Conveyance coefficients for these equations were selected upon the appropriate method of conveyance for each respective basin.

IV. Hydraulic Analysis

a. Major Drainageways

There are no major drainageways that exist within the development of the project.

b. Storm Sewer Infrastructure and Culvert Pipes

A storm system extension is proposed to capture and convey onsite flows to the offsite Regional Pond. Proposed onsite storm shall be privately maintained by the owner. This storm system has been approximately verified for capacity requirements based on existing Hydraulic Grade Lines per the Chipotle Phase 3 Drainage Report, and StormCAD modeling will be provided with the Phase 3 version of this report. Streets and inlets have been sized for capacity using MHFD UD-Inlet Software. The storm sewer system has been designed to not surcharge in the minor event, and in the 100 year event velocities shall remain below 18 feet per second with the HGL at least 1' below finished grade.

V. Detention and Water Quality Enhancement

a. Existing Regional Facility

The Master Drainage Report sized the Regional Detention Pond for two stage storage that includes the Excess Urban Runoff Volume (EURV) and 100-year detention plus Water Quality Capture Volume (WQCV). Per the Master Drainage Report, the pond for an allowed imperviousness for the development of 80% for Basin 53. In the developed condition, the proposed development improvements result is a composite impervious value of 47.8% within Basin 53, which is lower than the maximum allowed imperviousness. Therefore, the required water quality for this project has been accounted for in the existing Regional Pond.

b. Four Step Process

In accordance with the Town of Castle Rock's stormwater quality design procedure, this site has implemented the four-step process to minimize adverse impacts of urbanization.

Step 1 – Reducing Runoff Volume: Site imperviousness will not exceed previous approved study assumptions therefore anticipated runoff volume will not be exceeded. Landscaping areas have been incorporated into the development as well as the overall Promenade development to reduce imperviousness and runoff volumes.

Step 2 – Provide Water Quality Capture Volume and Flood Control Detention: The existing regional pond will provide Full Spectrum Detention for the site.

Step 3 – Utilize Stream Stabilization Techniques: There are no drainageways adjacent to or onsite.

Step 4 – Undertake Source Control: A site specific Grading & Erosion Control Plan and Stormwater Management Plan have been prepared in conjunction with this report. Site specific temporary source control BMPs are detailed in the GEC plan and narrative. Guidelines detailed in the UDFCD Volume 3 Manual pertaining to the covering and storage handling and spill containment and control shall be followed as necessary. The site use of the restaurant will minimize illicit discharges from material storage, vehicle maintenance and manufacturing as these activities are not generally associated with the proposed use. A waste receptacle will be provided onsite for trash disposal and good housekeeping practices will be implemented to control the potential for illicit discharges from the site. Good Housekeeping practices regarding proper storage and handling oils and grease from the restaurant as outlined in this manual include; regularly collecting and disposing of garbage/waste material, training employees on proper

cleanup and spill response procedures, promptly cleaning leaks, drips, and other spills, and keeping outdoor areas clean and free of oil/grease accumulation. Snow storage will occur in landscape areas.

VI. Drawings

Refer to the appendices for the Vicinity Map, FEMA Floodplain Map, NRCS Soils Map, hydrology and hydraulic calculations, and drainage basin maps. Reference materials from previously approved reports are also included in the appendix.

VII. Criteria Compliance

The proposed development conforms to the provisions of Town of Castle Rock Storm Drainage Design and Technical Criteria Manual (TOCR), Mile High Flood District (MHFD), and the *Phase III Drainage Report for Promenade at Castle Filing No. 1*, prepared by Bowman Consulting, approved July 22, 2015 (Master Drainage Report).

VIII. Variances

There are no variances from criteria associated with this project.

IX. Summary

The existing and proposed infrastructure has been evaluated with current Town of Castle Rock and MHFD drainage design standards; therefore, it is anticipated that there will be no negative impacts to downstream and surrounding developments and facilities due to the development of Lot 3A-1, Block 4, of the Promenade at Castle Rock Filing No. 1 (Whataburger).

X. References

Town of Castle Rock – Storm Drainage Design And Technical Criteria Manual, February 2025

Mile High Flood District Urban Storm Drainage Criteria Manual Volumes 1, 2, and 3; March 2024

Mile High Flood District Software Resources and Tools (UD-Inlet)

Phase III Drainage Report for Promenade at Castle Rock Filing No. 1 Castle Rock, CO; Bowman Consulting; June 5, 2015

Phase III Drainage Report for Chipotle Promenade at Castle Rock; Elevation Consulting Group, LTD.; October 19th, 2022

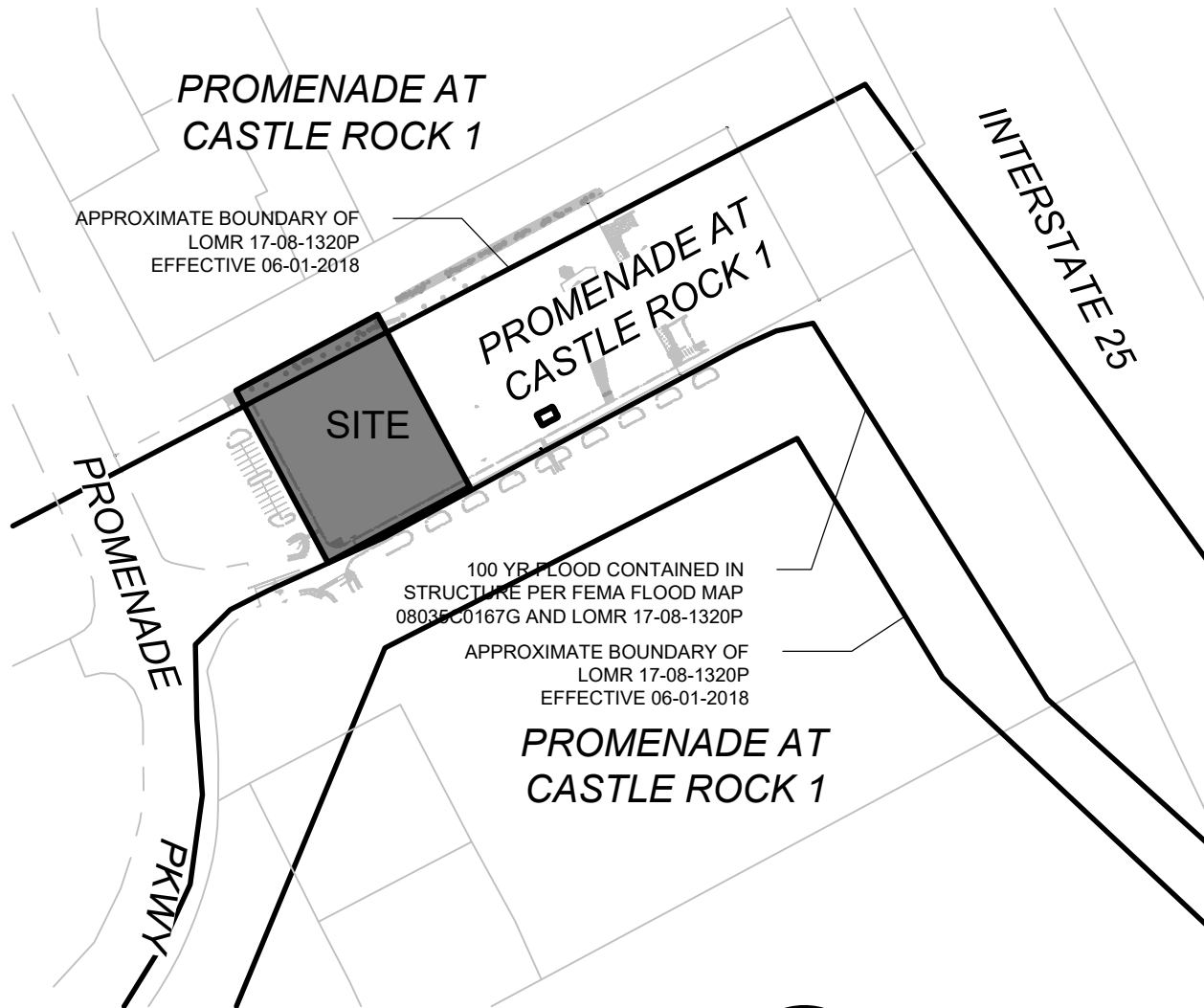
Final Drainage Conformance Letter for Woodspring Suites – Castle Rock; K2 Civil Consultants; September 27th, 2024

NRCS Web Soil Survey. Accessed January 2026.

FEMA Firm 08041C0545G. December 2018



Appendix A: Maps & Exhibits



VICINITY MAP
NOT TO SCALE



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **footprints** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables shown on this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **footprints** were computed at cross sections and interpolated between cross sections. The footprints were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Footprint widths and other pertinent floodway data are provided in the Floodway Data table shown on this FIRM.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight position differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations should be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNOS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided by the Douglas County GIS Department and the Town of Castle Rock GIS Department. Additional input was provided by the City of Lone Tree and Town of Parker. These data are current as of 2010.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for the jurisdiction.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

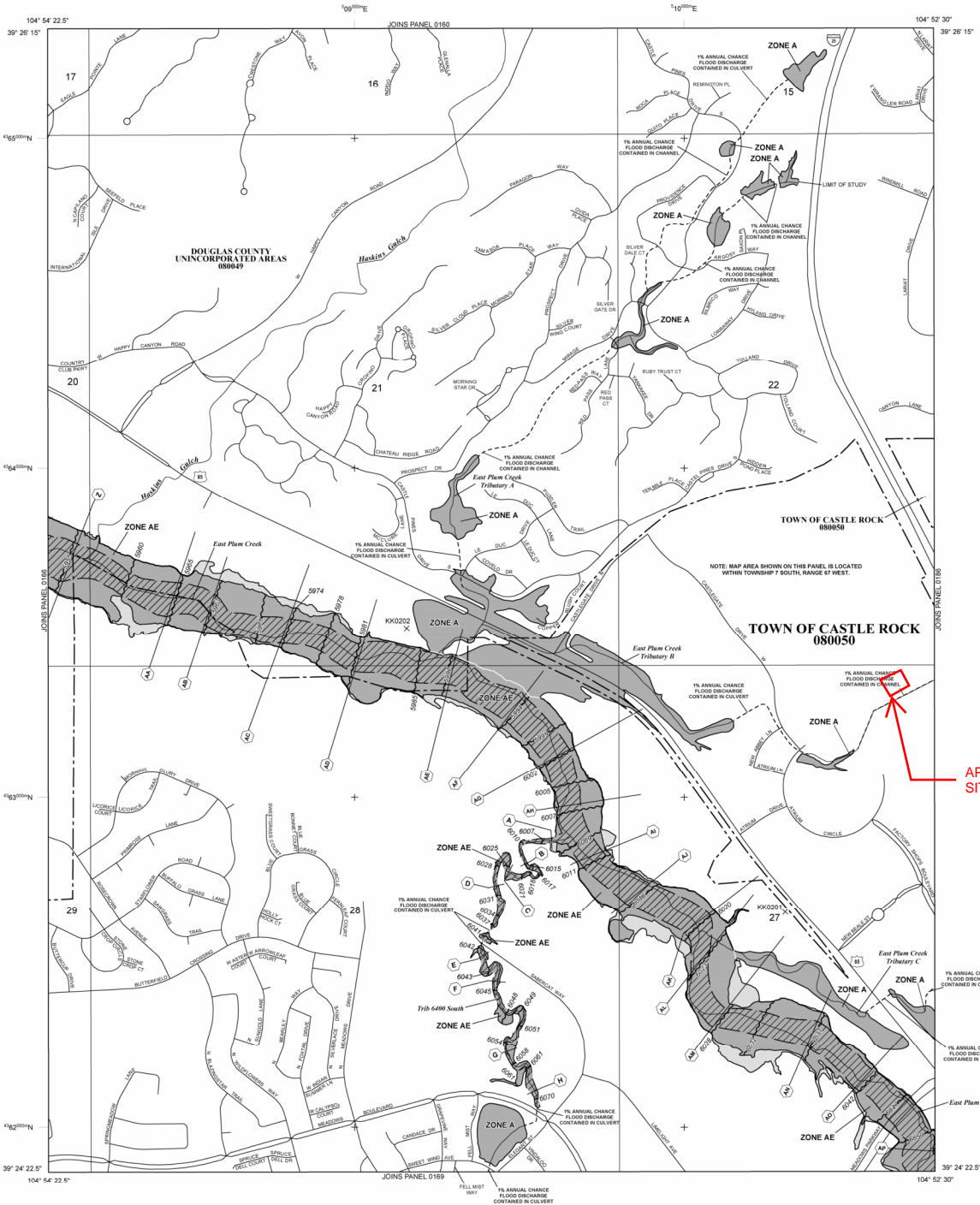
Based on updated topographic information this map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unretrofit streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have questions about this map, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/fip>.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

ZONE A
No Base Flood Elevations determined.
Base Flood Elevations determined.

ZONE AH
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO
Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined; for areas of sheet flow flooding, velocities also determined.

ZONE AR
Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decommissioned. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE ARS
Area to be protected from the 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE
Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X
Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood.

OTHER AREAS

ZONE X
Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

ZONE D
Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally hatched within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

Base Flood Elevation line and value: elevation in feet
Base Flood Elevation value which uniform within zone; elevation in feet
(EL 987)

*Referenced to the North American Vertical Datum of 1988

(A) (B) Cross section line
--- Transient line
45° 02' 00", 92° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Modern Hemisphere
1983m N 1000-meter Universal Transverse Mercator grid values, zone 13
DK5510 X Bench mark (see explanation in Notes to Users section of this FIRM map)
* M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repository List on Map Index

EFFECTIVE DATE OF COUNTY-WIDE FLOOD INSURANCE RATE MAP
SEPTEMBER 30, 2005

EFFECTIVE DATES OF REVISIONS TO THIS PANEL

MARCH 16, 2018: To update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to update map format, to add roads and road names, to reflect updated topographic information, to incorporate previously issued letters of map revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

200 0 500 1000
150 0 150 300
FEET
METERS

APPROXIMATE SITE LOCATION

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0167G

FIRM
FLOOD INSURANCE RATE MAP
DOUGLAS COUNTY,
COLORADO
AND INCORPORATED AREAS

PANEL 167 OF 495
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|----------------------|--------|-------|--------|
| CASTLE ROCK, TOWN OF | 88005 | 0167F | G |
| DOUGLAS COUNTY | 88049 | 0167F | G |

Notice to User: The **Map Number** shown below should be used when placing map orders, the **Community Number** shown above should be used on insurance applications for the subject community.

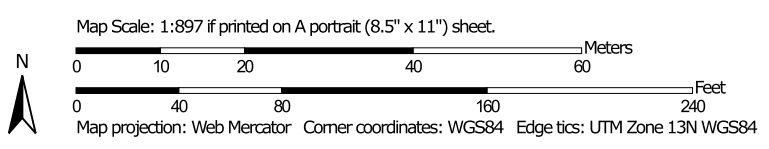
MAP NUMBER
0803C0167G
MAP REVISED
MARCH 16, 2016

Federal Emergency Management Agency

Hydrologic Soil Group—Castle Rock Area, Colorado




Soil Map may not be valid at this scale.



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 |
|------------------------------------|--|--------|--------------|----------------|
| KtE | Kutch sandy loam, 5 to 20 percent slopes | D | 1.8 | 97.7% |
| Su | Stony rough land | D | 0.0 | 2.3% |
| Totals for Area of Interest | | | 1.9 | 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



Appendix B: Hydrology Calculations



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1
EXISTING CONDITIONS
EL PASO COUNTY, COLORADO

| | |
|--------------------|------------------|
| Calc'd by: | CVW |
| Checked by: | KMH |
| Date: | 11/4/2025 |

| BASIN | AREA (ac) | % IMP. | C ₅ | C ₁₀₀ | Q ₅ (cfs) | Q ₁₀₀ (cfs) |
|--------------------|-------------|------------|----------------|------------------|----------------------|------------------------|
| OS1 | 2.49 | 2.8 | 0.06 | 0.49 | 0.5 | 7.2 |
| OS2 | 2.09 | 8.2 | 0.10 | 0.52 | 0.8 | 6.8 |
| OS3 | 0.26 | 100.0 | 0.85 | 0.89 | 1.1 | 2.0 |
| C2 | 0.46 | 7.7 | 0.10 | 0.51 | 0.2 | 1.3 |
| C4 | 0.39 | 89.9 | 0.77 | 0.85 | 1.5 | 2.8 |
| C5 | 0.35 | 44.0 | 0.39 | 0.66 | 0.7 | 2.0 |
| GRAND TOTAL | 6.04 | 0.2 | 0.17 | 0.55 | 4.8 | 22.1 |

| DESIGN POINT | CONTRIBUTING BASINS | ΣQ ₅ (cfs) | ΣQ ₁₀₀ (cfs) | Tributary Area (ac.) | Weighted % Impervious |
|--------------|---------------------|-----------------------|-------------------------|----------------------|-----------------------|
| 0 | OS1 | 0.5 | 7.2 | 2.49 | 2.8 |
| 1 | OS2 | 0.8 | 6.8 | 2.09 | 8.2 |
| 2 | C2, C4 | 1.3 | 3.5 | 0.85 | 45.3 |
| 3 | C5, DP1, OS3 | 1.7 | 10.7 | 2.70 | 21.6 |



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1

Calc'd by:

CVW

EXISTING CONDITIONS

Checked by:

KMH

EL PASO COUNTY, COLORADO

Date:

11/4/2025

COMPOSITE 'C' FACTORS

| BASIN | LANDSCAPING / UNDEVELOPED | ROADWAY/H ARDSCAPE | ROOFS | TOTAL | SOIL TYPE | LANDSCAPING / UNDEVELOPED | | | ROADWAY/H ARDSCAPE | | | ROOFS | | | COMPOSITE IMPERVIOUSNESS & C FACTOR | | |
|--------------------|---------------------------|--------------------|-------------|-------------|-----------|---------------------------|----------------|------------------|--------------------|----------------|------------------|-------|------------------|--------------------|-------------------------------------|----------------|------------------|
| | | | | | | %I | C ₅ | C ₁₀₀ | %I | C ₅ | C ₁₀₀ | %I | C ₅ * | C ₁₀₀ * | %I | C ₅ | C ₁₀₀ |
| | | | | | | | | | | | | | | | | | |
| OS1 | 2.47 | 0.02 | 0.00 | 2.49 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 2.8 | 0.06 | 0.49 |
| OS2 | 1.96 | 0.13 | 0.00 | 2.09 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 8.2 | 0.10 | 0.52 |
| OS3 | 0.00 | 0.26 | 0.00 | 0.26 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 100.0 | 0.85 | 0.89 |
| C2 | 0.44 | 0.03 | 0.00 | 0.46 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 7.7 | 0.10 | 0.51 |
| C4 | 0.04 | 0.35 | 0.00 | 0.39 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 89.9 | 0.77 | 0.85 |
| C5 | 0.20 | 0.15 | 0.00 | 0.35 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 44.0 | 0.39 | 0.66 |
| GRAND TOTAL | 5.11 | 1.37 | 0.00 | 6.04 | | | | | | | | | | | 17.18% | 0.17 | 0.55 |



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1
EXISTING CONDITIONS
EL PASO COUNTY, COLORADO

Calc'd by:

CVW

Checked by:

KMH

Date:

11/4/2025

TIME OF CONCENTRATION

| BASIN DATA | | | OVERLAND TIME (T _i) | | | TRAVEL TIME (T _t) | | | | | TOTAL | tc=(L/180)+10 | Design tc |
|-------------|----------------|-----------|---------------------------------|---------|----------------------|-------------------------------|-------------|---------|----------|----------------------|----------------------|---------------|-----------------|
| DESIGNATION | C _s | AREA (ac) | LENGTH (ft) | SLOPE % | t _i (min) | C _v | LENGTH (ft) | SLOPE % | V (ft/s) | t _t (min) | t _c (min) | tc max | tc design (min) |
| OS1 | 0.06 | 2.49 | 106 | 15.0 | 8.0 | 7 | 831 | 3.50 | 1.3 | 10.6 | 18.6 | 15.2 | 15.2 |
| OS2 | 0.10 | 2.09 | 100 | 2.5 | 13.5 | 15 | 441 | 2.50 | 2.4 | 3.1 | 16.6 | 13.0 | 13.0 |
| OS3 | 0.85 | 0.26 | 50 | 2.5 | 2.4 | 20 | 331 | 2.90 | 3.4 | 1.6 | 5.0 | 12.1 | 5.0 |
| C2 | 0.10 | 0.46 | 100 | 4.2 | 11.4 | 15 | 170 | 6.20 | 3.7 | 0.8 | 12.2 | 11.5 | 11.5 |
| C4 | 0.77 | 0.39 | 119 | 3.2 | 4.5 | 20 | 109 | 0.70 | 1.7 | 1.1 | 5.6 | 11.3 | 5.6 |
| C5 | 0.39 | 0.35 | 25 | 3.2 | 4.4 | 20 | 50 | 1.00 | 2.0 | 0.4 | 5.0 | 10.4 | 5.0 |

FORMULAS:

$$t_i = \frac{0.395(1.1 - C_s)\sqrt{L}}{S^{0.33}} \quad V = C_v S_w^{0.5}$$

Table 6-7. Conveyance Coefficient, C_v

| Type of Land Surface | C _v |
|--------------------------------------|----------------|
| Heavy meadow | 2.5 |
| Tillage/field | 5 |
| Riprap (not buried)* | 6.5 |
| Short pasture and lawns | 7 |
| Nearly bare ground | 10 |
| Grassed waterway | 15 |
| Paved areas and shallow paved swales | 20 |

*For buried riprap, select C_v value based on type of vegetative cover



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1

Calc'd by:

CVW

EXISTING CONDITIONS

Checked by:

KMH

DESIGN STORM: 5-YEAR

Date:

11/4/2025

| | | DIRECT RUNOFF | | | | | | TOTAL RUNOFF | | | | REMARKS |
|--------------|----------|---------------|----------------|----------------------|------------------------|-------------|---------|---------------------------------|------------------------|-------------|---------|---|
| DESIGN POINT | BASIN ID | AREA (ac) | C ₅ | t _c (min) | C ₅ *A (ac) | I (in./hr.) | Q (cfs) | t _c (min) | C ₅ *A (ac) | I (in./hr.) | Q (cfs) | |
| 0 | OS1 | 2.49 | 0.06 | 15.2 | 0.14 | 3.50 | 0.5 | | | | | UNMODIFIED CHIPOTLE SITE BASIN, OFFSITE FLOW CONVEYED WEST VIA DITCH TO EX. PRIVATE CHIPOTLE SITE INLET |
| 1 | OS2 | 2.09 | 0.10 | 13.0 | 0.21 | 3.73 | 0.8 | | | | | EXISTING UNDEVELOPED FLOW AT EX PRIVATE STORM STUB |
| | C2 | 0.46 | 0.10 | 11.5 | 0.04 | 3.92 | 0.2 | | | | | ONSITE FLOW ANTICIPATED AT EX. PRIVATE DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| | C4 | 0.39 | 0.77 | 5.6 | 0.30 | 5.00 | 1.5 | 11.5 | 0.34 | 3.92 | 1.3 | CHIPOTLE SITE BASIN CONVEYED TO EX. DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| 2 | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 1.3 | |
| | OS3 | 0.26 | 0.85 | 5.0 | 0.22 | 5.17 | 1.1 | | | | | PUBLIC ROADWAY FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |
| | DP1 | 2.49 | 0.06 | 15.2 | 0.14 | 3.50 | 0.5 | | | | | |
| | C5 | 0.35 | 0.39 | 5.0 | 0.14 | 5.17 | 0.7 | 15.2 | 0.50 | 3.50 | 1.7 | COMBINED FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |
| 3 | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 1.7 | |



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1

Calc'd by:

CVW

EXISTING CONDITIONS

Checked by:

KMH

DESIGN STORM: 100-YEAR

Date:

11/4/2025

| | | DIRECT RUNOFF | | | | | | TOTAL RUNOFF | | | | REMARKS |
|--------------|----------|---------------|------------------|----------------------|--------------------------|-------------|---------|---------------------------------|--------------------------|-------------|---------|---|
| DESIGN POINT | BASIN ID | AREA (ac) | C ₁₀₀ | t _c (min) | C ₁₀₀ *A (ac) | I (in./hr.) | Q (cfs) | t _c (min) | C ₁₀₀ *A (ac) | I (in./hr.) | Q (cfs) | |
| 0 | OS1 | 2.49 | 0.49 | 15.2 | 1.23 | 5.88 | 7.2 | | | | | UNMODIFIED CHIPOTLE SITE BASIN, OFFSITE FLOW CONVEYED WEST VIA DITCH TO EX. PRIVATE CHIPOTLE SITE INLET |
| 1 | OS2 | 2.09 | 0.52 | 13.0 | 1.08 | 6.27 | 6.8 | | | | | EXISTING UNDEVELOPED FLOW AT EX PRIVATE STORM STUB |
| | C2 | 0.39 | 0.51 | 11.5 | 0.20 | 6.58 | 1.3 | | | | | ONSITE FLOW ANTICIPATED AT EX. PRIVATE DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| | C4 | 0.39 | 0.85 | 5.6 | 0.33 | 8.40 | 2.8 | 11.5 | 0.53 | 6.58 | 3.5 | CHIPOTLE SITE BASIN CONVEYED TO EX. DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| 2 | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 2.7 | |
| | OS3 | 0.26 | 0.89 | 5.0 | 0.23 | 8.68 | 2.0 | | | | | PUBLIC ROADWAY FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |
| | OS1 | 2.49 | 0.49 | 15.2 | 1.23 | 5.88 | 7.2 | | | | | |
| | C5 | 0.35 | 0.66 | 5.0 | 0.23 | 8.68 | 2.0 | 15.2 | 1.69 | 5.88 | 9.9 | |
| | | | | | | | | BYPASS FLOW FROM DP2 | | | 0.8 | |
| 3 | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 10.7 | COMBINED FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1
PROPOSED CONDITIONS
 EL PASO COUNTY, COLORADO

| | |
|--------------------|------------------|
| Calc'd by: | CVW |
| Checked by: | KMH |
| Date: | 1/23/2026 |

| BASIN | AREA (ac) | % IMP. | C ₅ | C ₁₀₀ | Q ₅ (cfs) | Q ₁₀₀ (cfs) |
|--------------------|-------------|--------------|----------------|------------------|----------------------|------------------------|
| OS1 | 2.49 | 2.8 | 0.06 | 0.49 | 0.5 | 7.2 |
| A6 | 0.38 | 56.2 | 0.49 | 0.71 | 0.9 | 2.1 |
| OS3 | 0.12 | 77.2 | 0.66 | 0.80 | 0.4 | 0.8 |
| B1 | 0.80 | 91.4 | 0.78 | 0.85 | 3.2 | 5.9 |
| C2 | 0.42 | 52.5 | 0.46 | 0.70 | 0.8 | 1.8 |
| C3 | 0.05 | 100.0 | 0.85 | 0.89 | 0.2 | 0.4 |
| C4 | 0.39 | 89.9 | 0.77 | 0.85 | 1.5 | 2.8 |
| C5 | 0.35 | 44.0 | 0.34 | 0.64 | 0.7 | 2.0 |
| GRAND TOTAL | 4.63 | 36.2% | 0.33 | 0.63 | 7.3 | 20.9 |
| GRAND TOTAL | 5.01 | 37.7% | 0.34 | 0.64 | 8.2 | 23.0 |

| DESIGN POINT | CONTRIBUTING BASINS | ΣQ ₅ (cfs) | ΣQ ₁₀₀ (cfs) | Tributary Area (ac.) | Weighted % Impervious |
|--------------|-----------------------------|-----------------------|-------------------------|----------------------|-----------------------|
| 0 | OS1 | 0.5 | 7.2 | 2.49 | 2.8 |
| 1 | A6 | 0.9 | 2.1 | 0.38 | 56.2 |
| 2 | OS3 | 0.4 | 0.8 | 0.12 | 77.2 |
| 3 | B1 | 3.2 | 5.9 | 0.80 | 91.4 |
| 4 | C2, C4 | 1.9 | 3.9 | 0.81 | 70.4 |
| 5 | DP1, OS3, C3, C4 FLOWBY, C5 | 1.8 | 6.2 | 0.90 | 56.8 |



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1

Calc'd by:

CVW

PROPOSED CONDITIONS

Checked by:

KMH

EL PASO COUNTY, COLORADO

Date:

1/23/2026

COMPOSITE 'C' FACTORS

| BASIN | LANDSCAPING / UNDEVELOPED | ROADWAY/H ARDSCAPE | ROOFS | TOTAL | SOIL TYPE | LANDSCAPING / UNDEVELOPED | | | ROADWAY/H ARDSCAPE | | | ROOFS | | | COMPOSITE IMPERVIOUSNESS & C FACTOR | | | | | |
|---------------------|---------------------------|--------------------|-------------|-------------|-----------|---------------------------|------|------|--------------------|----------------|------------------|-------|----------------|------------------|-------------------------------------|------------------|--------------------|----|----------------|------------------|
| | | | | | | ACRES | | | %I | C ₅ | C ₁₀₀ | %I | C ₅ | C ₁₀₀ | %I | C ₅ * | C ₁₀₀ * | %I | C ₅ | C ₁₀₀ |
| | | | | | | | | | | | | | | | | | | | | |
| OS1 | 2.47 | 0.02 | 0.00 | 2.49 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 2.8 | 0.06 | 0.49 | | | |
| A6 | 0.17 | 0.21 | 0.00 | 0.38 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 56.2 | 0.49 | 0.71 | | | |
| OS3 | 0.03 | 0.10 | 0.00 | 0.12 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 77.2 | 0.66 | 0.80 | | | |
| B1 | 0.07 | 0.73 | 0.00 | 0.80 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 91.4 | 0.78 | 0.85 | | | |
| C2 | 0.20 | 0.15 | 0.08 | 0.42 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 52.5 | 0.46 | 0.70 | | | |
| C3 | 0.00 | 0.05 | 0.00 | 0.05 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 100.0 | 0.85 | 0.89 | | | |
| C4 | 0.04 | 0.35 | 0.00 | 0.39 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 89.9 | 0.77 | 0.85 | | | |
| C5 | 0.20 | 0.15 | 0.00 | 0.35 | D | 2 | 0.05 | 0.49 | 100 | 0.85 | 0.89 | 90 | 0.77 | 0.85 | 44.0 | 0.39 | 0.66 | | | |
| ONSITE TOTAL | 3.01 | 1.54 | 0.08 | 4.63 | | | | | | | | | | | 36.16% | 0.33 | 0.63 | | | |
| GRAND TOTAL | 3.18 | 1.75 | 0.08 | 5.01 | | | | | | | | | | | 37.67% | 0.34 | 0.64 | | | |



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1
PROPOSED CONDITIONS
EL PASO COUNTY, COLORADO

Calc'd by:

CVW

Checked by:

KMH

Date:

1/23/2026

TIME OF CONCENTRATION

| BASIN DATA | | | OVERLAND TIME (T _i) | | | TRAVEL TIME (T _t) | | | | | TOTAL | tc=(L/180)+10 | Design tc |
|-------------|----------------|-----------|---------------------------------|---------|----------------------|-------------------------------|-------------|---------|----------|----------------------|----------------------|---------------|-----------------|
| DESIGNATION | C _s | AREA (ac) | LENGTH (ft) | SLOPE % | t _i (min) | C _v | LENGTH (ft) | SLOPE % | V (ft/s) | t _t (min) | t _c (min) | tc max | tc design (min) |
| OS1 | 0.06 | 2.49 | 106 | 15.0 | 8.0 | 7 | 831 | 3.50 | 1.3 | 10.6 | 18.6 | 15.2 | 15.2 |
| A6 | 0.49 | 0.38 | 46 | 4.0 | 4.8 | 20 | 245 | 1.00 | 2.0 | 2.0 | 6.8 | 11.6 | 6.8 |
| OS3 | 0.66 | 0.12 | 107 | 2.5 | 6.1 | 20 | 196 | 2.90 | 3.4 | 1.0 | 7.1 | 11.7 | 7.1 |
| B1 | 0.78 | 0.80 | 50 | 1.2 | 3.9 | 20 | 209 | 3.00 | 3.5 | 1.0 | 5.0 | 11.4 | 5.0 |
| C2 | 0.46 | 0.42 | 82 | 0.5 | 13.3 | 20 | 240 | 0.50 | 1.4 | 2.8 | 16.1 | 11.8 | 11.8 |
| C3 | 0.85 | 0.05 | 50 | 2.9 | 2.3 | 20 | 155 | 2.90 | 3.4 | 0.8 | 5.0 | 11.1 | 5.0 |
| C4 | 0.77 | 0.39 | 119 | 3.2 | 4.5 | 20 | 109 | 0.70 | 1.7 | 1.1 | 5.6 | 11.3 | 5.6 |
| C5 | 0.39 | 0.35 | 25 | 3.2 | 4.4 | 20 | 50 | 1.00 | 2.0 | 0.4 | 5.0 | 10.4 | 5.0 |

FORMULAS:

$$t_i = \frac{0.395(1.1 - C_s)\sqrt{L}}{S^{0.33}} \quad V = C_v S_w^{0.5}$$

Table 6-7. Conveyance Coefficient, C_v

| Type of Land Surface | C _v |
|--------------------------------------|----------------|
| Heavy meadow | 2.5 |
| Tillage/field | 5 |
| Riprap (not buried)* | 6.5 |
| Short pasture and lawns | 7 |
| Nearly bare ground | 10 |
| Grassed waterway | 15 |
| Paved areas and shallow paved swales | 20 |

*For buried riprap, select C_v value based on type of vegetative cover



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1

Calc'd by:

CVW

PROPOSED CONDITIONS

Checked by:

KMH

DESIGN STORM: 5-YEAR

Date:

1/23/2026

| | | DIRECT RUNOFF | | | | | | TOTAL RUNOFF | | | | REMARKS |
|--------------|----------|---------------|----------------|----------------------|------------------------|-------------|---------|---------------------------------|------------------------|-------------|---------|--|
| DESIGN POINT | BASIN ID | AREA (ac) | C ₅ | t _c (min) | C ₅ *A (ac) | I (in./hr.) | Q (cfs) | t _c (min) | C ₅ *A (ac) | I (in./hr.) | Q (cfs) | |
| 0 | OS1 | 2.49 | 0.06 | 15.2 | 0.14 | 3.50 | 0.5 | | | | | OFFSITE FLOW CONVEYED WEST VIA DITCH AND PR. BERM TO EX. PRIVATE CHIPOTLE SITE INLET |
| 1 | A6 | 0.38 | 0.49 | 6.8 | 0.19 | 4.71 | 0.9 | | | | | OFFSITE FLOW NOT CAPTURED FROM WOODSPRING SUITES SITE |
| 2 | OS3 | 0.12 | 0.66 | 7.1 | 0.08 | 4.65 | 0.4 | | | | | ONSITE FLOW NOT CAPTURED ON WHATABURGER SITE |
| 3 | B1 | 0.80 | 0.78 | 5.0 | 0.62 | 5.17 | 3.2 | | | | | ONSITE FLOW CAPTURED AT PR. PRIVATE 6' TYPE 16 SUMP INLET |
| | C2 | 0.42 | 0.46 | 11.8 | 0.20 | 3.88 | 0.8 | | | | | ONSITE FLOW ANTICIPATED AT EX. PRIVATE DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| | C4 | 0.39 | 0.77 | 5.6 | 0.30 | 5.00 | 1.5 | 11.8 | 0.50 | 3.88 | 1.9 | CHIPOTLE SITE BASIN CONVEYED TO EX. DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| 4 | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 1.6 | |
| | C3 | 0.05 | 0.85 | 5.0 | 0.04 | 5.17 | 0.2 | | | | | ONSITE FLOW CONVEYED ULTIMATELY TO EX. PUBLIC 5' TYPE R INLET |
| | DP2 | 0.12 | 0.66 | 7.1 | 0.08 | | | | | | | PUBLIC ROADWAY FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |
| | DP1 | 0.38 | 0.05 | 6.8 | 0.02 | | | | | | | DP1 TREATED AS UNDEVELOPED FOR INTERIM CONDITION UNTIL FUTURE LOT DEVELOPMENT |
| | C5 | 0.35 | 0.39 | 5.0 | 0.14 | 5.17 | 0.7 | 5.0 | 0.28 | 5.17 | 1.5 | COMBINED FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |
| | | | | | | | | BYPASS FLOW FROM DP4 | | | 0.3 | |
| 5 | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 1.8 | |



LOT 3A-1 PROMENADE AT CASTLE ROCK FIL. 1

Calc'd by:

CVW

PROPOSED CONDITIONS

Checked by:

KMH

DESIGN STORM: 100-YEAR

Date:

1/23/2026

| | | DIRECT RUNOFF | | | | | | TOTAL RUNOFF | | | | REMARKS |
|--------------|----------|---------------|------------------|----------------------|--------------------------|-------------|---------|---------------------------------|--------------------------|-------------|---------|--|
| DESIGN POINT | BASIN ID | AREA (ac) | C ₁₀₀ | t _c (min) | C ₁₀₀ *A (ac) | I (in./hr.) | Q (cfs) | t _c (min) | C ₁₀₀ *A (ac) | I (in./hr.) | Q (cfs) | |
| 0 | OS1 | 2.49 | 0.49 | 15.2 | 1.23 | 5.88 | 7.2 | | | | | OFFSITE FLOW CONVEYED WEST VIA DITCH AND PR. BERM TO EX. PRIVATE CHIPOTLE SITE INLET |
| 1 | A6 | 0.38 | 0.71 | 6.8 | 0.27 | 7.90 | 2.1 | | | | | OFFSITE FLOW NOT CAPTURED FROM WOODSPRING SUITES SITE |
| 2 | OS3 | 0.12 | 0.80 | 7.1 | 0.10 | 7.81 | 0.8 | | | | | ONSITE FLOW NOT CAPTURED ON WHATABURGER SITE |
| 3 | B1 | 0.80 | 0.85 | 5.0 | 0.68 | 8.68 | 5.9 | | | | | ONSITE FLOW CAPTURED AT PR. PRIVATE 6' TYPE 16 SUMP INLET |
| | C2 | 0.39 | 0.70 | 11.8 | 0.27 | 6.52 | 1.8 | | | | | ONSITE FLOW ANTICIPATED AT EX. PRIVATE DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| | C4 | 0.39 | 0.85 | 5.6 | 0.33 | 8.40 | 2.8 | 11.8 | 0.60 | 6.52 | 3.9 | CHIPOTLE SITE BASIN CONVEYED TO EX. DOUBLE TYPE 16 SUMP INLET ON CHIPOTLE SITE |
| 4 | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 2.6 | |
| | C3 | 0.05 | 0.89 | 5.0 | 0.04 | 8.68 | 0.4 | | | | | ONSITE FLOW CONVEYED ULTIMATELY TO EX. PUBLIC 5' TYPE R INLET |
| | DP2 | 0.12 | 0.80 | 7.1 | 0.10 | | | | | | | PUBLIC ROADWAY FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |
| | DP1 | 0.38 | 0.49 | | 0.19 | | | | | | | DP1 TREATED AS UNDEVELOPED FOR INTERIM CONDITION UNTIL FUTURE LOT DEVELOPMENT |
| | C5 | 0.35 | 0.66 | 5.0 | 0.23 | 8.68 | 2.0 | 5.0 | 0.56 | 8.68 | 4.9 | COMBINED FLOW TO EX. PUBLIC 5' TYPE R SUMP INLET |
| 5 | | | | | | | | BYPASS FLOW FROM DP4 | | | 1.3 | |
| | | | | | | | | TOTAL FLOW INTERCEPTED AT INLET | | | 6.2 | |



Appendix C: Hydraulic Calculations

INLET MANAGEMENT

Project: LOT 3A-1 PROMENADE T CASTLE ROCK FIL. 1
Minor: 5-year
Major: 100-year

Worksheet Protected

| | | |
|------------------------------------|---------------------------|---------------------------|
| INLET NAME | DP_3 | DP_4 |
| Inlet Application (Street or Area) | STREET | STREET |
| Hydraulic Condition | In Sump | On Grade |
| Inlet Type | Denver No. 16 Combination | Denver No. 16 Combination |
| Number of Inlet Units | 2 | 2 |

USER-DEFINED INPUT

| | | |
|---|------|------|
| User-Defined Peak Flows | | |
| Minor Peak Flow, Q (cfs) | 3.20 | 1.90 |
| Major Peak Flow, Q (cfs) | 5.90 | 3.90 |
| Bypass (Carry-Over) Flow from Upstream Inlets must be organized from upstream (left) to downstream (right) in order for bypass | | |
| Receive Bypass Flow from: | | |
| Bypass Flow Description (Optional): | | |
| Minor Bypass Flow Received, Q _b (cfs) | | |
| Major Bypass Flow Received, Q _b (cfs) | | |

CALCULATED OUTPUT

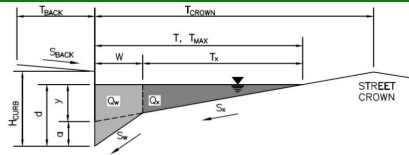
| | | |
|---|------|------|
| Minor Total Design Peak Flow, Q (cfs) | 3.20 | 1.90 |
| Major Total Design Peak Flow, Q (cfs) | 5.90 | 3.90 |
| Minor Inlet Interception Capacity, Q _a (cfs) | 7.68 | 1.60 |
| Major Inlet Interception Capacity, Q _a (cfs) | 7.68 | 2.62 |
| Minor Flow Bypassed Downstream, Q _b (cfs) | N/A | 0.30 |
| Major Flow Bypassed Downstream, Q _b (cfs) | N/A | 1.28 |
| Minor Flow Capture Percentage, C% | 100% | 84% |
| Major Flow Capture Percentage, C% | 100% | 67% |

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

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

Project: **LOT 3A-1 PROMENADE T CASTLE ROCK FIL. 1**

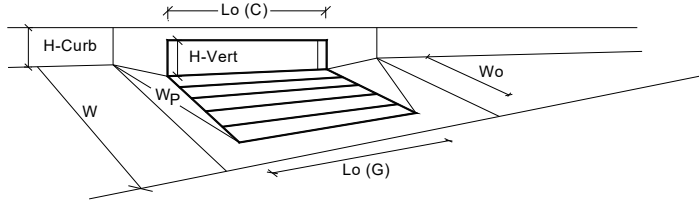
Inlet ID: **DP 3**



| | |
|--|--|
| Gutter Geometry: | |
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK} = 0.5$ ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK} = 0.020$ ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK} = 0.013$ |
| Height of Curb at Gutter Flow Line | $H_{CURB} = 6.00$ inches |
| Distance from Curb Face to Street Crown | $T_{CROWN} = 12.0$ ft |
| Gutter Width | $W = 2.00$ ft |
| Street Transverse Slope | $S_X = 0.040$ ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_W = 0.083$ ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_O = 0.000$ ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET} = 0.016$ |
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 12.0 & 12.0 \end{matrix}$ ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 6.0 & 6.0 \end{matrix}$ inches |
| Check boxes are not applicable in SUMP conditions | <input type="checkbox"/> <input type="checkbox"/> |
| MINOR STORM Allowable Capacity is not applicable to Sump Condition | |
| MAJOR STORM Allowable Capacity is not applicable to Sump Condition | |
| $Q_{allow} =$ | $\begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ \text{SUMP} & \text{SUMP} \end{matrix}$ cfs |

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)

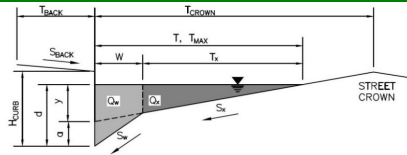


| Design Information (Input) | MINOR | MAJOR | |
|--|----------------------------------|-------|--|
| Type of Inlet Denver No. 16 Combination ▼ | Denver No. 16 Combination | | |
| Local Depression (additional to continuous gutter depression 'a' from above) | 2.00 | 2.00 | inches |
| Number of Unit Inlets (Grate or Curb Opening) | 2 | 2 | |
| Water Depth at Flowline (outside of local depression) | 6.0 | 6.0 | inches |
| Grate Information | MINOR | MAJOR | <input type="checkbox"/> Override Depths |
| Length of a Unit Grate | L _o (G) = 3.00 | 3.00 | feet |
| Width of a Unit Grate | W _o = 1.73 | 1.73 | feet |
| Open Area Ratio for a Grate (typical values 0.15-0.90) | A _{ratio} = 0.31 | 0.31 | |
| Clogging Factor for a Single Grate (typical value 0.50 - 0.70) | C _f (G) = 0.50 | 0.50 | |
| Grate Weir Coefficient (typical value 2.15 - 3.60) | C _w (G) = 3.60 | 3.60 | |
| Grate Orifice Coefficient (typical value 0.60 - 0.80) | C _o (G) = 0.60 | 0.60 | |
| Curb Opening Information | MINOR | MAJOR | |
| Length of a Unit Curb Opening | L _o (C) = 3.00 | 3.00 | feet |
| Height of Vertical Curb Opening in Inches | H _{vert} = 6.50 | 6.50 | inches |
| Height of Curb Orifice Throat in Inches | H _{throat} = 5.25 | 5.25 | inches |
| Angle of Throat | Theta = 0.00 | 0.00 | degrees |
| Side Width for Depression Pan (typically the gutter width of 2 feet) | W _p = 2.00 | 2.00 | feet |
| Clogging Factor for a Single Curb Opening (typical value 0.10) | C _f (C) = 0.10 | 0.10 | |
| Curb Opening Weir Coefficient (typical value 2.3-3.7) | C _w (C) = 3.70 | 3.70 | |
| Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) | C _o (C) = 0.66 | 0.66 | |
| Low Head Performance Reduction (Calculated) | MINOR | MAJOR | |
| Depth for Grate Midwidth | d _{Grate} = 0.52 | 0.52 | ft |
| Depth for Curb Opening Weir Equation | d _{Curb} = 0.33 | 0.33 | ft |
| Grated Inlet Performance Reduction Factor for Long Inlets | RF _{Grate} = 0.71 | 0.71 | |
| Curb Opening Performance Reduction Factor for Long Inlets | RF _{Curb} = N/A | N/A | |
| Combination Inlet Performance Reduction Factor for Long Inlets | RF _{Combination} = 0.71 | 0.71 | |
| Total Inlet Interception Capacity (assumes clogged condition) | Q _a = 7.7 | 7.7 | cfs |
| Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak) | Q _{PEAK REQUIRED} = 3.2 | 5.9 | cfs |

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

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

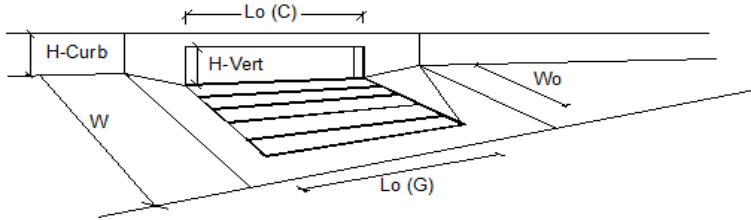
Project: **LOT 3A-1 PROMENADE T CASTLE ROCK FIL. 1**
 Inlet ID: **DP 4**



| | |
|---|--|
| Gutter Geometry: | |
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK} = 0.5$ ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK} = 0.020$ ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK} = 0.013$ |
| Height of Curb at Gutter Flow Line | $H_{CURB} = 6.00$ inches |
| Distance from Curb Face to Street Crown | $T_{CROWN} = 24.0$ ft |
| Gutter Width | $W = 2.00$ ft |
| Street Transverse Slope | $S_x = 0.028$ ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_w = 0.083$ ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_o = 0.026$ ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET} = 0.016$ |
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 12.0 & 24.0 \end{matrix}$ ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 6.0 & 6.0 \end{matrix}$ inches |
| Allow Flow Depth at Street Crown (check box for yes, leave blank for no) | <input type="checkbox"/> <input type="checkbox"/> |
| MINOR STORM Allowable Capacity is based on Spread Criterion | |
| MAJOR STORM Allowable Capacity is based on Depth Criterion | |
| | $Q_{allow} = \begin{matrix} \text{Minor Storm} & \text{Major Storm} \\ 12.4 & 14.9 \end{matrix}$ cfs |
| Minor storm max. allowable capacity GOOD - greater than the design peak flow of 1.90 cfs on sheet 'Inlet Management' | |
| Major storm max. allowable capacity GOOD - greater than the design peak flow of 3.90 cfs on sheet 'Inlet Management' | |

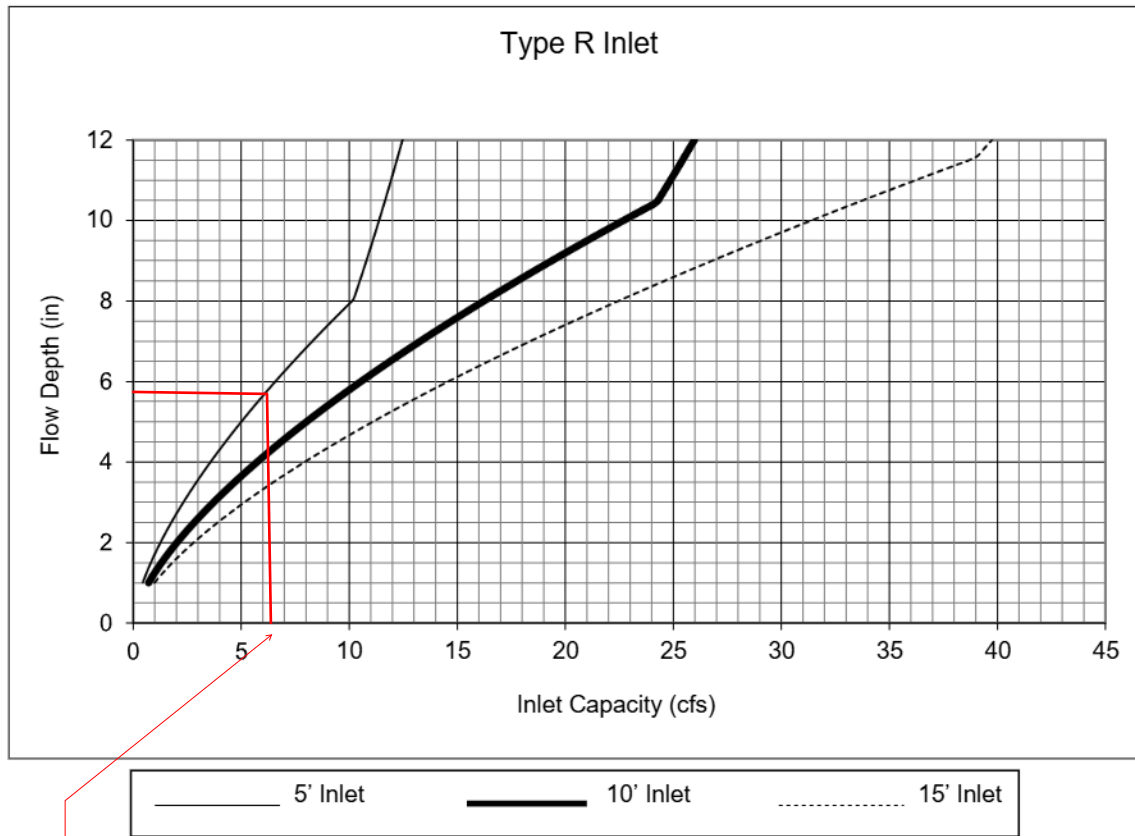
INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



| Design Information (input) | | MINOR | | MAJOR | |
|---|---------------------------|----------------------|---------------------------|-------|--------|
| Type of Inlet | Denver No. 16 Combination | Type = | Denver No. 16 Combination | | |
| Local Depression (additional to continuous gutter depression 'a') | | a _{LOCAL} = | 2.0 | 2.0 | inches |
| Total Number of Units in the Inlet (Grate or Curb Opening) | | No = | 2 | 2 | |
| Length of a Single Unit Inlet (Grate or Curb Opening) | | L _o = | 3.00 | 3.00 | ft |
| Width of a Unit Grate (cannot be greater than W, Gutter Width) | | W _o = | 1.73 | 1.73 | ft |
| Clogging Factor for a Single Unit Grate (typical min. value = 0.5) | | C _f (G) = | 0.50 | 0.50 | |
| Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1) | | C _f (C) = | 0.10 | 0.10 | |
| Street Hydraulics: OK - Q < Allowable Street Capacity | | | | | |
| Total Inlet Interception Capacity | | Q _s = | 1.6 | 2.6 | cfs |
| Total Inlet Carry-Over Flow (flow bypassing inlet) | | Q _b = | 0.3 | 1.3 | cfs |
| Capture Percentage = Q _s /Q _o | | C% = | 84 | 67 | % |

Figure 8-11. Inlet Capacity Chart Sump Conditions , Curb Opening (Type R) Inlet



DP 5 Q100=6.2 CFS,
DEPTH=4.8 INCHES

Notes:

1. The standard inlet parameters must apply to use this chart.



Appendix D: Referenced Report Excerpts

**PHASE III DRAINAGE REPORT
FOR CHIPOTLE
PROMENADE AT CASTLE ROCK**
(PROMENADE AT CASTLE ROCK, FILING NO. 1, AMENDMENT NO. 26
LOT 4A-1, BLOCK 4)

CASTLE ROCK, CO

Project Number: CD22-00 **33**

Prepared for:

Promenade Castle Rock, LLC
5750 DTC Parkway, Suite 210
Greenwood Village, CO 80111

Contact: Scott Hall
Phone: 303.771-4004

Prepared by:

ELEVATION CONSULTING GROUP, LTD.
P.O. Box 280869
Lakewood, CO 80226

Contact: Lincoln Thomas, P.E.
Phone: 303.204.5065

JN: 2022007
October 19, 2022

approved Phase III Drainage Report for Promenade at Castle Filing No. 1 Castle Rock, CO prepared by Bowman Consulting subbasin 53 commercial area. This drainage report assumes that the anticipated runoff for Lot 3A-1 after development will be piped to Design Point 4 and routed through the Site storm sewer system to the existing 24-inch storm sewer connection at the southeast corner of the Site. (Q5=7.3 cfs, Q100=14.3 cfs). Prior to development of Lot 3A-1, undeveloped flows will continue to follow existing drainage patterns and sheet flow to basin C5.

3 Drainage Design Criteria

3.1 Regulations

This drainage report was prepared in accordance with the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual (ToCR Drainage Manual) and the Mile High Flood District (MHFD), Drainage Criteria Manuals.

3.2 Drainage Studies, Master Plans, Site Constraints

One study has previously analyzed the Site.

- Phase III Drainage Report for Promenade at Castle Filing No. 1 Castle Rock, CO, July 22, 2015

The Phase III Drainage Report for Promenade at Castle Rock prepared by Bowman Consulting provided an analysis of the overall Promenade development. The Site is within Basin 53, as identified by the Phase III Drainage Report for Promenade at Castle Rock. This Basin had an existing composite imperviousness of 2%, an anticipated developed composite impervious of 80% and generally bounded by Promenade at Castle Rock Block 1 to the north, subbasin 52 to the east, Promenade Parkway to the west and the Castle Rock Outlet Mall to the south. Site is part of the anticipated 3.48 acres of commercial development (95% Impervious) for Basin 53. Hydrology analysis for this report had Basin 53 routed to Design Point J22, the 84-inch East Plum Creek Tributary B underground conduit within the basin. Water quality and detention for Basin 53 are provided within the Regional Detention Pond near the Castle Rock Pkwy and State Highway 85 interchange according to this report.

Additionally, the following previous studies were used to prepare this report.

- Phase III Drainage Report for Sam's Club of Promenade Store #4853, October 30, 2015

The Phase III Drainage Report for Sam's Club of Promenade Store #4853 prepared by Galloway & Company Inc. provided a final analysis for the Sam's Club development to the south of the Site.

Post-Development C Value Calculations
 Chipotle - Promenade at Castle Rock
 Castle Rock, Colorado

Global Parameters¹

| Land Use | % Imp. | C ₅ | C ₁₀₀ |
|------------------------|--------|----------------|------------------|
| Open Space/Landscaping | 2 | 0.05 | 0.49 |
| Hardscaping | 100 | 0.85 | 0.89 |
| Building Roofs | 90 | 0.77 | 0.85 |

| Subbasin | Total Area (acres) | Land Use Area per Sub-Basin | | | | | | Composite Imperviousness | C Coefficient ² | | |
|-----------------|--------------------|-----------------------------|--------------|------------------------|--------------|--------------|-------------|--------------------------|----------------------------|-------------|-------------|
| | | Hardscaping | | Open Space/Landscaping | | Roofs | | | % Check | 5-year | 100-year |
| | | Area (acres) | % | Area (acres) | % | Area (acres) | % | | | | |
| C1 | 0.06 | 0.00 | 0.0% | 0.00 | 0.0% | 0.06 | 100.0% | 100.00% | 90% | 0.77 | 0.85 |
| C2 | 0.30 | 0.18 | 60.0% | 0.12 | 40.0% | 0.00 | 0.0% | 100.00% | 61% | 0.53 | 0.73 |
| C3 | 0.05 | 0.05 | 100.0% | 0.00 | 0.0% | 0.00 | 0.0% | 100.00% | 100% | 0.86 | 0.89 |
| C4 | 0.39 | 0.35 | 89.7% | 0.04 | 10.3% | 0.00 | 0.0% | 100.00% | 90% | 0.77 | 0.85 |
| C5 | 0.35 | 0.15 | 42.9% | 0.20 | 57.1% | 0.00 | 0.0% | 100.00% | 44% | 0.40 | 0.66 |
| Subtotal | 1.15 | 0.73 | 63.5% | 0.36 | 31.3% | 0.06 | 5.2% | 100.00% | 69% | 0.60 | 0.77 |
| OS1 | 2.49 | 0.02 | 0.8% | 2.47 | 99.2% | 0.00 | 0.0% | 100.00% | 3% | 0.06 | 0.50 |
| OS2 | 0.26 | | | | | | | | 95% ³ | 0.81 | 0.87 |
| OS3 | 1.95 | | | | | | | | 95% ³ | 0.81 | 0.87 |
| Total | 5.85 | | | | | | | | | | |

1. From Table 6-5 in the UDFCD USDCM (Type D Soils)

2. From Table 6-4 in the UDFCD USDCM

3. From Phase III Drainage Report for Promenade at Castle Rock Filing No. 1 Subbasin 53 commercial area

STANDARD FORM SF-2
TIME OF CONCENTRATION

Development: Chipotle - Promenade at Castle Rock
Calculated By: LJT

Date: 6/9/2022

| Subbasin Data | | | Time of Concentration, T _c | | | | | | | | Final T _c | Remarks | | |
|---------------|-------|------|---|-------|----------------|-------------------------------|-------|----------|----------------|--|----------------------|---------------|--|--|
| Sub-Basin | Area | C5 | Initial/Overland Time (t _i) | | | Travel Time (t _t) | | | | | | | | |
| | | | Length (300' max) | Slope | t _i | Length | Slope | Velocity | t _t | t _c = t _i + t _t | min | | | |
| | acres | | ft | % | min. | ft | % | fps | min | min | min | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 15 | | | |
| C1 | 0.06 | 0.77 | | | | | | | | | 5.0 | 5 minute min. | | |
| C2 | 0.30 | 0.53 | 113 | 3.8% | 7.1 | 78 | 0.5% | 1.4 | 0.9 | 8.0 | 5.0 | 5 minute min. | | |
| C3 | 0.05 | 0.86 | | | | | | | | | 5.0 | 5 minute min. | | |
| C4 | 0.39 | 0.77 | 119 | 3.2% | 4.4 | 109 | 0.7% | 1.7 | 1.1 | 5.5 | 5.5 | | | |
| C5 | 0.35 | 0.40 | | | | | | | | | 5.0 | 5 minute min. | | |
| OS1 | 2.49 | 0.06 | 106 | 15.0% | 8.0 | 831 | 3.5% | 1.3 | 10.6 | 18.6 | 18.6 | | | |
| OS2 | 0.26 | 0.81 | | | | | | | | | 5.0 | 5 minute min. | | |
| OS3 | 1.95 | 0.81 | | | | | | | | | 6.0 | | | |

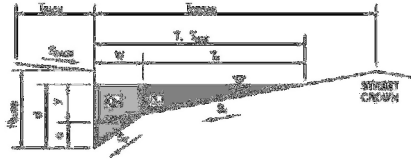
- Notes:
1. Flows calculated using the rational method, based on the methods provided in chapter 5 section 4 (rainfall), and Chapter 6 Section 2 (runoff) of the USDCM by UDFCD (2018).
 2. $T_i = 0.395(1.1 - C_5)(L)^{0.5} / S^{0.33}$
 3. $V = K * S^{0.5}$

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

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

Project: CHIPOTLE - PROMENADE AT CASTLE ROCK

Inlet ID: Storm Inlet 3



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

| | | |
|--------------|-------|-------|
| T_{BACK} = | 0.5 | ft |
| S_{BACK} = | 0.020 | ft/ft |
| n_{BACK} = | 0.013 | |

Height of Curb at Gutter Flow Line
 Distance from Curb Face to Street Crown
 Gutter Width
 Street Transverse Slope
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)
 Street Longitudinal Slope - Enter 0 for sump condition
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

| | | |
|----------------|-------|--------|
| H_{CURB} = | 6.00 | inches |
| T_{CROWN} = | 24.0 | ft |
| W = | 2.00 | ft |
| S_x = | 0.028 | ft/ft |
| S_w = | 0.083 | ft/ft |
| S_o = | 0.026 | ft/ft |
| n_{STREET} = | 0.016 | |

Max. Allowable Spread for Minor & Major Storm
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm
 Allow Flow Depth at Street Crown (check box for yes, leave blank for no)

| | | | |
|-------------|--------------------------|--------------------------|--------|
| | Minor Storm | Major Storm | |
| T_{MAX} = | 12.0 | 24.0 | ft |
| d_{MAX} = | 6.0 | 6.0 | inches |
| | <input type="checkbox"/> | <input type="checkbox"/> | |

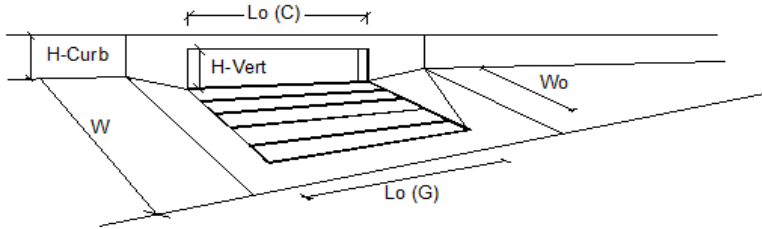
MINOR STORM Allowable Capacity is based on Spread Criterion
 MAJOR STORM Allowable Capacity is based on Depth Criterion

| | | | |
|---------------|-------------|-------------|-----|
| | Minor Storm | Major Storm | |
| Q_{allow} = | 12.4 | 14.9 | cfs |

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.01 (April 2021)



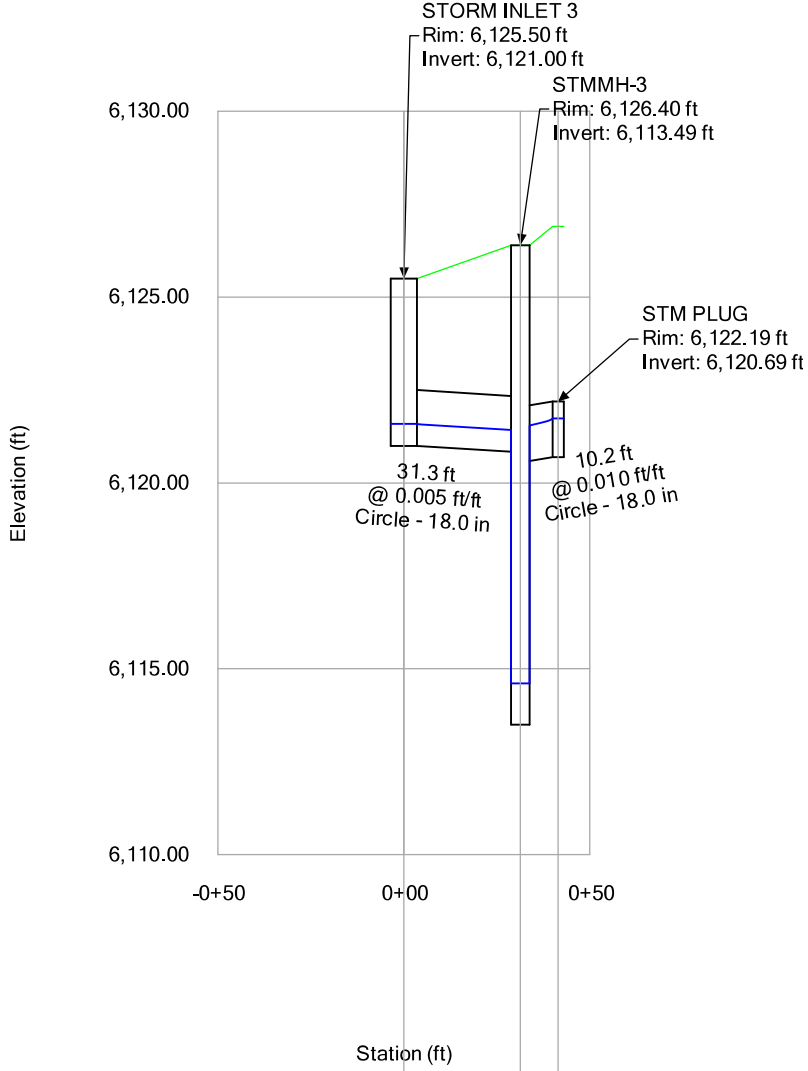
| Design Information (Input) | MINOR | MAJOR | |
|---|---------------------------|-------|--------|
| Type of Inlet | Denver No. 16 Combination | | |
| Local Depression (additional to continuous gutter depression 'a') | 2.0 | 2.0 | inches |
| Total Number of Units in the Inlet (Grate or Curb Opening) | 2 | 2 | |
| Length of a Single Unit Inlet (Grate or Curb Opening) | 3.00 | 3.00 | ft |
| Width of a Unit Grate (cannot be greater than W, Gutter Width) | 1.73 | 1.73 | ft |
| Clogging Factor for a Single Unit Grate (typical min. value = 0.5) | 0.50 | 0.50 | |
| Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1) | 0.10 | 0.10 | |
| Street Hydraulics: OK - Q < Allowable Street Capacity' | | | |
| Total Inlet Interception Capacity | 1.9 | 3.0 | cfs |
| Total Inlet Carry-Over Flow (flow bypassing inlet) | 0.5 | 1.8 | cfs |
| Capture Percentage = Q_i/Q_o = | 79 | 62 | % |

FlexTable: Conduit Table

| Start Node | Invert (Start) (ft) | Stop Node | Invert (Stop) (ft) | Length (Scaled) (ft) | Slope (Calculated) (ft/ft) | Hydraulic Grade Line (In) (ft) | Hydraulic Grade Line (Out) (ft) | Section Type | Diameter (in) | Manning's n | Velocity (ft/s) | Capacity (Full Flow) (cfs) | Flow (cfs) | Flow / Capacity (Design) (%) |
|---------------|------------------------|---------------|-----------------------|-------------------------|----------------------------------|--------------------------------------|---------------------------------------|--------------|------------------|-------------|--------------------|----------------------------------|---------------|------------------------------------|
| STORM INLET 1 | 6,122.78 | STMMH-1 | 6,122.47 | 52.3 | 0.006 | 6,123.16 | 6,122.83 | Circle | 18.0 | 0.013 | 3.13 | 8.09 | 1.02 | 12.7 |
| STMMH-1 | 6,122.22 | STORM INLET 2 | 6,121.98 | 39.5 | 0.006 | 6,122.60 | 6,122.34 | Circle | 18.0 | 0.013 | 3.15 | 8.19 | 1.01 | 12.3 |
| STORM INLET 2 | 6,121.73 | STMMH-2 | 6,121.62 | 17.6 | 0.006 | 6,122.12 | 6,121.99 | Circle | 18.0 | 0.013 | 3.27 | 8.30 | 1.11 | 13.4 |
| STORM INLET 3 | 6,121.00 | STMMH-3 | 6,120.84 | 31.3 | 0.005 | 6,121.59 | 6,121.43 | Circle | 18.0 | 0.013 | 3.78 | 7.51 | 2.42 | 32.2 |
| STMMH-3 | 6,113.49 | O-2 | 6,113.27 | 21.6 | 0.010 | 6,114.60 | 6,114.22 | Circle | 24.0 | 0.013 | 6.97 | 22.83 | 9.68 | 42.4 |
| STM PLUG | 6,120.69 | STMMH-3 | 6,120.59 | 10.2 | 0.010 | 6,121.74 | 6,121.55 | Circle | 18.0 | 0.013 | 6.38 | 10.41 | 7.33 | 70.4 |

Profile Report

Engineering Profile - Profile - 2 (SEWERGEMS-5yr.stsw)



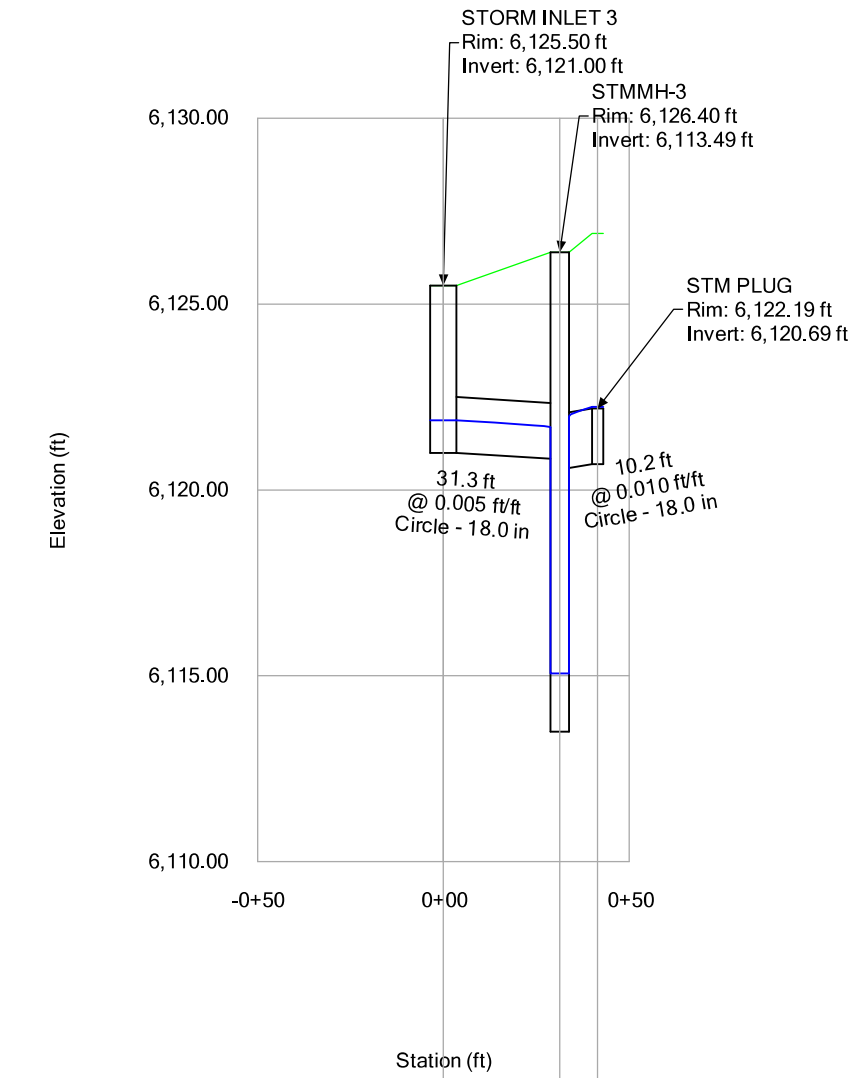
| | | |
|----------------------------|------------------|------------------|
| Length (Unified) (ft) | 31.3 | 10.2 |
| Conduit Description | Circle - 18.0 in | Circle - 18.0 in |
| Flow (cfs) | 2.42 | 7.33 |
| Slope (Calculated) (ft/ft) | 0.005 | 0.010 |

FlexTable: Conduit Table

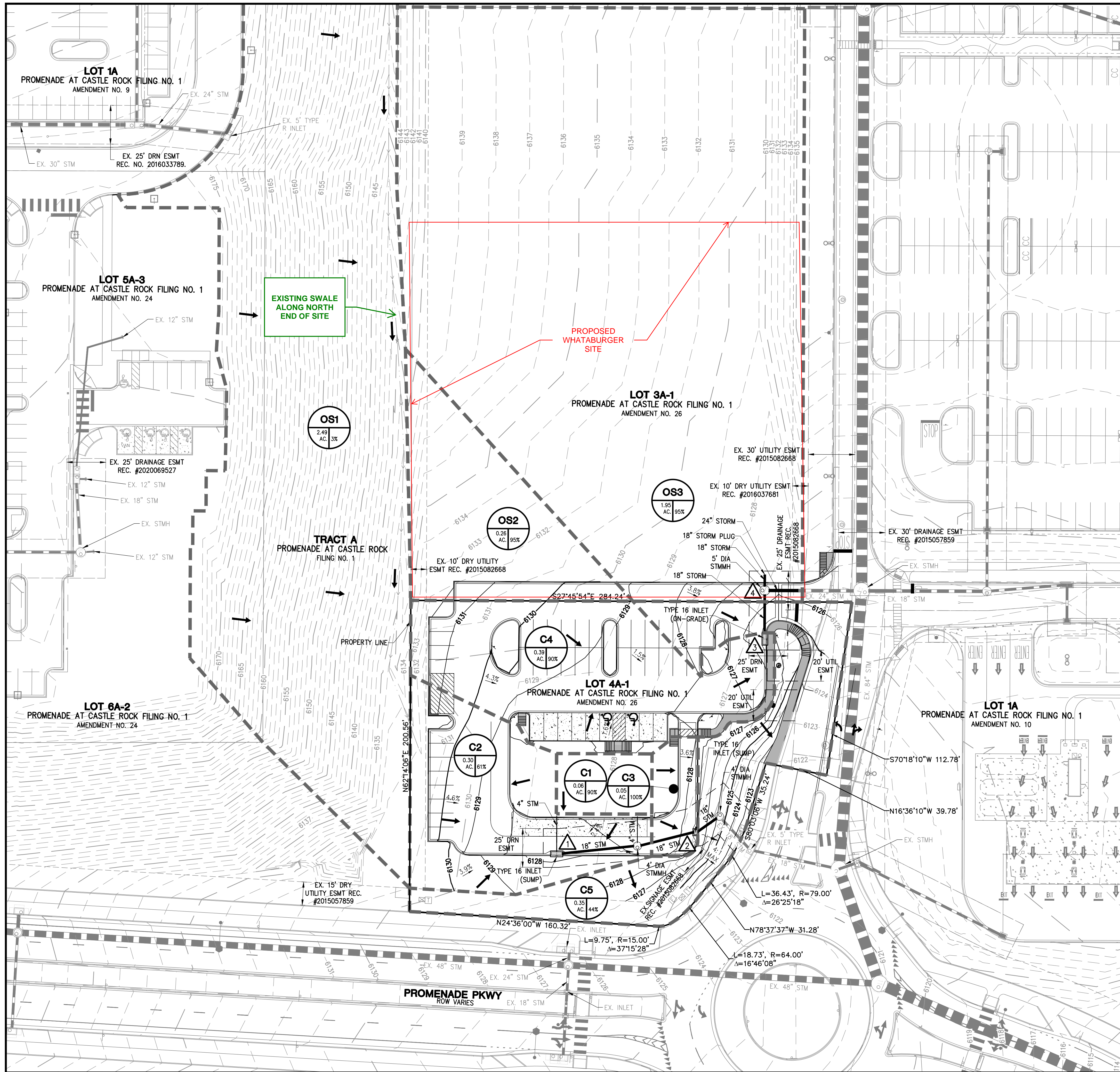
| Start Node | Invert (Start) (ft) | Stop Node | Invert (Stop) (ft) | Length (Scaled) (ft) | Slope (Calculated) (ft/ft) | Hydraulic Grade Line (In) (ft) | Hydraulic Grade Line (Out) (ft) | Section Type | Diameter (in) | Manning's n | Velocity (ft/s) | Capacity (Full Flow) (cfs) | Flow (cfs) | Flow / Capacity (Design) (%) |
|---------------|------------------------|---------------|-----------------------|-------------------------|----------------------------------|--------------------------------------|---------------------------------------|--------------|------------------|-------------|--------------------|----------------------------------|---------------|------------------------------------|
| STORM INLET 1 | 6,122.78 | STMMH-1 | 6,122.47 | 52.3 | 0.006 | 6,123.99 | 6,123.57 | Circle | 18.0 | 0.013 | 5.22 | 8.09 | 8.01 | 99.1 |
| STMMH-1 | 6,122.22 | STORM INLET 2 | 6,121.98 | 39.5 | 0.006 | 6,123.40 | 6,123.07 | Circle | 18.0 | 0.013 | 5.28 | 8.19 | 7.95 | 97.1 |
| STORM INLET 2 | 6,121.73 | STMMH-2 | 6,121.62 | 17.6 | 0.006 | 6,122.91 | 6,122.72 | Circle | 18.0 | 0.013 | 5.35 | 8.30 | 8.12 | 97.8 |
| STORM INLET 3 | 6,121.00 | STMMH-3 | 6,120.84 | 31.3 | 0.005 | 6,121.88 | 6,121.69 | Circle | 18.0 | 0.013 | 4.52 | 7.51 | 4.85 | 64.7 |
| STMMH-3 | 6,113.49 | O-2 | 6,113.27 | 21.6 | 0.010 | 6,115.06 | 6,114.71 | Circle | 24.0 | 0.013 | 8.14 | 22.83 | 19.12 | 83.8 |
| STM PLUG | 6,120.69 | STMMH-3 | 6,120.59 | 10.2 | 0.010 | 6,122.23 | 6,121.98 | Circle | 18.0 | 0.013 | 8.15 | 10.41 | 14.39 | 138.2 |

Profile Report

Engineering Profile - Profile - 2 (SEWERGEMS.stsw)



| | | |
|----------------------------|------------------|-------|
| Length (Unified) (ft) | 31.3 | 10.2 |
| Conduit Description | Circle - 18.0 in | |
| Flow (cfs) | 4.85 | 14.39 |
| Slope (Calculated) (ft/ft) | 0.005 | 0.010 |



LEGEND

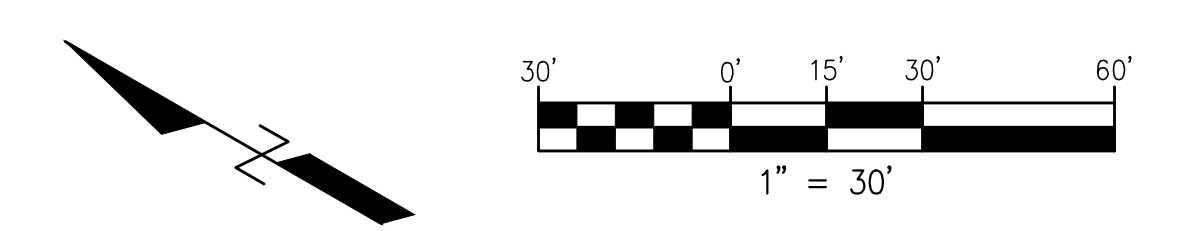
- BASIN DESIGNATION
- PERCENT IMPERVIOUSNESS
- DRAINAGE DESIGN POINT
- PROPOSED CONTOUR
- EXISTING CONTOUR
- UTILITY/DRAINAGE EASEMENT
- EXISTING DRAINAGE SWALE
- PROPOSED MINOR DRAINAGE BASIN
- PROPOSED DRAINAGE FLOW ARROW
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER STRUCTURE
- CLEAN OUT
- EMERGENCY OVERTFLOW

BASIN SUMMARY TABLE

| Basin | Area (acres) | 5-Year (cfs) | 100-Year (cfs) |
|-------|--------------|--------------|----------------|
| C1 | 0.06 | 0.2 | 0.5 |
| C2 | 0.30 | 0.8 | 1.9 |
| C3 | 0.05 | 0.2 | 0.4 |
| C4 | 0.39 | 1.4 | 2.9 |
| C5 | 0.35 | 0.7 | 2.0 |
| OS1 | 2.49 | 0.4 | 6.5 |
| OS2 | 0.26 | 1.0 | 2.0 |
| OS3 | 1.95 | 7.3 | 14.3 |

DESIGN POINT SUMMARY TABLE

| Design Point | Contributing Basins | Area (acres) | 5-Year (cfs) | 100-Year (cfs) |
|--------------|---------------------|--------------|--------------|----------------|
| 1 | C1, C2, OS1 | 2.85 | 1.0 | 8.0 |
| 2 | C1, C2, C3, OS1 | 2.90 | 1.1 | 8.2 |
| 3 | C4, OS2 | 0.65 | 2.4 | 4.8 |
| 4 | C4, OS2, OS3 | 2.60 | 9.6 | 18.9 |



BENCHMARK:
 (KK1334) BRASS DISK IN THE CENTER OF THE EAST END OF A 10' BY 15' EXPOSED AREA OF OUTCROPPING BEDROCK, 149.9' EAST OF THE NEAR RAIL, 50.9' WEST OF THE CENTERLINE OF COUNTY ROAD 25, 0.7' WEST OF THE EAST EDGE OF OUTCROP, AND EAST OF THE EXTENDED CENTER OF INTERSTATE 25 EXIT 182, 10' BELOW THE ROAD, AND 1 FT NORTH OF A FIBERGLASS WITNESS POST.
 DATUM=NAVD88
 ELEVATION=6222.12

CHIPOTLE - PROMENADE AT CASTLE ROCK
DRAINAGE MAP
 CASTLE ROCK, COLORADO

INFORMATION SHOWN IS SUBJECT TO CHANGE NOT FOR CONSTRUCTION

P.O. BOX 280869
 LAKEWOOD, CO 80226
 PHONE: (303) 204-5065

Elevation Consulting

REVISIONS: _____
 NO. _____
 DATE 8/29/22 JOB NO. 2022007 CHECKED BY LJT

SHEET **1**

**PHASE III DRAINAGE REPORT
FOR
PROMENADE AT CASTLE FILING NO. 1
CASTLE ROCK, CO**

Project Number: CD15-0005

Prepared for:

PROMENADE CASTLE ROCK, LLC
5750 DTC Parkway, Suite 210
Greenwood Village, Colorado 80111

Contact: Peter Cudlip
Phone: 303.771.4004

Prepared by:



603 Park Point Drive
Golden, Colorado 80401

Contact: Lincoln Thomas, PE
Phone: 303.674.7355

020029-01-002
January 31, 2015
Revised: March 16, 2015
Revised: June 5, 2015

the proposed roadways and will discharge to an existing open channel along the southern boundary of the Pines at Castle Rock Apartments then into the Regional Detention Pond (Q5=29.7 cfs, Q100=66.6 cfs).

Sub-basin 51, north of sub-basins 30 and 40, flows to the south and west and contains 5.77 acres at 75% imperviousness. The basin consists of commercial land use. The basin will be routed into the proposed storm sewer in Promenade Pkwy (Design Point 4) which ties into the 84" RCP storm sewer trunkline. The 84" RCP will convey the flows along the proposed roadways and will discharge to an existing open channel along the southern boundary of the Pines at Castle Rock Apartments then into the Regional Detention Pond (Q5=10.9 cfs, Q100=23.9 cfs).

Sub-basin 52, north of sub-basins 30 and 40, flows to the south and west and contains 14.24 acres at 63% imperviousness. The basin consists of commercial and open space land use. The basin will be routed into the 84" RCP storm sewer trunkline (Design Point J25). The 84" RCP will convey the flows along the proposed roadways and will discharge to an existing open channel along the southern boundary of the Pines at Castle Rock Apartments then into the Regional Detention Pond (Q5=19.8 cfs, Q100=47.6 cfs).

Sub-basin 53, north of sub-basins 30 and 40, flows to the south and west and contains 11.47 acres at 80% imperviousness. The basin consists of commercial and open space land use. The basin will be routed into the 84" RCP storm sewer trunkline (Design Point J23). The 84" RCP will convey the flows along the proposed roadways and will discharge to an existing open channel along the southern boundary of the Pines at Castle Rock Apartments then into the Regional Detention Pond (Q5=23.5 cfs, Q100=49.4 cfs).

Sub-basin 61, north of sub-basin 30, flows to the west and south and contains 9.61 acres at 85% imperviousness. The basin consists of commercial land use. The basin will be routed into an existing 48" RCP storm sewer (Design Point 1). The existing storm sewer is currently being constructed with the North Meadows Extension project and ultimately outfalls into the Regional Detention Pond (Q5=20.2 cfs, Q100=41.8 cfs).

Sub-basin 62, north of sub-basin 30 and east of sub-basin 61, flows to the west and south and contains 16.41 acres at 56% imperviousness. The basin consists of apartments and open space land use. The basin will be routed into 3 existing 48" RCP storm sewers (Design Point J50). The existing storm sewer is a part of the Castle Pines Commercial Filing 8 of the Pines at Castle Rock Apartments. The 3 culverts run beneath Castlegate Drive and discharge into an existing drainage swale. The drainage swale runs through 3 more 48" RCP downstream, discharging back into the drainage swale, and ultimately outfalls into the Regional Detention Pond (Q5=40 cfs, Q100=81 cfs).

Sub-basin 70, west of sub-basin 60, flows southwest and contains 3.00 acres at approximately 80% imperviousness. The basin consists of apartments land use. The basin will be routed into an existing 48" corrugated steel pipe storm sewer (Design Point 114d). The storm sewer is a part of the Castle Pines Commercial Filing 2 of the Pines at Castle Rock Apartments. The system consists of a 48" CSP and RCP storm network, along with

Post-Development C Value Calculations
 Promenade at Castle Rock
 Castle Rock, Colorado

| Global Parameters ¹ | |
|--------------------------------|--------|
| Land Use | % Imp. |
| Roads | 100 |
| Commercial | 95 |
| Neighborhood Areas | 85 |
| Apartments | 80 |
| Multifamily | 60 |
| Single Family Large Lot | 20 |
| Open Space | 2 |
| Lawns, Sandy Soil | 0 |

| Subbasin | Total Area (acres) | Land Use Area per Sub-Basin | | | | | | | | | | | | | | | | % Check | Composite Imperviousness | C Coefficient ² | |
|------------------------|--------------------|-----------------------------|--------|--------------|-------|--------------------|--------|--------------|--------|--------------|-------|-------------------------|-------|--------------|-------|-------------------|-------|---------|--------------------------|----------------------------|----------|
| | | Roads | | Commercial | | Neighborhood Areas | | Apartments | | Multifamily | | Single Family Large Lot | | Open Space | | Lawns, Sandy Soil | | | | 5-year | 100-year |
| | | Area (acres) | % | Area (acres) | % | Area (acres) | % | Area (acres) | % | Area (acres) | % | Area (acres) | % | Area (acres) | % | Area (acres) | % | | | | |
| 18A | 43.68 | | | | | | | | | | | | | | | | | | 30% | 0.25 | 0.47 |
| 18B | 9.24 | | | | | | | | | | | | | | | | | | 30% | 0.25 | 0.47 |
| 18C | 3.12 | | | | | | | | | | | | | | | | | | 6% | 0.11 | 0.38 |
| 18D | 3.79 | | | | | | | | | | | | | | | | | | 27% | 0.23 | 0.46 |
| NORTHEAST POND TOTAL | 59.83 | | | | | | | | | | | | | | | | | | 29% | | |
| 19A | 26.02 | 0.00 | 0.0% | 5.06 | 19.4% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 4.56 | 17.5% | 16.40 | 63.0% | 0.00 | 0.0% | 100.00% | 23% | 0.21 | 0.45 |
| 19B | 25.95 | 3.24 | 12.5% | 5.66 | 21.8% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 17.05 | 65.7% | 0.00 | 0.0% | 100.00% | 35% | 0.27 | 0.48 |
| 20A | 1.50 | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.60 | 40.0% | 0.90 | 60.0% | 0.00 | 0.0% | 100.00% | 9% | 0.13 | 0.40 |
| 20B | 3.35 | 0.42 | 12.5% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.47 | 14.0% | 2.46 | 73.4% | 0.00 | 0.0% | 100.00% | 17% | 0.18 | 0.43 |
| 21* | 122.37 | | | | | | | | | | | | | | | | | | 16% | 0.17 | 0.43 |
| 22* | 123.16 | | | | | | | | | | | | | | | | | | 5% | 0.10 | 0.38 |
| 23* | 54.99 | | | | | | | | | | | | | | | | | | 25% | 0.22 | 0.46 |
| CHAPEL POND TOTAL | 357.34 | | | | | | | | | | | | | | | | | | 15% | | |
| 3* | 10.75 | | | | | | | | | | | | | | | | | | 11% | 0.14 | 0.41 |
| 4* | 15.13 | | | | | | | | | | | | | | | | | | 70% | 0.49 | 0.62 |
| 7* | 11.13 | | | | | | | | | | | | | | | | | | 70% | 0.49 | 0.62 |
| 8* | 9.15 | | | | | | | | | | | | | | | | | | 70% | 0.49 | 0.62 |
| 10 | 13.00 | 0.00 | 0.0% | 0.00 | 0.0% | 2.01 | 15.5% | 0.00 | 0.0% | 9.64 | 74.2% | 0.00 | 0.0% | 0.00 | 0.0% | 1.35 | 10.4% | 100.00% | 58% | 0.40 | 0.55 |
| 11 | 16.05 | 0.00 | 0.0% | 14.79 | 92.1% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 1.26 | 7.9% | 0.00 | 0.0% | 100.00% | 88% | 0.69 | 0.78 |
| 30 | 15.61 | 0.00 | 0.0% | 14.18 | 90.8% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 1.43 | 9.2% | 100.00% | 86% | 0.67 | 0.77 |
| 40 | 3.58 | 0.00 | 0.0% | 3.38 | 94.4% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.20 | 5.6% | 100.00% | 90% | 0.72 | 0.81 |
| 41 | 2.20 | 0.00 | 0.0% | 2.08 | 94.5% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.12 | 5.5% | 100.00% | 90% | 0.72 | 0.81 |
| 50 | 18.37 | 0.00 | 0.0% | 14.50 | 78.9% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 3.87 | 21.1% | 100.00% | 75% | 0.54 | 0.66 |
| 51 | 5.77 | 0.00 | 0.0% | 4.56 | 79.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 1.21 | 21.0% | 100.00% | 75% | 0.54 | 0.66 |
| 52 | 14.24 | 0.00 | 0.0% | 9.45 | 66.4% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 4.79 | 33.6% | 100.00% | 63% | 0.43 | 0.58 |
| 53 | 11.47 | 0.00 | 0.0% | 3.48 | 30.3% | 6.95 | 60.6% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 1.04 | 9.1% | 100.00% | 80% | 0.60 | 0.70 |
| 61 | 9.61 | 0.00 | 0.0% | 0.00 | 0.0% | 9.61 | 100.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 100.00% | 85% | 0.66 | 0.75 |
| 62 | 16.41 | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 11.42 | 69.6% | 0.00 | 0.0% | 0.00 | 0.0% | 4.99 | 30.4% | 0.00 | 0.0% | 100.00% | 56% | 0.39 | 0.55 |
| 70 | 3.00 | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 3.00 | 100.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 100.00% | 80% | 0.59 | 0.70 |
| A1 | 2.25 | 1.61 | 71.6% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.64 | 28.4% | 100.00% | 72% | 0.51 | 0.63 |
| A3 | 1.94 | 1.57 | 80.9% | 0.25 | 12.9% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.12 | 6.2% | 100.00% | 93% | 0.78 | 0.85 |
| A4 | 1.95 | 1.23 | 63.1% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.53 | 27.2% | 0.19 | 9.7% | 100.00% | 64% | 0.44 | 0.58 |
| A5 | 1.63 | 0.91 | 55.8% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.59 | 36.2% | 0.13 | 8.0% | 100.00% | 57% | 0.39 | 0.55 |
| A6 | 2.68 | 1.57 | 58.6% | 0.91 | 34.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.20 | 7.5% | 100.00% | 91% | 0.74 | 0.82 |
| A7 | 1.41 | 1.06 | 75.2% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.35 | 24.8% | 100.00% | 75% | 0.54 | 0.66 |
| A8 | 3.92 | 2.40 | 61.2% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 1.52 | 38.8% | 100.00% | 61% | 0.42 | 0.57 |
| A10 | 2.14 | 2.04 | 95.3% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.10 | 4.7% | 100.00% | 95% | 0.81 | 0.88 |
| A11 | 1.62 | 1.33 | 82.1% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.29 | 17.9% | 100.00% | 82% | 0.62 | 0.72 |
| A12 | 3.19 | 1.31 | 41.1% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 1.55 | 48.6% | 0.33 | 10.3% | 100.00% | 42% | 0.31 | 0.50 |
| O1 | 8.52 | 3.31 | 38.8% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 5.21 | 61.2% | 0.00 | 0.0% | 100.00% | 40% | 0.30 | 0.50 |
| O2 | 8.34 | 0.00 | 0.0% | 5.36 | 64.3% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 2.98 | 35.7% | 0.00 | 0.0% | 100.00% | 62% | 0.42 | 0.57 |
| O3 | 1.65 | 0.00 | 0.0% | 0.99 | 60.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.66 | 40.0% | 0.00 | 0.0% | 100.00% | 58% | 0.40 | 0.55 |
| O4 | 5.06 | 0.82 | 16.2% | 2.65 | 52.4% | 1.15 | 22.7% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.44 | 8.7% | 0.00 | 0.0% | 100.00% | 85% | 0.66 | 0.76 |
| O5 | 0.60 | 0.60 | 100.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 100.00% | 100% | 0.90 | 0.96 |
| 6 | 13.85 | 1.38 | 10.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 1.65 | 11.9% | 10.82 | 78.1% | 0.00 | 0.0% | 100.00% | 14% | 0.16 | 0.42 |
| 80** | 19.57 | | | | | | | | | | | | | | | | | | 37% | 0.28 | 0.49 |
| 85 | 27.55 | | | | | | | | | | | | | | | | | | 16% | | |
| REGIONAL POND TOTAL | 283.34 | | | | | | | | | | | | | | | | | | 59% | | |
| B1*** | 14.20 | | | | | | | | | | | | | | | | | | 80% | 0.60 | 0.70 |
| 90 | 29.52 | 0.00 | 0.0% | 25.00 | 84.7% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 0.00 | 0.0% | 4.52 | 15.3% | 100.00% | 80% | 0.60 | 0.70 |
| LOWES NORTH POND TOTAL | 43.72 | | | | | | | | | | | | | | | | | | 80% | | |
| 17* | 54.14 | | | | | | | | | | | | | | | | | | 17% | 0.60 | 0.43 |
| OFFSITE FLOWS TOTAL | 54.14 | | | | | | | | | | | | | | | | | | | | |

¹Composite Imperviousness taken from East Plum Creek Tributary B Master Plan
^{**}Composite Imperviousness taken from North Meadows Final Drainage Report Package 2
^{***}Composite Imperviousness taken from Castle Pines Commercial Filing 10A Phase III Drainage Report
 1. From Table RO-3 and RO-5 in the UDFCD USDCM
 2. From Equations RO-6 and RO-7 and Table RO-4 in the UDFCD USDCM

Design Procedure Form: Extended Detention Basin (EDB)

Designer: _____
Company: Bowman Consulting
Date: March 15, 2015
Project: Promenade at Castle Rock
Location: Regional Pond

1. Basin Storage Volume
- A) Effective Imperviousness of Tributary Area, I_a
 - B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)
 - C) Contributing Watershed Area
 - D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm
 - E) Design Concept
(Select EURV when also designing for flood control)
 - F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time
($V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area * 1.2)$)
 - G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume
($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN} / 0.43))$)
 - H) User Input of Water Quality Capture Volume (WQCV) Design Volume
(Only if a different WQCV Design Volume is desired)
 - I) Predominant Watershed NRCS Soil Group
 - J) Excess Urban Runoff Volume (EURV) Design Volume
 For HSG A: $EURV_A = (0.1878i - 0.0104) * Area$
 For HSG B: $EURV_B = (0.1178i - 0.0042) * Area$
 For HSG C/D: $EURV_{C/D} = (0.1043i - 0.0031) * Area$

$I_a =$ 59.0 %
 $i =$ 0.590
 Area = 283.340 ac
 $d_6 =$ _____ in
 Choose One _____
 Water Quality Capture Volume (WQCV)
 Excess Urban Runoff Volume (EURV)

~~$V_{DESIGN} =$ 6.590 ac-ft~~ See attached calcs
 $V_{DESIGN\ OTHER} =$ _____ ac-ft
 $V_{DESIGN\ USER} =$ _____ ac-ft
 Choose One _____
 A
 B
 C / D
 $EURV =$ 18.503 ac-ft

2. Basin Shape: Length to Width Ratio
(A basin length to width ratio of at least 2:1 will improve TSS reduction.)

$L : W =$ 17.0 : 1

3. Basin Side Slopes

- A) Basin Maximum Side Slopes
(Horizontal distance per unit vertical, 4:1 or flatter preferred)

$Z =$ 4.00 ft / ft

4. Inlet

- A) Describe means of providing energy dissipation at concentrated inflow locations:

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| | |
|---|--|
| <p>5. Forebay</p> <p>A) Minimum Forebay Volume ($V_{FMIN} = \underline{3\%}$ of the WQCV)</p> <p>B) Actual Forebay Volume</p> <p>C) Forebay Depth ($D_F = \underline{30}$ inch maximum)</p> <p>D) Forebay Discharge</p> <p style="margin-left: 20px;">i) Undetained 100-year Peak Discharge</p> <p style="margin-left: 20px;">ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)</p> <p>E) Forebay Discharge Design</p> <p>F) Discharge Pipe Size (minimum 8-inches)</p> <p>G) Rectangular Notch Width</p> | <p>$V_{FMIN} = \underline{0.165}$ ac-ft</p> <p>$V_F = \underline{\hspace{2cm}}$ ac-ft</p> <p>$D_F = \underline{\hspace{2cm}}$ in</p> <p>$Q_{100} = \underline{\hspace{2cm}}$ cfs</p> <p>$Q_F = \underline{\hspace{2cm}}$ cfs</p> <p>Choose One _____</p> <p><input type="radio"/> Berm With Pipe</p> <p><input type="radio"/> Wall with Rect. Notch</p> <p><input type="radio"/> Wall with V-Notch Weir</p> <p>Calculated $D_p = \underline{\hspace{2cm}}$ in</p> <p>Calculated $W_N = \underline{\hspace{2cm}}$ in</p> |
| <p>6. Trickle Channel</p> <p>A) Type of Trickle Channel</p> <p>F) Slope of Trickle Channel</p> | <p>Choose One _____</p> <p><input checked="" type="radio"/> Concrete</p> <p><input type="radio"/> Soft Bottom</p> <p>$S = \underline{0.0050}$ ft / ft</p> |
| <p>7. Micropool and Outlet Structure</p> <p>A) Depth of Micropool (2.5-foot minimum)</p> <p>B) Surface Area of Micropool (10 ft² minimum)</p> <p>C) Outlet Type</p> <p>D) Depth of Design Volume (EURV or 1.2 WQCV) Based on the Design Concept Chosen Under 1.E.</p> <p>E) Volume to Drain Over Prescribed Time</p> <p>F) Drain Time (Min T_D for WQCV= 40 hours; Max T_D for EURV= 72 hours)</p> <p>G) Recommended Maximum Outlet Area per Row, (A_o)</p> <p>H) Orifice Dimensions:</p> <p style="margin-left: 20px;">i) Circular Orifice Diameter or</p> <p style="margin-left: 20px;">ii) Width of 2" High Rectangular Orifice</p> <p>I) Number of Columns</p> <p>J) Actual Design Outlet Area per Row (A_o)</p> <p>K) Number of Rows (nr)</p> <p>L) Total Outlet Area (A_{ot})</p> <p>M) Depth of WQCV (H_{WQCV}) (Estimate using actual stage-area-volume relationship and V_{WQCV})</p> <p>N) Ensure Minimum 40 Hour Drain Time for WQCV</p> | <p>$D_M = \underline{2.5}$ ft</p> <p>$A_M = \underline{58}$ sq ft</p> <p>Choose One _____</p> <p><input checked="" type="radio"/> Orifice Plate</p> <p><input type="radio"/> Other (Describe): _____</p> <hr/> <p>$H = \underline{13.33}$ feet</p> <p>EURV = $\underline{18.503}$ ac-ft</p> <p>$T_D = \underline{72}$ hours</p> <p>$A_o = \underline{4.61}$ square inches</p> <p>$D_{orifice} = \underline{\hspace{2cm}}$ inches</p> <p>$W_{orifice} = \underline{2.30}$ inches</p> <p>$n_c = \underline{1}$ number</p> <p>$A_o = \underline{4.61}$ square inches</p> <p>$n_r = \underline{39}$ number</p> <p>$A_{ot} = \underline{184.0}$ square inches</p> <p>$H_{WQCV} = \underline{\hspace{2cm}}$ feet</p> <p>$T_{D\ WQCV} = \underline{\hspace{2cm}}$ hours</p> |

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| | |
|--|--|
| <p>8. Initial Surcharge Volume</p> <p>A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches)</p> <p>B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV)</p> <p>C) Initial Surcharge Provided Above Micropool</p> | <p>$D_{IS} =$ <u>4.0</u> in</p> <p>$V_{IS} =$ <u>718.5</u> cu ft</p> <p>$V_s =$ <u>19.4</u> cu ft INCREASE DEPTH OF INITIAL SURCHARGE OR SURFACE AREA OF MICROPOOL</p> |
| <p>9. Trash Rack</p> <p>A) Type of Water Quality Orifice Used</p> <p>B) Water Quality Screen Open Area: $A_t = 38.5 * (e^{-0.095D}) * A_{ot}$</p> <p>C) For 2", or Smaller, <u>Circular Opening</u> (See Fact Sheet T-12):</p> <p style="margin-left: 20px;">i) Width of Water Quality Screen and Concrete Opening ($W_{opening}$)</p> <p style="margin-left: 20px;">ii) Height of Water Quality Screen (H_{TR})</p> <p style="margin-left: 20px;">iii) Type of Screen, Describe if "Other"</p> <p>D) For 2" High Rectangular Opening:</p> <p style="margin-left: 20px;">i) Width of Rectangular Opening ($W_{orifice}$)</p> <p style="margin-left: 20px;">ii) Width of Water Quality Screen Opening ($W_{opening}$)</p> <p style="margin-left: 20px;">iii) Height of Water Quality Screen (H_{TR})</p> <p style="margin-left: 20px;">iv) Type of Screen, Describe if "Other"</p> <p>v) Cross-bar Spacing</p> <p>vi) Minimum Bearing Bar Size</p> | <p>Choose One _____</p> <p><input type="radio"/> Circular (up to 2" diameter)</p> <p><input checked="" type="radio"/> Rectangular (2" high)</p> <p>$A_t =$ <u>5,857</u> square inches</p> <p>$W_{opening} =$ _____ inches</p> <p>$H_{TR} =$ _____ inches</p> <p>Choose One _____</p> <p><input type="radio"/> S.S. Well Screen with 60% Open Area*</p> <p><input type="radio"/> Other (Describe): _____</p> <hr/> <p>$W =$ <u>2.30</u> inches</p> <p>$W_{opening} =$ <u>3.7</u> ft</p> <p>$H_{TR} =$ <u>15.7</u> ft</p> <p>Choose One _____</p> <p><input checked="" type="radio"/> Aluminum Amico-Klemp SR Series (or equal)</p> <p><input type="radio"/> Other (Describe): _____</p> <hr/> <p><u>4.0</u> inches</p> <p><u>2-1/4 inch x 3/16 inch</u></p> |

Design Procedure Form: Extended Detention Basin (EDB)

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Company: Bowman Consulting
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Location: Regional Pond

| | |
|--|--|
| <p>10. Overflow Embankment</p> <p>A) Describe embankment protection for 100-year and greater overtopping:</p> <p>B) Slope of Overflow Embankment (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p> | <p>_____</p> <p>_____</p> <p>$Z_E =$ _____ ft / ft</p> |
| <p>11. Vegetation</p> | <p>Choose One _____</p> <p><input type="radio"/> Irrigated</p> <p><input checked="" type="radio"/> Not Irrigated</p> |
| <p>12. Access</p> <p>A) Describe Sediment Removal Procedures</p> | <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> |
| <p>Notes: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> | |

Bowman

VISION LAND

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Project: Promenade at Cattelbak Project #: 020029

Sheet No. 1 of 1

Calculated By: LJT Date: _____

Checked By: _____ Date: _____

WQW calc

$$WQW = a(0.91 I^3 - 1.19 I^2 + 0.78 I)$$

$$WQW = 1.0(0.91 (.59)^3 - 1.19 (.59)^2 + 0.78 (.59))$$

$$WQW = 0.23 \text{ inches}$$

$$V = \left(\frac{WQW}{12} \right) \Delta$$

$$V = \left(\frac{.23}{12} \right) 283.34 \text{ AC}$$

$$V = 5.50 \text{ AC-FT}$$

Table - Node RegionalDetentionPond

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 00:05:00 | 6.69 | 242567.70 | 0.00 | 0.00 |
| 0 | 00:10:00 | 6.68 | 241793.50 | 4.87 | 0.00 |
| 0 | 00:15:00 | 6.75 | 247965.40 | 44.18 | 0.00 |
| 0 | 00:20:00 | 7.38 | 297512.80 | 271.66 | 0.00 |
| 0 | 00:25:00 | 9.15 | 452605.30 | 636.66 | 0.00 |
| 0 | 00:30:00 | 11.26 | 666999.40 | 827.13 | 0.00 |
| 0 | 00:35:00 | 13.03 | 867489.40 | 954.51 | 0.00 |
| 0 | 00:40:00 | 13.34 | 904675.60 | 931.93 | 0.00 |
| 0 | 00:45:00 | 13.54 | 928902.90 | 904.81 | 0.00 |
| 0 | 00:50:00 | 13.68 | 947203.90 | 891.76 | 0.00 |
| 0 | 00:55:00 | 13.79 | 960638.90 | 866.01 | 0.00 |
| 0 | 01:00:00 | 13.86 | 969311.60 | 870.36 | 0.00 |
| 0 | 01:05:00 | 13.90 | 973940.90 | 826.79 | 0.00 |
| 0 | 01:10:00 | 13.81 | 962196.30 | 783.96 | 0.00 |
| 0 | 01:15:00 | 13.63 | 939484.80 | 746.31 | 0.00 |
| 0 | 01:20:00 | 13.36 | 906767.10 | 677.27 | 0.00 |
| 0 | 01:25:00 | 12.92 | 853945.70 | 491.10 | 0.00 |

← 6.69'=WQCV depth

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 01:30:00 | 12.77 | 836156.90 | 175.58 | 0.00 |
| 0 | 01:35:00 | 12.75 | 833726.40 | 128.29 | 0.00 |
| 0 | 01:40:00 | 12.74 | 833042.90 | 112.17 | 0.00 |
| 0 | 01:45:00 | 12.74 | 832615.30 | 101.85 | 0.00 |
| 0 | 01:50:00 | 12.73 | 832269.90 | 93.92 | 0.00 |
| 0 | 01:55:00 | 12.73 | 831981.80 | 87.11 | 0.00 |
| 0 | 02:00:00 | 12.73 | 831712.30 | 80.84 | 0.00 |
| 0 | 02:05:00 | 12.73 | 831281.00 | 70.60 | 0.00 |
| 0 | 02:10:00 | 12.72 | 830849.10 | 60.23 | 0.00 |
| 0 | 02:15:00 | 12.72 | 830504.50 | 52.30 | 0.00 |
| 0 | 02:20:00 | 12.72 | 830250.40 | 46.43 | 0.00 |
| 0 | 02:25:00 | 12.71 | 830064.80 | 42.08 | 0.00 |
| 0 | 02:30:00 | 12.71 | 829935.50 | 39.03 | 0.00 |
| 0 | 02:35:00 | 12.71 | 829824.90 | 36.42 | 0.00 |
| 0 | 02:40:00 | 12.71 | 829731.60 | 34.22 | 0.00 |
| 0 | 02:45:00 | 12.71 | 829651.80 | 32.34 | 0.00 |
| 0 | 02:50:00 | 12.71 | 829582.40 | 30.71 | 0.00 |
| 0 | 02:55:00 | 12.71 | 829525.50 | 29.37 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 03:00:00 | 12.71 | 829481.50 | 28.34 | 0.00 |
| 0 | 03:05:00 | 12.71 | 829444.60 | 27.47 | 0.00 |
| 0 | 03:10:00 | 12.71 | 829412.10 | 26.71 | 0.00 |
| 0 | 03:15:00 | 12.71 | 829382.80 | 26.02 | 0.00 |
| 0 | 03:20:00 | 12.71 | 829356.10 | 25.39 | 0.00 |
| 0 | 03:25:00 | 12.71 | 829331.50 | 24.81 | 0.00 |
| 0 | 03:30:00 | 12.71 | 829308.80 | 24.28 | 0.00 |
| 0 | 03:35:00 | 12.71 | 829288.80 | 23.81 | 0.00 |
| 0 | 03:40:00 | 12.71 | 829271.90 | 23.41 | 0.00 |
| 0 | 03:45:00 | 12.71 | 829256.90 | 23.06 | 0.00 |
| 0 | 03:50:00 | 12.71 | 829243.30 | 22.74 | 0.00 |
| 0 | 03:55:00 | 12.71 | 829230.70 | 22.44 | 0.00 |
| 0 | 04:00:00 | 12.71 | 829219.10 | 22.17 | 0.00 |
| 0 | 04:05:00 | 12.71 | 829208.40 | 21.91 | 0.00 |
| 0 | 04:10:00 | 12.71 | 829198.60 | 21.69 | 0.00 |
| 0 | 04:15:00 | 12.71 | 829189.70 | 21.48 | 0.00 |
| 0 | 04:20:00 | 12.71 | 829181.40 | 21.28 | 0.00 |
| 0 | 04:25:00 | 12.71 | 829173.40 | 21.09 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 04:30:00 | 12.71 | 829165.80 | 20.91 | 0.00 |
| 0 | 04:35:00 | 12.71 | 829158.30 | 20.74 | 0.00 |
| 0 | 04:40:00 | 12.71 | 829150.90 | 20.56 | 0.00 |
| 0 | 04:45:00 | 12.71 | 829143.80 | 20.39 | 0.00 |
| 0 | 04:50:00 | 12.71 | 829137.30 | 20.24 | 0.00 |
| 0 | 04:55:00 | 12.71 | 829131.90 | 20.12 | 0.00 |
| 0 | 05:00:00 | 12.71 | 829127.20 | 20.00 | 0.00 |
| 0 | 05:05:00 | 12.71 | 829122.80 | 19.90 | 0.00 |
| 0 | 05:10:00 | 12.71 | 829118.80 | 19.81 | 0.00 |
| 0 | 05:15:00 | 12.71 | 829114.90 | 19.71 | 0.00 |
| 0 | 05:20:00 | 12.71 | 829111.10 | 19.63 | 0.00 |
| 0 | 05:25:00 | 12.71 | 829107.60 | 19.54 | 0.00 |
| 0 | 05:30:00 | 12.71 | 829104.30 | 19.47 | 0.00 |
| 0 | 05:35:00 | 12.71 | 829100.90 | 19.39 | 0.00 |
| 0 | 05:40:00 | 12.71 | 829097.60 | 19.31 | 0.00 |
| 0 | 05:45:00 | 12.71 | 829094.40 | 19.23 | 0.00 |
| 0 | 05:50:00 | 12.71 | 829091.10 | 19.16 | 0.00 |
| 0 | 05:55:00 | 12.71 | 829087.90 | 19.08 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 06:00:00 | 12.71 | 829084.80 | 19.01 | 0.00 |
| 0 | 06:05:00 | 12.71 | 829081.70 | 18.93 | 0.00 |
| 0 | 06:10:00 | 12.71 | 829078.60 | 18.86 | 0.00 |
| 0 | 06:15:00 | 12.71 | 829075.60 | 18.79 | 0.00 |
| 0 | 06:20:00 | 12.71 | 829072.60 | 18.72 | 0.00 |
| 0 | 06:25:00 | 12.71 | 829069.60 | 18.65 | 0.00 |
| 0 | 06:30:00 | 12.71 | 829066.80 | 18.58 | 0.00 |
| 0 | 06:35:00 | 12.71 | 829063.80 | 18.51 | 0.00 |
| 0 | 06:40:00 | 12.71 | 829061.00 | 18.45 | 0.00 |
| 0 | 06:45:00 | 12.71 | 829058.10 | 18.38 | 0.00 |
| 0 | 06:50:00 | 12.71 | 829055.40 | 18.31 | 0.00 |
| 0 | 06:55:00 | 12.71 | 829052.60 | 18.25 | 0.00 |
| 0 | 07:00:00 | 12.71 | 829049.90 | 18.19 | 0.00 |
| 0 | 07:05:00 | 12.71 | 829047.30 | 18.12 | 0.00 |
| 0 | 07:10:00 | 12.71 | 829044.60 | 18.06 | 0.00 |
| 0 | 07:15:00 | 12.71 | 829042.00 | 18.00 | 0.00 |
| 0 | 07:20:00 | 12.71 | 829039.40 | 17.94 | 0.00 |
| 0 | 07:25:00 | 12.71 | 829036.80 | 17.88 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 07:30:00 | 12.71 | 829034.30 | 17.82 | 0.00 |
| 0 | 07:35:00 | 12.71 | 829031.80 | 17.76 | 0.00 |
| 0 | 07:40:00 | 12.71 | 829029.30 | 17.70 | 0.00 |
| 0 | 07:45:00 | 12.71 | 829026.90 | 17.64 | 0.00 |
| 0 | 07:50:00 | 12.71 | 829024.50 | 17.59 | 0.00 |
| 0 | 07:55:00 | 12.71 | 829022.10 | 17.53 | 0.00 |
| 0 | 08:00:00 | 12.71 | 829019.80 | 17.48 | 0.00 |
| 0 | 08:05:00 | 12.71 | 829017.50 | 17.42 | 0.00 |
| 0 | 08:10:00 | 12.71 | 829015.20 | 17.37 | 0.00 |
| 0 | 08:15:00 | 12.71 | 829012.90 | 17.32 | 0.00 |
| 0 | 08:20:00 | 12.71 | 829010.80 | 17.26 | 0.00 |
| 0 | 08:25:00 | 12.71 | 829008.60 | 17.21 | 0.00 |
| 0 | 08:30:00 | 12.71 | 829006.40 | 17.16 | 0.00 |
| 0 | 08:35:00 | 12.71 | 829004.30 | 17.11 | 0.00 |
| 0 | 08:40:00 | 12.71 | 829002.10 | 17.06 | 0.00 |
| 0 | 08:45:00 | 12.71 | 829000.10 | 17.01 | 0.00 |
| 0 | 08:50:00 | 12.71 | 828998.00 | 16.96 | 0.00 |
| 0 | 08:55:00 | 12.71 | 828996.00 | 16.92 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 09:00:00 | 12.71 | 828994.00 | 16.87 | 0.00 |
| 0 | 09:05:00 | 12.70 | 828992.00 | 16.82 | 0.00 |
| 0 | 09:10:00 | 12.70 | 828990.10 | 16.78 | 0.00 |
| 0 | 09:15:00 | 12.70 | 828988.20 | 16.73 | 0.00 |
| 0 | 09:20:00 | 12.70 | 828986.30 | 16.69 | 0.00 |
| 0 | 09:25:00 | 12.70 | 828984.40 | 16.64 | 0.00 |
| 0 | 09:30:00 | 12.70 | 828982.60 | 16.60 | 0.00 |
| 0 | 09:35:00 | 12.70 | 828980.80 | 16.56 | 0.00 |
| 0 | 09:40:00 | 12.70 | 828979.00 | 16.52 | 0.00 |
| 0 | 09:45:00 | 12.70 | 828977.30 | 16.48 | 0.00 |
| 0 | 09:50:00 | 12.70 | 828975.50 | 16.44 | 0.00 |
| 0 | 09:55:00 | 12.70 | 828973.80 | 16.39 | 0.00 |
| 0 | 10:00:00 | 12.70 | 828972.10 | 16.36 | 0.00 |
| 0 | 10:05:00 | 12.70 | 828970.40 | 16.32 | 0.00 |
| 0 | 10:10:00 | 12.70 | 828968.80 | 16.28 | 0.00 |
| 0 | 10:15:00 | 12.70 | 828967.20 | 16.24 | 0.00 |
| 0 | 10:20:00 | 12.70 | 828965.60 | 16.20 | 0.00 |
| 0 | 10:25:00 | 12.70 | 828964.10 | 16.17 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 10:30:00 | 12.70 | 828962.50 | 16.13 | 0.00 |
| 0 | 10:35:00 | 12.70 | 828961.00 | 16.09 | 0.00 |
| 0 | 10:40:00 | 12.70 | 828959.50 | 16.06 | 0.00 |
| 0 | 10:45:00 | 12.70 | 828958.10 | 16.02 | 0.00 |
| 0 | 10:50:00 | 12.70 | 828956.60 | 15.99 | 0.00 |
| 0 | 10:55:00 | 12.70 | 828955.20 | 15.96 | 0.00 |
| 0 | 11:00:00 | 12.70 | 828953.80 | 15.92 | 0.00 |
| 0 | 11:05:00 | 12.70 | 828952.40 | 15.89 | 0.00 |
| 0 | 11:10:00 | 12.70 | 828951.00 | 15.86 | 0.00 |
| 0 | 11:15:00 | 12.70 | 828949.60 | 15.83 | 0.00 |
| 0 | 11:20:00 | 12.70 | 828948.30 | 15.79 | 0.00 |
| 0 | 11:25:00 | 12.70 | 828947.00 | 15.76 | 0.00 |
| 0 | 11:30:00 | 12.70 | 828945.80 | 15.73 | 0.00 |
| 0 | 11:35:00 | 12.70 | 828944.40 | 15.70 | 0.00 |
| 0 | 11:40:00 | 12.70 | 828943.20 | 15.67 | 0.00 |
| 0 | 11:45:00 | 12.70 | 828942.00 | 15.65 | 0.00 |
| 0 | 11:50:00 | 12.70 | 828940.80 | 15.62 | 0.00 |
| 0 | 11:55:00 | 12.70 | 828939.60 | 15.59 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 12:00:00 | 12.70 | 828938.40 | 15.56 | 0.00 |
| 0 | 12:05:00 | 12.70 | 828937.30 | 15.53 | 0.00 |
| 0 | 12:10:00 | 12.70 | 828936.10 | 15.51 | 0.00 |
| 0 | 12:15:00 | 12.70 | 828934.90 | 15.48 | 0.00 |
| 0 | 12:20:00 | 12.70 | 828933.90 | 15.45 | 0.00 |
| 0 | 12:25:00 | 12.70 | 828932.80 | 15.43 | 0.00 |
| 0 | 12:30:00 | 12.70 | 828931.70 | 15.40 | 0.00 |
| 0 | 12:35:00 | 12.70 | 828930.60 | 15.38 | 0.00 |
| 0 | 12:40:00 | 12.70 | 828929.60 | 15.35 | 0.00 |
| 0 | 12:45:00 | 12.70 | 828928.60 | 15.33 | 0.00 |
| 0 | 12:50:00 | 12.70 | 828927.60 | 15.31 | 0.00 |
| 0 | 12:55:00 | 12.70 | 828926.60 | 15.28 | 0.00 |
| 0 | 13:00:00 | 12.70 | 828925.60 | 15.26 | 0.00 |
| 0 | 13:05:00 | 12.70 | 828924.70 | 15.24 | 0.00 |
| 0 | 13:10:00 | 12.70 | 828923.80 | 15.22 | 0.00 |
| 0 | 13:15:00 | 12.70 | 828922.80 | 15.19 | 0.00 |
| 0 | 13:20:00 | 12.70 | 828921.90 | 15.17 | 0.00 |
| 0 | 13:25:00 | 12.70 | 828921.00 | 15.15 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 13:30:00 | 12.70 | 828920.10 | 15.13 | 0.00 |
| 0 | 13:35:00 | 12.70 | 828919.30 | 15.11 | 0.00 |
| 0 | 13:40:00 | 12.70 | 828918.40 | 15.09 | 0.00 |
| 0 | 13:45:00 | 12.70 | 828917.60 | 15.07 | 0.00 |
| 0 | 13:50:00 | 12.70 | 828916.70 | 15.05 | 0.00 |
| 0 | 13:55:00 | 12.70 | 828915.90 | 15.03 | 0.00 |
| 0 | 14:00:00 | 12.70 | 828915.10 | 15.01 | 0.00 |
| 0 | 14:05:00 | 12.70 | 828914.30 | 14.99 | 0.00 |
| 0 | 14:10:00 | 12.70 | 828913.60 | 14.98 | 0.00 |
| 0 | 14:15:00 | 12.70 | 828912.80 | 14.96 | 0.00 |
| 0 | 14:20:00 | 12.70 | 828912.00 | 14.94 | 0.00 |
| 0 | 14:25:00 | 12.70 | 828911.30 | 14.92 | 0.00 |
| 0 | 14:30:00 | 12.70 | 828910.60 | 14.91 | 0.00 |
| 0 | 14:35:00 | 12.70 | 828909.90 | 14.89 | 0.00 |
| 0 | 14:40:00 | 12.70 | 828909.10 | 14.87 | 0.00 |
| 0 | 14:45:00 | 12.70 | 828908.40 | 14.86 | 0.00 |
| 0 | 14:50:00 | 12.70 | 828907.80 | 14.84 | 0.00 |
| 0 | 14:55:00 | 12.70 | 828907.10 | 14.83 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 15:00:00 | 12.70 | 828906.40 | 14.81 | 0.00 |
| 0 | 15:05:00 | 12.70 | 828905.80 | 14.79 | 0.00 |
| 0 | 15:10:00 | 12.70 | 828905.20 | 14.78 | 0.00 |
| 0 | 15:15:00 | 12.70 | 828904.60 | 14.76 | 0.00 |
| 0 | 15:20:00 | 12.70 | 828903.90 | 14.75 | 0.00 |
| 0 | 15:25:00 | 12.70 | 828903.30 | 14.74 | 0.00 |
| 0 | 15:30:00 | 12.70 | 828902.80 | 14.72 | 0.00 |
| 0 | 15:35:00 | 12.70 | 828902.20 | 14.71 | 0.00 |
| 0 | 15:40:00 | 12.70 | 828901.60 | 14.70 | 0.00 |
| 0 | 15:45:00 | 12.70 | 828901.10 | 14.68 | 0.00 |
| 0 | 15:50:00 | 12.70 | 828900.50 | 14.67 | 0.00 |
| 0 | 15:55:00 | 12.70 | 828899.90 | 14.66 | 0.00 |
| 0 | 16:00:00 | 12.70 | 828899.40 | 14.64 | 0.00 |
| 0 | 16:05:00 | 12.70 | 828898.90 | 14.63 | 0.00 |
| 0 | 16:10:00 | 12.70 | 828898.40 | 14.62 | 0.00 |
| 0 | 16:15:00 | 12.70 | 828897.90 | 14.61 | 0.00 |
| 0 | 16:20:00 | 12.70 | 828897.40 | 14.60 | 0.00 |
| 0 | 16:25:00 | 12.70 | 828896.90 | 14.58 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 16:30:00 | 12.70 | 828896.40 | 14.57 | 0.00 |
| 0 | 16:35:00 | 12.70 | 828895.90 | 14.56 | 0.00 |
| 0 | 16:40:00 | 12.70 | 828895.40 | 14.55 | 0.00 |
| 0 | 16:45:00 | 12.70 | 828895.00 | 14.54 | 0.00 |
| 0 | 16:50:00 | 12.70 | 828894.60 | 14.53 | 0.00 |
| 0 | 16:55:00 | 12.70 | 828894.10 | 14.52 | 0.00 |
| 0 | 17:00:00 | 12.70 | 828893.70 | 14.51 | 0.00 |
| 0 | 17:05:00 | 12.70 | 828893.30 | 14.50 | 0.00 |
| 0 | 17:10:00 | 12.70 | 828892.80 | 14.49 | 0.00 |
| 0 | 17:15:00 | 12.70 | 828892.40 | 14.48 | 0.00 |
| 0 | 17:20:00 | 12.70 | 828892.00 | 14.47 | 0.00 |
| 0 | 17:25:00 | 12.70 | 828891.60 | 14.46 | 0.00 |
| 0 | 17:30:00 | 12.70 | 828891.20 | 14.45 | 0.00 |
| 0 | 17:35:00 | 12.70 | 828890.80 | 14.44 | 0.00 |
| 0 | 17:40:00 | 12.70 | 828890.40 | 14.43 | 0.00 |
| 0 | 17:45:00 | 12.70 | 828890.10 | 14.42 | 0.00 |
| 0 | 17:50:00 | 12.70 | 828889.70 | 14.42 | 0.00 |
| 0 | 17:55:00 | 12.70 | 828889.40 | 14.41 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 18:00:00 | 12.70 | 828889.00 | 14.40 | 0.00 |
| 0 | 18:05:00 | 12.70 | 828888.70 | 14.39 | 0.00 |
| 0 | 18:10:00 | 12.70 | 828888.30 | 14.38 | 0.00 |
| 0 | 18:15:00 | 12.70 | 828888.00 | 14.38 | 0.00 |
| 0 | 18:20:00 | 12.70 | 828887.70 | 14.37 | 0.00 |
| 0 | 18:25:00 | 12.70 | 828887.30 | 14.36 | 0.00 |
| 0 | 18:30:00 | 12.70 | 828887.00 | 14.35 | 0.00 |
| 0 | 18:35:00 | 12.70 | 828886.70 | 14.35 | 0.00 |
| 0 | 18:40:00 | 12.70 | 828886.40 | 14.34 | 0.00 |
| 0 | 18:45:00 | 12.70 | 828886.10 | 14.33 | 0.00 |
| 0 | 18:50:00 | 12.70 | 828885.80 | 14.32 | 0.00 |
| 0 | 18:55:00 | 12.70 | 828885.50 | 14.32 | 0.00 |
| 0 | 19:00:00 | 12.70 | 828885.30 | 14.31 | 0.00 |
| 0 | 19:05:00 | 12.70 | 828884.90 | 14.30 | 0.00 |
| 0 | 19:10:00 | 12.70 | 828884.70 | 14.30 | 0.00 |
| 0 | 19:15:00 | 12.70 | 828884.40 | 14.29 | 0.00 |
| 0 | 19:20:00 | 12.70 | 828884.20 | 14.28 | 0.00 |
| 0 | 19:25:00 | 12.70 | 828883.90 | 14.28 | 0.00 |

| Days | Hours | Depth (ft) | Volume (ft3) | Total Inflow (CFS) | Flooding (CFS) |
|------|----------|------------|--------------|--------------------|----------------|
| 0 | 19:30:00 | 12.70 | 828883.60 | 14.27 | 0.00 |
| 0 | 19:35:00 | 12.70 | 828883.40 | 14.27 | 0.00 |
| 0 | 19:40:00 | 12.70 | 828883.10 | 14.26 | 0.00 |
| 0 | 19:45:00 | 12.70 | 828882.90 | 14.25 | 0.00 |
| 0 | 19:50:00 | 12.70 | 828882.70 | 14.25 | 0.00 |
| 0 | 19:55:00 | 12.70 | 828882.40 | 14.24 | 0.00 |
| 0 | 20:00:00 | 12.70 | 828882.20 | 14.24 | 0.00 |
| 0 | 20:05:00 | 12.70 | 828882.00 | 14.23 | 0.00 |
| 0 | 20:10:00 | 12.70 | 828881.80 | 14.23 | 0.00 |
| 0 | 20:15:00 | 12.70 | 828881.60 | 14.22 | 0.00 |
| 0 | 20:20:00 | 12.70 | 828881.30 | 14.22 | 0.00 |
| 0 | 20:25:00 | 12.70 | 828881.10 | 14.21 | 0.00 |
| 0 | 20:30:00 | 12.70 | 828880.90 | 14.21 | 0.00 |
| 0 | 20:35:00 | 12.70 | 828880.70 | 14.20 | 0.00 |
| 0 | 20:40:00 | 12.70 | 828880.50 | 14.20 | 0.00 |
| 0 | 20:45:00 | 12.70 | 828880.30 | 14.19 | 0.00 |
| 0 | 20:50:00 | 12.70 | 828880.10 | 14.19 | 0.00 |
| 0 | 20:55:00 | 12.70 | 828879.90 | 14.19 | 0.00 |

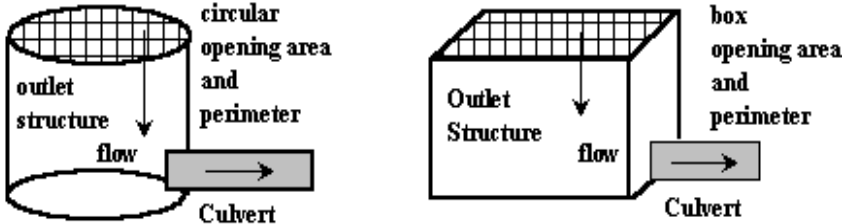
Stage, Storage Data
Regional Pond
Promenade at Castle Rock

| Elevation (ft., NAVD88) | Description | Depth (ft.) | | Area (sf) | Volume (cubic-feet) ¹ | | Vol (AF) |
|-------------------------|-------------|-------------|-------|-----------|----------------------------------|-----------|----------|
| | | Incremental | Total | | Incremental | Total | |
| 6016 | Pond Bottom | 0 | 0 | 0 | 0 | 0 | 0 |
| 6017 | | 1 | 1 | 3,100 | 1,550 | 1,550 | 0.0 |
| 6018 | | 1 | 2 | 14,371 | 8,736 | 10,286 | 0.2 |
| 6019 | | 1 | 3 | 29,693 | 22,032 | 32,318 | 0.7 |
| 6020 | | 1 | 4 | 46,845 | 38,269 | 70,587 | 1.6 |
| 6021 | * | 1 | 5 | 62,450 | 54,648 | 125,234 | 2.9 |
| 6022 | * | 1 | 6 | 70,984 | 66,717 | 191,951 | 4.4 |
| 6022.7 | WQCV | | | | | | 5.6 |
| 6023 | * | 1 | 7 | 78,482 | 74,733 | 266,684 | 6.1 |
| 6024 | * | 1 | 8 | 85,460 | 81,971 | 348,655 | 8.0 |
| 6025 | * | 1 | 9 | 93,811 | 89,636 | 438,291 | 10.1 |
| 6026 | * | 1 | 10 | 99,836 | 96,824 | 535,114 | 12.3 |
| 6027 | * | 1 | 11 | 107,169 | 103,503 | 638,617 | 14.7 |
| 6028 | * | 1 | 12 | 112,405 | 109,787 | 748,404 | 17.2 |
| 6028.7 | EURV | | | | | | 19.0 |
| 6029 | * | 1 | 13 | 117,817 | 115,111 | 863,515 | 19.8 |
| 6030 | * | 1 | 14 | 129,646 | 123,732 | 987,246 | 22.7 |
| 6030.51 | 100-YR+WQCV | 0.51 | 41.51 | | | | 23.6 |
| 6031 | * | 1 | 15 | 130,000 | 129,823 | 1,117,069 | 25.6 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

1. Calculated using the Average End Method.
2. * Denotes Area is from North Meadows Phase III Drainage Report

Collection Capacity of Horizontal Orifice (Inlet Control)

Project: Regional Pond Outlet Structure
 Basin ID: Existing Condition



Design Information (Input):

Circular Opening: Diameter Dia. = ft.
 OR
 Rectangular Opening: Width W = 5.27 ft.
 Length L = 30.00 ft.
 Percentage of Open Area After Trash Rack Reduction % open = 50.00 %
 Orifice Coefficient C_o = 0.67
 Weir Coefficient C_w = 3.00
 Orifice Elevation E_o = 6027.18 ft.

Calculation of Collection Capacity:

Net Opening Area (after Trash Rack Reduction) A_o = 79.05 sq. ft.
 Perimeter as Weir Length L_w = 70.54 ft.

Enter water surface elevations in ascending order.

| | Water Surface Elevation ft (input) | Weir Flow cfs (output) | Orifice Flow cfs (output) | Collection Capacity cfs (output) |
|-------|---|---|--|---|
| start | 6027.50 | 38.31 | 240.43 | 38.31 |
| | 6028.00 | 157.14 | 384.88 | 157.14 |
| | 6028.50 | 320.94 | 488.32 | 320.94 |
| | 6029.00 | 519.59 | 573.40 | 519.59 |
| | 6029.50 | 747.81 | 647.39 | 647.39 |
| | 6030.00 | 1002.14 | 713.75 | 713.75 |
| | 6030.50 | 1280.16 | 774.44 | 774.44 |
| | | | | |
| | | | | |
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| | | | | |

**INLET CAPACITY
CALCULATED AS A
WEIR PER TOCR
DIRECTION**

REGIONAL POND ORIFICE DESIGN-100 YEAR STORM

Invert Elev.: 6010.03 ft

Allow. Release Rate: 860.00 cfs

$$Q=C_d*A(2gh)^{1/2}$$

Where:

Q=

859.7347 cfs

Release Rate

Cd=

0.65

Orifice Coefficient

A=

38.25 ft²

Area

g=

32.2 ft/sec²

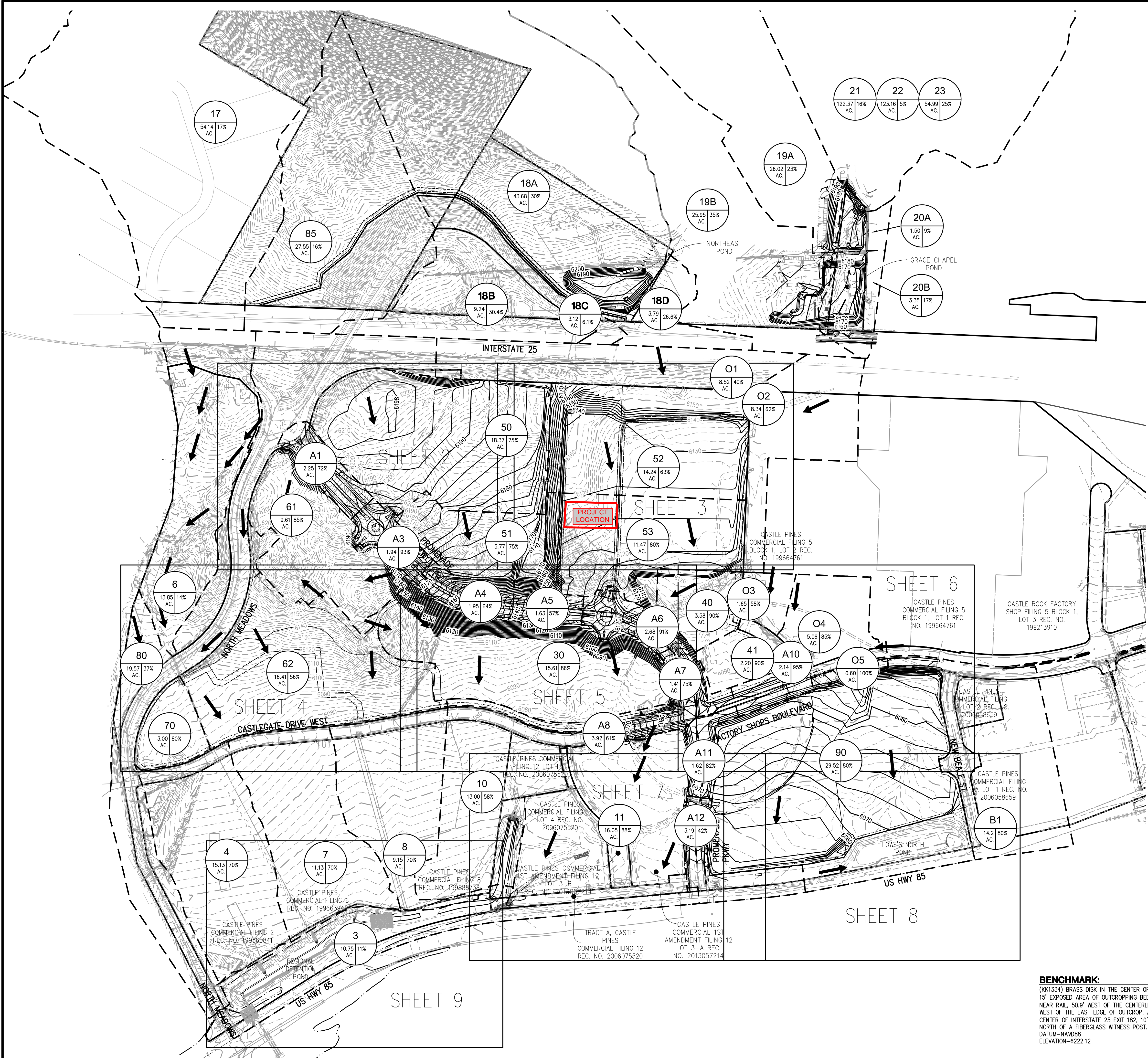
Gravitational constant

h=

18.57 ft

Head on Orifice Measured
from Centerline

Orifice height = 45.90 in

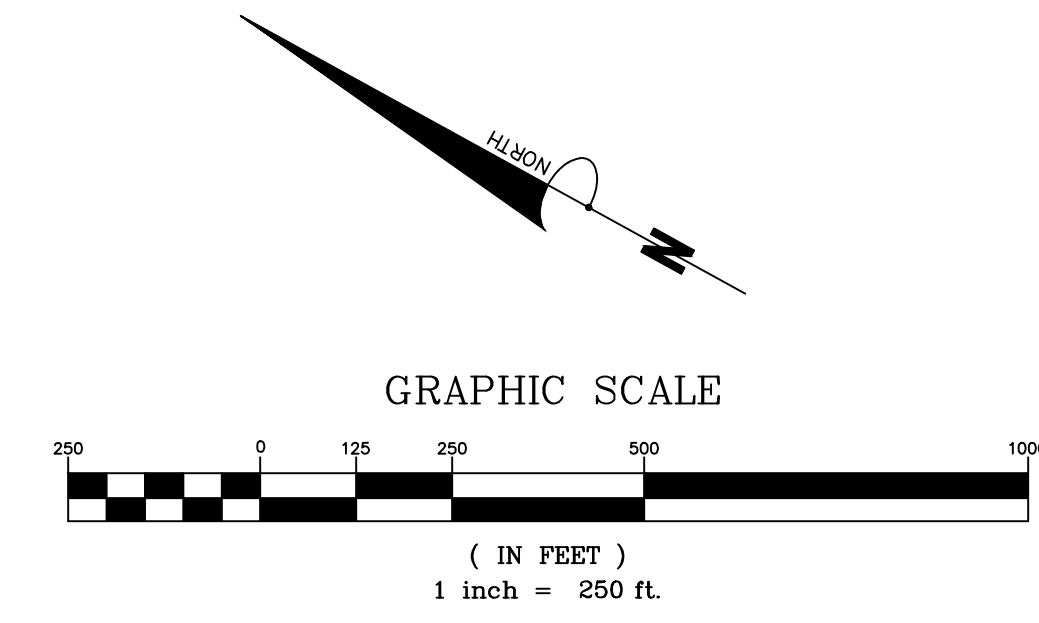


LEGEND:

- △ DESIGN POINT
- FEMA FLOODPLAIN
- - - - PROPOSED BASIN BOUNDARY
- ← FLOW DIRECTION
- ~ EMERGENCY OVERFLOW PATH FOR SUMP INLETS
- BASIN DESIGNATION: A1 PROPOSED BASIN
- BASIN AREA: 1.35 AC. 75% PERCENT IMPERVIOUS
- EXISTING BASIN

| BASIN SUMMARY TABLE | | | |
|---------------------|-----------|----------|------------|
| SUB-BASIN | AREA (AC) | Q5 (CFS) | Q100 (CFS) |
| 18A | 43.68 | 50 | 122 |
| 18B | 9.24 | 8 | 20 |
| 18C | 3.12 | 1 | 4 |
| 18D | 3.79 | 5 | 10 |
| 19A | 26.02 | 20 | 52 |
| 19B | 25.95 | 47 | 99 |
| 20A | 1.50 | 1 | 3 |
| 20B | 3.35 | 2 | 7 |
| 21 | 122.37 | 89 | 225 |
| 22 | 123.16 | 81 | 220 |
| 23 | 54.99 | 38 | 91 |
| 3 | 10.75 | 2 | 9 |
| 4 | 15.13 | 37 | 68 |
| 7 | 11.13 | 26 | 49 |
| 8 | 9.15 | 20 | 38 |
| 10 | 13.00 | 26 | 52 |
| 11 | 16.05 | 35.50 | 72.50 |
| 30 | 15.61 | 32.60 | 66.60 |
| 40 | 3.58 | 9.90 | 20.30 |
| 41 | 2.20 | 6.20 | 12.80 |
| 50 | 18.37 | 29.70 | 66.60 |
| 51 | 5.77 | 10.90 | 23.90 |
| 52 | 14.24 | 19.80 | 47.60 |
| 53 | 11.47 | 23.50 | 49.40 |
| 61 | 9.61 | 20.20 | 41.80 |
| 62 | 16.41 | 40 | 81 |
| 70 | 3.00 | 10 | 17 |
| A1 | 2.25 | 5.40 | 12.30 |
| A3 | 1.94 | 7.40 | 15.00 |
| A4 | 1.95 | 4.40 | 9.70 |
| A5 | 1.63 | 2.90 | 7.90 |
| A6 | 2.68 | 9.00 | 18.00 |
| A7 | 1.41 | 3.90 | 7.90 |
| A8 | 3.92 | 7.00 | 17.80 |
| A10 | 2.14 | 8.30 | 16.70 |
| A11 | 1.62 | 4.90 | 10.60 |
| A12 | 3.19 | 4.90 | 14.10 |
| O1 | 8.52 | 7.80 | 23.50 |
| O2 | 8.34 | 10.20 | 25.40 |
| O3 | 1.65 | 3.40 | 7.90 |
| O4 | 5.06 | 11.60 | 23.90 |
| O5 | 0.60 | 2.50 | 5.30 |
| 6 | 13.85 | 5 | 16 |
| 80 | 19.57 | 13 | 31 |
| B1 | 14.20 | 26.40 | 56.40 |
| 90 | 29.52 | 119 | 202 |
| 85 | 27.55 | 25 | 70 |
| 17 | 54.14 | 38 | 96 |

BENCHMARK:
(KK1334) BRASS DISK IN THE CENTER OF THE EAST END OF A 10' BY 15' EXPOSED AREA OF OUTCROPPING BEDROCK, 149.9' EAST OF THE NEAR RAIL, 50.9' WEST OF THE CENTERLINE OF COUNTY ROAD 25, 0.7' WEST OF THE EAST EDGE OF OUTCROP, AND EAST OF THE EXTENDED CENTER OF INTERSTATE 25 EXIT 182, 10' BELOW THE ROAD, AND 1 FT NORTH OF A FIBERGLASS WITNESS POST.
DATUM-NAVD88
ELEVATION-6222.12



Final Drainage Conformance Letter

Woodspring Suites – Castle Rock
5952 Promenade Parkway

Lot 1, Block 4, Promenade at Castle Rock Filing
No. 1, Amendment 27
Castle Rock, Colorado

September 27th, 2024
Resubmittal: January 20, 2025
CD24-0022

Prepared For:

KT Development

7951 Maplewood Ave, Suite 122
Greenwood Village, CO 80111
Contact: Luke Taylor
Phone: 303-906-9002

Prepared By:



Contact: Michael Drago, PE
Email: mdrago@k2civilconsultants.com

Basin A-3 – Basin A-3 is 0.30 acres, comprised of the proposed Woodspring Suites hotel for an impervious value of 95.0%. The 5-year and 100-year C values were determined to be 0.81 and 0.87, respectively; and the anticipated 5-year and 100-year runoff flows are 1.18 cfs and 2.30 cfs, respectively. Flows from A-3 drain towards the south side of the proposed hotel roof, where they are conveyed into an underground roof drain and flow towards MH-1 (5' Manhole) at Design Point 5. Flows are conveyed south through underground stormwater piping and connect into existing infrastructure within the Private Drive on the south side of the site. These flows ultimately discharge into the Regional Pond as described within the Master Drainage Report.

Basin A-4 – Basin A-4 is 0.50 acres, comprised of the northwest parking lot, drive aisles, and sidewalk areas on-site for an impervious value of 76.3%. The 5-year and 100-year C values were determined to be 0.66 and 0.79, respectively; and the anticipated 5-year and 100-year runoff flows are 1.51 cfs and 3.31 cfs, respectively. Flows from A-4 are conveyed to the east portion of the site as sheet flow or through a 3' concrete pan towards Inlet A-4 (5' Type R Inlet). Flows are captured at Design Point 3, where they are then conveyed south through underground stormwater piping and eventually connect to existing infrastructure within the Private Drive on the south side of the site. These flows ultimately discharge into the Regional Pond as described within the Master Drainage Report.

Basin A-5 – Basin A-5 is 0.25 acres, comprised of the SE parking lot, drive aisles, and sidewalk areas on-site for an impervious value of 83.5%. The 5-year and 100-year C values were determined to be 0.72 and 0.82, respectively; and the anticipated 5-year and 100-year runoff flows are 0.85 cfs and 1.78 cfs, respectively. Flows from A-5 are conveyed to the southeast portion of the site as sheet flow or through a 3' concrete pan towards Inlet A-5 (5' Type R Inlet). Flows are captured at Design Point 4, where they are conveyed west through underground stormwater piping and connect into existing infrastructure within the Private Drive on the south side of the site. These flows ultimately discharge into the Regional Pond as described within the Master Drainage Report.

Basin A-6 – Basin A-6 is 0.38 acres, comprised of the two access drives onto the private drive on the southern portion of the site, in addition to the sidewalk and landscape area on the south side of the site for an impervious value of 54.5%. The 5-year and 100-year C values were determined to be 0.48 and 0.70, respectively; and the anticipated 5-year and 100-year runoff flows are 0.77 cfs and 2.05 cfs, respectively. Flows from A-6 are conveyed directly south into the Private Drive on the south side of the site (Design Point 6). Flows are captured by the northern 2' gutter within the private drive and continue towards the west where they will be captured by an existing inlet within the Private Drive. These flows ultimately discharge into the Regional Pond as described within the Master Drainage Report.

There will be 3 off-site basins that will be analyzed as part of this compliance letter that follow the patterns described within the Master Drainage Report. The basins are as follows:

DEVELOPED CONDITION

Runoff Coefficients

Project: KT - CASTLE ROCK, CO - PROMENADE PARKWAY
 Section: Developed Condition

Created by: MRD Date: 5/6/2024
 Checked by: KMH Date:

NRCS HSG D

| Sub-Basin Data | | | Composite C | | | | | Sub Area (Roof) | | | | | | Sub Area (Drives/Walks) | | | | | | Sub Area (Landscape) | | | | | | | |
|-------------------|---------------------------------------|------|----------------|----------------|-----------------|------------------|------|-----------------|----------------|-----------------|------------------|-----|------|-------------------------|----------------|-----------------|------------------|-----|------|----------------------|----------------|-----------------|------------------|-----|------|--|--|
| Basin ID | Description | Area | C ₂ | C ₅ | C ₁₀ | C ₁₀₀ | (%) | C ₂ | C ₅ | C ₁₀ | C ₁₀₀ | (%) | (ac) | C ₂ | C ₅ | C ₁₀ | C ₁₀₀ | (%) | (ac) | C ₂ | C ₅ | C ₁₀ | C ₁₀₀ | (%) | (ac) | | |
| Developed Onsite | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A-1 | NW Parking and Drive Aisles | 0.55 | 0.64 | 0.66 | 0.70 | 0.79 | 76.7 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.44 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.11 | | |
| A-2 | SW Parking and Drive Aisles | 0.29 | 0.76 | 0.78 | 0.80 | 0.86 | 91.4 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.28 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.01 | | |
| A-3 | Hotel | 0.30 | 0.79 | 0.81 | 0.83 | 0.87 | 95.0 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.30 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.00 | | |
| A-4 | NE Parking and Drive Aisles | 0.50 | 0.63 | 0.66 | 0.69 | 0.79 | 76.3 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.40 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.10 | | |
| A-5 | SE Parking and Drive Aisles | 0.25 | 0.69 | 0.72 | 0.75 | 0.82 | 83.5 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.21 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.03 | | |
| A-6 | Access Drives and Public Improvements | 0.38 | 0.45 | 0.48 | 0.53 | 0.70 | 54.5 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.21 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.17 | | |
| Onsite Composite | | 2.26 | 0.65 | 0.67 | 0.71 | 0.80 | 78.0 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.30 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 1.53 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.43 | | |
| OFF-1 | NW Landscaping | 0.04 | 0.03 | 0.08 | 0.17 | 0.50 | 5.0 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.04 | | |
| OFF-2 | NE Landscaping | 0.04 | 0.03 | 0.08 | 0.17 | 0.50 | 5.0 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.04 | | |
| OFF-3 | North of Existing Retaining Wall | 0.58 | 0.03 | 0.08 | 0.17 | 0.50 | 5.0 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.58 | | |
| Offsite Composite | | 0.66 | 0.03 | 0.08 | 0.17 | 0.50 | 5.0 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.00 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 0.66 | | |
| Site Composite | | 2.92 | 0.51 | 0.54 | 0.58 | 0.73 | 61.5 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 0.30 | 0.79 | 0.81 | 0.83 | 0.87 | 95 | 1.53 | 0.03 | 0.08 | 0.17 | 0.50 | 5 | 1.09 | | |

SITE DEVELOPMENT PLAN

LOT 2A-2, BLOCK 4, PROMENADE AT CASTLE ROCK FILING NO. 1, AMENDMENT NO. 27
PART OF THE NORTH HALF OF SECTION 27, TOWNSHIP 7 SOUTH, RANGE 67 WEST OF THE 6TH P.M.,
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO.

DEVELOPED DRAINAGE LEGEND

- PROPERTY BOUNDARY
- EXISTING EASEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED BASIN DELINEATION
- EXISTING SANITARY SEWER
- EXISTING WATER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND COMM.
- EXISTING GAS
- PROPOSED STORM SEWER
- EXISTING STORM INLET AND MANHOLE
- PROPOSED STORM INLET AND MANHOLE
- PROPOSED DRAINAGE FLOW ARROWS
- DESIGN POINT
- BASIN DESIGNATION
- 5-YEAR RUNOFF COEFFICIENT
- 100-YEAR RUNOFF COEFFICIENT
- BASIN AREA IN ACRES

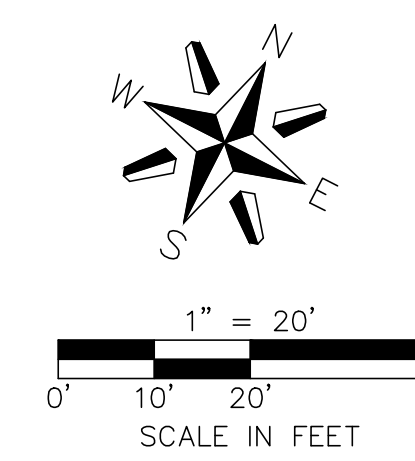
FLOOD ZONE:

PER THE FLOOD INSURANCE MAP (FIRM) NUMBER 08101C0491D EFFECTIVE AS OF AUGUST 15, 2019, THE PROPOSED PROJECT LOCATION IS LOCATED WITHIN "ZONE X". "ZONE X" HAS A 0.2% CHANCE OF FLOOD.

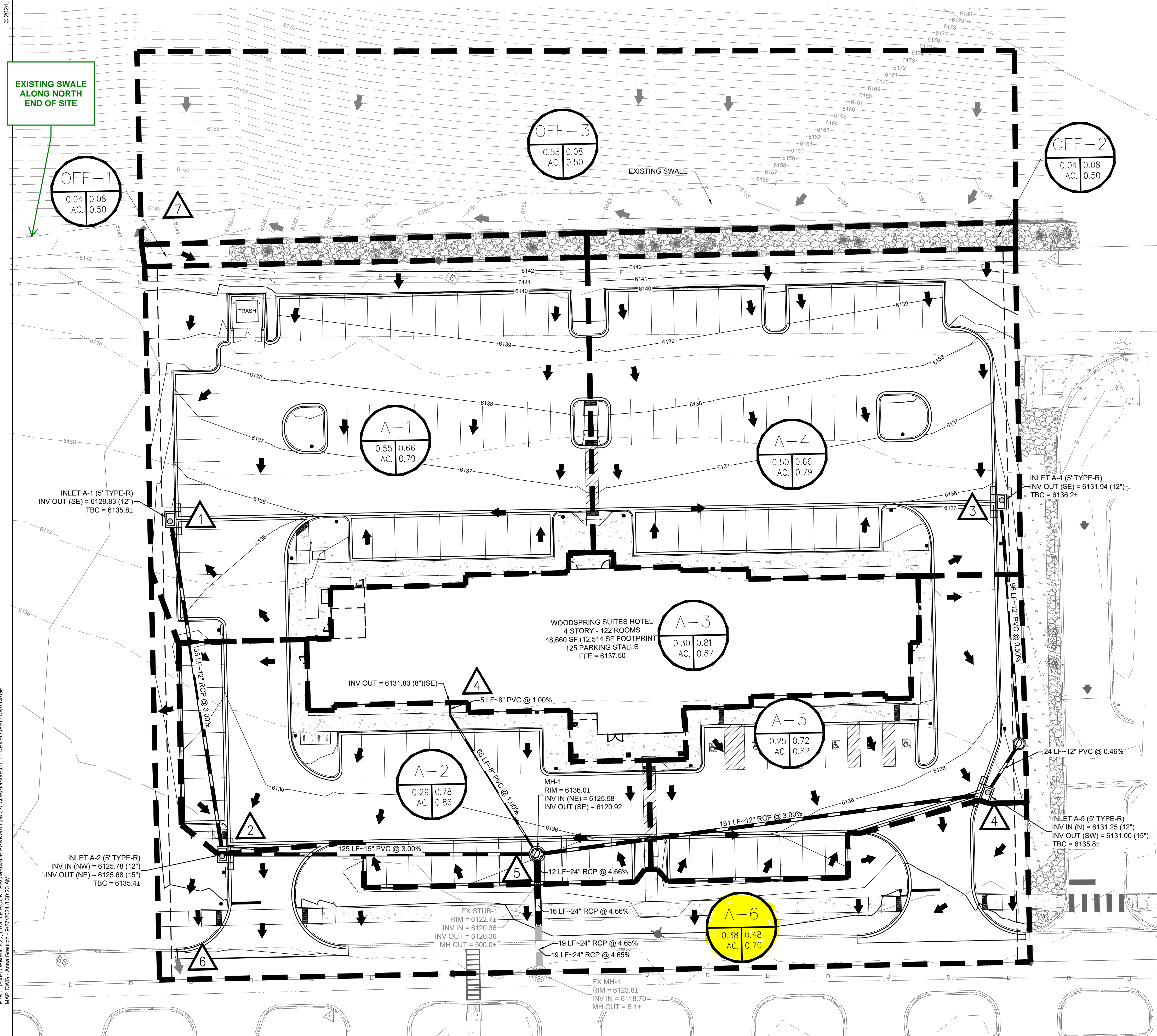
BENCHMARK:

CONTOURS SHOWN HEREON AT 1 FOOT INTERVALS BASED ON THE NORTHWEST PROPERTY CORNER OF THE SITE. MONUMENTED WITH A REBAR ATTACHED WITH A YELLOW PLASTIC CAP PLS 12933 HAVING AN ELEVATION OF 4847.40' (NAVD88 DATUM).

| DEVELOPED RUNOFF SUMMARY TABLE | | | | | | | |
|--------------------------------|-----------------|---------------------|------------------|-------------|------|--------------|------------|
| DESIGN POINT | TRIBUTARY BASIN | TRIBUTARY AREA (AC) | % IMPERVIOUSNESS | COEFFICIENT | | TOTAL RUNOFF | |
| | | | | C5 | C100 | Q5 (CFS) | Q100 (CFS) |
| | OFF-1 | 0.04 | 5.0 | 0.08 | 0.50 | 0.01 | 0.17 |
| | A-1 | 0.55 | 76.7 | 0.66 | 0.79 | 1.72 | 3.75 |
| 1 | OFF-1+A-1 | | | | | 1.73 | 3.91 |
| | A-2 | 0.29 | 91.4 | 0.78 | 0.86 | 1.11 | 2.21 |
| 2 | A-2 + DP2 | | | | | 2.81 | 6.06 |
| | A-4 | 0.50 | 76.3 | 0.66 | 0.79 | 1.51 | 3.31 |
| | OFF-2 | 0.04 | 5.0 | 0.08 | 0.50 | 0.02 | 0.18 |
| 3 | A-4 + OFF-2 | | | | | 1.52 | 3.47 |
| | A-5 | 0.25 | 83.5 | 0.72 | 0.82 | 0.85 | 1.78 |
| 4 | A-5+DP3 | | | | | 2.33 | 5.16 |
| | A-3 | 0.30 | 95.0 | 0.81 | 0.87 | 1.18 | 2.30 |
| 5 | A-3 + DP2 + DP4 | | | | | 6.18 | 13.22 |
| | A-6 | 0.38 | 54.5 | 0.48 | 0.70 | 0.77 | 2.05 |
| 6 | A-6 + DP5 | | | | | 6.51 | 14.34 |
| | OFF-3 | 0.58 | 5.0 | 0.08 | 0.17 | 0.21 | 0.82 |
| 7 | OFF-3 | | | | | 0.21 | 0.82 |



EXISTING SWALE ALONG NORTH END OF SITE



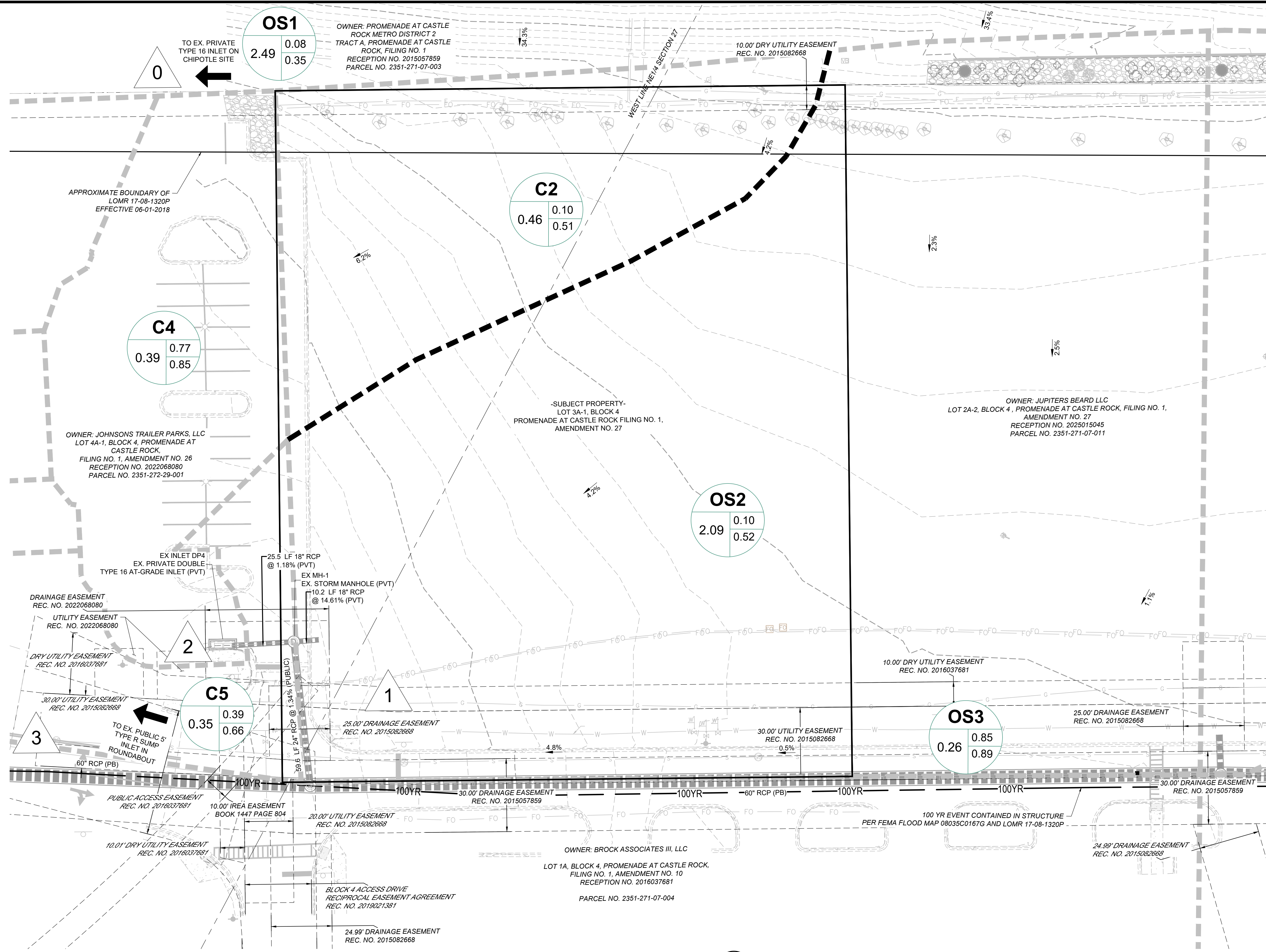
© 2024. ALL RIGHTS RESERVED.
 P:\KT DEVELOPMENT\CO. CASTLE ROCK - PROMENADE PARKWAY\08 CAD\DRAWING\01 - DEVELOPED DRAINAGE MAP.DWG - Anna Greulich - 5/31/2024 8:30:23 AM

| | |
|--|-----------|
| DATE | |
| BY | |
| REVISION | |
| No. | |
| PRELIMINARY NOT FOR CONSTRUCTION | |
| K2 CIVIL CONSULTANTS | |
| | |
| WOODSPRINGS SUITES - CASTLE ROCK PROMENADE PARKWAY, CASTLE ROCK, CO DEVELOPED DRAINAGE MAP | |
| PROJECT NO: | KTD008.01 |
| DESIGNED BY: | KH |
| DRAWN BY: | AG |
| DATE: | 5/3/2024 |
| D.1 | |

SITE DEVELOPMENT PLAN
WOODSPRING SUITES - CASTLE ROCK
LOT 2A-2, BLOCK 4, PROMENADE AT CASTLE ROCK
FILING NO. 1, AMENDMENT NO. 27
TOWN OF CASTLE ROCK PROJECT NO. SDP24-0018



Appendix E: Site Drainage Maps



LEGEND

| | EXISTING | PROPOSED |
|-----------------------------|----------|----------|
| PROPERTY LINE | --- | --- |
| EASEMENT LINE | --- | --- |
| RIGHT OF WAY | --- | --- |
| CENTERLINE | --- | --- |
| FENCE | X-X | X-X |
| OVERHEAD ELECTRIC | OHE | OHE |
| WATER MAIN | W | W |
| SANITARY MAIN | S | S |
| STORM SEWER | SS | SS |
| INDEX CONTOUR | --- | --- |
| INTER. CONTOUR | --- | --- |
| FIRE LANE STRIPING | --- | --- |
| DELIVERY STRIPING | --- | --- |
| ADA PATH | --- | --- |
| RETAINING WALL | --- | --- |
| LIMITS OF DISTURBANCE | --- | --- |
| MAINTENANCE ACCESS (GRAVEL) | --- | --- |
| LANDSCAPING | --- | --- |
| PERMEABLE PAVERS | --- | --- |
| CONCRETE PAVEMENT | --- | --- |
| RIP RAP | --- | --- |
| GATE VALVE | + | + |
| HYDRANT | + | + |
| WELL | ⊕ | ⊕ |

DRAINAGE LEGEND

| | EXISTING | PROPOSED |
|--------------|----------|----------|
| BASIN ID | OS1 | OS2 |
| DESIGN POINT | 3 | 3 |
| BASIN LINE | --- | --- |

- NOTES:
 1. ALL PROPOSED STORM INFRASTRUCTURE IS PRIVATE AND SHALL BE MAINTAINED BY OWNER, UNLESS OTHERWISE NOTED.
 2. ALL EXISTING UTILITIES AND SITE FEATURES TO REMAIN, UNLESS OTHERWISE NOTED.

SUMMARY RUNOFF TABLE

| BASIN | AREA (ac) | % IMP. | C _s | C ₁₀₀ | Q _s (cfs) | Q ₁₀₀ (cfs) |
|-------------|-----------|--------|----------------|------------------|----------------------|------------------------|
| OS1 | 2.49 | 2.8 | 0.06 | 0.49 | 0.5 | 7.2 |
| OS2 | 2.09 | 8.2 | 0.10 | 0.52 | 0.8 | 6.8 |
| OS3 | 0.26 | 100.0 | 0.85 | 0.89 | 1.1 | 2.0 |
| C2 | 0.46 | 7.7 | 0.10 | 0.51 | 0.2 | 1.3 |
| C4 | 0.39 | 89.9 | 0.77 | 0.85 | 1.5 | 2.8 |
| C5 | 0.35 | 44.0 | 0.39 | 0.66 | 0.7 | 2.0 |
| GRAND TOTAL | 6.04 | 0.2 | 0.17 | 0.55 | 4.8 | 22.1 |

CUMULATIVE DESIGN POINT SUMMARY TABLE

| DESIGN POINT | CONTRIBUTING BASINS | ΣQ _s (cfs) | ΣQ ₁₀₀ (cfs) | Tributary Area (ac) | Weighted % Impervious |
|--------------|---------------------|-----------------------|-------------------------|---------------------|-----------------------|
| 0 | OS1 | 0.5 | 7.2 | 2.49 | 2.8 |
| 1 | OS2 | 0.8 | 6.8 | 2.09 | 8.2 |
| 2 | C2, C4 | 1.3 | 3.5 | 0.85 | 45.3 |
| 3 | C5, DP1, OS3 | 1.7 | 10.7 | 2.70 | 21.6 |

DRAWN BY: CVW JOB DATE: 11/4/2025 BAR IS ONE INCH ON OFFICIAL DRAWINGS.
 APPROVED: KMH JOB NUMBER: 2502707
 CAD DATE: 11/4/2025 IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.
 CAD FILE: J:\2025\2502707\CAD\DWG\CID\Drainage\EX_Drainage

| NO. | DATE | BY | REVISION DESCRIPTION |
|-----|------|----|----------------------|
| | | | |
| | | | |

LOT 3A-1, BLK 4, PROMENADE AT CASTLE ROCK FIL. 1
 BURGERWORKS, LLC
 CASTLE ROCK, COLORADO

DRAINAGE MAPS
 EXISTING DRAINAGE MAP
 SHEET DR01 01

LEGEND

| | EXISTING | PROPOSED |
|-----------------------------------|-----------------|-----------------|
| PROPERTY LINE | --- | --- |
| EASEMENT LINE | --- | --- |
| RIGHT OF WAY | --- | --- |
| CENTERLINE | --- | --- |
| CHAIN LINK FENCE | --- --- --- --- | --- --- --- --- |
| WOODEN FENCE | --- --- --- --- | --- --- --- --- |
| ROD IRON FENCE | --- --- --- --- | --- --- --- --- |
| GUARDRAIL | --- --- --- --- | --- --- --- --- |
| OVERHEAD ELECTRIC | --- --- --- --- | --- --- --- --- |
| UNDERGROUND ELECTRIC | --- | --- |
| GAS | --- | --- |
| CURB & GUTTER (CATCH/SPILL) | --- | --- |
| FIBER OPTIC LINE | --- | --- |
| WATER LINE | --- | --- |
| STORM SEWER | --- | --- |
| SANITARY SEWER | --- | --- |
| ADA PATH | --- | --- |
| INTERSECTION SAFETY TRIANGLE LINE | --- | --- |

| | EXISTING | PROPOSED |
|------------------------|----------|----------|
| STORM SEWER | | |
| MANHOLE | ⊙ | ⊙ |
| STORM INLET | ⊙ | ⊙ |
| RIPRAP | ⊙ | ⊙ |
| SANITARY SEWER | | |
| CLEAN OUT | ⊙ | ⊙ |
| MANHOLE | ⊙ | ⊙ |
| WATER | | |
| FIRE HYDRANT | ⊙ | ⊙ |
| WATER VALVE | ⊙ | ⊙ |
| DRY UTILITIES | | |
| LIGHT POLE (PROPOSED) | ⊙ | ⊙ |
| LIGHT POLE (EXISTING) | ⊙ | ⊙ |
| MISCELLANEOUS | | |
| SIGN | ⊙ | ⊙ |
| BOLLARD | ⊙ | ⊙ |
| ACCESSIBLE PARKING | ⊙ | ⊙ |
| ADA DETECTABLE WARNING | ⊙ | ⊙ |

DRAINAGE LEGEND

| | EXISTING | PROPOSED |
|--------------|----------|----------|
| BASIN ID | ⊙ | ⊙ |
| DESIGN POINT | ⊙ | ⊙ |
| BASIN LINE | --- | --- |

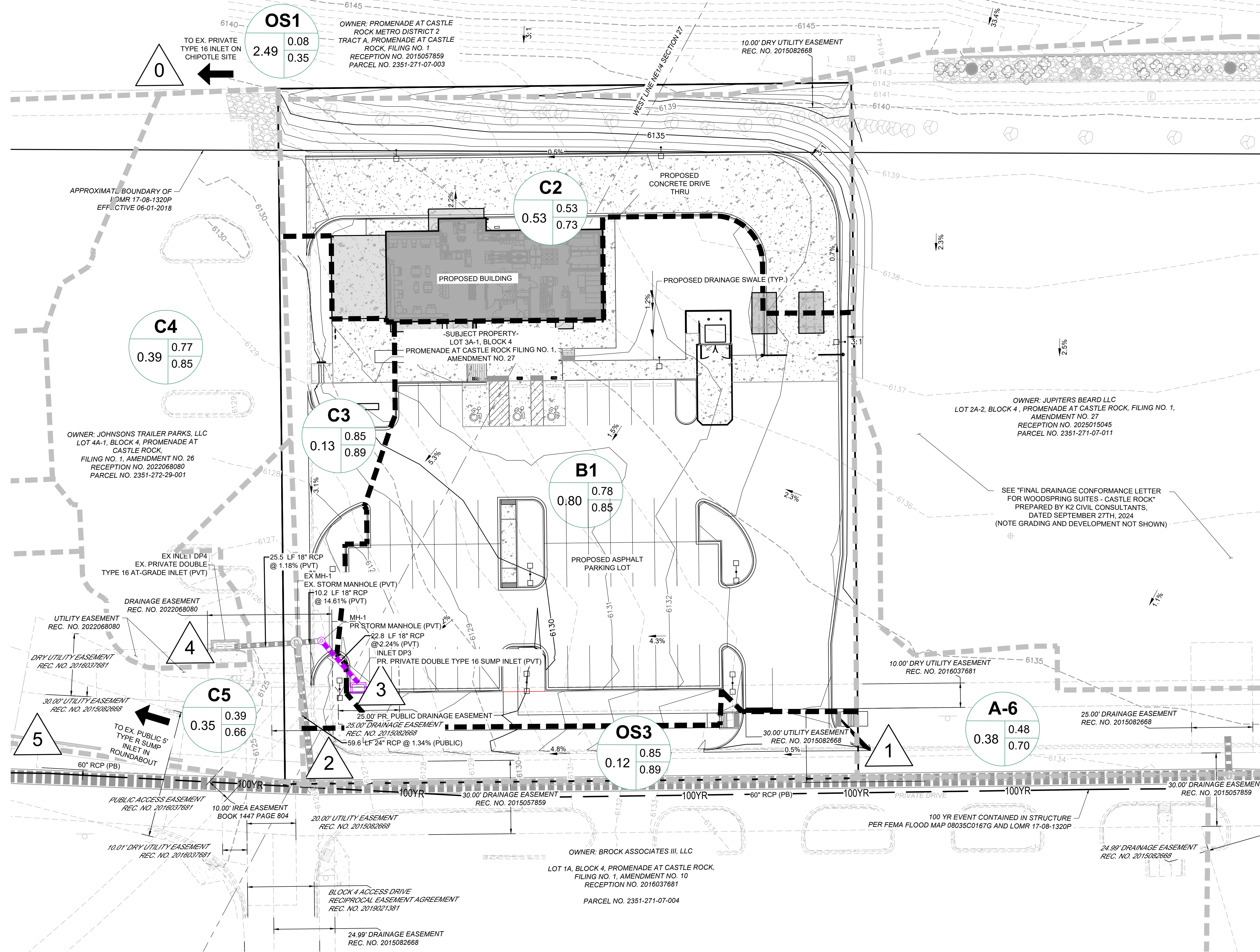
| | EXISTING | PROPOSED |
|------------|----------|----------|
| OS2 | ⊙ | ⊙ |
| 0.69 | 0.81 | 0.87 |
| 3 | ⊙ | ⊙ |

SUMMARY RUNOFF TABLE

| BASIN | AREA (ac) | % IMP. | C _s | C ₁₀₀ | Q _s (cfs) | Q ₁₀₀ (cfs) |
|--------------------|-------------|--------------|----------------|------------------|----------------------|------------------------|
| OS1 | 2.49 | 2.8 | 0.06 | 0.49 | 0.5 | 7.2 |
| A6 | 0.38 | 56.2 | 0.49 | 0.71 | 0.9 | 2.1 |
| OS3 | 0.12 | 77.2 | 0.66 | 0.80 | 0.4 | 0.8 |
| B1 | 0.80 | 91.4 | 0.78 | 0.85 | 3.2 | 5.9 |
| C2 | 0.42 | 52.5 | 0.46 | 0.70 | 0.8 | 1.8 |
| C3 | 0.05 | 100.0 | 0.85 | 0.89 | 0.2 | 0.4 |
| C4 | 0.39 | 89.9 | 0.77 | 0.85 | 1.5 | 2.8 |
| C5 | 0.35 | 44.0 | 0.34 | 0.64 | 0.7 | 2.0 |
| GRAND TOTAL | 4.63 | 36.2% | 0.33 | 0.63 | 7.3 | 20.9 |
| GRAND TOTAL | 5.01 | 37.7% | 0.34 | 0.64 | 8.2 | 23.0 |

CUMULATIVE DESIGN POINT SUMMARY TABLE

| DESIGN POINT | CONTRIBUTING BASINS | Q _s (cfs) | Q ₁₀₀ (cfs) | Tributary Area (ac.) | Weighted % Impervious |
|--------------|-----------------------------|----------------------|------------------------|----------------------|-----------------------|
| 0 | OS1 | 0.5 | 7.2 | 2.49 | 2.8 |
| 1 | A6 | 0.9 | 2.1 | 0.38 | 56.2 |
| 2 | OS3 | 0.4 | 0.8 | 0.12 | 77.2 |
| 3 | B1 | 3.2 | 5.9 | 0.80 | 91.4 |
| 4 | C2, C4 | 1.9 | 3.9 | 0.81 | 70.4 |
| 5 | DP1, OS3, C3, C4 FLOWBY, C5 | 1.8 | 6.2 | 0.90 | 56.8 |



DRAWN BY: CVW JOB DATE: 1/21/2026
 APPROVED: KMH JOB NUMBER: 2502707
 CAD DATE: 1/23/2026
 CAD FILE: J:\2025\2502707\CAD\DWG\CIDrainage\PR_Drainage

| NO. | DATE | BY | REVISION DESCRIPTION |
|-----|------|----|----------------------|
| | | | |

HRGreen
 HR GREEN - COLORADO SPRINGS
 1975 RESEARCH PARKWAY, SUITE 160
 COLORADO SPRINGS CO 80919
 PHONE: 719.300.4140
 FAX: 844.273.1057

LOT 3A-1, BLK 4, PROMENADE AT CASTLE ROCK FIL. 1
 BURGERWORKS, LLC
 CASTLE ROCK, COLORADO

DRAINAGE MAPS
 PROPOSED DRAINAGE MAP
 SHEET DR02 02