BRIGHTLIGHTER
ENGINEERING

PHASE I DRAINAGE REPORT

PDP24-0002
RIDGEVIEW TOWN CENTER
895 NORTH RIDGE RD
CASTLE ROCK, COLORADO 80104
DOUGLAS COUNTY

PREPARED BY:

Brightlighter Engineering LLC
1 Broadway, Ste. A225
Denver, CO 80203
Jesse Donovan, PE

PREPARED FOR:
George Mattione
53 Charlou Circle,
Cherry Hills Village, CO 80111

Original Submittal: August 2023
Revised: June 2025

Engineer's Certification:

I affirm that this report and plan for the Phase I drainage design of RidgeView Town Center 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: _____

Charles Keener Jr., P.E.
Registered Professional Engineer
State of Colorado No. 58234

Developer's Certification:

George Mattione hereby certifies that the drainage facilities for the RidgeView Town Center 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 Castle Rock reviews drainage plans pursuant to the Municipal Code; but cannot, on behalf of the Ridge Road Development, guarantee that final drainage design review will absolve Parker Center, LLC. and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

_____

Name of Developer

_____

Authorized Signature

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RIDGEVIEW TOWN CENTER
PHASE I DRAINAGE REPORT

I. INTRODUCTION

A. Site Location

RidgeView Town Center, located at 895 North Ridge Road, (the "Project" and/or "Site"), is located in the Town of Castle Rock, Douglas County. The project is bound to the north by a single-family residence, to the east by Ridge Road, and to the south and west by undeveloped land.

By rectangular survey coordinates the project is located in the northwest quarter of Section 7, Township 8 South, Range 66 West of the 6th Principal Meridian, and in the northeast quarter of Section 12, Township 8 South, Range 67 West of the 6th Principal Meridian, Douglas County, State of Colorado.

Figure 1: Vicinity Map

B. Site Description

The project site is located in Castle Rock, Colorado and is in a suburban area. More specifically the lot is approximately 1000 feet south of the intersection of State Highway 86 and North Ridge Road. The Site is accessed via North Ridge Road.

The entire project Site encompasses approximately ±10.18 acres. Major adjacent land areas do not drain onto the project site. Most onsite existing topography slopes north and east to the North Ridge Road public right-of-way at grades ranging from 2% to 35%. The average grade is approximately 5%. There is a significant cliff ridge that runs parallel to the western property line and directs runoff from approximately 30% of the Site to flow west. There is approximately 30 feet of fall on the site with the high point being the southeast corner and the low point at the northwest corner. Currently, the entire Site sheet flows into the North Ridge Road right-of-way where it is collected by existing inlets. These flows are ultimately discharged into the McMurdo Gulch.

Predominant soil types consist of Hydrologic Soil Group Type C, as can be seen in the soil map attached to this report.

The project site falls within floodplain Zone X as defined per FEMA FIRM Map Panel 08035C0302G dated 03/16/2016.

Groundwater elevations were reported from the geotechnical investigation dated February 7th, 2022 by Cole Garner Geotechnical. Borings from this investigation indicated groundwater levels to be 31 feet below ground surface in one of the boreholes. Many boreholes encountered drill refusal from bedrock before they encountered any groundwater.

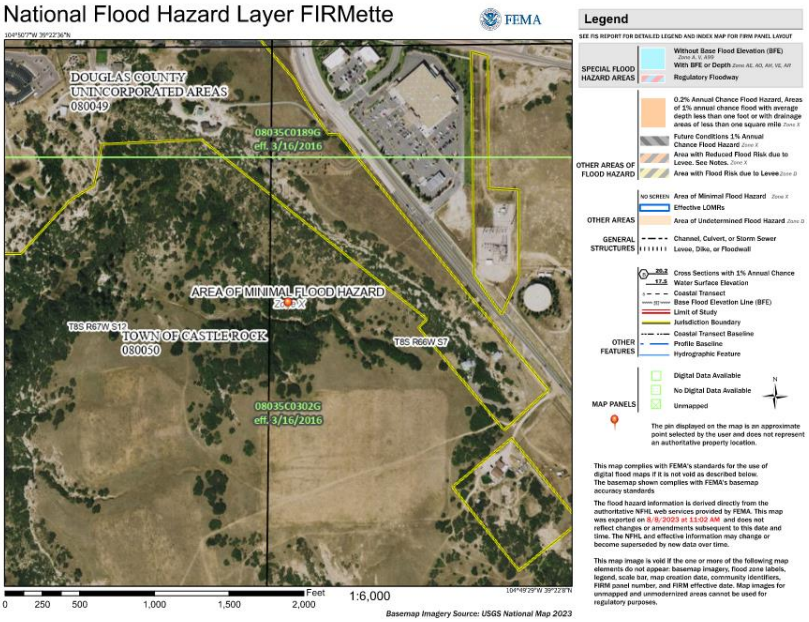

Figure 2: FIRM Map, March 16th, 2016 (Courtesy FEMA)

C. Proposed Project Description

RidgeView Town Center will consist of multiple commercial and retail buildings situated on approximately 10.18-acres, with accompanying parking, drives, access points, curb, gutter, retaining walls, landscaping, and utilities. One access point to the site will be proposed from North Ridge Road aligning with the intersection of the adjacent King Soopers.

Grading will move runoff away from the buildings in conformance with the geotechnical report. The downspouts from the proposed buildings will be piped to storm inlets or daylighted to onsite curb and gutter. Storm sewer and full capture inlets will be placed around the site to transport runoff to the proposed pond located in the northeast corner of the subject property. The portion of flows on the west of the Site's significant ridge will continue flowing west per historic patterns and shall remain undisturbed.

Regional detention is provided for the existing Site per the Phase III Drainage Report for Founders Marketplace, Filing No.1, Block 1. However, the additional runoff from the developed site was not accounted for in the report, and onsite detention shall be provided for this additional runoff. Runoff will be released from the Site at rates equal to or less than the rates specified in this report. See Appendix B for excerpts from this report.

McMurdo Gulch is the initial receiving waters which ultimately discharges into the Cherry Creek Basin.

D. Flood Hazard and Drainage Studies Relevant to Site

The Site is not located within or adjacent to any major drainageways.

The Phase III Drainage Report for Founders Marketplace, Filing No.1, Block 1 includes a portion of the project site area. This report was prepared for the retail development adjacent to the project site and shall be referenced in the detention design of the subject property.

II. DRAINAGE BASINS AND SUB-BASINS

A. Major Drainage Basins

There are no major drainage basins that traverse the project site.

B. Pre-Development Sub-basins

The existing drainage pattern is primarily from the southeast to the northwest. The Site consists of three existing sub-basins, EX-1, EX-2, and EX-3. EX-1 is on the south and west side of the Site's

significant ridge. Runoff from this basin sheet flows directly west offsite and is eventually discharged into the East Plum Creek.

Basins EX-2 and EX-3 are both on the east side of the Site's ridge. Runoff from these basins sheet flows east and north into the North Ridge Road right-of-way. From here, it is collected at the existing Type R-10 inlets located at Design Points EX2 and EX3. Discharge is then conveyed via storm sewer to regional detention and then discharged into McMurdo Gulch. The ultimate receiving waters for Basins EX-2 and EX-3 is the Cherry Creek. See Appendix E for the existing drainage map and specific characteristics of each basin.

C. Developed Sub-basins

The developed sub-basins are illustrated on the proposed drainage map, attached in the Appendix E of this report. The developed project site will be composed of roofs, drives, parking, walks, retaining walls, patio areas, and landscaped areas.

The subject property has been divided into four (4) sub-basins.

Sub-basins A-1, OS-2, and OS-3 contain the disturbed project site. Sub-basin OS-1 is the west side of the property which is undeveloped and drains via historic patterns.

Sub-basin A-1 consists of roofs, drives, parking, walks, retaining walls, patio areas, and landscaped areas. This sub-basin is collected via inlets, storm sewers, and curb and gutter; runoff is transported to the proposed detention pond at the northeast corner of the project site. Storm sewer and inlet configuration, along with hydraulic modeling will be provided with the Phase III drainage report. The effect on capacity of the receiving system at Founders Marketplace with the development will also be provided with the Phase III drainage report.

Sub-basins OS-2 and OS-3 are basins that will not be captured and shall leave the site un-detained. Both basins are landscaped areas which boarder the property boundary and are not captured due to physical constraints. These basins qualify for exclusion in the Cherry Creek watershed, per section 72.7.2 (c) 4 (f) and defined in the water quality worksheet provided in the appendix of this report.

Runoff volumes were determined using MHFD UD-Rational spreadsheet. See Appendix C for the hydrologic calculations and Appendix E for the proposed drainage map.

III. DRAINAGE DESIGN CRITERIA

The criteria used for this study is from the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual (SDDTC), Department of Public Health and Environment Water Quality

Control Commission Cherry Creek Reservoir Control Regulation 5 CCR 1002-7, and Mile High Flood District (MHFD). Criteria and standards set forth in the current Urban Storm Drainage Manual published by MHFD will be utilized as a guide in designing the storm drainage system when the "SDDTC" does not provide specific guidance. Peak runoff values were calculated using the rational method:

Q = CIA, where

Q = Storm runoff in cubic feet per second (cfs)

C = Rainfall coefficients - ratio runoff to rainfall

I = Rainfall intensity in inches per hour

A = Drainage area in acres

The minor (5-year) and major (100-year) storm events were calculated using the Rainfall Intensity Frequency Values from the SDDTC. The runoff coefficient values were taken from the MHFD Criteria Manual. A Composite "C" value has been calculated for the site. Runoff Coefficients for each drainage sub-basin were calculated using the MHFD UD-Rational Workbook. Time of Concentration (Tc) was calculated based on MHFD equations (3-3) and (3-4) and the MHFD Velocity Chart. The 5-year and 100-year frequency runoff rates for historic and developed conditions are summarized in the Appendix C.

A. Areas in Flood Hazard Zone

No portion of the Site is located within a flood hazard boundary zone. See FEMA flood map 08035C0302G in Appendix A for details.

B. Streets

No new public streets are being constructed as part of this project. Minor improvements along the west side of Ridge Road may be required along the Site frontage.

C. Open Channel Flow

No open channels are proposed as part of this site development.

D. Storm Sewers and Culverts

The project site will have a private storm sewer network to carry flows to the detention facility at the northeast corner of the subject property. A network of inlets and downspouts will collect water from the buildings, low spots, parking, and landscape areas and transport them to these inlets via storm sewer.

In the Phase III Drain Report, Storm Sewer and Sanitary Analysis will be used to calculate the hydraulic and energy grade line for each onsite section of pipe and their corresponding structures.

E. State Compliance with Applicable Criteria

Water quality treatment for the Site is addressed with an extended detention basin, and approved method by MHFD. The extended detention basin will meet the State of Colorado drain time requirements as defined in CRS 37-92-602(8).

IV. DRAINAGE FACILITY DESIGN

A. Hydraulics

All proposed onsite storm sewer and inlet capacities will be analyzed in the Phase III Drainage Report. In addition, offsite storm sewer capacities shall be analyzed using information presented in the Founders Marketplace Drainage Report. The Site will be design in accordance with this approved report.

B. Stormwater Conveyance Facilities

In the developed condition, runoff from the sub-basins is being transported by ditches, culverts, and inlets and transported to proposed extended detention basin.

C. Stormwater Storage Facilities

Approximately 6.91-acres of the Site will be conveyed and treated by the extended detention at the northeast corner of the subject property. The proposed detention pond shall be designed in conformance with the Founders Marketplace report to ensure no adverse impact to downstream infrastructure. Release rates and water quality drains times shall be designed in accordance with the City of Castle Rock Storm Drainage Design and Technical Criteria Manual Chapter 13.

A portion of 0.70-acres will be un-detained due to site and topography constraints, these areas consist of tree lawn a. The remaining 2.58-acres of the Site will be undisturbed and will therefore be released un-detained to the west where it will follow historic drainage patterns.

Preliminary calculations of the site have determined a required detention volume of 0.958 ac-ft or 41,730 cu-ft. This volume includes water quality capture volume, excessive urban runoff volume, and 100-year runoff volume.

The proposed drainage map illustrates preliminary grading of the site and the general required detention footprint. This map is presented in the appendix of this report.

The pond shall release runoff at 90% of the historic rate, and in accordace with the Founders Marketplace report. An outlet structure with water quality orifice plate shall be placed along the east bank of the detention pond and discharge via pipe and restrictor plate to the existing storm sewer within Ridge Road right-of-way. Pipe and capacity analysis shall be provided with the Phase III Drainage report. Release rates shall be designed using MHFD software.

D. Emergency Overflow

Emergency spillway shall be provided with the required freeboard, discharging east into the Ridge Road right-of-way.

E. Water Quality

A permanent post-construction BMP for water quality shall be provided in the proposed detention pond. Water quality shall be achieved using orifice plates maintaining minimum drains times per CRS 37-92-602(8).

F. Low Impact Development Practices

To the extent possible, low impact development practices shall be implemented on the project site. Those practices include capture and transport of over 95% of the developed site to the existing detention area. Landscaped areas are graded to low points around the project site, and grass swales are utilized prior to collection where possible. Hardscape, including walks and asphalt paving, drain across landscaped areas as sheet flow for water quality when possible.

G. Ground Water

Groundwater elevations were reported from the geotechnical investigation dated February 7th, 2022 by Cole Garner Geotechnical. Borings from this investigation indicated groundwater levels to be 31-ft below ground surface in one boring.

V. OPERATIONS AND MAINTENANCE

The extended detention basin will be private and place within a tract. The maintenance of the associated facilities and appurtenances will be the responsibility of the HOA or metro district established for development of the site. Access will be provided through the project site for inspection by authorities having jurisdiction, established via plat or separate document.

VI. CONCLUSIONS

This report has been prepared in accordance with Mile High Flood District and Town of Castle Rock Storm Drainage Design and Technical Criteria Manual. It outlines the routing of the 5-year and 100-year storm events through the project drainage system and the conveyance of flows to the existing regional detention pond. The proposed improvements provide adequate protection to this Site without adverse impacts on adjoining upstream and downstream properties.

VII. VARIANCES

At the current time, no variances are being requested for the development of the Site.

REFERENCES

1. *Town of Castle Rock Storm Drainage Design and Technical Criteria Manual, Revised June 2019.*

2. *Urban Storm Drainage Criteria Manual, Mile High Flood District, Volumes 1-3, Denver, CO, Latest Version.*

3. *Natural Resources Conservation Service, Web Soil Survey 2.0, accessed August 8th, 2023.*

4. *Federal Emergency Management Agency, February 16, 2016, Flood Insurance Rate Map.*

5. *Preliminary Geotechnical Engineering Report, Cole Garner Geotechnical, February 7th, 2022.*

6. *Phase III Drainage Report for Founders Marketplace Filing No. 1, Block 1, CLC Associates, Inc., November 23, 2004.*

7. *Department of Public Health and Environment Water Quality Control Commission Cherry Creek Reservoir Control Regulation 5 CCR 1002-7*

APPENDIX A: VICINITY MAP, FIRM MAP, NRCS SOIL REPORT

895 North Ridge Road – Vicinity Map

National Flood Hazard Layer FIRMette

FEMA

104°50'7"W 39°22'36"N

104°49'29"W 39°22'8"N

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

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

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

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

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

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/8/2023 at 11:02 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Castle Rock Area, Colorado

August 8, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,680 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 15, Sep 1, 2022

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

Date(s) aerial images were photographed: Jun 9, 2021—Jun 12, 2021

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FoD	Fondis clay loam, 3 to 9 percent slopes	4.7	100.0%
Totals for Area of Interest		**4.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Castle Rock Area, Colorado

FoD—Fondis clay loam, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: jqyp
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Fondis and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting

Landform: Ridges, buttes, mesas
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits over coarse-silty outwash derived from arkose

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: clay
H3 - 24 to 60 inches: sandy clay loam

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Minor Components

Kutch

Percent of map unit: 5 percent
Hydric soil rating: No

Englewood

Percent of map unit: 5 percent
Hydric soil rating: No

Denver

Percent of map unit: 4 percent
Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

References

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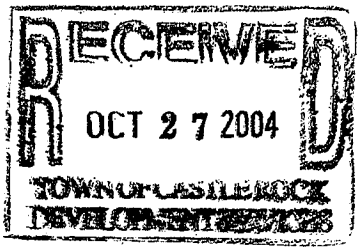
APPENDIX B: EXCERPTS FROM EXISTING REPORTS

1242



PHASE III DRAINAGE REPORT
FOR
FOUNDERS MARKETPLACE
FILING NO. 1, BLOCK 1
TOWN OF CASTLE ROCK, COLORADO

PHASE III DRAINAGE REPORT
FOR
FOUNDERS MARKETPLACE
FILING NO. 1, BLOCK 1
TOWN OF CASTLE ROCK, COLORADO

October 8, 2004
Revised November 23, 2004

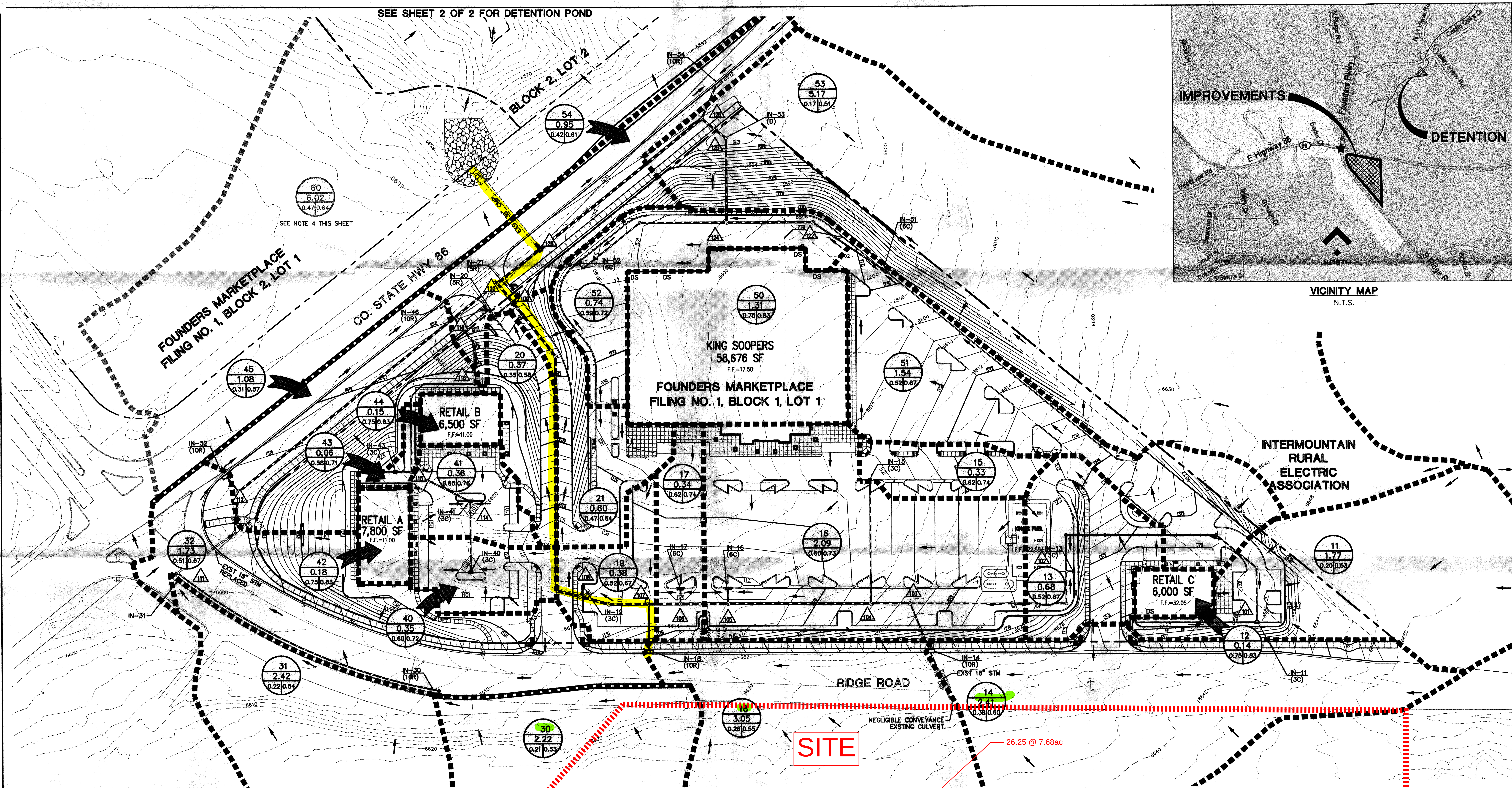
Prepared for:

Flamingo Partners LLC
7600 East Arapahoe Road, Ste. 211
Englewood, Colorado 80112
Ph. (303) 771-3344
Mr. Glen Smith, Manager

Prepared by:

Joel D. Tompkins, P.E.
CLC Associates, Inc.
8480 E. Orchard Rd, #2000
Greenwood Village, CO 80111

(CLC Job No. 03.0292)



LEGEND

PROPOSED		EXISTING
	STORM SEWER MANHOLE	●
▬	STORM SEWER INLET	⊂
━ ━ ━	STORM SEWER	───
─58─	CONTOUR LINE	— — —5845 —
■ ■ ■ ■ ■	DEVELOPED BASIN BOUNDARIES	
▬▬ ▬▬	HISTORIC BASIN BOUNDARIES	
▬ | ▬ | ▬	CONSTRUCTION PHASE LINE.	

T / 2.34 / 0.60 | 0.76 — DRAINAGE BASIN DESIGNATION; DRAINAGE BASIN ACRES; 100–YEAR RUNOFF COEFFICIENT; 5–YEAR RUNOFF COEFFICIENT

← DIRECTION OF RUNOFF

△4 DESIGN NODE

DS DOWNSPOUT

INLET KEY

ID	DESCRIPTION
D	CDOT TYPE D INLET
3C	THREE–FOOT TYPE 13C INLET
6C	SIX–FOOT TYPE 13C INLET
5R	FIVE–FOOT TYPE R INLET
10R	TEN–FOOT TYPE R INLET

BASIN SUMMARY TABLE

BASIN ID	TIME OF CONCENTRATION (MIN)	I_5 (IN/HR)	I_{100} (IN/HR)	AREA (ACRES)	C_5	C_{100}	Q_5 (CFS)	Q_{100} (CFS)
11	21.9	2.83	5.15	1.77	0.20	0.53	1.02	4.81
12	5.0	4.90	9.00	0.14	0.75	0.83	0.51	1.05
13	5.0	4.90	9.00	0.68	0.52	0.67	1.74	4.11
14	13.4	3.42	6.33	2.41	0.38	0.60	3.17	9.11
15	5.0	4.90	9.00	0.33	0.62	0.74	1.00	2.19
16	8.8	4.16	7.63	2.09	0.60	0.73	5.25	11.61
17	5.0	4.90	9.00	0.34	0.62	0.74	1.03	2.26
18	15.9	3.13	5.80	3.05	0.26	0.55	2.51	9.78
19	5.0	4.90	9.00	0.38	0.52	0.67	0.97	2.29
20	5.0	4.90	9.00	0.37	0.35	0.59	0.64	1.95
21	5.0	4.90	9.00	0.60	0.47	0.64	1.37	3.45
30	13.8	3.37	6.24	2.22	0.21	0.53	1.57	7.36
31	15.9	3.13	5.80	2.42	0.22	0.54	1.66	7.51
32	5.0	4.90	9.00	1.73	0.51	0.67	4.36	10.39
40	5.0	4.90	9.00	0.35	0.60	0.72	1.02	2.28
41	5.0	4.90	9.00	0.36	0.65	0.76	1.15	2.47
42	5.0	4.90	9.00	0.18	0.75	0.83	0.66	1.35
43	5.0	4.90	9.00	0.08	0.51	0.66	0.20	0.48
44	5.0	4.90	9.00	0.15	0.75	0.83	0.55	1.13
45	9.0	4.10	7.52	1.11	0.30	0.57	1.39	4.76
50	5.0	4.90	9.00	1.31	0.75	0.83	4.78	9.84
51	8.6	4.18	7.67	1.54	0.52	0.67	3.37	7.95
52	5.0	4.90	9.00	0.74	0.59	0.72	2.14	4.79
53	20.6	2.83	5.15	5.17	0.17	0.51	2.48	13.61
54	7.1	4.50	8.26	0.95	0.42	0.61	1.80	4.82

DESIGN NODE SUMMARY TABLE

NODE ID	TIME OF CONCENTRATION (MIN)	5–YEAR			100–YEAR		
		CA	I (IN/HR)	Q (CFS)	CA	I (IN/HR)	Q (CFS)
101	7.0	0.26	4.50	1.17	0.43	8.26	3.58
102	7.0	0.61	4.50	2.76	0.89	8.26	7.36
103	7.0	1.54	4.50	6.91	1.93	8.26	15.93
104	7.0	1.74	4.50	7.82	2.17	8.26	17.94
105	8.8	3.00	4.16	12.48	3.69	7.63	28.18
106	8.8	3.21	4.16	13.36	3.94	7.63	30.10
107	8.8	3.71	4.16	15.42	4.74	7.63	36.14
108	8.8	3.91	4.16	16.25	4.99	7.63	38.09
109	8.8	4.30	4.16	17.90	5.57	7.63	42.48
111	7.0	0.58	4.50	2.61	1.22	8.26	10.05
112	7.0	1.47	4.50	6.61	2.37	8.26	19.58
114	5.0	0.44	4.90	2.17	0.53	9.00	4.75
115	5.0	0.62	4.90	3.03	0.73	9.00	6.58
116	5.0	0.73	4.90	3.58	0.86	9.00	7.71
118	7.0	2.49	4.50	11.21	3.73	8.26	30.78
120	8.8	6.79	4.16	28.26	9.29	7.63	70.91
122	8.6	1.30	4.18	5.41	1.58	7.67	12.14
124	8.6	2.22	4.18	9.28	2.66	7.67	20.41
125	8.6	2.54	4.18	10.62	3.57	7.67	27.39
126	8.6	2.94	4.18	12.29	4.15	7.67	31.83
128	8.8	9.73	4.16	40.49	13.44	7.63	102.59

GENERAL NOTES

1. THIS PLAN IS INTENDED TO BE USED AS REFERENCE IN CONJUNCTION WITH THE FINAL DRAINAGE REPORT. DO NOT USE THIS PLAN FOR CONSTRUCTION.
2. ALL STORM SEWER CONSTRUCTION (Ie PIPE LINE, INLETS, MANHOLES) SHALL BE IN ACCORDANCE WITH TOWN OF CASTLE ROCK STANDARDS AND SPECIFICATIONS.
3. THE CONTACTOR SHALL PHASE GRADING ACTIVITIES TO LIMIT THE POSSIBILITY OF EROSION.
4. BASIN 60 IS TRIBUTARY TO THE EXISTING POND BEING UTILIZED FOR CONSTRUCTION EROSION CONTROL BUT IS NOT INCLUDED AS A DEVELOPED BASIN FOR ANY ANALYSIS OR DESIGN.

NORTH

60 0 30 60
SCALE: 1" =60'

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

CAUTION: NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE LOCAL UTILITY LOCATION CENTER AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

THIS DRAWING IS INTENDED
FOR REFERENCE ONLY
NOT TO BE USED FOR CONSTRUCTION

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COLORADO 80111
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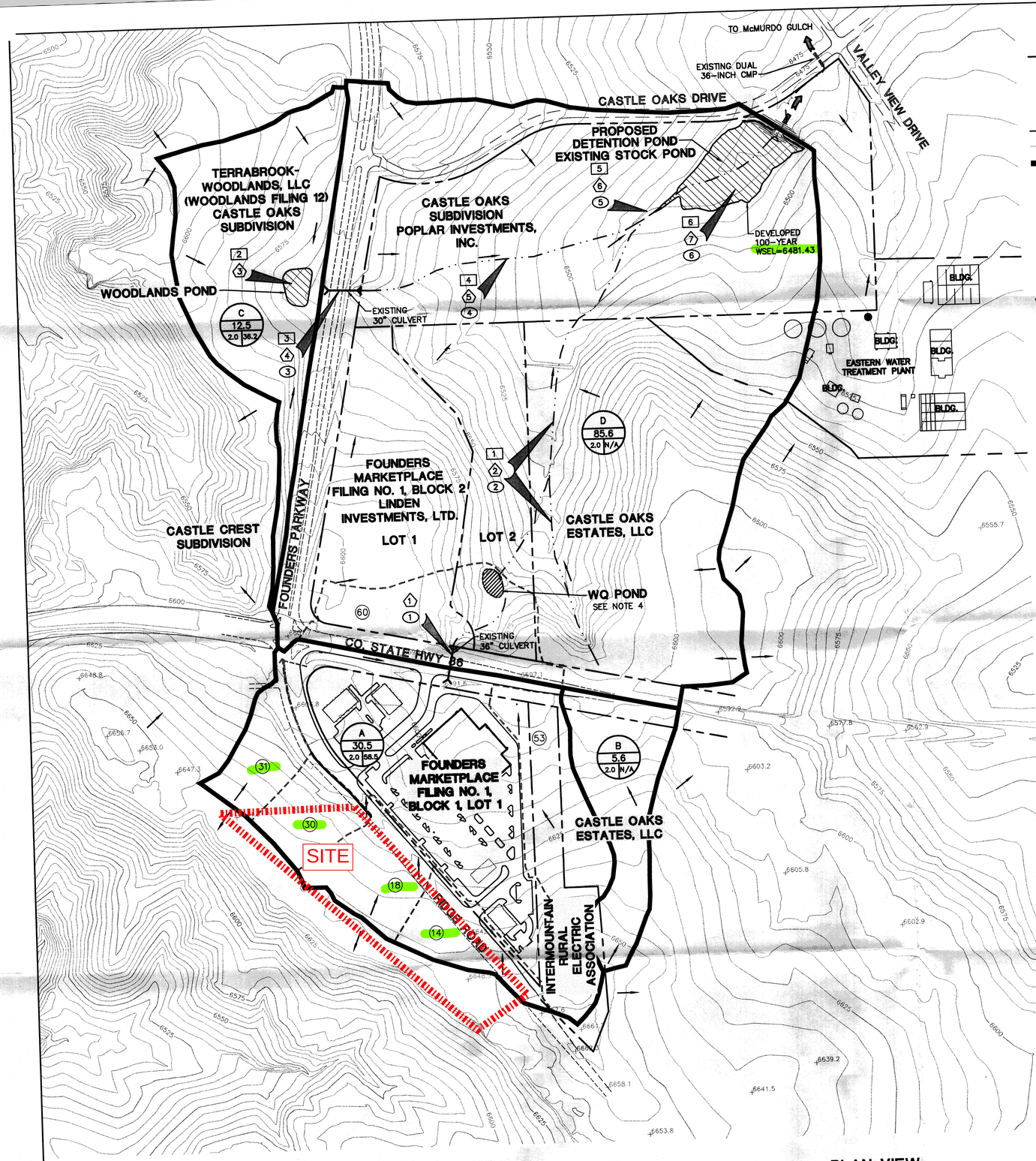
F 303 770 2349
CLCASSOC.COM
ARCHITECTURE
ENGINEERING PLANNING
LANDSCAPE ARCHITECTURE
LAND SURVEYING

DRAINAGE PLAN
FOUNDERS MARKETPLACE FILING NO. 1
BLOCK 1, LOT 1
SE CORNER - CO HWY. 86 AND RIDGE ROAD
CASTLE ROCK, CO

DATE	△	DESCRIPTION
10/08/04	.	INITIAL APPROVAL
11/23/04	.	FCD 4-072 REVISION

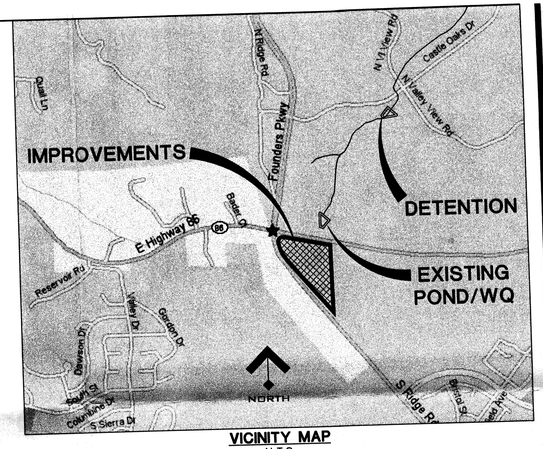
ON-SITE DRAINAGE PLAN

PROJECT #:03.0292
DRAWN BY: JLS
DESIGNED BY: JDT
CHECKED BY: JDT



LEGEND

- PROPERTY LINE
- POND ROUTING ELEMENT
- CULVERT ROUTING ELEMENT
- CHANNEL ROUTING ELEMENT
- 6500 CONTOUR LINE
- BASIN BOUNDARIES
- T / 2.34 / 0.60 / 0.76 — DRAINAGE BASIN DESIGNATION; DRAINAGE BASIN ACRES; DEVELOPED PERCENT IMPERVIOUS; HISTORIC DIRECTION OF FLOW
- DIRECTION OF FLOW
- (18) ON-SITE BASIN
- ON-SITE BASIN BOUNDARY
- WQ WATER QUALITY



VICINITY MAP
N.T.S.

UDSWM ROUTING ELEMENTS

- 1 DEVELOPED
- (2) WOODLANDS DEVELOPED (ONLY)
- (2) HISTORIC

BASIN CHARACTERISTICS

HISTORIC

ID	AREA (ACRE)	TC (MIN)	PERCENT IMPERVIOUS	PEAK RUNOFF (CFS) 10-YEAR	PEAK RUNOFF (CFS) 100-YEAR
A	30.5	23.5	2.0	26	72
B	5.6	20.2	2.0	4	11
C	12.5	15.8	2.0	10	26
D	85.6	32.0	2.0	74	200

DEVELOPED

ID	AREA (ACRE)	TC (MIN)	PERCENT IMPERVIOUS	PEAK RUNOFF (CFS) 10-YEAR	PEAK RUNOFF (CFS) 100-YEAR
A	30.5	20.6	39.0	49	102
C	12.5	13.4	36.2	19	39

WQ CHARACTERISTICS

TOP OF BERM/TOP OF RISER	6558.0
BOTTOM OF RISER	6556.0
PROVIDED WQ VOLUME	23,230 C.F.
24 HR DRAWDOWN PROVIDED BY TWO 7/8" DIAMETER HOLES PER ROW (SEE SHEET C4.21)	CONFIRM

DETENTION CHARACTERISTICS

PEAK INFLOW			
10-YEAR	127 CFS		
100-YEAR	319 CFS		
PEAK DISCHARGE			
10-YEAR	56 CFS		
100-YEAR	225 CFS		
POND STORAGE	C.F.	ACRE FT	WSEL
10-YEAR	56 CFS	2.4	6479.02
100-YEAR	225 CFS	6.1	6481.43

104,544
265,716

ROUTING ELEMENTS

UDSWM NODE ID	DESCRIPTION	PEAK FLOW (CFS) 10-YEAR			100-YEAR		
1	36" CMP CULVERT AT HWY. 86	27			71		
1			27			71	
–				–			–
2	NATURAL CHANNEL HWY. 86 TO DETENTION POND	30			82		
2			30			82	
1				51			110
–	WOODLANDS FILING 12 DETENTION POND	–			–		
3			4			13	
2				4			13
3	30" CMP CULVERT AT FOUNDERS PKWY	10			26		
4			4			13	
3				4			13
4	NATURAL CHANNEL FOUNDERS PKWY TO DETENTION POND	10			26		
5			4			13	
4				4			13
5	CHANNEL CONFLUENCE	114			309		
6			107			291	
5				127			319
6	EXISTING STOCK POND	63			253		
7			58			238	
6				73			262
–	IMPROVED DETENTION POND	–			–		
–			–			–	
6				56			225

GENERAL NOTES

1. THIS PLAN IS INTENDED TO BE USED AS REFERENCE IN CONJUNCTION WITH THE FINAL DRAINAGE REPORT. DO NOT USE THIS PLAN FOR CONSTRUCTION.
2. WOODLAND'S POND INFORMATION EXCERPTED FROM THE "PHASE 3 DRAINAGE REPORT FOR THE WOODLANDS FILING NO. 12", BY PEAK CIVIL CONSULTANTS, JUNE 2002.
3. REFER TO SHEET C4.20 OF THE FOUNDERS MARKETPLACE FILING NO. 1, BLOCK 1, LOT 1 CONSTRUCTION IMPROVEMENT PLANS FOR DETENTION POND STRUCTURES DETAILS. INCLUDED AS AN EXCERPT IN DRAINAGE REPORT OF WHICH THIS SHEET IS A PART.
4. THE WATER QUALITY POND DOES NOT HAVE A SIGNIFICANT STORAGE VOLUME AND IS NOT CONSIDERED AS A ROUTING ELEMENT.

PLAN VIEW

NORTH 200 0 100 200
SCALE: 1" = 200'

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

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NOT TO BE USED FOR CONSTRUCTION

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COLORADO 80111
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ARCHITECTURE
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LAND SURVEYING

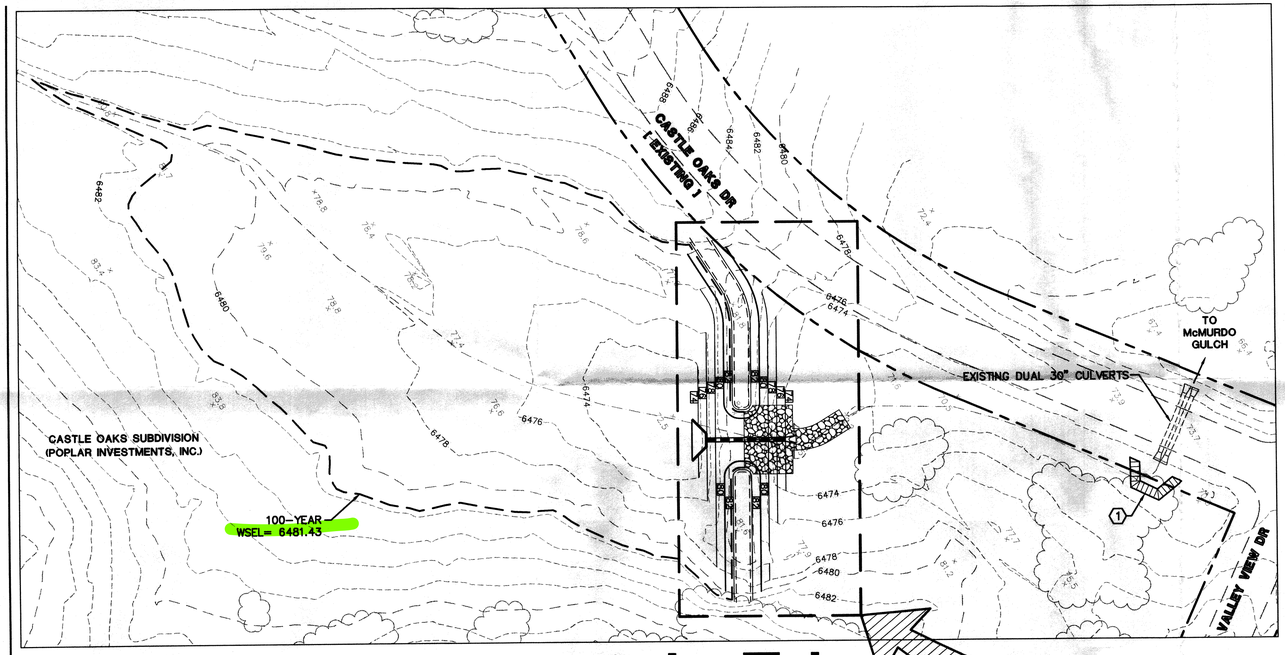
DRAINAGE PLAN
FOUNDERS MARKETPLACE FILING NO. 1
BLOCK 1, LOT 1
SE CORNER - CO HWY. 86 AND RIDGE ROAD
CASTLE ROCK, CO

DESCRIPTION	DATE
INITIAL APPROVAL	10/06/04
FDO 4-072 REVISION	11/23/04

REGIONAL DRAINAGE PLAN

PROJECT #:03.0088
DRAWN BY: JLS
DESIGNED BY: JDT
CHECKED BY: JDT

SHEET 2 OF 2
DP

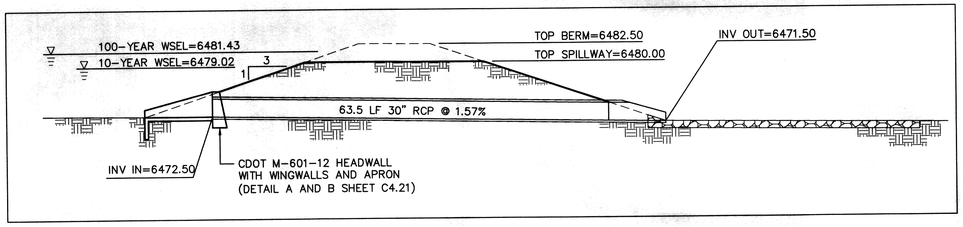


PLAN VIEW

NORTH 50 0 25 50
SCALE: 1" =50'-0"

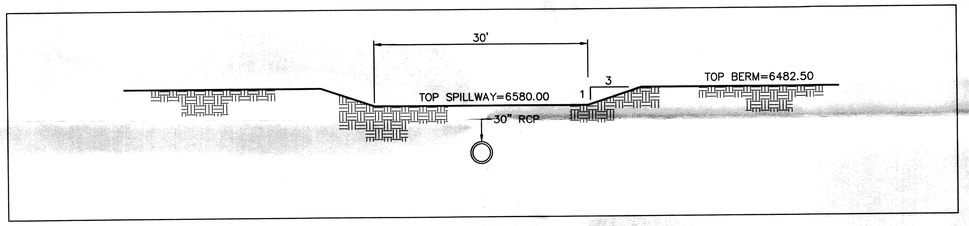
DETENTION CHARACTERISTICS

PEAK INFLOW			
10-YEAR	127 CFS		
100-YEAR	319 CFS		
PEAK DISCHARGE			
10-YEAR	56 CFS		
100-YEAR	225 CFS		
POND STORAGE	C.F.	ACRE FT	WSEL
10-YEAR	104,544	2.4	6479.02
100-YEAR	265,716	6.1	6481.43



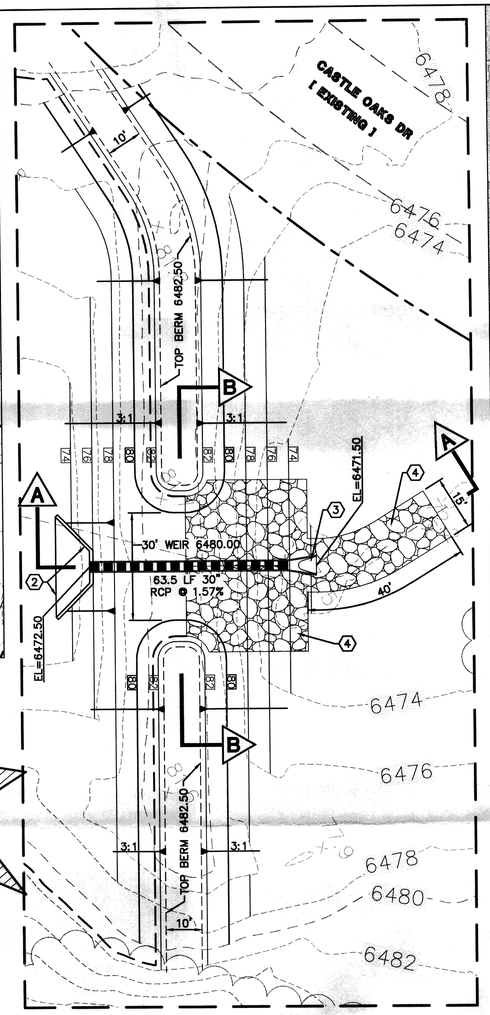
SECTION A-A

SCALE: 1"=10'



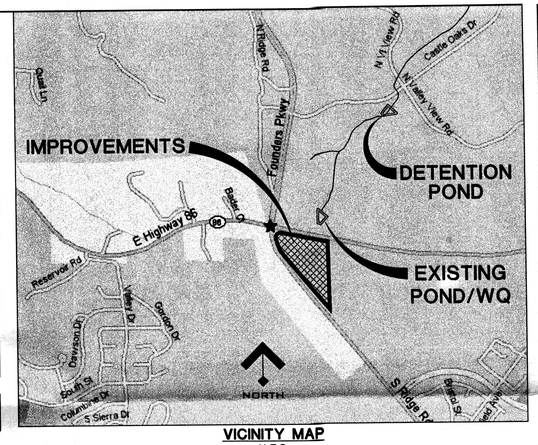
SECTION B-B

SCALE: 1"=10'



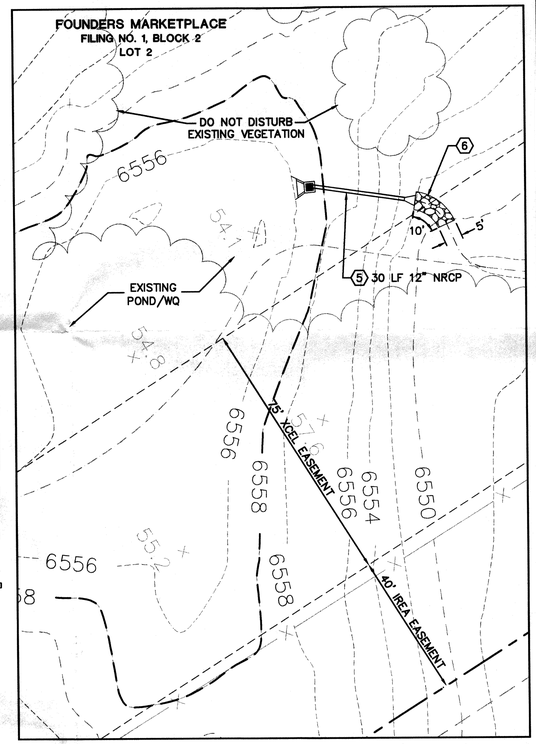
DETENTION POND DETAIL

NORTH 20 0 10 20
SCALE: 1" =20'-0"



VICINITY MAP

N.T.S.



EXISTING POND/WQ DETAIL

NORTH 20 0 10 20
SCALE: 1" =20'-0"

CONSTRUCTION NOTES

1. INSTALL CHECK DAM MODIFIED TO PROVIDE INLET PROTECTION. RE: SHEET C5.90, DETAIL B.
2. CONSTRUCT DCOT M-601-12 HEADWALL FOR 30-INCH RCP. RE: SHEET C4.21, DETAILS A AND B.
3. INSTALL 30-INCH FLARED END SECTION. RE: SHEET C4.21, DETAIL C.
4. INSTALL TYPE H ROCK RIPRAP. RE: SHEET C5.90, DETAIL H.
5. INSTALL WATER QUALITY OUTLET AND DISCHARGE. RE: SHEET C4.21, DETAIL D.
6. INSTALL TYPE L ROCK RIPRAP; 10 FEET DOWNSTREAM OF FES AND 2.5 FEET EITHER SIDE OF THALWEG. RE: SHEET C5.90, DETAIL H.

WQ CHARACTERISTICS

TOP OF BERM/TOP OF RISER	6558.0
BOTTOM OF RISER	6556.0
PROVIDED WQ VOLUME	23,230 C.F.
24 HR DRAWDOWN PROVIDED BY TWO 7/8" DIAMETER HOLES PER ROW (SEE SHEET C4.21)	

LEGEND

96.80	PROPOSED SPOT ELEVATION	(1)	REFER TO CONSTRUCTION NOTES
18" RCP STM	PROPOSED STORM SEWER W/ MANHOLE AND INLET		PROPERTY LINE
EX. 36" CMP	EXISTING STORM CULVERT W/ FES AND RIPRAP	20	PROPOSED CONTOUR
		6600	EXISTING CONTOUR
GB	GRADE BREAK		PROPOSED VEGETATION BOUNDARY
TC	TOP CURB		EXISTING VEGETATION BOUNDARY
FL	FLOW LINE		CHECK DAM
GRATE	TOP GRATE		
HP	HIGH POINT		
LP	LOW POINT		

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
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CAUTION: NOTICE TO CONTRACTOR

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ENGINEER CERTIFICATION:

I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS WERE PREPARED UNDER MY DIRECT SUPERVISION, IN ACCORDANCE WITH ALL APPLICABLE TOWN OF CASTLE ROCK AND STATE OF COLORADO STANDARDS AND STATUTES, RESPECTIVELY: AND THAT I AM FULLY RESPONSIBLE FOR ALL DESIGN, REVISIONS AND AS-BUILT CONDITIONS RELATIVE TO SAID PLANS.

JOEL D. TOMPKINS, P.E. NO. 32415 DATE
FOR AND ON BEHALF OF
CLC ASSOCIATES, INC.

TOWN OF CASTLE ROCK APPROVALS

THESE PLANS ARE HEREBY APPROVED FOR ONE YEAR FROM THE APPROVAL DATE OF THE DEVELOPMENT SERVICES DIRECTOR.

RECOMMENDED APPROVAL:

ENGINEERING DIVISION DATE

APPROVED BY:

DEVELOPMENT SERVICES DIRECTOR DATE

CLC ASSOCIATES
8480 E. ORCHARD RD.
SUITE 5000
GREENWOOD VILLAGE
COLORADO 80111
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CLCASSOC.COM

ARCHITECTURE
ENGINEERING PLANNING
LANDSCAPE ARCHITECTURE
LAND SURVEYING

CONSTRUCTION IMPROVEMENT PLANS
FOUNDERS MARKETPLACE FILING NO. 1
BLOCK 1, LOT 1
SE CORNER OF COLORADO HWY. 86 AND RIDGE ROAD
CASTLE ROCK, CO

DATE	DESCRIPTION
07/21/04	0 ISSUED FOR CONSTRUCTION
11/23/04	1 FCD 4-072 DETENTION RE-LOCATION

GRADING PLAN: OFF-SITE

PROJECT #:03.0292
DRAWN BY: JLS
DESIGNED BY: JDT
CHECKED BY: JDT

between the access points grading will require approximately 125,000 cubic yards of import to complete.

The following basins are defined for the developed condition:

2.01.01 Basin 11 is the south portion of the Retail C parking field and a large area of off-site open space. The open space includes a portion of the IREA substation; though the structures and towers therein do not constitute any substantial impervious cover. Runoff will sheet down the proposed cut slopes to the parking area and be directed to a sump condition 3-foot Type 13C inlet in the curb and gutter.

2.01.02 Basin 12 consists of the roof top area of the Retail C. Roof runoff will be collected in downspouts and tight-lined (e.g. there will be no splash pads) in 6" PVC to the underground drain system via the Type 13C inlet in Basin 11.

2.01.03 Basin 13 is roughly half the area of the King Soopers Gas Pad, which will be a canopied, self-service facility. The area also includes peripheral drive and landscaping. Runoff will be collected in a sump condition 3-foot Type 13C curb inlet.

2.01.04 Basin 14 is one of the areas primarily associated with the peripheral public rights-of-way to Founders Marketplace proper. Basin 14 accounts for approximately 700 LF of South Ridge Road. Ridge Road is being widened to the east to provide curb and gutter at a location compliant to the Town's ultimate improvement plan. This excessive widening, for this interim condition, will be striped to provide adequate turn and deceleration lanes to service Founders Marketplace. Also included is a relatively large area of open space on the west side of Ridge Road. That open space is in a native condition and contributes storm runoff directly to the road in an un-concentrated manner. An on-grade ten-foot Type R inlet set in the east curb line of Ridge Road will intercept storm runoff. The bypass will continue down the east curb line to the next inlet at Basin 18.

2.01.05 Basin 15 is approximately 225 LF of the main drive off of the southwest corner of the King Soopers. Storm runoff will collect against the west side curb line and be conveyed to a 3-foot Type 13C curb inlet set in a sump condition at a landscape aisle. Should any bypass occur due to a clogged condition that overflow would continue to the inlet in Basin 16.

2.01.06 Basin 16 is the bulk of the parking field at the front (southwest) of the King Soopers. Included therein are associated drive and landscaping as well as a portion of the self-service gas facility. Runoff will be directed to a sump condition six-foot Type 13C inlet in a parking lot landscape island at the far northwest corner of that basin. For a clogged inlet condition or an event in excess of the 100-year return period overflow into the adjacent inlet in Basin 17 will occur.

2.01.07 Basin 17 is a smaller portion of the parking field at the front of the King Soopers. A sump condition six-foot Type 13C inlet in a landscape island will be used to capture runoff from this basin.

2.01.08 Basin 18, similar to Basin 14 previously, this basin is a mix of Ridge Road and upland open space. Accounted for herein is about 350 LF of South Ridge Road. The 5-year and 100-year storm event's runoff, along with associated bypass flows from Basin 14, are directed to an on-grade ten-foot Type R inlet. Any bypass storm runoff will continue down the east curb line thence northeast around the intersection to the first new inlet proposed with the Highway 86 improvements.

2.01.09 Basin 19 is a small area of drive and parking at the northwest corner of the main parking field for King Soopers. Runoff will collect against the curb and gutter and be conveyed and intercepted at a 3-foot Type 13C inlet set in a sump condition.

2.01.10 Basin 20 is the northwest quarter of the site access drive between Highway 86 and Ridge Road. Runoff is collected at the curb line and conveyed to a 5-foot Type R on-grade inlet immediately adjacent to the Highway 86 right-of-way. Any bypass runoff will continue to the crosspan at the access and thence to the sump inlet in Basin 54.

2.01.11 Basin 21 is the northeast quarter of the Highway 86 to Ridge Road site access drive. Runoff is collected at the curb line and conveyed to a 5-foot Type R on-grade inlet immediately adjacent to the Highway 86 right-of-way. Any bypass runoff will continue north and east around the curb return and thence to the sump inlet in Basin 54.

2.01.12 Basin 30 is another portion of Ridge Road and associated upland open space. Unlike the previous two basins collecting Ridge Road runoff, a new center median in the road will impede runoff from reaching the east side curb line. An on-grade ten-foot Type R inlet will be installed in the median just south of where the existing median terminates. Bypass from this inlet, either due to large return period events or from a clogged condition, will continue down the curb to the existing median inlet in Basin 31.

2.01.13 Basin 31 has an existing on-grade ten-foot Type R inlet set in the median curb of South Ridge Road at the Highway 86 intersection providing runoff interception for its contributing area. That area and operating conditions remain unchanged except that the 100-year rainfall event runoff thereto will be increased by bypass flows from the inlet at Basin 30. Bypass flows from the inlet in Basin 31 will cross the north bound lanes of Ridge Road to it's east side curb and gutter. From there it combines with bypass from Basin 18 and direct runoff from Basin 32 and makes it's way to the Type R inlet in the latter.

2.01.14 Basin 32 consists of a large part of South Ridge Road and a portion it's intersection with Highway 86. An on-grade ten-foot Type R inlet will be set in the proposed curb and gutter proximal to the location where the existing vertical curb terminates and runoff is directed to the bar ditch through a concrete run down. In the existing condition all

APPENDIX C: HYDROLOGY

Project Ridge Road - Preliminary Basins

Date 12/18/2023

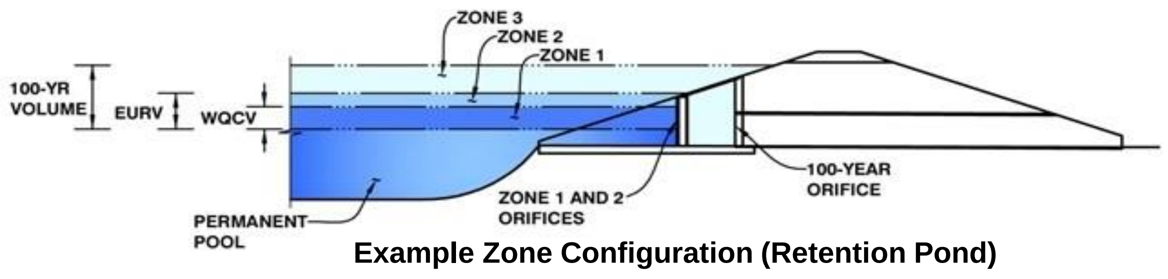
BASIN	OVERALL (SF)	OVERALL (Ac)	DRIVE/ WALKS (SF)	ROOFS (SF)	LANDSCAPE (SF)	%I
A-1	301,000 SF	6.91	212,250 SF	48,000 SF	40,750 SF	85%
OS-3	25,264 SF	0.58	0 SF	0 SF	25,264 SF	2%
OS-2	5,227 SF	0.12	0 SF	0 SF	5,227 SF	2%
OS-1	112,384 SF	2.58	0 SF	0 SF	112,384 SF	2%

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: ______________________________

Basin ID: ______________________________



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	6.91	acres
Watershed Length =	1,150	ft
Watershed Length to Centroid =	575	ft
Watershed Slope =	0.050	ft/ft
Watershed Imperviousness =	85.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.208	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	0.580	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.06 in.) =	0.499	acre-feet	1.06	inches
5-yr Runoff Volume (P1 = 1.43 in.) =	0.712	acre-feet	1.43	inches
10-yr Runoff Volume (P1 = 1.66 in.) =	0.847	acre-feet	1.66	inches
25-yr Runoff Volume (P1 = 1.69 in.) =	0.869	acre-feet		inches
50-yr Runoff Volume (P1 = 2.26 in.) =	1.208	acre-feet	2.26	inches
100-yr Runoff Volume (P1 = 2.6 in.) =	1.416	acre-feet	2.60	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	1.739	acre-feet		inches
Approximate 2-yr Detention Volume =	0.469	acre-feet		
Approximate 5-yr Detention Volume =	0.676	acre-feet		
Approximate 10-yr Detention Volume =	0.778	acre-feet		
Approximate 25-yr Detention Volume =	0.733	acre-feet		
Approximate 50-yr Detention Volume =	0.891	acre-feet		
Approximate 100-yr Detention Volume =	0.958	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.208	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.371	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.378	acre-feet
Total Detention Basin Volume =	0.958	acre-feet
Initial Surcharge Volume (ISV) =		ft^3
Initial Surcharge Depth (ISD) =		ft
Total Available Detention Depth (H_{total}) =		ft
Depth of Trickle Channel (H_{TC}) =		ft
Slope of Trickle Channel (S_{TC}) =		ft/ft
Slopes of Main Basin Sides (S_{main}) =		H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =		

Initial Surcharge Area (A_{ISV}) =		ft^2
Surcharge Volume Length (L_{ISV}) =		ft
Surcharge Volume Width (W_{ISV}) =		ft
Depth of Basin Floor (H_{FLOOR}) =		ft
Length of Basin Floor (L_{FLOOR}) =		ft
Width of Basin Floor (W_{FLOOR}) =		ft
Area of Basin Floor (A_{FLOOR}) =		ft^2
Volume of Basin Floor (V_{FLOOR}) =		ft^3
Depth of Main Basin (H_{MAIN}) =		ft
Length of Main Basin (L_{MAIN}) =		ft
Width of Main Basin (W_{MAIN}) =		ft
Area of Main Basin (A_{MAIN}) =		ft^2
Volume of Main Basin (V_{MAIN}) =		ft^3
Calculated Total Basin Volume (V_{total}) =		acre-feet

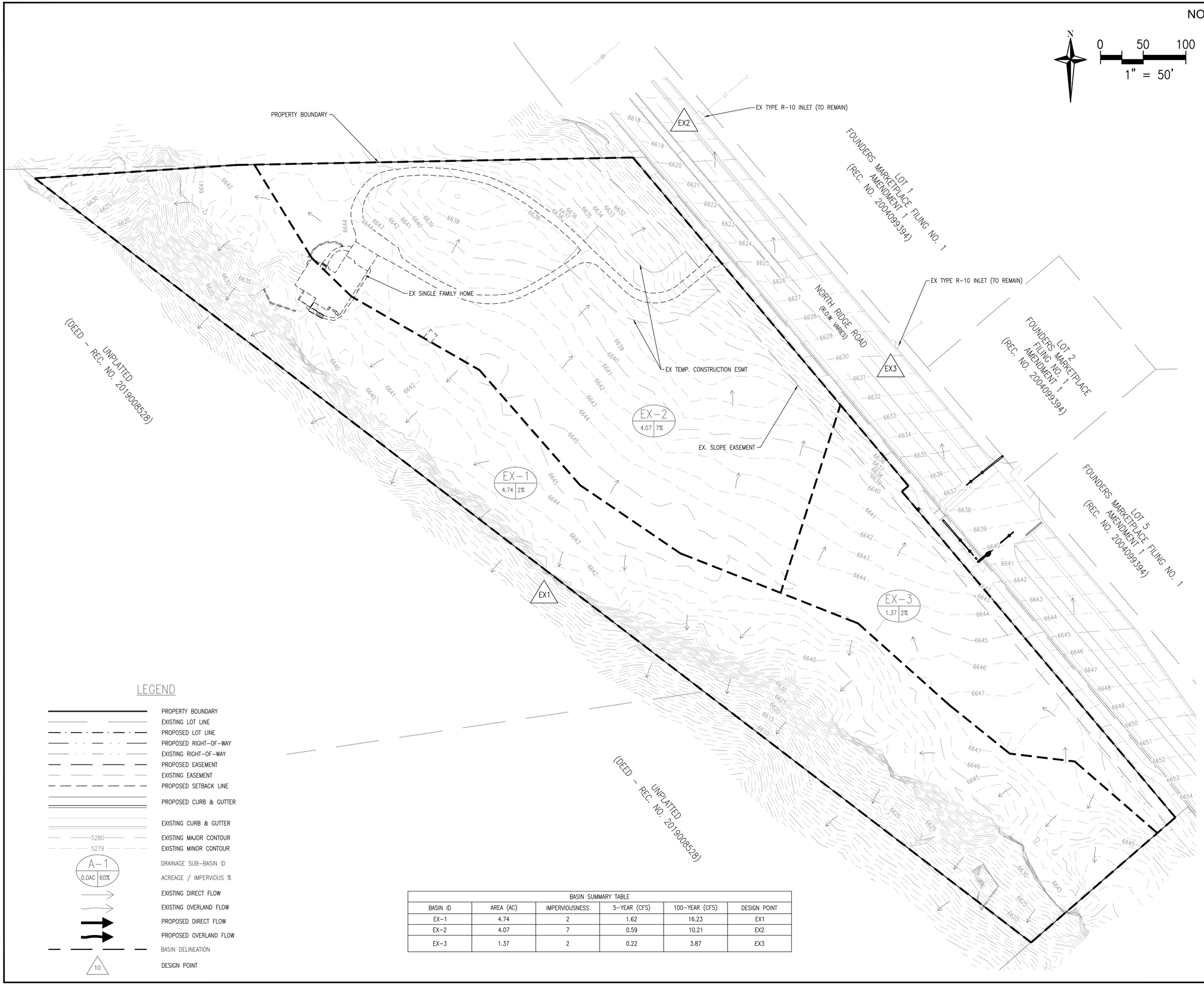
Depth Increment = ______ ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool									

APPENDIX D: HYDRAULICS

APPENDIX E: DRAINAGE MAPS AND CDS

NOT FOR CONSTRUCTION



LEGEND

- PROPERTY BOUNDARY
- EXISTING LOT LINE
- PROPOSED LOT LINE
- PROPOSED RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROPOSED EASEMENT
- EXISTING EASEMENT
- PROPOSED SETBACK LINE
- PROPOSED CURB & GUTTER
- EXISTING CURB & GUTTER
- 5280 EXISTING MAJOR CONTOUR
- 5279 EXISTING MINOR CONTOUR
- A-1 / 0.0AC | 60% DRAINAGE SUB-BASIN ID / ACREAGE / IMPERVIOUS %
- EXISTING DIRECT FLOW
- EXISTING OVERLAND FLOW
- PROPOSED DIRECT FLOW
- PROPOSED OVERLAND FLOW
- BASIN DELINEATION
- 10 DESIGN POINT

BASIN SUMMARY TABLE

BASIN ID	AREA (AC)	IMPERVIOUSNESS	5-YEAR (CFS)	100-YEAR (CFS)	DESIGN POINT
EX-1	4.74	2	1.62	16.23	EX1
EX-2	4.07	7	0.59	10.21	EX2
EX-3	1.37	2	0.22	3.87	EX3

PROJECT #	PC2203
PROJECT DATE	00/00/00
DESIGNER	CWK
REVIEWER	JSD

BRIGHTLIGHTER ENGINEERING

DRAINAGE MAPS

RIDGEVIEW TOWN CENTER

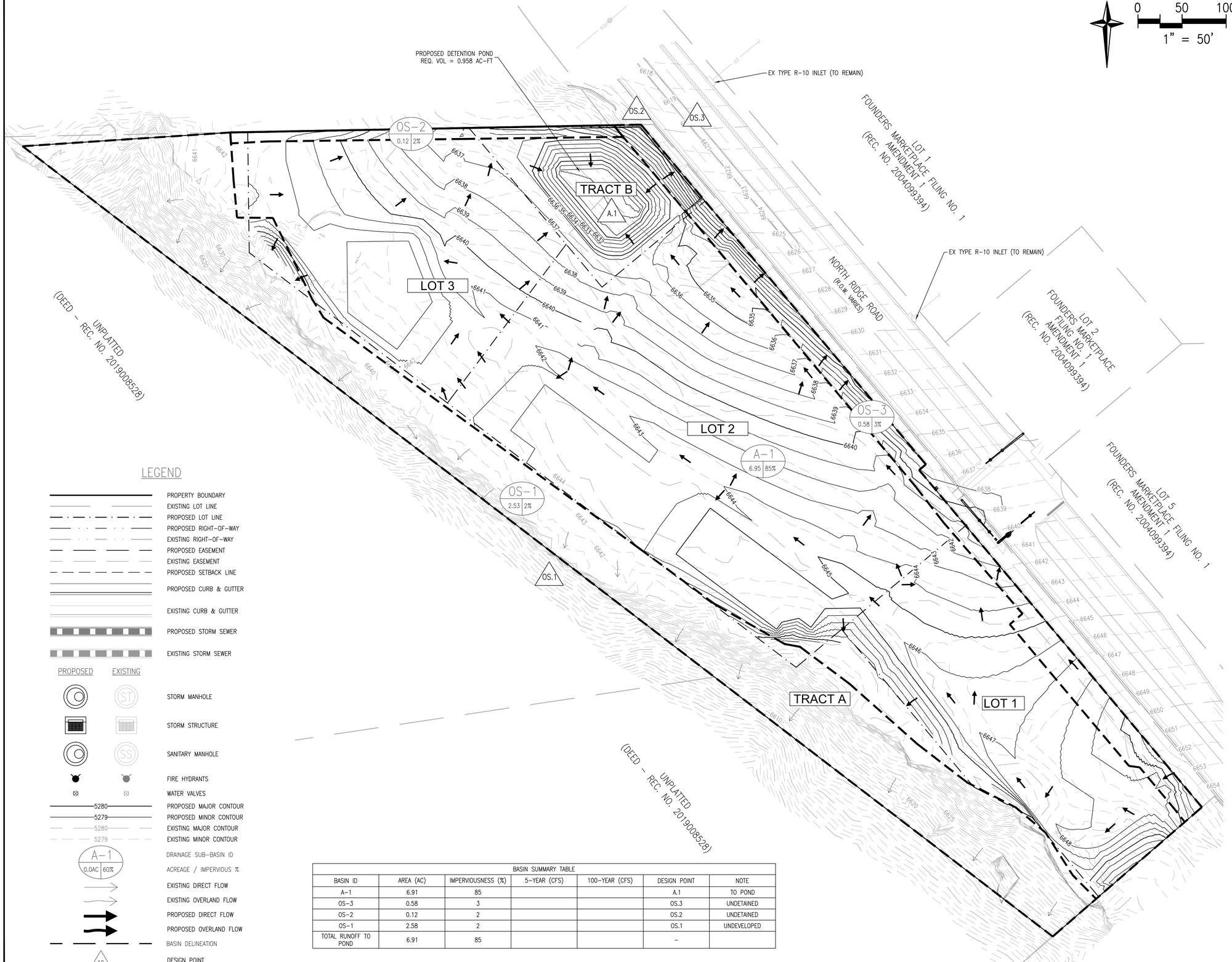
895 NORTH RIDGE ROAD
CASTLE ROCK, CO 80104
CHARLES KEENER JR., P.E.

REVISION NUMBER	REVISION DESCRIPTION	DATE

EX DRAINAGE MAP

DR.1

NOT FOR CONSTRUCTION



LEGEND

- PROPERTY BOUNDARY
- EXISTING LOT LINE
- PROPOSED LOT LINE
- PROPOSED RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROPOSED EASEMENT
- EXISTING EASEMENT
- PROPOSED SETBACK LINE
- PROPOSED CURB & GUTTER
- EXISTING CURB & GUTTER
- PROPOSED STORM SEWER
- EXISTING STORM SEWER

PROPOSED	EXISTING	
	ST	STORM MANHOLE
		STORM STRUCTURE
	SS	SANITARY MANHOLE
		FIRE HYDRANTS
⊠	⊠	WATER VALVES

- 5280 PROPOSED MAJOR CONTOUR
- 5279 PROPOSED MINOR CONTOUR
- 5280 EXISTING MAJOR CONTOUR
- 5279 EXISTING MINOR CONTOUR
- A-1 / 0.0AC / 60% — DRAINAGE SUB-BASIN ID / ACREAGE / IMPERVIOUS %
- EXISTING DIRECT FLOW
- EXISTING OVERLAND FLOW
- PROPOSED DIRECT FLOW
- PROPOSED OVERLAND FLOW
- BASIN DELINEATION
- 10 — DESIGN POINT

BASIN SUMMARY TABLE

BASIN ID	AREA (AC)	IMPERVIOUSNESS (%)	5-YEAR (CFS)	100-YEAR (CFS)	DESIGN POINT	NOTE
A-1	6.91	85			A.1	TO POND
OS-3	0.58	3			OS.3	UNDETAINED
OS-2	0.12	2			OS.2	UNDETAINED
OS-1	2.58	2			OS.1	UNDEVELOPED
TOTAL RUNOFF TO POND	6.91	85			-	

PROJECT #	PC2203
PROJECT DATE	00/00/00
DESIGNER	CWK
REVIEWER	JSD

BRIGHTLIGHTER ENGINEERING

DRAINAGE MAPS

RIDGEVIEW TOWN CENTER

895 NORTH RIDGE ROAD
CASTLE ROCK, CO 80104

CHARLES KEENER JR., P.E.

REVISION NUMBER	REVISION DESCRIPTION	DATE

PR DRAINAGE MAP

DR.2

APPENDIX F: CITY OF CASTLE ROCK WORKSHEETS

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

Project: **Project #:** **Applicant:**

Section	Question	Response	Instructions
1	**Non-applicable Sites**		
1.1	Will the project result in a temporary disturbance of greater than one acre?	○ No ◉ Yes	Proceed to section 1.2. Proceed to section 2.
1.2	Is the project part of a larger common plan of development or sale where multiple separate and distinct construction activities may be taking place at different times on different schedules, but remain related and are within 1/4 mile of each other? (A common plan of development will generally be documented on a site development plan, master plan, or equivalent, for the property/project)	○ No ○ Yes	Proceed to section 1.3. Proceed to section 2.
1.3	Is the project within the Cherry Creek Watershed?	○ Yes ○ No	Permanent water quality control measures may be required. Refer to Water Qualtiy Control Regulation 72.7 for details and allowable exclusions. Permanent water quality control measures are not required.

Section	Question	Response	Instructions
2	**Applicable Site Types and Exclusions by Variance**		
2.1	Does the project have more than 35% impervious area on the existing site?	◉ No ○ Yes	Project is an applicable Development Site. Proceed to section 3. Proceed to 2.2.
2.2	Does the project have greater than 75% impervious area on the existing site?	○ No ○ Yes	Project is an applicable Redevelopment Site. Proceed to section 3. Project is an applicable Constrainted Redevelopment Site. Proceed to 2.3.
2.3	Will 100% of the runoff from the existing and proposed site be captured and treated using one or more of the allowable design standards for permanent water quality?	○ Yes ○ No	No further action required. Proceed to 2.4.
2.4	Do any other water quality exclusions apply to the site?	○ No ○ Yes	Portions of the project are excluded. Proceed with design in accordance with Constrained Redevelopment standards and apply for **variance** for Constrained Redevelopment Sites. Proceed to section 3. Following approval of other exclusions, design remaining site in accordance with Constrained Redevelopment standards and apply for **variance** for Constrained Redevelopment Sites.

Section	Question	Response	Instructions
3	**Applicable Sites with Other Exclusions by Variance**		
3.1	**Category 1: Roadways, bridges and trails only**		
3.1.1	Is the project a bike or pedestrian trail?	○ Yes ○ No	Proceed to next line. Proceed to 3.1.2.
	Is the trail for a roadway?	○ Yes ○ No	Proceed to 3.1.2. Project is excluded. Submit **variance** for Trails Excluded from Permanent Water Quality Requirements.
3.1.2	Is the project primarily used for parking or access to parking?	○ Yes ○ No	This exclusion does not apply. Permanent water quality is required. Proceed to 3.1.3.
3.1.3	Does the project add impervious area?	○ No ○ Yes	Project is excluded. Submit **variance** for Pavement Management Sites Excluded from Permanent Water Quality Requirements. Proceed to 3.1.4.
3.1.4	Does the project add more than 8.25 feet of paved width at any location to the existing roadway?	○ No ○ Yes	Project is excluded. Submit **variance** for Roadway Redevelopment Sites Excluded from Permanent Water Quality Requirements. Proceed to next line.
	Does the project add more than one acre of paved area per mile to an existing roadway?	○ No ○ Yes	Project is excluded. Submit **variance** for Roadway Redevelopment Sites Excluded from Permanent Water Quality Requirements. Proceed to next line.
	Does the project increase the width by two times or more, on average, of the original roadway area?	○ No ○ Yes	Existing areas of site are excluded only. Submit **variance** for Existing Roadway Surfaces Only Excluded from Permanent Water Quality Requirements. This exclusion does not apply. Permanent water quality is required.
3.2	**Category 2: Non-residential and non-commercial projects only**		
3.2.1	Is the project associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities, including activities necessary to prepare a site for drilling and the movement and placement of drilling equipment?	○ Yes ○ No	Project is excluded. Submit **variance** for Oil and Gas Exploration Sites Excluded from Permanent Water Quality Requirements. Proceed to 3.2.2.
3.2.2	Is the project for stream stabilization?	○ Yes ○ No	Project is excluded. Submit **variance** for Stream Stabilization Sites Excluded from Permanent Water Quality Requirements. Proceed to 3.2.3.
3.2.3	Is the project for installation or maintenance of aboveground or underground utilities or infrastructure that does not permanently alter the terrain, ground cover, or drainage patterns from those present prior to the construction activity including activities to install, replace or maintain utilities under roadways or other paved areas that return the surface to the same condition?	○ Yes ○ No	Project is excluded. Submit **variance** for Aboveground and Underground Utilities Excluded from Permanent Water Quality Requirements. Proceed to 3.2.4.
3.2.4	Is the project on undeveloped land (land with no human-made structures such as buildings or pavement) that will remain undeveloped after the project?	○ Yes ○ No	Project is excluded. Submit **variance** for Sites with Land Disturbances to Undeveloped Land that will Remain Undeveloped Excluded from Permanent Water Quality Requirements. Proceed to 3.2.5.
3.2.5	Will the post-project condition result in surface water discharge during the 80th percentile storm runoff event?	○ No ○ Yes	Project is excluded. Submit **study** along with **variance** for Non-residential and Non-commercial Infiltration Conditions Excluded from Permanent Water Quality Requirements. This exclusion does not apply. Permanent water quality is required.

Section	Question	Response	Instructions
3.3	**Category 3: Residential, Agricultural and Commercial projects**		
3.3.1	Is the project a single-family residential lot, or agricultural zoned lands, greater than or equal to 2.5 acres in size per dwelling unit?	○ Yes ◉ No	Proceed to next line. Proceed to 3.3.2.
	Is the project site greater than 10% impervious?	○ No ○ Yes	Project is excluded. Submit **variance** for Large Lot Single Family Sites Excluded from Permanent Water Quality Requirements. Proceed to next line.
	Is the project site greater than 20% impervious?	○ Yes ○ No	This exclusion does not apply. Permanent water quality is required. Proceed to next line.
	Will the post-project condition result in surface water discharge during the 80th percentile storm runoff event?	○ No ○ Yes	Project is excluded. Submit **study** along with **variance** for Large Lot Single Family Sites Excluded from Permanent Water Quality Requirements. This exclusion does not apply. Permanent water quality is required.
3.3.2	Will 100% of the runoff from the residential or commercial site be captured?	○ Yes ◉ No	This exclusion does not apply. Permanent water quality is required. Proceed to next line.
	Is all or a portion of the site undeveloped or will it remain undeveloped after construction?	◉ Yes ○ No	This portion of the project is excluded. Submit **variance** for Sites with Land Disturbance to Undeveloped Land that will Remain Undeveloped Excluded from Permanent Water Quality Requirements. Proceed to next line. Proceed to next line.
	Is the remaining untreated impervious area greater than 20% of the site?	○ Yes ◉ No	This exclusion does not apply. Permanent water quality is required. Proceed to next line.
	Is the remaining untreated impervious area greater than one acre?	○ Yes ◉ No	This exclusion does not apply. Permanent water quality is required. Proceed to next line.
	Is it practicable to capture runoff from portions of the site that will not drain to a control measure?	◉ No ○ Yes	Document justification demonstrating that it is not practicable to capture runoff from this portion of the site in the **drainage report**. No further action is needed. This exclusion does not apply. Permanent water quality is required.