RG AND ASSOCIATES, LLC
Del Norte • Wheat Ridge
303-293-8107 • www.rgengineers.com

MEMO

Date: June 30, 2021

To: El Paso County

From: RG and Associates, LLC
Paintbrush Hills Metropolitan District

RGA Job No. 1070.0022

RE: **Scenic View at Paintbrush Hills Pond Modifications**

Scenic View at Paintbrush Hills Pond Modifications:

Purpose and Scope

The purpose of this memorandum is to update the detention pond associated with the Final Drainage Report prepared by Core Engineering Group, LLC in July 2014, which provided a detailed analysis of existing and developed runoff from "Scenic View at Paintbrush Hills". This site is located within an area previously studied by the "Master Development Drainage Plan for Falcon Hills Development". The approved Final Drainage Report analyzed developed drainage patterns and storm sewer infrastructure necessary to convey developed runoff for the Scenic View at Paintbrush Hills development. The Scenic View at Paintbrush Hills Pond was surveyed, and record drawings provided on July 3, 2016. Excerpts are attached from the approved Final Drainage Report and Record Drawings.

Property Location and Description

The Scenic View at Paintbrush Hills is located on approximately 18.76 acres with 89 proposed single family residential units. The site is in the south ½ of the southwest ¼ of Section 36, Township 12 South, Range 65 West of the 6th Principal Meridian, of El Paso County, State of Colorado. The property is bounded to the north by Falcon Middle School, on the east by Paintbrush Hills Filing No. 4, on the south by Stapleton Drive and on the west by Towner Avenue. See attached vicinity map.

According to the current FEMA Flood Insurance Rate Map (FIRM) number 08041CO515G; this site is not located within the 100-year floodplain. See attached FEMA Flood Map.

The site consists of the following soils: Pring Coarse Sandy Loam (98-percent) and Columbine Gravelly Sandy Loam (2-percent), these soil types being Type B and Type A soils classifications, respectively. See attached SCS Soil Map.

Pond Modifications

The existing Scenic View at Paintbrush Hills Pond will be modified and brought up to current Mile High Flood District (MHFD) design standards. The following modifications are proposed for the on-site detention pond:

- A concrete lined forebay will be installed at the outlet of the existing 42-RCP outfall (sized for 8-percent of the water quality capture volume).

- A concrete weir wall will be installed in the forebay to control the release from the forebay and overflow into the detention basin with a soil riprap mitigation on the downstream face (sized for 2-percent of the design inflow for the forebay notch and 100-percent of the inflow for the overflow).
- A concrete trickle channel will be installed between the forebay and the existing outlet structure (sized for 13-percent of the design inflow).
- The existing concrete outlet structure will be modified to conform to MHFD Excess Urban Runoff Volume (EURV) methodology. The existing Type C box will be increased in high by approximately 2-feet with a new EURV orifice plate installed and a new 100-year restrictor plate installed on the existing 21-inch RCP outlet pipe.
- The existing detention pond will be re-graded to obtain more volume with the existing top of berm raised by approximately 1-foot and the emergency spillway raised by approximately 0.70-feet.
- The remainder of the pond sides and pond bottom will remain unchanged.

Supporting calculations related to the Scenic View at Paintbrush Hill Detention Pond Modification have been attached.

Sincerely,

Gary E. Welp, P.E., CFM
Senior Project Manager

VICINITY MAP

1" = 2000 FEET

National Flood Hazard Layer FIRMette

FEMA

104°37'37"W 38°58'26"N

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

1:6,000

104°37'W 38°57'58"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

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

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 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 6/29/2021 at 12:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

United States Department of Agriculture

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

El Paso County Area, Colorado

Scenic View Pond Subdivision

April 22, 2021

Contents

Soil Map

Map Scale: 1:2,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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 1:24,000.

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 18, Jun 5, 2020

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

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	0.3	1.4%
71	Pring coarse sandy loam, 3 to 8 percent slopes	22.4	98.6%
Totals for Area of Interest		**22.7**	**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.

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Fans, flood plains, fan terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XB215CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Pleasant

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

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Fluvaquentic haplaquolls

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

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

NOAA Atlas 14, Volume 8, Version 2
Location name: Peyton, Colorado, USA*
Latitude: 38.9707°, Longitude: -104.6207°
Elevation: 7152.99 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.238 (0.192-0.297)	0.290 (0.233-0.362)	0.380 (0.305-0.476)	0.459 (0.366-0.578)	0.575 (0.445-0.755)	0.670 (0.505-0.890)	0.769 (0.560-1.05)	0.875 (0.611-1.22)	1.02 (0.685-1.47)	1.14 (0.742-1.65)
10-min	0.348 (0.281-0.435)	0.424 (0.342-0.531)	0.556 (0.446-0.697)	0.672 (0.536-0.846)	0.842 (0.652-1.11)	0.980 (0.740-1.30)	1.13 (0.820-1.53)	1.28 (0.894-1.79)	1.50 (1.00-2.15)	1.67 (1.09-2.42)
15-min	0.425 (0.342-0.531)	0.518 (0.417-0.647)	0.678 (0.544-0.850)	0.819 (0.654-1.03)	1.03 (0.795-1.35)	1.20 (0.902-1.59)	1.37 (1.00-1.87)	1.56 (1.09-2.18)	1.83 (1.22-2.62)	2.04 (1.33-2.95)
30-min	0.611 (0.492-0.763)	0.743 (0.598-0.930)	0.973 (0.780-1.22)	1.17 (0.937-1.48)	1.47 (1.14-1.93)	1.71 (1.29-2.27)	1.96 (1.43-2.67)	2.23 (1.56-3.11)	2.60 (1.74-3.73)	2.90 (1.89-4.20)
60-min	0.785 (0.632-0.980)	0.939 (0.756-1.18)	1.22 (0.976-1.53)	1.47 (1.17-1.85)	1.85 (1.44-2.45)	2.17 (1.65-2.90)	2.52 (1.84-3.44)	2.89 (2.02-4.06)	3.42 (2.30-4.93)	3.85 (2.51-5.58)
2-hr	0.959 (0.779-1.19)	1.14 (0.921-1.41)	1.46 (1.18-1.82)	1.77 (1.42-2.21)	2.24 (1.76-2.95)	2.64 (2.02-3.51)	3.08 (2.27-4.18)	3.56 (2.51-4.96)	4.25 (2.88-6.08)	4.81 (3.16-6.92)
3-hr	1.05 (0.860-1.30)	1.23 (1.00-1.52)	1.57 (1.28-1.95)	1.90 (1.53-2.36)	2.42 (1.92-3.19)	2.88 (2.22-3.82)	3.38 (2.51-4.59)	3.94 (2.80-5.49)	4.75 (3.24-6.79)	5.42 (3.58-7.78)
6-hr	1.22 (1.01-1.50)	1.41 (1.16-1.73)	1.79 (1.46-2.20)	2.16 (1.76-2.67)	2.77 (2.22-3.64)	3.31 (2.57-4.37)	3.91 (2.93-5.29)	4.58 (3.29-6.36)	5.58 (3.84-7.93)	6.40 (4.26-9.12)
12-hr	1.41 (1.17-1.72)	1.64 (1.36-1.99)	2.08 (1.71-2.53)	2.50 (2.05-3.06)	3.19 (2.58-4.15)	3.80 (2.98-4.97)	4.47 (3.38-6.00)	5.22 (3.78-7.19)	6.32 (4.39-8.93)	7.23 (4.85-10.2)
24-hr	1.63 (1.36-1.96)	1.91 (1.60-2.30)	2.43 (2.02-2.94)	2.92 (2.42-3.55)	3.69 (2.99-4.73)	4.35 (3.42-5.62)	5.06 (3.85-6.71)	5.85 (4.26-7.97)	6.99 (4.89-9.78)	7.92 (5.36-11.1)
2-day	1.89 (1.59-2.26)	2.24 (1.88-2.67)	2.85 (2.39-3.41)	3.41 (2.84-4.10)	4.25 (3.45-5.36)	4.95 (3.92-6.32)	5.70 (4.36-7.47)	6.51 (4.77-8.77)	7.66 (5.39-10.6)	8.59 (5.87-12.0)
3-day	2.08 (1.76-2.47)	2.45 (2.07-2.91)	3.11 (2.62-3.71)	3.71 (3.11-4.44)	4.60 (3.75-5.77)	5.34 (4.24-6.78)	6.12 (4.70-7.98)	6.97 (5.13-9.34)	8.17 (5.78-11.3)	9.13 (6.27-12.7)
4-day	2.24 (1.90-2.65)	2.63 (2.23-3.11)	3.31 (2.80-3.93)	3.93 (3.30-4.68)	4.85 (3.97-6.07)	5.62 (4.48-7.11)	6.43 (4.96-8.35)	7.31 (5.40-9.77)	8.55 (6.07-11.8)	9.55 (6.58-13.3)
7-day	2.65 (2.27-3.11)	3.06 (2.61-3.60)	3.79 (3.22-4.46)	4.44 (3.76-5.26)	5.42 (4.47-6.73)	6.24 (5.01-7.84)	7.11 (5.51-9.17)	8.04 (5.98-10.7)	9.37 (6.69-12.8)	10.4 (7.23-14.4)
10-day	3.01 (2.59-3.52)	3.46 (2.97-4.05)	4.24 (3.62-4.98)	4.94 (4.20-5.83)	5.98 (4.95-7.38)	6.84 (5.51-8.55)	7.75 (6.03-9.94)	8.73 (6.52-11.5)	10.1 (7.25-13.7)	11.2 (7.80-15.4)
20-day	4.03 (3.49-4.68)	4.64 (4.01-5.38)	5.67 (4.88-6.59)	6.54 (5.61-7.65)	7.80 (6.47-9.47)	8.79 (7.13-10.8)	9.82 (7.69-12.4)	10.9 (8.18-14.2)	12.4 (8.93-16.6)	13.5 (9.49-18.4)
30-day	4.86 (4.23-5.60)	5.61 (4.87-6.47)	6.83 (5.91-7.91)	7.85 (6.76-9.13)	9.27 (7.71-11.2)	10.4 (8.43-12.7)	11.5 (9.02-14.4)	12.6 (9.50-16.3)	14.1 (10.2-18.8)	15.3 (10.8-20.8)
45-day	5.88 (5.14-6.75)	6.78 (5.92-7.79)	8.23 (7.16-9.48)	9.41 (8.14-10.9)	11.0 (9.17-13.1)	12.2 (9.96-14.8)	13.4 (10.6-16.7)	14.6 (11.0-18.7)	16.1 (11.7-21.3)	17.2 (12.2-23.3)
60-day	6.74 (5.91-7.70)	7.75 (6.79-8.87)	9.36 (8.18-10.7)	10.7 (9.25-12.3)	12.4 (10.3-14.7)	13.6 (11.2-16.4)	14.9 (11.7-18.4)	16.0 (12.2-20.5)	17.6 (12.8-23.2)	18.6 (13.3-25.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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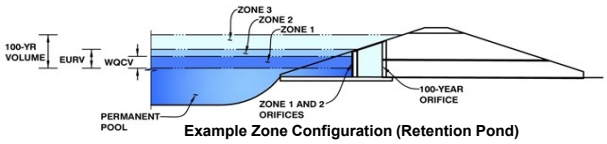
PF graphical

Project: **Paintbrush Hills Scenic View Detention Pond**

Basin ID: **Pond #2**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	19.72	acres
Watershed Length =	1,000	ft
Watershed Length to Centroid =	500	ft
Watershed Slope =	0.031	ft/ft
Watershed Imperviousness =	60.50%	percent
Percentage Hydrologic Soil Group A =	2.0%	percent
Percentage Hydrologic Soil Group B =	98.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	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) =	0.391	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	1.298	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 0.94 in.) =	0.843	acre-feet	0.94	inches
5-yr Runoff Volume (P1 = 1.22 in.) =	1.180	acre-feet	1.22	inches
10-yr Runoff Volume (P1 = 1.47 in.) =	1.534	acre-feet	1.47	inches
25-yr Runoff Volume (P1 = 1.85 in.) =	2.204	acre-feet	1.85	inches
50-yr Runoff Volume (P1 = 2.17 in.) =	2.715	acre-feet	2.17	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	3.340	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	4.364	acre-feet		inches
Approximate 2-yr Detention Volume =	0.786	acre-feet		
Approximate 5-yr Detention Volume =	1.092	acre-feet		
Approximate 10-yr Detention Volume =	1.450	acre-feet		
Approximate 25-yr Detention Volume =	1.729	acre-feet		
Approximate 50-yr Detention Volume =	1.882	acre-feet		
Approximate 100-yr Detention Volume =	2.128	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.391	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.907	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.830	acre-feet
Total Detention Basin Volume =	2.128	acre-feet

Depth Increment = 1.00 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	--	0.00	--	--	--	33	0.001		
7138	--	0.85	--	--	--	3,174	0.073	1,363	0.031
7139	--	2.00	--	--	--	6,012	0.138	6,645	0.153
7140	--	3.00	--	--	--	8,153	0.187	13,727	0.315
7141	--	4.00	--	--	--	10,260	0.236	22,934	0.526
7142	--	5.00	--	--	--	12,558	0.288	34,343	0.788
7143	--	6.00	--	--	--	15,009	0.345	48,126	1.105
7144	--	7.00	--	--	--	17,647	0.405	64,454	1.480
7145	--	8.00	--	--	--	20,403	0.468	83,479	1.916
7146	--	9.00	--	--	--	23,274	0.534	105,318	2.418
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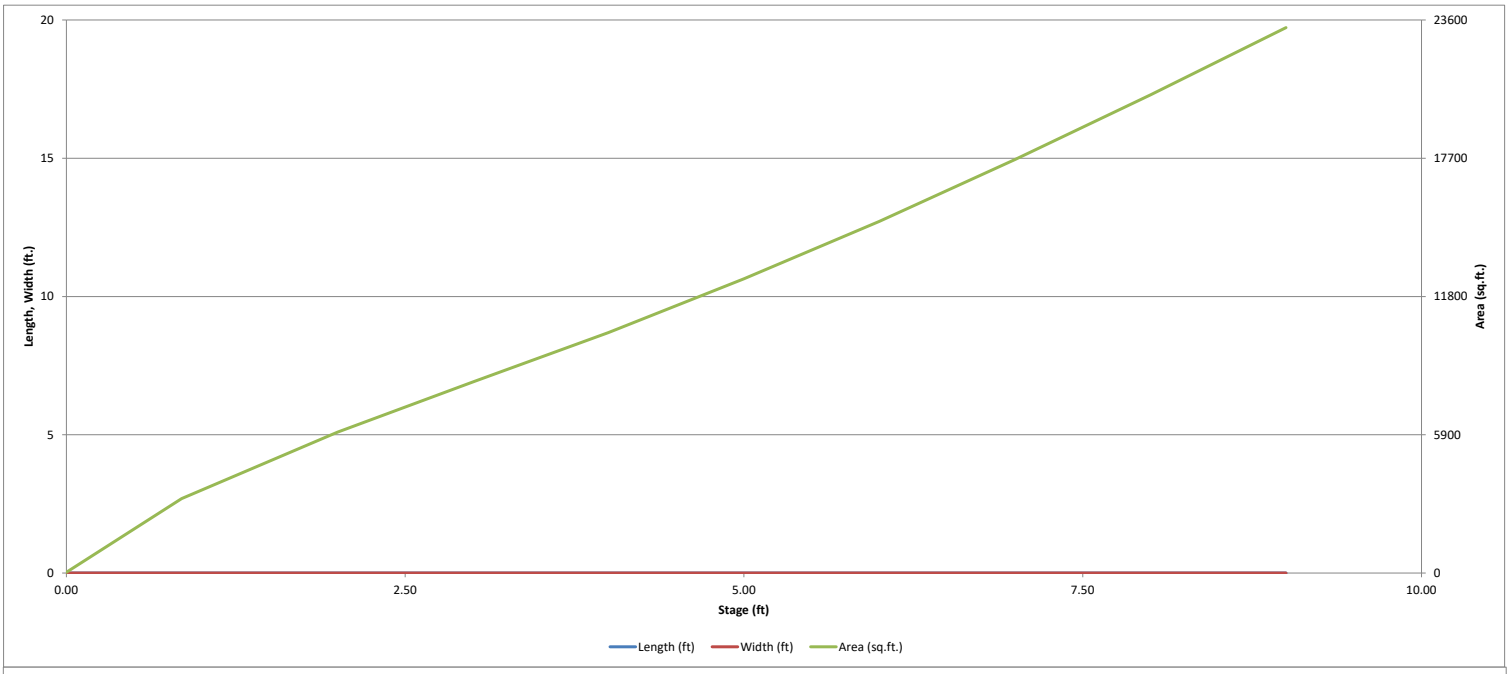
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5
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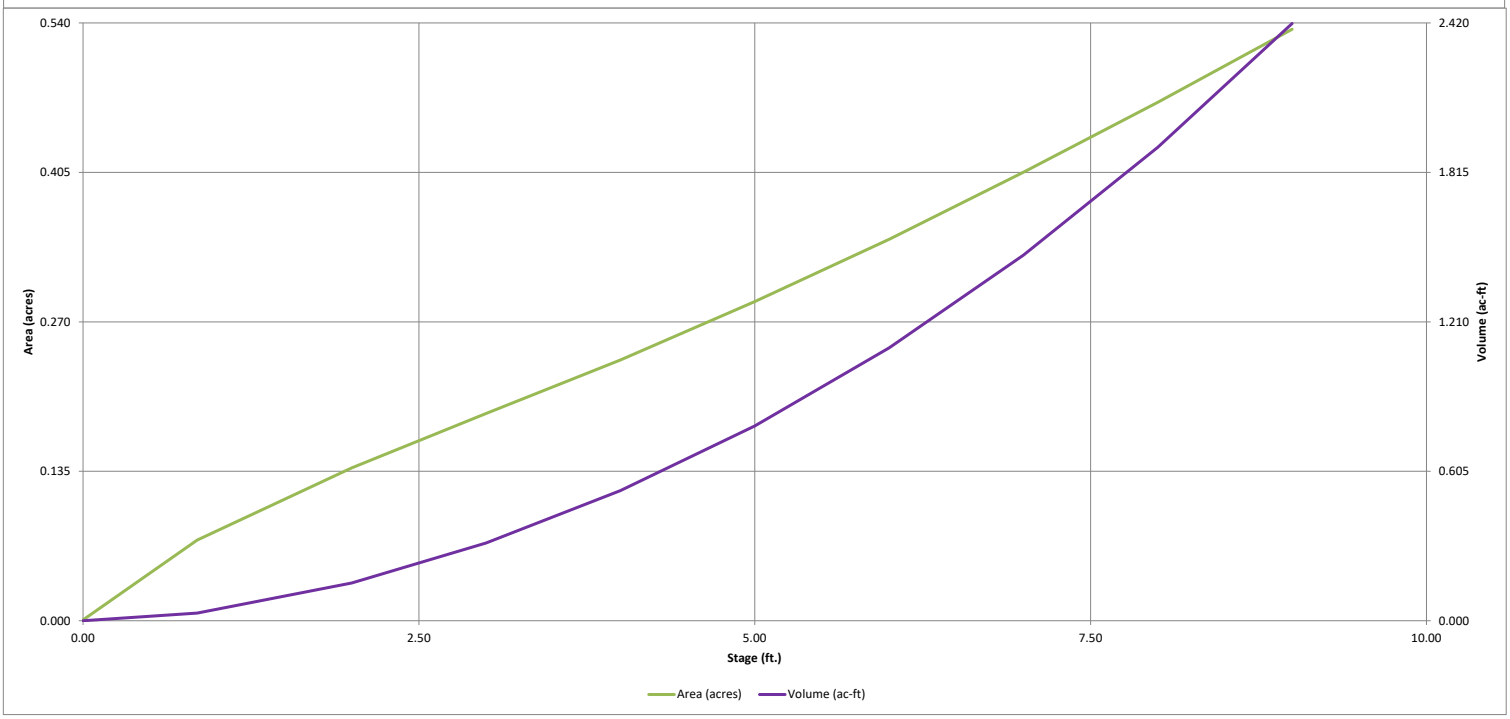
0.00
2.50
5.00
7.50
10.00
Length, Width (ft.)
Area (sq.ft.)
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)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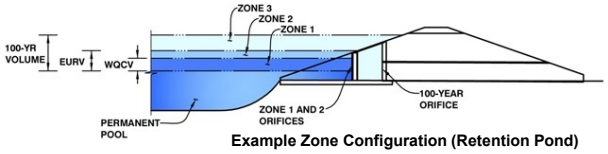
1.815
1.210
0.605
0.000
0.00
2.50
5.00
7.50
10.00
Area (acres)
Volume (ac-ft)
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: **Paintbrush Hills Scenic View Detention Pond**

Basin ID: **Pond #2**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.39	0.391	Orifice Plate
Zone 2 (EURV)	6.54	0.907	Orifice Plate
Zone 3 (100-year)	8.44	0.830	Weir&Pipe (Circular)
Total (all zones)		2.128	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =		ft (distance below the filtration media surface)	Underdrain Orifice Area =		ft^2
Underdrain Orifice Diameter =		inches	Underdrain Orifice Centroid =		feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	1.271E-02	ft^2
Depth at top of Zone using Orifice Plate =	6.57	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	18.00	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	1.83	sq. inches (diameter = 1-1/2 inches)	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.50	3.00	4.50	6.00			
Orifice Area (sq. inches)	1.83	1.83	1.83	1.83	1.83			

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	6.57	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	3.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	3.00	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	38%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	6.57	N/A	feet
Overflow Weir Slope Length =	3.00	N/A	feet
Grate Open Area / 100-yr Orifice Area =	2.60	N/A	
Overflow Grate Open Area w/o Debris =	6.26	N/A	ft^2
Overflow Grate Open Area w/ Debris =	3.92	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.75	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	21.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	2.41	N/A	ft^2
Outlet Orifice Centroid =	0.88	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	8.07	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	29.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

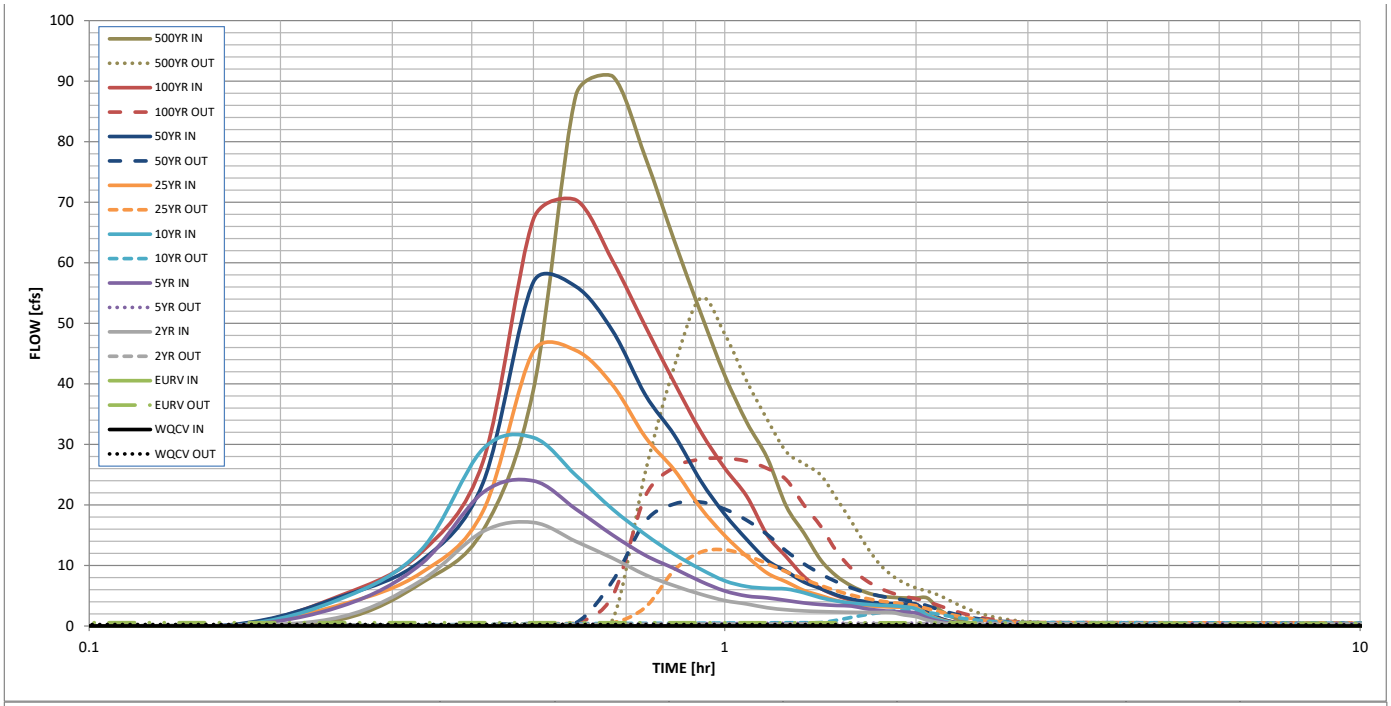
Calculated Parameters for Spillway

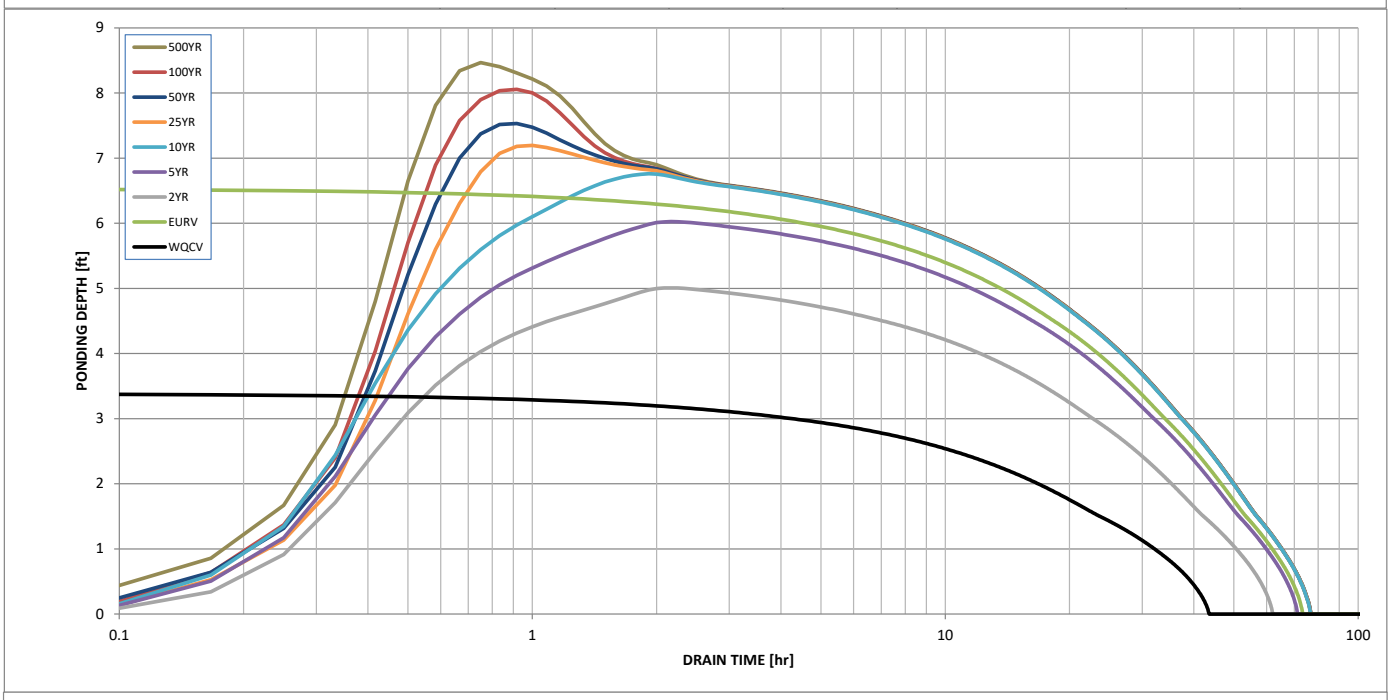
Spillway Design Flow Depth=	0.81	feet
Stage at Top of Freeboard =	9.88	feet
Basin Area at Top of Freeboard =	0.53	acres
Basin Volume at Top of Freeboard =	2.42	acre-ft

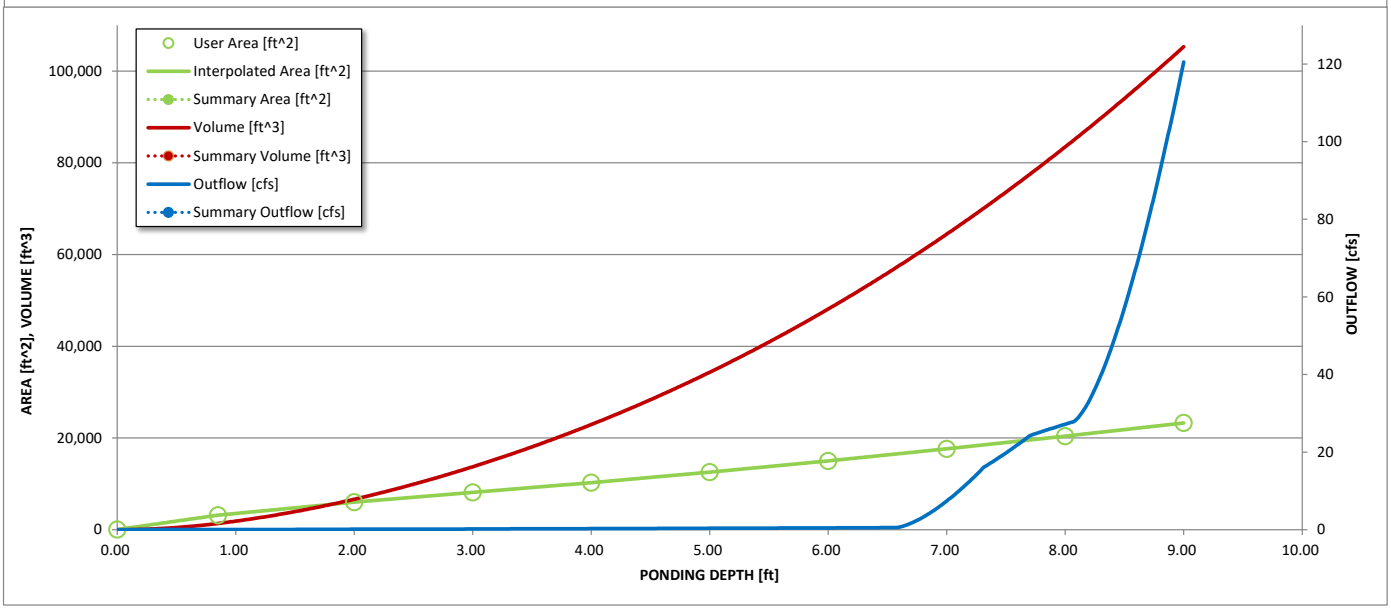
Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	0.94	1.22	1.47	1.85	2.17	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.391	1.298	0.843	1.180	1.534	2.204	2.715	3.340	4.364
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.843	1.180	1.534	2.204	2.715	3.340	4.364
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.3	2.5	6.6	17.9	24.7	33.1	46.1
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.02	0.12	0.34	0.91	1.25	1.68	2.34
Peak Inflow Q (cfs) =	N/A	N/A	17.1	24.0	31.1	45.5	56.8	70.4	90.8
Peak Outflow Q (cfs) =	0.2	0.5	0.4	0.5	2.6	12.6	20.5	27.7	54.1
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.2	0.4	0.7	0.8	0.8	1.2
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.3	1.9	3.2	4.3	4.9
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	39	63	54	61	65	61	58	56	52
Time to Drain 99% of Inflow Volume (hours) =	**42**	69	59	67	71	70	69	67	65
Maximum Ponding Depth (ft) =	3.39	6.54	5.01	6.03	6.76	7.20	7.53	8.06	8.47
Area at Maximum Ponding Depth (acres) =	0.21	0.38	0.29	0.35	0.39	0.42	0.44	0.47	0.50
Maximum Volume Stored (acre-ft) =	0.392	1.300	0.788	1.112	1.384	1.558	1.703	1.940	2.139







C-A-V-D Chart Axis Override X-axis Left Y-Axis Right Y-Axis

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer:	**GEW**
Company:	**RGA**
Date:	**June 29, 2021**
Project:	**Scenic View Detention Pond Modifications**
Location:	**Paint Brush Hills**

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a — I_a = 60.5 %

B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$) — i = 0.605

C) Contributing Watershed Area — Area = 19.720 ac

D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm — d_6 = 0.43 in

E) Design Concept
(Select EURV when also designing for flood control)

Choose One
- ○ Water Quality Capture Volume (WQCV)
- ◉ Excess Urban Runoff Volume (EURV)

F) Design Volume (WQCV) Based on 40-hour Drain Time
($V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area$)
— V_{DESIGN}= ac-ft

G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume
($V_{WQCV\ OTHER} = (d_6*(V_{DESIGN}/0.43))$
— $V_{DESIGN\ OTHER}$= ac-ft

H) User Input of Water Quality Capture Volume (WQCV) Design Volume
(Only if a different WQCV Design Volume is desired)
— $V_{DESIGN\ USER}$= 0.391 ac-ft

I) NRCS Hydrologic Soil Groups of Tributary Watershed
- i) Percentage of Watershed consisting of Type A Soils — HSG_A = 2 %
- ii) Percentage of Watershed consisting of Type B Soils — HSG_B = 98 %
- iii) Percentage of Watershed consisting of Type C/D Soils — $HSG_{C/D}$ = 0 %

J) Excess Urban Runoff Volume (EURV) Design Volume
For HSG A: $EURV_A = 1.68 * i^{1.28}$
For HSG B: $EURV_B = 1.36 * i^{1.08}$
For HSG C/D: $EURV_{C/D} = 1.20 * i^{1.08}$
— $EURV_{DESIGN}$ = ac-f t

K) User Input of Excess Urban Runoff Volume (EURV) Design Volume
(Only if a different EURV Design Volume is desired)
— $EURV_{DESIGN\ USER}$= 1.298 ac-f t

2. Basin Shape: Length to Width Ratio
(A basin length to width ratio of at least 2:1 will improve TSS reduction.)
— L : W = 3.0 : 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:

5. Forebay

A) Minimum Forebay Volume
(V_{FMIN} = 3% of the WQCV)
— V_{FMIN} = 0.01200 ac-ft

B) Actual Forebay Volume — V_F = 0.034 ac-ft

C) Forebay Depth
(D_F = 18 inch maximum)
— D_F = 18.0 in

D) Forebay Discharge

i) Undetained 100-year Peak Discharge — Q_{100} = 68.50 cfs

ii) Forebay Discharge Design Flow
($Q_F = 0.02 * Q_{100}$)
— Q_F = 1.37 cfs

E) Forebay Discharge Design

Choose One
- ○ Berm With Pipe
- ◉ Wall with Rect. Notch
- ○ Wall with V-Notch Weir

Flow too small for berm w/ pipe

F) Discharge Pipe Size (minimum 8-inches) — Calculated D_P = in

G) Rectangular Notch Width — Calculated W_N = 6.3 in

Design Procedure Form: Extended Detention Basin (EDB)

Designer: GEW
Company: RGA
Date: June 29, 2021
Project: Scenic View Detention Pond Modifications
Location: Paint Brush Hills

6. Trickle Channel	
A) Type of Trickle Channel	Choose One: (●) Concrete ( ) Soft Bottom
F) Slope of Trickle Channel	S = 0.0050 ft / ft
7. Micropool and Outlet Structure	
A) Depth of Micropool (2.5-feet minimum)	D_M = ft
B) Surface Area of Micropool (10 ft^2 minimum)	A_M = sq ft
C) Outlet Type	Choose One: ( ) Orifice Plate ( ) Other (Describe):
D) Smallest Dimension of Orifice Opening Based on Hydrograph Routing (Use UD-Detention)	$D_{orifice}$ = inches
E) Total Outlet Area	A_{ot} = square inches
8. Initial Surcharge Volume	
A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches)	D_{IS} = in
B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV)	V_{IS} = 51 cu ft
C) Initial Surcharge Provided Above Micropool	V_s= cu ft
9. Trash Rack	
A) Water Quality Screen Open Area: $A_t = A_{ni} * 38.5*(e^{-0.095D})$	A_t = square inches
B) Type of Screen (If specifying an alternative to the materials recommended in the USDCM, indicate "other" and enter the ratio of the total open are to the total screen are for the material specified.)	
Other (Y/N): N	
C) Ratio of Total Open Area to Total Area (only for type 'Other')	User Ratio =
D) Total Water Quality Screen Area (based on screen type)	A_{total} = sq. in.
E) Depth of Design Volume (EURV or WQCV) (Based on design concept chosen under 1E)	H= feet
F) Height of Water Quality Screen (H_{TR})	H_{TR}= inches
G) Width of Water Quality Screen Opening ($W_{opening}$) (Minimum of 12 inches is recommended)	$W_{opening}$ = inches

Worksheet for Trickle Channel

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.5	%
Normal Depth	0.50	ft
Bottom Width	4.00	ft

Results

Discharge	8.78	ft^3/s
Flow Area	2.00	ft^2
Wetted Perimeter	5.00	ft
Hydraulic Radius	0.40	ft
Top Width	4.00	ft
Critical Depth	0.53	ft
Critical Slope	0.00416	ft/ft
Velocity	4.39	ft/s
Velocity Head	0.30	ft
Specific Energy	0.80	ft
Froude Number	1.09	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.53	ft
Channel Slope	0.5	%
Critical Slope	0.00416	ft/ft

Worksheet for Forebay Overflow

Project Description

Solve For	Headwater Elevation

Input Data

Discharge	68.50	ft^3/s
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Weir Coefficient	3.33	US
Crest Length	21.0	ft
Number Of Contractions	0	

Results

Headwater Elevation	0.99	ft
Headwater Height Above Crest	0.99	ft
Tailwater Height Above Crest	0.00	ft
Flow Area	20.71	ft^2
Velocity	3.31	ft/s
Wetted Perimeter	22.97	ft
Top Width	21.00	ft

FINAL DRAINAGE REPORT

SCENIC VIEW AT PAINTBRUSH HILLS

NOVEMBER, 2013
FEBRUARY, 2014
APRIL, 2014
JUNE, 2014
JULY, 2014

Prepared for:

Babcock Land Corp.
212 N. Wahsatch Ave, Suite 301
Colorado Springs, Colorado 80903
(719) 635-3200

Prepared by:

Core Engineering Group, LLC
15004 1st Avenue South
Burnsville Minnesota 55306
(719) 570-1100

Project No. 100.203

CORE
ENGINEERING GROUP

ENGINEER'S STATEMENT

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by El Paso County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

Richard L. Schindler, P.E. #33997 — Date: 9-2-14

OWNER'S STATEMENT

I, the Owner, have read and will comply with all the requirements specified in the drainage report and plan.

BABCOCK LAND CORP. — 9/4/14

Business Name — Date

By

Director

Title

212 North Wahsatch Avenue, Suite 301

Address

Colorado Springs, Colorado 80903

FLOODPLAIN STATEMENT

To the best of my knowledge and belief, this development is not located within a designated 100 year floodplain as shown on Flood Insurance Rate Map Panel No. 08041C0575 F, dated March 17, 1997. (See Appendix A, FEMA FIRM Exhibit)

EL PASO COUNTY

Filed in accordance with El Paso County Land Development Code, Drainage Criteria manual, Volumes 1 & 2, and the Engineering Criteria Manual, As Amended.

Andre Brackin, P.E., County Engineer / ECM Administrator — 9-12-14 Date

Conditions:

Sub-Basin C6b

Sub-Basin C6b consists of residential lots and directs runoff east and south to the proposed street. The total developed flow from this 1.49 acre sub-basin is 3.7cfs for the 5-year event and 7.6cfs for the 100-year event. Runoff from this basin is directed westerly within the street to the proposed 10' type "R" inlet #2 on a continuous grade. For the 5-year flow of 4.7cfs (includes 1.0cfs flowby from inlet #2 in C6a), this inlet intercepts a total of 4.5cfs, with 0.2cfs flowby directed to inlet #4, for the 100-year flow of 12.9cfs (includes 5.3cfs flowby from inlet #2 in C6a) 8.1cfs will be intercepted with 4.8cfs flowby directed to inlet #4. Runoff from this proposed inlet is routed westerly underground via proposed 18" & 24" RCP's, then to the proposed detention pond located in the southwest corner of this development. See ***Appendix B*** for a flow summary of this basin.

Sub-Basin C6c

Sub-Basin C6c consists of residential lots and directs runoff south to the proposed street. The total developed flow from this 1.35 acre sub-basin is 3.5cfs for the 5-year event and 7.4cfs for the 100-year event. Runoff from this basin and the flowby is directed westerly within the street to the proposed 15' type "R" inlet #4 in a sump condition. This inlet will be discussed in greater detail in the following design point DP-4 section. See ***Appendix B*** for a flow summary of this basin.

Sub-Basin C6

Sub-Basin C consists of residential lots and directs runoff north and west to the proposed street. The peak developed flow from this 5.18 acre sub-basin is 12.8cfs for the 5-year event and 26.6cfs for the 100-year event, flows from this sub-basin have been intercepted as detailed previously in sub-basins C6a and C6b the remaining flow is directed to the proposed 15' type "R" inlet #4 in a sump condition. This inlet will be discussed in greater detail in the following design point DP-4 section. See ***Appendix B*** for a flow summary of this basin.

Design Point DP-4

Design Point DP-4 consists of sub-basins C5 and C6, the total developed flow from this combined 7.18 acre basin is 17.0cfs for the 5-year event and 35.2cfs for the 100-year event, of this flow, 10.1cfs for the 5-year event and 16.4cfs for the 100-year event have been intercepted upstream by inlets #2 and #3 and conveyed westerly underground via 18" & 24" RCP's to the low point in the proposed street. The remaining runoff is routed via curb and gutter to a proposed 15' type "R" inlet #4 in a sump condition on the north side of the proposed street. This 15' inlet will intercept the 5-year flow of 8.4cfs (4.7cfs from basin C5 + 3.5cfs from basin C6c + 0.2cfs flowby from inlet #3 = 8.4cfs; additive) at a depth of 0.48', the 100-year flow of 22.0cfs (9.8cfs from basin C5 + 7.4cfs from basin C6c + 4.8cfs flowby from inlet #3 = 8.4cfs; additive) will be intercepted at a depth of 0.69'. Runoff from this proposed inlet is routed southerly underground via proposed 24" RCP (pipe flow is 8.4cfs for the 5-year event and 22.0cfs for the 100-year event) to the proposed manhole, then a 42" RCP to proposed inlet #5, and the 42" RCP outlets into the proposed detention pond located in the southwest corner of this development. See ***Appendix B*** for a flow summary of this basin.

Sub-Basin C7

Sub-Basin C7 consists of residential lots and directs runoff north to the proposed street. The peak developed flow from this 1.65 acre sub-basin is 4.1cfs for the 5-year event and 8.6cfs for the 100-year event, these flows are routed westerly via curb and gutter to a proposed 20' type "R" inlet #5 in a sump condition on the south side of the proposed street. This inlet will be discussed in greater detail in the following design point DP-5 section. See ***Appendix B*** for a flow summary of this basin.

Sub-Basin C8

Sub-Basin C8 consists of residential lots and directs runoff easterly to the proposed street. The peak developed flow from this 1.54 acre sub-basin is 4.1cfs for the 5-year event and 8.4cfs for the 100-year event, these flows are routed southerly, the easterly via curb and gutter to a proposed 20' type "R"

inlet #5 in a sump condition on the south side of the proposed street. This inlet will be discussed in greater detail in the following design point DP-5 section. See ***Appendix B*** for a flow summary of this basin.

Design Point DP-5

Design Point DP-5 consists of design point DP-3 and sub-basins C7 and C8, the total developed flow from this combined 32.27 acre basin is 24.4cfs for the 5-year event and 60.1cfs for the 100-year event, a portion of the 5-year flow and the 100-year flow have been intercepted upstream and conveyed underground southerly and easterly via 30" RCP to the low point in the proposed street. The remaining runoff is routed via curb and gutter to a proposed 20' type "R" inlet #5 in a sump condition on the south side of the proposed street. This 20' inlet will intercept the 5-year flow of 9.6cfs (4.1cfs from basin C7 + 4.1cfs from basin C8 + 0.3cfs flowby from basin EX-B1 + 1.1cfs flowby from inlet #1 = 9.3cfs; additive) at a depth of 0.46', the 100-year flow of 32.2cfs (8.6cfs from basin C7 + 8.4cfs from basin C8 + 8.1cfs flowby from basin EX-B1 + 7.1cfs flowby from inlet #1 = 32.2cfs; additive) will be intercepted at a depth of 0.73'. Runoff from this proposed inlet is routed southerly underground via proposed 42" RCP to the proposed detention pond located in the southwest corner of this development. See ***Appendix B*** for a flow summary of this basin.

Design Point DP-6

Design Point DP-6 collects surface and pipe flow from design points DP-4 and DP-5, which includes the released flows of 10.9cfs for the 5-year event and 46.2cfs for the 100-year event from the existing detention pond. The total developed flow from this 39.45 acre design point is 32.5cfs for the 5-year event and 68.6cfs for the 100-year event. Design point DP-6 flows are directed to the proposed detention pond located in the southwest corner of this development. This pond will be discussed in greater detail in the following Detention Pond and Water Quality section. See ***Appendix B*** for a flow summary of this basin.

Sub-Basin C9

Sub-Basin C9 encompasses the detention pond area, contains 0.67 acres and generates a peak developed flow of 0.8cfs for the 5-year event and 2.1cfs for the 100-year event, flows are routed through the detention pond and outlets to the existing 30" RCP at the corner of Stapleton Drive and Towner Avenue via proposed 24" RCP. See ***Appendix B*** for a flow summary of this basin.

Design Point DP-6a

Design Point DP-6 collects surface and pipe flow from sub-basin C9 and design point DP-6, which includes the released flows of 10.9cfs for the 5-year event and 46.2cfs for the 100-year event from the existing detention pond. The total developed flow from this 40.12 acre design point is 33.2cfs for the 5-year event and 70.4cfs for the 100-year event. Design point DP-6a flows are directed to the proposed detention pond located in the southwest corner of this development. This pond will be discussed in greater detail in the following Detention Pond and Water Quality section. See ***Appendix B*** for a flow summary of this basin.

Design Point DP-7

Design Point DP-7 collects surface and pipe flow from design point DP-6a and basin J, which includes the released flows of 10.9cfs for the 5-year event and 46.2cfs for the 100-year event from the existing detention pond. The total developed flow from this 41.88 acre design point is 8.8cfs for the 5-year event and 28.6cfs for the 100-year event. Design point DP-7 is located at the southwest corner of this development at the intersection of Stapleton Drive and Towner Avenue. This design point does not generate an increase in runoff; therefore, there should be no downstream impacts. See ***Appendix B*** for a flow summary of this basin.

5.0 HYDRAULIC SUMMARY

Hydraulic and pond calculations have been performed using an Excel spreadsheet, Street and Inlet Hydraulics by Denver Urban Drainage and Flood Control District, Stormwater Quality Procedures by the City of Colorado Springs, Hydraflow for Storm Sewers, Hydraflow Hydrographs and Hydraflow Express by Intellisolve computer modeling programs. The inlets have been sized using local runoff for interception and runby flows, if any. The pipe flows shown are based on an additive flow and was used for the sizing of the storm drain system only, and was not used for the hydraulic modeling of the proposed Scenic View Pond. A separate Hydrologic modeling program (Hydraflow Hydrographs; by Intellisolve) using peak flow at the various design points, was used to design the proposed Scenic View detention pond. These storm sewer calculations are located in ***Appendix C***.

It is the intent of this FDR to use the proposed curb/gutter and storm sewer in the streets to convey runoff to the detention facility and water quality pond where runoff can be treated prior to discharge. Maintenance of the private grass swale sedimentation facility will be provided by the "Paint Brush Hills Metro District". Inlet locations have been indicated on the developed conditions drainage map and have been sized for the 5-year and 100-year storms. See ***Appendix C*** for detailed hydraulic calculations and the storm sewer model.

6.0 DRAINAGE AND BRIDGE FEES

Scenic View at Paintbrush Hills is located within the Falcon Area Drainage Basin which is currently a fee basin in El Paso County. Current El Paso County regulations require drainage and bridge fees to be paid for platting of land.

Scenic View at Paintbrush Hills Final Plat contains 18.76 acres and will be assessed Drainage and Bridge fees. This project has a percent impervious of 53%, this is based on 0.138 acre lots obtained from the "Addendum; Revised Drainage Basin Fees Based on Impervious Area". The 2014 drainage fees are $8,115, and the bridge fees are $3,115 per impervious acre. The fees are calculated as follows:

Table 1: Drainage/Bridge Fees

Type of Land Use	Total Area (ac)	Impervious	2014 Drainage Fees ($8,115)	2014 Bridge Fees ($3,115)
Residential	18.76	53%	$80,686	$30,972

7.0 DETENTION AND WATER QUALITY POND

Runoff from Scenic View at Paintbrush Hills drains southwest to the proposed Scenic View Pond; the total contributing area is 40.12 acres and generates a peak flow of 33.2cfs for the 5-year event and 70.4cfs for the 100-year event. Release rate is 8.8cfs for the 5-year event and 28.6cfs for the 100-year event. This pond also includes water quality. See the drainage map, also the early grading plan and detail sheet for the proposed pond that are included in the appendix of this report.
Current conditions Drainage Plan show peak flows exiting this site at 4 existing culverts, proposed conditions show that developed flow exiting at these locations are at or below current condition flows. Since these basins do not generate an increase in runoff; there should be no downstream impacts.

Table 1: Detention Pond Data

Pond	Incoming Flow	Pond Discharge	WSEL	Storage (ac-ft)	Water Quality
Scenic View Pond (5-yr.)	33.2cfs	8.8cfs	7141.74	0.70	yes
Scenic View Pond (100-yr)	70.4cfs	28.6cfs	7144.20	1.55	yes

Table 3: Water Quality Pond Summary

Pond	Tributary Area	WQCV	WSEL	Comments
Scenic View Pond	13.09 ac	0.33 ac-ft	7139.00	
Porous Landscape Detention	1.52 ac.	0.03 ac-ft	7147.69	1,122 cu-ft

8.0 CONCLUSIONS

This drainage report has been prepared in accordance with the City of Colorado Springs/El Paso County Drainage Criteria Manual. The proposed development and drainage infrastructure will not cause adverse impacts to adjacent properties or properties located downstream. Several key aspects of the development discussed above are summarized as follows:

- Developed runoff will be conveyed via curb/gutter and storm sewer facilities
- Detention for this filing is provided in Scenic View Pond
- Water Quality for this filing is provided in Scenic View Pond

9.0 REFERENCES

1. City of Colorado Springs/El Paso County Drainage Criteria Manual DCM
2. Soil Survey of El Paso County Area, Colorado by USDA, SCS
3. City of Colorado Springs "Drainage Criteria Manual, Volume 2
4. El Paso County "Engineering Criteria Manual"
5. MDDP for Falcon Hills Development, Dated October 22, 2002 by Kiowa Engineering
6. Paintbrush Hills Filing No. 4, Dated February, 1987, by KKBNA, Inc.
7. The Meadows Filing No. 3, Dated July, 2000, by Ladd Engineering Consultants, Inc.

CORE
ENGINEERING GROUP
15004 1st Avenue South
Burnsville, MN 55306

PROJECT NAME: Scenic View at Paintbrush Hills
PROJECT NUMBER: 100.203
ENGINEER: LAB
DATE: 11/04/13

Final Drainage Plan
DEVELOPED CONDITIONS HYDROLOGY CALCULATIONS

BASIN	CRITERIA REFERENCE[1]	Offsite EX-A	Offsite EX-B1	Offsite EX-C1	Offsite EX-C2	C1 & C2 DP-1	W/Det. DP-1	Offsite EX-C3	C4	C3 & C4	W/Det. DP-2	W/Det. DP-3	C5
AREA, A [ACRE]	-	9.18	2.16	3.11	19.47	22.58	22.58	1.43	2.91	4.34	26.92	29.08	2.00
RUN-OFF COEFFICIENT, C5	-	0.47	0.80	0.65	0.47	0.49		0.30	0.60	0.50			0.60
OVERLAND DROP [FT]	-	16.00	1.00	1.00	24.00	24.00		6.00	3.10	6.00			0.80
OVERLAND FLOW LENGTH, L_O [FT]	-	300.00	26.00	15.00	300.00	300.00		271.00	124.00	271.00			40.00
OVERLAND SLOPE, S_O [%]	-	5.33%	3.85%	6.67%	8.00%	8.00%		2.21%	2.50%	2.21%			2.00%
OVERLAND FLOW TIME, t_i [MIN]	-	11.24	1.76	1.67	9.82	9.51		18.19	7.38	13.64			4.52
TRAVEL FLOW DROP [FT]	-	51.00	31.30		34.00	34.00		10.00		16.80			
TRAVEL FLOW LENGTH, Lt [FT]	-	1536.0	738.0		1059.0	1059.0		151.0		261.0			
TRAVEL SLOPE, S_t [%]	-	3.32%			3.21%	3.21%				6.44%			
CHANNEL TRAVEL VELOCITY, V_t [FT/SEC]	-	3.11			2.82	2.82				2.67			
CHANNEL TRAVEL TIME, t_t [MIN]	Channel "tt"	8.23	3.90		6.26	6.26		0.60		1.63			
STREET FLOW DROP [FT]	-		2.50	26.00					5.70	5.90			14.90
STREET FLOW LENGTH, Lt [FT]	-		81.0	807.0					895.0	791.0			1450.0
STREET TRAVEL SLOPE, S_t [%]	-		3.09%	3.22%					0.64%	0.75%			1.03%
STREET TRAVEL VELOCITY, V_t [FT/SEC]	29.4927*Slope^0.5		5.18	5.29					2.35	2.55			2.99
STREET TRAVEL TIME, t_t [MIN]	Street "tt"		0.26	2.54					6.34	5.18			8.08
PIPE DIAMETER	-		1.25										
PIPE FLOW DROP [FT]	-		2.44										
PIPE FLOW LENGTH, Lt [FT]	-		65.0										
PIPE TRAVEL SLOPE, S_t [%]	-		3.75%										
PIPE TRAVEL VELOCITY, V_t [FT/SEC]	$V=1.486/n * R^{2/3} * S^{1/2}$		10.20										
PIPE TRAVEL TIME, t_t [MIN]	Pipe "tt"		0.11										
TIME OF CONCENTRATION, t_c	t_i+t_t	19.5	6.0	4.2	16.1	15.8	5 & 23	18.8	13.7	20.4	5 & 23	5 & 23	12.6
	-												
5-YR RUN-OFF COEFFICIENT, C5	-	0.47	0.80	0.65	0.47	0.49		0.30	0.60	0.50			0.60
5-YR RAINFALL INTENSITY, I5 [IN/HR]	-	3.22	5.11	5.20	3.53	3.56		3.28	3.80	3.14			3.94
5-YR MAXIMUM RUN-OFF, Q5 [CFS]	Q=CIA	13.9	8.8	10.5	32.3	39.4	10.9	1.4	6.6	6.8	12.6	20.0	4.7
100-YR RUN-OFF COEFFICIENT, C_{100}		0.69	0.89	0.80	0.69	0.71		0.60	0.70	0.67			0.70
100-YR RAINFALL INTENSITY, I_{100} [IN/HR]	-	5.72	8.94	9.00	6.28	6.34		5.83	6.75	5.58			7.00
100-YR MAXIMUM RUN-OFF, Q_{100} [CFS]	Q=CIA	36.3	17.5	22.4	84.4	101.6	46.2	5.0	13.6	16.2	60.1	60.1	9.8

[1] *City of Colorado Springs and El Paso County Drainage Criteria Manual*

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DATE: 11/04/13

Final Drainage Plan
DEVELOPED CONDITIONS HYDROLOGY CALCULATIONS

BASIN	CRITERIA REFERENCE	C6a	C6b	C6c	C6	C5 & C6 DP-4	C7	C8	C7 & C8	W/Det. DP-5	W/Det. DP-6	W/Det. DP-6a	C9
AREA, A [ACRE]	-	2.34	1.49	1.35	5.18	7.18	1.65	1.54	3.19	32.27	39.45	40.12	0.67
RUN-OFF COEFFICIENT, C5	-	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60				0.25
OVERLAND DROP [FT]	-	1.00	8.80	8.00	1.00	0.80	0.40	3.00	0.40				8.20
OVERLAND FLOW LENGTH, L_O [FT]	-	50.00	247.00	196.00	50.00	40.00	22.00	95.00	22.00				50.00
OVERLAND SLOPE, S_O [%]	-	2.00%	3.56%	4.08%	2.00%	2.00%	1.82%	3.16%	1.82%				16.40%
OVERLAND FLOW TIME, t_i [MIN]	-	5.05	9.26	7.88	5.05	4.52	3.46	5.98	3.46				4.26
TRAVEL FLOW DROP [FT]	-												1.60
TRAVEL FLOW LENGTH, Lt [FT]	-												160.0
TRAVEL SLOPE, S_t [%]	-												1.00%
CHANNEL TRAVEL VELOCITY, V_t [FT/SEC]	-												1.16
CHANNEL TRAVEL TIME, t_t [MIN]	Channel "tt"												2.29
STREET FLOW DROP [FT]	-	11.80	1.60	1.50	14.90	14.90	5.40	6.60	5.40				
STREET FLOW LENGTH, Lt [FT]	-	684.0	288.0	243.0	1215.0	1450.0	976.0	636.0	976.0				
STREET TRAVEL SLOPE, S_t [%]	-	1.73%	0.56%	0.62%	1.23%	1.03%	0.55%	1.04%	0.55%				
STREET TRAVEL VELOCITY, V_t [FT/SEC]	29.4927*Slope^0.5	3.87	2.20	2.32	3.27	2.99	2.19	3.00	2.19				
STREET TRAVEL TIME, t_t [MIN]	Street "tt"	2.94	2.18	1.75	6.20	8.08	7.42	3.53	7.42				
PIPE DIAMETER	-												
PIPE FLOW DROP [FT]	-												
PIPE FLOW LENGTH, Lt [FT]	-												
PIPE TRAVEL SLOPE, S_t [%]	-												
PIPE TRAVEL VELOCITY, V_t [FT/SEC]	$V=1.486/n * R^{2/3} * S^{1/2}$												
PIPE TRAVEL TIME, t_t [MIN]	Pipe "tt"												
TIME OF CONCENTRATION, t_c	t_i+t_t	8.0	11.4	9.6	11.3	12.6	10.9	9.5	10.9	8 & 24	9 & 8	6	6.5
	-												
5-YR RUN-OFF COEFFICIENT, C5	-	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60				0.25
5-YR RAINFALL INTENSITY, I5 [IN/HR]	-	4.68	4.10	4.38	4.13	3.94	4.18	4.40	4.18				4.99
5-YR MAXIMUM RUN-OFF, Q5 [CFS]	Q=CIA	6.6	3.7	3.5	12.8	17.0	4.1	4.1	8.0	24.4	32.5	33.2	0.8
100-YR RUN-OFF COEFFICIENT, C_{100}		0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70				0.35
100-YR RAINFALL INTENSITY, I_{100} [IN/HR]	-	8.33	7.29	7.79	7.34	7.00	7.44	7.83	7.44				8.87
100-YR MAXIMUM RUN-OFF, Q_{100} [CFS]	Q=CIA	13.6	7.6	7.4	26.6	35.2	8.6	8.4	16.6	60.1	68.6	70.4	2.1

[1] *City of Colorado Springs and El Paso County Drainage Criteria*

CORE
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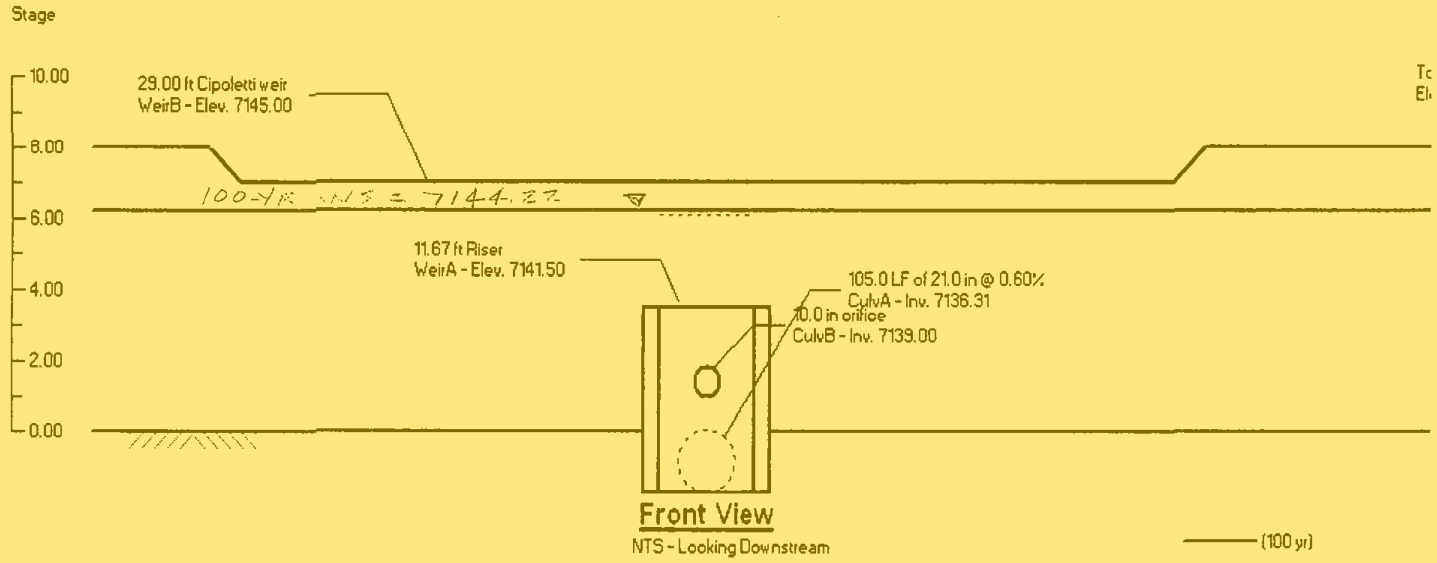
Final Drainage Plan
DEVELOPED CONDITIONS HYDROLOGY CALCULATIONS

Basin C Flow Does not include Existing offsite Detention, But does Include the Offsite EX-C1 & EX-C2 Sub-Basins.

BASIN	CRITERIA REFERENCE[1]	W/O Det. C	W/Det. DP-7	Offsite EX-E1	E2	E	F	G	H	I	J		
AREA, A [ACRE]	-	37.99	41.88	0.29	0.44	0.73	1.02	1.52	0.87	0.94	1.76		
RUN-OFF COEFFICIENT, C5	-	0.52		0.30	0.60	0.48	0.38	0.60	0.44	0.38	0.60		
OVERLAND DROP [FT]	-	6.00		12.0	10.00	19.00	3.00	1.60	3.00	9.20	2.60		
OVERLAND FLOW LENGTH, L_O [FT]	-	271.00		134.0	265.00	330.00	100.00	78.00	70.00	93.00	76.00		
OVERLAND SLOPE, S_O [%]	-	2.21%		9.0%	3.77%	5.76%	3.00%	2.05%	4.29%	9.89%	3.42%		
OVERLAND FLOW TIME, t_i [MIN]	-	13.19		8.0	9.41	11.40	8.99	6.26	6.12	5.82	5.21		
TRAVEL FLOW DROP [FT]	-	16.80					5.60	2.00	5.00	1.40	14.00		
TRAVEL FLOW LENGTH, Lt [FT]	-	261.0					184.0	30.0	174.0	281.0	407.0		
TRAVEL SLOPE, S_t [%]	-	6.44%					3.04%	6.67%	2.87%	0.50%	3.44%		
CHANNEL TRAVEL VELOCITY, V_t [FT/SEC]	-	2.67					1.85	1.65	1.78	1.01	2.32		
CHANNEL TRAVEL TIME, t_t [MIN]	Channel "tt"	1.63					1.66	0.30	1.63	4.62	2.92		
STREET FLOW DROP [FT]	-	13.60						12.00					
STREET FLOW LENGTH, Lt [FT]	-	1475.0						312.0					
STREET TRAVEL SLOPE, S_t [%]	-	0.92%						3.85%					
STREET TRAVEL VELOCITY, V_t [FT/SEC]	29.4927*Slope^0.5	2.83						5.78					
STREET TRAVEL TIME, t_t [MIN]	Street "tt"	8.68						0.90					
PIPE DIAMETER	-												
PIPE FLOW DROP [FT]	-												
PIPE FLOW LENGTH, Lt [FT]	-												
PIPE TRAVEL SLOPE, S_t [%]	-												
PIPE TRAVEL VELOCITY, V_t [FT/SEC]	$V=1.486/n * R^{2/3} * S^{1/2}$												
PIPE TRAVEL TIME, t_t [MIN]	Pipe "tt"												
TIME OF CONCENTRATION, t_c	t_i+t_t	23.5	10 & 13	8.0	9.4	11.4	10.6	7.5	7.7	10.4	8.1		
	-												
5-YR RUN-OFF COEFFICIENT, C5	-	0.52		0.30	0.60	0.48	0.38	0.60	0.44	0.38	0.60		
5-YR RAINFALL INTENSITY, I5 [IN/HR]	-	2.92		4.68	4.42	3.92	4.22	4.79	4.73	4.25	4.66		
5-YR MAXIMUM RUN-OFF, Q5 [CFS]	Q=CIA	57.7	8.8	0.4	1.2	1.3	1.6	4.4	1.8	1.5	4.9		
100-YR RUN-OFF COEFFICIENT, C_{100}		0.70		0.60	0.70	0.66	0.65	0.70	0.66	0.64	0.70		
100-YR RAINFALL INTENSITY, I_{100} [IN/HR]	-	5.19		8.32	7.86	7.30	7.50	8.52	8.42	7.56	8.28		
100-YR MAXIMUM RUN-OFF, Q_{100} [CFS]	Q=CIA	138.1	28.6	1.4	2.4	3.5	5.0	9.1	5.0	4.5	10.2		

[1] *City of Colorado Springs and El Paso County Drainage Criteria*

Scenic View Proposed Pond



Front View

NTS - Looking Downstream

Schematic only. Not for construction.

Hydraflow Hydrographs Pond Draw	Project: Proposed Paintbrush Pond-100yr.gpw	Tuesday, Jun 24 2014, 8:44 AM

Pond Report

Hydraflow Hydrographs by Intelisolve — Tuesday, Jun 24 2014, 9:37 AM

Pond No. 2 - Scenic View Proposed Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	7138.00	4,261	0	0 ← Spun
1.00	7139.00	6,250	5,256	5,256
2.00	7140.00	8,240	7,245	12,501
3.00	7141.00	10,400	9,320	21,821
4.00	7142.00	12,558	11,479	33,300
5.00	7143.00	15,102	13,830	47,130
6.00	7144.00	17,647	16,375	63,504
7.00	7145.00	20,461	19,054	82,558
8.00	7146.00	23,274	21,868	104,426

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise (in)	= 21.00	10.00	0.00	0.00
Span (in)	= 21.00	10.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 7136.31	7139.00	0.00	0.00
Length (ft)	= 105.00	0.00	0.00	0.00
Slope (%)	= 0.60	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 11.67	29.00	0.00	0.00
Crest El. (ft)	= 7141.50	7145.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	0.00	0.00
Weir Type	= Riser	Cipiti	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control. Weir riser checked for orifice conditions.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0	7138.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
1.00	5,256	7139.00	9.02	0.00	---	---	0.00	0.00	---	---	---	0.00
2.00	12,501	7140.00	9.02	2.01	---	---	0.00	0.00	---	---	---	2.01
3.00	21,821	7141.00	9.02	3.30	---	---	0.00	0.00	---	---	---	3.30
4.00	33,300	7142.00	17.51	3.77	---	---	13.74	0.00	---	---	---	17.51
5.00	47,130	7143.00	25.94	0.68	---	---	25.25	0.00	---	---	---	25.93
6.00	63,504	7144.00	28.19	0.71	---	---	27.47	0.00	---	---	---	28.18
7.00	82,558	7145.00	30.27	0.74	---	---	29.53	0.00	---	---	---	30.26
8.00	104,426	7146.00	32.21	0.77	---	---	31.43	96.57	---	---	---	128.77

Design Procedure Form: Extended Detention Basin (EDB) - Sedimentation Facility

Designer:	Len Beasley
Company:	Core Engineering Group
Date:	November 13, 2013
Project:	Scenic View at Paintbrush Hills
Location:	Scenic View Pond (SW Corner) #100.203

1. Basin Storage Volume			
A) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	I_a =	65.00	%
	i =	0.65	
B) Contributing Watershed Area (Area)	Area =	13.09	acres
C) Water Quality Capture Volume (WQCV) ($WQCV = 1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i)$)	WQCV =	0.25	watershed inches
D) Design Volume: Vol = (WQCV / 12) * Area * 1.2	Vol =	0.333	acre-feet
2. Outlet Works			
A) Outlet Type (Check One)	x	Orifice Plate	
		Perforated Riser Pipe	
		Other:	
B) Depth at Outlet Above Lowest Perforation (H)	H =	2.00	feet
C) Required Maximum Outlet Area per Row, (A_o)	A_o =	0.71	square inches
D) Perforation Dimensions **(enter one only)**:			
i) Circular Perforation Diameter **OR**	D =	0.9000	inches, **OR**
ii) 2" Height Rectangular Perforation Width	W =		inches
E) Number of Columns (nc, See Table 6a-1 For Maximum)	nc =	1	number
F) Actual Design Outlet Area per Row (A_o)	A_o =	0.64	square inches
G) Number of Rows (nr)	nr =	6	number
H) Total Outlet Area (A_{ot})	A_{ot} =	3.82	square inches
3. Trash Rack			
A) Needed Open Area: A_t = 0.5 * (Figure 7 Value) * A_{ot}	A_t =	131	square inches
B) Type of Outlet Opening (Check One)	X	≤ 2" Diameter **Round**	
		2" High **Rectangular**	
		Other:	
C) For 2", or Smaller, **Round Opening** (Ref.: Figure 6a):			
i) Width of Trash Rack and Concrete Opening (W_{conc}) from Table 6a-1	W_{conc} =	6	inches (minimum)
		Use 11" to accomodate 10" Orifice	
ii) Height of Trash Rack Screen (H_{TR})	H_{TR} =	48	inches

Design Procedure Form: Extended Detention Basin (EDB) - Sedimentation Facility

Designer: Len Beasley
Company: Core Engineering Group
Date: November 13, 2013
Project: Scenic View at Paintbrush Hills
Location: Scenic View Pond (SW Corner) #100.203

iii) Type of Screen (Based on Depth H), Describe if "Other"	x S.S. #93 VEE Wire (US Filter) Other:
iv) Screen Opening Slot Dimension, Describe if "Other"	X 0.139" (US Filter) Other:
v) Spacing of Support Rod (O.C.) Type and Size of Support Rod (Ref.: Table 6a-2)	0.75 inches #156 VEE
vi) Type and Size of Holding Frame (Ref.: Table 6a-2)	3/8 in. x 1.0 in. flat bar
D) For 2" High **Rectangular Opening** (Refer to Figure 6b):	
I) Width of Rectangular Opening (W)	W = _____ inches
ii) Width of Perforated Plate Opening (W_{conc} = W + 12")	W_{conc} = _____ inches
iii) Width of Trashrack Opening ($W_{opening}$) from Table 6b-1	$W_{opening}$ = _____ inches
iv) Height of Trash Rack Screen (H_{TR})	H_{TR} = _____ inches
v) Type of Screen (based on depth H) (Describe if "Other")	Klemp™ KPP Series Aluminum Other:
vi) Cross-bar Spacing (Based on Table 6b-1, Klemp™ KPP Grating). Describe if "Other"	inches Other:
vii) Minimum Bearing Bar Size (Klemp™ Series, Table 6b-2) (Based on depth of WQCV surcharge)	
4. Detention Basin length to width ratio	2.00 (L/W)
5 Pre-sedimentation Forebay Basin - Enter design values	
A) Volume (5 to 10% of the Design Volume in 1D)	0.017 acre-feet
B) Surface Area	0.017 acres
C) Connector Pipe Diameter (Size to drain this volume in 5-minutes under inlet control)	2 - 8" inches
D) Paved/Hard Bottom and Sides	no yes/no

Design Procedure Form: Extended Detention Basin (EDB) - Sedimentation Facility

Designer: Len Beasley
Company: Core Engineering Group
Date: November 13, 2013
Project: Scenic View at Paintbrush Hills
Location: Scenic View Pond (SW Corner) #100.203

6. Two-Stage Design	
A) Top Stage (D_{WQ} = 2' Minimum)	D_{WQ} = 2.00 feet Storage= 0.300 acre-feet
B) Bottom Stage (D_{BS} = D_{WQ} + 1.5' Minimum, D_{WQ} + 3.0' Maximum, Storage = 5% to 15% of Total WQCV)	D_{BS} = 3.50 feet Storage= 0.017 acre-feet Surf. Area= 0.005 acres
C) Micro Pool (Minimum Depth = the Larger of 0.5 * Top Stage Depth or 2.5 Feet)	Depth= 2.50 feet Storage= 0.003 acre-feet Surf. Area= 0.001 acres
D) Total Volume: Vol_{tot} = Storage from 5A + 6A + 6B Must be ≥ Design Volume in 1D	Vol_{tot} = 0.334 acre-feet
7. Basin Side Slopes (Z, horizontal distance per unit vertical) Minimum Z = 3, Flatter Preferred	Z = 4.00 (horizontal/vertical)
8. Dam Embankment Side Slopes (Z, horizontal distance) per unit vertical) Minimum Z = 3, Flatter Preferred	Z = 4.00 (horizontal/vertical)
9. Vegetation (Check the method or describe "Other")	X Native Grass Irrigated Turf Grass Other:

Notes:

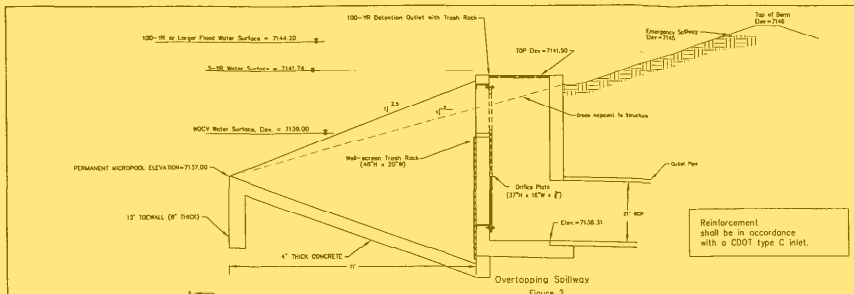
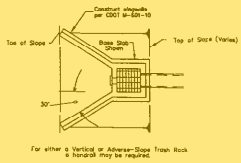


Figure 2
Typical WQCV Outlet Structure Profiles
Including 5-Year and 100-Year Detention

Reinforcement shall be in accordance with a CDOT type C inlet.



Plan View-Flared Wingwall

Figure 3
Typical WQCV Outlet Structure
Wingwall Configurations

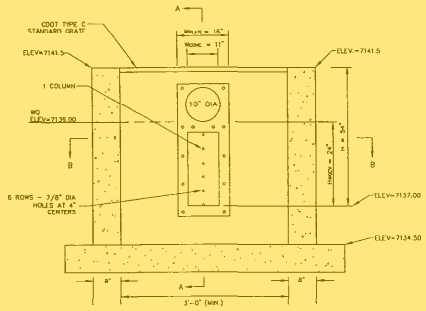
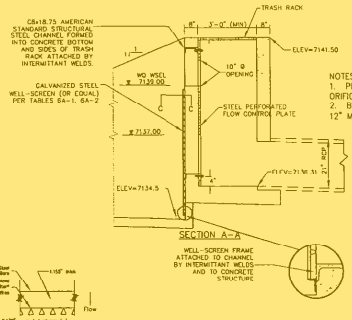
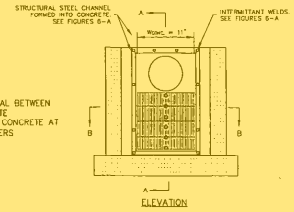


FIGURE 4:
ORIFICE PERFORATION DETAILS
SCALE: NTS

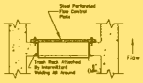


SECTION A-A

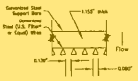
NOTES:
1. PROVIDE GASKET MATERIAL BETWEEN ORIFICE PLATE AND CONCRETE
2. BOLT ORIFICE PLATE TO CONCRETE AT 12" MAX. SPACING ON CENTERS



ELEVATION



Section B-B - Plan View



Section C-C

From Figure 8, Circular Openings Only
R Value = (net open area)/(gross rack area) = 0.60

Figure 8-a
Standardized Trash Rack and Outlet
Design For WQCV Outlets With
Circular Openings

Limits for this Standardized Design:
1. All outlet plate openings are circular.
2. Maximum diameter of opening = 2 inches

*U.S. Filter, St. Paul, Minnesota, USA

POND DATA TABLE				
	INFLOW (CFS)	DISCHARGE (CFS)	WSEL	STORAGE (AC FT)
WQCV	--	--	7139.00	0.33
5-YR	33.2	8.8	7141.74	0.70
100-YR	70.40	28.6	7144.20	1.55

WQCV Trash Racks:

1. Wall-screen trash racks shall be galvanized steel and shall be attached by intermittant welds along the edge of the mounting frame.
2. Bar grate trash racks shall be aluminum and shall be bolted using galvanized steel hardware.
3. Trash Rack widths are for specified trash rack material. Finer wall-screen or mesh size than specified is acceptable, however, trash rack dimensions need to be adjusted for materials having a different open area/gross area ratio (R value)
4. Structural design of trash rack shall be based on full hydrostatic head with zero head downstream of the rack.

Overflow Trash Racks:

1. All trash racks shall be mounted using galvanized steel hardware and provided with hinged and lockable or bolitable access panels.
2. Trash racks shall be galvanized steel, aluminum, or steel. Steel trash racks shall be hot dip galvanized and may be hot powder painted after galvanizing.
3. Trash Racks shall be designed such that the diagonal dimension of each opening is smaller than the diameter of the outlet pipe.
4. Structural design of trash rack shall be based on full hydrostatic head with zero head downstream of the rack.

Outlet Structure Details
Scale: NTS

CORE ENGINEERING GROUP
10333 E. DRY CREEK RD. SUITE 200
ENGLEWOOD, CO 80112
PHONE: (720) 772-5605
CONTACT: RICHARD L. SCHNOUR, P.E.
EMAIL: RSCHNOUR@CORE-EG.COM
CORE Project Number

NO.	DESCRIPTION	DATE

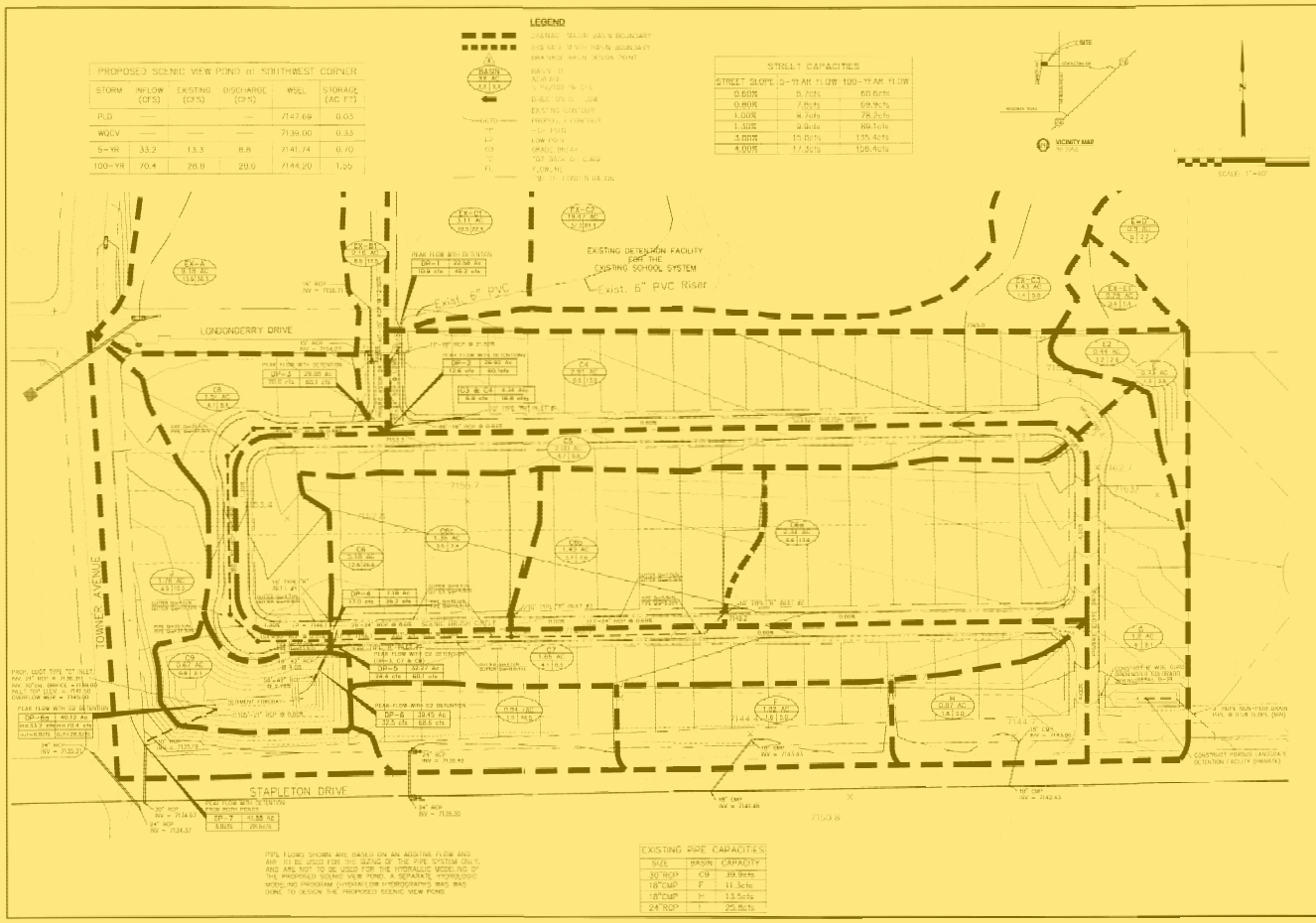
PREPARED FOR:
BABCOCK LAND CORPORATION
2236 N. WOODCREST AVE., SUITE 201
CONCORD, CALIFORNIA 94520
(714) 843-2200
CONTACT: JOHN BABCOCK

PROJECT: SCENIC VIEW AT PAINTBRUSH HILLS
STARTING ON AC. 10 TOWARD AVENUE
EL PASO COUNTY, COLORADO

DRAWN: LJA
DESIGNED: RLS
CHECKED: RLS

WATER QUALITY POND
OUTLET STRUCTURE DETAILS

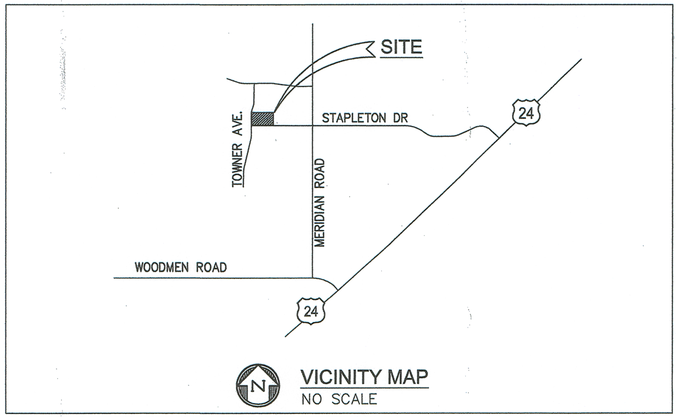
DATE: JUN 2014
PROJECT NO.: 100.203
SHEET NUMBER: C4.4
TOTAL SHEETS: 8


LEGEND
PROPOSED SCENIC VIEW POND at SOUTHWEST CORNER
STREET CAPACITIES
EXISTING PIPE CAPACITIES
VICINITY MAP
EXISTING DETENTION FACILITY FOR THE EXISTING SCHOOL SYSTEM
Exist. 6" PVC Riser
Exist. 6" PVC
LONDONDERRY DRIVE
TOWNER AVENUE
STAPLETON DRIVE
PIPE FLOWS SHOWN ARE BASED ON AN ADDITIVE FLOW AND ARE TO BE USED FOR THE SIZING OF THE PIPE SYSTEM ONLY, AND ARE NOT TO BE USED FOR THE HYDRAULIC MODELING OF THE PROPOSED SCENIC VIEW POND. A SEPARATE HYDROLOGIC MODELING PROGRAM (HYDRAD) OR HYDROGRAPHS WAS WAS DONE TO DESIGN THE PROPOSED SCENIC VIEW POND.
CORE ENGINEERING GROUP
BABCOCK LAND CORP.
SCENIC VIEW at PAINTBRUSH HILLS
DEVELOPED CONDITIONS DRAINAGE PLAN
SCENIC VIEW at PAINTBRUSH HILLS
FALCON, EL PASO COUNTY, CO
November 5, 2013
100.203
2

CONSTRUCTION PLANS
FOR

SCENIC VIEW AT PAINTBRUSH HILLS

STREET, STORM
WATER AND SANITARY SEWER



VICINITY MAP
NO SCALE

Know what's below.
Call before you dig.

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

RECORD DRAWING SHEETS ADDED
C4.2 - DETENTION POND
C4.3 - PLD DETAILS
C4.4 - POND OUTLET DETAILS

SHEET INDEX

COLORADO REGISTERED PROFESSIONAL ENGINEER
RICHARD L. SCHINDLER
33997
3-10-2010

RECORD DRAWING

THESE RECORD DRAWINGS, PRODUCED BY CORE ENGINEERING GROUP ARE BASED ON FIELD INFORMATION GATHERED BY OTHERS. CORE ENGINEERING GROUP ASSUMES NO LIABILITY FOR THE ACCURACY OF THIS FIELD INFORMATION.

DEVELOPER'S STATEMENT

THE UNDERSIGNED OWNER/DEVELOPER HAS READ AND WILL COMPLY WITH ALL THE REQUIREMENTS SPECIFIED IN THESE CONSTRUCTION PLANS AND THE ACCOMPANYING DRAINAGE REPORT.

BUSINESS NAME BABCOCK LAND CORPORATION
BY _____ DATE 9/4/14
TITLE Director
ADDRESS 212 N. WAHSATCH AVE. SUITE 301
COLORADO SPRINGS, CO 80903

WATER / SANITARY	CABLE	ELECTRIC	FALCON FIRE PROTECTION DISTRICT
PAINTBRUSH HILLS METRO DISTRICT 9830 LIBERTY GROVE DRIVE FALCON, CO 80831 719-495-8188	COMCAST P.O. BOX 173838 DENVER, CO 80217 970-641-4774	MOUNTAIN VIEW ELECTRIC 11140 E. WOODMEN RD. COLORADO SPRINGS, CO 80831 719-495-2283	7030 OLD MERIDIAN ROAD FALCON, CO 80831 719-495-4050

TELEPHONE	GAS	EL PASO COUNTY
CENTURYLINK 7925 INDUSTRY ROAD COLORADO SPRINGS, CO 80939 719-278-4651	BLACK HILLS ENGERGY 7060 ALLEGRE ST. FOUNTAIN, CO 80817 719-393-6639	DEVELOPMENT SERVICES 2880 INTERNATIONAL CIRCLE COLORADO SPRINGS, CO 80910 719-520-6300

BASIS OF BEARING

ALL BEARINGS USED HEREIN ARE BASED ON AN ASSUMED BEARING OF N89°04'59"E PER THE RECORDED PLAT OF PAINT BRUSH HILLS FILING NO. 10, AS RECORDED UNDER RECEPTION NO. 203174940 OF THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER), A DISTANCE OF 2614.11 FEET BETWEEN THE SOUTHWEST CORNER OF SECTION 25, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6th P.M., AS MONUMENTED BY 3-1/4" ALUMINUM SURVEYORS CAP STAMPED "PLS 120103" AND THE SOUTH ONE-QUARTER CORNER OF SAID SECTION 25, AS MONUMENTED BY A 2-1/2" ALUMINUM SURVEYORS CAP STAMPED "P.L.S. 4842".

BENCHMARK

THE NORTHWEST CORNER OF THE FALCON SCHOOL DISTRICT 49 PARCEL OF LAND AS DESCRIBED IN BOOK 2732 AT PAGE 860 OF THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER, SAID POINT BEING A NO. 4 REBAR WITH YELLOW PLASTIC CAP STAMPED "PLS 4842" ELEVATION OF 7205.70'

TRAFFIC CONTROL NOTE

THE CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL DEVICES AND MONITORING NECESSARY TO SAFELY COMPLETE THE WORK SHOWN IN THESE CONSTRUCTION DOCUMENTS IN CONFORMANCE WITH M.U.T.C.D. GUIDELINES. THE CONTRACTOR SHALL COMPLETE ALL NECESSARY WORK FOR PLAN REVIEW, PERMITS AND PROCESSING. TRAFFIC CONTROL WILL NOT BE PAID SEPARATELY BUT IS INCLUDED IN THE COST OF THE PROJECT.

PREPARED FOR:
BABCOCK LAND CORPORATION
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, CO 80903
719-635-3200
CONTACT: JEFF MARK

PREPARED BY:
CORE ENGINEERING GROUP
15004 1ST AVENUE S.
BURNSVILLE, MN 55306
719-570-1100
CONTACT: RICHARD L. SCHINDLER P.E.

DISTRICT APPROVAL (WATER)

THE PAINTBRUSH HILLS METROPOLITAN DISTRICT RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN. [redacted] DISTRICT HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

PAINTBRUSH HILLS METROPOLITAN DISTRICT
WATER DESIGN APPROVAL

DATE 10/1/2014 BY _____
PROJECT NO. NA

IN CASE OF ERRORS OR OMISSIONS WITH THE WATER DESIGN AS SHOWN ON THIS DOCUMENT THE STANDARDS AS DEFINED IN THE "RULES AND REGULATIONS FOR INSTALLATION OF WATER MAINS AND SERVICES" SHALL RULE.

APPROVAL EXPIRES 180 DAYS FROM DESIGN APPROVAL

DISTRICT APPROVAL (WASTEWATER)

THE PAINTBRUSH HILLS METROPOLITAN DISTRICT RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN. THE PAINTBRUSH HILLS METROPOLITAN DISTRICT HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

PAINTBRUSH HILLS METROPOLITAN DISTRICT
WASTEWATER DESIGN APPROVAL

DATE 10/1/2014 BY _____
PROJECT NO. NA

IN CASE OF ERRORS OR OMISSIONS WITH THE WATER DESIGN AS SHOWN ON THIS DOCUMENT THE STANDARDS AS DEFINED IN THE "RULES AND REGULATIONS FOR INSTALLATION OF WATER MAINS AND SERVICES" SHALL RULE.

APPROVAL EXPIRES 180 DAYS FROM DESIGN APPROVAL

FIRE DISTRICT APPROVAL

THE NUMBER OF FIRE HYDRANTS AND HYDRANT LOCATIONS TOGETHER WITH THE MAIN SIZES INDICATED ON THIS WATER INSTALLATION PLAN ARE ADEQUATE TO SATISFY THE REQUIREMENTS OF THE FALCON FIRE PROTECTION DISTRICT'S FIRE AND RESCUE DEPARTMENT. THIS APPROVAL IS BASED ON THE INFORMATION IN THESE PLANS, SPECIFICATIONS AND SUPPLEMENTAL INFORMATION PROVIDED BY THE DESIGN ENGINEER WHOSE SIGNATURE APPEARS IN THESE PLANS, AND THE PAINTBRUSH HILLS METROPOLITAN DISTRICT.

SIGNED _____ DATE 10-1-2014
BY FIRE PROTECTION ~~CHIEF OR COORDI~~RATOR

CONSTRUCTION APPROVAL

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUALS VOLUME 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

_____ 9-12-14
ANDRE BRACKIN, COUNTY ENGINEER/ECM ADMINISTRATOR DATE
CONDITIONS:

ENGINEER'S APPROVAL

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMANCE WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.

COLORADO REGISTERED PROFESSIONAL ENGINEER
RICHARD L. SCHINDLER
33997
9-2-14

RICHARD L. SCHINDLER, P.E. # 33997
FOR AND ON BEHALF OF CORE ENGINEERING GROUP

RECEIVED
SEP 04 2014
BY: _____

CORE ENGINEERING GROUP
15004 1st AVE. SO.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: rlschindler@cegi.com

NO.	DESCRIPTION	DATE:

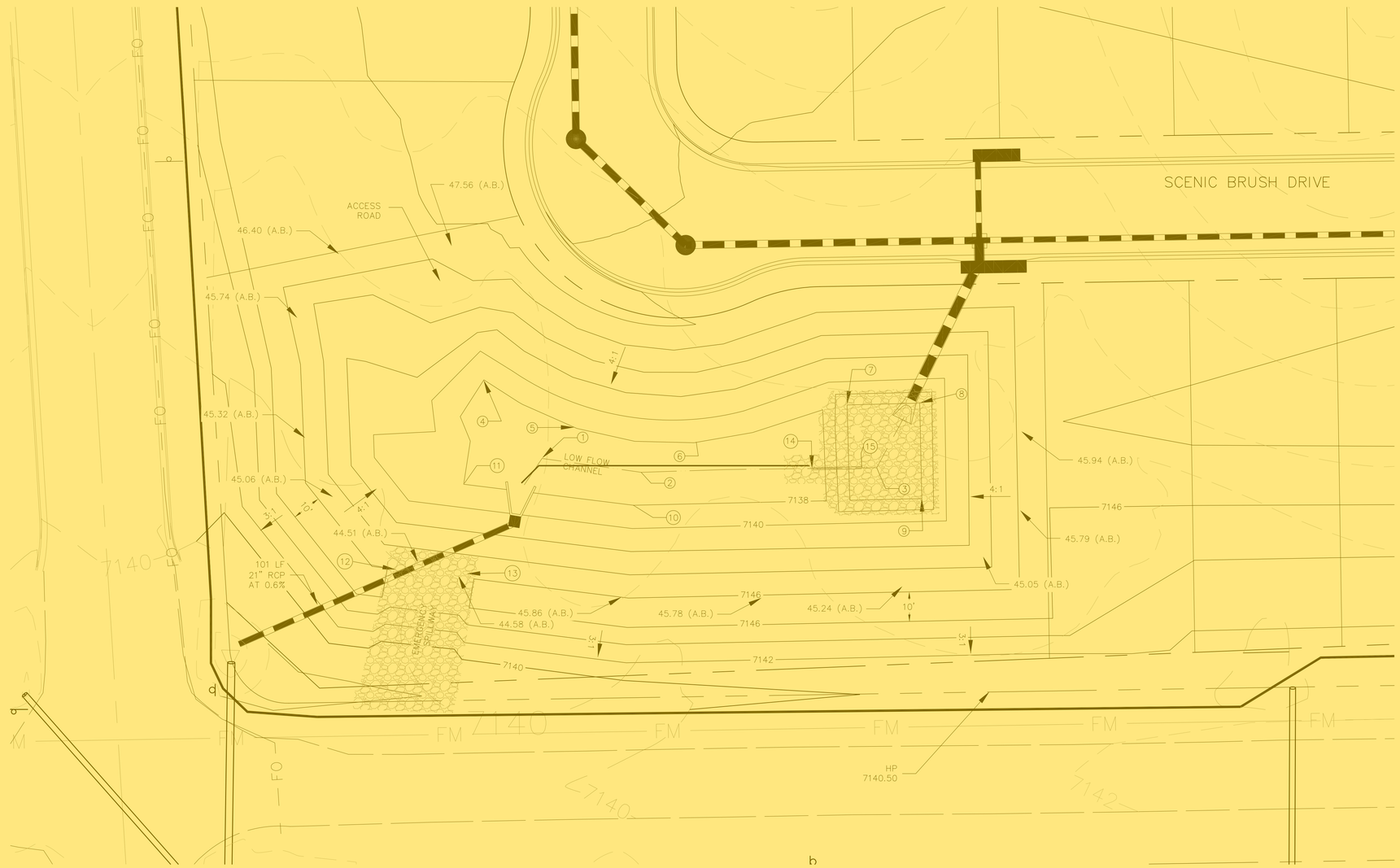
PREPARED FOR:
BABCOCK LAND CORP.
212 N. WAHSATCH AVE. SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
SCENIC VIEW AT PAINTBRUSH HILLS
STAPLETON DRIVE--TOWNER AVENUE
FALCON, COLORADO

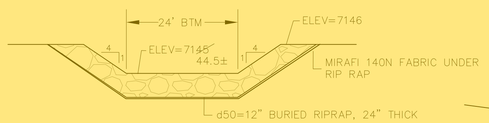
DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

COVER SHEET

DATE: SEPT 2014
PROJECT NO. 100.203
SHEET NUMBER C1.1
TOTAL SHEETS: 25

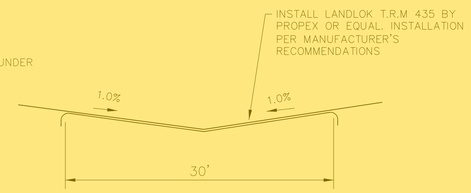


POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	
1	20161.78	21199.17	7137.06	
2	20157.19	21233.17	7137.23	
3	20158.71	21314.23	7137.63	
4	20189.10	21178.90	7138	
5	20172.68	21210.45	7138	
6	20167.42	21252.07	7138	
7	20180.43	21303.79	7138	
8	20180.99	21328.75	7138	
9	20148.26	21329.51	7138	
10	20146.01	21230.11	7138	
11	20153.13	21172.11	7138	
12	20123.74	21148.82	7145	
13	20122.34	21173.11	7145	
14	20158.41	21291.80	~~7137.52~~	7137.51
15	20158.74	21308.96	~~7137.61~~	7137.68

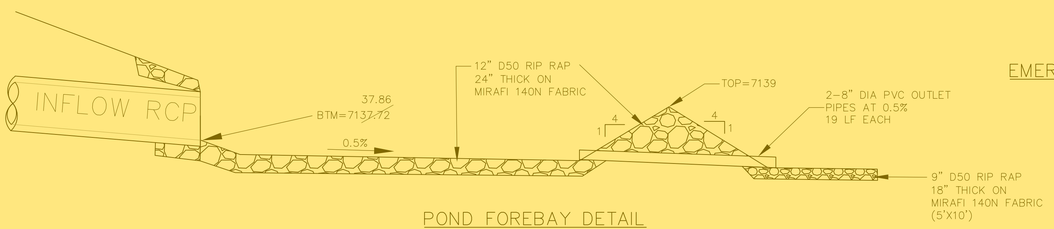


EMERGENCY SPILLWAY DETAIL

SCALE: NTS



LOW FLOW CHANNEL – TYP. SECTION

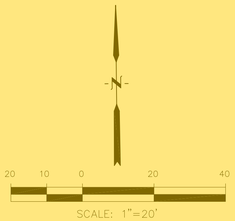


POND FOREBAY DETAIL

N.T.S.

RECORD DRAWINGS

DATE: MARCH 16, 2016



CORE ENGINEERING GROUP
15004 1ST AVE. SOUTH
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

NO.	DESCRIPTION	DATE

PREPARED FOR:
BABCOCK LAND CORPORATION
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-7200
CONTACT: JEFF MARK

PROJECT:
SCENIC VIEW AT PAINTBRUSH HILLS
STAPLETON DRIVE – TONNER AVENUE
FALCON, COLORADO

DRAWN: LJA
DESIGNED: RLS
CHECKED: RLS

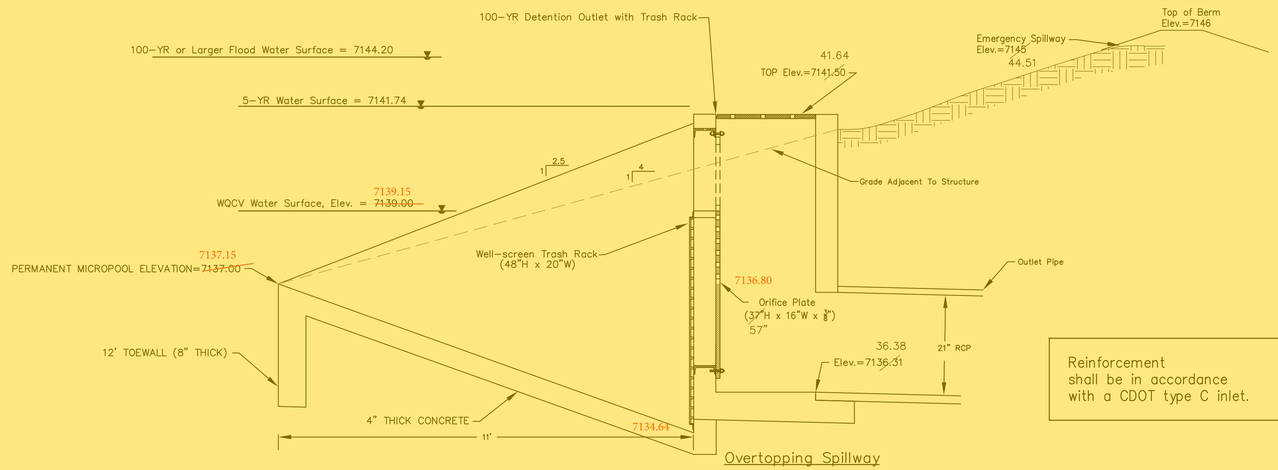
DETENTION & WQ POND DETAILS

DATE
SEOT 2014

PROJECT NO.
100.203

SHEET NUMBER
C4.2

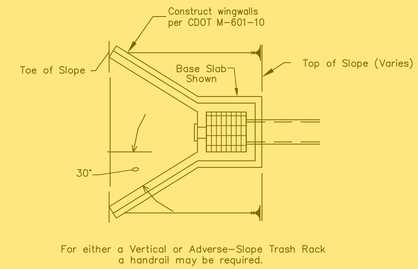
TOTAL SHEETS: 8



Overtopping Spillway

Figure 2
Typical WQCV Outlet Structure Profiles
Including 5-Year and 100-Year Detention

Reinforcement
shall be in accordance
with a CDOT type C inlet.



Plan View-Flared Wingwall

Figure 3
Typical WQCV Outlet Structure
Wingwall Configurations

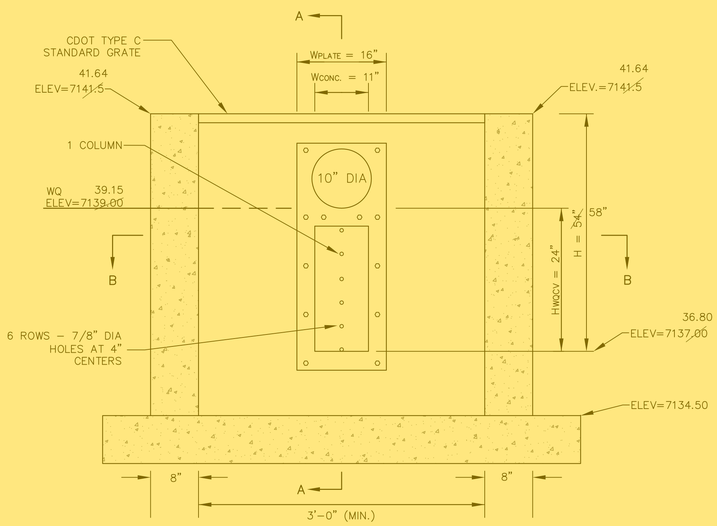
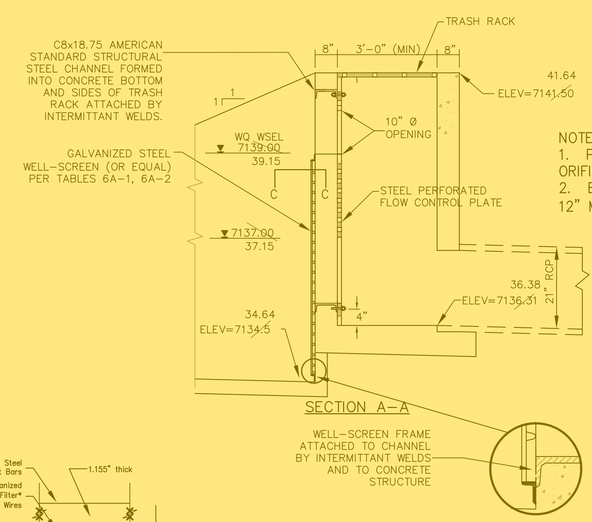


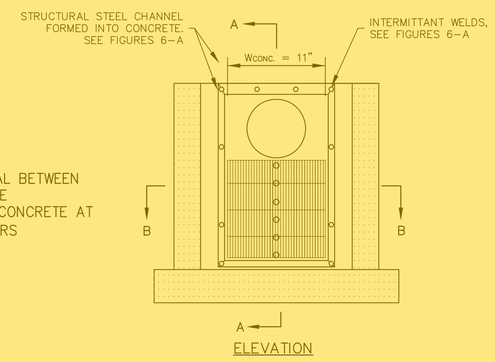
FIGURE 4:
ORIFICE PERFORATION DETAILS

SCALE: NTS

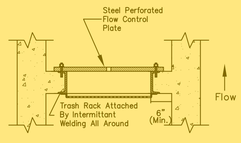


SECTION A-A

NOTES:
1. PROVIDE GASKET MATERIAL BETWEEN ORIFICE PLATE AND CONCRETE
2. BOLT ORIFICE PLATE TO CONCRETE AT 12" MAX. SPACING ON CENTERS



ELEVATION



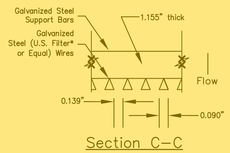
Section B-B - Plan View

From Figure 6, Circular Openings Only

Limits for this Standardized Design:

1. All outlet plate openings are circular.
2. Maximum diameter of opening = 2 inches.

*U.S. Filter, St. Paul, Minnesota, USA



Section C-C

From Figure 6, Circular Openings Only

R Value = (net open area)/(gross rack area) = 0.60

Figure 6-a
Standardized Trash Rack and Outlet
Design For WQCV Outlets With
Circular Openings

POND DATA TABLE				
	INFLOW (CFS)	DISCHARGE (CFS)	WSEL	STORAGE (AC FT)
WQCV	--	--	7139.00	0.33
5-YR	33.2	8.8	7141.74	0.70
100-YR	70.40	28.6	7144.20	1.55

WQCV Trash Racks:

1. Well-screen trash racks shall be galvanized steel and shall be attached by intermittant welds along the edge of the mounting frame.
2. Bar grate trash racks shall be aluminum and shall be bolted using galvanized steel hardware.
3. Trash Rack widths are for specified trash rack material. Finer well-screen or mesh size than specified is acceptable, however, trash rack dimensions need to be adjusted for materials having a different open area/gross area ratio (R value)
4. Structural design of trash rack shall be based on full hydrostatic head with zero head downstream of the rack.

Overflow Trash Racks:

1. All trash racks shall be mounted using galvanized steel hardware and provided with hinged and lockable or boltable access panels.
2. Trash racks shall be galvanized steel, aluminum, or steel. Steel trash racks shall be hot dip galvanized and may be hot powder painted after galvanizing.
3. Trash Racks shall be designed such that the diagonal dimension of each opening is smaller than the diameter of the outlet pipe.
4. Structural design of trash rack shall be based on full hydrostatic head with zero head downstream of the rack.

Outlet Structure Details

Scale: NTS

RECORD DRAWINGS

DATE: MARCH 16, 2016

CORE ENGINEERING GROUP
15004 1ST AVE. SOUTH
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

NO.	DESCRIPTION	DATE

PREPARED FOR:
BABCOCK LAND CORPORATION
212 N. WAHSATCH AVE, SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
SCENIC VIEW AT
PAINTBRUSH HILLS
STAPLETON DRIVE - TONNER AVENUE
FALCON, COLORADO

DRAWN: LJA
DESIGNED: RLS
CHECKED: RLS

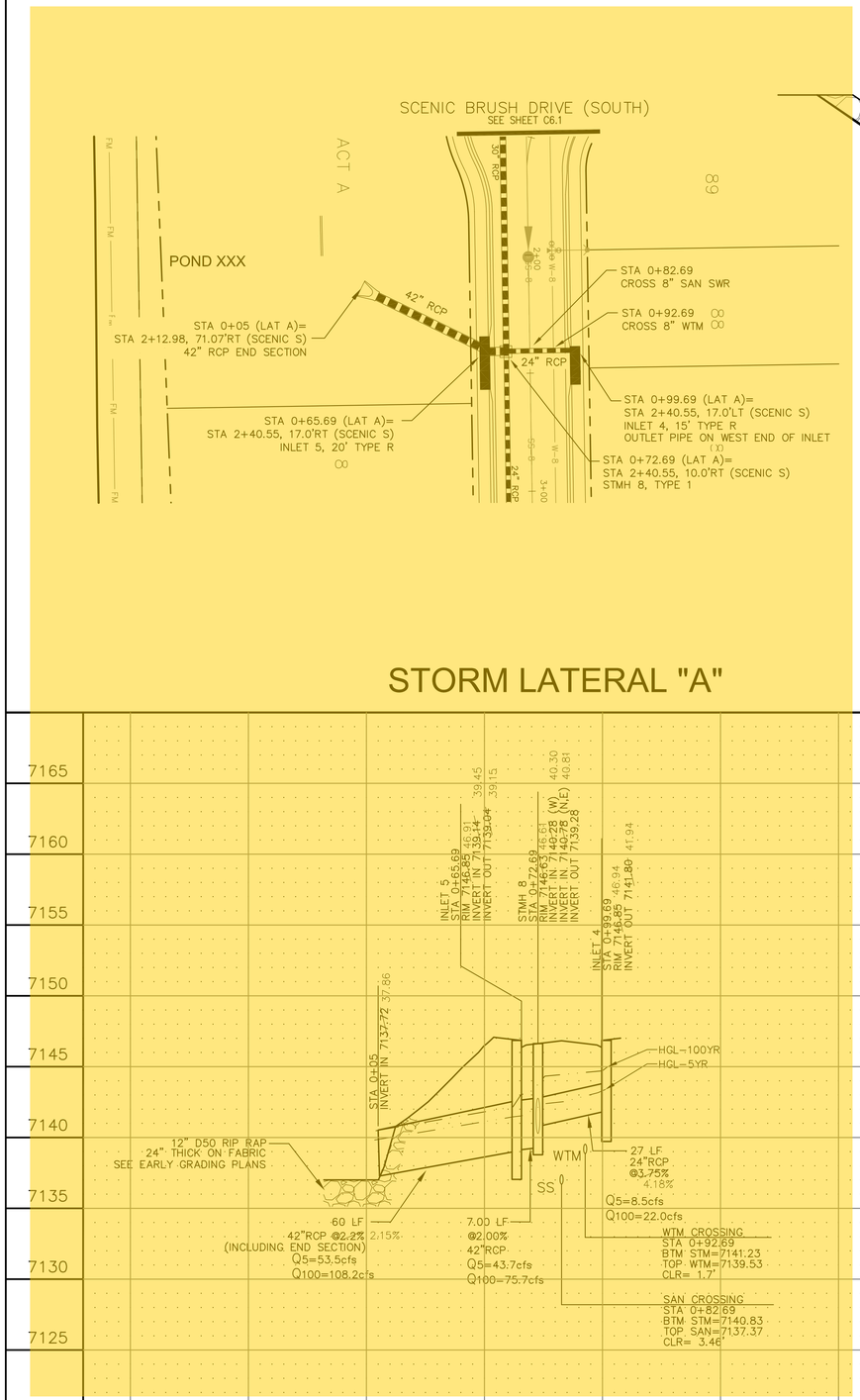
WATER QUALITY POND
OUTLET STRUCTURE DETAILS

DATE
SEOT 2014

PROJECT NO.
100.203

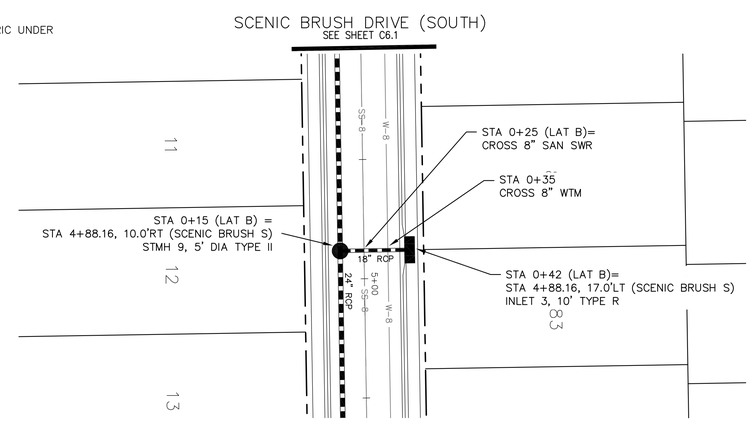
SHEET NUMBER
C4.4

TOTAL SHEETS: 8

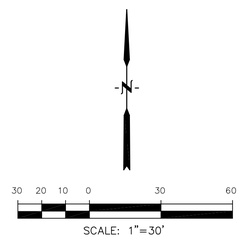


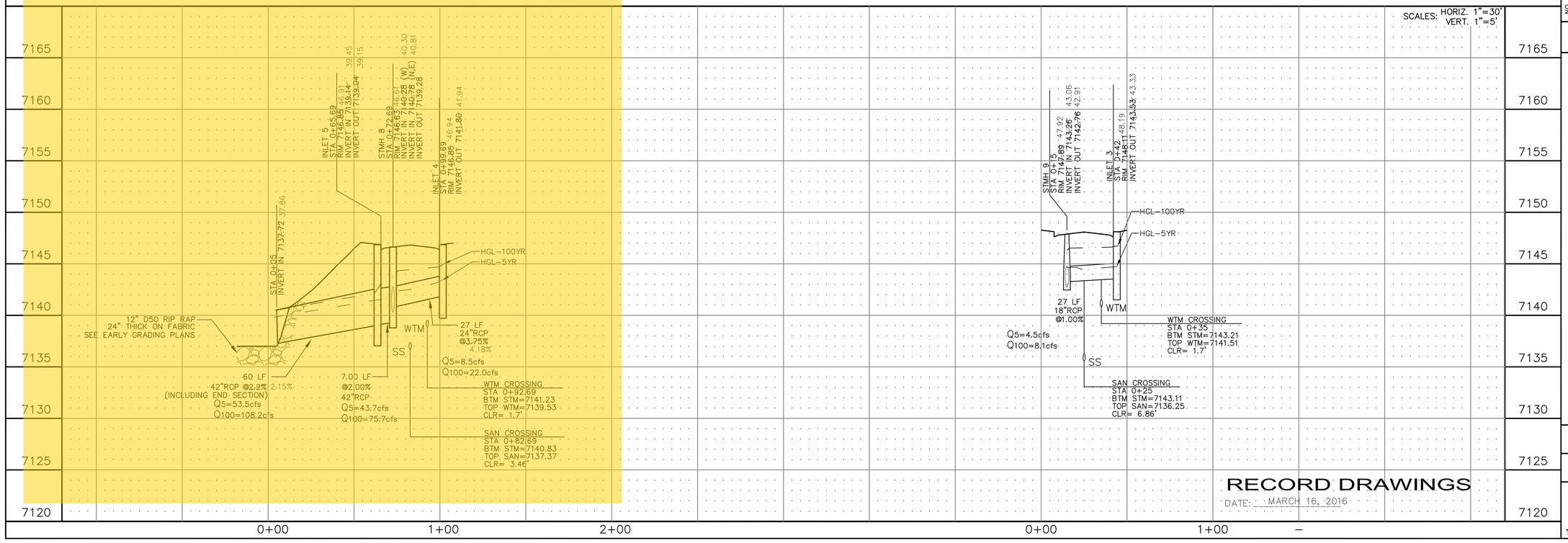
STORM LATERAL "A"

RIP RAP DETAIL



STORM LATERAL "B"





RECORD DRAWINGS
DATE: MARCH 16, 2016

CORE ENGINEERING GROUP
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NO.	DESCRIPTION	DATE:

PREPARED FOR:
BABCOCK LAND CORP.
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-2700
CONTACT: JEFF MARK

PROJECT:
SCENIC VIEW AT PAINTBRUSH HILLS
STAPLETON DRIVE - TOWNER AVENUE
FALCON, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

ROADWAY AND STORM SEWER
STORM LATERALS "A" & "B"
SCENIC BRUSH DRIVE(SOUTH)

DATE: SEPT, 2014
PROJECT NO. 100.203
SHEET NUMBER C6.8
TOTAL SHEETS: 25