FINAL DRAINAGE REPORT
FOR
THE RIDGE AT SPRING CREEK

July 2021

Prepared for:

Challenger Homes
8605 Explorer Drive #250
Colorado Springs, CO 80920
(719) 598-5192

Prepared By:

CATAMOUNT ENGINEERING
321 W. HENRIETTA AVE
Woodland Park, CO 80863
719-426-2124

FINAL DRAINAGE REPORT THE RIDGE AT SPRING CREEK

Engineer's Statement:
This report and plan for the drainage design of THE RIDGE AT SPRING CREEK was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report and plan has been prepared in accordance with the City of Colorado Springs Drainage Criteria Manual and is in conformity with the master plan of the drainage basin. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

David L. Mijares, Colorado PE #40510 Date
For and on behalf of Catamount Engineering

Developer's Statement:

Challenger Homes hereby certifies that the drainage facilities for THE RIDGE AT SPRING CREEK shall be constructed according to the design presented in this report. I understand that the City of Colorado Springs does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that are submitted to the City of Colorado Springs pursuant to section 7.7.906 of the City Code; and cannot, on behalf of THE RIDGE AT SPRING CREEK guarantee that final drainage design review will absolve Challenger Homes. 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.

Challenger Homes
Name of Developer

Authorized Signature Date

James Byers
Printed Name

Director of Planning
Title

8605 Explorer Drive #250

Colorado Springs, CO 80920

Address

City of Colorado Springs Only:
Filed in accordance with Section 7.7.906 of the Code of the City of Colorado Springs, 2001, as amended.

For City Engineer Date

Conditions:

FINAL DRAINAGE REPORT for
THE RIDGE AT SPRING CREEK

PURPOSE

The purpose of this drainage report is to identify existing drainage patterns, quantify developed storm water runoff, and establish outfall and water quality scenarios from the proposed development. Additionally this analysis will establish compliance with previous drainage studies and provide for water quality and detention of developed runoff from the development.

GENERAL LOCATION AND DESCRIPTION

The subject 16.71 acres (THE RIDGE AT SPRING CREEK) is proposed to be platted into approximately 88 single family detached residential lots and private infrastructure and open space tracts. The parcel is located within the southeast quarter of Section 28, Township 14 South, Range 66 West of the 6th principal meridian in the city of Colorado Springs, county of El Paso, State of Colorado. The filing is a portion of the overall Spring Creek Development.

The parcel is bounded to the north by existing apartment development within Lot 1, Block 1, Spring Creek Filing No. 1, to the east and south by S. Circle Drive and to the west by existing South Union Boulevard.

The site has been overlot graded and utilized for stockpile storage with development of the adjacent Spring Creek residential development. The northerly and westerly portions of the site contain significant slopes (approximately 3.5:1) containing the lower portions of the bluff where the adjacent apartment buildings exist. The northerly portion of the site slopes to the south and the westerly portion of the site slopes west directly into S. Union Blvd. The southerly portion of the site has been terraced for proposed previous development and slopes to the southwest to the intersection of S. Circle Drive and S. Union Blvd at approximately 5.5%.

A utility corridor for wastewater and sanitary mains traverses the parcel from east to west in the central portion of the property. Utilities are a mix of public and private mains developed to serve the adjacent northerly apartment parcel.

Vegetative cover consists of sparse erosion control grasses and low quality volunteer trees. Existing soils on the site consist of Schamber-Razor complex (Hydrologic Group ‘A’) as determined by the Natural Resources Conservation Service Web Soil Survey.

No portion of the development lies within an F.E.M.A. designated floodplain per FIRM 08041C0741 G and 08041C0742 G, effective December 07, 2018. A F.E.M.A. Flood Insurance Firmette has been provided in the appendix.

EXISTING DRAINAGE ANALYSIS

EXISTING STUDIES SUMMARY

The site is contained within the Spring Creek Drainage Basin and was initially studied in the "Drainage Report for Spring Creek Filing No. 1", prepared by KLH Engineering Consultants approved March 1986. The report indicated the parcel as a portion of sub-basins M-6, M-16, M-17 and proposed undetained direct outfall to north West Loop Road (Circle Drive offramp) and Union Boulevard Storm infrastructure. The adjacent northerly apartment development delineated as Basin M-14 drains north and east the Circle Drive ROW and developed portions were not proposed to enter the parcel.

EXISTING DRAINAGE BASINS

The parcel is located at the southerly limits of the overall Spring Creek development. No developed off-site flows enter the site. There are no existing site improvements beyond overlot grading/stockpiling, limited utility main installation, and storm sewer stubs into the property.
Due to the current code requirement to provide water quality and full spectrum detention for impervious development the majority of storm sewer stubs will not be utilized. The proposed pond will outfall to existing storm sewer at the southwest corner of the parcel.

Basin EX-1 (2.04 Acres, undeveloped, Q_5=0.8 cfs, Q_{100}=5.2 cfs) contains the westerly portion of the site directly tributary to S. Union Blvd. Basin EX-1 is combined with offsite flow from undeveloped basin OS1 (0.25 Acres, undeveloped, Q_5=0.1 cfs, Q_{100}=0.6 cfs) at DP-E1 representing site contribution to an existing At grade 16' D-10-R. Combined flow at Design Point E1 is Q_5=0.9 cfs, Q_{100}=5.7 cfs. Flows are collected in existing inlet and conveyed westerly in public dual 53" x 34" elliptical RCP storm sewer.

Basin EX-2 (8.54 Acres, undeveloped, Q_5=2.7 cfs, Q_{100}=18.4 cfs) contains the central portion of the site directly tributary to Design Point EX-2 at the intersection of S. Circle offramp and S. Union Blvd. Basin EX-2 is combined with offsite flow from undeveloped basin OS2 (1.85 Acres, undeveloped, Q_5=0.6 cfs, Q_{100}=4.0 cfs) at DP-E2 representing site contribution to an existing At grade 8' D-10-R. Combined flow at Design Point E2 is Q_5=3.3 cfs, Q_{100}=22.2 cfs. Flows are collected in existing inlet and conveyed westerly in public 38" x 24" elliptical RCP storm sewer.

Basin EX-3 (3.93 Acres, undeveloped, Q_5=1.3 cfs, Q_{100}=8.9 cfs) contains the southerly and east-central portion of the site directly tributary to Design Point EX-3 west of the existing parcel access. On the Circle offramp. Flows at Design Point E3 is Q_5=1.5 cfs, Q_{100}=10.0 cfs are collected in an existing public 8' D-10-R at grade inlet and conveyed westerly in public 24" RCP storm sewer.

Basin EX-4 (2.19 Acres, undeveloped, Q_5=0.8 cfs, Q_{100}=5.5 cfs) contains the easterly portion of the site directly tributary to Design Point EX-4 tributary to existing public asphalt lined swale and 36" CMP outfall within the Circle ROW. Basin EX-4 is combined with offsite flow from undeveloped basin OS3 (1.35 Acres, undeveloped, Q_5=0.4 cfs, Q_{100}=2.8 cfs) at DP-E4 representing site contribution to the existing asphalt swale and 36" CMP. Combined flow at Design Point E4 is Q_5=1.1 cfs, Q_{100}=7.3 cfs. Flows are collected in existing swale and conveyed south in a public 36" CMP storm sewer.

DEVELOPED DRAINAGE BASINS

The Rational method was used to determine runoff quantities for developed basins. Peak runoff for the 2-YR, 5-YR, 10-YR, 25-YR, 50-YR, and 100-YR frequency storm were provided for each basin. Conservatively, additional travel time for pipe routing was not utilized in attenuating peak flows and additive flows were utilized beyond inlet capture providing 5-YR and 100-YR analysis. No developed off-site flows enter the site in the developed condition.

BASIN A-

A1 (1.24 Acres, Q_5=2.9 cfs, Q_{100}=6.3 cfs
A2 (1.43 Acres, Q_5=2.6 cfs, Q_{100}=6.2 cfs
A3 (0.85 Acres, Q_5=1.6 cfs, Q_{100}=3.8 cfs
A4 (0.36 Acres, Q_5=0.8 cfs, Q_{100}=2.0 cfs
A5 (0.29 Acres, Q_5=0.8 cfs, Q_{100}=1.7 cfs
A6 (0.72 Acres, Q_5=2.0 cfs, Q_{100}=4.2 cfs
A7 (0.10 Acres, Q_5=0.3 cfs, Q_{100}=0.7 cfs
A8 (2.45 Acres, Q_5=4.1 cfs, Q_{100}=10.6 cfs
A9 (2.17 Acres, Q_5=2.5 cfs, Q_{100}=8.0 cfs
A10 (0.13 Acres, Q_5=0.6 cfs, Q_{100}=1.0 cfs
A11 (1.43 Acres, Q_5=2.6 cfs, Q_{100}=6.8 cfs
A12 (1.01 Acres, Q_5=2.3 cfs, Q_{100}=4.8 cfs
A13 (1.05 Acres, Q_5=0.5 cfs, Q_{100}=2.8 cfs

Basin A consists of the portion of the development tributary to the proposed on-site private full spectrum extended detention basin. 'A' Designated Basins consist of single family detached residences, roadway improvements and side yard drainage sheet flow to inverted crown roadways and outfall directly to private Type R inlets within the roadway system. Roof drains for buildings within Basin A will be directed to the interior streets and runoff collected within the street inlet system. Inlet capture and storm sewer will be detailed in the storm sewer section of this report.

BASIN B-

B1 (0.59 Acres, Q_5=0.2 cfs, Q_{100}=1.2 cfs
B2 (0.71 Acres, Q_5=0.4 cfs, Q_{100}=2.1 cfs
B3 (0.74 Acres, Q_5=0.4 cfs, Q_{100}=1.9 cfs
B4 (1.44 Acres, Q_5=0.7 cfs, Q_{100}=4.0 cf

Basin B1 consists of the landscape setback and rear yards within the northwesterly portion of the development adjacent to South Union Blvd and tributary to Design point 1. Runoff from Basin B1 sheet flows to the existing curb line within South Union and is collected at the existing public 16' D-10-R inlet at design Point 1. Developed flows at Design Point 1 of Q_5=cfs, Q_{100}=1.2 cfs are less than existing condition runoff at Design Point EX1 is Q_5=0.9 cfs, Q_{100}=5.7 cfs.

Basin B2 consists of the landscape setback and landscaped area between the pond embankment and existing curb lines of Union Boulevard and Circle Drive and tributary to Design point 2. Runoff from Basin B2 sheet flows to the existing curb lines and is collected in the existing public 8' D-10-R inlet at design Point 2. Developed flows at Design Point 2 of Q_5=0.4 cfs, Q_{100}=2.1 cfs are less than existing condition runoff at Design Point E2 of Q_5=3.3 cfs, Q_{100}=22.2 cfs.

Basin B3 consists of the landscaped area adjacent to South Circle Drive tributary to the public 8' D-10-R at design point 3. Runoff from Basin B3 sheet flows to the existing curb lines and is collected in the existing public 8' D-10-R inlet at design Point 3. Developed flows at Design Point 2 of Q_5=0.4 cfs, Q_{100}=1.9 cfs are less than existing condition runoff at Design Point E3 of Q_5=1.5 cfs, Q_{100}=10.0 cfs.

Basin B4 consists of the landscape landscaped area and remaining undeveloped area in the northeast portion of the development tributary to the existing Public asphalt swale within Circle Drive ROW at design point 4. Runoff from Basin B4 of Q_5=0.7 cfs, Q_{100}=4.0 cfs combined with runoff from off-site undeveloped basin OS-3 of Q_5=0.4 cfs, Q_{100}=2.8 cfs sheet flows to the existing public swale and are conveyed to the existing public 36" CMP outfall. Developed flows at Design Point 4 of Q_5=1.0 cfs, Q_{100}=6.0 cfs are less than existing condition runoff at Design Point E4 of Q_5=1.1 cfs, Q_{100}=7.3 cfs.

BASIN OS-

OS1 (0.25 Acres, Q_5=0.1 cfs, Q_{100}=0.6 cfs
OS2.1 (0.45 Acres, Q_5=0.2 cfs, Q_{100}=1.2 cfs
OS2.2(1.44 Acres, Q_5=0.5 cfs, Q_{100}=3.5 cfs
OS3 (1.35 Acres, Q_5=0.4 cfs, Q_{100}=2.8 cf

Basin OS1 is tributary to basin A11 and sheetflows through Basin A11 to proposed curbline improvements. Combined flows from Basin OS1 and Basin A11 conveyed in the curbline to the proposed private 10' Type R inlet at Design Point 6 are Q_5=2.2 cfs, Q_{100}=6.2 cfs. Flow by from the at-grade inlet of Q_5=0.0 cfs and Q_{100}=0.9 cfs is conveyed in the curbline to Design Point 7

Basin OS2.1 is tributary to basin A9 and sheetflows through Basin A9 to proposed curbline improvements. Combined flows from Basin OS1 and Basin A9 including bypass flow from at-grade inlets at design points 5 and 6 are conveyed in the curbline to the proposed private 10' Type R sump inlet at Design Point 7 are Q_5=2.9 cfs, Q_{100}=16.5 cfs.

Basin OS2.2 is tributary to basin A8 and sheetflows through Basin A11 to proposed curbline improvements. Combined flows from Basin OS2.2 and Basin A8 conveyed in the curbline to the proposed private 10' Type R inlet at Design Point 5 are Q_5=4.2 cfs, Q_{100}=12.9 cfs. Flow by from the at-grade inlet of Q_5=0.1 cfs and Q_{100}=5.0 cfs is conveyed in the curbline to Design Point 7

STORM SEWER

Southerly System-

Runoff from Basin A1 of Q_5=2.9 cfs and Q_{100}=6.3 cfs is intercepted by a private 5' Type R inlet and conveyed in a 15" private HDPE to confluence with runoff from Basin A2 at pipe design point P1. Runoff from Basin A2 of Q_5=2.6 cfs, Q_{100}=6.2 cfs is intercepted by a private 5' Type R inlet and conveyed in a 12" private HDPE to pipe design point P1. Combined runoff from design point P1 of Q_5=5.5 cfs, Q_{10}=12.3 cfs are conveyed in a private 24" HDPE to Design Point 2.

Runoff from Basin A3 of Q_5=1.6 cfs, Q_{100}=3.8 cfs is intercepted by a private 5' Type R inlet and conveyed in a 12" private HDPE to confluence with runoff from Basins A1 and A2 at pipe design point P2. Combined runoff from design point P2 of Q_5=7.1 cfs, Q_{100}=16.1 cfs are conveyed in a private 24" HDPE to Pipe Design Point 3.

Runoff from Basin A4 of Q_5=0.8 cfs, Q_{100}=2.0 cfs is intercepted by a private 5' Type R inlet at pipe design Point P3. Combined runoff from design point P3 of Q_5=7.8 cfs, Q_{100}=17.7 cfs are conveyed in a private 24" HDPE to Pipe Design Point 4.

Runoff from Basin A5 of Q_5=0.8 cfs, Q_{100}=1.7 cfs is intercepted by a private 5' Type R inlet at pipe design Point P4. Combined runoff from design point P4 of Q_5=8.4 cfs, Q_{100}=19.1 cfs are conveyed in a private 24" HDPE to Pipe Design Point P5.

Runoff from Basin A6 of Q_5=2.0 cfs, Q_{100}=4.2 cfs is intercepted by a private 5' Type R inlet and conveyed in a 12" private HDPE to confluence with runoff from Pipe Design Point P4 at pipe design point P5. Combined runoff from design point P5 of Q_5=10.2 cfs, Q_{100}=22.9 cfs are conveyed in a private 24" HDPE to the proposed EDB at Design Point P.

Central System-

Runoff from Basin A7 of Q_5=0.3 cfs and Q_{100}=0.7 cfs is intercepted by a private 10' Type R inlet and conveyed in a 15" private HDPE to confluence with intercepted runoff from Design Point 5 at design point P6. Combined runoff at pipe design point P6 of Q_5=4.4 cfs, Q_{100}=13.4 cfs is conveyed in a private 18" HDPE to pipe design point P7.

Runoff from Design Point 7 of Q_5=2.9 cfs and Q_{100}=16.5 cfs is intercepted by a private 10' Type R sump inlet. Combined runoff at pipe design point P7 of Q_5=7.3 cfs, Q_{100}=29.9 cfs is conveyed in a private 24" HDPE to pipe design point P8.

Runoff from Basin A10 of Q_5=0.6 cfs and Q_{100}=1.0 cfs is intercepted by a private 10' Type R sump inlet. Combined runoff at pipe design point P8 of Q_5=7.7 cfs, Q_{100}=30.7 cfs is conveyed in a private 24" HDPE to pipe design point P9.

Intercepted runoff from Design Point 6 of Q_5=2.2 cfs and Q_{100}=6.6 cfs is intercepted by a private 10' Type R inlet and conveyed in a 15" private HDPE to confluence at pipe design point P9. Combined runoff at pipe design point P9 of Q_5=12.0 cfs, Q_{100}=35.5 cfs is conveyed in a private 30" HDPE to the proposed EDB at Design Point P.

EXTENDED DETENTION BASIN

The parcel proposes to develop 16.71 acres within the Spring Creek Drainage requiring development of water quality treatment and full-spectrum detention per the criteria of the City of Colorado Springs Drainage Criteria Manual Volume 2.

EDB A

The proposed Extended Detention Basin located in the southwesterly portion of the development has 15.37 tributary acres of development with an average imperviousness of 32.00%. Full spectrum pond development requires 0.202 acre-ft of water quality capture volume ponding to an elevation of 5891.01 an EURV volume of 0.299-acre ft, and a total volume of 0.912 acre-ft ponding to an elevation of 5894.24 providing full spectrum detention including the 100-YR event.

Runoff generated within the site will be conveyed to the pond through storm sewer systems or as direct sheetflow. The storm sewer systems will outfall directly to 12" concrete forebays with baffle providing adequate protection at discharge point. The concrete forebays require a total volume of 176 cubic feet of volume (2% of the design WQCV). The forebay will be constructed of a concrete slab with sides conforming to the pond slopes and 1' wall with a rectangular notch which outfalls to the proposed trickle channel at the downstream end.

The pond will be constructed with 4:1 minimum side slopes to be vegetated per the final landscape plan. A 2' wide by 6" deep concrete trickle channel with a 0.5% longitudinal slope will convey low flows across the pond bottom to the micropool/outlet structure. The trickle channel will outfall to a 5' long by 4' wide by 2.5' deep concrete micropool. The micropool will provide a surface area of 20 square feet and an initial surcharge volume of 6.6 cubic feet utilizing a 4" initial surcharge depth.

The outlet structure will consist of a concrete box with orifice plate and screen providing water quality outlet and weir with trash rack for larger storm outfall. The pond will outfall through a private 12" HDPE pipe system to adjacent inlet and Eliptical RCP at Design Point 2.

The emergency spillway will consist of a 40' weir along the southerly end of the pond at an elevation of 5894.92. The 40' weir will convey developed undetained flows a depth of 0.34' and consist of 12" depth of type VL soil riprap.

Outfall from the extended detention basin of Q_2=0.1 cfs, Q_5=0.2 cfs, Q_{10}=0.2 cfs, Q_{25}=0.4 cfs, Q_{50}=3.6 cfs, and Q_{100}=3.9 will be conveyed in a private 12" HDPE.

4-STEP PROCESS

1. The development addresses Low Impact Development strategies primarily through the utilization of landscape swales within rear lots directing runoff from patios and walkways through swales with minimal longitudinal grade prior to outfall to storm systems where appropriate.
2. On-site flow is directed to the proposed full spectrum extended detention basin constructed with the development The extended detention basin provides Water Quality Capture Volume required for this site and attenuates release of flows to approximate historic runoff.
3. The ultimate recipient of runoff from the site is Spring Creek. Flows from the site are tributary to the full spectrum extended detention basin and are reduced below existing historic outfall to the creek reach. No impacts to Spring Creek are anticipated.
4. A Grading, Erosion Control, and Stormwater Quality Plan and narrative have been approved by the city prior to any soil disturbance. The erosion control plan included specific source control BMP's as well as defined overall site management practices for the construction period. The grading narrative approved by the City addresses materials storage and spill containment during construction operations.

DRAINAGE METHODOLOGY

This drainage report was prepared in accordance to the criteria established in the City of Colorado Springs Drainage Criteria Manual Volumes 1 and 2, as revised May 2014.

The rational method for drainage basin study areas of less than 100 acres was utilized in the analysis. For the Rational Method, flows were calculated for the 2, 5, 10, 25, 50, and 100-year recurrence intervals. The average runoff coefficients, 'C' values, are taken from Table 6-6 and the Intensity-Duration-Frequency curves are taken from Figure 6-5 of the City Drainage Criteria Manual. Time of concentration for overland flow and storm drain or gutter flow are calculated per Section 3.2 of the City Drainage Criteria Manual. Calculations for the Rational Method are shown in the Appendix of this report.

Urban Drainage and Flood Control District methodology was utilized for determination of street capacity, inlet sizing, and extended detention basin design. UD-Inlet Version 4.05 was utilized in street capacity and inlet sizing calculations. UD-Culvert Version 3.05 was utilized in developing preliminary pipe sizing. Details and analysis of final storm drain conveyance and collection system will be developed in an addendum to the final drainage report submitted with Public Storm Sewer Plans for Spring Creek North Filing No. 1. Preliminary sizing calculations were provided in the appendix of this report. Calculations are shown in the appendix of this report.

COST ESTIMATE

Private Improvements Non-reimbursable

DRAINAGE FEE CALCULATION

The Ridge at Spring Creek proposes to plat 16.71 Acres within the Spring Creek Basin

2020 Drainage Fee:
(16.71 acres X $11,034/ac) = $ 184,378.14

SUMMARY

The residential development proposed for the parcel contains less impervious area and generates less runoff than the original commercial site anticipated in development of downstream infrastructure. Water Quality and Full Spectrum Detention is provided on site with project development. Site runoff, storm drain, and appurtenances associated with the development of The ridge at Spring Creek in accordance with the recommendations of this Final Drainage report will not have an adverse effect on downstream and surrounding developments. This report is in conformance with all previously approved reports which included this site.

REFERENCES:

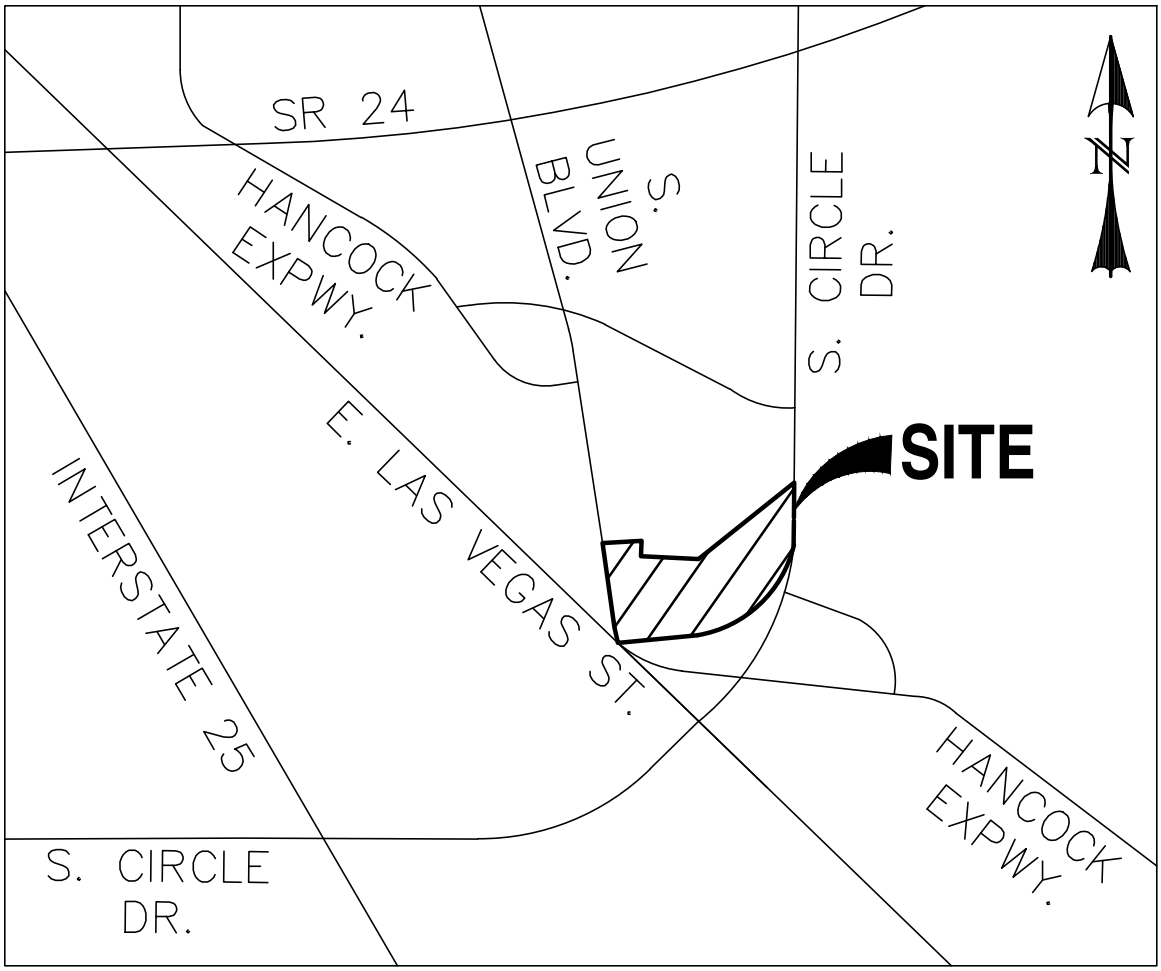
City of Colorado Springs Engineering Division Drainage Criteria Manual Volumes 1 and 2, revised May 2014

"Master Drainage Plan for Broadmoor View at Spring Creek West Subdivisions Filing No. 1 and 2 and Final Drainage Report for Spring Creek West Filing No. 1 and 2, A Traditional Neighborhood" by Rockwell Consulting Inc. dated September 2016

"Drainage Report for Spring Creek Filing No. 1", prepared by KLH Engineering Consultants approved March 1986.

Flood Insurance Rate Map Number 08041C0741 G and 08041C0742 G, effective date December 07, 2018

Natural Resources Conservation Service Web Soil Survey



CATAMOUNT ENGINEERING PO BOX 692 DIVIDE, CO 80814 (719) 426-2124	**THE RIDGE AT SPRING CREEK**	SCALE: NTS	DATE: 07/18/21
	VICINITY MAP	JOB NO.: 21-306	SHEET: 1 OF 1

National Flood Hazard Layer FIRMette

FEMA

104°47'12"W 38°48'13"N

104°46'35"W 38°47'45"N

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

1:6,000

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

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

N

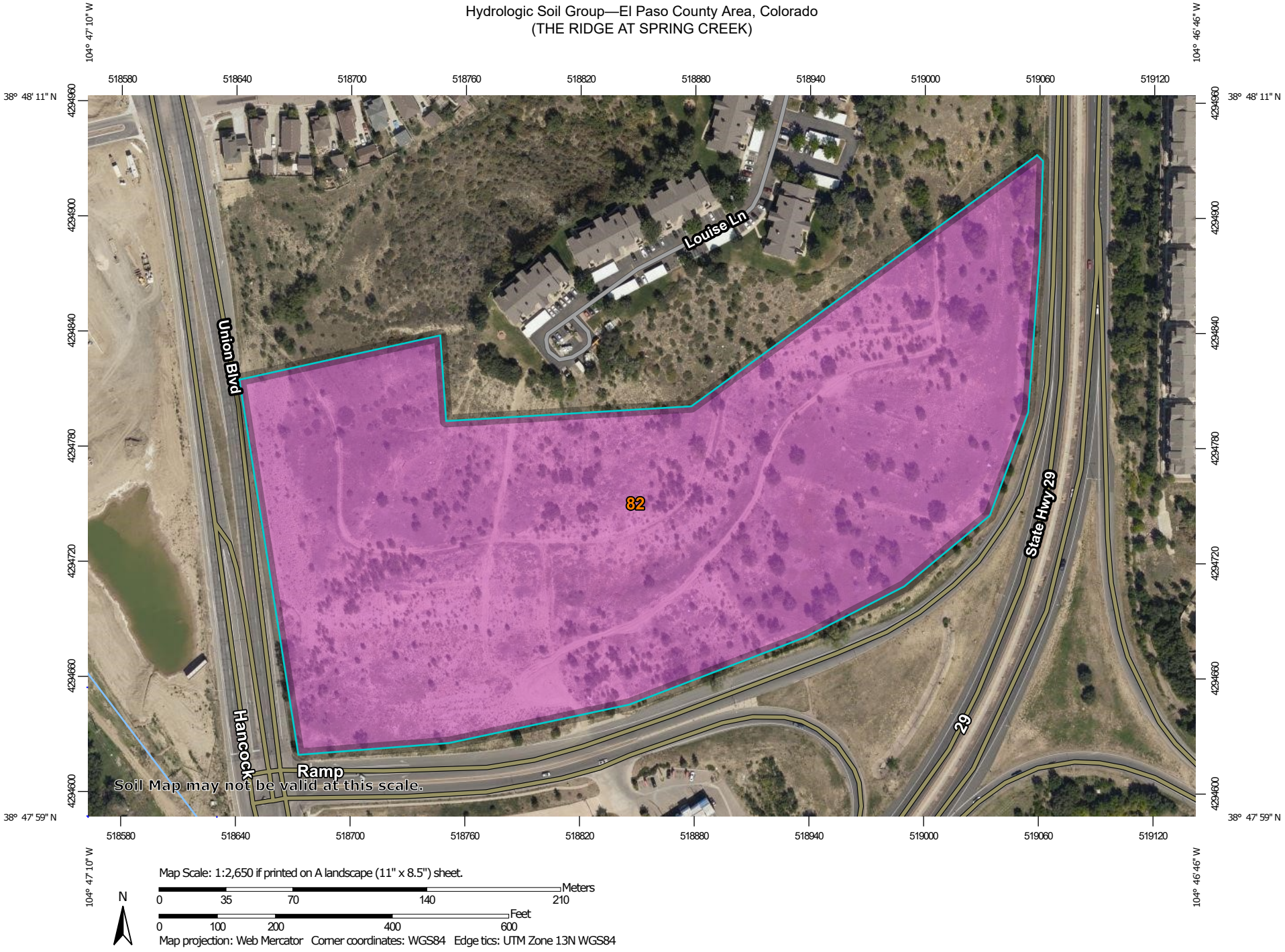
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/18/2021 at 1:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Hydrologic Soil Group—El Paso County Area, Colorado
(THE RIDGE AT SPRING CREEK)



Map Scale: 1:2,650 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 Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Aug 19, 2018—Sep 23, 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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
82	Schamber-Razor complex, 8 to 50 percent slopes	A	17.0	100.0%
Totals for Area of Interest			**17.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

											CONVEYANCE TC						TT	INTENSITY						TOTAL FLOWS					
BASIN	**AREA TOTAL**	C_2	C_5	C_{10}	C_{25}	C_{50}	C_{100}	**Length**	**Height**	**TI**	**Length**	**Height**	C_V	**Slope**	**Velocity**	**TC**	**TOTAL**	I_2	I_5	I_{10}	I_{25}	I_{50}	I_{100}	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}
	(Acres)							**(ft)**	**(ft)**	**(min)**	**(ft)**	**(ft)**		**(%)**	**(fps)**	**(min)**	**(min)**	**(in/hr)**	**(in/hr)**	**(in/hr)**	**(in/hr)**	**(in/hr)**	**(in/hr)**	**(c.f.s.)**	**(c.f.s.)**	**(c.f.s.)**	**(c.f.s.)**	**(c.f.s.)**	**(c.f.s.)**
OS1 Undeveloped	0.25	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	178	71	7.2	290 *283*	72 *5*	10 *20*	24.8% *1.8%*	5.0 *2.7*	1.0 *1.8*	10.0	3.3	4.1	4.8	5.5	6.2	6.9	**0.0**	**0.1**	**0.2**	**0.4**	**0.5**	**0.6**
OS2 Undeveloped	1.85	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	173	47	8.1	1121	94	10	8.4%	2.9	6.5	14.5	2.9	3.6	4.2	4.8	5.4	6.0	**0.2**	**0.6**	**1.3**	**2.3**	**3.1**	**4.0**
OS3 Undeveloped	1.35	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	174	50	7.9	784 *440*	29 *28*	10 *20*	3.7% *6.4%*	1.9 *5.0*	6.8 *1.5*	16.2	2.7	3.4	4.0	4.5	5.1	5.7	**0.1**	**0.4**	**0.9**	**1.6**	**2.1**	**2.8**
EX1 Undeveloped	2.04	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	150	50	7.0	198 *283*	48 *5*	10 *20*	24.2% *1.8%*	4.9 *2.7*	0.7 *1.8*	9.5	3.4	4.2	4.9	5.6	6.3	7.1	**0.2**	**0.8**	**1.7**	**3.0**	**4.0**	**5.2**
EX2 Undeveloped	8.54	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	133	38	7.0	971	43	10	4.4%	2.1	7.7	14.6	2.8	3.6	4.1	4.7	5.3	6.0	**0.7**	**2.7**	**6.0**	**10.5**	**14.1**	**18.4**
EX3 Undeveloped	3.93	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	146	53	6.7	547 *354*	18 *18*	10 *20*	3.3% *5.1%*	1.8 *4.5*	5.0 *1.3*	13.1	3.0	3.7	4.3	5.0	5.6	6.3	**0.4**	**1.3**	**2.9**	**5.1**	**6.8**	**8.9**
EX4 Undeveloped	2.19	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	132	32	7.3	163 *440*	16 *28*	10 *20*	9.8% *6.4%*	3.1 *5.0*	0.9 *1.5*	9.6	3.3	4.2	4.9	5.6	6.3	7.0	**0.2**	**0.8**	**1.8**	**3.2**	**4.3**	**5.5**

Calculated by: DLM

Date: 6/9/2021

		WEIGHTED						TT	INTENSITY						TOTAL FLOWS					
DESIGN POINT	**AREA TOTAL (Acres)**	**C_2**	**C_5**	**C_{10}**	**C_{25}**	**C_{50}**	**C_{100}**	**TOTAL (min)**	**I_2 (in/hr)**	**I_5 (in/hr)**	**I_{10} (in/hr)**	**I_{25} (in/hr)**	**I_{50} (in/hr)**	**I_{100} (in/hr)**	**Q_2 (c.f.s.)**	**Q_5 (c.f.s.)**	**Q_{10} (c.f.s.)**	**Q_{25} (c.f.s.)**	**Q_{50} (c.f.s.)**	**Q_{100} (c.f.s.)**
E1	**2.29**	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	10.0	3.3	4.1	4.8	5.5	6.2	6.9	**0.2**	**0.9**	**1.9**	**3.3**	**4.4**	**5.7**
BASIN OS1	0.25	0.03	0.09	0.17	0.26	0.31	0.36	10.0												
BASINEX1	2.04	0.03	0.09	0.17	0.26	0.31	0.36	9.5												
E2	**10.39**	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	14.6	2.8	3.6	4.1	4.7	5.3	6.0	**0.9**	**3.3**	**7.3**	**12.8**	**17.2**	**22.3**
BASIN OS2	1.85	0.03	0.09	0.17	0.26	0.31	0.36	14.5												
BASINEX2	8.54	0.03	0.09	0.17	0.26	0.31	0.36	14.6												
E3	**3.93**	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	9.5	3.4	4.2	4.9	5.6	6.3	7.1	**0.4**	**1.5**	**3.3**	**5.7**	**7.7**	**10.0**
BASIN EX3	3.93	0.03	0.09	0.17	0.26	0.31	0.36	9.5												
E4	**3.54**	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	16.2	2.7	3.4	4.0	4.5	5.1	5.7	**0.3**	**1.1**	**2.4**	**4.2**	**5.6**	**7.3**
BASIN OS3	1.35	0.03	0.09	0.17	0.26	0.31	0.36	16.2												
BASIN EX4	2.19	0.03	0.09	0.17	0.26	0.31	0.36	9.6												

Calculated by: DLM

Date: 4/2/2018

											CONVEYANCE TC						TT	INTENSITY						TOTAL FLOWS					
BASIN	**AREA TOTAL (Acres)**	**C_2**	**C_5**	**C_{10}**	**C_{25}**	**C_{50}**	**C_{100}**	**Length (ft)**	**Height (ft)**	**TI (min)**	**Length (ft)**	**Height (ft)**	**C_V**	**Slope (%)**	**Velocity (fps)**	**TC (min)**	**TOTAL (min)**	**I_2 (in/hr)**	**I_5 (in/hr)**	**I_{10} (in/hr)**	**I_{25} (in/hr)**	**I_{50} (in/hr)**	**I_{100} (in/hr)**	**Q_2 (c.f.s.)**	**Q_5 (c.f.s.)**	**Q_{10} (c.f.s.)**	**Q_{25} (c.f.s.)**	**Q_{50} (c.f.s.)**	**Q_{100} (c.f.s.)**
A1	1.24	**0.51**	**0.54**	**0.59**	**0.64**	**0.67**	**0.70**	67	1.4	6.4	435	12	20	2.8%	3.3	2.2	8.6	3.5	4.4	5.1	5.8	6.5	7.3	**2.2**	**2.9**	**3.7**	**4.6**	**5.4**	**6.3**
ROOF	0.25	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.48	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.51	0.05	0.12	0.20	0.30	0.34	0.39																						
A2	1.43	**0.39**	**0.43**	**0.49**	**0.56**	**0.58**	**0.62**	100	3	8.4	186	4	20	2.2%	2.9	1.1	9.4	3.4	4.2	4.9	5.6	6.3	7.1	**1.9**	**2.6**	**3.4**	**4.5**	**5.3**	**6.2**
ROOF	0.20	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.42	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.81	0.05	0.12	0.20	0.30	0.34	0.39																						
A3	0.85	**0.40**	**0.45**	**0.50**	**0.57**	**0.59**	**0.63**	100	3	8.2	149	3	20	2.0%	2.8	0.9	9.1	3.4	4.3	5.0	5.7	6.4	7.2	**1.2**	**1.6**	**2.1**	**2.7**	**3.2**	**3.8**
ROOF	0.15	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.24	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.46	0.05	0.12	0.20	0.30	0.34	0.39																						
A4	0.36	**0.40**	**0.45**	**0.50**	**0.57**	**0.59**	**0.63**	82	12	4.4	87	4	20	4.6%	4.3	0.3	5.0	4.1	5.2	6.0	6.9	7.8	8.7	**0.6**	**0.8**	**1.1**	**1.4**	**1.7**	**2.0**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81										MIN												
PAVEMENT	0.15	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.21	0.05	0.12	0.20	0.30	0.34	0.39																						
A5	0.29	**0.48**	**0.52**	**0.57**	**0.63**	**0.66**	**0.68**	55	6	3.5	85	4	20	4.7%	4.3	0.3	5.0	4.1	5.2	6.0	6.9	7.8	8.7	**0.6**	**0.8**	**1.0**	**1.3**	**1.5**	**1.7**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81										MIN												
PAVEMENT	0.15	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.14	0.05	0.12	0.20	0.30	0.34	0.39																						
A6	0.72	**0.57**	**0.60**	**0.64**	**0.69**	**0.71**	**0.73**	67	1.4	5.8	180	3.6	20	2.0%	2.8	1.1	6.9	3.7	4.7	5.5	6.3	7.0	7.9	**1.5**	**2.0**	**2.5**	**3.1**	**3.6**	**4.2**
ROOF	0.17	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.31	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.24	0.05	0.12	0.20	0.30	0.34	0.39																						
	PL																												

Calculated by: DLM

Date: 6/8/2021

											CONVEYANCE TC						TT	INTENSITY						TOTAL FLOWS					
BASIN	**AREA TOTAL (Acres)**	**C_2**	**C_5**	**C_{10}**	**C_{25}**	**C_{50}**	**C_{100}**	**Length (ft)**	**Height (ft)**	**TI (min)**	**Length (ft)**	**Height (ft)**	**C_V**	**Slope (%)**	**Velocity (fps)**	**TC (min)**	**TOTAL (min)**	**I_2 (in/hr)**	**I_5 (in/hr)**	**I_{10} (in/hr)**	**I_{25} (in/hr)**	**I_{50} (in/hr)**	**I_{100} (in/hr)**	**Q_2 (c.f.s.)**	**Q_5 (c.f.s.)**	**Q_{10} (c.f.s.)**	**Q_{25} (c.f.s.)**	**Q_{50} (c.f.s.)**	**Q_{100} (c.f.s.)**
A7	0.10	**0.64**	**0.67**	**0.70**	**0.75**	**0.77**	**0.79**	10	0.2	2.0	70	4	20	5.7%	4.8	0.2	5.0	4.1	5.2	6.0	6.9	7.8	8.7	**0.3**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81										MIN												
PAVEMENT	0.07	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.03	0.05	0.12	0.20	0.30	0.34	0.39																						
A8	2.45	**0.32**	**0.37**	**0.43**	**0.50**	**0.54**	**0.57**	86	12	5.1	760	46	20	6.1%	4.9	2.6	7.7	3.6	4.5	5.3	6.0	6.8	7.6	**2.9**	**4.1**	**5.6**	**7.5**	**8.9**	**10.6**
ROOF	0.35	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.52	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	1.58	0.05	0.12	0.20	0.30	0.34	0.39																						
A9	2.17	**0.20**	**0.26**	**0.33**	**0.41**	**0.45**	**0.49**	200	50	7.4	202	15	20	7.4%	5.5	0.6	8.0	3.6	4.5	5.2	5.9	6.7	7.5	**1.5**	**2.5**	**3.7**	**5.3**	**6.5**	**8.0**
ROOF	0.19	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.24	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	1.74	0.05	0.12	0.20	0.30	0.34	0.39																						
A10	0.13	**0.83**	**0.84**	**0.86**	**0.89**	**0.90**	**0.92**	10	0.02	2.5	120	5	20	4.2%	4.1	0.5	5.0	4.1	5.2	6.0	6.9	7.8	8.7	**0.4**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81										MIN												
PAVEMENT	0.12	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.01	0.05	0.12	0.20	0.30	0.34	0.39																						
A11	1.43	**0.31**	**0.36**	**0.42**	**0.50**	**0.53**	**0.57**	75	30	3.4	363	8	20	2.2%	3.0	2.0	5.4	4.0	5.0	5.9	6.7	7.6	8.5	**1.8**	**2.6**	**3.6**	**4.8**	**5.7**	**6.8**
ROOF	0.15	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.33	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.95	0.05	0.12	0.20	0.30	0.34	0.39																						
A12	1.01	**0.50**	**0.54**	**0.59**	**0.64**	**0.67**	**0.69**	69	1.4	6.6	462	6	20	1.3%	2.3	3.4	10.0	3.3	4.1	4.8	5.5	6.2	6.9	**1.7**	**2.3**	**2.8**	**3.6**	**4.2**	**4.8**
ROOF	0.25	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.35	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.41	0.05	0.12	0.20	0.30	0.34	0.39																						
A13	1.05	**0.05**	**0.12**	**0.20**	**0.30**	**0.34**	**0.39**	100	8	8.9	136	14	5	10.3%	1.6	1.4	10.3	3.3	4.1	4.8	5.4	6.1	6.9	**0.2**	**0.5**	**1.0**	**1.7**	**2.2**	**2.8**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.00	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	1.05	0.05	0.12	0.20	0.30	0.34	0.39																						

Calculated by: DLM

Date: 6/8/2021

											CONVEYANCE TC						TT	INTENSITY						TOTAL FLOWS					
BASIN	**AREA TOTAL (Acres)**	**C_2**	**C_5**	**C_{10}**	**C_{25}**	**C_{50}**	**C_{100}**	**Length (ft)**	**Height (ft)**	**TI (min)**	**Length (ft)**	**Height (ft)**	**C_V**	**Slope (%)**	**Velocity (fps)**	**TC (min)**	**TOTAL (min)**	**I_2 (in/hr)**	**I_5 (in/hr)**	**I_{10} (in/hr)**	**I_{25} (in/hr)**	**I_{50} (in/hr)**	**I_{100} (in/hr)**	**Q_2 (c.f.s.)**	**Q_5 (c.f.s.)**	**Q_{10} (c.f.s.)**	**Q_{25} (c.f.s.)**	**Q_{50} (c.f.s.)**	**Q_{100} (c.f.s.)**
OS2.1 UNDEVELOPED	0.45	**0.09**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	178	71	7.2	404	69	10	17.1%	4.1	1.6	8.8	3.4	4.3	5.0	5.8	6.5	7.2	**0.1**	**0.2**	**0.4**	**0.7**	**0.9**	**1.2**
OS2.2 UNDEVELOPED	1.44	**0.03**	**0.09**	**0.17**	**0.26**	**0.31**	**0.36**	173	47	8.1	656	94	10	14.3%	3.8	2.9	11.0	3.2	4.0	4.7	5.3	6.0	6.7	**0.1**	**0.5**	**1.1**	**2.0**	**2.7**	**3.5**
B1	0.59	**0.03**	**0.07**	**0.12**	**0.17**	**0.20**	**0.22**	100	28	6.2	467	10	20	2.1%	2.9	2.7	8.9	3.4	4.3	5.0	5.7	6.5	7.2	**0.1**	**0.2**	**0.3**	**0.6**	**0.7**	**1.0**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.00	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.34	0.05	0.12	0.20	0.30	0.34	0.39																						
B2	0.71	**0.05**	**0.12**	**0.20**	**0.30**	**0.34**	**0.39**	69	14	5.4	388	10	20	2.6%	3.2	2.0	7.5	3.6	4.6	5.3	6.1	6.9	7.7	**0.1**	**0.4**	**0.8**	**1.3**	**1.7**	**2.1**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.00	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.71	0.05	0.12	0.20	0.30	0.34	0.39																						
B3	0.74	**0.05**	**0.12**	**0.20**	**0.30**	**0.34**	**0.39**	100	8	8.9	505	24	20	4.8%	4.4	1.9	10.8	3.2	4.0	4.7	5.3	6.0	6.7	**0.1**	**0.4**	**0.7**	**1.2**	**1.5**	**1.9**
ROOF	0.00	0.71	0.73	0.75	0.78	0.80	0.81																						
PAVEMENT	0.00	0.89	0.90	0.92	0.94	0.95	0.96																						
LANDSCAPE	0.74	0.05	0.12	0.20	0.30	0.34	0.39																						
B4	1.44	**0.05**	**0.12**	**0.20**	**0.30**	**0.34**	**0.39**	123	32	6.7	199	18	10	9.0%	3.0	1.1	9.3	3.4	4.2	5.0	5.7	6.4	7.1	**0.2**	**0.7**	**1.4**	**2.4**	**3.1**	**4.0**
LANDSCAPE	1.44	0.05	0.12	0.20	0.30	0.34	0.39				440	28	20	6.4%	5.0	1.5														

Calculated by: DLM

Date: 6/8/2021

		WEIGHTED						TT	INTENSITY						TOTAL FLOWS					
DESIGN POINT	**AREA TOTAL (Acres)**	C_2	C_5	C_{10}	C_{25}	C_{50}	C_{100}	**TOTAL (min)**	I_2 (in/hr)	I_5 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	I_{50} (in/hr)	I_{100} (in/hr)	Q_2 (c.f.s.)	Q_5 (c.f.s.)	Q_{10} (c.f.s.)	Q_{25} (c.f.s.)	Q_{50} (c.f.s.)	Q_{100} (c.f.s.)
P1	**2.67**	**0.44**	**0.49**	**0.54**	**0.60**	**0.62**	**0.65**	**9.4**	3.4	4.2	4.9	5.6	6.3	7.1		**5.5**				**12.3**
BASIN A1	1.24	0.51	0.54	0.59	0.64	0.67	0.70	8.6												
BASIN A2	1.43	0.39	0.43	0.49	0.56	0.58	0.62	9.4												
P2	**3.52**	**0.43**	**0.48**	**0.53**	**0.59**	**0.62**	**0.65**	**9.4**	3.4	4.2	4.9	5.6	6.3	7.1		**7.1**				**16.1**
BASIN A3	0.85	0.40	0.45	0.50	0.57	0.59	0.63	9.1												
DESIGN POINT P1	2.67	0.44	0.49	0.54	0.60	0.62	0.65	9.4												
P3	**3.88**	**0.43**	**0.47**	**0.52**	**0.59**	**0.61**	**0.64**	**9.4**	3.4	4.2	4.9	5.6	6.3	7.1		**7.8**				**17.7**
BASIN A4	0.36	0.40	0.45	0.50	0.57	0.59	0.63	5.0												
DESIGN POINT P2	3.52	0.43	0.48	0.53	0.59	0.62	0.65	9.4												
P4	**4.17**	**0.44**	**0.48**	**0.53**	**0.59**	**0.62**	**0.65**	**9.4**	3.4	4.2	4.9	5.6	6.3	7.1		**8.4**				**19.1**
BASIN A5	0.29	0.48	0.52	0.57	0.63	0.66	0.68	5.0												
DESIGN POINT P3	3.88	0.43	0.47	0.52	0.59	0.61	0.64	9.4												
P5	**4.89**	**0.45**	**0.50**	**0.54**	**0.60**	**0.63**	**0.66**	**9.4**	3.4	4.2	4.9	5.6	6.3	7.1		**10.2**				**22.9**
BASIN A6	0.72	0.57	0.60	0.64	0.69	0.71	0.73	6.9												
DESING POINT P4	4.17	0.44	0.48	0.53	0.59	0.62	0.65	9.4												
P6	**3.99**	**0.22**	**0.28**	**0.34**	**0.42**	**0.46**	**0.50**	**11.0**	3.2	4.0	4.7	5.3	6.0	6.7		**4.4**				**13.4**
BASIN A7	0.10	0.64	0.67	0.70	0.75	0.77	0.79	5.00												
DESIGN POINT 5	3.89	0.21	0.27	0.33	0.41	0.45	0.49	11.0												
P7	**7.60**	**0.18**	**0.24**	**0.31**	**0.39**	**0.43**	**0.47**	**11.0**	3.2	4.0	4.7	5.3	6.0	6.7		**7.3**				**29.9**
DESIGN POINT 7	3.61	0.13	0.19	0.26	0.35	0.39	0.44	11.0												
DESIGN POINT P6	3.99	0.22	0.28	0.34	0.42	0.46	0.50	11.0												
FB-DP-5																**0.1**				**5.0**
FB-DB-6																**0.0**				**0.9**
P8	**7.73**	**0.19**	**0.25**	**0.32**	**0.40**	**0.44**	**0.48**	**11.0**	3.2	4.0	4.7	5.3	6.0	6.7		**7.7**				**30.7**
BASIN A10	0.13	0.83	0.84	0.86	0.89	0.90	0.92	5.0												
DESIGN POINT P7	7.60	0.18	0.24	0.31	0.39	0.43	0.47	11.0												
P9	**10.42**	**0.23**	**0.29**	**0.35**	**0.43**	**0.47**	**0.51**	**11.0**	3.2	4.0	4.7	5.3	6.0	6.7		**12.0**				**35.5**
DESIGN POINT 6	1.68	0.27	0.32	0.39	0.46	0.50	0.54	9.95												
BASIN A12	1.01	0.50	0.54	0.59	0.64	0.67	0.69	10.0												
DESIGN POINT P8	7.73	0.19	0.25	0.32	0.40	0.44	0.48	11.0												

Calculated by: DLM

Date: 6/8/2021

		WEIGHTED						TT	INTENSITY						TOTAL FLOWS					
DESIGN POINT	**AREA TOTAL (Acres)**	**C_2**	**C_5**	**C_{10}**	**C_{25}**	**C_{50}**	**C_{100}**	**TOTAL (min)**	**I_2 (in/hr)**	**I_5 (in/hr)**	**I_{10} (in/hr)**	**I_{25} (in/hr)**	**I_{50} (in/hr)**	**I_{100} (in/hr)**	**Q_2 (c.f.s.)**	**Q_5 (c.f.s.)**	**Q_{10} (c.f.s.)**	**Q_{25} (c.f.s.)**	**Q_{50} (c.f.s.)**	**Q_{100} (c.f.s.)**
4	**2.79**	**0.04**	**0.11**	**0.19**	**0.28**	**0.33**	**0.38**	**16.2**	2.7	3.4	4.0	4.5	5.1	5.7		**1.0**				**6.0**
BASIN B4	1.44	0.05	0.12	0.20	0.30	0.34	0.39	9.3												
BASIN OS3	1.35	0.03	0.09	0.17	0.26	0.31	0.36	16.2												
5	**3.89**	**0.21**	**0.27**	**0.33**	**0.41**	**0.45**	**0.49**	**11.0**	3.2	4.0	4.7	5.3	6.0	6.7		**4.2**				**12.9**
BASIN A8	2.45	0.32	0.37	0.43	0.50	0.54	0.57	7.7												
BASIN OS2.2	1.44	0.03	0.09	0.17	0.26	0.31	0.36	11.0												
6	**1.68**	**0.27**	**0.32**	**0.39**	**0.46**	**0.50**	**0.54**	**10.0**	3.3	4.1	4.8	5.5	6.2	6.9		**2.2**				**6.2**
BASIN A11	1.43	0.31	0.36	0.42	0.50	0.53	0.57	5.4												
BASIN OS1	0.25	0.03	0.09	0.17	0.26	0.31	0.36	10.0												
7	**3.61**	**0.13**	**0.19**	**0.26**	**0.35**	**0.39**	**0.44**	**11.0**	3.2	4.0	4.7	5.3	6.0	6.7		**2.9**				**16.5**
BASIN A9	2.17	0.20	0.26	0.33	0.41	0.45	0.49	8.0												
BASIN OS2.1	1.44	0.03	0.09	0.17	0.26	0.31	0.36	8.8												
FB DP-5								11.0								**0.1**				**5.0**
FB DP-6								10.0								**0.0**				**0.9**
POND	**16.36**	**0.29**	**0.34**	**0.40**	**0.47**	**0.51**	**0.55**	**11.0**	3.2	4.0	4.7	5.3	6.0	6.7		**22.2**				**59.9**
BASIN A13	1.05	0.05	0.12	0.20	0.30	0.34	0.39	10.3												
DESIGN POINT P5	4.89	0.45	0.50	0.54	0.60	0.63	0.66	9.4												
DESIGN POINT P9	10.42	0.23	0.29	0.35	0.43	0.47	0.51	11.0												

Calculated by: DLM

Date: 6/8/2021

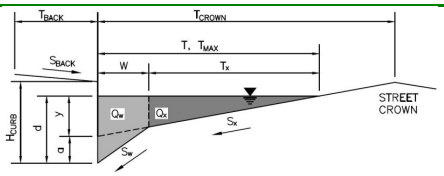
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A1



Gutter Geometry (Enter data in the blue cells)

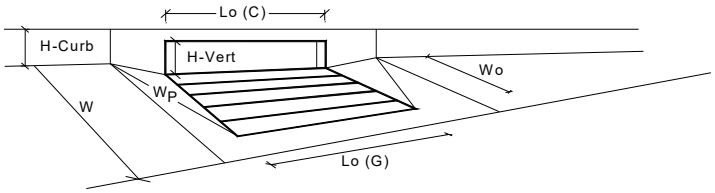
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.42	0.58	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**5.9**	**9.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	2.9	6.3	cfs

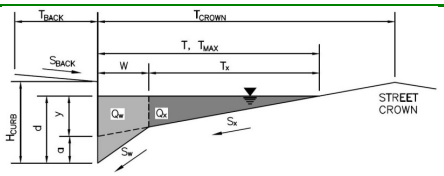
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A2



Gutter Geometry (Enter data in the blue cells)

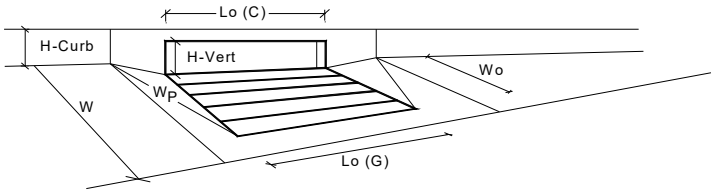
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.42	0.58	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**5.9**	**9.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	2.6	6.2	cfs

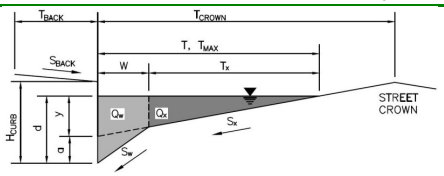
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A3



Gutter Geometry (Enter data in the blue cells)

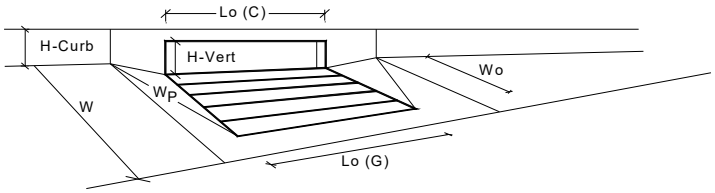
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	8.0	8.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.58	0.58	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	1.00	1.00	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**9.3**	**9.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	1.6	3.8	cfs

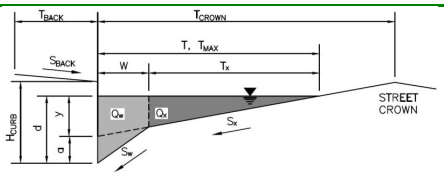
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A4



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	24.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	4.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	24.0	24.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	8.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☑	☑	check = yes

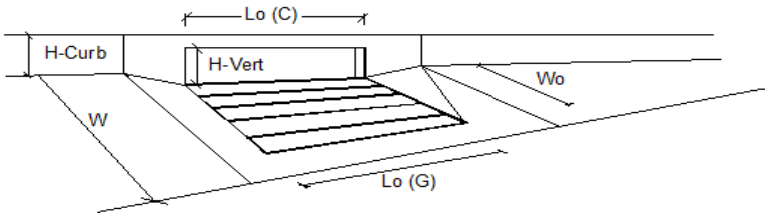
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**12.8**	**12.8**	**cfs**

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**0.8**	**1.9**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.1**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**97**	**%**

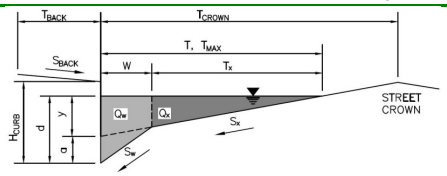
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A5



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	8.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	24.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	4.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	24.0	24.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	8.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

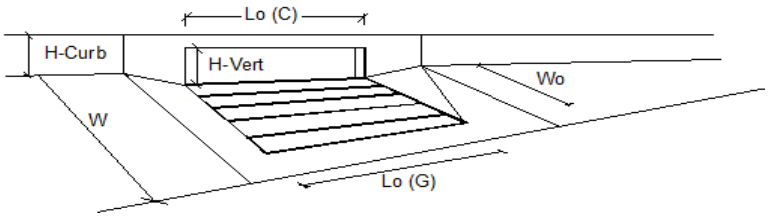
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**12.8**	**12.8**	**cfs**

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**0.8**	**1.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**99**	**%**

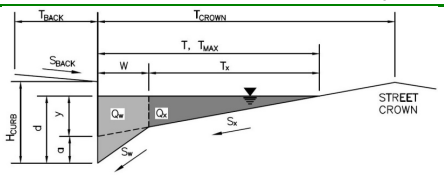
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A6



Gutter Geometry (Enter data in the blue cells)

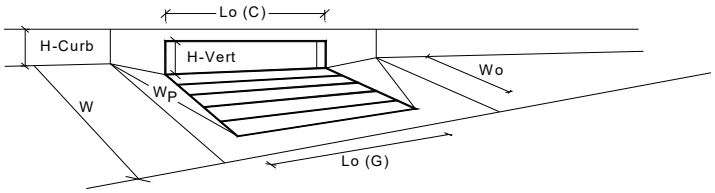
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	8.0	8.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	1.00	1.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.58	0.58	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	1.00	1.00	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**9.3**	**9.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	2.0	4.5	cfs

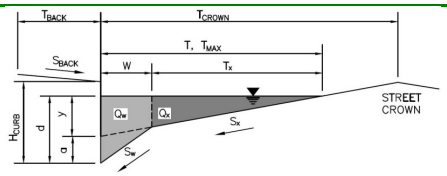
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A7



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.050	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

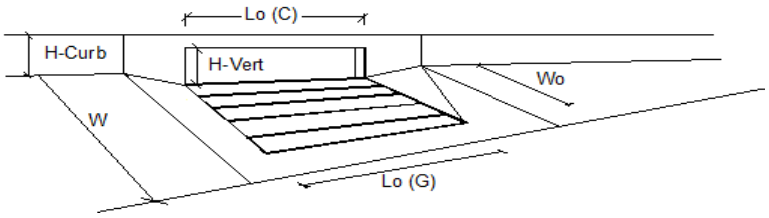
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**13.0**	**13.0**	**cfs**

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**0.3**	**0.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

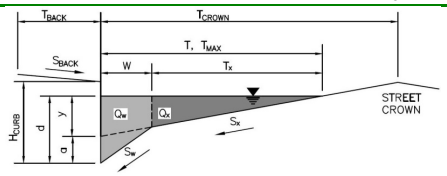
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: DP-5



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.050	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

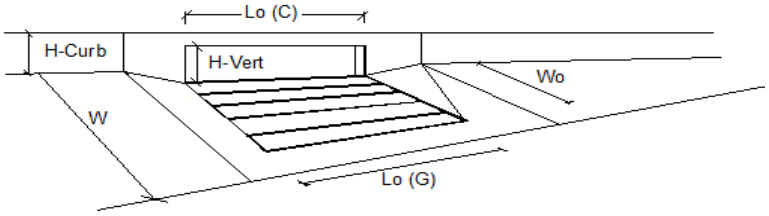
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**13.0**	**13.0**	**cfs**

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.1**	**7.9**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.1**	**5.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**97**	**61**	**%**

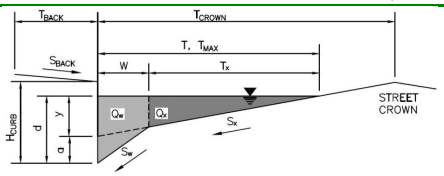
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: DP 6



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.020	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

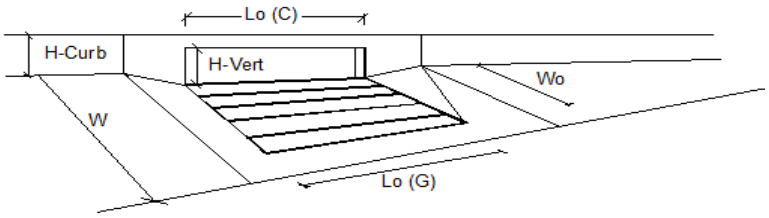
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**8.2**	**8.2**	**cfs**

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**2.2**	**5.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.9**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**85**	**%**

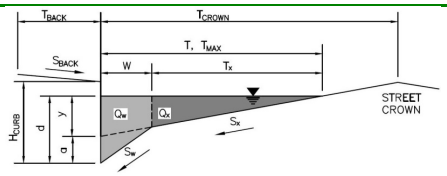
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: DP 7



Gutter Geometry (Enter data in the blue cells)

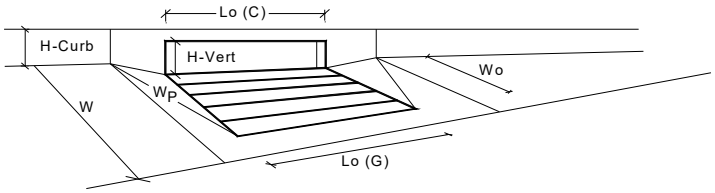
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	8.0	8.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.50	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	0.75	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.89	0.89	
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**29.9**	**29.9**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	2.9	16.5	cfs

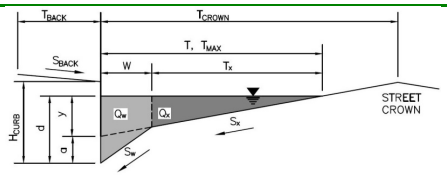
Version 4.05 Released March 2017

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

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

Project: THE RIDGE AT SPRING CREEK

Inlet ID: A12



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.020	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.013	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

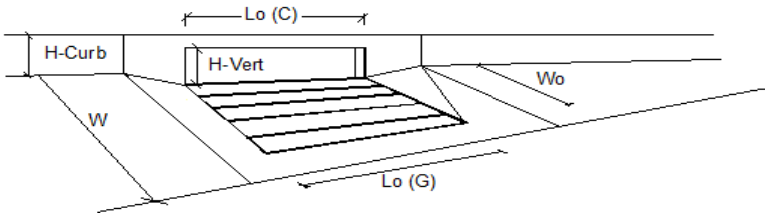
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**8.2**	**8.2**	**cfs**

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

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

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**2.3**	**4.5**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.3**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**93**	**%**

Worksheet Protected

Site-Level Low Impact Development (LID) Design Effective Impervious Calculator

LID Credit by Impervious Reduction Factor (IRF) Method

User Input

Calculated cells

***Design Storm: 1-Hour Rain Depth	2-Year Event	1.19	inches
***Minor Storm: 1-Hour Rain Depth	5-Year Event	1.50	inches
***Major Storm: 1-Hour Rain Depth	100-Year Event	2.52	inches
Optional User Defined Storm	CUHP		
(CUHP) NOAA 1 Hour Rainfall Depth and Frequency for User Defined Storm	100-Year Event		
Max Intensity for Optional User Defined Storm	0		

Designer: David Mijares
Company: Catamount Engineering
Date: July 19, 2021
Project: RIDGE AT SPRING CREEK
Location:

SITE INFORMATION (USER-INPUT)

Sub-basin Identifier	A1	A2	A3	A4	A5	A6	A7	DP5	DP7	A10	DP6	A12	A13	
Receiving Pervious Area Soil Type	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	
Total Area (ac., Sum of DCIA, UIA, RPA, & SPA)	1.240	1.430	0.850	0.360	0.290	0.720	0.100	3.890	2.620	0.130	1.680	1.010	1.050	
Directly Connected Impervious Area (DCIA, acres)	0.480	0.420	0.240	0.150	0.150	0.310	0.070	0.520	0.240	0.120	0.330	0.350	0.000	
Unconnected Impervious Area (UIA, acres)	0.250	0.200	0.150	0.000	0.000	0.170	0.000	0.350	0.190	0.000	0.150	0.250	0.000	
Receiving Pervious Area (RPA, acres)	0.255	0.410	0.230	0.000	0.000	0.120	0.000	0.490	0.440	0.000	0.460	0.410	0.000	
Separate Pervious Area (SPA, acres)	0.255	0.400	0.230	0.210	0.140	0.120	0.030	2.530	1.750	0.010	0.740	0.000	1.050	
RPA Treatment Type: Conveyance (C), Volume (V), or Permeable Pavement (PP)	C	C	C	C	C	C	C	C	C	C	C	C	C	

CALCULATED RESULTS (OUTPUT)

Total Calculated Area (ac, check against input)	1.240	1.430	0.850	0.360	0.290	0.720	0.100	3.890	2.620	0.130	1.680	1.010	1.050	
Directly Connected Impervious Area (DCIA, %)	38.7%	29.4%	28.2%	41.7%	51.7%	43.1%	70.0%	13.4%	9.2%	92.3%	19.6%	34.7%	0.0%	
Unconnected Impervious Area (UIA, %)	20.2%	14.0%	17.6%	0.0%	0.0%	23.6%	0.0%	9.0%	7.3%	0.0%	8.9%	24.8%	0.0%	
Receiving Pervious Area (RPA, %)	20.6%	28.7%	27.1%	0.0%	0.0%	16.7%	0.0%	12.6%	16.8%	0.0%	27.4%	40.6%	0.0%	
Separate Pervious Area (SPA, %)	20.6%	28.0%	27.1%	58.3%	48.3%	16.7%	30.0%	65.0%	66.8%	7.7%	44.0%	0.0%	100.0%	
A_R (RPA / UIA)	1.020	2.050	1.533	0.000	0.000	0.706	0.000	1.400	2.316	0.000	3.067	1.640	0.000	
I_a Check	0.500	0.330	0.390	1.000	1.000	0.590	1.000	0.420	0.300	1.000	0.250	0.380	1.000	
f / I for 2-Year Event:	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
f / I for 5-Year Event:	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
f / I for 100-Year Event:	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
f / I for Optional User Defined Storm CUHP:														
IRF for 2-Year Event:	0.68	0.61	0.64	1.00	1.00	0.72	1.00	0.65	0.60	1.00	0.58	0.63	1.00	
IRF for 5-Year Event:	0.89	0.86	0.87	1.00	1.00	0.91	1.00	0.88	0.86	1.00	0.85	0.87	1.00	
IRF for 100-Year Event:	0.91	0.89	0.90	1.00	1.00	0.93	1.00	0.90	0.88	1.00	0.87	0.89	1.00	
IRF for Optional User Defined Storm CUHP:														
Total Site Imperviousness: I_{total}	58.9%	43.4%	45.9%	41.7%	51.7%	66.7%	70.0%	22.4%	16.4%	92.3%	28.6%	59.4%	0.0%	
Effective Imperviousness for 2-Year Event:	52.4%	37.9%	39.4%	41.7%	51.7%	60.0%	70.0%	19.2%	13.5%	92.3%	24.8%	50.3%	0.0%	
Effective Imperviousness for 5-Year Event:	56.6%	41.4%	43.6%	41.7%	51.7%	64.4%	70.0%	21.2%	15.4%	92.3%	27.2%	56.2%	0.0%	
Effective Imperviousness for 100-Year Event:	57.1%	41.8%	44.0%	41.7%	51.7%	64.9%	70.0%	21.5%	15.6%	92.3%	27.4%	56.8%	0.0%	
Effective Imperviousness for Optional User Defined Storm CUHP:														

LID / EFFECTIVE IMPERVIOUSNESS CREDITS

This line only for WQCV Event	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
This line only for 10-Year Event	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100-Year Event CREDIT**: Reduce Detention By:	2.9%	3.7%	4.1%	0.2%	0.2%	2.5%	0.4%	4.4%	5.9%	0.2%	4.2%	4.3%	N/A	N/A
User Defined CUHP CREDIT: Reduce Detention By:														

Total Site Imperviousness:	**33.1%**
Total Site Effective Imperviousness for 2-Year Event:	**29.1%**
Total Site Effective Imperviousness for 5-Year Event:	**31.7%**
Total Site Effective Imperviousness for 100-Year Event:	**32.0%**
Total Site Effective Imperviousness for Optional User Defined Storm CUHP:	

Notes:

* Use Green-Ampt average infiltration rate values from Table 3-3.

** Flood control detention volume credits based on empirical equations from Storage Chapter of USDCM.

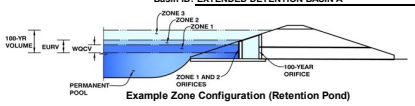
*** Method assumes that 1-hour rainfall depth is equivalent to 1-hour intensity for calculation purposed

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: THE RIDGE AT SPRING CREEK

Basin ID: EXTENDED DETENTION BASIN A



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	15.37	acres
Watershed Length =	1,205	ft
Watershed Slope =	0.080	ft/ft
Watershed Imperviousness =	32.00%	percent
Percentage Hydrologic Soil Group A =	100.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Denver - Capitol Building	
Water Quality Capture Volume (WQCV) =	0.202	acre-feet
Excess Urban Runoff Volume (EURV) =	0.500	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.337	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.448	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.562	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	0.735	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	0.999	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	1.342	acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	2.147	acre-feet
Approximate 2-yr Detention Volume =	0.316	acre-feet
Approximate 5-yr Detention Volume =	0.420	acre-feet
Approximate 10-yr Detention Volume =	0.524	acre-feet
Approximate 25-yr Detention Volume =	0.659	acre-feet
Approximate 50-yr Detention Volume =	0.758	acre-feet
Approximate 100-yr Detention Volume =	0.912	acre-feet

Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
	inches

Stage-Storage Calculation

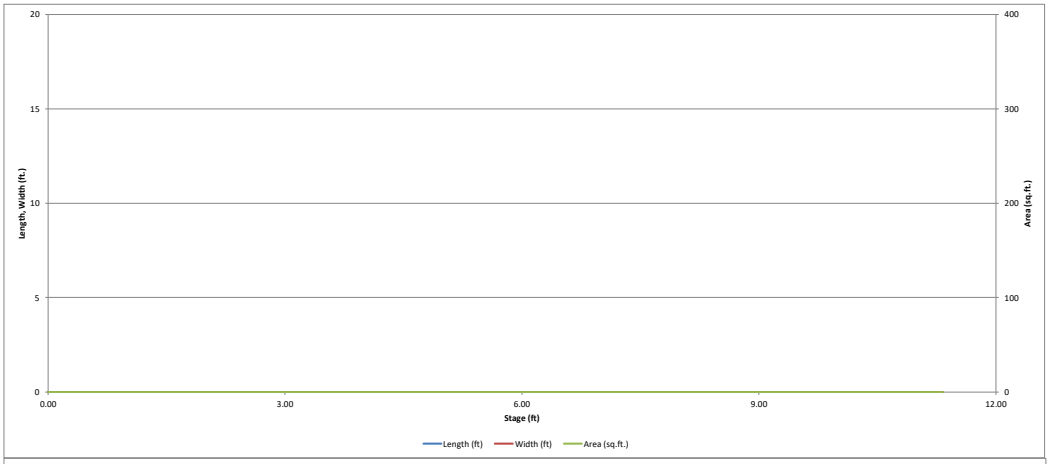
Zone 1 Volume (WQCV) =	0.202	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.299	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.412	acre-feet
Total Detention Basin Volume =	0.912	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

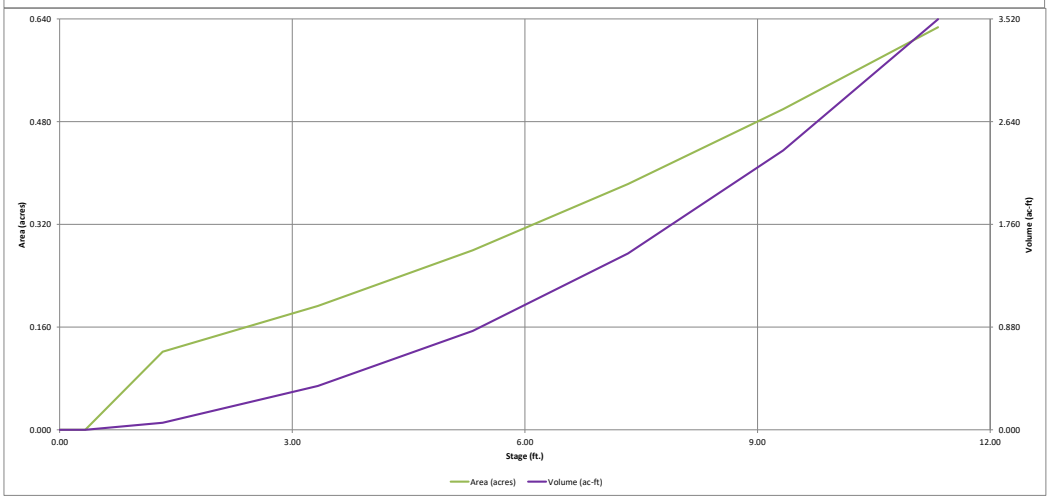
Depth Increment = 1 ft

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	--	--	--	10	0.000		
ISV	--	0.33	--	--	--	10	0.000	3	0.000
5890	--	1.33	--	--	--	5,303	0.122	2,607	0.060
5892	--	3.33	--	--	--	8,407	0.193	16,370	0.376
5894	--	5.33	--	--	--	12,167	0.279	36,944	0.848
5896	--	7.33	--	--	--	16,667	0.383	65,778	1.510
5898	--	9.33	--	--	--	21,745	0.499	104,190	2.392
5900	--	11.33	--	--	--	27,315	0.627	153,250	3.518

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



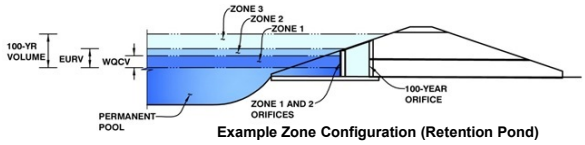


Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: THE OVERLOOK AT SPRING CREEK

Basin ID: EXTENDED DETENTION BASIN A



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.34	0.202	Orifice Plate
Zone 2 (EURV)	3.94	0.299	Orifice Plate
Zone 3 (100-year)	5.56	0.412	Weir&Pipe (Restrict)
		0.912	Total

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

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	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 =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	3.94	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	15.80	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	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	1.31	2.63					
Orifice Area (sq. inches)	1.19	1.19	1.19					

	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			Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	N/A	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches				

Calculated Parameters for Vertical Orifice

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.75	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	4.75	N/A	feet
Overflow Weir Front Edge Length =	4.00	N/A	feet	Over Flow Weir Slope Length =	4.00	N/A	feet
Overflow Weir Slope =	0.00	N/A	H:V (enter zero for flat grate)	Grate Open Area / 100-yr Orifice Area =	36.16	N/A	should be ≥ 4
Horiz. Length of Weir Sides =	4.00	N/A	feet	Overflow Grate Open Area w/o Debris =	11.20	N/A	ft^2
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area	Overflow Grate Open Area w/ Debris =	5.60	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	1.00	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	0.31	N/A	ft^2
Outlet Pipe Diameter =	12.00	N/A	inches	Outlet Orifice Centroid =	0.24	N/A	feet
Restrictor Plate Height Above Pipe Invert =	5.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	1.40	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.25	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.34	feet
Spillway Crest Length =	40.00	feet	Stage at Top of Freeboard =	7.59	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.40	acres
Freeboard above Max Water Surface =	1.00	feet			

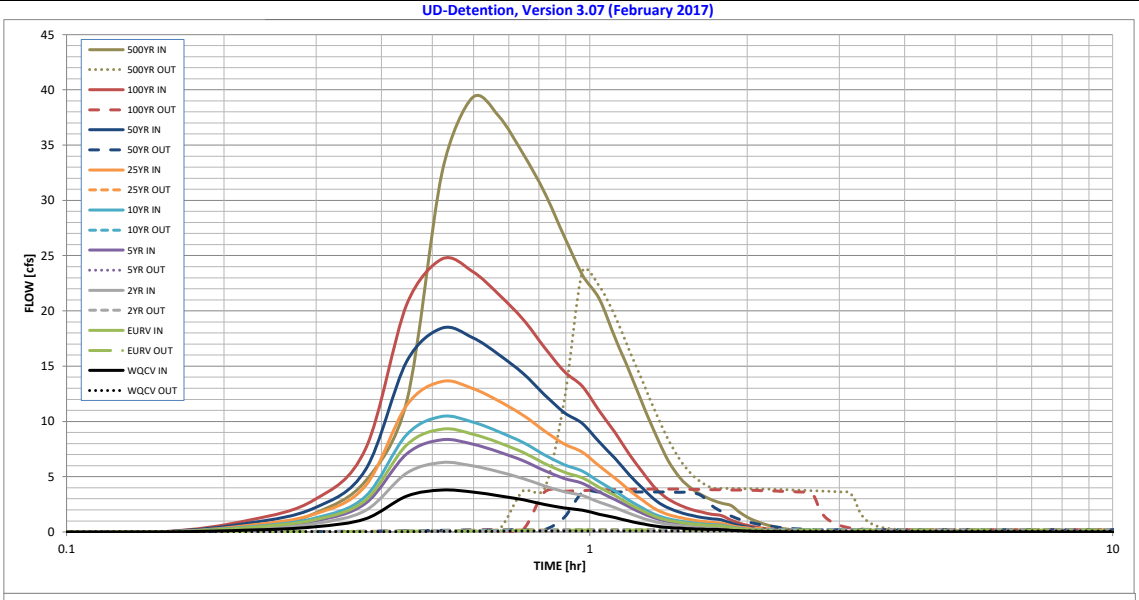
Calculated Parameters for Spillway

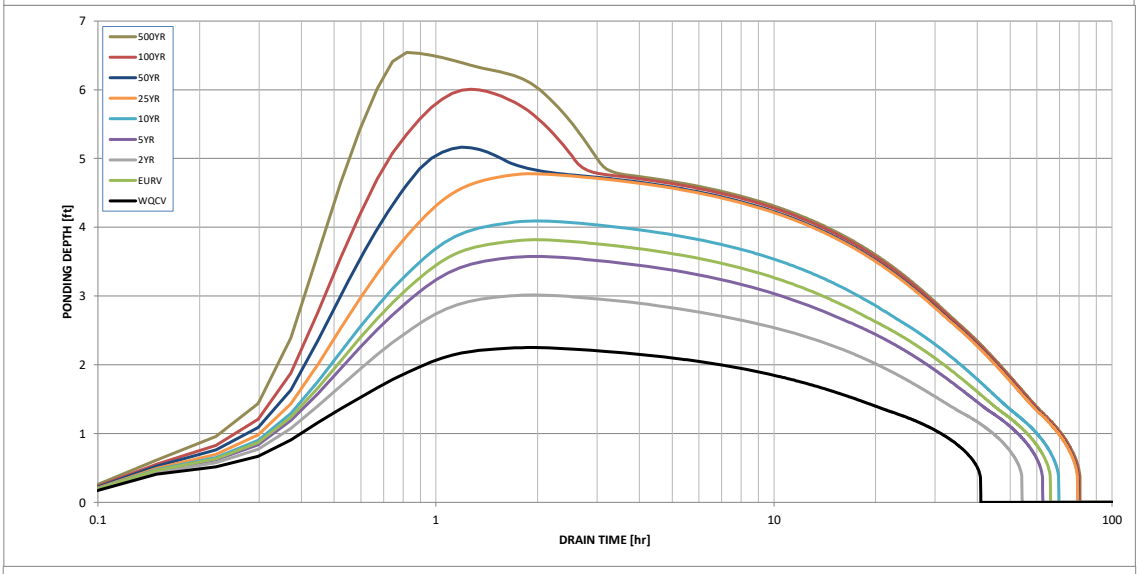
Routed Hydrograph Results

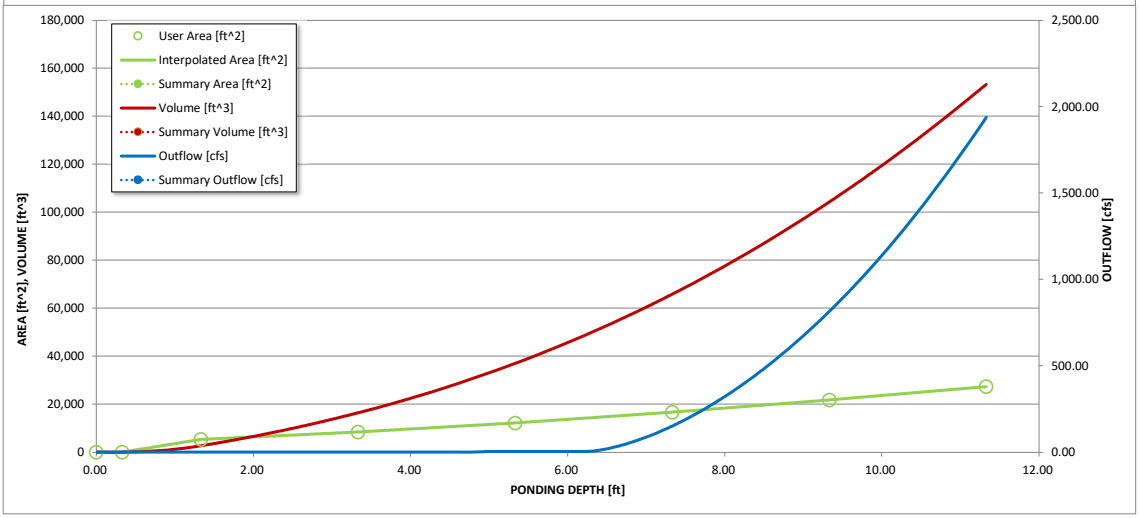
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	3.14
Calculated Runoff Volume (acre-ft) =	0.202	0.500	0.337	0.448	0.562	0.735	0.999	1.342	2.147
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.201	0.500	0.336	0.447	0.561	0.734	0.997	1.340	2.145
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.00	0.01	0.01	0.03	0.22	0.53	1.19
Predevelopment Peak Q (cfs) =	0.0	0.0	0.0	0.1	0.2	0.5	3.4	8.2	18.3
Peak Inflow Q (cfs) =	3.8	9.3	6.3	8.3	10.4	13.6	18.4	24.7	39.3
Peak Outflow Q (cfs) =	0.1	0.2	0.1	0.2	0.2	0.4	3.6	3.9	23.6
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	2.0	1.0	0.8	1.1	0.5	1.3
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Grate 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.0	0.3	0.3	0.3
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) =	38	60	50	57	63	71	69	67	61
Time to Drain 99% of Inflow Volume (hours) =	**40**	64	53	61	67	76	76	75	73
Maximum Ponding Depth (ft) =	2.25	3.82	3.02	3.58	4.09	4.78	5.16	6.01	6.54
Area at Maximum Ponding Depth (acres) =	0.15	0.21	0.18	0.20	0.23	0.26	0.27	0.31	0.34
Maximum Volume Stored (acre-ft) =	0.188	0.473	0.316	0.423	0.535	0.698	0.801	1.047	1.224

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

Outflow Hydrograph Workbook Filename:

Storm Inflow Hydrographs **UD-Detention, Version 3.07 (February 2017)**

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

Time Interval	SOURCE	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK
	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
4.47 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:04:28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrograph	0:08:56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	0:13:25	0.17	0.41	0.28	0.37	0.46	0.60	0.81	1.07	1.68
1.118	0:17:53	0.46	1.11	0.76	1.00	1.25	1.62	2.19	2.92	4.61
	0:22:21	1.18	2.86	1.94	2.57	3.21	4.17	5.62	7.49	11.83
	0:26:49	3.24	7.87	5.34	7.07	8.82	11.45	15.44	20.57	32.46
	0:31:17	3.80	9.31	6.28	8.35	10.45	13.62	18.44	24.68	39.27
	0:35:46	3.61	8.87	5.98	7.96	9.96	13.00	17.62	23.60	37.61
	0:40:14	3.28	8.08	5.45	7.24	9.07	11.83	16.04	21.49	34.23
	0:44:42	2.91	7.21	4.85	6.46	8.10	10.58	14.35	19.26	30.75
	0:49:10	2.50	6.21	4.17	5.56	6.98	9.14	12.43	16.70	26.75
	0:53:38	2.18	5.42	3.64	4.85	6.09	7.96	10.81	14.52	23.26
	0:58:07	1.97	4.90	3.29	4.39	5.51	7.21	9.80	13.17	21.08
	1:02:35	1.61	4.04	2.70	3.61	4.54	5.96	8.12	10.94	17.58
	1:07:03	1.30	3.29	2.19	2.94	3.71	4.87	6.66	8.99	14.51
	1:11:31	0.98	2.52	1.67	2.25	2.85	3.76	5.16	7.01	11.39
	1:15:59	0.71	1.87	1.23	1.67	2.12	2.81	3.88	5.30	8.69
	1:20:28	0.52	1.36	0.90	1.21	1.53	2.03	2.81	3.86	6.40
	1:24:56	0.41	1.06	0.70	0.94	1.19	1.57	2.16	2.95	4.85
	1:29:24	0.34	0.87	0.58	0.78	0.98	1.29	1.77	2.42	3.94
	1:33:52	0.29	0.74	0.49	0.66	0.83	1.10	1.50	2.04	3.33
	1:38:20	0.26	0.65	0.43	0.58	0.73	0.96	1.32	1.79	2.91
	1:42:49	0.23	0.58	0.39	0.52	0.66	0.87	1.19	1.61	2.61
	1:47:17	0.21	0.54	0.36	0.48	0.61	0.80	1.09	1.48	2.39
	1:51:45	0.16	0.40	0.26	0.35	0.45	0.59	0.80	1.09	1.77
	1:56:13	0.11	0.29	0.19	0.26	0.33	0.43	0.59	0.79	1.29
	2:00:41	0.08	0.21	0.14	0.19	0.24	0.31	0.43	0.58	0.95
	2:05:10	0.06	0.16	0.10	0.14	0.18	0.23	0.32	0.43	0.70
	2:09:38	0.04	0.11	0.07	0.10	0.13	0.17	0.23	0.31	0.51
	2:14:06	0.03	0.08	0.05	0.07	0.09	0.12	0.16	0.22	0.36
	2:18:34	0.02	0.06	0.04	0.05	0.06	0.08	0.12	0.16	0.26
	2:23:02	0.01	0.04	0.02	0.03	0.04	0.06	0.08	0.11	0.18
	2:27:31	0.01	0.02	0.01	0.02	0.02	0.03	0.05	0.07	0.11
	2:31:59	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.06
	2:36:27	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.03
	2:40:55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	2:45:23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:49:52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:54:20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:58:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:03:16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:07:44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:12:13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:16:41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:21:09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:34:34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:39:02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:43:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:47:58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:52:26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:56:55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:01:23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:14:47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:19:16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:23:44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:28:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:32:40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:37:08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:41:37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:46:05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:59:29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:03:58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:08:26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:12:54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:17:22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:21:50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

N

0 60 120

SCALE: 1" = 60'

EXISTING DRAINAGE BASINS

BASIN	AREA (ACRES)	Q5 (CFS)	Q100 (CFS)
OS1	.25	.1	.6
OS2	1.85	0.6	4.0
OS3	1.35	0.4	2.8
EX1	2.04	0.8	5.2
EX2	8.54	2.7	18.4
EX3	3.93	1.3	8.9
EX4	2.19	0.8	5.5

EXISTING DESIGN POINTS

DESIGN POINT	Q5 (CFS)	Q100 (CFS)
E1	0.9	5.7
E2	3.3	22.3
E3	1.5	10.0
E4	1.1	7.3

DRAINAGE LEGEND

BASIN IDENTIFIER / BASIN AREA [AC]	F / 0.36
DESIGN POINT IDENTIFIERS	3
STORM SEWER DESIGN POINT IDENTIFIERS	P5
DRAINAGE BASIN BOUNDARY	
SURFACE SHEET FLOW DIRECTION	
EXISTING MAJOR CONTOUR (10')	5900
EXISTING MINOR CONTOUR (2')	
PROPOSED MAJOR CONTOUR (10')	5900
PROPOSED MINOR CONTOUR (2')	
EXISTING	(E)
PROPOSED	(P)
FUTURE	(F)
SLOPE/DIRECTION	1.00%
(E) STORM SEWER	
(P) STORM SEWER, INLET, OUTFALL	

REV.	DESCRIPTION	DATE

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(719) 598-5192

CATAMOUNT ENGINEERING
321 W. HENRIETTA AVE PO BOX 221 WOODLAND PARK, CO 80866 (719)426-2124

THE RIDGE AT SPRING CREEK

EXISTING CONDITIONS DRAINAGE MAP

DESIGNED BY: DLM	DRAWN BY: DBM
SCALE: 1" = 60'	DATE: 07/06/21
JOB NUMBER: 21-306	SHEET: 1 OF 1

PROPOSED DRAINAGE BASINS			
BASIN	AREA (ACRES)	Q5 (CFS)	Q100 (CFS)
A1	1.24	2.9	6.3
A2	1.43	2.6	6.2
A3	0.85	1.6	3.8
A4	0.36	0.8	2.0
A5	0.29	0.8	1.7
A6	0.72	2.0	4.2
A7	0.10	0.3	0.7
A8	2.45	4.1	10.6
A9	2.17	2.5	8.0
A10	0.13	0.6	1.0
A11	1.43	2.6	6.8
A12	1.01	2.3	4.8
A13	1.05	0.5	2.8
OS1	0.25	0.1	0.6
OS2.1	4.50	0.2	1.2
OS2.2	1.44	0.5	3.5
OS3	1.35	0.4	2.8
B1	0.59	0.2	1.0
B2	0.71	0.4	2.1
B3	0.74	0.4	1.9
B4	1.44	0.7	4.0

PROPOSED DESIGN POINTS		
DESIGN POINT	Q5 (CFS)	Q100 (CFS)
P1	5.5	12.3
P2	7.1	16.1
P3	7.8	16.1
P4	8.4	17.7
P5	10.2	22.9
P6	4.4	13.4
P7	7.3	29.9
P8	7.7	30.7
P9	12.0	35.5
4	1.0	6.0
5	4.2	12.9
6	2.2	6.2
7	2.9	16.5
POND	22.2	59.9

N

0 80 160

SCALE: 1" = 80'

DRAINAGE LEGEND

BASIN IDENTIFIER
BASIN AREA [AC]

DESIGN POINT IDENTIFIERS

STORM SEWER DESIGN POINT IDENTIFIERS

DRAINAGE BASIN BOUNDARY

SURFACE SHEET FLOW DIRECTION

EXISTING MAJOR CONTOUR (10')

EXISTING MINOR CONTOUR (2')

PROPOSED MAJOR CONTOUR (10')

PROPOSED MINOR CONTOUR (2')

EXISTING (E)
PROPOSED (P)
FUTURE (F)

SLOPE/DIRECTION 1.00%

(E) STORM SEWER

(P) STORM SEWER, INLET, OUTFALL

REV.	DESCRIPTION	DATE

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CATAMOUNT ENGINEERING
321 W. HENRIETTA AVE PO BOX 221 WOODLAND PARK, CO 80866 (719)428-2124

THE RIDGE AT SPRING CREEK

FINAL CONDITIONS DRAINAGE MAP

DESIGNED BY:	DRAWN BY:
DLM	DBM
SCALE: 1" = 80'	DATE: 07/06/21
JOB NUMBER	SHEET
21-306	1 OF 1