DRAINAGE LETTER FOR WOODMEN VALLEY CHAPEL-MONUMENT CAMPUS

Lot 1, Conexus Business Park Filing No. 1

May 22 2020

Prepared for:
Town of Monument, Colorado
Planning Department
645 Beacon Lite Rd.
Monument, CO 80132

Woodmen Valley Chapel
290 E. Woodmen Rd.
Colorado Springs, CO 80919

Prepared by:

2435 Research Parkway, Suite 300
Colorado Springs, CO 80920
(719) 575-0100
fax (719) 572-0208

Matrix Project No. 20.346.018

Engineer's Statement:

The attached drainage plan and letter for Woodmen Valley Chapel- Monument Campus in Lot 1, Conexus Business Park Filing No. 1 was prepared by me (or under my direct supervision) and are correct to the best of my knowledge and belief. Said drainage letter and plan has been prepared in accordance with The City of Colorado Springs and the El Paso County 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.

_____ _____ SEAL

Colleen Monahan Date
Registered Professional Engineer
State of Colorado #56067

Developer's Statement:

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

Woodmen Valley Chapel
Business Name

By: _____

Title: _____
Address: 290 E. Woodmen Rd.
Colorado Springs, CO 80919

Town of Monument:

Filed in accordance with Section 17.45 of the Zoning Ordinance for the Town of Monument, and Section 16.12.060 of the Subdivision Code for the Town of Monument, revised February, 2007.

_____ _____
Director of Development Services Date

Purpose

This drainage letter has been prepared to support the PD Site Plan Application for Woodmen Valley Chapel (WVC)- Monument Campus. This site is Lot 1 of the Conexus Business Park Filing No. 1. This letter has been prepared in accordance with the City of Colorado Springs and the El Paso County Drainage Criteria Manual (DCM) and satisfies the development plan submittal requirements. The *Conexus Business Park Preliminary Drainage Report* that covers the larger development where this site is located was completed by Rockwell Consulting, Inc. The overarching drainage report anticipated fully developed commercial on this lot to drain into the proposed water quality/detention pond in Drainage Tract C of the Conexus Business Park Filing No. 1. The drainage values for this site have been given to Rockwell Consulting Inc. and are being incorporated into an addendum to the Drainage Report.

General Location and Description

The proposed project area is located in the north half of Section 26, T11S, R67W between Old Denver Road and US Interstate 25 and is currently covered by sparse natural grasses. The soil type for the area is a Pring coarse sandy loam, which is classified by NRCS soil survey to be "well drained" and in hydrologic soil group "B." (See Appendix for National Cooperative Soil Survey) Runoff from the site drains to the southwest and into a small, unnamed tributary to Monument Creek. The proposed development of the area is a new 20,000 square foot chapel footprint with a parking lot of approximately 396 spaces.

The *Conexus Business Park Preliminary Drainage Report* covers 15.1 acres and includes a proposed water quality/detention pond in the southwest corner of the site in Drainage Tract C. This pond will provide water quality/ detention for the entire Conexus Business Park Filing No. 1 site, including the WVC Monument Campus development. The pond will be located directly south of the WVC Monument Campus site.

Floodplain Statement

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel #08041C0278 F effective December 7th, 2018, there is a 100 year floodplain just south of the site (See Appendix for FIRMETTE and FIRM). However, the proposed site is entirely outside of the floodplain limits.

Drainage Criteria

The El Paso County Drainage Criteria Manual, which references the City of Colorado Springs Drainage Criteria Manual, was utilized in the preparation of this report. The Rational Method for the 5 year and 100 year storms was utilized to determine the peak runoff quantities.

Historic Drainage

The historic drainage basins and runoff rates from the *Conexus Business Park Preliminary Drainage Report* are shown on the Historic Drainage Map DR01 in the Appendix. The WVC property is within historic basins B and C.

Basin B is 4.16 acres and has a 5 year runoff rate of 0.9 cfs and a 100 year runoff rate of 6.5 cfs. This basin drains from east to west and enters an existing swale along the west boundary of the site. The swale then flows southerly.

Basin C is 6.3 acres and has a 5 year runoff rate of 1.2 cfs and a 100 year runoff rate of 8.7 cfs. This basin sheet flows to the south into the floodplain.

Developed Drainage Basin Descriptions

The developed chapel site has been divided into 9 sub-basins that each drain to an inlet at a design point. The basins, inlets and design points are shown on the developed drainage map DR02 in the Appendix. Pipe sizes are shown on DR02. HGLs will be provided in an addendum to this letter to be submitted along with the construction drawings. The basins and design point flows for this site have been given to Rockwell Consulting, Inc. and will be incorporated into their addendum to the *Conexus Business Park Preliminary Drainage Report*. Runoff on this site will flow in the same direction as the historic basins.

The storm collection system on site will collect storm water runoff from 9 inlets and connect into the Conexus Business Park Filing No. 1 storm system at two points along the west boundary of the site.

Inlets 1 through 4 collect stormwater runoff along the north of the site and are connected, conveying runoff into the Conexus storm system (by others) at an existing manhole at the north west corner of the site. Inlets 5 through 9 are connected and collect stormwater from the middle of the site to the south end and then connect to a manhole in the Conexus storm system that outlets the water into the water quality/ detention pond on the south end of the site. All the inlets are in sump condition.

Sub-basin rational calculations, Inlet sizing calculations and storm sewer sizing calculations have been included in the Appendix. The tables below summarize the design points, inlets, flows and inlet overflow descriptions.

PROPOSED DESIGN POINT SUMMARY WOODMEN VALLEY CHAPEL- MONUMENT CAMPUS				
DESIGN POINT ID	***SUB-BASINS***	***TOTAL AREA (AC)***	***Q(5) TOTAL FLOW (cfs)***	***Q(100) TOTAL FLOW (cfs)***
1-O	O-1	1.45	**6.34**	**11.57**
1-A	A-1, O-1	1.64	**7.24**	**13.17**
2-A	A-1, A-2, O-1	1.74	**7.66**	**13.95**
3-A	A-1, A-2, A-3, O-1	2.06	**8.31**	**15.38**
4-A	A-1, A-2, A-3, A-4, O-1	3.30	**12.80**	**23.82**
5-A	A-5	0.90	**3.67**	**6.70**
6-A	A-5, A-6	1.18	**4.58**	**8.39**
7-A	A-5, A-6, A-7	1.83	**6.61**	**12.12**
8-A	A-5, A-6, A-7, A-8	2.06	**7.20**	**13.17**
9-A	A-9	0.80	**3.34**	**6.20**
10-A	A-5, A-6, A-7, A-8, A-9	2.86	**9.23**	**16.95**

PROPOSED INLET SUMMARY WOODMEN VALLEY CHAPEL- MONUMENT CAMPUS								
INLET ID	SUB-BASINS	TOTAL AREA (AC)	INLET			Q(5) TOTAL INFLOW (cfs)	Q(100) TOTAL INFLOW (cfs)	INLET CAPACITY (cfs)
			SIZE (Ft.)	TYPE	CONDITION			
1	A-1	0.19	**4**	**D-10-R**	**SUMP**	**0.89**	**1.60**	**2.40**
2	A-2	0.10	**4**	**D-10-R**	**SUMP**	**0.43**	**0.78**	**2.40**
3	A-3	0.32	**4**	**D-10-R**	**SUMP**	**0.94**	**1.96**	**4.90**
4	A-4	1.24	**6**	**D-10-R**	**SUMP**	**4.98**	**9.35**	**19.30**
5	A-5	0.90	**4**	**D-10-R**	**SUMP**	**3.67**	**6.70**	**8.40**
6	A-6	0.29	**4**	**D-10-R**	**SUMP**	**1.21**	**2.23**	**5.30**
7	A-7	0.65	**4**	**D-10-R**	**SUMP**	**2.70**	**4.96**	**4.90**
8	A-8	0.22	**4**	**D-10-R**	**SUMP**	**1.01**	**1.82**	**3.00**
9	A-9	0.80	**6**	**D-10-R**	**SUMP**	**3.34**	**6.20**	**6.90**

INLET OVERFLOW DESCRIPTIONS WOODMEN VALLEY CHAPEL- MONUMENT CAMPUS	
INLET	OVERFLOW ROUTING UNDER INLET BLOCKAGE CONDITIONS
1	If blocked, flow to this inlet will surcharge over the crown of the street and enter Inlet 2 on the opposite side before it surcharges the curb and gutter. If depth surcharges more than 0.5' then flow will back up into landscape strip behind inlet.
2	Overflow from Inlet 2 can surcharge the street crown and enter Inlet 1 or back up around the curb and then flow down curb and gutter to Inlet 3.
3	This inlet would back up around the west curb and gutter and flow west to inlet 4. If surcharge is greater than 0.5' deep it will overflow into the landscape area behind the inlet.
4	Overflow from this inlet will back up into the landscape area behind the inlet and north west along curb and gutter to Wagon Bow Way and to the first Inlet by Others.
5	This inlet would back up around the curb to the north and then sheet flow north west to inlet 4.
6	Overflow would drain northwest to Inlet 5.
7	Overflow would back up along curb and gutter and then flow south to Inlet 8.
8	Inlet 8 would back up into landscaping behind the curb and gutter and then down into the existing drainage swale. It would also flow west to Inlet 9.
9	This inlet would overflow south behind curb and gutter and flow down into the water quality/ detention pond.

Water Quality

An Extended Detention Basin (EDB)/ Full Spectrum Pond will be installed south of this site in Drainage Tract C as part of the larger *Conexus Business Park Preliminary Drainage Report*. The original Drainage Report anticipated an addendum after the individual lots of the development had been bought and planned. The Addendum will reflect any changes needed to the Water Quality/Detention Pond to support the drainage needs of the lots that make up the larger development. This pond will provide water quality capture volume (WQCV), Excessive Urban Runoff Volume (EURV) and Full Spectrum Detention (FSD).

Drainage Fees

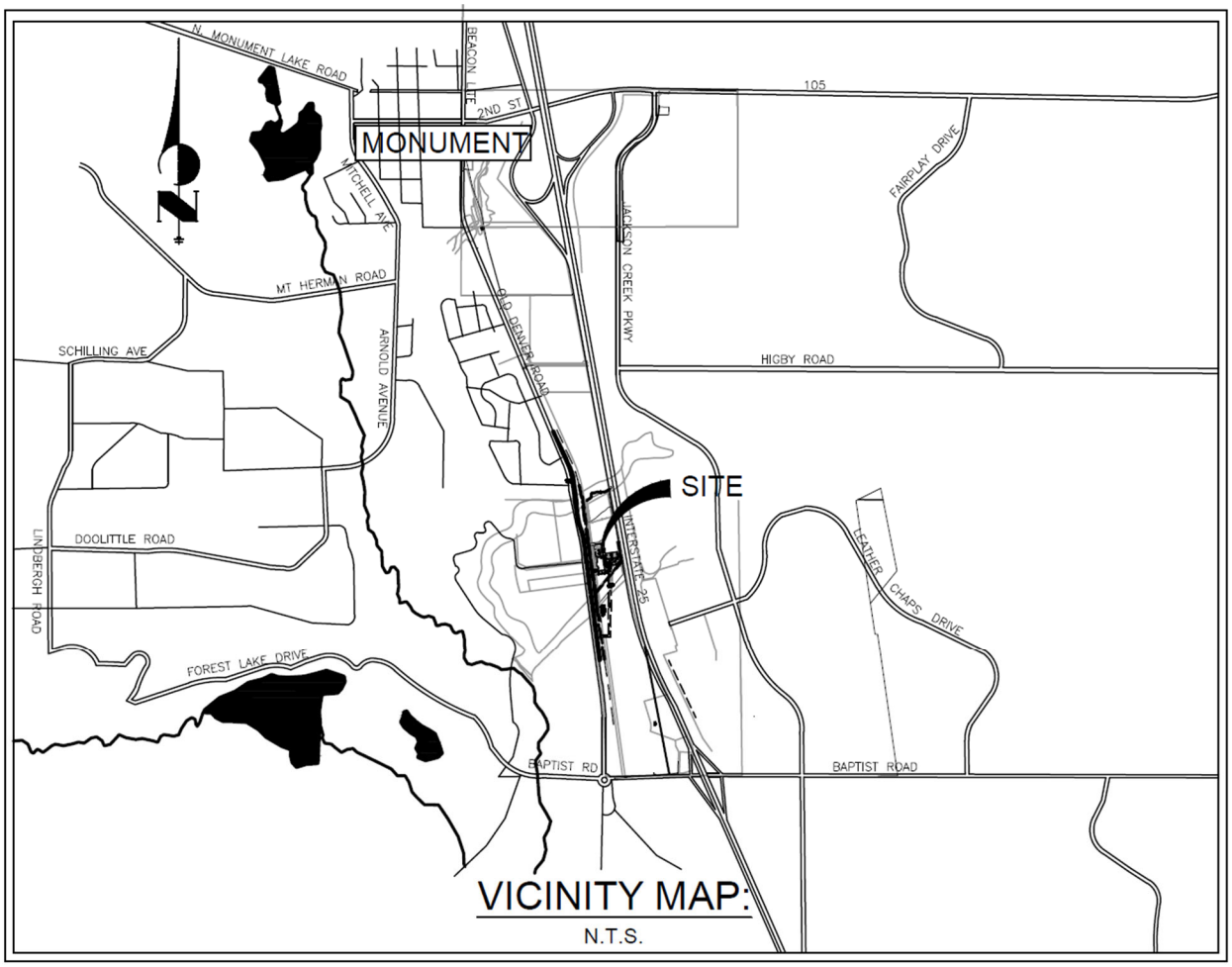
Drainage fees were paid at the time of platting.

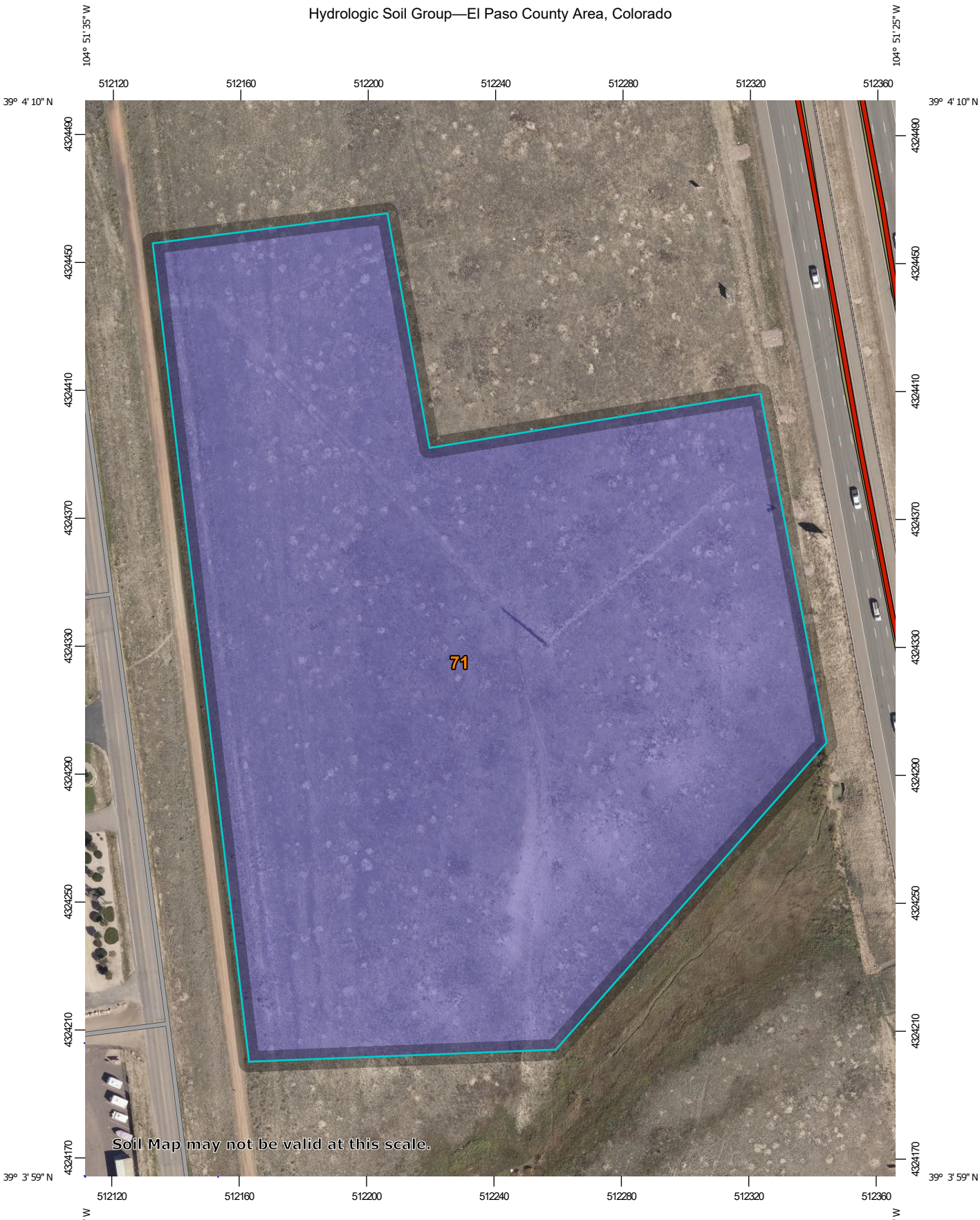
Conclusion

The *Conexus Business Park Preliminary Drainage Report* planned for commercial developments within the park, and anticipated submitting an addendum after lots had been designed. The drainage values for the WVC Monument Campus in Lot 1, Conexus Business Park Filing No. 1 site have been given to Rockwell Consulting Inc. who will be responsible for submitting an Addendum to the *Conexus Business Park Drainage Report* so that this drainage letter will be in agreement with the overarching drainage report. The runoff from the site will enter the Conexus storm pipe system and route to the water quality/ detention pond to the south for treatment. The pond will be sized to handle flows from this site as well as the other lots in the Conexus Business Park. Approval of this report will not result in an increase in peak discharges to the adjacent, unnamed tributary to Monument Creek because of the above mentioned addendum. Therefore, this site will not adversely impact the FEMA regulatory floodplain or downstream or surrounding developments and is consistent with the requirements of the City of Colorado Springs DCM and the El Paso County DCM. Pipe HGLs will be provided in an addendum to this drainage letter which will be submitted along with the construction drawings for the site.

Appendix/Attachments

1. Vicinity Map
2. National Resources Conservation Service- National Cooperative Soil Survey
3. Flood Insurance Rate Map (FIRM)
4. FIRMette
5. Rational Calculations
6. UD-Inlet Inlet Sizing Calculations
7. Pipe Sizing Calculations
8. Drawing DR01 – Historic Drainage Plan
9. Drawing DR02 – Developed Drainage Plan


N. MONUMENT LAKE ROAD
BEACON LITE
2ND ST
MONUMENT
105
MITCHELL AVE
FAIRPLAY DRIVE
JACKSON CREEK PKWY
MT HERMAN ROAD
OLD DENVER ROAD
SCHILLING AVE
ARNOLD AVENUE
HIGBY ROAD
SITE
DOOLITTLE ROAD
INTERSTATE 25
LEATHER CHAPS DRIVE
LINDBERGH ROAD
FOREST LAKE DRIVE
BAPTIST RD
BAPTIST ROAD
VICINITY MAP:
N.T.S.



Map Scale: 1:1,640 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil 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 17, Sep 13, 2019

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
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	9.4	100.0%
Totals for Area of Interest			**9.4**	**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

39°5'44.18"N

104°52'30.53"W

USGS The National Map: Orthoimagery. Data refreshed April, 2019

39°3'38.37"N

104°50'37.67"W

FLOOD HAZARD INFORMATION

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
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can beordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

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

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **5/8/2020 12:22:01 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. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

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

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.

SCALE

N

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

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

0 50 100 200 300 400 Meters

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 278 OF 1275

Panel Contains:

COMMUNITY	NUMBER	PANEL
EL PASO COUNTY COLORADO	080059	0278
TOWN OF MONUMENT COLORADO	080064	0278

MAP NUMBER
08041C0278G
EFFECTIVE DATE
12/07/2018

National Flood Hazard Layer FIRMette

FEMA

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
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/8/2020 at 12:10:36 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.

Project Name:	WOODMEN VALLEY CHURCH MONUMENT CAMPUS
Project Location:	TOWN OF MONUMENT
Designer	KMZ & JTS
Notes:	Proposed Condition

Average Channel Velocity	4	ft/s
Average Slope for Initial Flow	0.04	ft/ft

Channel Flow Type Key

Heavy Meadow	2
Tillage/Field	3
Short Pasture and Lawns	4
Nearly Bare Ground	5
Grassed Waterway	6
Paved Areas	7

	Area		Rational 'C' Values								Flow Lengths				Initial Flow		Channel Flow				Tc	Rainfall Intensity & Rational Flow Rate					
			Surface Type 2 Pavement (100% Imp.)			Surface Type 3 Park (7% Imp.)			Composite		Initial	True Initial	Channel	True Channel	Average (decimal)	Initial	Average (%)	Channel Flow Type (See Key above)	Velocity	Channel	Total	i2	Q2	i5	Q5	i100	Q100
Basin	sf	acres	C5	C100	Area (SF)	C5	C100	Area	C5	C100	ft	Length ft	ft	Length ft	Slope	Tc (min)	Slope	Ground Type	(ft/s)	Tc (min)	(min)	in/hr	cfs	in/hr	cfs	in/hr	cfs
O-1 (1-O)	63,112	1.45	0.90	0.96	59,112	0.12	0.39	4000	0.85	0.92	50.00	50.00	230.00	230.00	0.03	2.20	2.50	7	3.2	1.2	5.0	4.0	5.0	5.1	**6.34**	8.6	**11.57**
A-1	8,415	0.19	0.90	0.96	8,415	0.12	0.39		0.90	0.96	58.00	58.00	443.00	443.00	0.04	1.79	2.20	7	3.0	2.5	5.0	4.0	0.7	5.1	**0.89**	8.6	**1.60**
A-2	4,260	0.10	0.90	0.96	3986	0.12	0.39	274	0.85	0.92	5.00	5.00	77.00	77.00	0.02	0.80	1.20	7	2.2	0.6	5.0	4.0	0.3	5.1	**0.43**	8.6	**0.78**
A-3	14,123	0.32	0.90	0.96	8,450	0.12	0.39	5673	0.59	0.73	82.00	82.00	149.00	149.00	0.04	5.23	3.10	7	3.5	0.7	5.9	3.9	0.7	4.9	**0.94**	8.2	**1.96**
A-4	53,936	1.24	0.90	0.96	45781	0.12	0.39	8155	0.78	0.87	31.50	31.50	301.30	301.30	0.03	2.23	1.50	7	2.4	2.1	5.0	4.0	4.0	5.1	**4.98**	8.6	**9.35**
A-5 (5-A)	39,133	0.90	0.90	0.96	36,492	0.12	0.39	2641	0.85	0.92	130.00	100.00	204.00	234.00	0.03	3.60	0.55	7	1.4	2.8	6.4	3.8	2.9	4.8	**3.67**	8.0	**6.70**
A-6	12,422	0.29	0.90	0.96	11201	0.12	0.39	1221	0.82	0.90	40.00	40.00	229.00	229.00	0.02	2.50	2.80	7	3.3	1.1	5.0	4.0	1.0	5.1	**1.21**	8.6	**2.23**
A-7	28,328	0.65	0.90	0.96	25,973	0.12	0.39	2356	0.84	0.91	134.00	100.00	320.00	354.00	0.03	3.78	2.45	7	3.1	1.9	5.7	3.9	2.1	4.9	**2.70**	8.3	**4.96**
A-8	9,717	0.22	0.90	0.96	9476	0.12	0.39	241	0.88	0.95	90.00	90.00	119.00	119.00	0.03	2.66	1.00	7	2.0	1.0	5.0	4.0	0.8	5.1	**1.01**	8.6	**1.82**
A-9 (9-A)	35,007	0.80	0.90	0.96	30,872	0.12	0.39	4135	0.81	0.89	34.00	34.00	256.00	256.00	0.06	1.69	1.00	7	2.0	2.1	5.0	4.0	2.7	5.1	**3.34**	8.6	**6.20**
Design Point Routing																											
1-A	71,527	1.64	0.90	0.96	67,527	0.12	0.39	4000	0.86	0.93	50.00	50.00	260.17	260.17	0.03	2.15	2.40	7	3.0	1.4	5.0	4.0	5.7	5.1	**7.24**	8.6	**13.17**
2-A	75,787	1.74	0.90	0.96	71,512	0.12	0.39	4274	0.86	0.93	58.00	58.00	473.17	473.17	0.04	2.18	2.40	7	3.0	2.6	5.0	4.0	6.1	5.1	**7.66**	8.6	**13.95**
3-A	89,910	2.06	0.90	0.96	79,963	0.12	0.39	9947	0.81	0.90	58.00	58.00	615.19	615.19	0.04	2.56	2.51	7	3.2	3.2	5.8	3.9	6.6	4.9	**8.31**	8.2	**15.38**
4-A	143,846	3.30	0.90	0.96	125,744	0.12	0.39	18102	0.80	0.89	58.00	58.00	674.37	674.37	0.04	2.67	2.43	7	3.1	3.6	6.3	3.8	10.2	4.8	**12.80**	8.1	**23.82**
6-A	51,555	1.18	0.90	0.96	47,693	0.12	0.39	3862	0.84	0.92	130.00	100.00	283.38	313.38	0.03	3.68	0.54	7	1.4	3.7	7.4	3.6	3.6	4.6	**4.58**	7.7	**8.39**
7-A	79,883	1.83	0.90	0.96	73,665	0.12	0.39	6218	0.84	0.92	130.00	100.00	421.38	451.38	0.03	3.71	0.52	7	1.4	5.3	9.0	3.4	5.2	4.3	**6.61**	7.2	**12.12**
8-A	89,600	2.06	0.90	0.96	83,142	0.12	0.39	6458	0.84	0.92	130.00	100.00	503.68	533.68	0.03	3.65	0.56	7	1.4	6.3	9.9	3.3	5.7	4.1	**7.20**	6.9	**13.17**
10-A	124,607	2.86	0.90	0.96	114,014	0.12	0.39	10593	0.83	0.91	130.00	100.00	776.68	806.68	0.03	3.79	0.79	7	1.7	8.0	11.8	3.0	7.3	3.8	**9.23**	6.5	**16.95**

Overall Impervious Calculations	205,340	4.71	180,646	24,695	% Impervious	Impervious Acreage
			100.00	7.00	88.82	4.187

Note: Q2, Q5 & Q10 are based on C5; Q25, Q50 & Q100 are based on C100

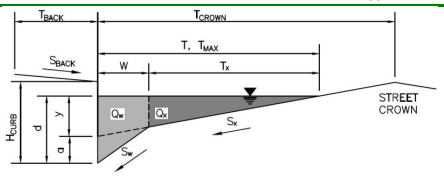
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 1-A



Gutter Geometry (Enter data in the blue cells)

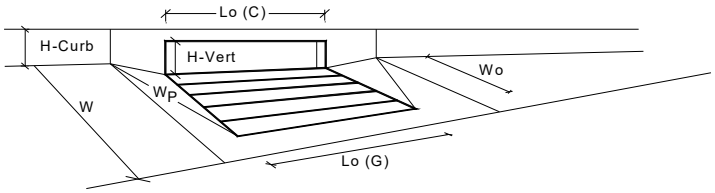
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	6.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.4	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)		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	4.1	4.1	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) =	4.00	4.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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} =	0.26	0.26	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.58	0.58	
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 =**	**2.4**	**2.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	0.9	1.6	cfs

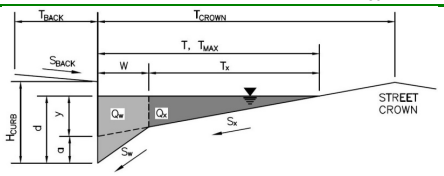
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 2-A



Gutter Geometry (Enter data in the blue cells)

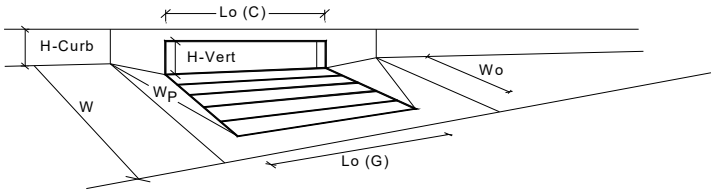
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	6.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	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} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.4	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)	Colorado Springs D-10-R	MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	4.1	4.1	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) =	4.00	4.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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} =	0.26	0.26	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.58	0.58	
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 =**	**2.4**	**2.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	0.4	0.8	cfs

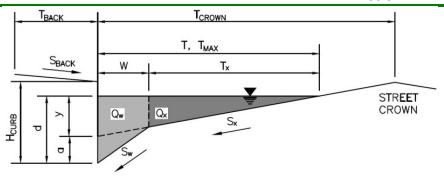
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 3-A



Gutter Geometry (Enter data in the blue cells)

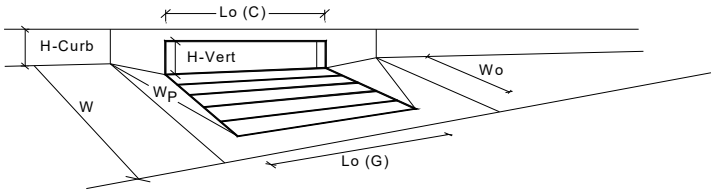
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	8.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	23.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.019	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	23.0	23.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.4	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)	Colorado Springs D-10-R			
		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	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) =	4.00	4.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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	0.42	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.85	0.85	
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 =**	**4.9**	**4.9**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	0.9	2.0	cfs

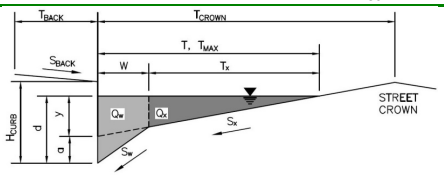
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 4-A



Gutter Geometry (Enter data in the blue cells)

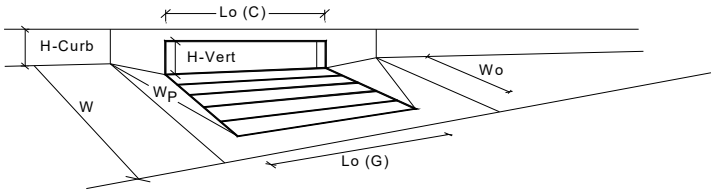
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	8.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	31.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.030	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	31.0	31.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	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)		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	11.8	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) =	6.00	6.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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	0.90	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.71	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 =**	**6.9**	**19.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	5.0	9.4	cfs

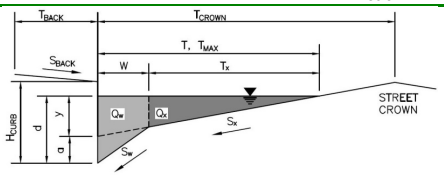
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 5-A



Gutter Geometry (Enter data in the blue cells)

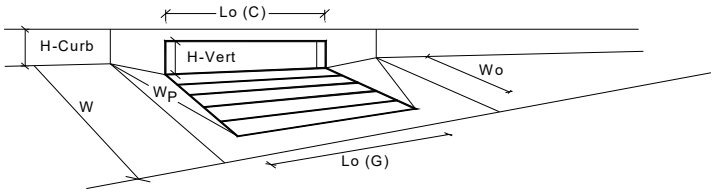
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	6.8	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.090	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.046	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	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)		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.2	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) =	4.00	4.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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	0.60	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.85	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 =**	**4.9**	**8.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	3.7	6.7	cfs

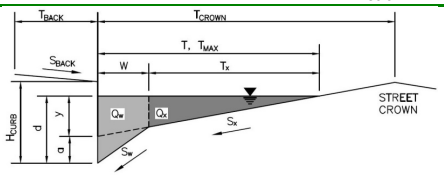
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 6-A



Gutter Geometry (Enter data in the blue cells)

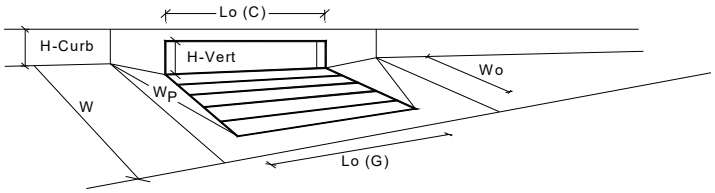
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.010	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	23.0	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} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	23.0	23.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	7.0	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)		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.3	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) =	4.00	4.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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	0.44	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.85	0.88	
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 =**	**4.9**	**5.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	1.2	2.2	cfs

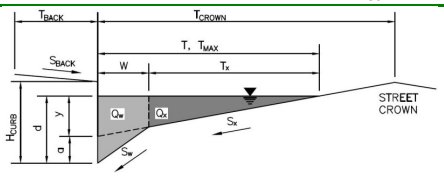
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 7-A



Gutter Geometry (Enter data in the blue cells)

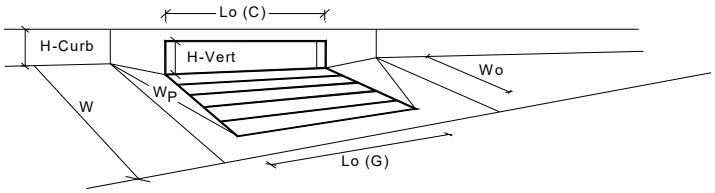
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	1.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.010	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.016	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	29.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.022	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	19.0	29.0	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)		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.7	6.0	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) =	4.00	4.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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} =	0.40	0.42	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.81	0.85	
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 =**	**4.6**	**4.9**	**cfs**
WARNING: Inlet Capacity less than Q Peak for Major Storm	$Q_{PEAK\ REQUIRED}$ =	2.7	5.0	cfs

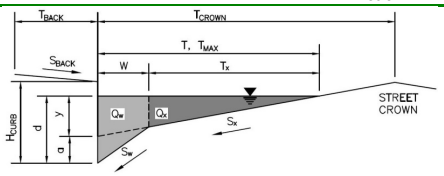
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 8-A



Gutter Geometry (Enter data in the blue cells)

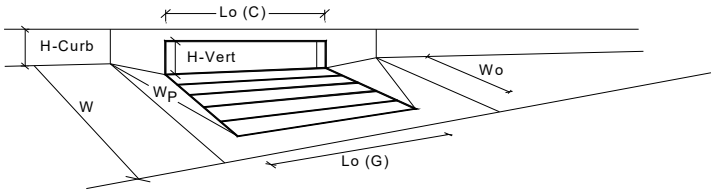
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	31.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.010	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	31.0	31.0	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)		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	4.6	4.6	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) =	4.00	4.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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} =	0.30	0.30	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.65	0.65	
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 =**	**3.0**	**3.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	1.0	1.8	cfs

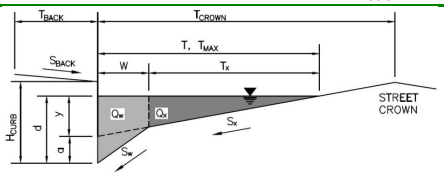
Version 4.05 Released March 2017

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

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

Project: WVC - Monument Campus

Inlet ID: Inlet 9-A



Gutter Geometry (Enter data in the blue cells)

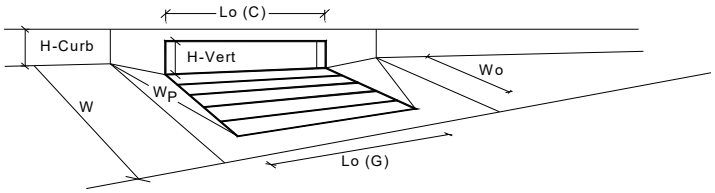
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	8.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	31.0	ft
Gutter Width	W =	1.00	ft
Street Transverse Slope	S_X =	0.034	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	31.0	31.0	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)		MINOR	MAJOR	
Type of Inlet	Type =	Colorado Springs D-10-R		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	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) =	6.00	6.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	8.00	8.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	8.00	8.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	81.00	81.00	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	0.42	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.71	0.71	
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 =**	**6.9**	**6.9**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	3.3	6.2	cfs

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

1-O

Circular

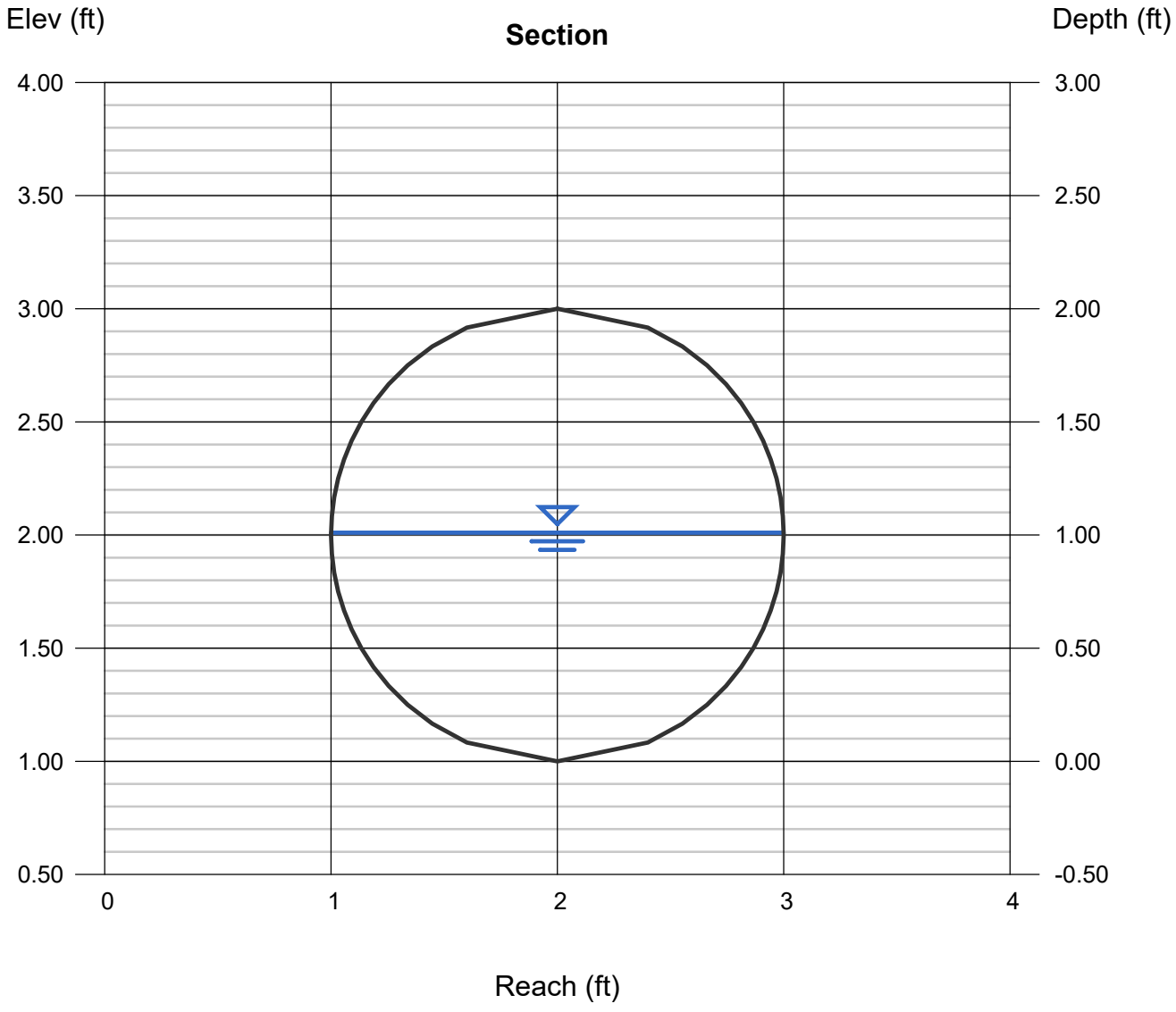
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 11.57

Highlighted

Depth (ft)	= 1.01
Q (cfs)	= 11.57
Area (sqft)	= 1.60
Velocity (ft/s)	= 7.23
Wetted Perim (ft)	= 3.17
Crit Depth, Yc (ft)	= 1.22
Top Width (ft)	= 2.00
EGL (ft)	= 1.82



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

DP 1-A

Circular

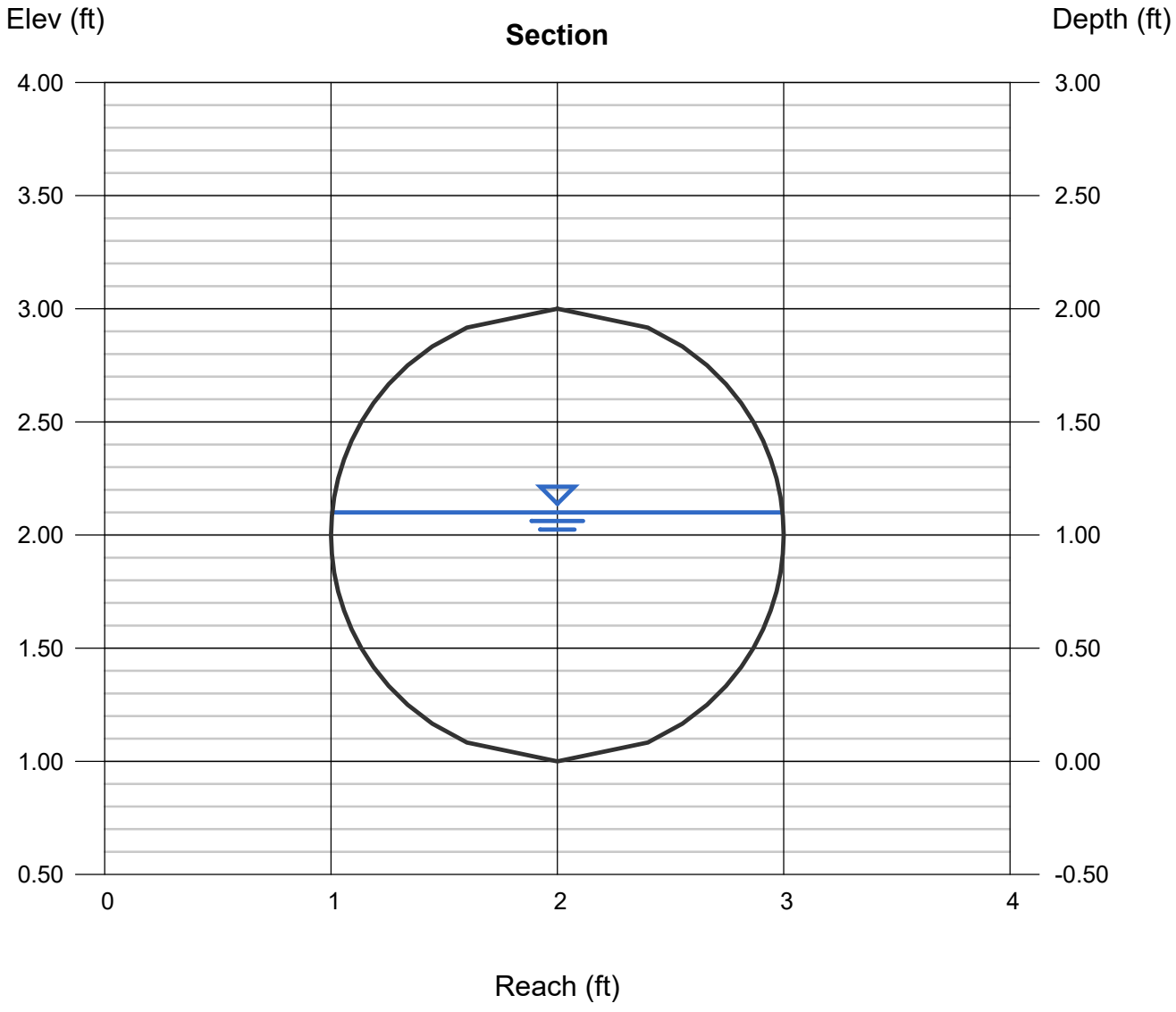
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 13.17

Highlighted

Depth (ft)	= 1.10
Q (cfs)	= 13.17
Area (sqft)	= 1.78
Velocity (ft/s)	= 7.41
Wetted Perim (ft)	= 3.35
Crit Depth, Yc (ft)	= 1.31
Top Width (ft)	= 1.99
EGL (ft)	= 1.95



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

DP 2-A

Circular

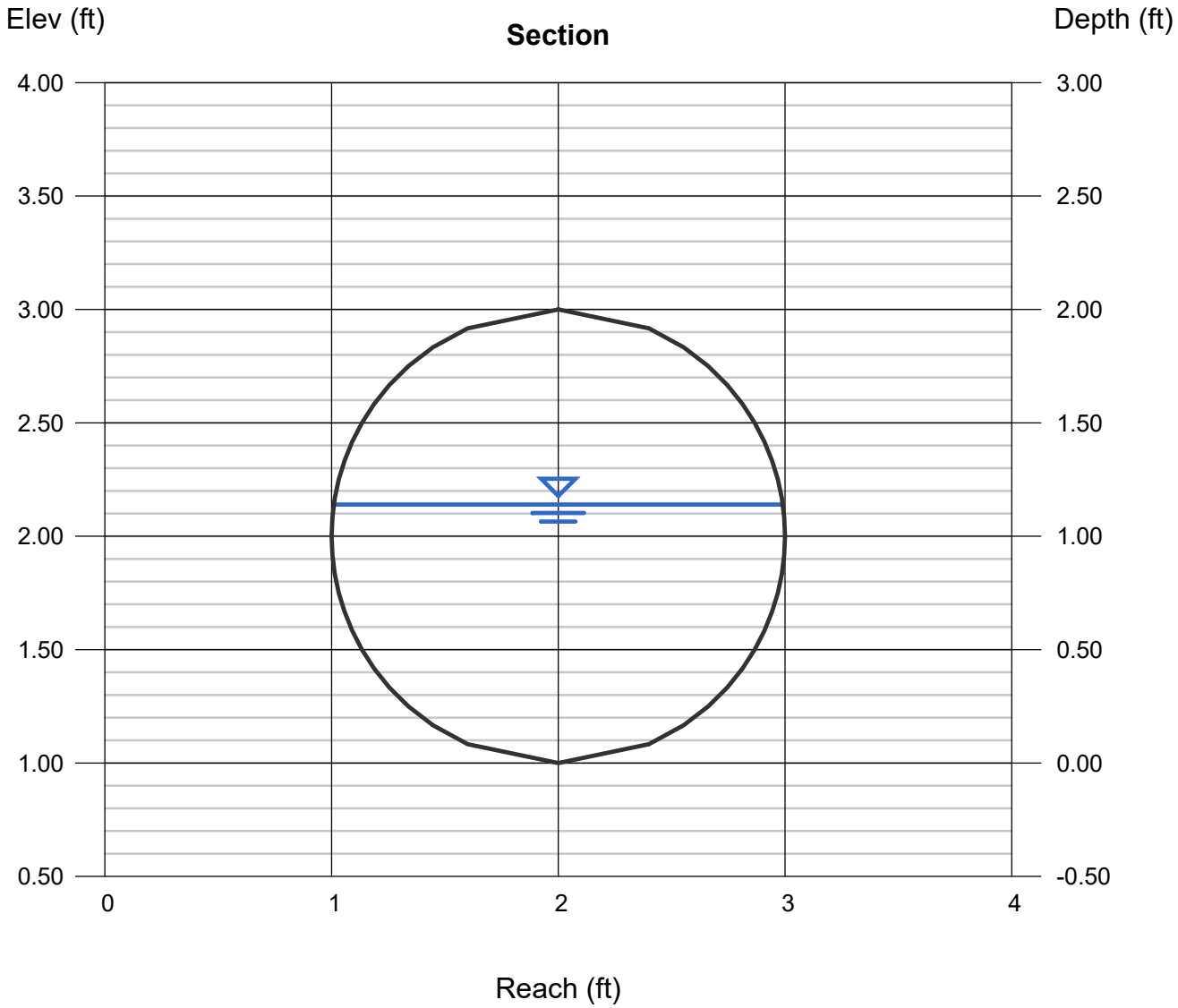
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 13.95

Highlighted

Depth (ft)	= 1.14
Q (cfs)	= 13.95
Area (sqft)	= 1.86
Velocity (ft/s)	= 7.51
Wetted Perim (ft)	= 3.43
Crit Depth, Yc (ft)	= 1.35
Top Width (ft)	= 1.98
EGL (ft)	= 2.02



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

DP 3-A

Circular

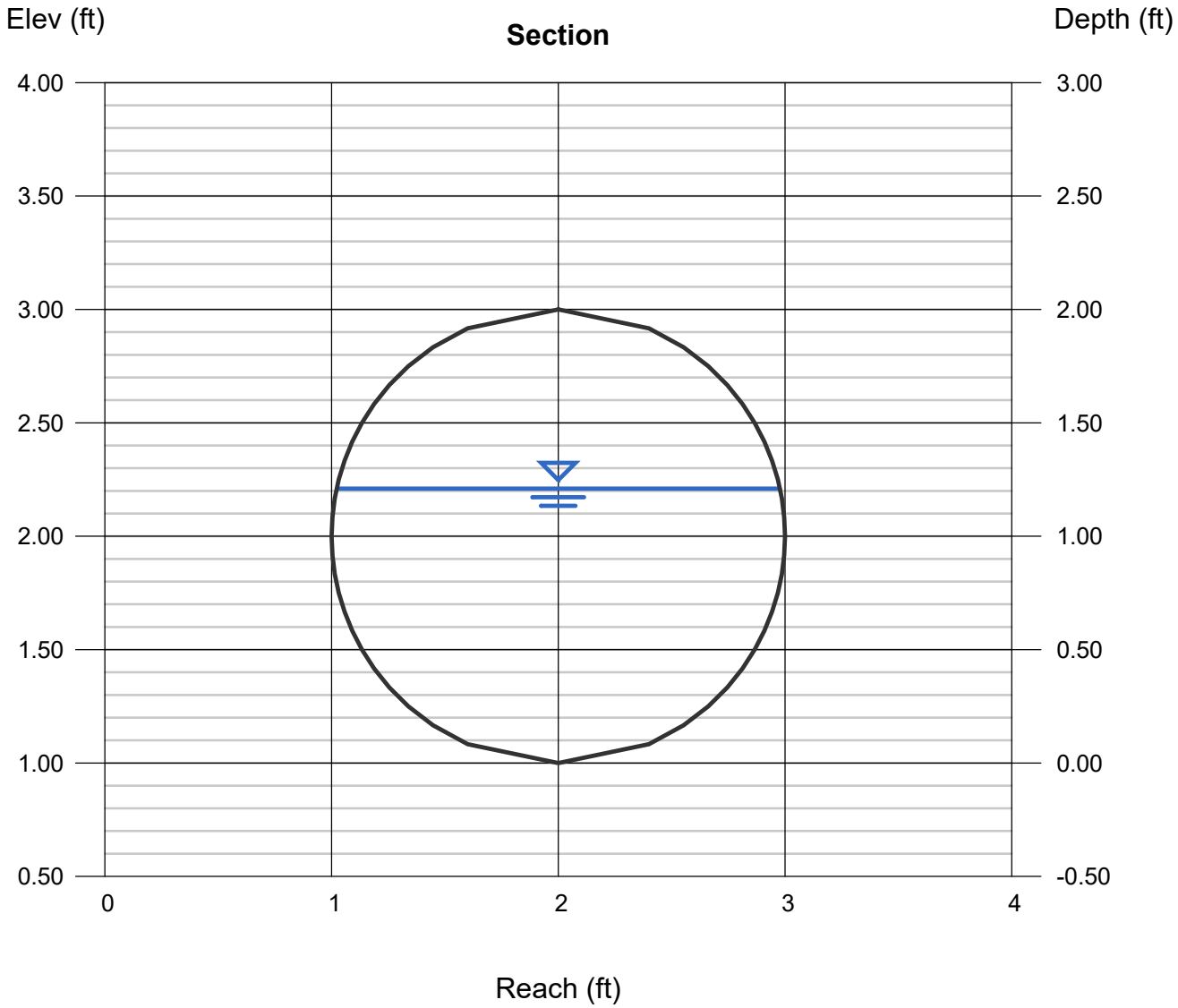
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 15.38

Highlighted

Depth (ft)	= 1.21
Q (cfs)	= 15.38
Area (sqft)	= 1.99
Velocity (ft/s)	= 7.72
Wetted Perim (ft)	= 3.57
Crit Depth, Yc (ft)	= 1.42
Top Width (ft)	= 1.95
EGL (ft)	= 2.14



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

DP 4-A

Circular

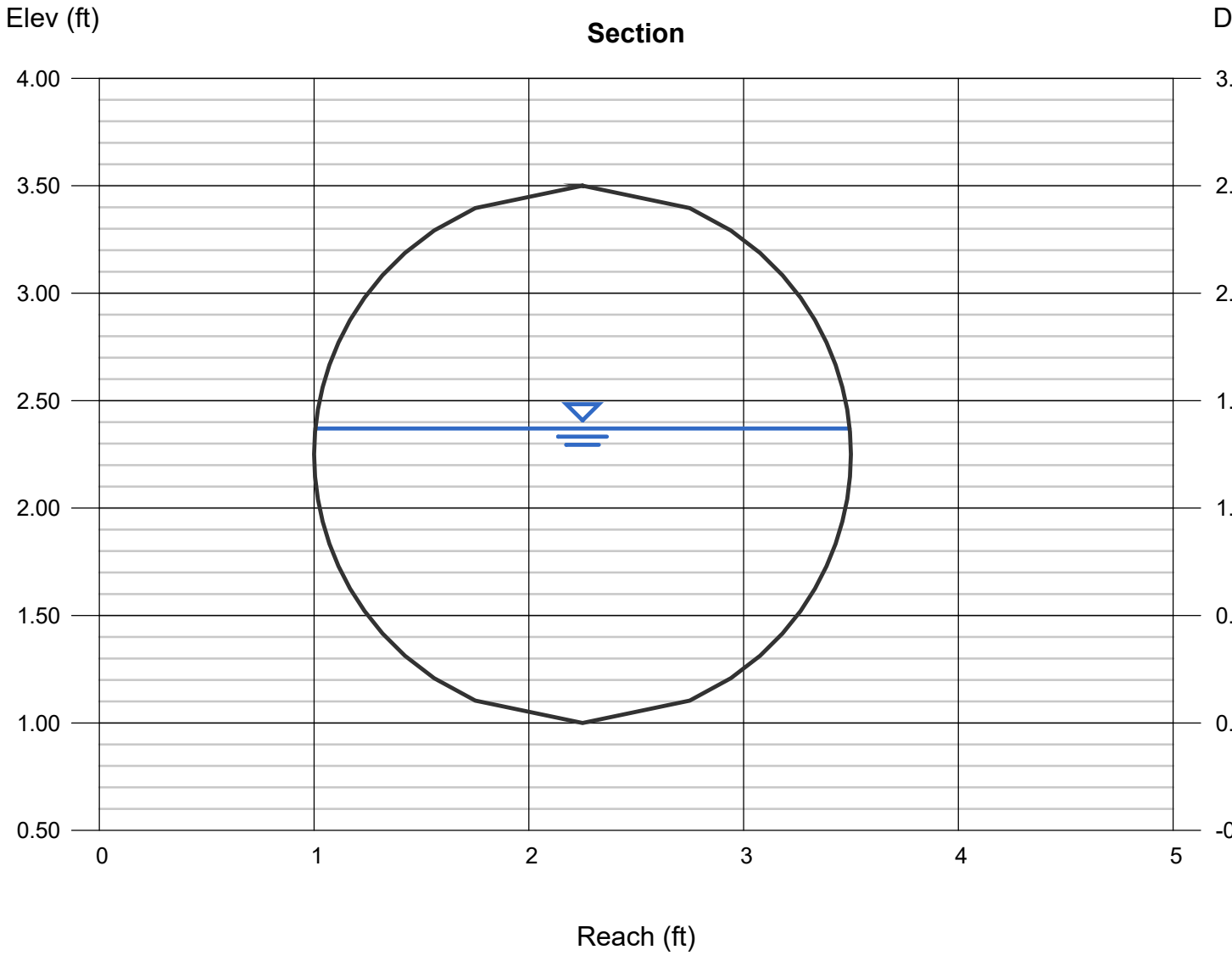
Diameter (ft)	= 2.50
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 23.82

Highlighted

Depth (ft)	= 1.37
Q (cfs)	= 23.82
Area (sqft)	= 2.76
Velocity (ft/s)	= 8.62
Wetted Perim (ft)	= 4.17
Crit Depth, Yc (ft)	= 1.67
Top Width (ft)	= 2.49
EGL (ft)	= 2.53



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Saturday, May 9 2020

DP 5-A

Circular

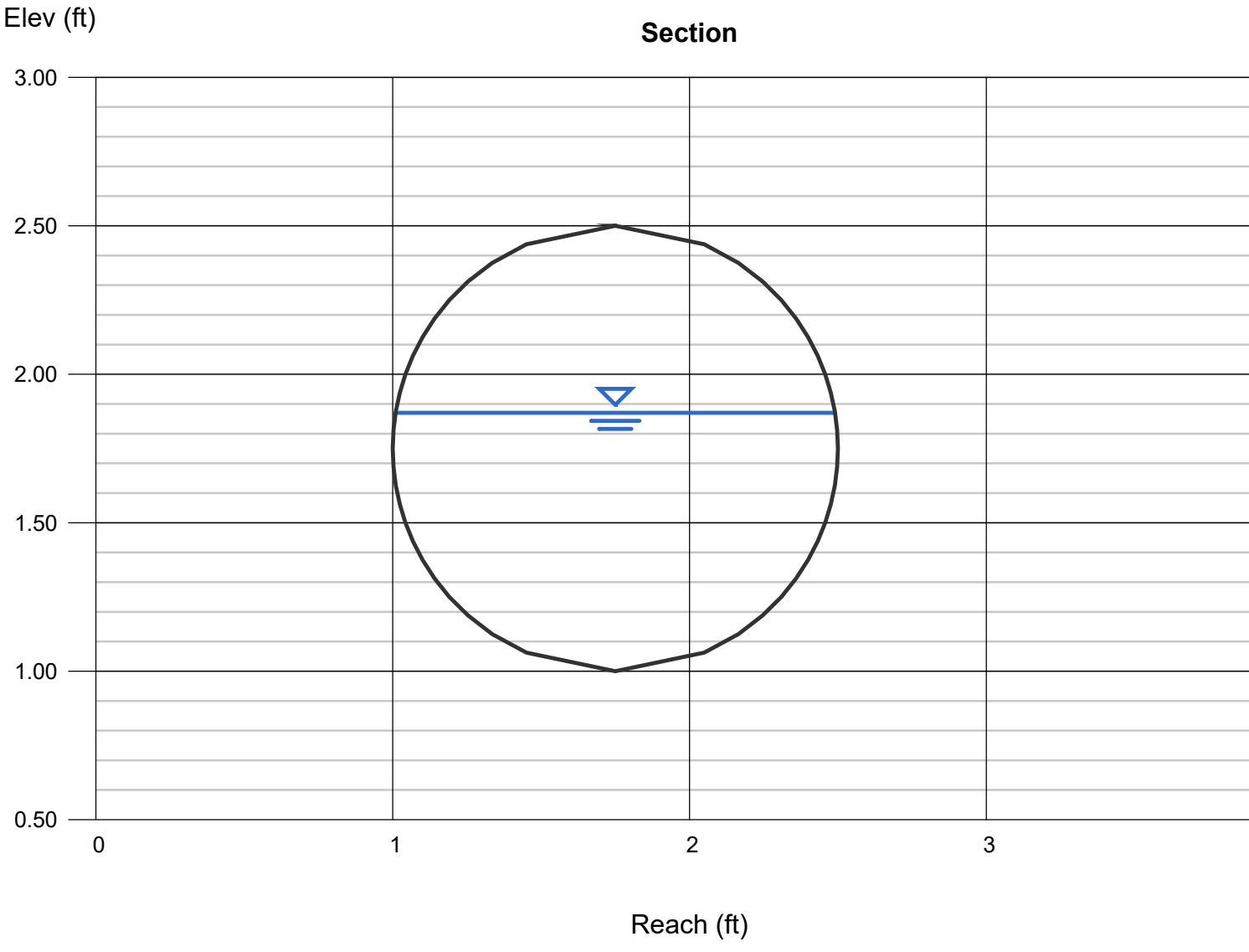
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 6.70

Highlighted

Depth (ft)	= 0.87
Q (cfs)	= 6.700
Area (sqft)	= 1.07
Velocity (ft/s)	= 6.28
Wetted Perim (ft)	= 2.60
Crit Depth, Yc (ft)	= 1.00
Top Width (ft)	= 1.48
EGL (ft)	= 1.48



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Saturday, May 9 2020

DP 6-A

Circular

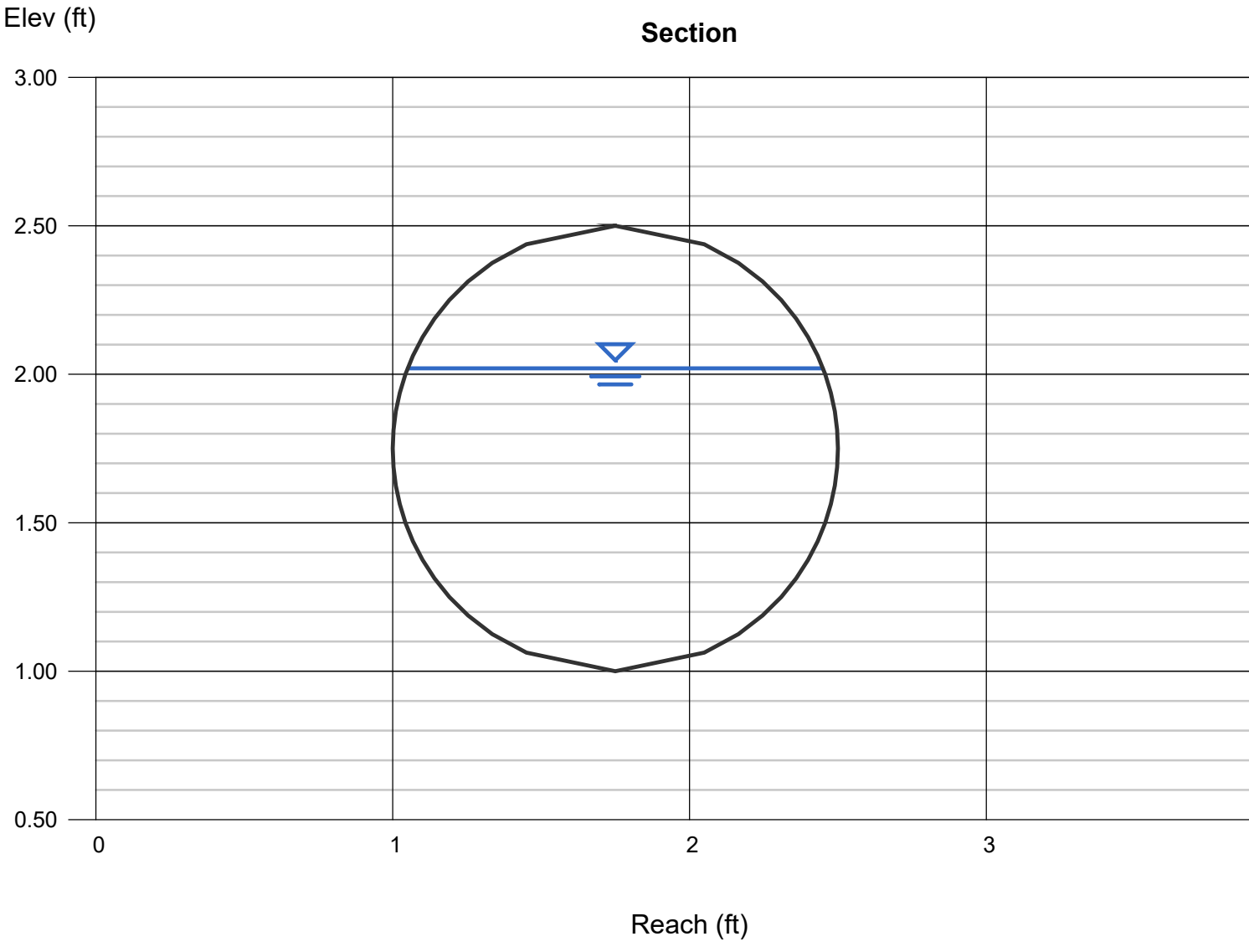
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 8.39

Highlighted

Depth (ft)	= 1.02
Q (cfs)	= 8.390
Area (sqft)	= 1.28
Velocity (ft/s)	= 6.55
Wetted Perim (ft)	= 2.91
Crit Depth, Yc (ft)	= 1.12
Top Width (ft)	= 1.40
EGL (ft)	= 1.69



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Saturday, May 9 2020

DP 7-A

Circular

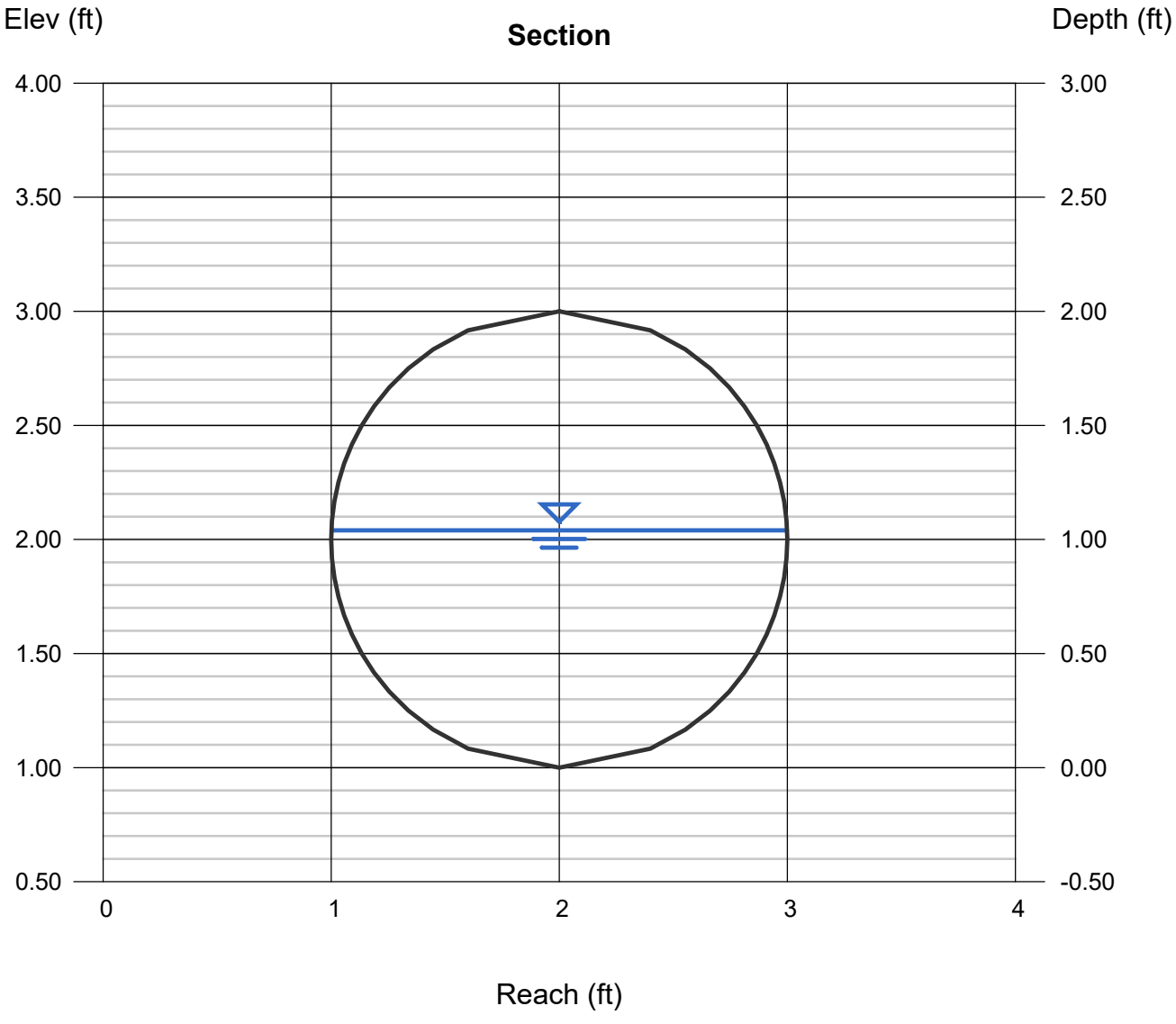
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 12.12

Highlighted

Depth (ft)	= 1.04
Q (cfs)	= 12.12
Area (sqft)	= 1.66
Velocity (ft/s)	= 7.30
Wetted Perim (ft)	= 3.23
Crit Depth, Yc (ft)	= 1.25
Top Width (ft)	= 2.00
EGL (ft)	= 1.87



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Saturday, May 9 2020

DP 8-A

Circular

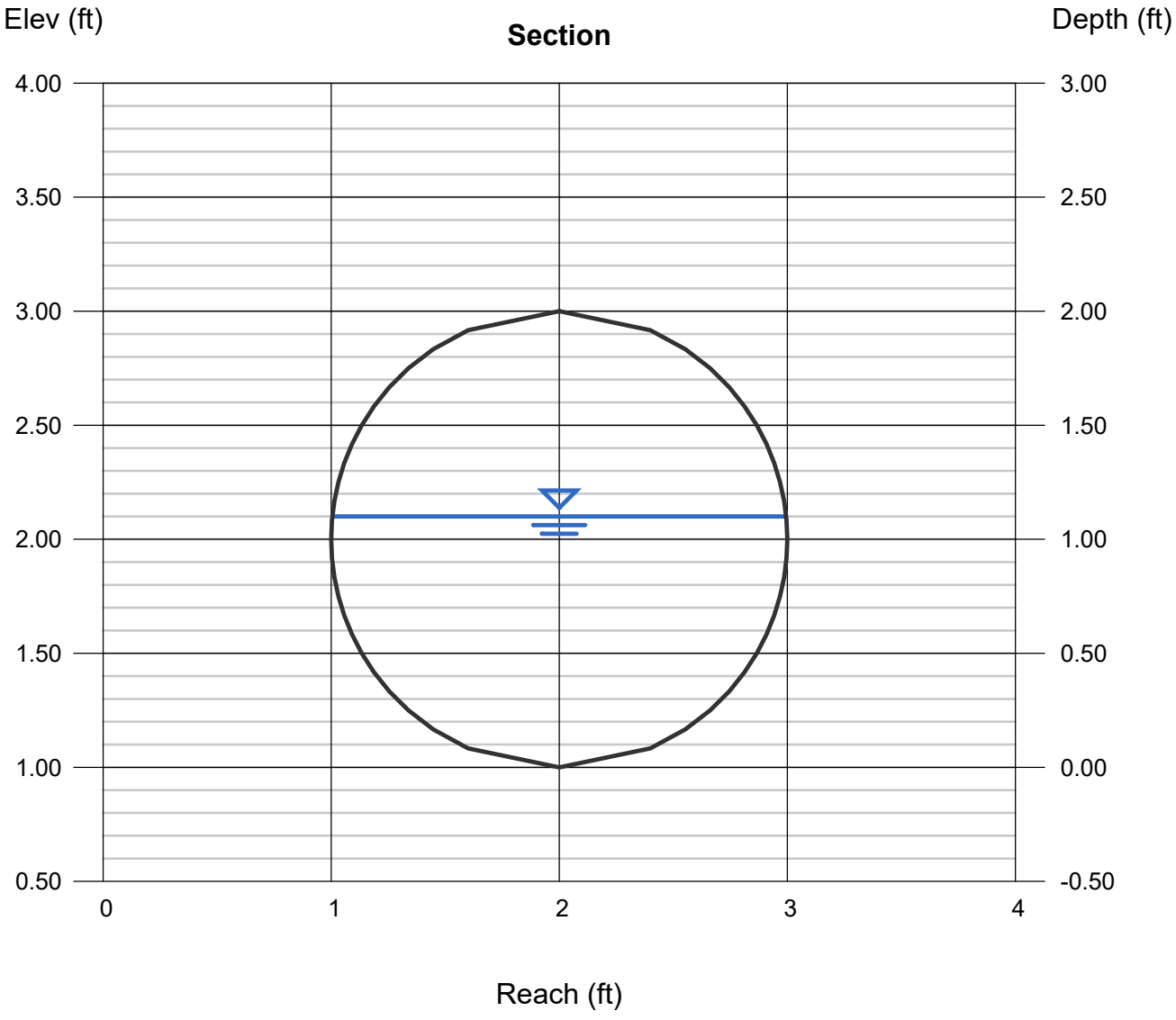
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 13.17

Highlighted

Depth (ft)	= 1.10
Q (cfs)	= 13.17
Area (sqft)	= 1.78
Velocity (ft/s)	= 7.41
Wetted Perim (ft)	= 3.35
Crit Depth, Yc (ft)	= 1.31
Top Width (ft)	= 1.99
EGL (ft)	= 1.95



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Saturday, May 9 2020

DP 9-A

Circular

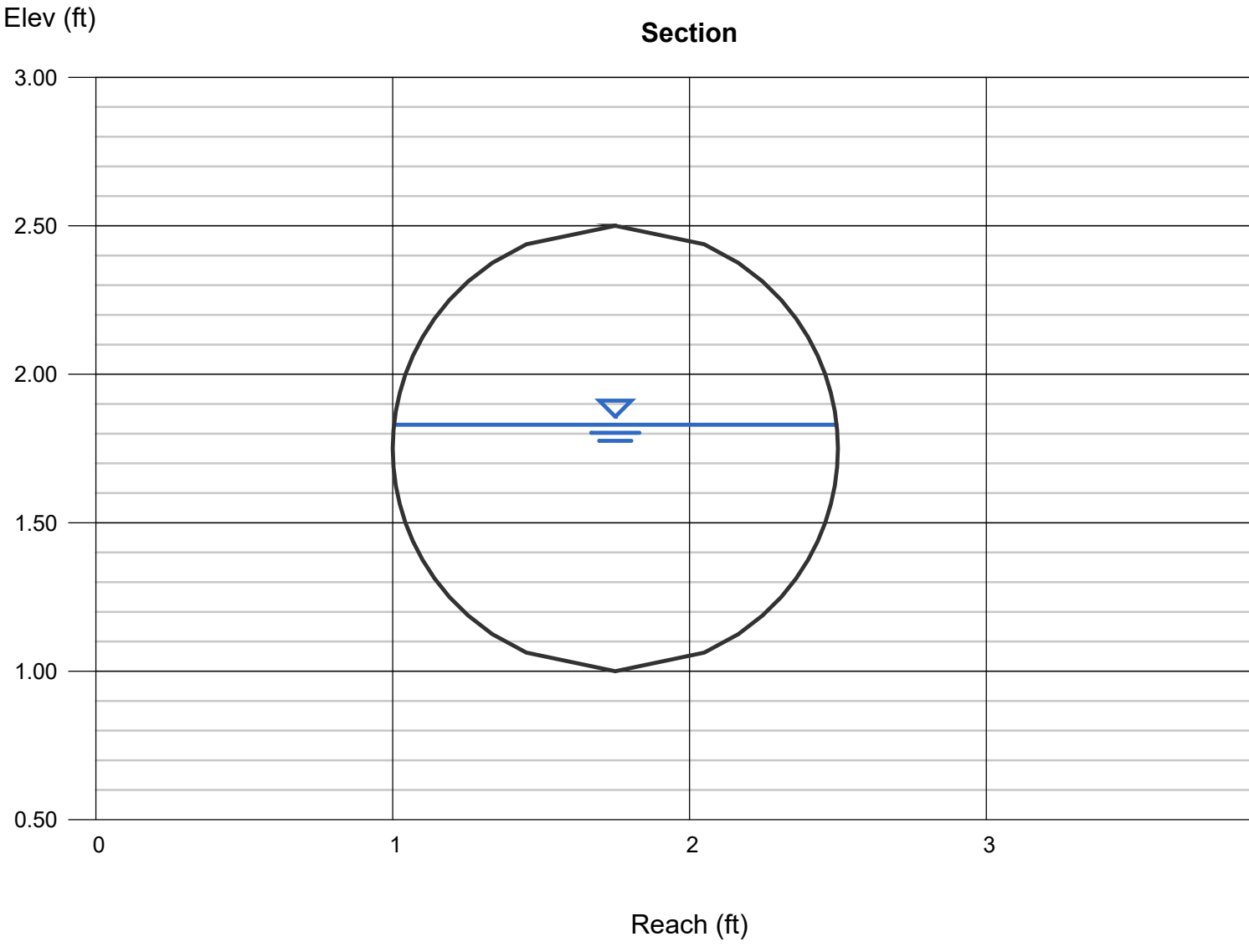
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 6.20

Highlighted

Depth (ft)	= 0.83
Q (cfs)	= 6.200
Area (sqft)	= 1.01
Velocity (ft/s)	= 6.16
Wetted Perim (ft)	= 2.52
Crit Depth, Yc (ft)	= 0.97
Top Width (ft)	= 1.49
EGL (ft)	= 1.42



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Saturday, May 9 2020

DP 10-A

Circular

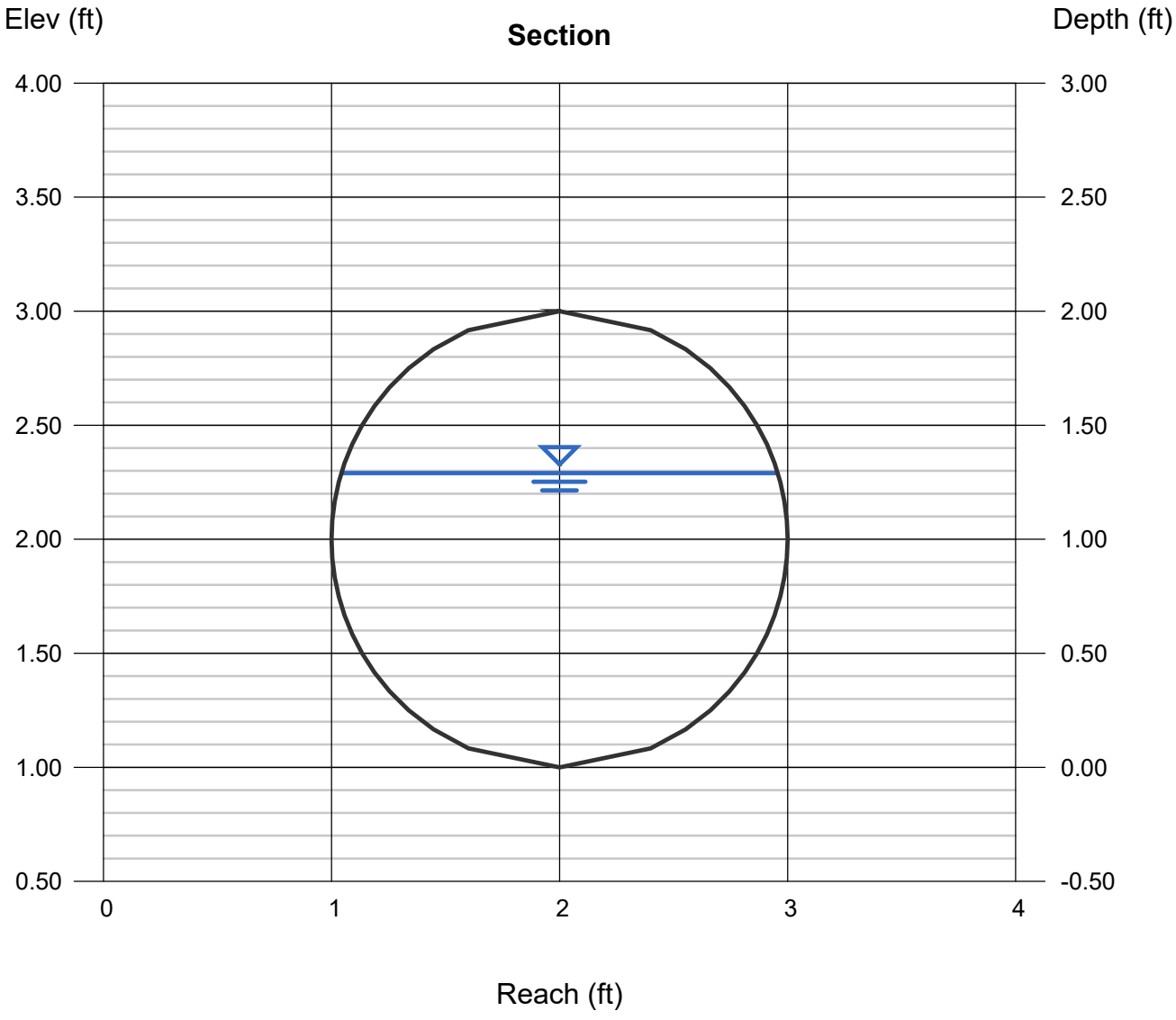
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 1.00
N-Value	= 0.013

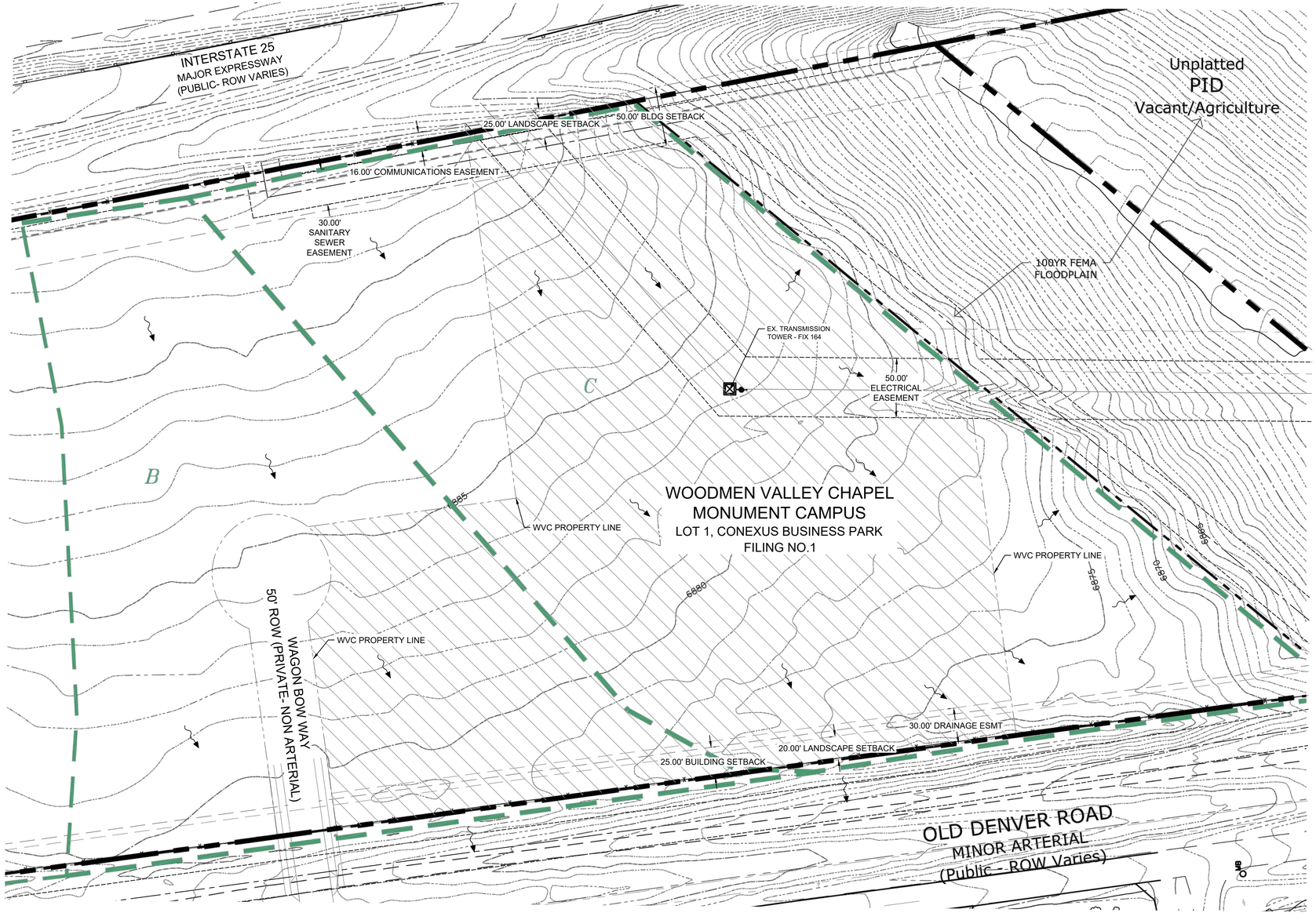
Calculations

Compute by:	Known Q
Known Q (cfs)	= 16.95

Highlighted

Depth (ft)	= 1.29
Q (cfs)	= 16.95
Area (sqft)	= 2.15
Velocity (ft/s)	= 7.88
Wetted Perim (ft)	= 3.74
Crit Depth, Yc (ft)	= 1.49
Top Width (ft)	= 1.91
EGL (ft)	= 2.25





Know what's **below.**
Call before you dig.

HISTORIC DRAINAGE BASIN TABLE			
BASIN	AREA (AC)	Q5 (CFS)	Q100 (CFS)
B	4.16	0.9	6.5
C	6.3	1.2	8.7

LEGEND

- EXISTING 1' CONTOUR
- 6450 EXISTING 5' CONTOUR
- EXISTING BASINS

N

GRAPHIC SCALE

50' 0' 50' 100'

(IN FEET)
1 inch = 50 ft.

WOODMEN VALLEY CHAPEL- MONUMENT CAMPUS FINAL PD SITE PLAN

CONSULTANT:

PLANNER/ CIVIL ENGINEER/ LANDSCAPE ARCHITECT:

Matrix
Excellence by Design
2435 Research Parkway, Suite 300
Colorado Springs, CO 80920
Phone 719-575-0100
Fax 719-575-0208

ARCHITECT:

BUCHER
DESIGN STUDIO
12325 Oracle Blvd., Suite 111
Colorado Springs, CO 80921
Phone 719-484-0480

CONSTRUCTION:

WD Construction
BUILDING TRUST.
919 W. Cucharras Street, Suite 100
Colorado Springs, CO 80905
Phone 719-465-2519

PHOTOMETRICS:

PSI
110 S. Sierra Madre
Colorado Springs, CO 80903
Phone 719-418-4213

PROJECT:

WOODMEN VALLEY CHAPEL
MONUMENT CAMPUS
FINAL PD SITE PLAN

TOWN OF MONUMENT

OWNER:

WOODMEN VALLEY CHAPEL
290 E. WOODMEN RD
COLORADO SPRINGS, CO 80919
(719) 388-5000

DEVELOPER:

WOODMEN VALLEY CHAPEL
290 E. WOODMEN RD
COLORADO SPRINGS, CO 80919
(719) 388-5000

ISSUE: MAY 22 2020

DRAWING INFORMATION:

PROJECT NO:	18.346.017
DRAWN BY:	KZ
CHECKED BY:	GS
APPROVED BY:	GS

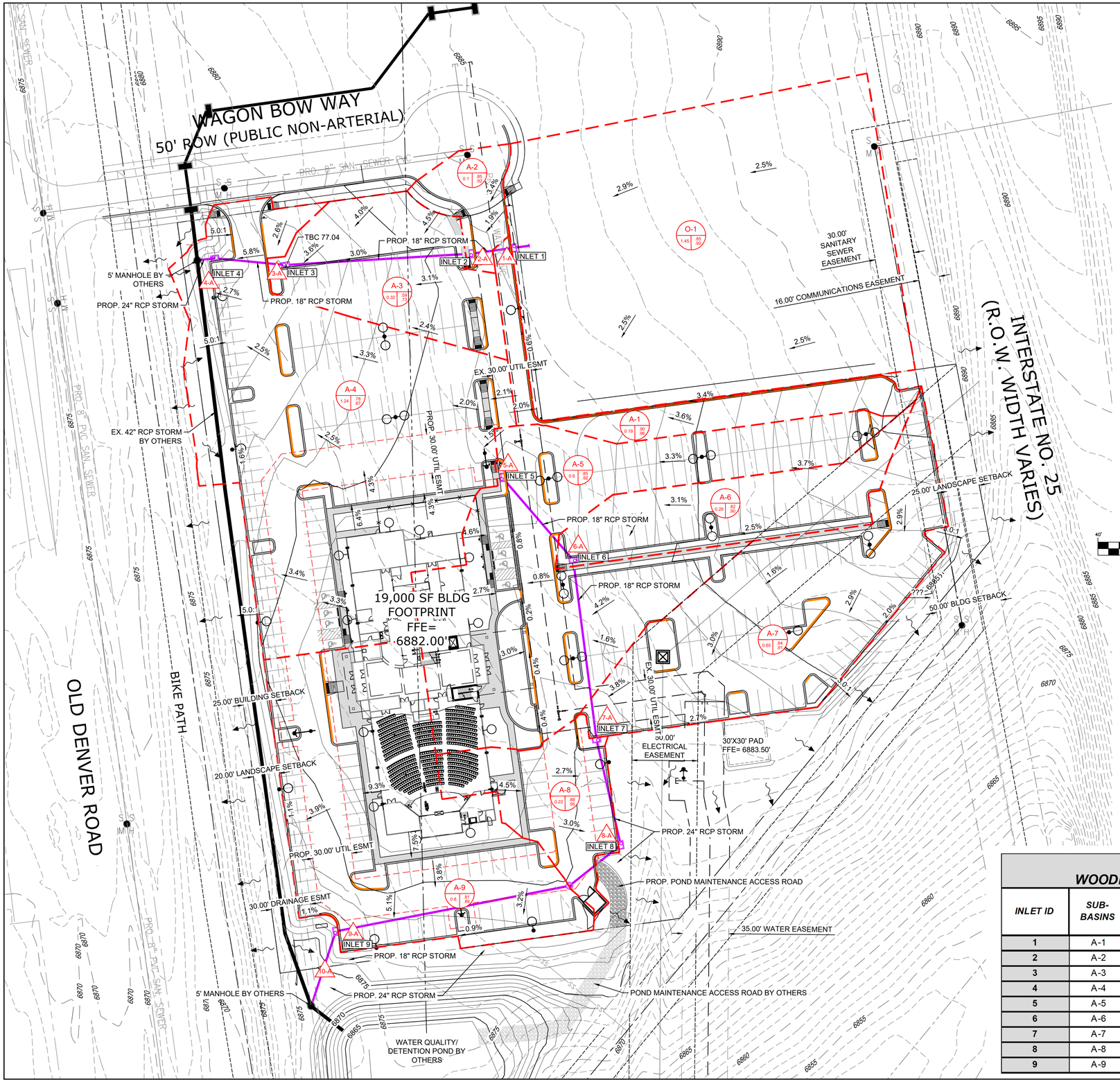
SHEET TITLE:

HISOTRIC DRAINAGE MAP

PLANNING FILE NO:

DR01

SHEET 1 OF 2



LEGEND:

- PROP. INLET
- PROP. MANHOLE
- PROP. STORM PIPE
- INLET BY OTHERS
- STORM PIPE BY OTHERS
- DESIGN POINT IDENTIFIER (X-A)
- BASIN IDENTIFICATION (A-X)
- BASIN AREA (A) — BASIN RUNOFF COEFFICIENTS (C5 / C100)
- BASIN BOUNDARY
- EXISTING SURFACE SLOPE ARROW

	MINOR	MAJOR
EXISTING CONTOURS		
PROPOSED CONTOURS		

NOTE: ALL PROPOSED STORM SEWER WILL BE PRIVATELY OWNED AND MAINTAINED.

N

GRAPHIC SCALE

40' 0' 40' 80'

(IN FEET)
1 inch = 40 ft.

Know what's below. Call before you dig.

PROPOSED DESIGN POINT SUMMARY
WOODMEN VALLEY CHAPEL- MONUMENT CAMPUS

DESIGN POINT ID	SUB-BASINS	TOTAL AREA (AC)	Q(5) TOTAL FLOW (cfs)	Q(100) TOTAL FLOW (cfs)
1-A	A-1	0.19	0.89	1.60
2-A	A-1, A-2	0.29	1.32	2.38
3-A	A-1, A-2, A-3	0.62	2.13	4.11
4-A	A-1, A-2, A-3, A-4	1.85	6.73	12.75
5-A	A-5	0.90	3.67	6.70
6-A	A-5, A-6	1.18	4.58	8.39
7-A	A-5, A-6, A-7	1.83	6.61	12.12
8-A	A-5, A-6, A-7, A-8	2.06	7.20	13.17
9-A	A-9	0.80	3.34	6.20
10-A	A-5, A-6, A-7, A-8, A-9	2.86	9.23	16.95

PROPOSED INLET SUMMARY
WOODMEN VALLEY CHAPEL- MONUMENT CAMPUS

INLET ID	SUB-BASINS	TOTAL AREA (AC)	INLET SIZE (Ft.)	INLET TYPE	INLET CONDITION	Q(5) TOTAL INFLOW (cfs)	Q(100) TOTAL INFLOW (cfs)	INLET CAPACITY (cfs)
1	A-1	0.19	4	D-10-R	SUMP	0.89	1.60	2.40
2	A-2	0.10	4	D-10-R	SUMP	0.43	0.78	2.40
3	A-3	0.32	4	D-10-R	SUMP	0.94	1.96	4.90
4	A-4	1.24	6	D-10-R	SUMP	4.98	9.35	19.30
5	A-5	0.90	4	D-10-R	SUMP	3.67	6.70	8.40
6	A-6	0.29	4	D-10-R	SUMP	1.21	2.23	5.30
7	A-7	0.65	4	D-10-R	SUMP	2.70	4.96	4.90
8	A-8	0.22	4	D-10-R	SUMP	1.01	1.82	3.00
9	A-9	0.80	6	D-10-R	SUMP	3.34	6.20	6.90

WOODMEN VALLEY CHAPEL- MONUMENT CAMPUS
FINAL PD SITE PLAN

CONSULTANT:

PLANNER/ CIVIL ENGINEER/ LANDSCAPE ARCHITECT:

Matrix
Excellence by Design
2435 Research Parkway, Suite 300
Colorado Springs, CO 80920
Phone 719-575-0100
Fax 719-575-0208

ARCHITECT:

BUCHER DESIGN STUDIO
12325 Oracle Blvd., Suite 111
Colorado Springs, CO 80921
Phone 719-484-0480

CONSTRUCTION:

WD Construction BUILDING TRUST.
919 W. Cucharras Street, Suite 100
Colorado Springs, CO 80905
Phone 719-465-2519

PHOTOMETRICS:

PST
110 S. Sierra Madre
Colorado Springs, CO 80903
Phone 719-418-4213

PROJECT:

WOODMEN VALLEY CHAPEL
MONUMENT CAMPUS
FINAL PD SITE PLAN
TOWN OF MONUMENT

OWNER:

WOODMEN VALLEY CHAPEL
290 E. WOODMEN RD
COLORADO SPRINGS, CO 80919
(719) 388-5000

DEVELOPER:

WOODMEN VALLEY CHAPEL
290 E. WOODMEN RD
COLORADO SPRINGS, CO 80919
(719) 388-5000

ISSUE: MAY 22, 2020

DRAWING INFORMATION:

PROJECT NO:	18.346.017
DRAWN BY:	KZ
CHECKED BY:	GS
APPROVED BY:	GS

SHEET TITLE:

DEVELOPED CONDITION DRAINAGE MAP

PLANNING FILE NO:

DR02

SHEET 2 OF 2