J·R ENGINEERING

March 03, 2023

Mr. Jacob James PE, CFM
City Engineer
City of Lone Tree Public Works
9220 Kimmer Drive
Lone Tree, CO 80124

Re: Lyric Condos at Ridgegate Filing 1 – Drainage Compliance Letter

Dear Mr. James:

Please accept this letter as verification of drainage compliance for Lyric Condos at Ridgegate Filing 1, located in a portion of Section 14, Section 22, Section 23, and Section 24, Township 6 South, Range 67 West of the Sixth Principal Meridian, City of Lone Tree, Douglas County, Colorado. Ridgegate Parkway bounds the site to the north, an existing drainage swale bounds the site to the east, Lyric Street bounds the site to the west, and Octave Avenue bounds the site to the south. A vicinity map for the project is included in the Appendix to this letter.

Currently, the project site is vacant. The site generally slopes northwest from the high point southeast of the proposed Lyric Condos development, with slopes ranging between 0.5% to 5%. This project consists of the development of multi-family lots with public roadways. Final design of Lyric Condos will include storm sewer, sanitary sewer and water line. Lyric Condos consists of approximately 14.41 acres.

The purpose of this letter is to demonstrate that the proposed project conforms to the established drainage patterns and criteria set forth in the previously approved Phase III Drainage Report for Ridgegate Southwest Village Filing 1. The governing master report is the Approved *Phase III Drainage Report for Ridgegate Southwest Village Filing 1* by JR Engineering, LLC, Addendum #1 revised September 28, 2021. The referenced information from the governing master report is included in the Appendix of the report.

The site is tributary to the Happy Canyon floodplain as defined by the FEMA Flood Insurance Rate Maps, FIRM #08035C0063H and effective September 4, 2020, and is included in the Appendix. The site lies entirely within Zone X which is the flood insurance rate zone that corresponds to areas outside the one percent annual chance floodplain.

The Natural Resources Conservation Service Web Soil Survey in the approved drainage reports identify the soil on the property as Hydrologic Soils Group C and D. Hydrologic Group C soils are described as “soils that have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine structure.” Hydrologic Group D soils are described as “soils that have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface and shallow soils over nearly impervious material.” A soils map has been included in the Attachments.

The Lyric Condos site is located within Basin F4 (66% impervious, 5.58 acres) and Basin F5 (75% impervious, 7.54 acres) as defined in the Phase III Drainage Report for Ridgegate Southwest Village Filing 1, see Appendix D. In the proposed condition, the site will consist of 42 sub-basins. Sub-Basins C1-C24 represent Basin F5 from the previously approved drainage report. Captured stormwater runoff from Sub-Basins C1-C24 will generally be routed northwest and discharge from the Lyric Condos site at an existing 36-inch RCP Stub. Runoff from Sub-Basins C1-C24 will then be conveyed via existing storm sewer in Ridgegate Parkway to an existing quality pond on the north side of Ridegate Parkway (described as Pond R in the Filing 1 report) where water quality will be provided. Captured stormwater runoff from Sub-Basins T1-T23 will generally route south and discharge from the Lyric Condos site at an existing 24-inch RCP stub. Sub-Basins O1-O3 represent on-site areas that will drain offsite and be captured by existing infrastructure. Runoff from Sub-Basins T1-T23 as well as Sub-Basins O1-O3 will be conveyed via existing storm sewer in Octave

5475 Tech Center Drive, Suite 235, Colorado Springs, CO 80919
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Avenue and Lyric Street to an existing EURV Pond A in the regional park northwest of the Lyric/Octave intersection where water quality will be provided. 100-yr flood control volume will be provided by on-line peak shaving ponds in Happy Canyon Creek.

Table 1: Approved Filing 1 Imperviousness vs. Proposed Imperviousness

Approved Filing 1 Basins Per Previously Approved Drainage Report

Basin ID	Percent Impervious	Area Onsite	Impervious Area
EX-Basin F4	66%	5.58 Acres	3.68 Acres
Ex-Basin F5	75%	7.54 Acres	5.66 Acres
Total	70.5%	13.12 Acres	9.34 Acres

Proposed Basins Onsite

Basin	Percent Impervious	Area Onsite (ac)	Impervious Area (ac)
T1	57.4%	1.06	0.61
T2	61.1%	1.57	0.96
T3	54.7%	0.10	0.05
T4	54.0%	0.12	0.06
T5	54.0%	0.12	0.06
T6	54.3%	0.14	0.08
T7	54.0%	0.12	0.06
T8	54.0%	0.12	0.06
T9	16.3%	0.09	0.01
T10	11.9%	0.13	0.02
T11	2.0%	0.02	0.00
T12	2.0%	0.06	0.00
T13	2.0%	0.03	0.00
T14	2.0%	0.04	0.00
T15	27.8%	0.05	0.01
T16	87.2%	0.23	0.20
T17	79.0%	0.14	0.11
T18	65.1%	0.34	0.22
T19	56.6%	0.43	0.24
T20	58.0%	0.07	0.04
T21	2.0%	0.08	0.00
T22	2.0%	0.03	0.00
T23	2.0%	0.10	0.00
Total Basin T	54.5%	5.19	2.83

Basin	Percent Impervious	Area Onsite (ac)	Impervious Area (ac)
C1	65.2%	0.44	0.29
C2	55.9%	0.86	0.48
C3	82.2%	0.11	0.09
C4	49.8%	0.14	0.07
C5	66.0%	0.77	0.51
C6	11.1%	0.57	0.06
C7	64.1%	0.84	0.54
C8	21.1%	0.09	0.02
C9	19.9%	0.12	0.02
C10	2.0%	0.02	0.00
C11	25.5%	0.11	0.03
C12	30.7%	0.09	0.03
C13	20.4%	0.07	0.01
C14	62.6%	0.7	0.44
C15	61.5%	0.31	0.19
C16	62.6%	0.86	0.54
C17	39.6%	0.16	0.06
C18	38.4%	0.13	0.05
C19	2.0%	1.51	0.03
C20	2.0%	0.05	0.00
C21	2.0%	0.04	0.00
C22	36.9%	0.13	0.05
C23	27.4%	0.28	0.08
C24	66.9%	0.91	0.61
Total Basin C	45.1%	9.31	4.20

Basin	Percent Impervious	Area Onsite (ac)	Impervious Area (ac)
TOTAL	48.4%	14.5	7.03

As shown in Table 1, the historic impervious area assumed from the Phase III Drainage Report for Ridgegate Southwest Village Filing 1 is 9.34 acres and the proposed impervious area is 7.03 acres. As a result, the decrease in impervious area will not affect the previously approved Filing 1 Phase III Drainage Plan and thus this project is in conformance with the Filing 1 Phase III Drainage Report and City of Lone Tree Drainage Criteria.

Sincerely,
JR ENGINEERING, LLC

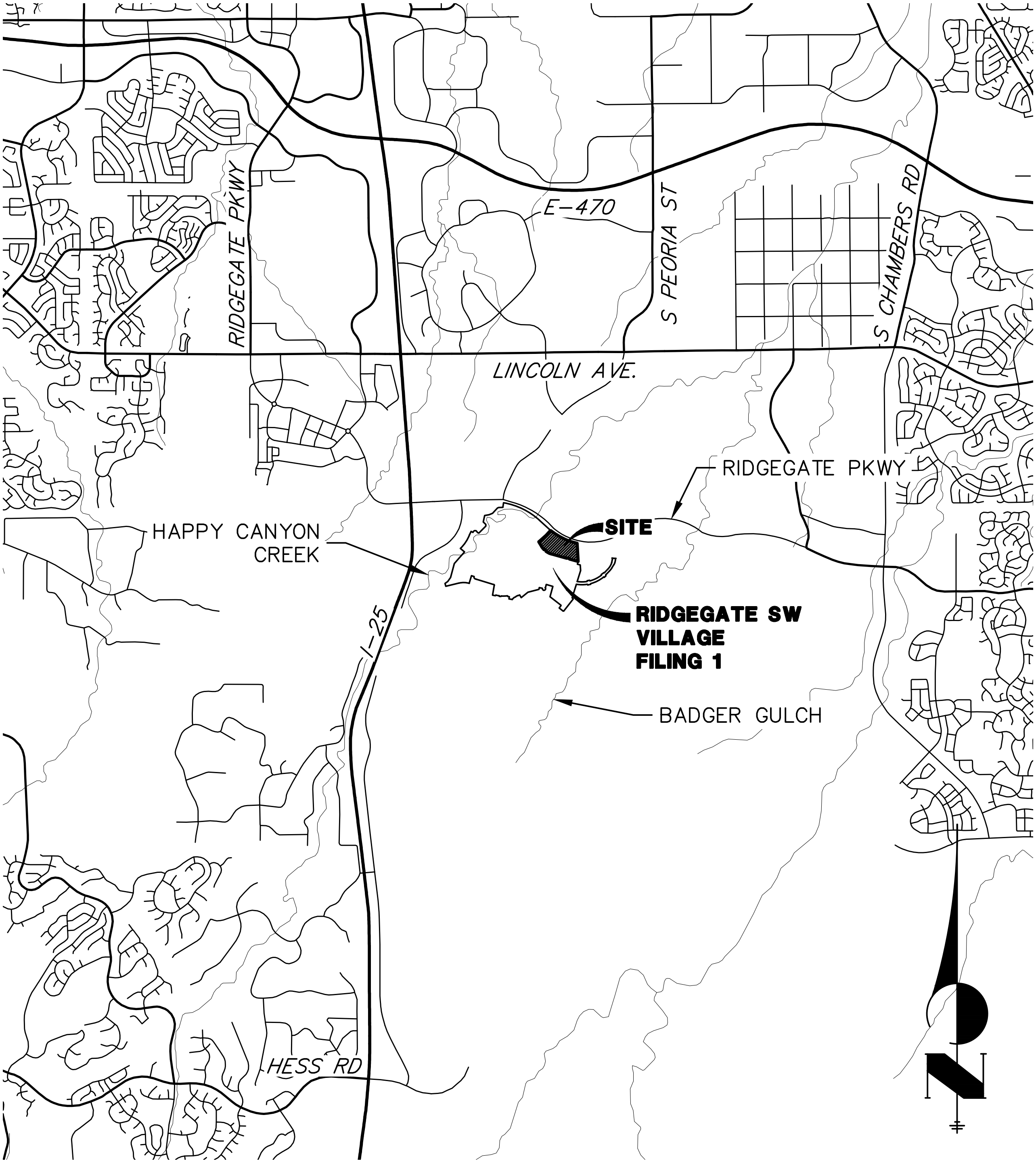
Kurtis W. Williams, P.E.

Attachments:

- Attachment A
  - Vicinity Map
  - FEMA Flood Insurance Rate Map
  - NRCS Soils Map
- Attachment B
  - Hydrologic Calculations
- Attachment C
  - Hydraulic Calculations
- Attachment D
  - References-Previously Approved Phase III Drainage Report, Addendum #1, Sheet 4
- Attachment E
  - Proposed Drainage Plan

ATTACHMENT A

FIGURES



VICINITY MAP

SCALE 1'=5000'

15950.02
01/10/2022
SHEET 1 OF 1

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A Westrian Company

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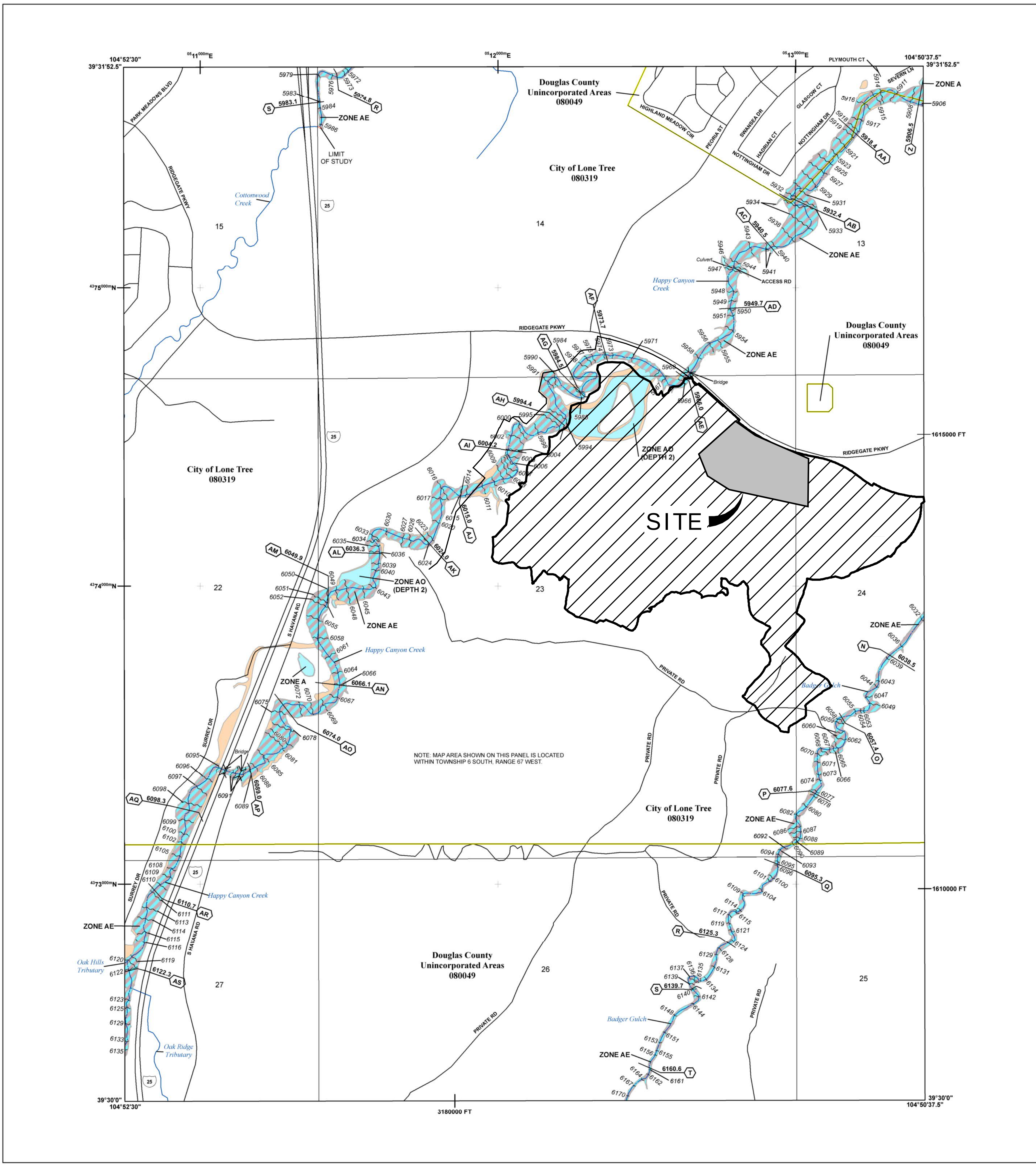
X:\1590000.all\1595010\Drawings\Blocks\1595010 Vicinity Map.dwg, 8.5x11 Portrait, 8/25/2022 4:17:24 PM, CS



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

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*
OTHER AREAS	NO SCREEN Areas of Minimal Flood Hazard *Zone X*
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Accredited or Provisionally Accredited Levee, Dike, or Floodwall
	Non-accredited Levee, Dike, or Floodwall
OTHER FEATURES	18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	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 https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the 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 the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

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

SCALE

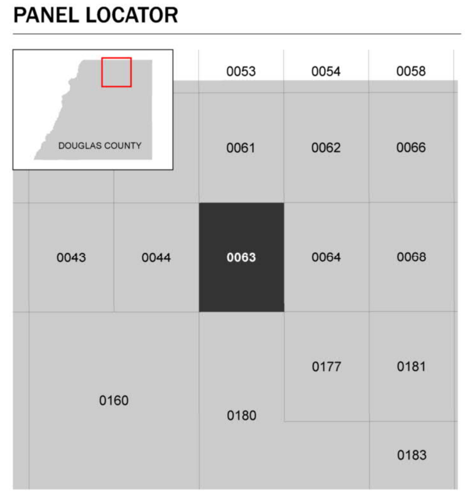
Map Projection:
NAD83 UTM Zone 13N
Western Hemisphere; Vertical Datum: NAVD88

1 inch = 500 feet 1:6,000

0 1,000 2,000 Feet

0 250 500 Meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

DOUGLAS COUNTY, COLORADO
And Incorporated Areas

PANEL 63 OF 495

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
DOUGLAS COUNTY	080049	0063	H
LONE TREE, CITY OF	080319	0063	H

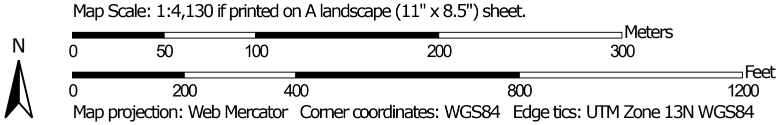
VERSION NUMBER
2.3.3.2

MAP NUMBER
08035C0063H

MAP REVISED
SEPTEMBER 4, 2020

Hydrologic Soil Group—Castle Rock Area, Colorado

Map Scale: 1:4,130 if printed on A landscape (11" x 8.5") sheet.



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 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Castle Rock Area, Colorado
Survey Area Data: Version 14, Aug 31, 2021

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

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

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
En	Englewood clay loam	C	13.5	44.7%
Fu	Fondis-Kutch association	C	2.8	9.3%
NsE	Newlin-Satanta complex, 5 to 20 percent slopes	B	1.1	3.6%
RmE	Renohill-Buick complex, 5 to 25 percent slopes	D	12.8	42.5%
Totals for Area of Interest			**30.2**	**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.

ATTACHMENT B

HYDROLOGIC CALCULATIONS

Subdivision: Lyric Condos
Location: City of Lone Tree
Project Name: Ridgegate Filing No. 1
Project No.: 15950.10

Calculated By: MJP
Date: 2/21/2023

BASIN SUMMARY TABLE							
Tributary Sub-basin	Area (acres)	Percent Impervious	C_5	C_{100}	t_c (min)	Q_5 (cfs)	Q_{100} (cfs)
T1	1.06	57%	0.51	0.72	5.0	2.67	6.70
T2	1.57	61%	0.54	0.74	5.0	4.16	10.14
T3	0.10	55%	0.48	0.71	5.0	0.25	0.62
T4	0.12	54%	0.48	0.70	5.0	0.30	0.71
T5	0.12	54%	0.48	0.70	5.0	0.30	0.71
T6	0.14	54%	0.48	0.71	5.0	0.35	0.88
T7	0.12	54%	0.48	0.70	8.3	0.25	0.60
T8	0.12	54%	0.48	0.70	8.3	0.25	0.60
T9	0.09	16%	0.17	0.55	8.4	0.08	0.38
T10	0.13	12%	0.13	0.53	8.6	0.08	0.52
T11	0.02	2%	0.05	0.49	9.2	0.00	0.07
T12	0.06	2%	0.05	0.49	9.2	0.00	0.22
T13	0.03	2%	0.05	0.49	9.2	0.00	0.07
T14	0.04	2%	0.05	0.49	9.2	0.00	0.15
T15	0.05	28%	0.26	0.60	5.0	0.05	0.26
T16	0.23	87%	0.75	0.84	5.0	0.84	1.68
T17	0.14	79%	0.68	0.81	5.0	0.50	0.97
T18	0.34	65%	0.57	0.75	5.0	0.94	2.29
T19	0.43	57%	0.50	0.72	5.0	1.04	2.73
T20	0.07	58%	0.51	0.72	5.0	0.20	0.44
T21	0.08	2%	0.05	0.49	5.0	0.00	0.35
T22	0.03	2%	0.05	0.49	5.0	0.00	0.09
T23	0.10	2%	0.05	0.49	8.5	0.04	0.37
C1	0.44	65%	0.57	0.75	5.5	1.21	2.83
C2	0.86	56%	0.49	0.71	5.0	2.08	5.38
C3	0.11	82%	0.71	0.82	5.0	0.40	0.79
C4	0.14	50%	0.44	0.69	6.2	0.28	0.83
C5	0.77	66%	0.58	0.75	5.0	2.18	5.12
C6	0.57	11%	0.13	0.53	8.9	0.29	2.20
C7	0.84	64%	0.56	0.75	8.7	1.96	4.67
C8	0.09	21%	0.21	0.57	5.0	0.10	0.44
C9	0.12	20%	0.20	0.57	5.0	0.10	0.62
C10	0.02	2%	0.05	0.49	5.0	0.00	0.09
C11	0.11	25%	0.24	0.59	5.0	0.15	0.53
C12	0.09	31%	0.29	0.61	5.0	0.15	0.44
C13	0.07	20%	0.20	0.57	5.0	0.05	0.35
C14	0.70	63%	0.55	0.74	5.0	1.88	4.59
C15	0.31	62%	0.54	0.74	5.0	0.84	2.03
C16	0.86	63%	0.55	0.74	5.0	2.33	5.64
C17	0.16	40%	0.36	0.65	5.0	0.30	0.88
C18	0.13	38%	0.35	0.64	5.0	0.25	0.71
C19	1.51	2%	0.05	0.49	16.4	0.25	4.18
C20	0.05	2%	0.05	0.49	5.0	0.00	0.18
C21	0.04	2%	0.05	0.49	5.9	0.00	0.17
C22	0.13	37%	0.34	0.63	5.0	0.20	0.71
C23	0.28	27%	0.26	0.60	5.0	0.35	1.50
C24	0.91	67%	0.58	0.76	5.0	2.62	6.09
O1	0.13	2%	0.05	0.49	6.3	0.05	0.50
O2	0.24	5%	0.08	0.50	5.0	0.10	1.06
O3	0.07	2%	0.05	0.49	5.0	0.00	0.26

Subdivision: Lyric Condos
Location: City of Lone Tree
Project Name: Ridgegate Filing No. 1
Project No.: 15950.10

Calculated By: MJP
Date: 2/21/2023

DESIGN POINT TABLE

Design Point	Basin	Direct Flow Q5	Direct Flow Q100	Cumulative Flow Q5	Cumulative Flow Q100
1	C1	1.21	2.83	---	---
2	C2	2.08	5.38	---	---
3	C2	0.40	0.79	---	---
2.1	---	---	---	3.62	8.69
4	C4	0.28	0.83	---	---
4.1	---	---	---	3.77	9.22
24	C4	2.62	6.09	---	---
24.1	---	---	---	6.23	14.94
21	C4	0.00	0.17	---	---
21.1	---	---	---	6.23	15.10
22	C4	0.20	0.71	---	---
22.1	---	---	---	6.42	15.77
23	C4	0.35	1.50	---	---
23.1	---	---	---	6.74	17.18
5	C5	2.18	5.12	---	---
7	C7	1.96	4.67	---	---
7.1	---	---	---	9.71	22.71
14	C14	1.99	6.37	---	---
15	C15	0.84	2.03	---	---
15.1	---	---	---	2.85	7.30
15.2	---	---	---	12.11	30.01
20	C20	0.00	0.18	---	---
16	C16	2.33	5.64	---	---
16.1	---	---	---	2.33	5.82
16.2	---	---	---	14.06	34.90
6	C6	0.29	2.20	---	---
8	C8	0.10	0.44	---	---
8.1	---	---	---	0.37	2.57
9	C9	0.10	0.62	---	---
9.1	---	---	---	0.45	3.08
10	C10	0.00	0.09	---	---
10.1	---	---	---	0.45	3.16
11	C11	0.15	0.53	---	---
11.1	---	---	---	0.58	3.60
12	C12	0.15	0.44	---	---
12.1	---	---	---	0.70	3.96
13	C13	0.05	0.35	---	---
13.1	---	---	---	0.74	4.26
17	C17	0.30	0.88	---	---
18	C18	0.25	0.71	---	---
18.1	---	---	---	0.54	1.59
18.2	---	---	---	15.12	40.15
19	C19	0.25	4.18	---	---
19.1	---	---	---	11.93	35.09
103	T3	0.25	0.62	---	---
109	T9	0.08	0.38	---	---
109.1	---	---	---	0.30	0.90
104	T4	0.30	0.71	---	---
110	T10	0.08	0.52	---	---
110.1	---	---	---	0.63	2.01
105	T5	0.30	0.71	---	---
111	T11	0.00	0.07	---	---
111.1	---	---	---	0.86	2.61
101	T1	2.67	6.70	---	---
106	T6	0.35	0.88	---	---
106.1	---	---	---	2.09	3.81
112	T12	0.00	0.22	---	---
112.1	---	---	---	2.58	5.96
107	T7	0.25	0.60	---	---
113	T13	0.00	0.07	---	---
113.1	---	---	---	2.82	6.62
108	T8	0.25	0.60	---	---
114	T14	0.00	0.15	---	---
114.1	---	---	---	3.07	7.34
122	T22	0.00	0.09	---	---
115	T15	0.05	0.26	---	---
115.1	---	---	---	0.05	0.35
121	T21	0.00	0.35	---	---
116	T16	0.84	1.68	---	---
116.1	---	---	---	0.84	2.03
116.2	---	---	---	0.89	2.38
117	T17	0.50	0.97	---	---
117.1	---	---	---	1.39	3.35
118	T18	0.94	2.29	---	---
118.1	---	---	---	2.33	5.64
118.2	---	---	---	4.99	11.99
102	T2	5.09	13.92	---	---
102.1	---	---	---	8.85	18.72
119	T19	1.04	2.73	---	---
123	T23	0.04	0.37	---	---
120	T20	0.60	6.19	---	---
120.1	---	---	---	10.24	26.43

COMPOSITE % IMPERVIOUS CALCULATIONS

Subdivision: Ridgegate
Location: Douglas County - Zone 1

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

Basin ID	Total Area (ac)	Single Family Residential/Commercial			Roads/Pond			Open Space/Park			Basins Total Weighted % Imp.
		% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	
T1	1.06	45%	0.34	14.4%	100%	0.45	42.5%	2%	0.27	0.5%	57.4%
T2	1.57	45%	0.45	12.9%	100%	0.75	47.8%	2%	0.37	0.5%	61.1%
T3	0.10	45%	0.05	20.3%	100%	0.03	34.0%	2%	0.02	0.4%	54.7%
T4	0.12	45%	0.05	20.3%	100%	0.04	33.3%	2%	0.03	0.4%	54.0%
T5	0.12	45%	0.05	20.3%	100%	0.04	33.3%	2%	0.03	0.4%	54.0%
T6	0.14	45%	0.06	20.3%	100%	0.05	33.6%	2%	0.03	0.4%	54.3%
T7	0.12	45%	0.05	20.3%	100%	0.04	33.3%	2%	0.03	0.4%	54.0%
T8	0.12	45%	0.05	20.3%	100%	0.04	33.3%	2%	0.03	0.4%	54.0%
T9	0.09	45%	0.03	15.0%	100%	0.00	0.0%	2%	0.06	1.3%	16.3%
T10	0.13	45%	0.03	10.4%	100%	0.00	0.0%	2%	0.10	1.5%	11.9%
T11	0.02	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.02	2.0%	2.0%
T12	0.06	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.06	2.0%	2.0%
T13	0.03	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.03	2.0%	2.0%
T14	0.04	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.04	2.0%	2.0%
T15	0.05	45%	0.03	27.0%	100%	0.00	0.0%	2%	0.02	0.8%	27.8%
T16	0.23	45%	0.00	0.0%	100%	0.20	87.0%	2%	0.03	0.3%	87.2%
T17	0.14	45%	0.00	0.0%	100%	0.11	78.6%	2%	0.03	0.4%	79.0%
T18	0.34	45%	0.18	23.8%	100%	0.14	41.2%	2%	0.02	0.1%	65.1%
T19	0.43	45%	0.09	9.4%	100%	0.20	46.5%	2%	0.14	0.7%	56.6%
T20	0.07	45%	0.00	0.0%	100%	0.04	57.1%	2%	0.03	0.9%	58.0%
T21	0.08	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.08	2.0%	2.0%
T22	0.03	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.03	2.0%	2.0%
T23	0.10	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.10	2.0%	2.0%
TOTAL	5.19										54.5%

Basin ID	Total Area (ac)	Single Family Residential/Commercial			Roads/Pond			Open Space/Park			Basins Total Weighted % Imp.
		% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	
C1	0.44	45%	0.10	10.2%	100%	0.24	54.5%	2%	0.10	0.5%	65.2%
C2	0.86	45%	0.28	14.7%	100%	0.35	40.7%	2%	0.23	0.5%	55.9%
C3	0.11	45%	0.00	0.0%	100%	0.09	81.8%	2%	0.02	0.4%	82.2%
C4	0.14	45%	0.11	35.4%	100%	0.02	14.3%	2%	0.01	0.1%	49.8%
C5	0.77	45%	0.12	7.0%	100%	0.45	58.4%	2%	0.20	0.5%	66.0%
C6	0.57	45%	0.12	9.5%	100%	0.00	0.0%	2%	0.45	1.6%	11.1%
C7	0.84	45%	0.12	6.4%	100%	0.48	57.1%	2%	0.24	0.6%	64.1%
C8	0.09	45%	0.04	20.0%	100%	0.00	0.0%	2%	0.05	1.1%	21.1%
C9	0.12	45%	0.05	18.8%	100%	0.00	0.0%	2%	0.07	1.2%	19.9%
C10	0.02	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.02	2.0%	2.0%
C11	0.11	45%	0.06	24.5%	100%	0.00	0.0%	2%	0.05	0.9%	25.5%
C12	0.09	45%	0.06	30.0%	100%	0.00	0.0%	2%	0.03	0.7%	30.7%
C13	0.07	45%	0.03	19.3%	100%	0.00	0.0%	2%	0.04	1.1%	20.4%
C14	0.70	45%	0.12	7.7%	100%	0.38	54.3%	2%	0.20	0.6%	62.6%
C15	0.31	45%	0.11	16.0%	100%	0.14	45.2%	2%	0.06	0.4%	61.5%
C16	0.86	45%	0.30	15.7%	100%	0.40	46.5%	2%	0.16	0.4%	62.6%
C17	0.16	45%	0.14	39.4%	100%	0.00	0.0%	2%	0.02	0.3%	39.6%
C18	0.13	45%	0.11	38.1%	100%	0.00	0.0%	2%	0.02	0.3%	38.4%
C19	1.51	45%	0.00	0.0%	100%	0.00	0.0%	2%	1.51	2.0%	2.0%
C20	0.05	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.05	2.0%	2.0%
C21	0.04	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.04	2.0%	2.0%
C22	0.13	45%	0.06	20.8%	100%	0.02	15.4%	2%	0.05	0.8%	36.9%
C23	0.28	45%	0.12	19.3%	100%	0.02	7.1%	2%	0.14	1.0%	27.4%
C24	0.91	45%	0.12	5.9%	100%	0.55	60.4%	2%	0.24	0.5%	66.9%
TOTAL	9.31										45.1%
O1	0.13	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.13	2.0%	2.0%
O2	0.24	45%	0.00	0.0%	100%	0.01	2.9%	2%	0.23	1.9%	4.9%
O3	0.07	45%	0.00	0.0%	100%	0.00	0.0%	2%	0.07	2.0%	2.0%
TOTAL	0.44										3.6%

COMPOSITE RUNOFF COEFFICIENT CALCULATIONS

Subdivision: Ridgegate
Location: Douglas County - Zone 1

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

Basin ID	Total Area (ac)	Basins Total Weighted % Imp.	Hydrologic Soil Group			Hydrologic Soil Group			Minor Coefficients			Major Coefficients			Basins Total Weighted C_5	Basins Total Weighted C_{100}
			Area A (ac)	Area B (ac)	Area C/D (ac)	% A (ac)	% B (ac)	% C/D (ac)	$C_{5,A}$	$C_{5,B}$	$C_{5,C/D}$	$C_{100,A}$	$C_{100,B}$	$C_{100,C/D}$		
T1	1.06	57.4%	0.00	0.00	1.06	0%	0%	100%	0.42	0.47	0.51	0.56	0.70	0.72	0.51	0.72
T2	1.57	61.1%	0.00	0.00	1.57	0%	0%	100%	0.46	0.50	0.54	0.59	0.71	0.74	0.54	0.74
T3	0.10	54.7%	0.00	0.00	0.10	0%	0%	100%	0.40	0.45	0.48	0.54	0.68	0.71	0.48	0.71
T4	0.12	54.0%	0.00	0.00	0.12	0%	0%	100%	0.39	0.44	0.48	0.53	0.68	0.70	0.48	0.70
T5	0.12	54.0%	0.00	0.00	0.12	0%	0%	100%	0.39	0.44	0.48	0.53	0.68	0.70	0.48	0.70
T6	0.14	54.3%	0.00	0.00	0.14	0%	0%	100%	0.39	0.44	0.48	0.53	0.68	0.71	0.48	0.71
T7	0.12	54.0%	0.00	0.00	0.12	0%	0%	100%	0.39	0.44	0.48	0.53	0.68	0.70	0.48	0.70
T8	0.12	54.0%	0.00	0.00	0.12	0%	0%	100%	0.39	0.44	0.48	0.53	0.68	0.70	0.48	0.70
T9	0.09	16.3%	0.00	0.00	0.09	0%	0%	100%	0.09	0.12	0.17	0.24	0.50	0.55	0.17	0.55
T10	0.13	11.9%	0.00	0.00	0.13	0%	0%	100%	0.06	0.09	0.13	0.20	0.48	0.53	0.13	0.53
T11	0.02	2.0%	0.00	0.00	0.02	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
T12	0.06	2.0%	0.00	0.00	0.06	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
T13	0.03	2.0%	0.00	0.00	0.03	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
T14	0.04	2.0%	0.00	0.00	0.04	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
T15	0.05	27.8%	0.00	0.00	0.05	0%	0%	100%	0.17	0.21	0.26	0.33	0.56	0.60	0.26	0.60
T16	0.23	87.2%	0.00	0.00	0.23	0%	0%	100%	0.72	0.74	0.75	0.79	0.84	0.84	0.75	0.84
T17	0.14	79.0%	0.00	0.00	0.14	0%	0%	100%	0.64	0.67	0.68	0.73	0.80	0.81	0.68	0.81
T18	0.34	65.1%	0.00	0.00	0.34	0%	0%	100%	0.50	0.54	0.57	0.62	0.73	0.75	0.57	0.75
T19	0.43	56.6%	0.00	0.00	0.43	0%	0%	100%	0.42	0.46	0.50	0.55	0.69	0.72	0.50	0.72
T20	0.07	58.0%	0.00	0.00	0.07	0%	0%	100%	0.43	0.47	0.51	0.56	0.70	0.72	0.51	0.72
T21	0.08	2.0%	0.00	0.00	0.08	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
T22	0.03	2.0%	0.00	0.00	0.03	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
T23	0.10	2.0%	0.00	0.00	0.10	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
C1	0.44	65.2%	0.00	0.00	0.44	0%	0%	100%	0.50	0.54	0.57	0.62	0.73	0.75	0.57	0.75
C2	0.86	55.9%	0.00	0.00	0.86	0%	0%	100%	0.41	0.46	0.49	0.55	0.69	0.71	0.49	0.71
C3	0.11	82.2%	0.00	0.00	0.11	0%	0%	100%	0.67	0.69	0.71	0.75	0.81	0.82	0.71	0.82
C4	0.14	49.8%	0.00	0.00	0.14	0%	0%	100%	0.35	0.40	0.44	0.50	0.66	0.69	0.44	0.69
C5	0.77	66.0%	0.00	0.00	0.77	0%	0%	100%	0.51	0.55	0.58	0.63	0.74	0.75	0.58	0.75

Basin ID	Total Area (ac)	Basins Total Weighted % Imp.	Hydrologic Soil Group			Hydrologic Soil Group			Minor Coefficients			Major Coefficients			Basins Total Weighted C_5	Basins Total Weighted C_{100}
			Area A (ac)	Area B (ac)	Area C/D (ac)	% A (ac)	% B (ac)	% C/D (ac)	$C_{5,A}$	$C_{5,B}$	$C_{5,C/D}$	$C_{100,A}$	$C_{100,B}$	$C_{100,C/D}$		
C6	0.57	11.1%	0.00	0.00	0.57	0%	0%	100%	0.05	0.08	0.13	0.20	0.48	0.53	0.13	0.53
C7	0.84	64.1%	0.00	0.00	0.84	0%	0%	100%	0.49	0.53	0.56	0.61	0.73	0.75	0.56	0.75
C8	0.09	21.1%	0.00	0.00	0.09	0%	0%	100%	0.12	0.16	0.21	0.28	0.52	0.57	0.21	0.57
C9	0.12	19.9%	0.00	0.00	0.12	0%	0%	100%	0.11	0.15	0.20	0.26	0.52	0.57	0.20	0.57
C10	0.02	2.0%	0.00	0.00	0.02	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
C11	0.11	25.5%	0.00	0.00	0.11	0%	0%	100%	0.15	0.19	0.24	0.31	0.55	0.59	0.24	0.59
C12	0.09	30.7%	0.00	0.00	0.09	0%	0%	100%	0.19	0.24	0.29	0.35	0.57	0.61	0.29	0.61
C13	0.07	20.4%	0.00	0.00	0.07	0%	0%	100%	0.11	0.15	0.20	0.27	0.52	0.57	0.20	0.57
C14	0.70	62.6%	0.00	0.00	0.70	0%	0%	100%	0.47	0.52	0.55	0.60	0.72	0.74	0.55	0.74
C15	0.31	61.5%	0.00	0.00	0.31	0%	0%	100%	0.46	0.51	0.54	0.59	0.71	0.74	0.54	0.74
C16	0.86	62.6%	0.00	0.00	0.86	0%	0%	100%	0.47	0.52	0.55	0.60	0.72	0.74	0.55	0.74
C17	0.16	39.6%	0.00	0.00	0.16	0%	0%	100%	0.26	0.31	0.36	0.42	0.61	0.65	0.36	0.65
C18	0.13	38.4%	0.00	0.00	0.13	0%	0%	100%	0.25	0.30	0.35	0.41	0.61	0.64	0.35	0.64
C19	1.51	2.0%	0.00	0.00	1.51	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
C20	0.05	2.0%	0.00	0.00	0.05	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
C21	0.04	2.0%	0.00	0.00	0.04	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
C22	0.13	36.9%	0.00	0.00	0.13	0%	0%	100%	0.24	0.29	0.34	0.40	0.60	0.63	0.34	0.63
C23	0.28	27.4%	0.00	0.00	0.28	0%	0%	100%	0.17	0.21	0.26	0.32	0.56	0.60	0.26	0.60
C24	0.91	66.9%	0.00	0.00	0.91	0%	0%	100%	0.51	0.56	0.58	0.63	0.74	0.76	0.58	0.76
O1	0.13	2.0%	0.00	0.00	0.13	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
O2	0.24	4.9%	0.00	0.00	0.24	0%	0%	100%	0.02	0.03	0.08	0.15	0.45	0.50	0.08	0.50
O3	0.07	2.0%	0.00	0.00	0.07	0%	0%	100%	0.01	0.01	0.05	0.13	0.44	0.49	0.05	0.49
TOTAL	14.94		0.00	0.00	14.94	0%	0%	100%	---	---	---	---	---	---	0.42	0.68

Table 6-4. Runoff coefficient equations based on NRCS soil group and storm return period

NRCS Soil Group	Storm Return Period						
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
A	$C_A = 0.84i^{1.302}$	$C_A = 0.86i^{1.276}$	$C_A = 0.87i^{1.232}$	$C_A = 0.84i^{1.124}$	$C_A = 0.85i+0.025$	$C_A = 0.78i+0.110$	$C_A = 0.65i+0.254$
B	$C_B = 0.84i^{1.169}$	$C_B = 0.86i^{1.088}$	$C_B = 0.81i+0.057$	$C_B = 0.63i+0.249$	$C_B = 0.56i+0.328$	$C_B = 0.47i+0.426$	$C_B = 0.37i+0.536$
C/D	$C_{C/D} = 0.83i^{1.122}$	$C_{C/D} = 0.82i+0.035$	$C_{C/D} = 0.74i+0.132$	$C_{C/D} = 0.56i+0.319$	$C_{C/D} = 0.49i+0.393$	$C_{C/D} = 0.41i+0.484$	$C_{C/D} = 0.32i+0.588$

Where:

i = % imperviousness (expressed as a decimal)

C_A = Runoff coefficient for Natural Resources Conservation Service (NRCS) HSG A soils

C_B = Runoff coefficient for NRCS HSG B soils

$C_{C/D}$ = Runoff coefficient for NRCS HSG C and D soils.

STANDARD FORM SF-2
TIME OF CONCENTRATION

Subdivision: Ridgegate
Location: Douglas County - Zone 1

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

SUB-BASIN DATA						INITIAL/OVERLAND (T_i)			TRAVEL TIME (T_t)					tc CHECK (URBANIZED BASINS)			FINAL
BASIN ID	D.A. (ac)	Hydrologic Soils Group	Impervious (%)	C_5	C_{100}	L (ft)	S_o (%)	t_i (min)	L_t (ft)	S_t (%)	K	VEL. (ft/s)	t_t (min)	COMP. t_c (min)	TOTAL LENGTH (ft)	Urbanized t_c (min)	t_c (min)
T1	1.06	C	57%	0.51	0.72	50	33.0%	2.4	326	3.5%	20.0	3.7	1.5	3.8	376.0	17.9	5.0
T2	1.57	C	61%	0.54	0.74	50	33.0%	2.3	583	3.5%	20.0	3.7	2.6	4.9	633.0	18.6	5.0
T3	0.10	C	55%	0.48	0.71	30	33.0%	1.9	65	1.0%	20.0	2.0	0.5	2.5	95.0	17.4	5.0
T4	0.12	C	54%	0.48	0.70	30	33.0%	1.9	65	1.0%	20.0	2.0	0.5	2.5	95.0	17.5	5.0
T5	0.12	C	54%	0.48	0.70	30	33.0%	1.9	65	1.0%	20.0	2.0	0.5	2.5	95.0	17.5	5.0
T6	0.14	C	54%	0.48	0.71	30	33.0%	1.9	65	1.0%	20.0	2.0	0.5	2.5	95.0	17.4	5.0
T7	0.12	C	54%	0.48	0.70	30	0.5%	7.7	65	1.0%	20.0	2.0	0.5	8.3	95.0	17.5	8.3
T8	0.12	C	54%	0.48	0.70	30	0.5%	7.7	65	1.0%	20.0	2.0	0.5	8.3	95.0	17.5	8.3
T9	0.09	C	16%	0.17	0.55	10	0.5%	6.7	50	0.5%	7.0	0.5	1.7	8.4	60.0	24.3	8.4
T10	0.13	C	12%	0.13	0.53	10	0.5%	6.9	50	0.5%	7.0	0.5	1.7	8.6	60.0	25.1	8.6
T11	0.02	C	2%	0.05	0.49	10	0.5%	7.5	50	0.5%	7.0	0.5	1.7	9.2	60.0	26.9	9.2
T12	0.06	C	2%	0.05	0.49	10	0.5%	7.5	50	0.5%	7.0	0.5	1.7	9.2	60.0	26.9	9.2
T13	0.03	C	2%	0.05	0.49	10	0.5%	7.5	50	0.5%	7.0	0.5	1.7	9.2	60.0	26.9	9.2
T14	0.04	C	2%	0.05	0.49	10	0.5%	7.5	50	0.5%	7.0	0.5	1.7	9.2	60.0	26.9	9.2
T15	0.05	C	28%	0.26	0.60	50	33.0%	3.4	20	0.5%	20.0	1.4	0.2	3.6	70.0	21.6	5.0
T16	0.23	C	87%	0.75	0.84	10	33.0%	0.6	134	0.5%	20.0	1.4	1.6	2.2	144.0	12.7	5.0
T17	0.14	C	79%	0.68	0.81	10	33.0%	0.8	113	2.5%	20.0	3.2	0.6	1.3	123.0	13.2	5.0
T18	0.34	C	65%	0.57	0.75	50	33.0%	2.1	148	2.5%	20.0	3.2	0.8	2.9	198.0	15.8	5.0
T19	0.43	C	57%	0.50	0.72	50	33.0%	2.4	286	2.5%	20.0	3.2	1.5	3.9	336.0	18.2	5.0
T20	0.07	C	58%	0.51	0.72	50	33.0%	2.4	286	2.5%	20.0	3.2	1.5	3.9	336.0	17.9	5.0
T21	0.08	C	2%	0.05	0.49	10	25.0%	2.1	150	2.0%	7.0	1.0	2.5	4.6	160.0	27.6	5.0
T22	0.03	C	2%	0.05	0.49	10	25.0%	2.1	41	2.0%	7.0	1.0	0.7	2.8	51.0	26.2	5.0
T23	0.10	C	2%	0.05	0.49	10	2.0%	4.8	220	2.0%	7.0	1.0	3.7	8.5	230.0	28.5	8.5
C1	0.44	C	65%	0.57	0.75	25	2.0%	3.8	322	2.5%	20.0	3.2	1.7	5.5	347.0	16.8	5.5
C2	0.86	C	56%	0.49	0.71	50	33.0%	2.4	410	2.5%	20.0	3.2	2.2	4.6	460.0	19.1	5.0
C3	0.11	C	82%	0.71	0.82	50	33.0%	1.6	87	2.3%	20.0	3.0	0.5	2.1	137.0	12.5	5.0
C4	0.14	C	50%	0.44	0.69	40	2.0%	6.0	45	2.0%	20.0	2.8	0.3	6.2	85.0	17.9	6.2
C5	0.77	C	66%	0.58	0.75	40	33.0%	1.9	400	2.5%	20.0	3.2	2.1	4.0	440.0	17.1	5.0
C6	0.57	C	11%	0.13	0.53	55	33.0%	4.1	613	2.0%	15.0	2.1	4.8	8.9	668.0	31.0	8.9
C7	0.84	C	64%	0.56	0.75	45	2.0%	5.2	641	2.3%	20.0	3.0	3.5	8.7	686.0	19.0	8.7

STANDARD FORM SF-2
TIME OF CONCENTRATION

Subdivision: Ridgegate
Location: Douglas County - Zone 1

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

SUB-BASIN DATA						INITIAL/OVERLAND (T_i)			TRAVEL TIME (T_t)					t_c CHECK (URBANIZED BASINS)			FINAL
BASIN ID	D.A. (ac)	Hydrologic Soils Group	Impervious (%)	C_5	C_{100}	L (ft)	S_o (%)	t_i (min)	L_t (ft)	S_t (%)	K	VEL. (ft/s)	t_t (min)	COMP. t_c (min)	TOTAL LENGTH (ft)	Urbanized t_c (min)	t_c (min)
C8	0.09	C	21%	0.21	0.57	45	33.0%	3.4	65	1.0%	20.0	2.0	0.5	3.9	110.0	23.3	5.0
C9	0.12	C	20%	0.20	0.57	45	33.0%	3.4	98	1.0%	20.0	2.0	0.8	4.3	143.0	24.0	5.0
C10	0.02	C	2%	0.05	0.49	20	33.0%	2.7	65	1.0%	20.0	2.0	0.5	3.2	85.0	26.8	5.0
C11	0.11	C	25%	0.24	0.59	40	33.0%	3.1	70	1.0%	20.0	2.0	0.6	3.7	110.0	22.6	5.0
C12	0.09	C	31%	0.29	0.61	40	33.0%	2.9	70	1.0%	20.0	2.0	0.6	3.5	110.0	21.7	5.0
C13	0.07	C	20%	0.20	0.57	40	33.0%	3.2	70	1.0%	20.0	2.0	0.6	3.8	110.0	23.5	5.0
C14	0.70	C	63%	0.55	0.74	55	33.0%	2.3	276	2.3%	20.0	3.0	1.5	3.8	331.0	17.1	5.0
C15	0.31	C	62%	0.54	0.74	55	33.0%	2.4	116	2.4%	20.0	3.1	0.6	3.0	171.0	16.3	5.0
C16	0.86	C	63%	0.55	0.74	55	33.0%	2.3	382	2.5%	20.0	3.2	2.0	4.3	437.0	17.6	5.0
C17	0.16	C	40%	0.36	0.65	32	33.0%	2.4	30	1.0%	20.0	2.0	0.3	2.6	62.0	19.6	5.0
C18	0.13	C	38%	0.35	0.64	32	33.0%	2.4	30	1.0%	20.0	2.0	0.3	2.7	62.0	19.8	5.0
C19	1.51	C	2%	0.05	0.49	10	5.0%	3.5	765	2.0%	7.0	1.0	12.9	16.4	775.0	35.4	16.4
C20	0.05	C	2%	0.05	0.49	10	5.0%	3.5	54	2.0%	7.0	1.0	0.9	4.4	64.0	26.3	5.0
C21	0.04	C	2%	0.05	0.49	10	2.0%	4.8	70	2.0%	7.0	1.0	1.2	5.9	80.0	26.5	5.9
C22	0.13	C	37%	0.34	0.63	40	33.0%	2.7	80	2.0%	7.0	1.0	1.3	4.1	120.0	20.4	5.0
C23	0.28	C	27%	0.26	0.60	40	33.0%	3.0	80	2.0%	7.0	1.0	1.3	4.4	120.0	22.1	5.0
C24	0.91	C	67%	0.58	0.76	40	33.0%	1.9	400	2.5%	20.0	3.2	2.1	4.0	440.0	16.9	5.0
O1	0.13	C	2%	0.05	0.49	10	1.0%	6.0	20	2.0%	7.0	1.0	0.3	6.3	30.0	25.9	6.3
O2	0.24	C	5%	0.08	0.50	10	33.0%	1.8	40	33.0%	7.0	4.0	0.2	2.0	50.0	25.3	5.0
O3	0.07	C	2%	0.05	0.49	10	33.0%	1.9	40	33.0%	7.0	4.0	0.2	2.1	50.0	25.8	5.0

NOTES:

$$t_c = t_i + t_t$$ Equation 6-2

Where:

t_c = computed time of concentration (minutes)

t_i = overland (initial) flow time (minutes)

t_t = channelized flow time (minutes).

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L_i}}{S_o^{0.33}}$$ Equation 6-3

Where:

t_i = overland (initial) flow time (minutes)
C_5 = runoff coefficient for 5-year frequency (from Table 6-4)
L_i = length of overland flow (ft)
S_o = average slope along the overland flow path (ft/ft).

$$t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t}$$ Equation 6-4

Where:

t_t = channelized flow time (travel time, min)
L_t = waterway length (ft)
S_o = waterway slope (ft/ft)
V_t = travel time velocity (ft/sec) = $K\sqrt{S_o}$
K = NRCS conveyance factor (see Table 6-2).

$$t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_t}}$$ Equation 6-5

Where:

t_c = minimum time of concentration for first design point when less than t_c from Equation 6-1.
L_t = length of channelized flow path (ft)
i = imperviousness (expressed as a decimal)
S_t = slope of the channelized flow path (ft/ft).

Table 6-2. NRCS Conveyance factors, K

Type of Land Surface	Conveyance Factor, K
Heavy meadow	2.5
Tillage/field	5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

Use a minimum t_c value of 5 minutes for urbanized areas and a minimum t_c value of 10 minutes for areas that are not considered urban. Use minimum values even when calculations result in a lesser time of concentration.

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 5-Year
P_1: 1.43 Inches

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
	1	C1	0.44	0.57	5.5	0.25	4.83	1.21															Basin C1 flows routed via curb & gutter to on-grade inlet at DP01
	2	C2	0.86	0.49	5.0	0.42	4.95	2.08															Basin C2 flows routed via curb & gutter to on-grade inlet at DP02
	3	C3	0.11	0.71	5.0	0.08	4.95	0.40															Basin C3 flows routed via alley to sump inlet DP03
	2.1								5.5	0.75	4.83	3.62											Combined flows routed via pipe to DP4.1
	4	C4	0.14	0.44	6.2	0.06	4.65	0.28															Basin C04 flows routed via drainage swale to 24-inch nyoplast inlet at DP04
	4.1								6.2	0.81	4.65	3.77											Combined flows routed via pipe to DP24.1
	24	C24	0.91	0.58	5.0	0.53	4.95	2.62															Basin C24 flows routed via curb & gutter to on-grade inlet at DP24
	24.1								6.2	1.34	4.65	6.23											Combined flows routed via pipe to DP21.1
	21	C21	0.04	0.05	5.9	0.00	4.72	0.00															Basin C21 flows routed via drainage swale to 24-inch nyoplast inlet at DP21
	21.1								6.2	1.34	4.65	6.23											Combined flows routed via pipe to DP22.1
	22	C22	0.13	0.34	5.0	0.04	4.95	0.20															Basin C22 flows routed via drainage swale to 24-inch nyoplast inlet at DP22
	22.1								6.2	1.38	4.65	6.42											Combined flows routed via pipe to DP23.1
	23	C23	0.28	0.26	5.0	0.07	4.95	0.35															Basin C23 flows routed via drainage swale to 24-inch nyoplast inlet at DP23
	23.1								6.2	1.45	4.65	6.74											Combined flows routed via pipe to DP7.1
	5	C5	0.77	0.58	5.0	0.44	4.95	2.18															Basin C5 flows routed via curb & gutter to on-grade inlet at DP05
	7	C7	0.84	0.56	8.7	0.47	4.16	1.96								1.85	0.44	2.2	18	119	5.9	0.3	Basin C7 flows routed via curb & gutter to on-grade inlet at DP07
													0.11	0.026	2.2					84	3.0	0.5	
	7.1								8.7	2.33	4.16	9.71											Combined flows routed via pipe to DP15.2
	14	C14	0.70	0.55	5.0	0.38	4.95	1.88	5.0	0.41	4.90	1.99											Basin C14 flows routed via curb & gutter to sump inlet at DP14
	15	C15	0.31	0.54	5.0	0.17	4.95	0.84															Basin C15 flows routed via curb & gutter to sump inlet at DP15
	15.1								5.0	0.58	4.95	2.85											Combined flows routed via pipe to DP15.2
	15.2								8.7	2.91	4.16	12.11											Combined flows routed via pipe to DP16.2
	20	C20	0.05	0.05	5.0	0.00	4.95	0.00															Basin C20 flows routed via drainage swale to 24-inch nyoplast inlet at DP20
	16	C16	0.86	0.55	5.0	0.47	4.95	2.33															Basin C16 flows routed via alley to sump inlet at DP16

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 5-Year
P_1: 1.43 Inches

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
	16.1								5.0	0.47	4.95	2.33											Combined flows routed via pipe to DP16.2
	16.2								8.7	3.38	4.16	14.06											Combined flows routed via pipe to DP18.2
	6	C6	0.57	0.13	8.9	0.07	4.12	0.29															Basin C06 flows routed via drainage swale to 24-inch nyoplast inlet at DP06
	8	C8	0.09	0.21	5.0	0.02	4.95	0.10															Basin C08 flows routed via drainage swale to 24-inch nyoplast inlet at DP08
	8.1								8.9	0.09	4.12	0.37											Combined flows routed via pipe to DP9.1
	9	C9	0.12	0.20	5.0	0.02	4.95	0.10															Basin C09 flows routed via drainage swale to 24-inch nyoplast inlet at DP09
	9.1								8.9	0.11	4.12	0.45											Combined flows routed via pipe to DP10.1
	10	C10	0.02	0.05	5.0	0.00	4.95	0.00															Basin C10 flows routed via drainage swale to 24-inch nyoplast inlet at DP10
	10.1								8.9	0.11	4.12	0.45											Combined flows routed via pipe to DP11.1
	11	C11	0.11	0.24	5.0	0.03	4.95	0.15															Basin C11 flows routed via drainage swale to 24-inch nyoplast inlet at DP11
	11.1								8.9	0.14	4.12	0.58											Combined flows routed via pipe to DP12.1
	12	C12	0.09	0.29	5.0	0.03	4.95	0.15															Basin C12 flows routed via drainage swale to 24-inch nyoplast inlet at DP12
	12.1								8.9	0.17	4.12	0.70											Combined flows routed via pipe to DP13.1
	13	C13	0.07	0.20	5.0	0.01	4.95	0.05															Basin C13 flows routed via drainage swale to 24-inch nyoplast inlet at DP13
	13.1								8.9	0.18	4.12	0.74											Combined flows routed via pipe to DP18.2
	17	C17	0.16	0.36	5.0	0.06	4.95	0.30															Basin C17 flows routed via drainage swale to 24-inch nyoplast inlet at DP17
	18	C18	0.13	0.35	5.0	0.05	4.95	0.25															Basin C18 flows routed via drainage swale to 24-inch nyoplast inlet at DP18
	18.1								5.0	0.11	4.95	0.54											Combined flows routed via pipe to DP18.2
	18.2								8.9	3.67	4.12	15.12											Combined flows routed via pipe to DP19.1
	19	C19	1.51	0.05	16.4	0.08	3.18	0.25															Basin C19 flows routed via drainage swale to 24-inch nyoplast inlet at DP19
	19.1								16.4	3.75	3.18	11.93											Combined flows routed via pipe to existing 36" RCP stub
	103	T3	0.10	0.48	5.0	0.05	4.95	0.25															Basin T3 flows routed via alley to sump inlet at DP103
	109	T9	0.09	0.17	8.4	0.02	4.22	0.08															Basin T9 flows routed via property swales to area inlet at DP109

STANDARD FORM SF-3

STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 5-Year
P_1: 1.43 Inches

		DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			
STREET	Design Point	Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	REMARKS
	109.1								8.4	0.07	4.22	0.30											Combined flows routed via pipe to DP110.1
	104	T4	0.12	0.48	5.0	0.06	4.95	0.30															Basin T4 flows routed via alley to sump inlet at DP104
	110	T10	0.13	0.13	8.6	0.02	4.18	0.08															Basin T10 flows routed via property swales to area inlet at DP110
	110.1								8.6	0.15	4.18	0.63											Combined flows routed via pipe to DP111.1
	105	T5	0.12	0.48	5.0	0.06	4.95	0.30															Basin T5 flows routed via alley to sump inlet at DP105
	111	T11	0.02	0.05	9.2	0.00	4.08	0.00															Basin T11 flows routed via property swales to area inlet at DP111
	111.1								9.2	0.21	4.08	0.86											Combined flows routed via pipe to DP112.1
	101	T1	1.06	0.51	5.0	0.54	4.95	2.67								1.7	0.35	2.8	18	587	6.1	1.6	Basin T1 flows routed via alley to valley inlet at DP101
													0.93	0.188	2.7					446	3.3	2.3	
	106	T6	0.14	0.48	5.0	0.07	4.95	0.35															Basin T6 flows routed via alley to sump inlet at DP106
	106.1								5.0	0.42	4.95	2.09											Combined flows routed via pipe to DP112.1
	112	T12	0.06	0.05	9.2	0.00	4.08	0.00															Basin T12 flows routed via property swales to area inlet at DP112
	112.1								9.2	0.63	4.08	2.58											Combined flows routed via pipe to DP113.1
	107	T7	0.12	0.48	8.3	0.06	4.24	0.25															Basin T7 flows routed via alley to sump inlet at DP107
	113	T13	0.03	0.05	9.2	0.00	4.08	0.00															Basin T13 flows routed via property swales to area inlet at DP113
	113.1								9.2	0.69	4.08	2.82											Combined flows routed via pipe to DP114.1
	108	T8	0.12	0.48	8.3	0.06	4.24	0.25															Basin T8 flows routed via alley to sump inlet at DP108
	114	T14	0.04	0.05	9.2	0.00	4.08	0.00															Basin T14 flows routed via property swales to area inlet at DP114
	114.1								9.2	0.75	4.08	3.07											Combined flows routed via pipe to DP118.2
	122	T22	0.03	0.05	5.0	0.00	4.95	0.00															Basin T22 flows routed via drainage swale to 24-inch nyoplast inlet at DP122
	115	T15	0.05	0.26	5.0	0.01	4.95	0.05															Basin T15 flows routed via property swale to 24-inch area inlet at DP115
	115.1								5.0	0.01	4.95	0.05											Combined flows routed via pipe to DP116.2
	121	T21	0.08	0.05	5.0	0.00	4.95	0.00															Basin T21 flows routed via drainage swale to 24-inch nyoplast inlet at DP121
	116	T16	0.23	0.75	5.0	0.17	4.95	0.84															Basin T116 flows routed via alley to sump inlet at DP116

STANDARD FORM SF-3

STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 5-Year
P_1: 1.43 Inches

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
	116.1								5.0	0.17	4.95	0.84											Combined flows routed via pipe to DP116.2
	116.2								5.0	0.18	4.95	0.89											Combined flows routed via pipe to DP117.1
	117	T17	0.14	0.68	5.0	0.10	4.95	0.50															Basin T117 flows routed via alley to sump inlet at DP117
	117.1								5.0	0.28	4.95	1.39											Combined flows routed via pipe to DP118.1
	118	T18	0.34	0.57	5.0	0.19	4.95	0.94															Basin T118 flows routed via alley to sump inlet at DP118
	118.1								5.0	0.47	4.95	2.33											Combined flows routed via pipe to DP118.2
	118.2								9.2	1.22	4.08	4.99											Combined flows routed via pipe to DP102.1
	102	T2	1.57	0.54	5.0	0.84	4.95	4.16	5.0	1.03	4.95	5.09				4.7	0.95	2.0	24	69	7.2	0.2	Basin T2 flows routed via curb & gutter to on-grade inlet at DP102
													0.40	0.081	3.5					70	3.7	0.3	
	102.1								9.2	2.17	4.08	8.85											Combined flows routed via pipe to DP120.1
	119	T19	0.43	0.50	5.0	0.21	4.95	1.04															Basin T119 flows routed via curb & gutter to on-grade inlet at DP119
	123	T23	0.10	0.05	8.5	0.01	4.21	0.04															
	120	T20	0.07	0.51	5.0	0.04	4.95	0.20	5.0	0.12	4.95	0.60											Basin T20 flows routed via curb & gutter to on-grade inlet at DP120
	120.1								9.2	2.51	4.08	10.24											Combined flows routed via pipe to Existing 24-inch stub

Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

STANDARD FORM SF-3

STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 100-Year
P_1: 2.60 Inches

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (ac)	Runoff Coeff.	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
	1	C1	0.44	0.75	5.5	0.33	8.59	2.83															Basin C1 flows routed via curb & gutter to on-grade inlet at DP01
	2	C2	0.86	0.71	5.0	0.61	8.82	5.38								5.2	0.59	2.2	18	119	7.9	0.3	Basin C2 flows routed via curb & gutter to on-grade inlet at DP02
													0.16	0.02	2.5					84	3.2	0.4	
	3	C3	0.11	0.82	5.0	0.09	8.82	0.79															Basin C3 flows routed via alley to sump inlet DP03
	2.1								5.5	1.01	8.59	8.69											Combined flows routed via pipe to DP4.1
	4	C4	0.14	0.69	6.2	0.10	8.29	0.83															Basin C04 flows routed via drainage swale to 24-inch nyoplast inlet at DP04
	4.1								6.2	1.11	8.29	9.22											Combined flows routed via pipe to DP24.1
	24	C24	0.91	0.76	5.0	0.69	8.82	6.09	5.0	0.85	7.35	6.25				5.8	0.79	2.2	18	119	8.1	0.2	Basin C24 flows routed via curb & gutter to on-grade inlet at DP24
													0.43	0.06	2.2					84	3.0	0.5	
	24.1								6.2	1.80	8.29	14.94											Combined flows routed via pipe to DP21.1
	21	C21	0.04	0.49	5.9	0.02	8.41	0.17															Basin C21 flows routed via drainage swale to 24-inch nyoplast inlet at DP21
	21.1								6.2	1.82	8.29	15.10											Combined flows routed via pipe to DP22.1
	22	C22	0.13	0.63	5.0	0.08	8.82	0.71															Basin C22 flows routed via drainage swale to 24-inch nyoplast inlet at DP22
	22.1								6.2	1.90	8.29	15.77											Combined flows routed via pipe to DP23.1
	23	C23	0.28	0.60	5.0	0.17	8.82	1.50															Basin C23 flows routed via drainage swale to 24-inch nyoplast inlet at DP23
	23.1								6.2	2.07	8.29	17.18											Combined flows routed via pipe to DP7.1
	5	C5	0.77	0.75	5.0	0.58	8.82	5.12	5.0	0.60	9.27	5.55				5.3	0.58	2.2	18	119	7.9	0.3	Basin C5 flows routed via curb & gutter to on-grade inlet at DP05
													0.20	0.02	2.2					84	3.0	0.5	
	7	C7	0.84	0.75	8.7	0.63	7.41	4.67								3.1	0.42	2.2	18	119	6.7	0.3	Basin C7 flows routed via curb & gutter to on-grade inlet at DP07
													1.58	0.21	2.2					84	3.0	0.5	
	7.1								8.7	3.07	7.41	22.71											Combined flows routed via pipe to DP15.2
	14	C14	0.70	0.74	5.0	0.52	8.82	4.59	8.7	0.75	8.4	6.37											Basin C14 flows routed via curb & gutter to sump inlet at DP14
	15	C15	0.31	0.74	5.0	0.23	8.82	2.03															Basin C15 flows routed via curb & gutter to sump inlet at DP15

STANDARD FORM SF-3

STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 100-Year
P_1: 2.60 Inches

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (ac)	Runoff Coeff.	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
	15.1								8.7	0.98	7.41	7.30											Combined flows routed via pipe to DP15.2
	15.2								8.7	4.05	7.41	30.01											Combined flows routed via pipe to DP16.2
	20	C20	0.05	0.49	5.0	0.02	8.82	0.18															Basin C20 flows routed via drainage swale to 24-inch nyoplast inlet at DP20
	16	C16	0.86	0.74	5.0	0.64	8.82	5.64															Basin C16 flows routed via alley to sump inlet at DP16
	16.1								5.0	0.66	8.82	5.82											Combined flows routed via pipe to DP16.2
	16.2								8.7	4.71	7.41	34.90											Combined flows routed via pipe to DP18.2
	6	C6	0.57	0.53	8.9	0.30	7.34	2.20															Basin C06 flows routed via drainage swale to 24-inch nyoplast inlet at DP06
	8	C8	0.09	0.57	5.0	0.05	8.82	0.44															Basin C08 flows routed via drainage swale to 24-inch nyoplast inlet at DP08
	8.1								8.9	0.35	7.34	2.57											Combined flows routed via pipe to DP9.1
	9	C9	0.12	0.57	5.0	0.07	8.82	0.62															Basin C09 flows routed via drainage swale to 24-inch nyoplast inlet at DP09
	9.1								8.9	0.42	7.34	3.08											Combined flows routed via pipe to DP10.1
	10	C10	0.02	0.49	5.0	0.01	8.82	0.09															Basin C10 flows routed via drainage swale to 24-inch nyoplast inlet at DP10
	10.1								8.9	0.43	7.34	3.16											Combined flows routed via pipe to DP11.1
	11	C11	0.11	0.59	5.0	0.06	8.82	0.53															Basin C11 flows routed via drainage swale to 24-inch nyoplast inlet at DP11
	11.1								8.9	0.49	7.34	3.60											Combined flows routed via pipe to DP12.1
	12	C12	0.09	0.61	5.0	0.05	8.82	0.44															Basin C12 flows routed via drainage swale to 24-inch nyoplast inlet at DP12
	12.1								8.9	0.54	7.34	3.96											Combined flows routed via pipe to DP13.1
	13	C13	0.07	0.57	5.0	0.04	8.82	0.35															Basin C13 flows routed via drainage swale to 24-inch nyoplast inlet at DP13
	13.1								8.9	0.58	7.34	4.26											Combined flows routed via pipe to DP18.2
	17	C17	0.16	0.65	5.0	0.10	8.82	0.88															Basin C17 flows routed via drainage swale to 24-inch nyoplast inlet at DP17
	18	C18	0.13	0.64	5.0	0.08	8.82	0.71															Basin C18 flows routed via drainage swale to 24-inch nyoplast inlet at DP18
	18.1								5.0	0.18	8.82	1.59											Combined flows routed via pipe to DP18.2
	18.2								8.9	5.47	7.34	40.15											Combined flows routed via pipe to DP19.1

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 100-Year
P$_1$: 2.60 Inches

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (ac)	Runoff Coeff.	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
	19	C19	1.51	0.49	16.4	0.74	5.65	4.18															Basin C19 flows routed via drainage swale to 24-inch nyoplast inlet at DP19
	19.1								16.4	6.21	5.65	35.09											Combined flows routed via pipe to existing 36" RCP stub
	103	T3	0.10	0.71	5.0	0.07	8.82	0.62															Basin T3 flows routed via alley to sump inlet at DP103
	109	T9	0.09	0.55	8.4	0.05	7.52	0.38															Basin T9 flows routed via property swales to area inlet at DP109
	109.1								8.4	0.12	7.52	0.90											Combined flows routed via pipe to DP110.1
	104	T4	0.12	0.70	5.0	0.08	8.82	0.71															Basin T4 flows routed via alley to sump inlet at DP104
	110	T10	0.13	0.53	8.6	0.07	7.44	0.52															Basin T10 flows routed via property swales to area inlet at DP110
	110.1								8.6	0.27	7.44	2.01											Combined flows routed via pipe to DP111.1
	105	T5	0.12	0.70	5.0	0.08	8.82	0.71															Basin T5 flows routed via alley to sump inlet at DP105
	111	T11	0.02	0.49	9.2	0.01	7.26	0.07															Basin T11 flows routed via property swales to area inlet at DP111
	111.1								9.2	0.36	7.26	2.61											Combined flows routed via pipe to DP112.1
	101	T1	1.06	0.72	5.0	0.76	8.82	6.70								2.9	0.33	2.8	18	587	7.2	1.4	Basin T1 flows routed via alley to valley inlet at DP101
													3.78	0.43	2.7					446	3.3	2.3	
	106	T6	0.14	0.71	5.0	0.10	8.82	0.88															Basin T6 flows routed via alley to sump inlet at DP106
	106.1								5.0	0.43	8.82	3.81											Combined flows routed via pipe to DP112.1
	112	T12	0.06	0.49	9.2	0.03	7.26	0.22															Basin T12 flows routed via property swales to area inlet at DP112
	112.1								9.2	0.82	7.26	5.96											Combined flows routed via pipe to DP113.1
	107	T7	0.12	0.70	8.3	0.08	7.55	0.60															Basin T7 flows routed via alley to sump inlet at DP107
	113	T13	0.03	0.49	9.2	0.01	7.26	0.07															Basin T13 flows routed via property swales to area inlet at DP113
	113.1								9.2	0.91	7.26	6.62											Combined flows routed via pipe to DP114.1
	108	T8	0.12	0.70	8.3	0.08	7.55	0.60															Basin T8 flows routed via alley to sump inlet at DP108
	114	T14	0.04	0.49	9.2	0.02	7.26	0.15															Basin T14 flows routed via property swales to area inlet at DP114
	114.1								9.2	1.01	7.26	7.34											Combined flows routed via pipe to DP118.2

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

Subdivision: Ridgegate
Location: Douglas County - Zone 1
Design Storm: 100-Year
P_1: 2.60 Inches

Project Name: Lyric Condos
Project No.: 15950.10
Calculated By: MJP
Checked By:
Date: 12/27/22

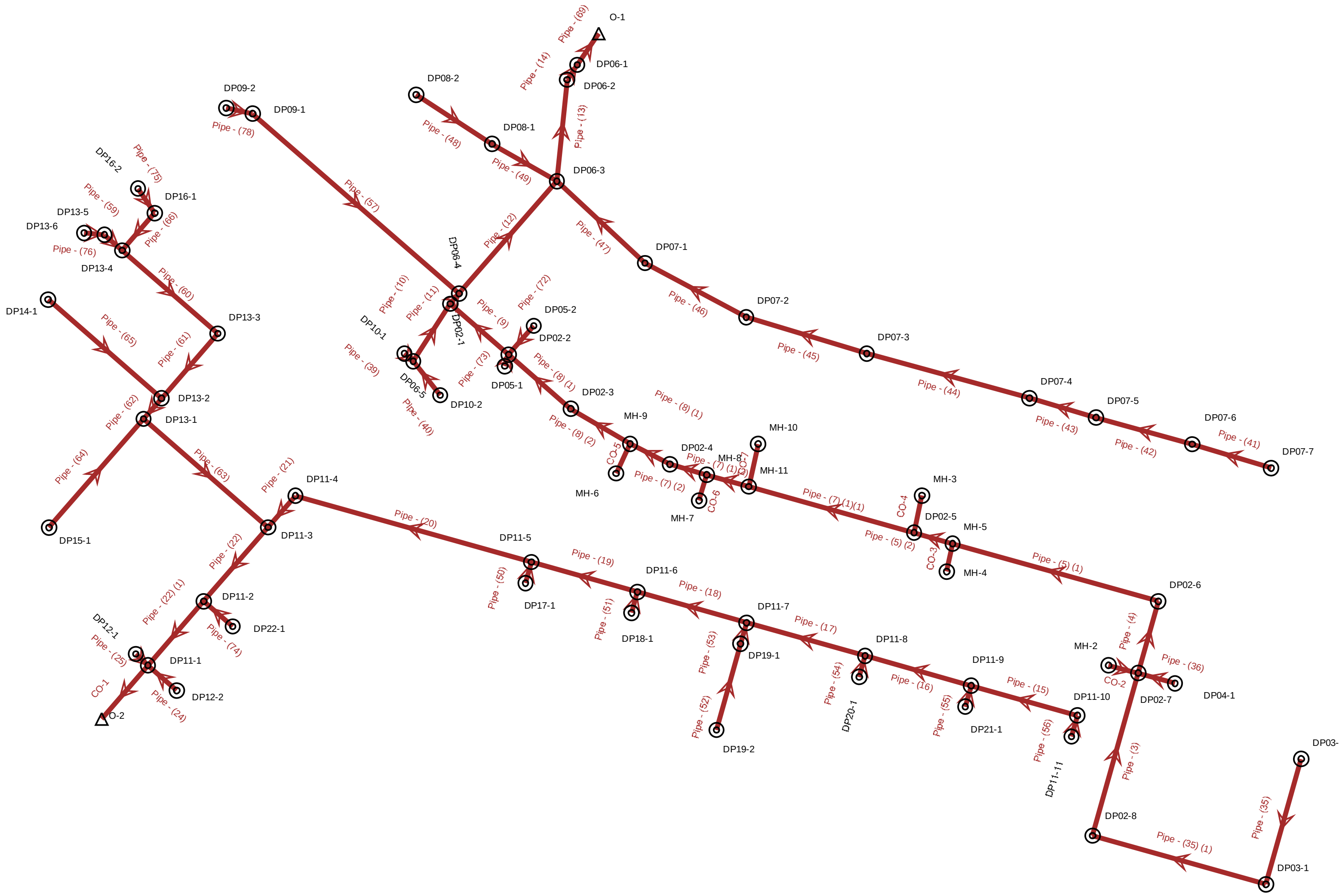
STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (ac)	Runoff Coeff.	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
	122	T22	0.03	0.49	5.0	0.01	8.82	0.09															Basin T22 flows routed via drainage swale to 24-inch nyoplast inlet at DP122
	115	T15	0.05	0.60	5.0	0.03	8.82	0.26															Basin T15 flows routed via property swale to 24-inch area inlet at DP115
	115.1								5.0	0.04	8.82	0.35											Combined flows routed via pipe to DP116.2
	121	T21	0.08	0.49	5.0	0.04	8.82	0.35															Basin T21 flows routed via drainage swale to 24-inch nyoplast inlet at DP121
	116	T16	0.23	0.84	5.0	0.19	8.82	1.68															Basin T116 flows routed via alley to sump inlet at DP116
	116.1								5.0	0.23	8.82	2.03											Combined flows routed via pipe to DP116.2
	116.2								5.0	0.27	8.82	2.38											Combined flows routed via pipe to DP117.1
	117	T17	0.14	0.81	5.0	0.11	8.82	0.97															Basin T117 flows routed via alley to sump inlet at DP117
	117.1								5.0	0.38	8.82	3.35											Combined flows routed via pipe to DP118.1
	118	T18	0.34	0.75	5.0	0.26	8.82	2.29															Basin T118 flows routed via alley to sump inlet at DP118
	118.1								5.0	0.64	8.82	5.64											Combined flows routed via pipe to DP118.2
	118.2								9.2	1.65	7.26	11.99											Combined flows routed via pipe to DP102.1
	102	T2	1.57	0.74	5.0	1.15	8.82	10.14	5.0	1.58	8.82	13.92				8.2	0.93	2.0	24	69	8.5	0.1	Basin T2 flows routed via curb & gutter to on-grade inlet at DP102
													5.75	0.65	3.5					70	3.7	0.3	
	102.1								9.2	2.58	7.26	18.72											Combined flows routed via pipe to DP120.1
	119	T19	0.43	0.72	5.0	0.31	8.82	2.73															Basin T119 flows routed via curb & gutter to on-grade inlet at DP119
	123	T23	0.10	0.49	8.5	0.05	7.49	0.37															
	120	T20	0.07	0.72	5.0	0.05	8.82	0.44	5.0	0.70	8.82	6.19											Basin T20 flows routed via curb & gutter to on-grade inlet at DP120
	120.1								9.2	3.64	7.26	26.43											Combined flows routed via pipe to Existing 24-inch stub

Notes:
Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

ATTACHMENT C

HYDRAULIC CALCULATIONS

Scenario: 100-YR



Scenario: 5-YR
Current Time Step: 0.000 h
Conduit FlexTable: Combined Pipe/Node Report

Label	Slope (Calculated) (ft/ft)	Diameter (in)	Capacity (Full Flow) (cfs)	Length (User Defined) (ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Flow (cfs)	HGL (In) (ft)	HGL (Out) (ft)	Velocity (ft/s)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)	Manning's n	Upstream Structure Headloss Coefficient
CO-1	0.011	24.0	24.01	57.7	6,005.59	6,004.94	10.24	6,006.74	6,005.86	7.34	6,007.21	6,006.67	0.013	0.013
CO-2	0.025	18.0	16.63	11.2	6,029.69	6,029.41	1.21	6,030.10	6,029.70	5.48	6,030.25	6,030.09	0.013	0.000
CO-3	0.020	12.0	6.57	17.9	6,023.86	6,023.50	0.00	6,023.86	6,023.73	0.00	6,023.86	6,023.73	0.010	0.000
CO-4	0.010	18.0	10.48	31.2	6,022.83	6,022.52	2.62	6,023.44	6,023.03	4.93	6,023.67	6,023.41	0.013	0.000
CO-5	0.020	12.0	5.07	15.3	6,016.49	6,016.18	0.00	6,016.65	6,016.65	0.00	6,016.65	6,016.65	0.013	0.000
CO-6	0.020	12.0	6.58	16.8	6,018.98	6,018.64	0.00	6,019.10	6,019.10	0.00	6,019.10	6,019.10	0.010	0.000
CO-7	0.020	12.0	6.54	41.1	6,020.32	6,019.50	0.00	6,020.32	6,019.96	0.00	6,020.32	6,019.96	0.010	0.000
Pipe - (3)	0.022	18.0	15.58	137.9	6,032.45	6,029.42	0.40	6,032.69	6,029.66	3.76	6,032.77	6,029.74	0.013	0.041
Pipe - (4)	0.022	18.0	15.58	60.7	6,028.93	6,027.59	3.62	6,029.65	6,028.08	7.18	6,029.94	6,028.89	0.013	0.021
Pipe - (5) (1)	0.029	18.0	17.81	141.9	6,027.08	6,023.00	3.62	6,027.81	6,023.73	7.91	6,028.09	6,024.01	0.013	0.081
Pipe - (5) (2)	0.029	18.0	17.79	16.7	6,023.00	6,022.52	3.62	6,023.73	6,023.03	7.90	6,024.01	6,023.77	0.013	0.000
Pipe - (7) (1)(1)	0.018	18.0	13.98	170.5	6,022.02	6,019.00	6.23	6,022.98	6,019.97	7.68	6,023.40	6,020.38	0.013	0.030
Pipe - (7) (1)(2)	0.018	18.0	13.96	48.7	6,019.00	6,018.14	6.23	6,019.96	6,019.11	7.67	6,020.38	6,019.52	0.013	0.000
Pipe - (7) (2)	0.018	18.0	13.97	38.4	6,018.14	6,017.46	6.23	6,019.10	6,018.19	7.68	6,019.52	6,019.03	0.013	0.000
Pipe - (8) (1)	0.022	18.0	15.66	58.0	6,016.97	6,015.68	6.23	6,017.93	6,016.65	8.35	6,018.35	6,017.06	0.013	0.033
Pipe - (8) (1)	0.022	18.0	15.58	67.2	6,014.43	6,012.95	6.23	6,015.40	6,013.62	8.32	6,015.81	6,014.68	0.013	0.033
Pipe - (8) (2)	0.022	18.0	15.58	34.6	6,015.68	6,014.92	6.23	6,016.65	6,015.61	8.32	6,017.06	6,016.56	0.013	0.001
Pipe - (9)	0.060	18.0	25.71	63.4	6,012.45	6,008.65	9.71	6,013.65	6,009.31	13.53	6,014.29	6,011.94	0.013	0.022
Pipe - (10)	0.028	18.0	17.52	55.8	6,010.20	6,008.65	2.85	6,010.84	6,009.59	7.30	6,011.09	6,009.68	0.013	0.101
Pipe - (11)	0.010	18.0	10.50	11.0	6,008.15	6,008.04	12.11	6,009.56	6,009.36	6.85	6,010.32	6,010.20	0.013	0.038
Pipe - (12)	0.020	24.0	32.09	121.6	6,007.54	6,005.09	14.06	6,008.89	6,006.02	9.88	6,009.49	6,007.53	0.013	0.015
Pipe - (13)	0.020	24.0	31.99	83.2	5,992.31	5,990.64	15.12	5,993.71	5,991.63	10.04	5,994.35	5,993.12	0.013	0.063
Pipe - (14)	0.020	36.0	94.31	14.6	5,989.64	5,989.35	11.93	5,990.74	5,990.20	9.14	5,991.15	5,991.03	0.013	0.033
Pipe - (15)	0.020	18.0	14.94	90.0	6,029.05	6,027.23	0.30	6,029.25	6,027.38	3.35	6,029.32	6,027.55	0.013	0.057
Pipe - (16)	0.010	18.0	10.50	90.0	6,027.03	6,026.13	0.63	6,027.32	6,026.38	3.27	6,027.42	6,026.54	0.013	0.033
Pipe - (17)	0.020	18.0	14.85	100.5	6,025.93	6,023.92	0.86	6,026.28	6,024.17	4.57	6,026.40	6,024.49	0.013	0.009
Pipe - (18)	0.030	18.0	18.19	92.5	6,023.42	6,020.65	2.58	6,024.03	6,021.03	7.28	6,024.26	6,021.85	0.013	0.017
Pipe - (19)	0.035	18.0	19.64	90.1	6,020.14	6,016.99	2.82	6,020.78	6,017.38	7.89	6,021.02	6,018.34	0.013	0.010
Pipe - (20)	0.031	18.0	18.37	200.1	6,016.49	6,010.37	3.07	6,017.16	6,010.79	7.71	6,017.41	6,011.71	0.013	0.012
Pipe - (21)	0.020	18.0	14.85	34.2	6,010.17	6,009.49	3.07	6,010.84	6,009.96	6.62	6,011.09	6,010.61	0.013	0.071
Pipe - (22)	0.020	24.0	31.99	79.9	6,008.99	6,007.39	4.94	6,009.77	6,008.26	7.39	6,010.06	6,008.48	0.013	0.011
Pipe - (22) (1)	0.020	24.0	31.99	69.4	6,007.19	6,005.80	8.85	6,008.25	6,006.53	8.71	6,008.68	6,007.66	0.013	0.013
Pipe - (24)	0.020	18.0	14.85	31.2	6,007.43	6,006.80	0.60	6,007.71	6,007.01	4.11	6,007.81	6,007.27	0.013	0.000
Pipe - (25)	0.020	18.0	14.85	9.1	6,006.98	6,006.80	1.04	6,007.37	6,007.09	4.84	6,007.50	6,007.39	0.013	0.000
Pipe - (35)	0.010	18.0	10.50	104.8	6,035.45	6,034.40	0.40	6,035.69	6,034.60	2.86	6,035.77	6,034.73	0.013	0.000
Pipe - (35) (1)	0.009	18.0	9.69	147.0	6,034.20	6,032.95	0.40	6,034.44	6,033.16	2.70	6,034.52	6,033.27	0.013	0.040
Pipe - (36)	0.020	18.0	14.85	29.8	6,030.02	6,029.42	2.08	6,030.56	6,029.81	5.93	6,030.76	6,030.33	0.013	0.000
Pipe - (39)	0.020	18.0	14.85	9.5	6,010.89	6,010.70	0.84	6,011.23	6,010.96	4.54	6,011.35	6,011.23	0.013	0.000
Pipe - (40)	0.020	18.0	14.85	34.1	6,011.38	6,010.70	1.99	6,011.92	6,011.08	5.85	6,012.11	6,011.60	0.013	0.000
Pipe - (41)	0.025	12.0	7.32	67.3	6,032.61	6,030.93	0.29	6,032.84	6,031.07	4.53	6,032.91	6,031.39	0.010	0.000
Pipe - (42)	0.025	12.0	7.32	81.4	6,030.73	6,028.69	0.37	6,030.98	6,028.84	4.87	6,031.07	6,029.21	0.010	0.018
Pipe - (43)	0.025	12.0	7.32	56.7	6,028.49	6,027.07	0.45	6,028.77	6,027.24	5.17	6,028.87	6,027.66	0.010	0.032
Pipe - (44)	0.025	12.0	7.32	137.8	6,026.88	6,023.43	0.45	6,027.15	6,023.60	5.17	6,027.25	6,024.02	0.010	0.008
Pipe - (45)	0.025	12.0	7.32	102.8	6,023.23	6,020.66	0.58	6,023.55	6,020.85	5.56	6,023.66	6,021.33	0.010	0.046
Pipe - (46)	0.025	12.0	7.32	93.7	6,020.46	6,018.12	0.70	6,020.81	6,018.33	5.88	6,020.94	6,018.87	0.010	0.078
Pipe - (47)	0.020	18.0	14.85	98.1	6,017.62	6,015.66	0.74	6,017.94	6,015.88	4.38	6,018.05	6,016.18	0.013	0.014
Pipe - (48)	0.015	12.0	5.67	73.8	6,011.88	6,010.77	0.30	6,012.11	6,010.93	3.83	6,012.19	6,011.16	0.010	0.000
Pipe - (49)	0.015	18.0	12.86	61.1	6,010.27	6,009.36	0.54	6,010.55	6,009.57	3.60	6,010.64	6,009.77	0.013	0.006
Pipe - (50)	0.050	18.0	23.47	17.9	6,017.88	6,016.99	0.25	6,018.07	6,017.18	4.35	6,018.13	6,017.24	0.013	0.000
Pipe - (51)	0.050	18.0	23.47	17.9	6,021.53	6,020.64	0.25	6,021.72	6,020.75	4.35	6,021.78	6,021.04	0.013	0.000
Pipe - (52)	0.020	18.0	14.85	73.0	6,026.40	6,024.94	2.00	6,026.94	6,025.31	5.86	6,027.13	6,025.85	0.013	0.000
Pipe - (53)	0.035	18.0	19.64	17.8	6,024.55	6,023.92	2.09	6,025.09	6,024.27	7.24	6,025.29	6,024.95	0.013	0.033
Pipe - (54)	0.050	18.0	23.47	17.9	6,027.02	6,026.13	0.30	6,027.23	6,026.25	4.59	6,027.29	6,026.58	0.013	0.000
Pipe - (55)	0.050	18.0	23.47	17.9	6,028.12	6,027.23	0.30	6,028.33	6,027.35	4.59	6,028.40	6,027.68	0.013	0.000
Pipe - (56)	0.030	18.0	18.19	17.8	6,029.79	6,029.25	0.25	6,029.97	6,029.38	3.63	6,030.04	6,029.58	0.013	0.000
Pipe - (57)	0.005	18.0	7.40	222.1	6,009.14	6,008.04	2.33	6,009.72	6,008.95	3.71	6,009.93	6,009.01	0.013	0.044
Pipe - (59)	0.010	18.0	10.50	17.9	6,013.04	6,012.86	0.84	6,013.38	6,013.15	3.56	6,013.50	6,013.34	0.013	0.033
Pipe - (60)	0.010	18.0	10.50	103.3	6,012.66	6,011.63	0.89	6,013.01	6,011.92	3.62	6,013.14	6,012.13	0.013	0.002
Pipe - (61)	0.007	18.0	8.79	70.0	6,011.43	6,010.94	0.89	6,011.78	6,011.26	3.19	6,011.91	6,011.42	0.013	0.053
Pipe - (62)	0.007	18.0	8.79	22.3	6,010.74	6,010.59	1.39	6,011.18	6,010.99	3.63	6,011.34	6,011.19	0.013	0.017
Pipe - (63)	0.007	18.0	8.55	134.8	6,010.38	6,009.49	2.33	6,010.96	6,010.03	4.12	6,011.17	6,010.29	0.013	0.023
Pipe - (64)	0.025	18.0	16.61	117.5	6,013.52	6,010.58	0.94	6,013.88	6,010.96	5.08	6,014.01	6,011.07	0.013	0.000
Pipe - (65)	0.027	18.0	17.42	121.3	6,014.28	6,010.94	0.50	6,014.54	6,011.12	4.35	6,014.63	6,011.41	0.013	0.000
Pipe - (66)	0.006	18.0	8.25	40.3	6,013.11	6,012.86	0.05	6,013.19	6,013.01	1.28	6,013.22	6,013.02	0.013	0.019
Pipe - (69)	0.020	36.0	94.56	30.8	5,989.34	5,988.72	11.93	5,990.44	5,989.51	9.15	5,990.84	5,990.52	0.013	0.000
Pipe - (72)	0.020	18.0	14.85	29.7	6,013.55	6,012.95	2.18	6,014.10	6,013.72	6.01	6,014.31	6,013.81	0.013	0.000
Pipe - (73)	0.020	18.0	14.85	9.0	6,013.13	6,012.95	1.96	6,013.66	6,013.72	5.83	6,013.85	6,013.79	0.013	0.000
Pipe - (74)	0.050	18.0	23.47	31.3	6,009.45	6,007.89	5.09	6,010.32	6,008.40	10.61	6,010.68	6,009.86	0.013	0.000
Pipe - (75)	0.010	12.0	4.63	24.2	6,013.85	6,013.61	0.00	6,013.85	6,013.61	0.00	6,013.85	6,013.61	0.010	0.000
Pipe - (76)	0.030	12.0	8.02	15.9	6,014.02	6,013.54	0.00	6,014.02	6,013.54	0.00	6,014.02	6,013.54	0.010	0.000
Pipe - (78)	0.020	12.0	6.55	21.0	6,010.06	6,009.64	0.00	6,010.06	6,009.73	0.00	6,010.06	6,009.73	0.010	0.000

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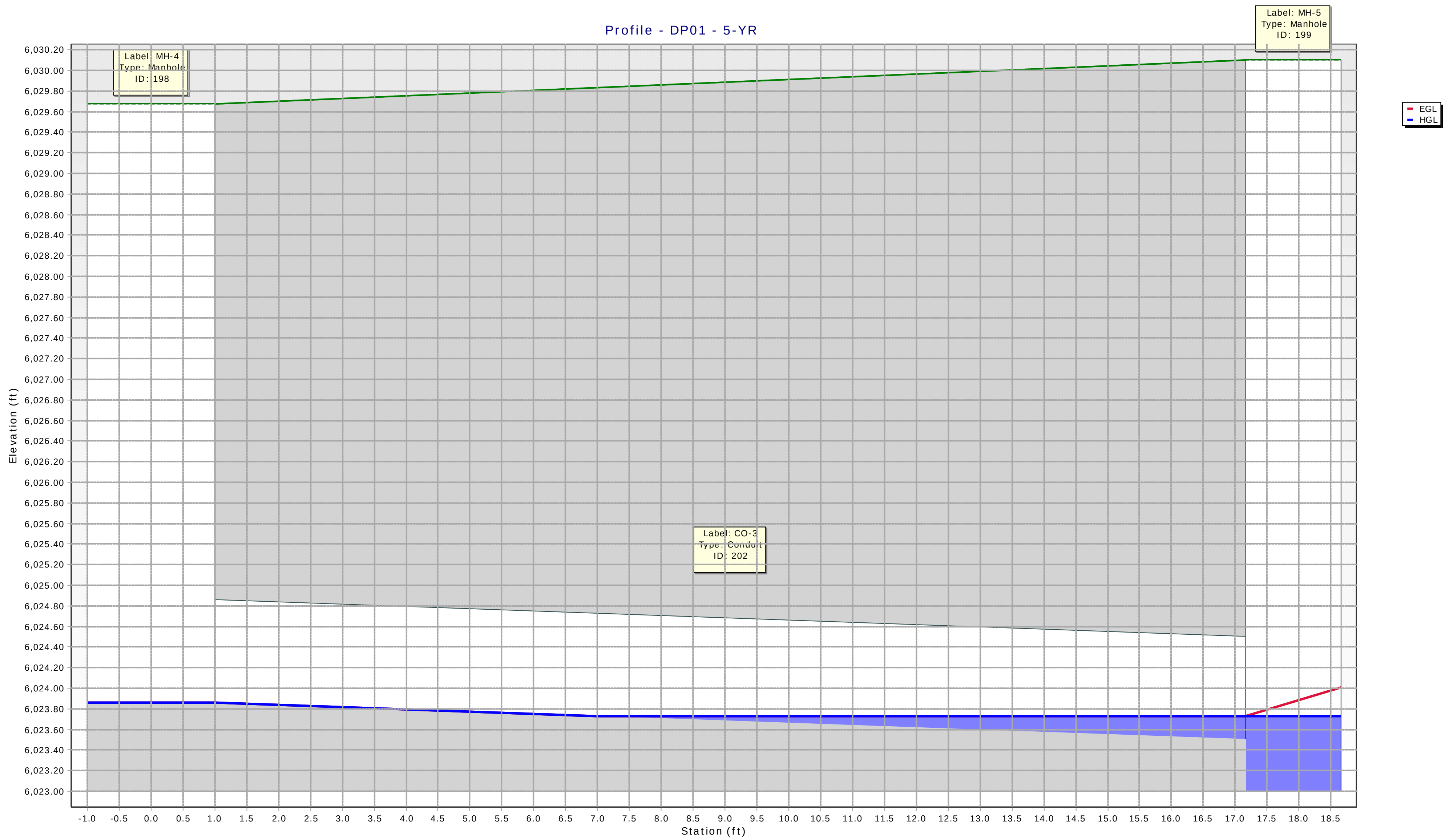
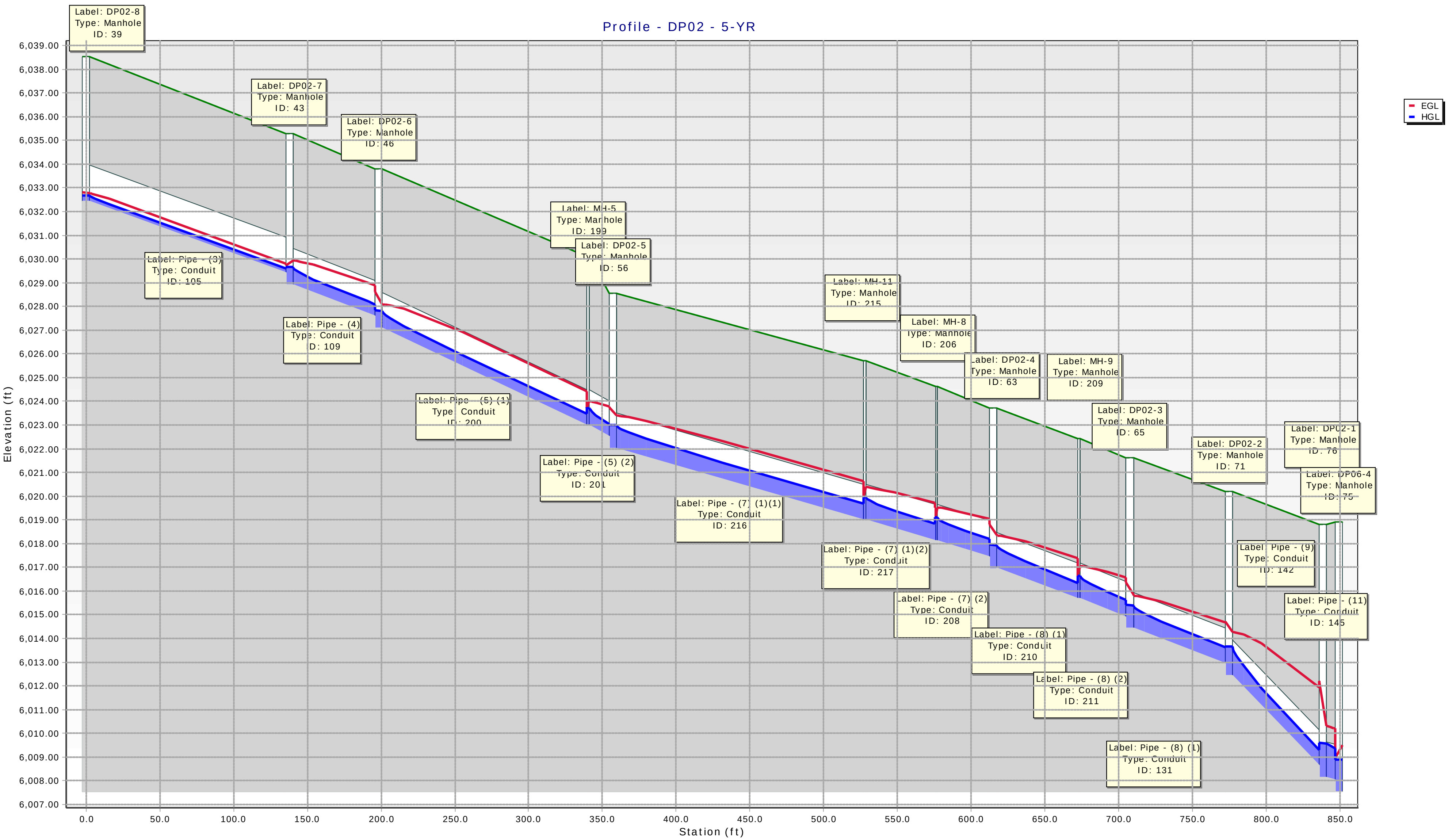
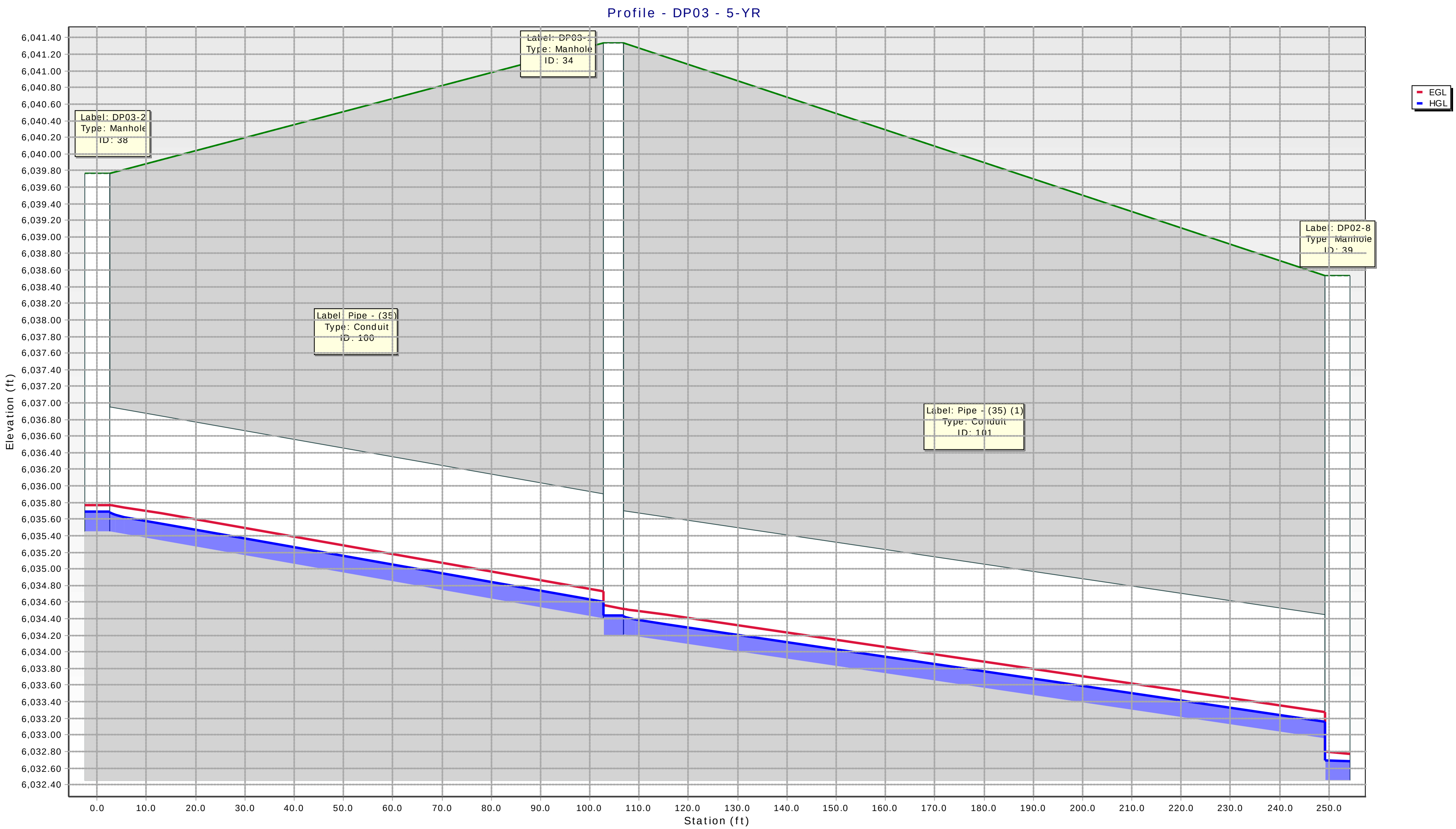


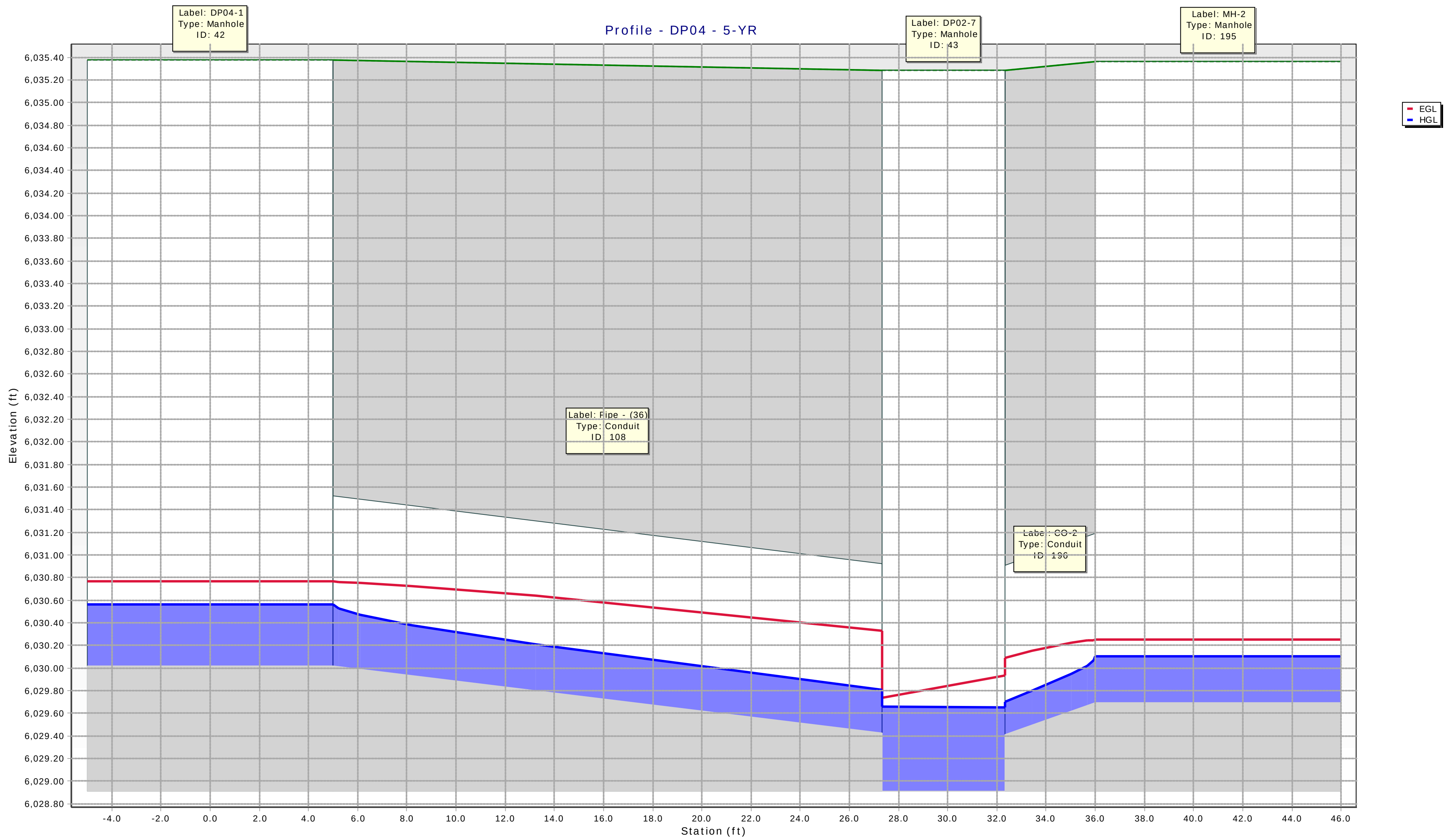
Profile - DP01 - 5-YR
Label: MH-4
Type: Manhole
ID: 198
Label: MH-5
Type: Manhole
ID: 199
Label: CO-3
Type: Conduit
ID: 202
EGL
HGL
Elevation (ft)
Station (ft)
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
6,028.60
6,028.40
6,028.20
6,028.00
6,027.80
6,027.60
6,027.40
6,027.20
6,027.00
6,026.80
6,026.60
6,026.40
6,026.20
6,026.00
6,025.80
6,025.60
6,025.40
6,025.20
6,025.00
6,024.80
6,024.60
6,024.40
6,024.20
6,024.00
6,023.80
6,023.60
6,023.40
6,023.20
6,023.00
-1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5



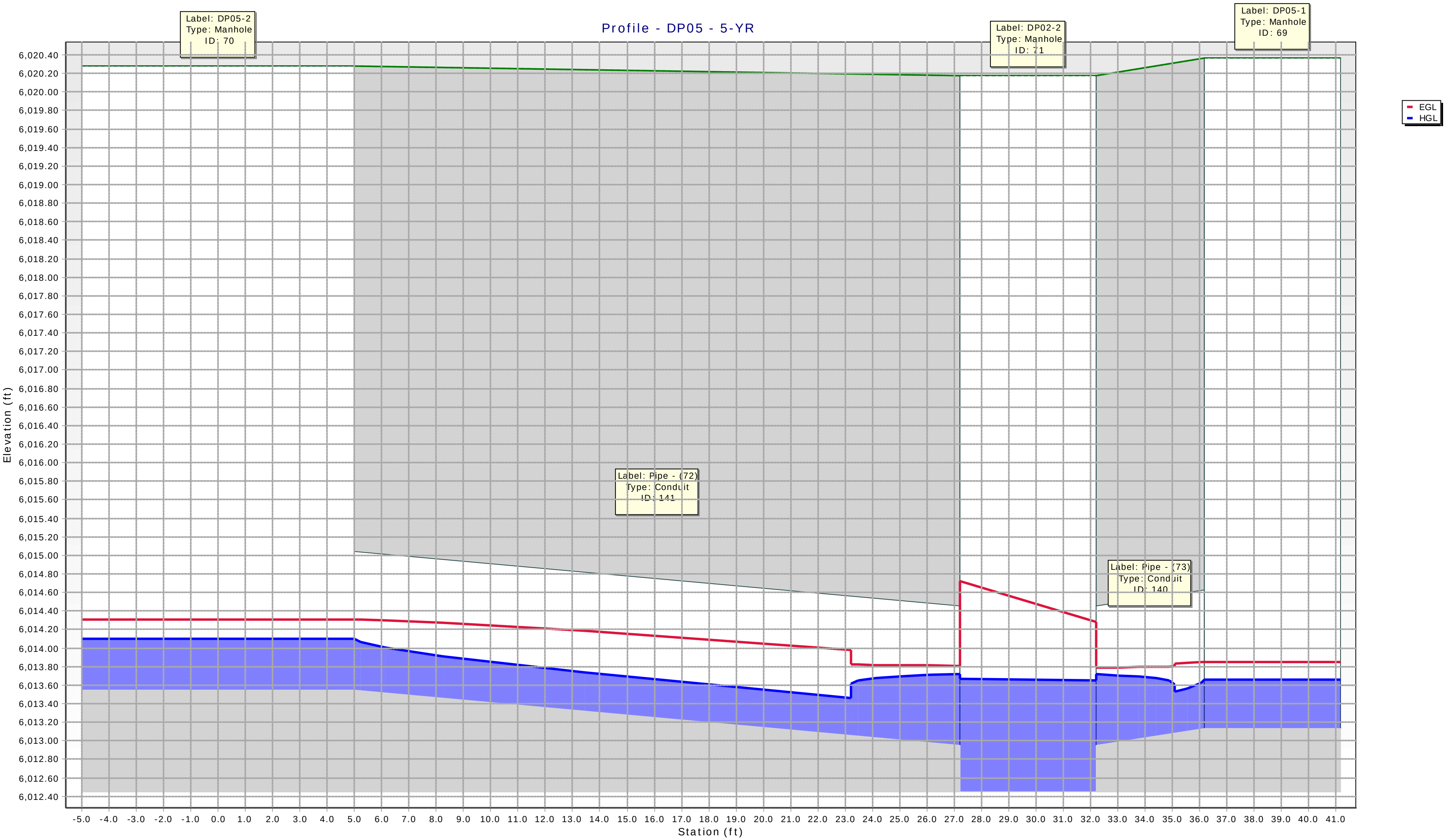
Profile - DP02 - 5-YR
Label: DP02-8 Type: Manhole ID: 39
Label: DP02-7 Type: Manhole ID: 43
Label: DP02-6 Type: Manhole ID: 46
Label: MH-5 Type: Manhole ID: 199
Label: DP02-5 Type: Manhole ID: 56
Label: MH-11 Type: Manhole ID: 215
Label: MH-8 Type: Manhole ID: 206
Label: DP02-4 Type: Manhole ID: 63
Label: MH-9 Type: Manhole ID: 209
Label: DP02-3 Type: Manhole ID: 65
Label: DP02-2 Type: Manhole ID: 71
Label: DP02-1 Type: Manhole ID: 76
Label: DP06-4 Type: Manhole ID: 75
Label: Pipe - (3) Type: Conduit ID: 105
Label: Pipe - (4) Type: Conduit ID: 109
Label: Pipe - (5) (1) Type: Conduit ID: 200
Label: Pipe - (5) (2) Type: Conduit ID: 201
Label: Pipe - (7) (1)(1) Type: Conduit ID: 216
Label: Pipe - (7) (1)(2) Type: Conduit ID: 217
Label: Pipe - (7) (2) Type: Conduit ID: 208
Label: Pipe - (8) (1) Type: Conduit ID: 210
Label: Pipe - (8) (2) Type: Conduit ID: 211
Label: Pipe - (8) (1) Type: Conduit ID: 131
Label: Pipe - (9) Type: Conduit ID: 142
Label: Pipe - (11) Type: Conduit ID: 145
EGL
HGL
Elevation (ft)
6,039.00
6,038.00
6,037.00
6,036.00
6,035.00
6,034.00
6,033.00
6,032.00
6,031.00
6,030.00
6,029.00
6,028.00
6,027.00
6,026.00
6,025.00
6,024.00
6,023.00
6,022.00
6,021.00
6,020.00
6,019.00
6,018.00
6,017.00
6,016.00
6,015.00
6,014.00
6,013.00
6,012.00
6,011.00
6,010.00
6,009.00
6,008.00
6,007.00
Station (ft)
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
750.0
800.0
850.0



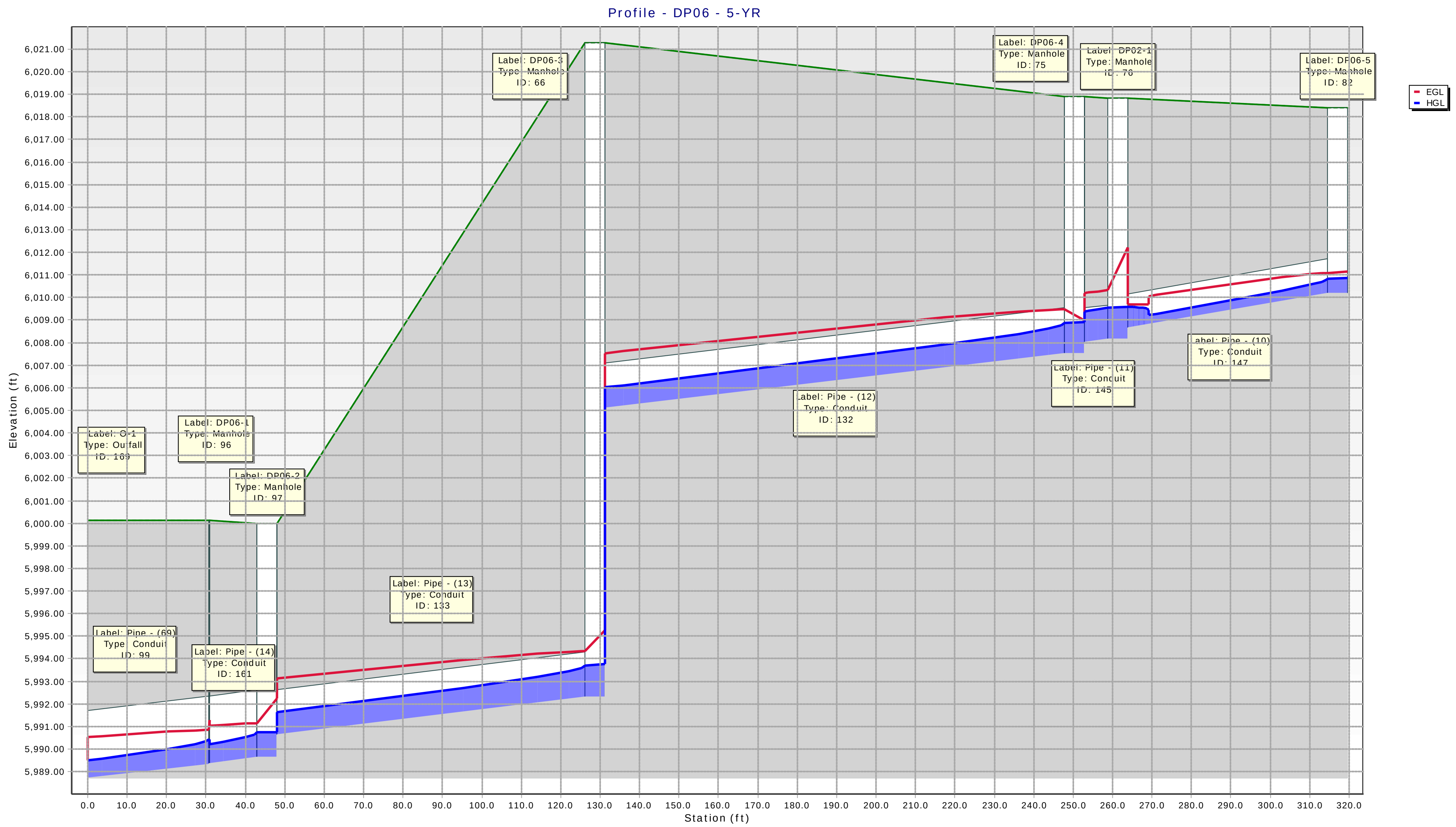
Profile - DP03 - 5-YR
Label: DP03-2
Type: Manhole
ID: 38
Label: DP03-1
Type: Manhole
ID: 34
Label: DP02-8
Type: Manhole
ID: 39
Label: Pipe - (35)
Type: Conduit
ID: 100
Label: Pipe - (35) (1)
Type: Conduit
ID: 101
EGL
HGL
Elevation (ft)
Station (ft)
6,041.40
6,041.20
6,041.00
6,040.80
6,040.60
6,040.40
6,040.20
6,040.00
6,039.80
6,039.60
6,039.40
6,039.20
6,039.00
6,038.80
6,038.60
6,038.40
6,038.20
6,038.00
6,037.80
6,037.60
6,037.40
6,037.20
6,037.00
6,036.80
6,036.60
6,036.40
6,036.20
6,036.00
6,035.80
6,035.60
6,035.40
6,035.20
6,035.00
6,034.80
6,034.60
6,034.40
6,034.20
6,034.00
6,033.80
6,033.60
6,033.40
6,033.20
6,033.00
6,032.80
6,032.60
6,032.40
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
110.0
120.0
130.0
140.0
150.0
160.0
170.0
180.0
190.0
200.0
210.0
220.0
230.0
240.0
250.0



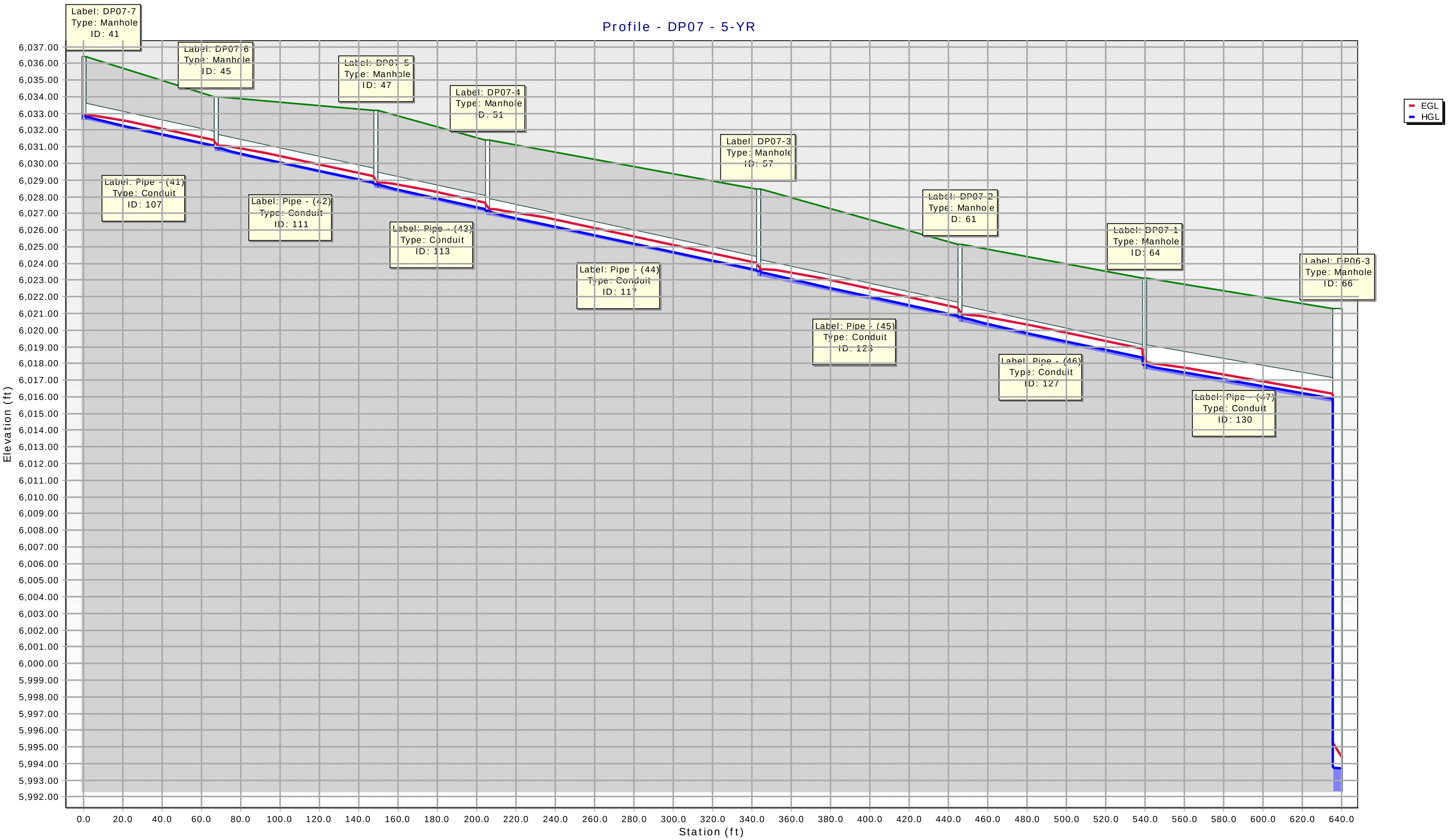
Profile - DP04 - 5-YR
Label: DP04-1
Type: Manhole
ID: 42
Label: DP02-7
Type: Manhole
ID: 43
Label: MH-2
Type: Manhole
ID: 195
Label: Pipe - (36)
Type: Conduit
ID: 108
Label: CO-2
Type: Conduit
ID: 196
EGL
HGL
Elevation (ft)
Station (ft)
6,035.40
6,035.20
6,035.00
6,034.80
6,034.60
6,034.40
6,034.20
6,034.00
6,033.80
6,033.60
6,033.40
6,033.20
6,033.00
6,032.80
6,032.60
6,032.40
6,032.20
6,032.00
6,031.80
6,031.60
6,031.40
6,031.20
6,031.00
6,030.80
6,030.60
6,030.40
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
-4.0
-2.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
34.0
36.0
38.0
40.0
42.0
44.0
46.0



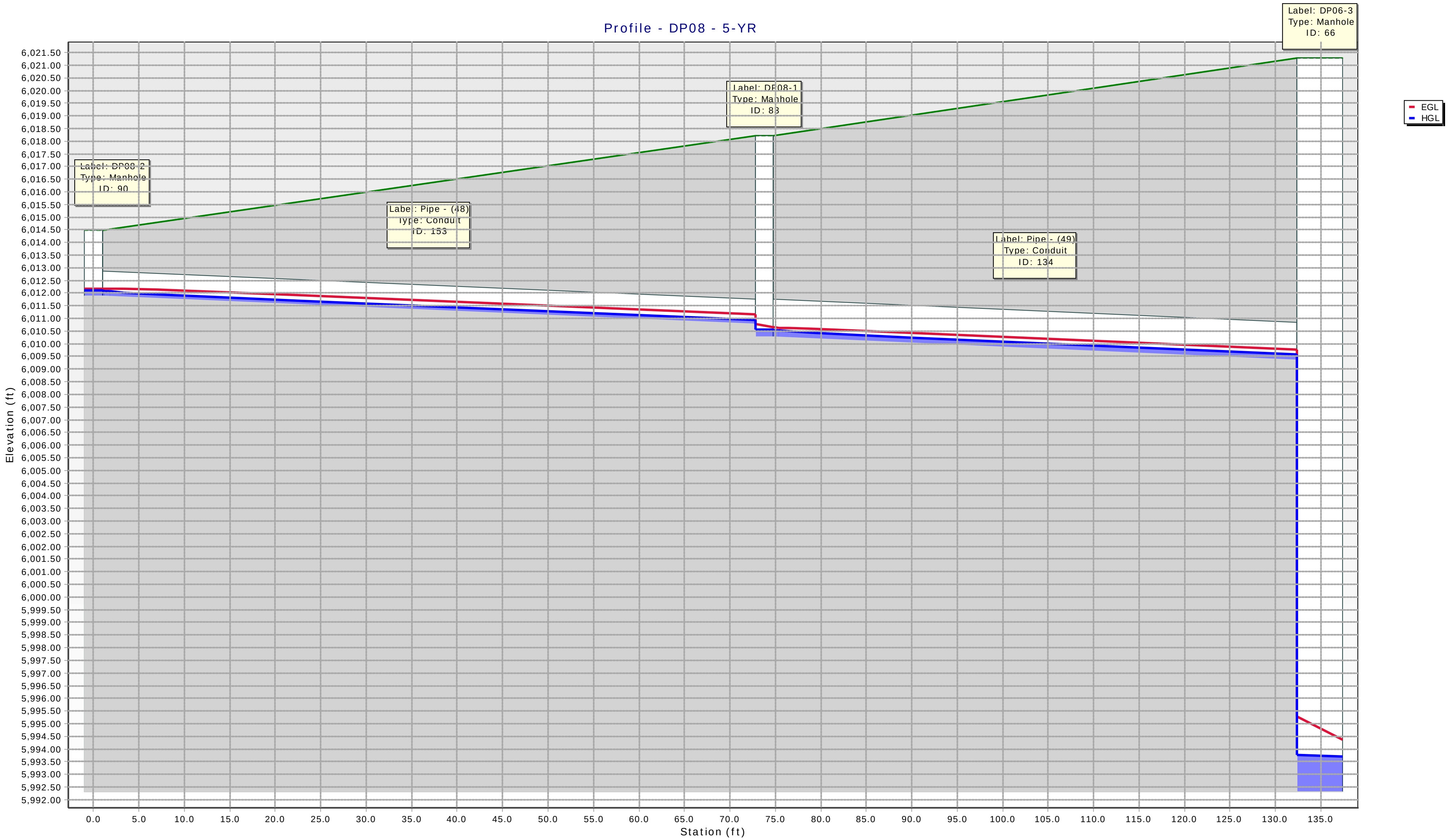
Profile - DP05 - 5-YR
Label: DP05-2
Type: Manhole
ID: 70
Label: DP02-2
Type: Manhole
ID: 71
Label: DP05-1
Type: Manhole
ID: 69
Label: Pipe - (72)
Type: Conduit
ID: 141
Label: Pipe - (73)
Type: Conduit
ID: 140
EGL
HGL
Elevation (ft)
Station (ft)



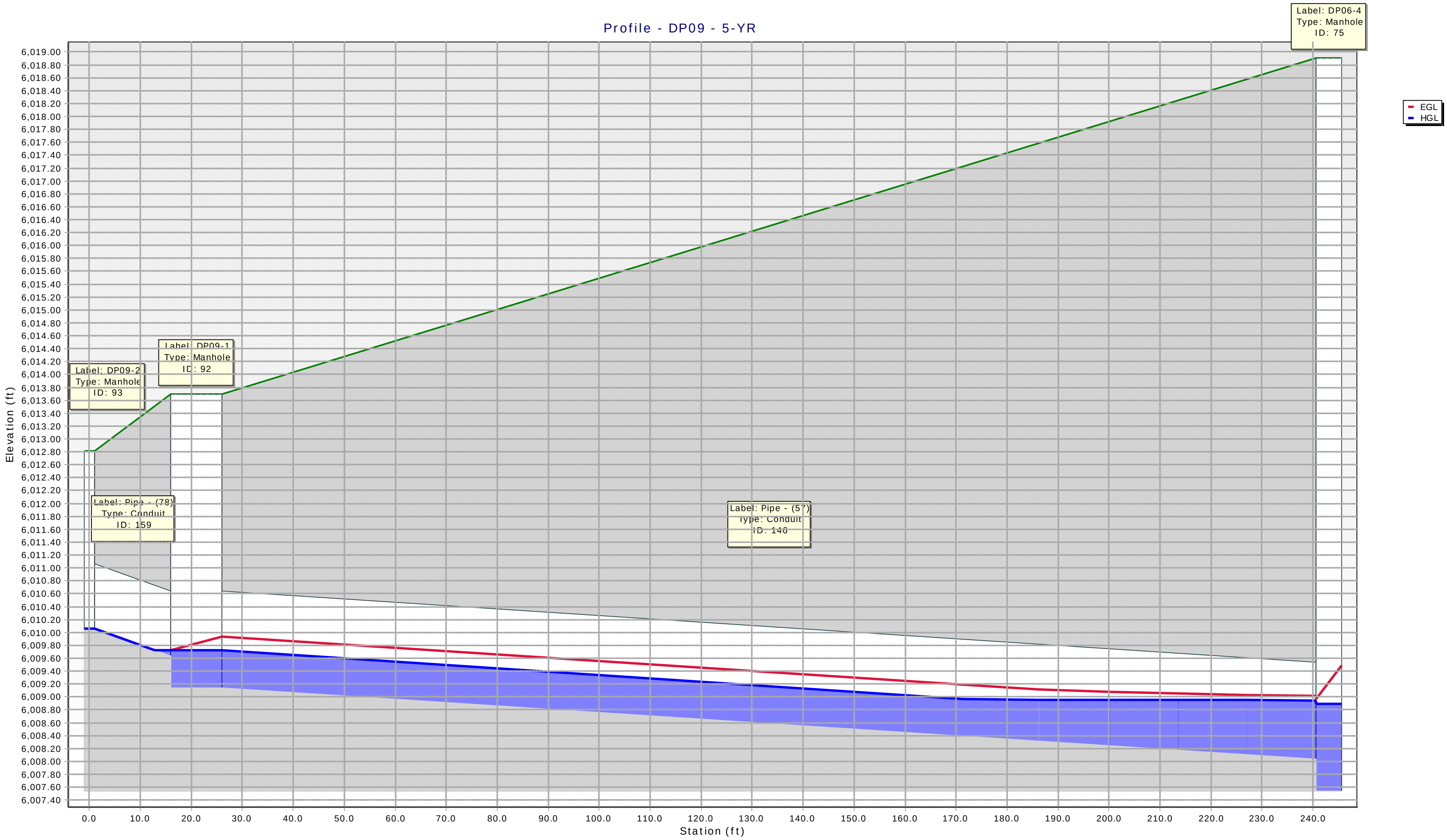
Profile - DP06 - 5-YR
Elevation (ft)
Station (ft)
EGL
HGL
Label: O-1
Type: Outfall
ID: 169
Label: DP06-1
Type: Manhole
ID: 96
Label: DP06-2
Type: Manhole
ID: 97
Label: DP06-3
Type: Manhole
ID: 66
Label: DP06-4
Type: Manhole
ID: 75
Label: DP02-1
Type: Manhole
ID: 76
Label: DP06-5
Type: Manhole
ID: 82
Label: Pipe - (69)
Type: Conduit
ID: 99
Label: Pipe - (14)
Type: Conduit
ID: 161
Label: Pipe - (13)
Type: Conduit
ID: 133
Label: Pipe - (12)
Type: Conduit
ID: 132
Label: Pipe - (11)
Type: Conduit
ID: 145
Label: Pipe - (10)
Type: Conduit
ID: 147



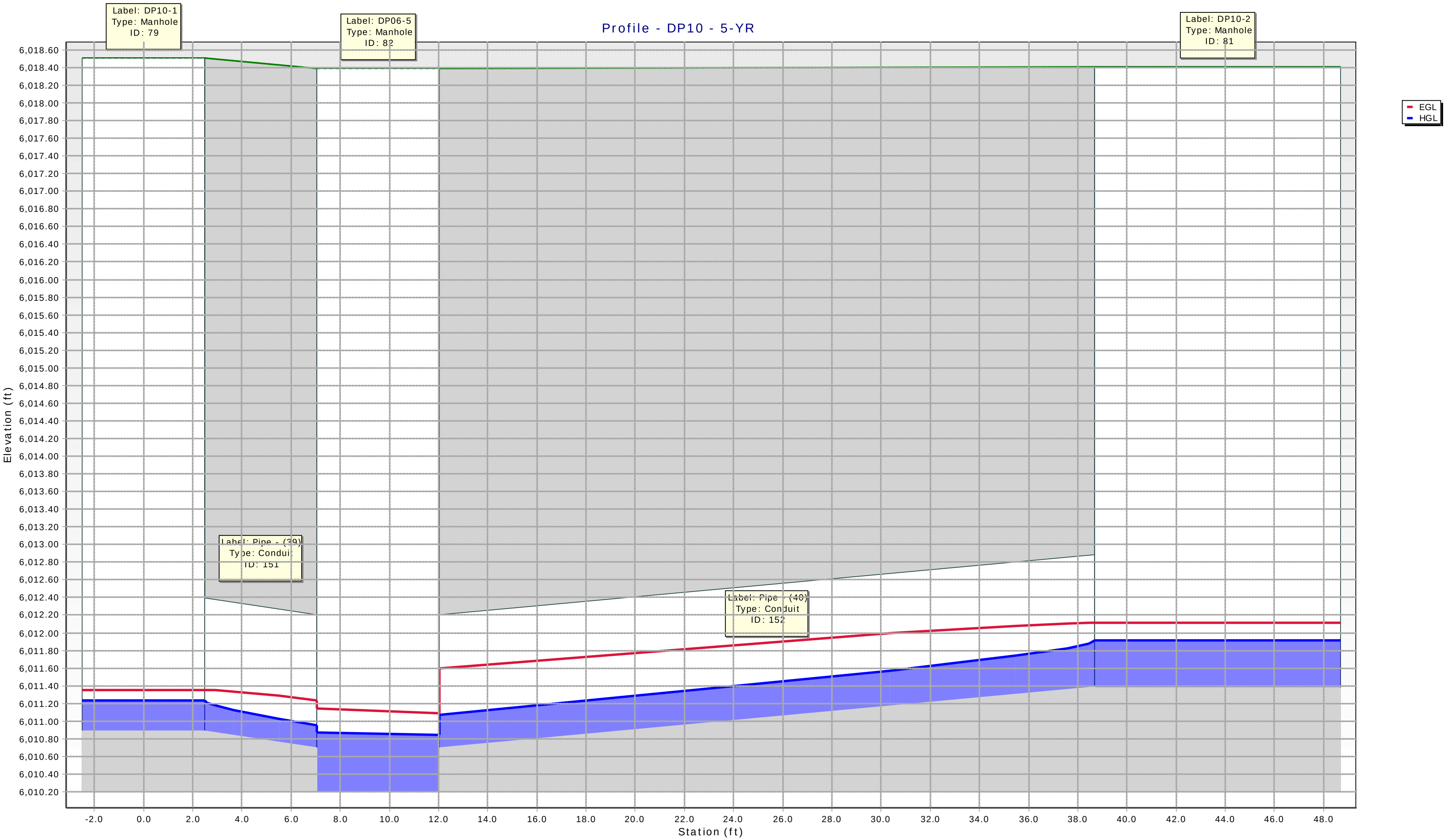
Profile - DP07 - 5-YR
Label: DP07-7
Type: Manhole
ID: 41
Label: DP07-6
Type: Manhole
ID: 45
Label: DP07-5
Type: Manhole
ID: 47
Label: DP07-4
Type: Manhole
ID: 51
Label: DP07-3
Type: Manhole
ID: 57
Label: DP07-2
Type: Manhole
ID: 61
Label: DP07-1
Type: Manhole
ID: 64
Label: DP06-3
Type: Manhole
ID: 66
Label: Pipe - (41)
Type: Conduit
ID: 107
Label: Pipe - (42)
Type: Conduit
ID: 111
Label: Pipe - (43)
Type: Conduit
ID: 113
Label: Pipe - (44)
Type: Conduit
ID: 117
Label: Pipe - (45)
Type: Conduit
ID: 123
Label: Pipe - (46)
Type: Conduit
ID: 127
Label: Pipe - (47)
Type: Conduit
ID: 130
EGL
HGL
Elevation (ft)
Station (ft)
6,037.00
6,036.00
6,035.00
6,034.00
6,033.00
6,032.00
6,031.00
6,030.00
6,029.00
6,028.00
6,027.00
6,026.00
6,025.00
6,024.00
6,023.00
6,022.00
6,021.00
6,020.00
6,019.00
6,018.00
6,017.00
6,016.00
6,015.00
6,014.00
6,013.00
6,012.00
6,011.00
6,010.00
6,009.00
6,008.00
6,007.00
6,006.00
6,005.00
6,004.00
6,003.00
6,002.00
6,001.00
6,000.00
5,999.00
5,998.00
5,997.00
5,996.00
5,995.00
5,994.00
5,993.00
5,992.00
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
220.0
240.0
260.0
280.0
300.0
320.0
340.0
360.0
380.0
400.0
420.0
440.0
460.0
480.0
500.0
520.0
540.0
560.0
580.0
600.0
620.0
640.0



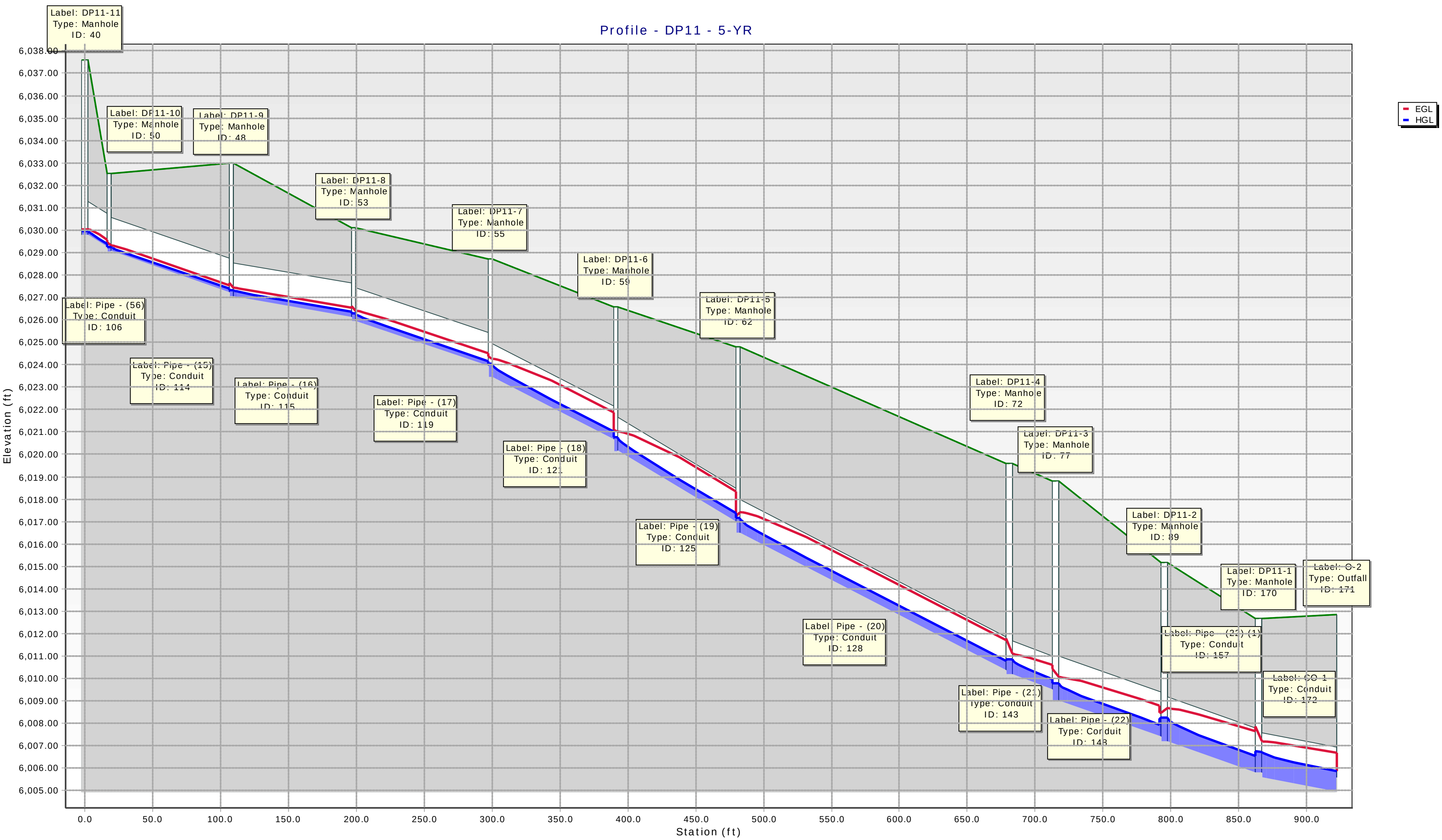
Profile - DP08 - 5-YR
Label: DP06-3
Type: Manhole
ID: 66
Label: DP08-1
Type: Manhole
ID: 88
Label: DP08-2
Type: Manhole
ID: 90
Label: Pipe - (48)
Type: Conduit
ID: 153
Label: Pipe - (49)
Type: Conduit
ID: 134
EGL
HGL
Elevation (ft)
Station (ft)



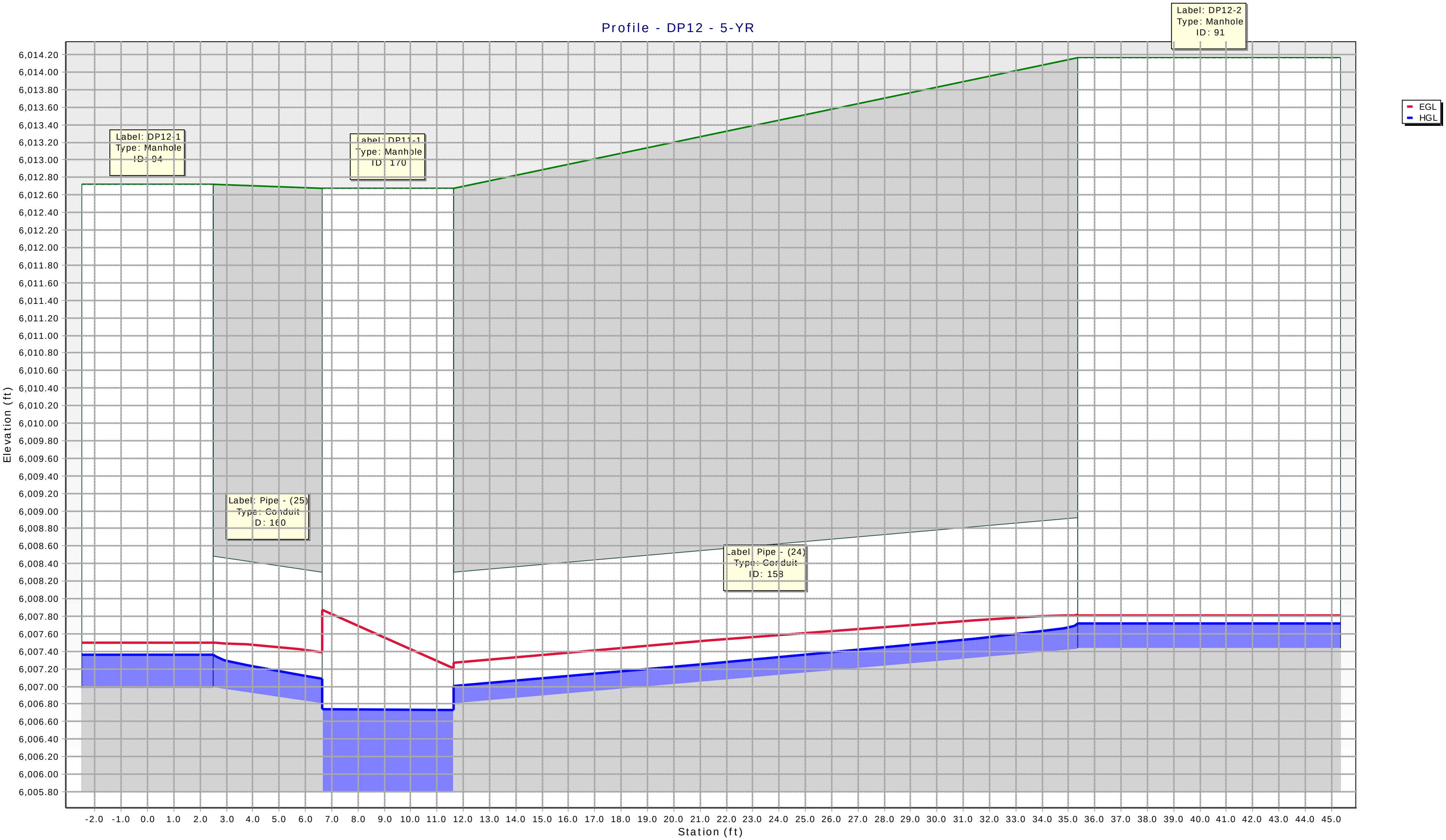
Profile - DP09 - 5-YR
Label: DP06-4
Type: Manhole
ID: 75
Label: DP09-1
Type: Manhole
ID: 92
Label: DP09-2
Type: Manhole
ID: 93
Label: Pipe - (78)
Type: Conduit
ID: 159
Label: Pipe - (57)
Type: Conduit
ID: 146
EGL
HGL
Elevation (ft)
Station (ft)
6,019.00
6,018.80
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
6,016.20
6,016.00
6,015.80
6,015.60
6,015.40
6,015.20
6,015.00
6,014.80
6,014.60
6,014.40
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
6,010.40
6,010.20
6,010.00
6,009.80
6,009.60
6,009.40
6,009.20
6,009.00
6,008.80
6,008.60
6,008.40
6,008.20
6,008.00
6,007.80
6,007.60
6,007.40
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
110.0
120.0
130.0
140.0
150.0
160.0
170.0
180.0
190.0
200.0
210.0
220.0
230.0
240.0

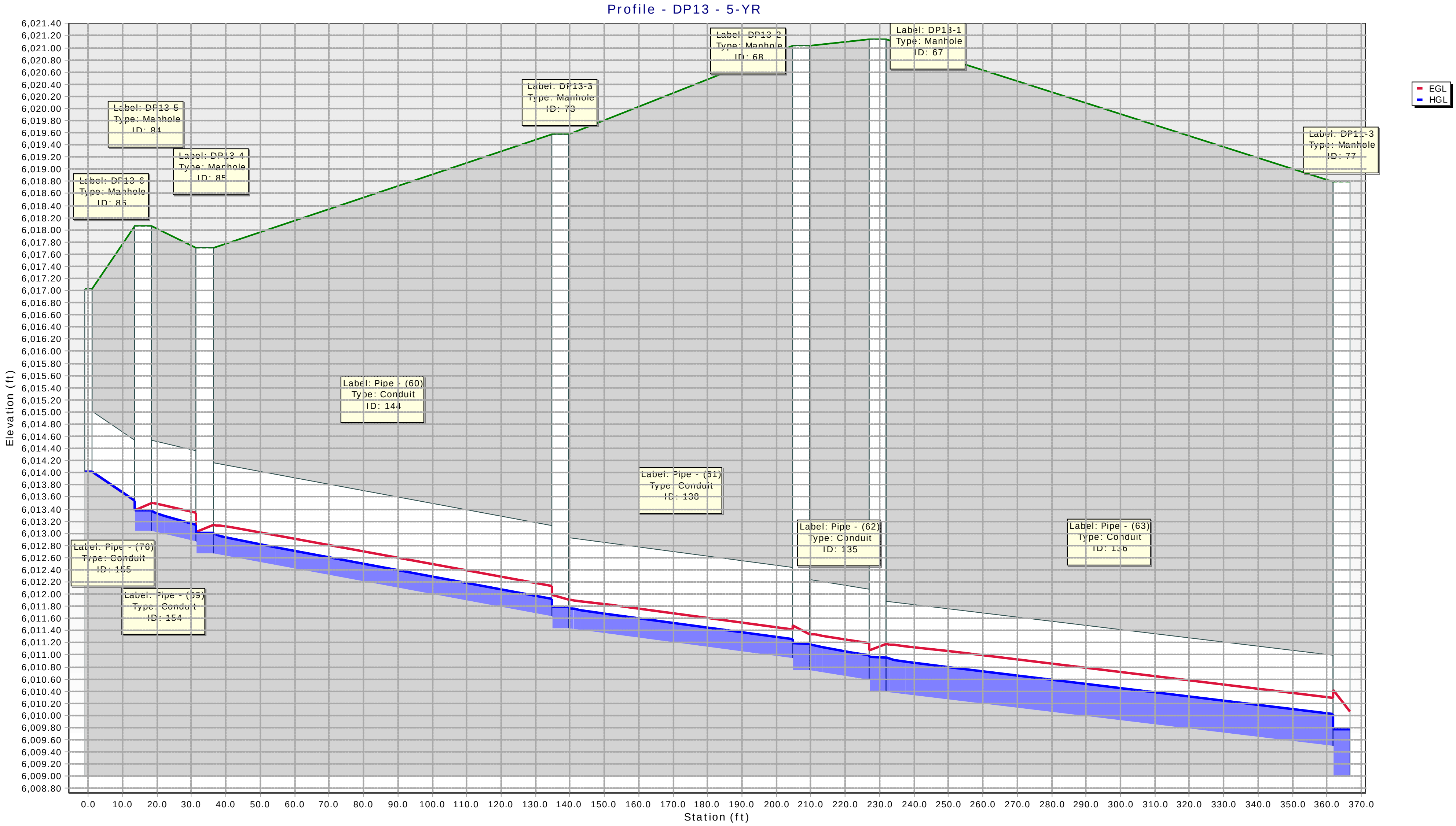


Profile - DP10 - 5-YR
Label: DP10-1
Type: Manhole
ID: 79
Label: DP06-5
Type: Manhole
ID: 82
Label: DP10-2
Type: Manhole
ID: 81
Label: Pipe - (39)
Type: Conduit
ID: 151
Label: Pipe - (40)
Type: Conduit
ID: 152
EGL
HGL
Elevation (ft)
Station (ft)
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
6,016.20
6,016.00
6,015.80
6,015.60
6,015.40
6,015.20
6,015.00
6,014.80
6,014.60
6,014.40
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
6,010.40
6,010.20
-2.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
34.0
36.0
38.0
40.0
42.0
44.0
46.0
48.0

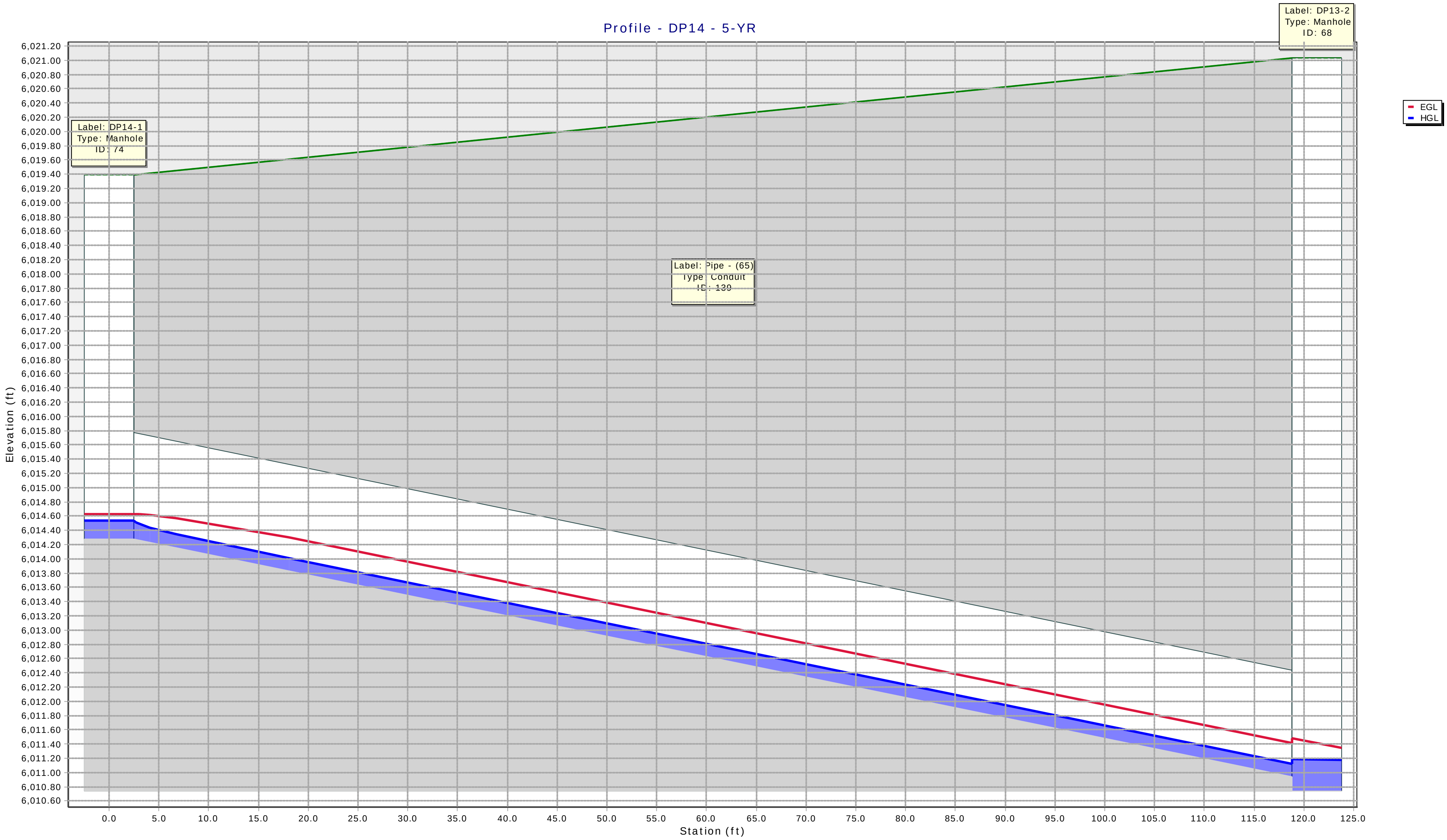


Profile - DP11 - 5-YR
Label: DP11-11 Type: Manhole ID: 40
Label: DP11-10 Type: Manhole ID: 50
Label: DP11-9 Type: Manhole ID: 48
Label: DP11-8 Type: Manhole ID: 53
Label: DP11-7 Type: Manhole ID: 55
Label: DP11-6 Type: Manhole ID: 59
Label: DP11-5 Type: Manhole ID: 62
Label: DP11-4 Type: Manhole ID: 72
Label: DP11-3 Type: Manhole ID: 77
Label: DP11-2 Type: Manhole ID: 89
Label: DP11-1 Type: Manhole ID: 170
Label: O-2 Type: Outfall ID: 171
Label: Pipe - (56) Type: Conduit ID: 106
Label: Pipe - (15) Type: Conduit ID: 114
Label: Pipe - (16) Type: Conduit ID: 115
Label: Pipe - (17) Type: Conduit ID: 119
Label: Pipe - (18) Type: Conduit ID: 121
Label: Pipe - (19) Type: Conduit ID: 125
Label: Pipe - (20) Type: Conduit ID: 128
Label: Pipe - (21) Type: Conduit ID: 143
Label: Pipe - (22) Type: Conduit ID: 148
Label: Pipe - (22) (1) Type: Conduit ID: 157
Label: CO-1 Type: Conduit ID: 172
EGL
HGL
Elevation (ft)
6,038.00
6,037.00
6,036.00
6,035.00
6,034.00
6,033.00
6,032.00
6,031.00
6,030.00
6,029.00
6,028.00
6,027.00
6,026.00
6,025.00
6,024.00
6,023.00
6,022.00
6,021.00
6,020.00
6,019.00
6,018.00
6,017.00
6,016.00
6,015.00
6,014.00
6,013.00
6,012.00
6,011.00
6,010.00
6,009.00
6,008.00
6,007.00
6,006.00
6,005.00
Station (ft)
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
750.0
800.0
850.0
900.0

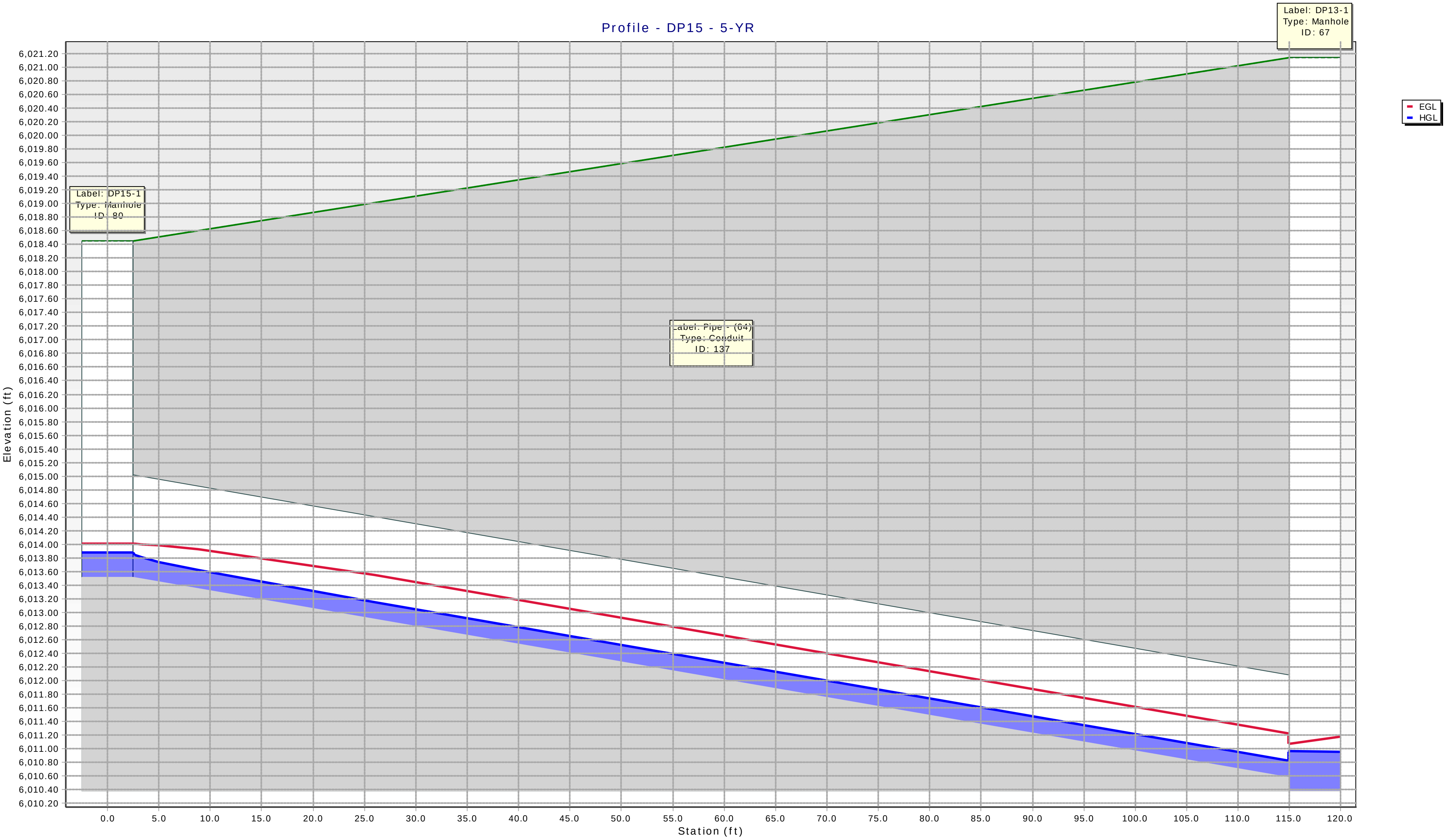

Profile - DP12 - 5-YR
Label: DP12-2
Type: Manhole
ID: 91
Label: DP12-1
Type: Manhole
ID: 84
Label: DP11-1
Type: Manhole
ID: 170
Label: Pipe - (25)
Type: Conduit
ID: 160
Label: Pipe - (24)
Type: Conduit
ID: 158
EGL
HGL
Elevation (ft)
Station (ft)
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
6,010.40
6,010.20
6,010.00
6,009.80
6,009.60
6,009.40
6,009.20
6,009.00
6,008.80
6,008.60
6,008.40
6,008.20
6,008.00
6,007.80
6,007.60
6,007.40
6,007.20
6,007.00
6,006.80
6,006.60
6,006.40
6,006.20
6,006.00
6,005.80
-2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0 41.0 42.0 43.0 44.0 45.0



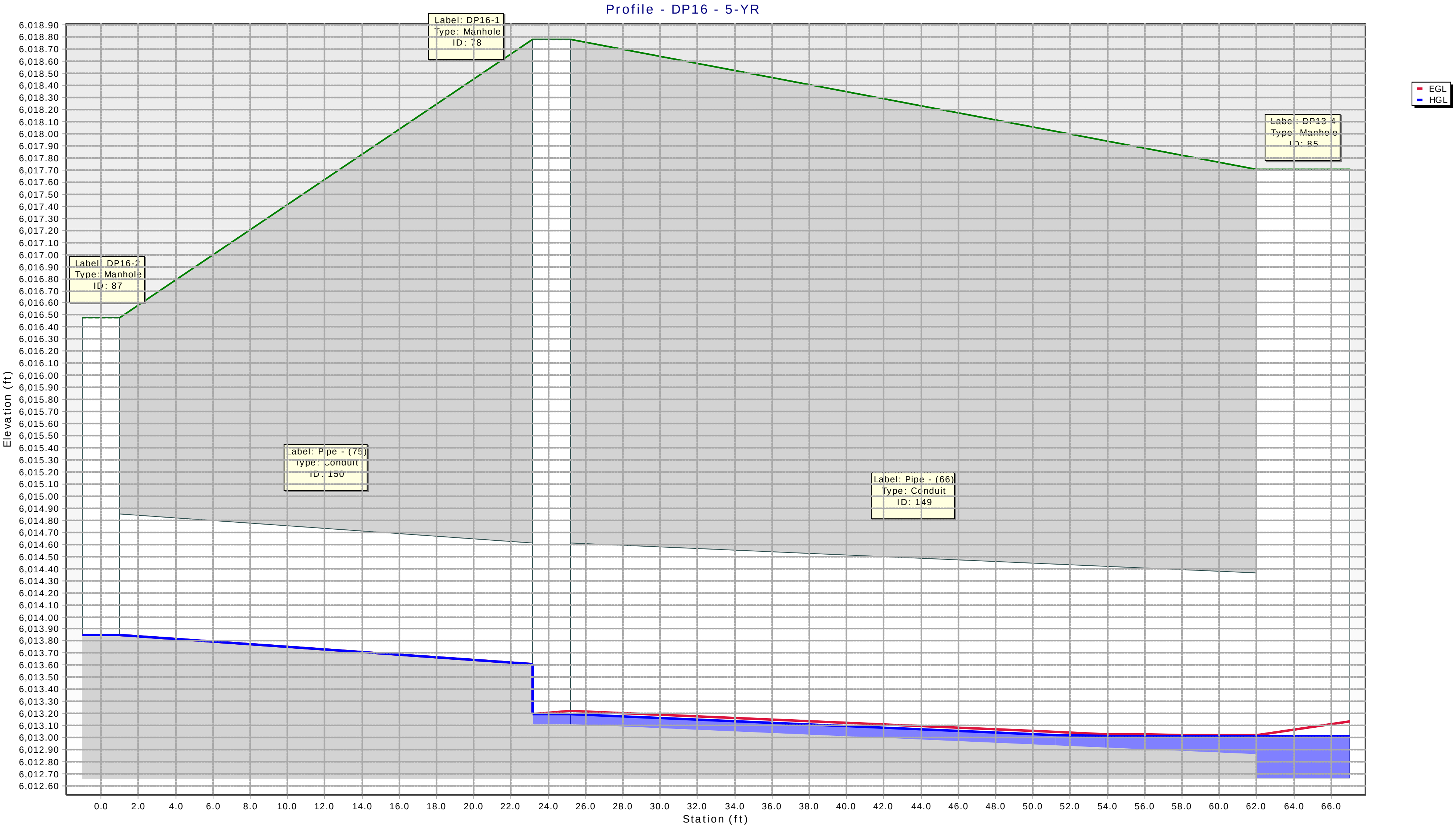
Profile - DP13 - 5-YR
Elevation (ft)
Station (ft)
EGL
HGL
Label: DP13-6
Type: Manhole
ID: 86
Label: DP13-5
Type: Manhole
ID: 81
Label: DP13-4
Type: Manhole
ID: 85
Label: DP13-3
Type: Manhole
ID: 73
Label: DP13-2
Type: Manhole
ID: 68
Label: DP13-1
Type: Manhole
ID: 67
Label: DP11-3
Type: Manhole
ID: 77
Label: Pipe - (60)
Type: Conduit
ID: 144
Label: Pipe - (61)
Type: Conduit
ID: 138
Label: Pipe - (62)
Type: Conduit
ID: 135
Label: Pipe - (63)
Type: Conduit
ID: 136
Label: Pipe - (76)
Type: Conduit
ID: 165
Label: Pipe - (59)
Type: Conduit
ID: 154



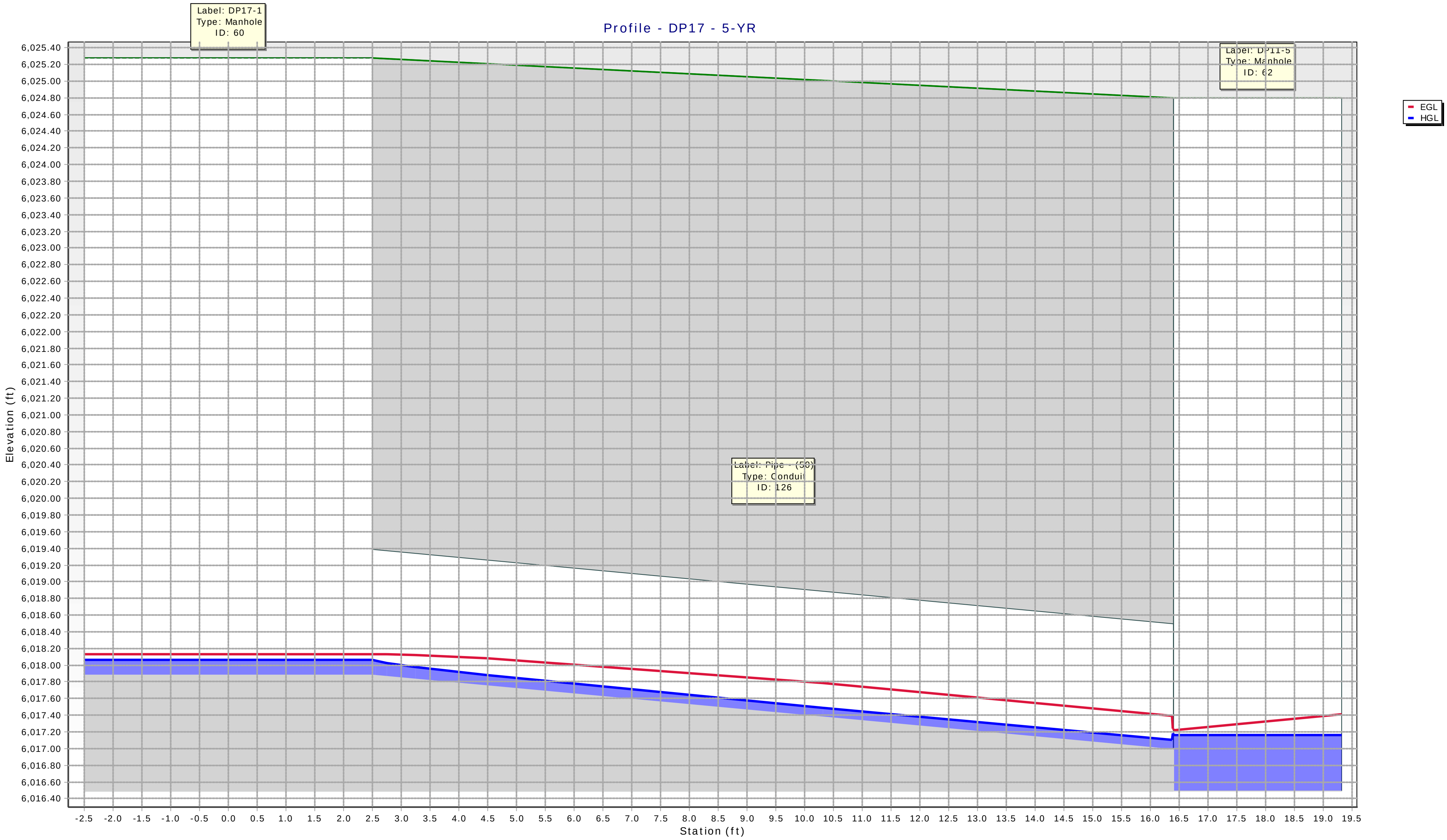
Profile - DP14 - 5-YR
Label: DP14-1
Type: Manhole
ID: 74
Label: Pipe - (65)
Type: Conduit
ID: 139
Label: DP13-2
Type: Manhole
ID: 68
EGL
HGL
Elevation (ft)
Station (ft)
6,021.20
6,021.00
6,020.80
6,020.60
6,020.40
6,020.20
6,020.00
6,019.80
6,019.60
6,019.40
6,019.20
6,019.00
6,018.80
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
6,016.20
6,016.00
6,015.80
6,015.60
6,015.40
6,015.20
6,015.00
6,014.80
6,014.60
6,014.40
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
95.0
100.0
105.0
110.0
115.0
120.0
125.0



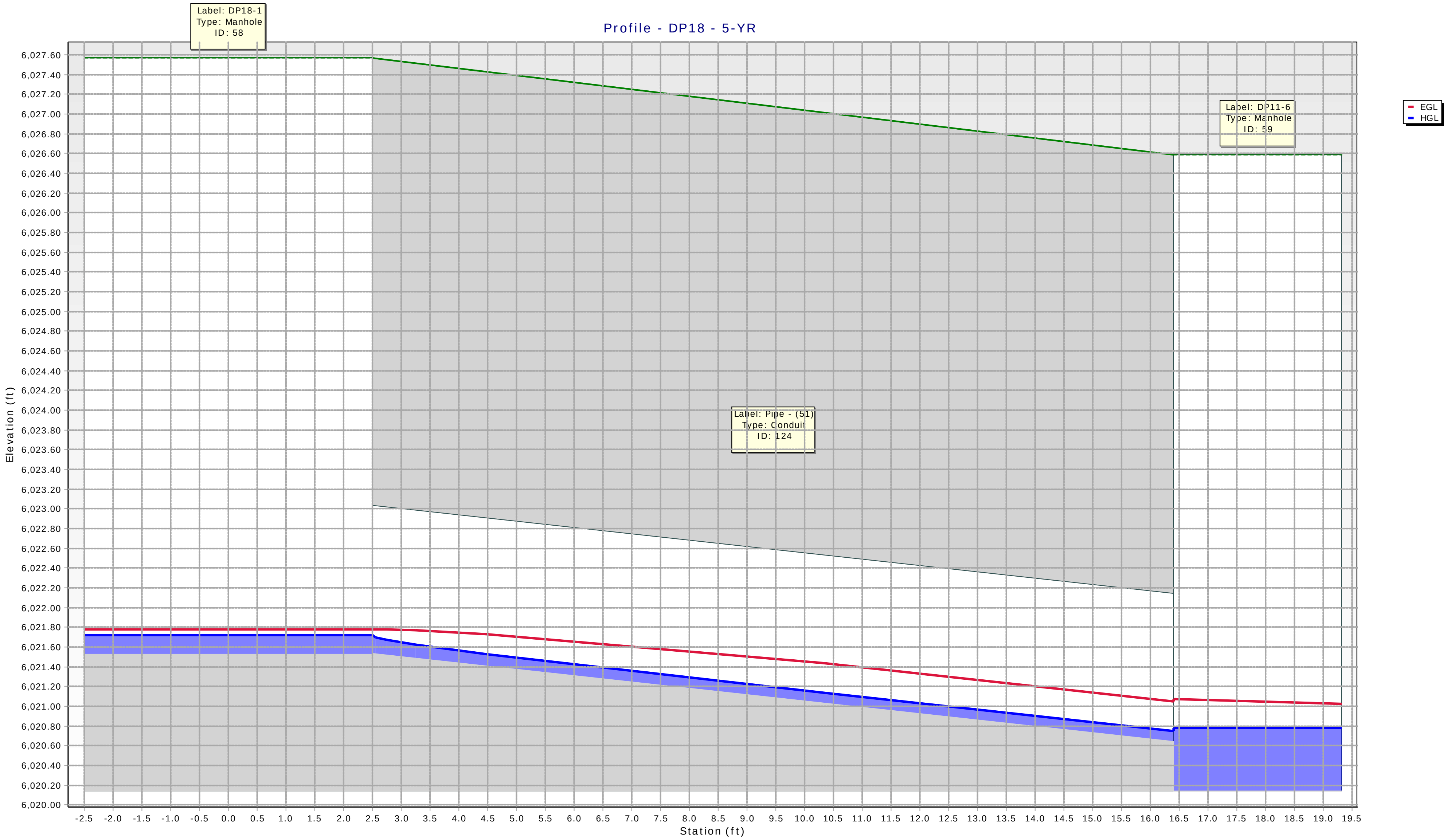
Profile - DP15 - 5-YR
Label: DP15-1
Type: Manhole
ID: 80
Label: Pipe - (64)
Type: Conduit
ID: 137
Label: DP13-1
Type: Manhole
ID: 67
EGL
HGL
Elevation (ft)
Station (ft)



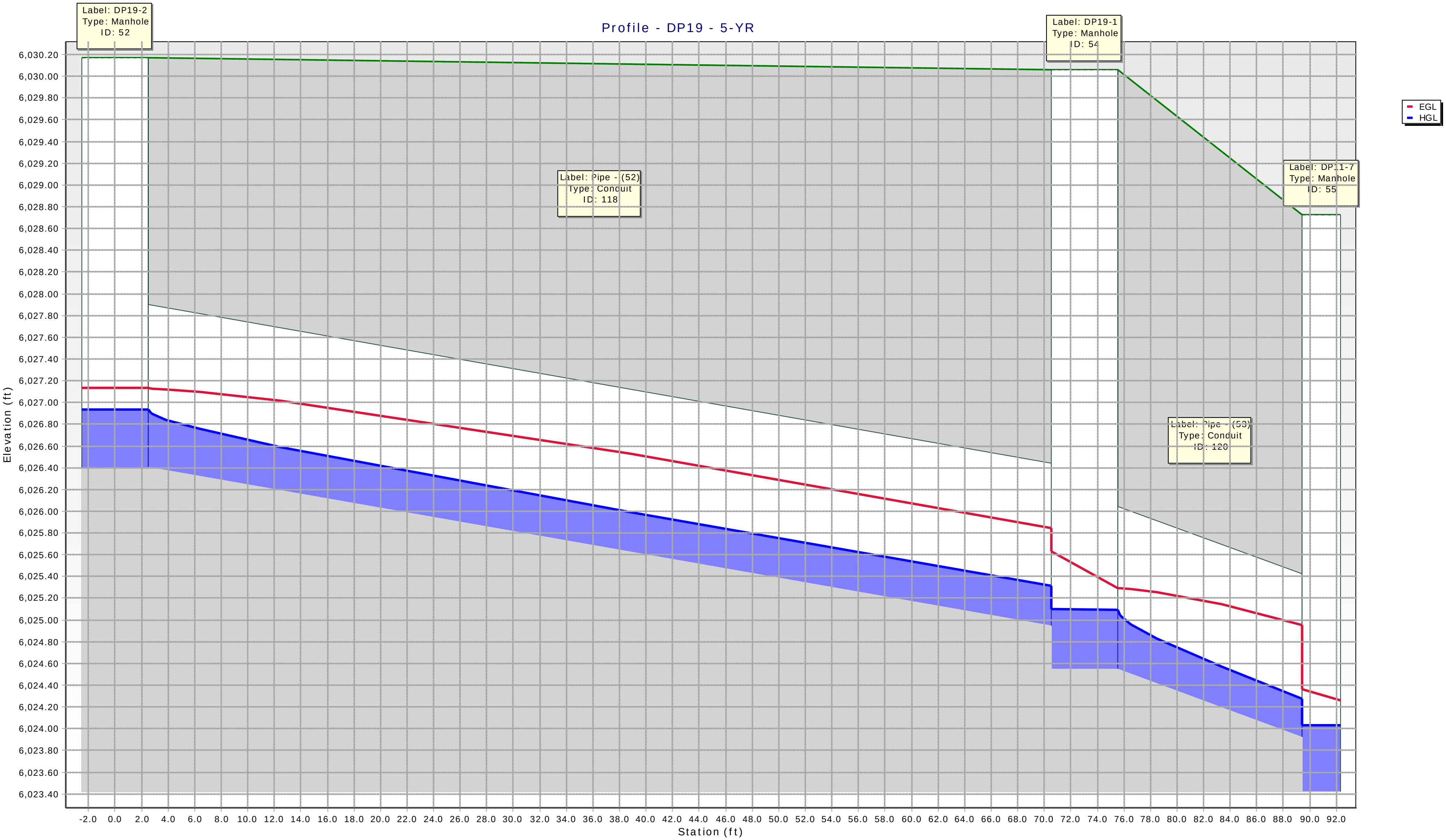
Profile - DP16 - 5-YR
Label: DP16-1
Type: Manhole
ID: 78
Label: DP16-2
Type: Manhole
ID: 87
Label: DP13-4
Type: Manhole
ID: 85
Label: Pipe - (75)
Type: Conduit
ID: 150
Label: Pipe - (66)
Type: Conduit
ID: 149
EGL
HGL
Elevation (ft)
Station (ft)



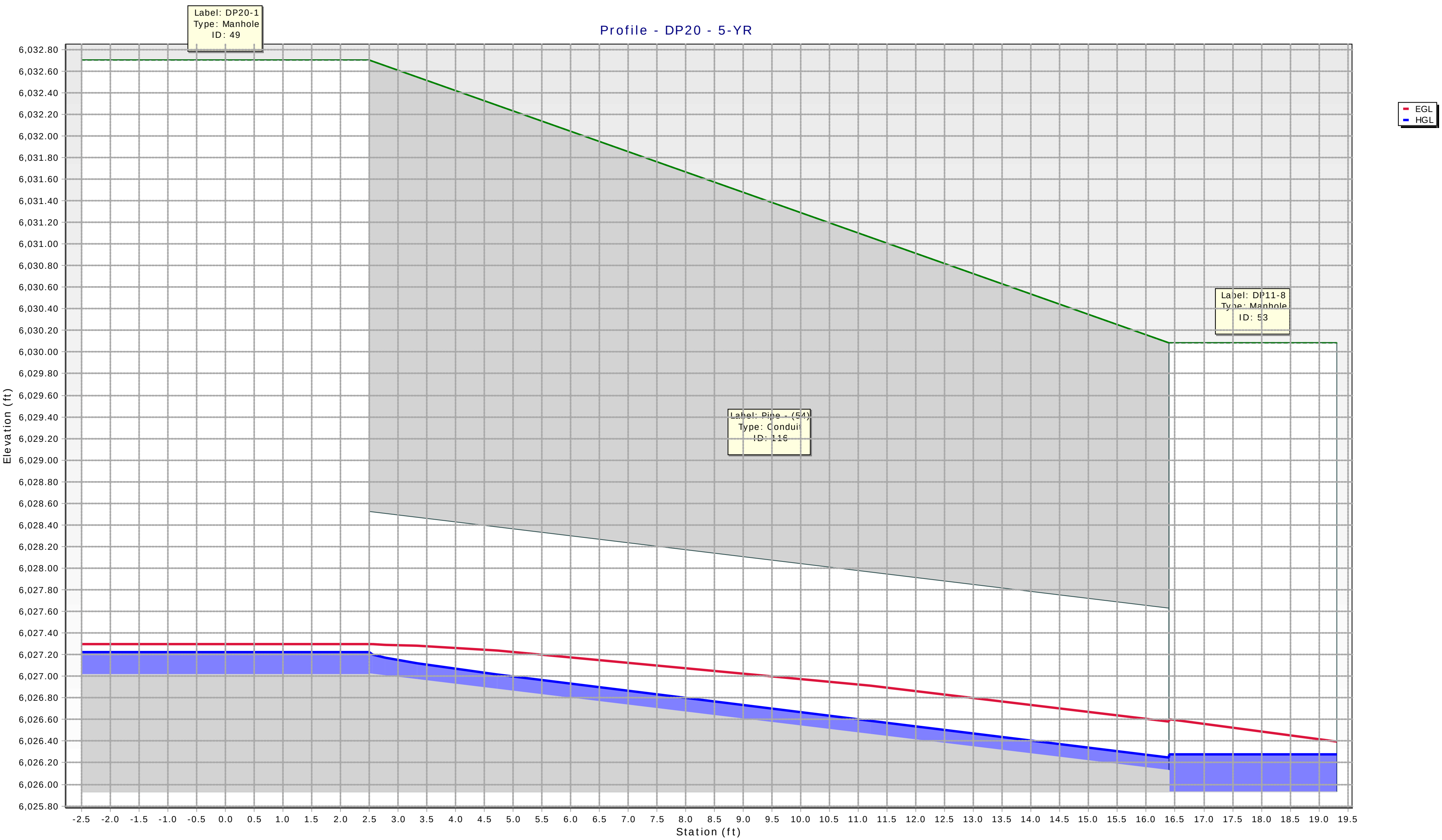
Profile - DP17 - 5-YR
Label: DP17-1
Type: Manhole
ID: 60
Label: DP11-5
Type: Manhole
ID: 62
Label: Pipe - (50)
Type: Conduit
ID: 126
EGL
HGL
Elevation (ft)
Station (ft)
6,025.40
6,025.20
6,025.00
6,024.80
6,024.60
6,024.40
6,024.20
6,024.00
6,023.80
6,023.60
6,023.40
6,023.20
6,023.00
6,022.80
6,022.60
6,022.40
6,022.20
6,022.00
6,021.80
6,021.60
6,021.40
6,021.20
6,021.00
6,020.80
6,020.60
6,020.40
6,020.20
6,020.00
6,019.80
6,019.60
6,019.40
6,019.20
6,019.00
6,018.80
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
-2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5



Profile - DP18 - 5-YR
Label: DP18-1
Type: Manhole
ID: 58
Label: DP11-6
Type: Manhole
ID: 59
Label: Pipe - (51)
Type: Conduit
ID: 124
EGL
HGL
Elevation (ft)
Station (ft)
6,027.60
6,027.40
6,027.20
6,027.00
6,026.80
6,026.60
6,026.40
6,026.20
6,026.00
6,025.80
6,025.60
6,025.40
6,025.20
6,025.00
6,024.80
6,024.60
6,024.40
6,024.20
6,024.00
6,023.80
6,023.60
6,023.40
6,023.20
6,023.00
6,022.80
6,022.60
6,022.40
6,022.20
6,022.00
6,021.80
6,021.60
6,021.40
6,021.20
6,021.00
6,020.80
6,020.60
6,020.40
6,020.20
6,020.00
-2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

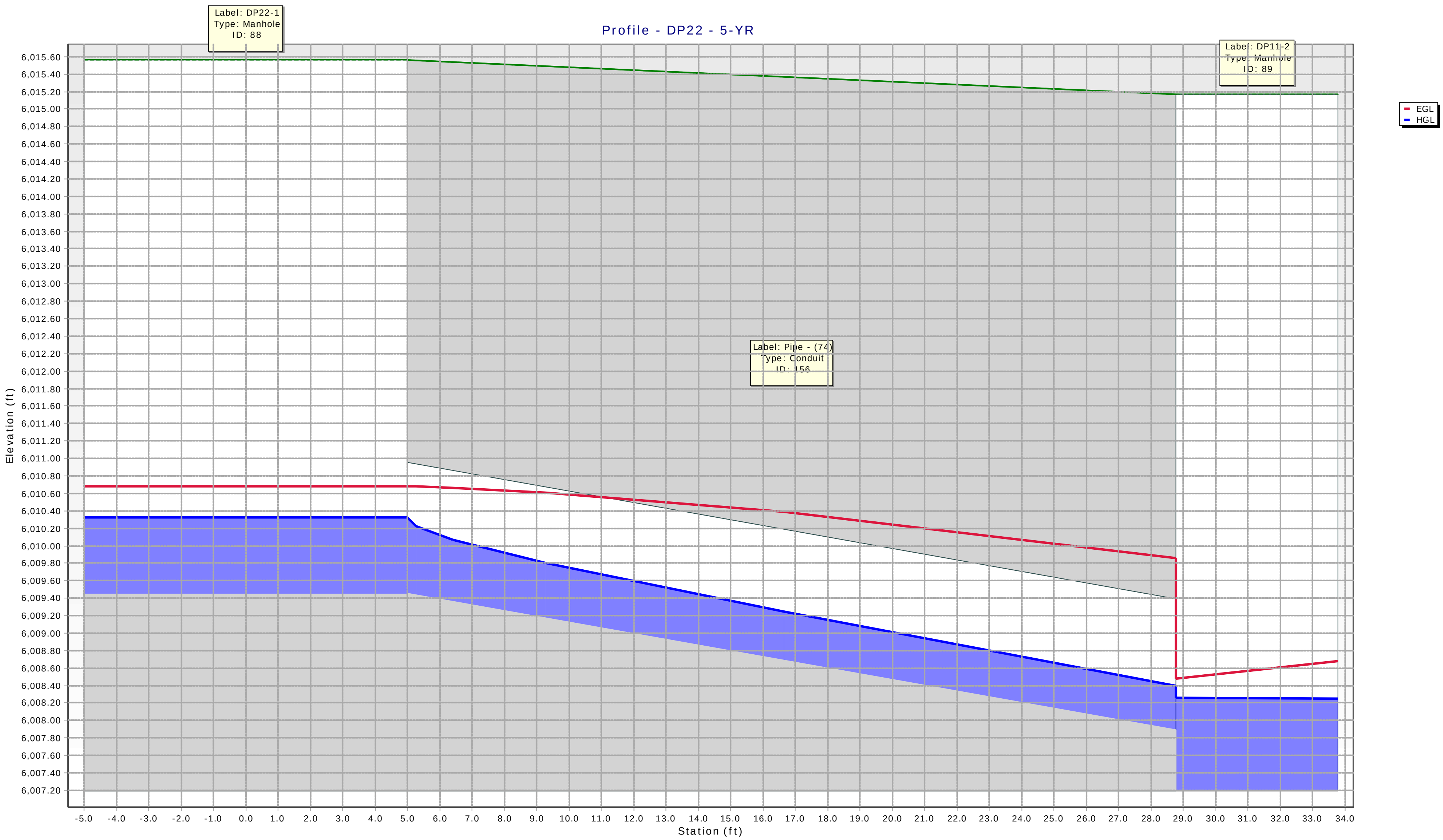


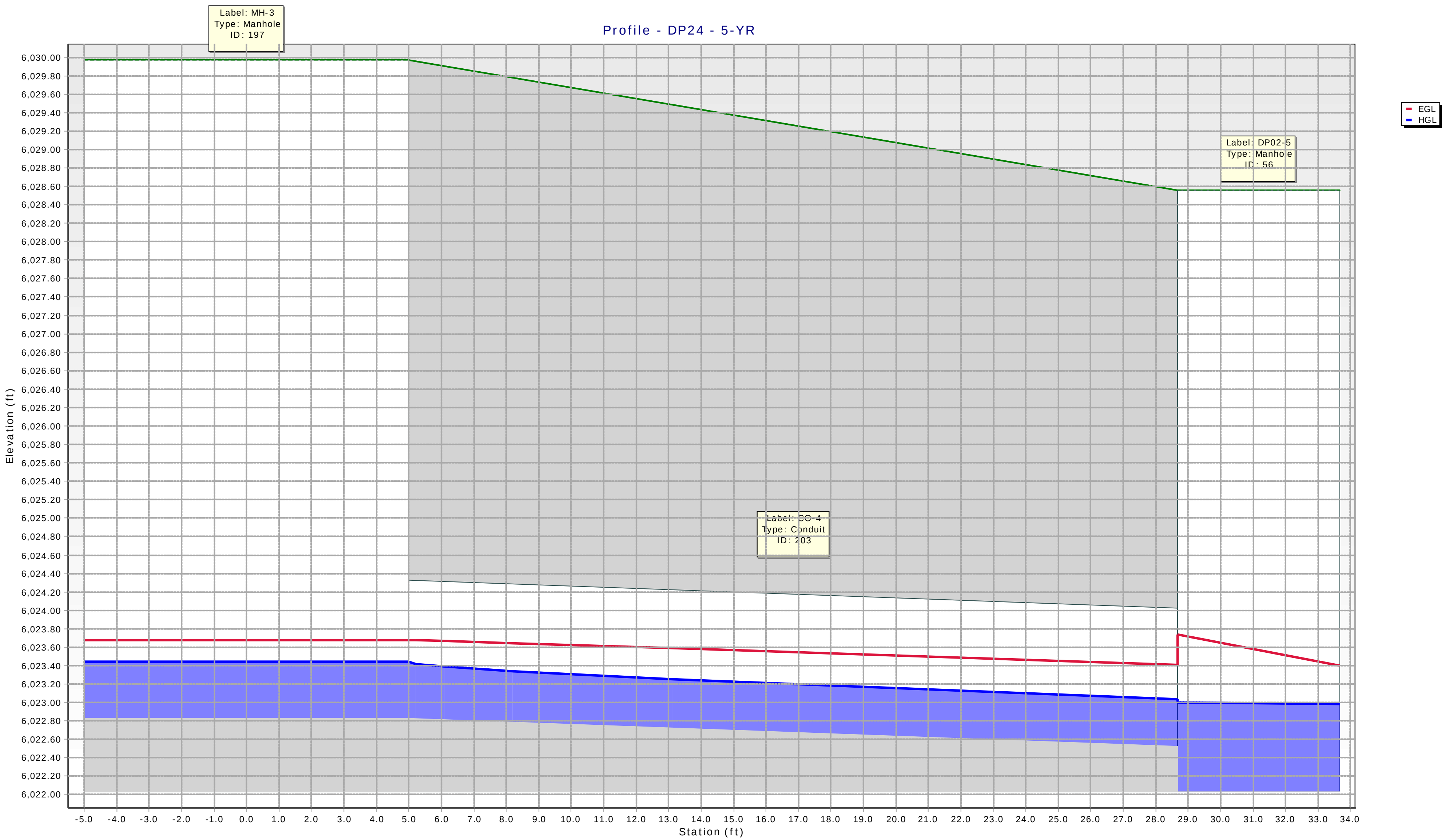
Profile - DP19 - 5-YR
Label: DP19-2
Type: Manhole
ID: 52
Label: DP19-1
Type: Manhole
ID: 54
Label: DP11-7
Type: Manhole
ID: 55
Label: Pipe - (52)
Type: Conduit
ID: 118
Label: Pipe - (53)
Type: Conduit
ID: 120
EGL
HGL
Elevation (ft)
Station (ft)
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
6,028.60
6,028.40
6,028.20
6,028.00
6,027.80
6,027.60
6,027.40
6,027.20
6,027.00
6,026.80
6,026.60
6,026.40
6,026.20
6,026.00
6,025.80
6,025.60
6,025.40
6,025.20
6,025.00
6,024.80
6,024.60
6,024.40
6,024.20
6,024.00
6,023.80
6,023.60
6,023.40
-2.0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 42.0 44.0 46.0 48.0 50.0 52.0 54.0 56.0 58.0 60.0 62.0 64.0 66.0 68.0 70.0 72.0 74.0 76.0 78.0 80.0 82.0 84.0 86.0 88.0 90.0 92.0



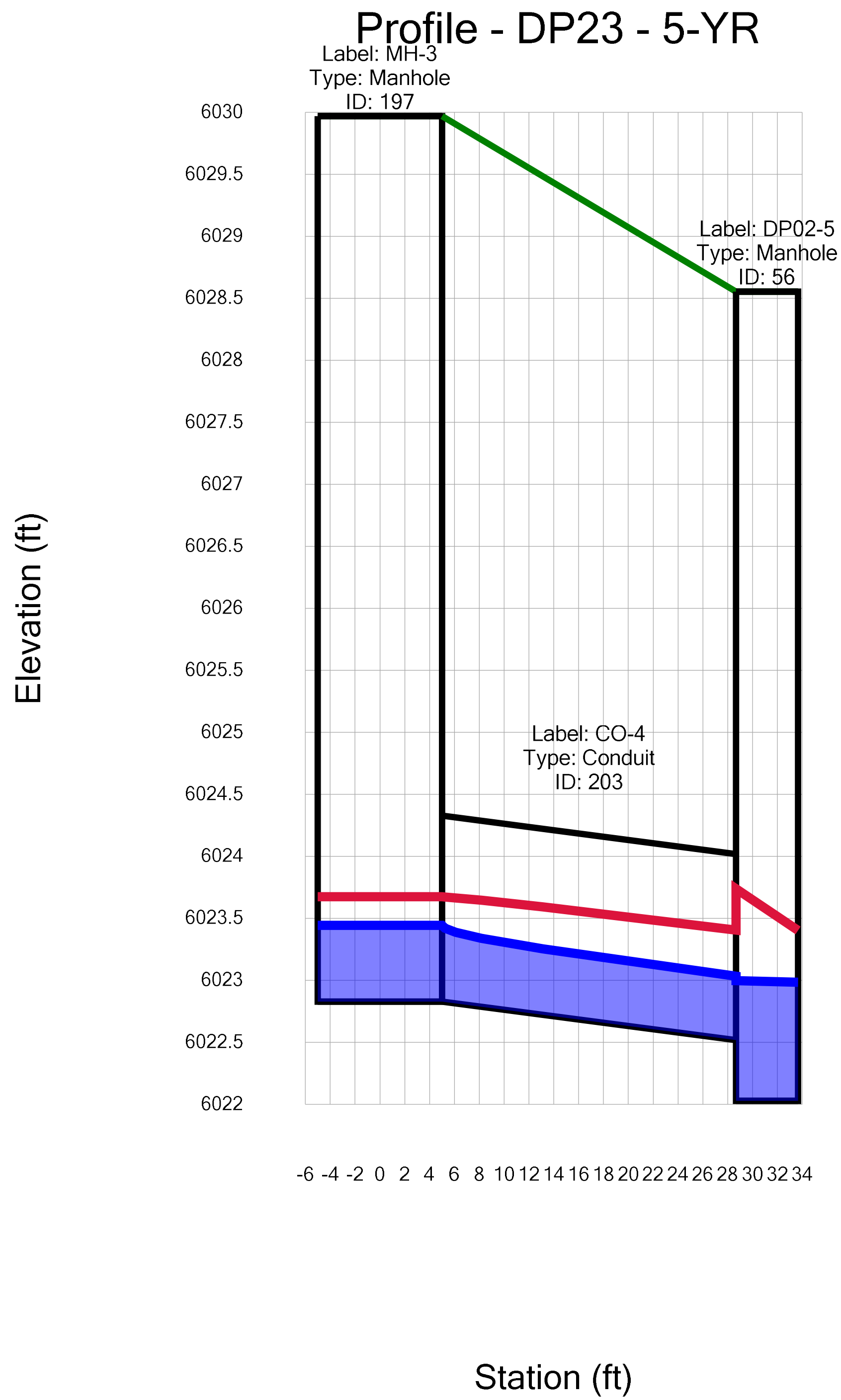
Profile - DP20 - 5-YR
Label: DP20-1
Type: Manhole
ID: 49
Label: DP11-8
Type: Manhole
ID: 53
Label: Pipe - (54)
Type: Conduit
ID: 116
EGL
HGL
Elevation (ft)
Station (ft)

Profile - DP21 - 5-YR
Label: DP21-1
Type: Manhole
ID: 44
Label: DP11-9
Type: Manhole
ID: 48
Label: Pipe - (55)
Type: Conduit
ID: 110
EGL
HGL
Elevation (ft)
Station (ft)
6,035.20
6,035.00
6,034.80
6,034.60
6,034.40
6,034.20
6,034.00
6,033.80
6,033.60
6,033.40
6,033.20
6,033.00
6,032.80
6,032.60
6,032.40
6,032.20
6,032.00
6,031.80
6,031.60
6,031.40
6,031.20
6,031.00
6,030.80
6,030.60
6,030.40
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
6,028.60
6,028.40
6,028.20
6,028.00
6,027.80
6,027.60
6,027.40
6,027.20
6,027.00
-2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5


Profile - DP22 - 5-YR
Label: DP22-1
Type: Manhole
ID: 88
Label: DP11-2
Type: Manhole
ID: 89
Label: Pipe - (74)
Type: Conduit
ID: 156
EGL
HGL
Elevation (ft)
Station (ft)


Profile - DP24 - 5-YR
Label: MH-3
Type: Manhole
ID: 197
Label: DP02-5
Type: Manhole
ID: 56
Label: CO-4
Type: Conduit
ID: 203
EGL
HGL
Elevation (ft)
Station (ft)
6,030.00
6,029.00
6,028.00
6,027.00
6,026.00
6,025.00
6,024.00
6,023.00
6,022.00
-5.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
34.0

Profile Report
Profile: Profile - DP23



Scenario: 100-YR
Current Time Step: 0.000 h
Conduit FlexTable: Combined Pipe/Node Report

Label	Slope (Calculated) (ft/ft)	Diameter (in)	Capacity (Full Flow) (cfs)	Length (User Defined) (ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Flow (cfs)	HGL (In) (ft)	HGL (Out) (ft)	Velocity (ft/s)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)	Manning's n	Upstream Structure Headloss Coefficient
CO-1	0.011	24.0	24.01	57.7	6,005.59	6,004.94	26.43	6,007.73	6,006.94	8.41	6,008.83	6,008.04	0.013	0.023
CO-2	0.025	18.0	16.63	11.2	6,029.69	6,029.41	2.83	6,030.33	6,030.08	7.02	6,030.57	6,030.29	0.013	0.000
CO-3	0.020	12.0	6.57	17.9	6,023.86	6,023.50	0.00	6,024.14	6,024.14	0.00	6,024.14	6,024.14	0.010	0.000
CO-4	0.010	18.0	10.48	31.2	6,022.83	6,022.52	0.00	6,023.16	6,023.16	0.00	6,023.16	6,023.16	0.013	0.000
CO-5	0.020	12.0	5.07	15.3	6,016.49	6,016.18	0.00	6,017.56	6,017.56	0.00	6,017.56	6,017.56	0.013	0.000
CO-6	0.020	12.0	6.58	16.8	6,018.98	6,018.64	0.00	6,019.28	6,019.28	0.00	6,019.28	6,019.28	0.010	0.000
CO-7	0.020	12.0	6.54	41.1	6,020.32	6,019.50	0.00	6,020.32	6,020.14	0.00	6,020.32	6,020.14	0.010	0.000
Pipe - (3)	0.022	18.0	15.58	137.9	6,032.45	6,029.42	0.79	6,032.78	6,030.09	4.61	6,032.90	6,030.11	0.013	0.051
Pipe - (4)	0.022	18.0	15.58	60.7	6,028.93	6,027.59	8.69	6,030.07	6,028.41	9.06	6,030.63	6,029.62	0.013	0.027
Pipe - (5) (1)	0.029	18.0	17.81	141.9	6,027.08	6,023.00	8.69	6,028.22	6,024.15	10.02	6,028.79	6,024.71	0.013	0.107
Pipe - (5) (2)	0.029	18.0	17.79	16.7	6,023.00	6,022.52	8.69	6,024.14	6,023.37	10.01	6,024.71	6,024.47	0.013	0.000
Pipe - (7) (1)(1)	0.018	18.0	13.98	170.5	6,022.02	6,019.00	8.69	6,023.16	6,020.15	8.34	6,023.73	6,020.71	0.013	0.000
Pipe - (7) (1)(2)	0.018	18.0	13.96	48.7	6,019.00	6,018.14	8.69	6,020.14	6,019.29	8.33	6,020.71	6,019.85	0.013	0.000
Pipe - (7) (2)	0.018	18.0	13.97	38.4	6,018.14	6,017.46	8.69	6,019.28	6,018.35	8.33	6,019.85	6,019.33	0.013	0.000
Pipe - (8) (1)	0.022	18.0	15.66	58.0	6,016.97	6,015.68	8.69	6,018.11	6,017.57	9.09	6,018.67	6,017.95	0.013	0.037
Pipe - (8) (1)	0.022	18.0	15.58	67.2	6,014.43	6,012.95	8.69	6,017.25	6,016.79	4.92	6,017.63	6,017.17	0.013	0.198
Pipe - (8) (2)	0.022	18.0	15.58	34.6	6,015.68	6,014.92	8.69	6,017.56	6,017.33	4.92	6,017.94	6,017.70	0.013	0.002
Pipe - (9)	0.060	18.0	25.71	63.4	6,012.45	6,008.65	22.71	6,016.26	6,013.30	12.85	6,018.83	6,015.86	0.013	0.207
Pipe - (10)	0.028	18.0	17.52	55.8	6,010.20	6,008.65	7.30	6,011.91	6,011.64	4.13	6,012.17	6,011.90	0.013	0.042
Pipe - (11)	0.010	18.0	10.50	11.0	6,008.15	6,008.04	30.01	6,010.88	6,009.98	16.98	6,015.36	6,014.46	0.013	0.169
Pipe - (12)	0.020	24.0	32.09	121.6	6,007.54	6,005.09	34.90	6,009.92	6,007.01	11.11	6,011.84	6,008.98	0.013	0.031
Pipe - (13)	0.020	24.0	31.99	83.2	5,992.31	5,990.64	40.15	5,995.25	5,992.60	12.78	5,997.79	5,995.17	0.013	0.209
Pipe - (14)	0.020	36.0	94.31	14.6	5,989.64	5,989.35	35.09	5,991.57	5,991.60	12.36	5,992.40	5,992.19	0.013	0.046
Pipe - (15)	0.020	18.0	14.94	90.0	6,029.05	6,027.23	0.90	6,029.41	6,027.48	4.66	6,029.53	6,027.82	0.013	0.078
Pipe - (16)	0.010	18.0	10.50	90.0	6,027.03	6,026.13	2.01	6,027.56	6,026.57	4.58	6,027.76	6,026.90	0.013	0.046
Pipe - (17)	0.020	18.0	14.85	100.5	6,025.93	6,023.92	2.61	6,026.54	6,024.35	6.33	6,026.77	6,024.97	0.013	0.013
Pipe - (18)	0.030	18.0	18.19	92.5	6,023.42	6,020.65	5.96	6,024.37	6,021.24	9.22	6,024.77	6,022.56	0.013	0.021
Pipe - (19)	0.035	18.0	19.64	90.1	6,020.14	6,016.99	6.62	6,021.14	6,017.59	10.03	6,021.58	6,019.16	0.013	0.013
Pipe - (20)	0.031	18.0	18.37	200.1	6,016.49	6,010.37	7.34	6,017.54	6,011.03	9.81	6,018.02	6,012.53	0.013	0.084
Pipe - (21)	0.020	18.0	14.85	34.2	6,010.17	6,009.49	7.34	6,011.22	6,010.27	8.38	6,011.70	6,011.24	0.013	0.094
Pipe - (22)	0.020	24.0	31.99	79.9	6,008.99	6,007.39	11.99	6,010.23	6,008.76	9.45	6,010.76	6,009.19	0.013	0.014
Pipe - (22) (1)	0.020	24.0	31.99	69.4	6,007.19	6,005.80	18.72	6,008.75	6,007.75	10.58	6,009.54	6,008.31	0.013	0.016
Pipe - (24)	0.020	18.0	14.85	31.2	6,007.43	6,006.80	6.19	6,008.39	6,007.89	8.02	6,008.80	6,008.21	0.013	0.000
Pipe - (25)	0.020	18.0	14.85	9.1	6,006.98	6,006.80	2.73	6,007.86	6,007.89	6.41	6,007.96	6,007.95	0.013	0.000
Pipe - (35)	0.010	18.0	10.50	104.8	6,035.45	6,034.40	0.79	6,035.78	6,034.68	3.49	6,035.90	6,034.87	0.013	0.000
Pipe - (35) (1)	0.009	18.0	9.69	147.0	6,034.20	6,032.95	0.79	6,034.53	6,033.24	3.30	6,034.65	6,033.41	0.013	0.049
Pipe - (36)	0.020	18.0	14.85	29.8	6,030.02	6,029.42	5.38	6,030.91	6,030.08	7.73	6,031.29	6,030.89	0.013	0.000
Pipe - (39)	0.020	18.0	14.85	9.5	6,010.89	6,010.70	2.03	6,011.91	6,011.92	5.89	6,011.95	6,011.94	0.013	0.000
Pipe - (40)	0.020	18.0	14.85	34.1	6,011.38	6,010.70	6.37	6,012.36	6,011.94	8.08	6,012.79	6,012.20	0.013	0.000
Pipe - (41)	0.025	12.0	7.32	67.3	6,032.61	6,030.93	2.20	6,033.25	6,031.31	8.15	6,033.52	6,032.33	0.010	0.000
Pipe - (42)	0.025	12.0	7.32	81.4	6,030.73	6,028.69	2.57	6,031.41	6,029.10	8.50	6,031.72	6,030.22	0.010	0.030
Pipe - (43)	0.025	12.0	7.32	56.7	6,028.49	6,027.07	3.08	6,029.24	6,027.54	8.93	6,029.61	6,028.68	0.010	0.053
Pipe - (44)	0.025	12.0	7.32	137.8	6,026.88	6,023.43	3.16	6,027.64	6,023.89	8.98	6,028.01	6,025.15	0.010	0.051
Pipe - (45)	0.025	12.0	7.32	102.8	6,023.23	6,020.66	3.60	6,024.04	6,021.16	9.29	6,024.48	6,022.50	0.010	0.073
Pipe - (46)	0.025	12.0	7.32	93.7	6,020.46	6,018.12	3.96	6,021.31	6,018.65	9.51	6,021.79	6,020.04	0.010	0.119
Pipe - (47)	0.020	18.0	14.85	98.1	6,017.62	6,015.66	4.26	6,018.41	6,016.21	7.26	6,018.73	6,017.02	0.013	0.024
Pipe - (48)	0.015	12.0	5.67	73.8	6,011.88	6,010.77	0.88	6,012.27	6,011.04	5.25	6,012.42	6,011.47	0.010	0.000
Pipe - (49)	0.015	18.0	12.86	61.1	6,010.27	6,009.36	1.59	6,010.75	6,009.71	4.95	6,010.92	6,010.09	0.013	0.008
Pipe - (50)	0.050	18.0	23.47	17.9	6,017.88	6,016.99	0.60	6,018.17	6,017.59	5.66	6,018.27	6,017.60	0.013	0.000
Pipe - (51)	0.050	18.0	23.47	17.9	6,021.53	6,020.64	0.60	6,021.82	6,021.18	5.66	6,021.92	6,021.20	0.013	0.000
Pipe - (52)	0.020	18.0	14.85	73.0	6,026.40	6,024.94	3.40	6,027.10	6,025.43	6.82	6,027.38	6,026.15	0.013	0.000
Pipe - (53)	0.035	18.0	19.64	17.8	6,024.55	6,023.92	3.81	6,025.29	6,024.42	8.60	6,025.58	6,025.29	0.013	0.039
Pipe - (54)	0.050	18.0	23.47	17.9	6,027.02	6,026.13	0.71	6,027.34	6,026.55	5.95	6,027.45	6,026.60	0.013	0.000
Pipe - (55)	0.050	18.0	23.47	17.9	6,028.12	6,027.23	0.71	6,028.44	6,027.57	5.95	6,028.55	6,027.66	0.013	0.000
Pipe - (56)	0.030	18.0	18.19	17.8	6,029.79	6,029.25	0.62	6,030.08	6,029.44	4.79	6,030.18	6,029.80	0.013	0.000
Pipe - (57)	0.005	18.0	7.40	222.1	6,009.14	6,008.04	5.82	6,010.98	6,010.30	3.29	6,011.15	6,010.47	0.013	0.138
Pipe - (59)	0.010	18.0	10.50	17.9	6,013.04	6,012.86	2.03	6,013.58	6,013.31	4.60	6,013.77	6,013.63	0.013	0.044
Pipe - (60)	0.010	18.0	10.50	103.3	6,012.66	6,011.63	2.38	6,013.25	6,012.11	4.81	6,013.46	6,012.47	0.013	0.008
Pipe - (61)	0.007	18.0	8.79	70.0	6,011.43	6,010.94	2.38	6,012.02	6,011.48	4.23	6,012.23	6,011.75	0.013	0.071
Pipe - (62)	0.007	18.0	8.79	22.3	6,010.74	6,010.59	3.35	6,011.44	6,011.32	4.64	6,011.71	6,011.56	0.013	0.153
Pipe - (63)	0.007	18.0	8.55	134.8	6,010.38	6,009.49	5.64	6,011.30	6,010.38	5.17	6,011.68	6,010.79	0.013	0.030
Pipe - (64)	0.025	18.0	16.61	117.5	6,013.52	6,010.58	2.29	6,014.09	6,011.31	6.60	6,014.30	6,011.42	0.013	0.000
Pipe - (65)	0.027	18.0	17.42	121.3	6,014.28	6,010.94	0.97	6,014.64	6,011.48	5.30	6,014.77	6,011.53	0.013	0.000
Pipe - (66)	0.006	18.0	8.25	40.3	6,013.11	6,012.86	0.35	6,013.33	6,013.25	2.32	6,013.40	6,013.26	0.013	0.033
Pipe - (69)	0.020	36.0	94.56	30.8	5,989.34	5,988.72	35.09	5,991.60	5,991.72	12.38	5,992.19	5,992.10	0.013	0.001
Pipe - (72)	0.020	18.0	14.85	29.7	6,013.55	6,012.95	5.12	6,019.00	6,018.93	2.90	6,019.14	6,019.06	0.013	0.000
Pipe - (73)	0.020	18.0	14.85	9.0	6,013.13	6,012.95	4.67	6,018.80	6,018.78	2.64	6,018.91	6,018.89	0.013	0.000
Pipe - (74)	0.050	18.0	23.47	31.3	6,009.45	6,007.89	13.92	6,010.83	6,008.83	13.85	6,011.88	6,011.05	0.013	0.000
Pipe - (75)	0.010	12.0	4.63	24.2	6,013.85	6,013.61	0.09	6,013.98	6,013.71	2.31	6,014.02	6,013.79	0.010	0.000
Pipe - (76)	0.030	12.0	8.02	15.9	6,014.02	6,013.54	0.35	6,014.26	6,013.68	5.12	6,014.35	6,014.06	0.010	0.000
Pipe - (78)	0.020	12.0	6.55	21.0	6,010.06	6,009.64	0.18	6,011.01	6,011.00	3.63	6,011.01	6,011.01	0.010	0.000

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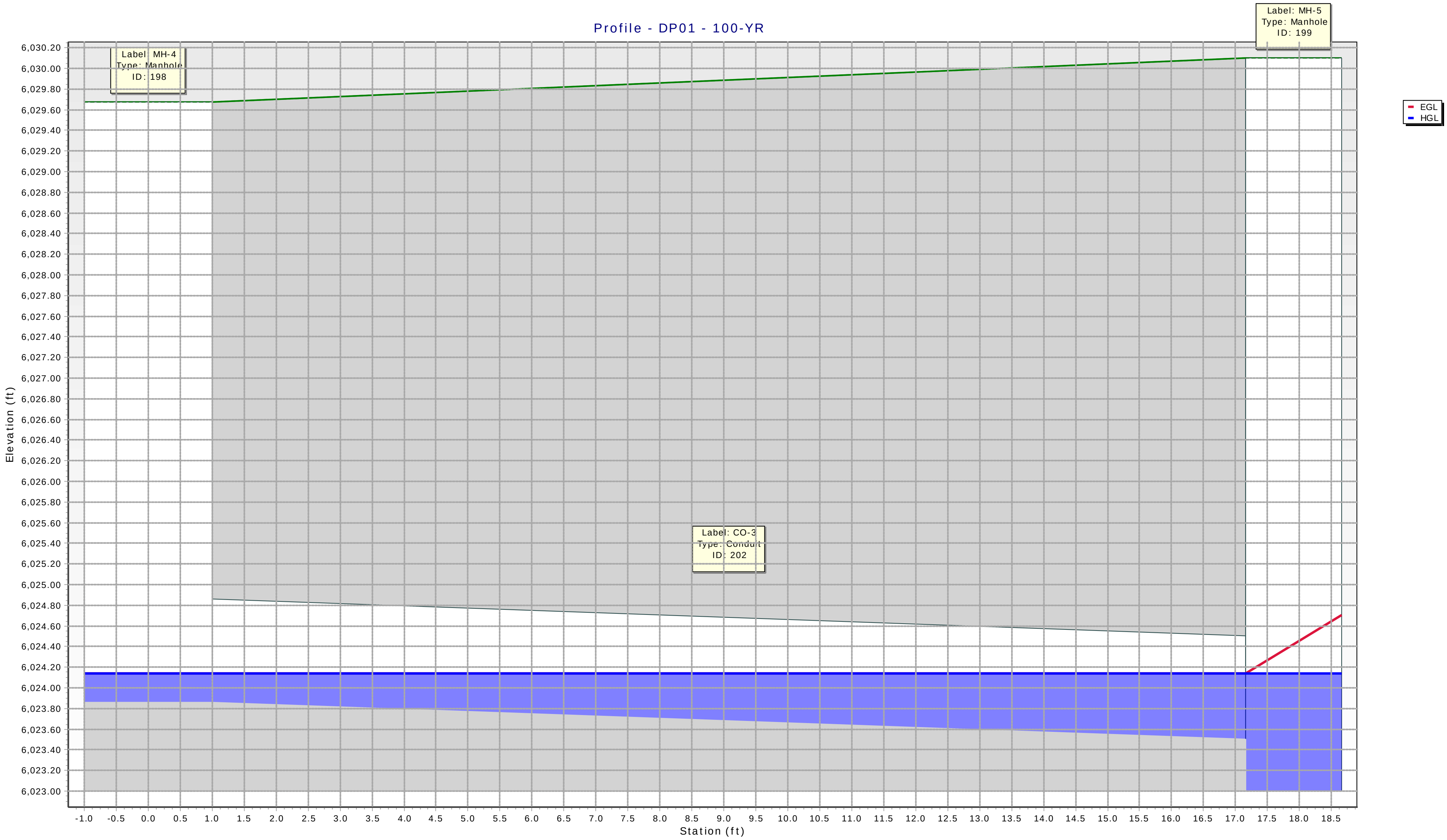
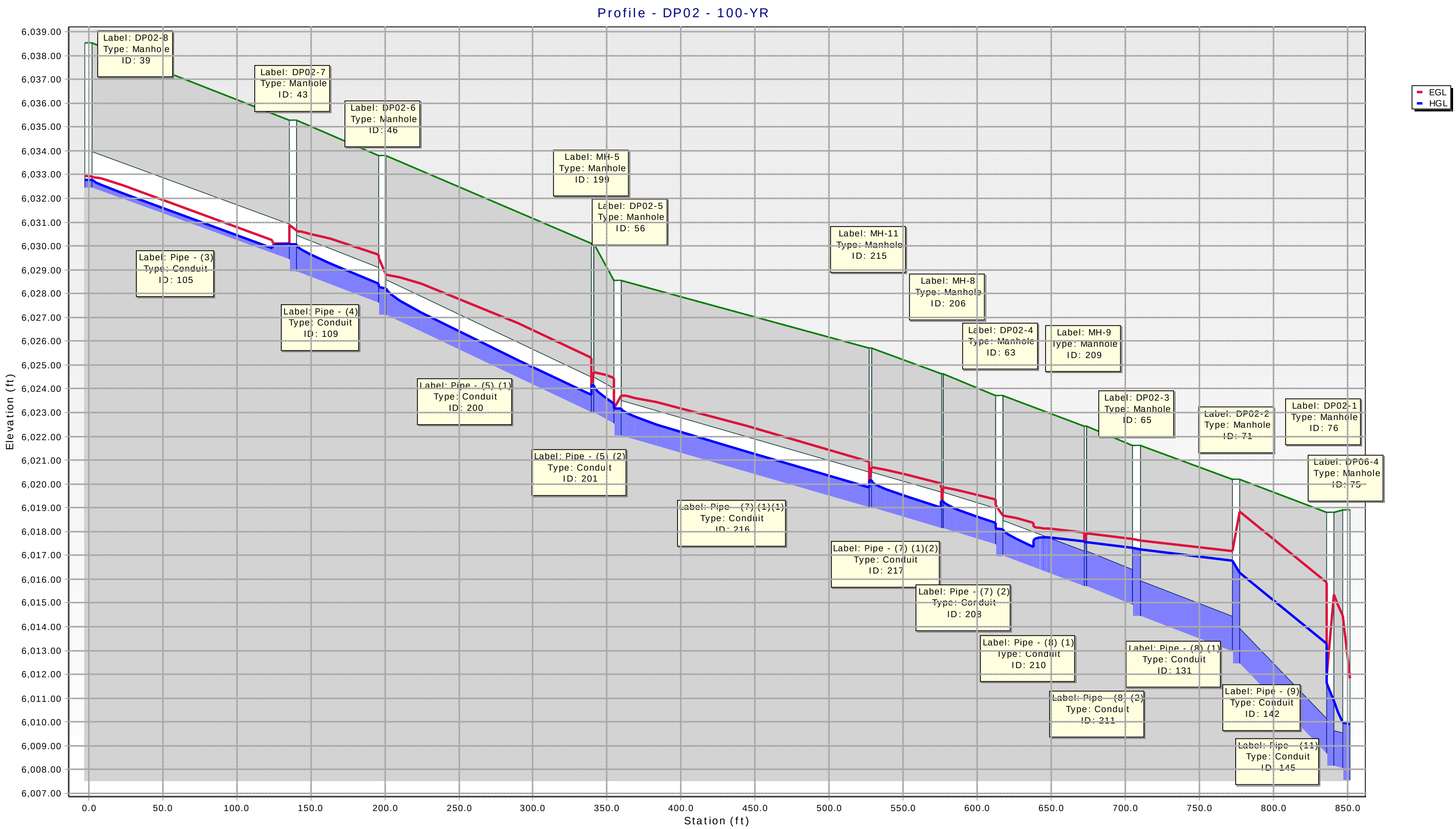
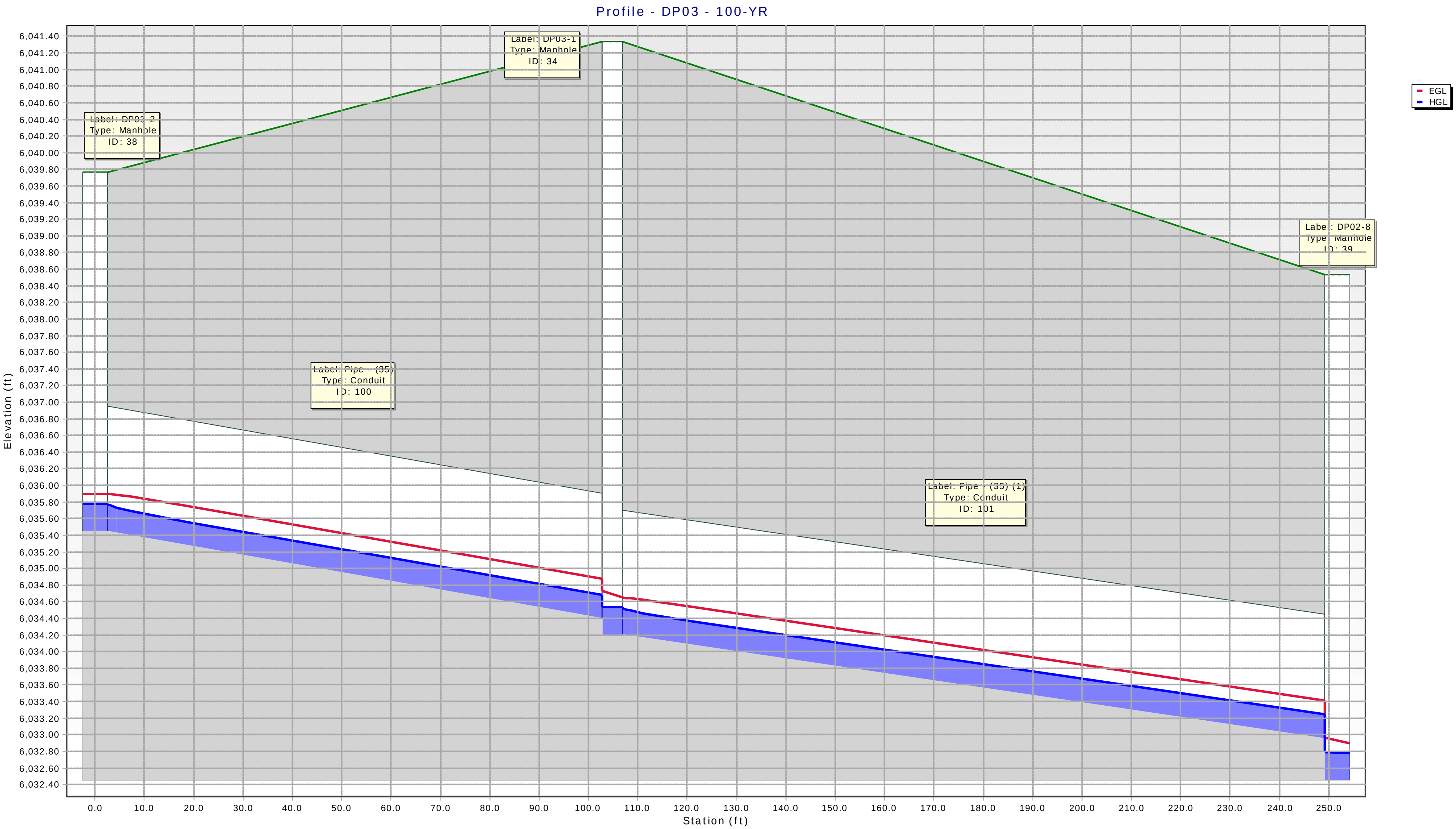
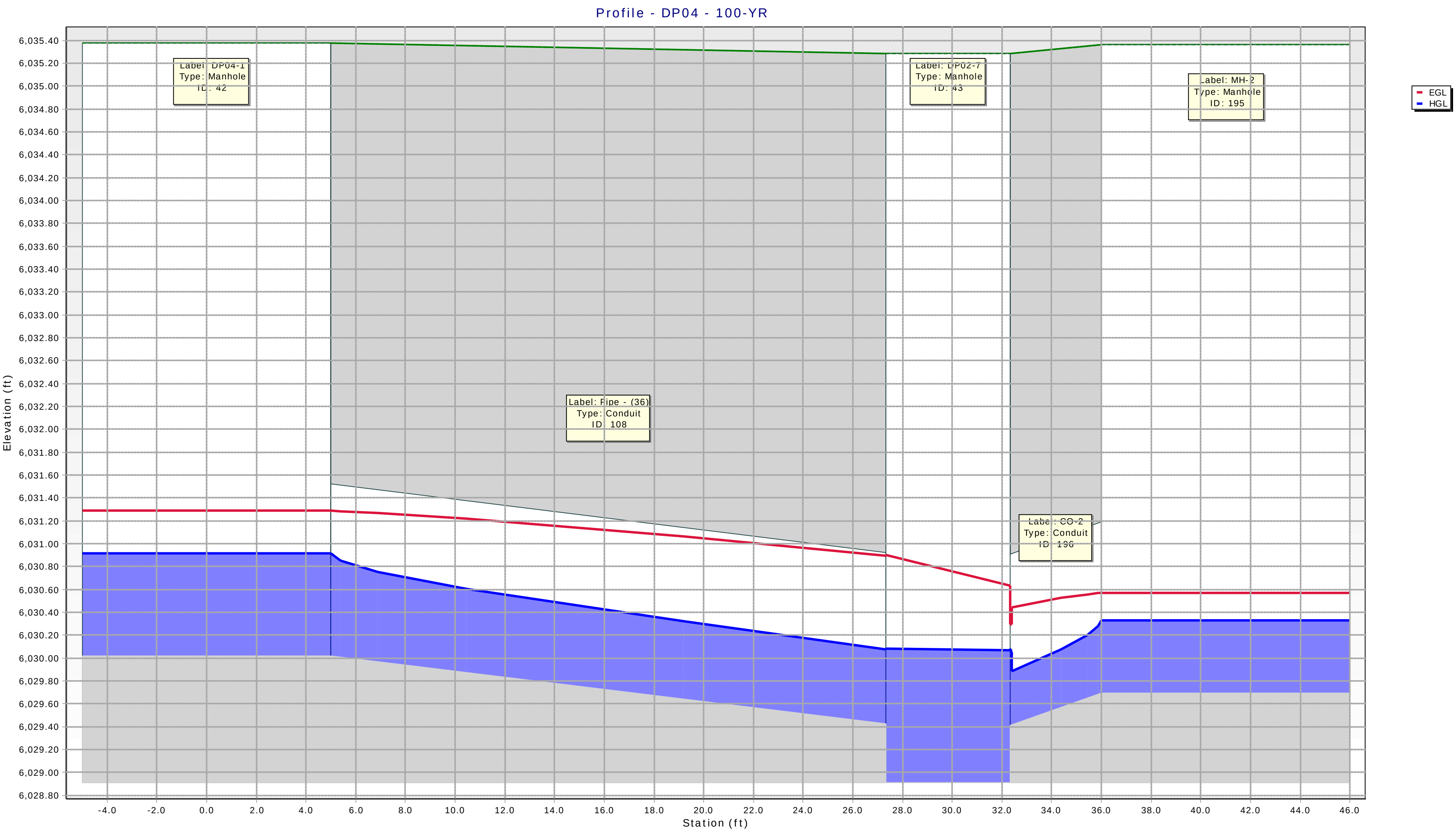

Profile - DP01 - 100-YR
Label: MH-4
Type: Manhole
ID: 198
Label: MH-5
Type: Manhole
ID: 199
Label: CO-3
Type: Conduit
ID: 202
EGL
HGL
Elevation (ft)
Station (ft)
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
6,028.60
6,028.40
6,028.20
6,028.00
6,027.80
6,027.60
6,027.40
6,027.20
6,027.00
6,026.80
6,026.60
6,026.40
6,026.20
6,026.00
6,025.80
6,025.60
6,025.40
6,025.20
6,025.00
6,024.80
6,024.60
6,024.40
6,024.20
6,024.00
6,023.80
6,023.60
6,023.40
6,023.20
6,023.00
-1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5



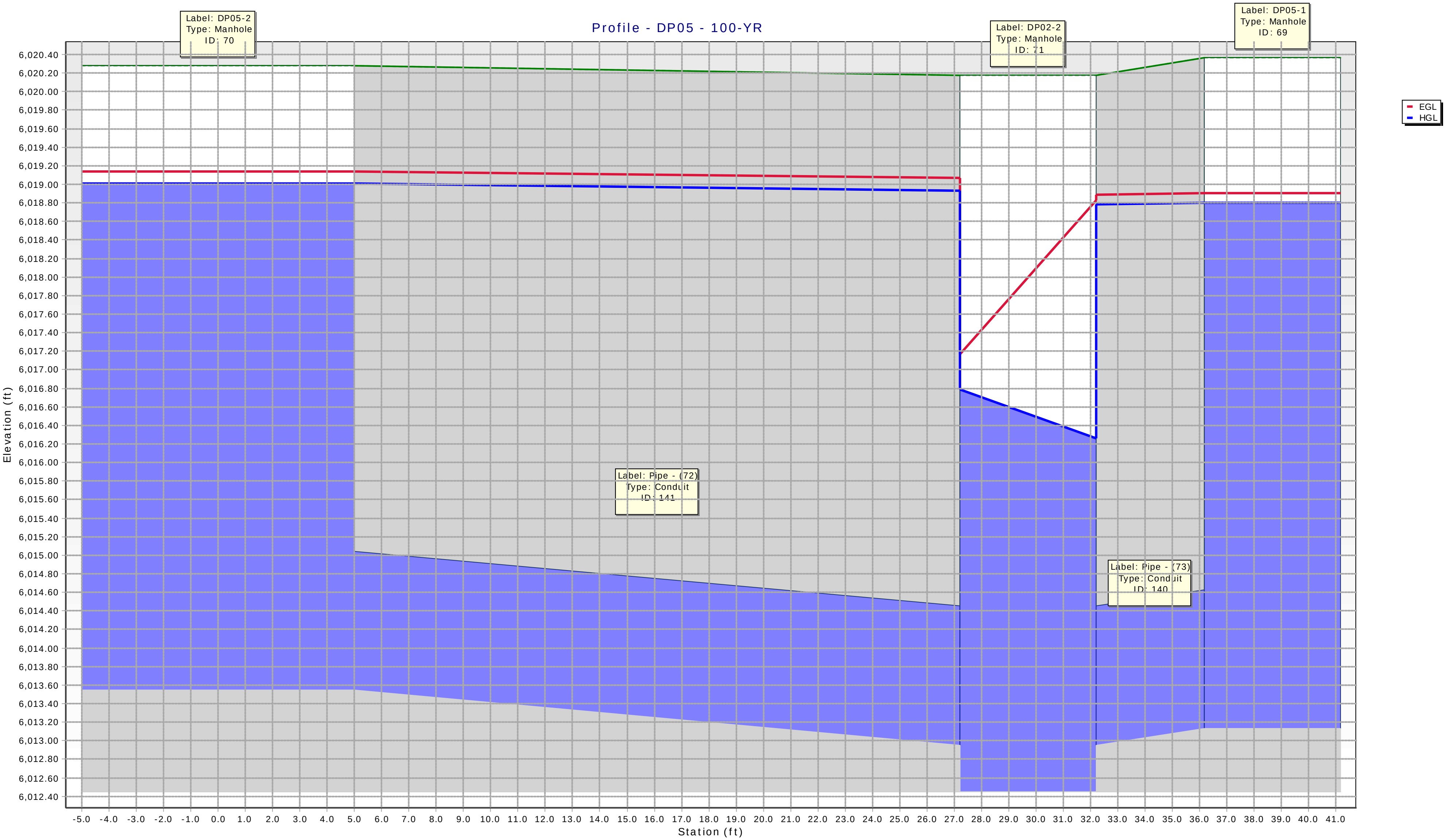
Profile - DP02 - 100-YR
EGL
HGL
Elevation (ft)
Station (ft)
Label: DP02-8
Type: Manhole
ID: 39
Label: DP02-7
Type: Manhole
ID: 43
Label: DP02-6
Type: Manhole
ID: 46
Label: MH-5
Type: Manhole
ID: 199
Label: DP02-5
Type: Manhole
ID: 56
Label: MH-11
Type: Manhole
ID: 215
Label: MH-8
Type: Manhole
ID: 206
Label: DP02-4
Type: Manhole
ID: 63
Label: MH-9
Type: Manhole
ID: 209
Label: DP02-3
Type: Manhole
ID: 65
Label: DP02-2
Type: Manhole
ID: 71
Label: DP02-1
Type: Manhole
ID: 76
Label: DP06-4
Type: Manhole
ID: 75
Label: Pipe - (3)
Type: Conduit
ID: 105
Label: Pipe - (4)
Type: Conduit
ID: 109
Label: Pipe - (5) (1)
Type: Conduit
ID: 200
Label: Pipe - (5) (2)
Type: Conduit
ID: 201
Label: Pipe - (7) (1)(1)
Type: Conduit
ID: 216
Label: Pipe - (7) (1)(2)
Type: Conduit
ID: 217
Label: Pipe - (7) (2)
Type: Conduit
ID: 208
Label: Pipe - (8) (1)
Type: Conduit
ID: 210
Label: Pipe - (8) (1)
Type: Conduit
ID: 131
Label: Pipe - (8) (2)
Type: Conduit
ID: 211
Label: Pipe - (9)
Type: Conduit
ID: 142
Label: Pipe - (11)
Type: Conduit
ID: 145



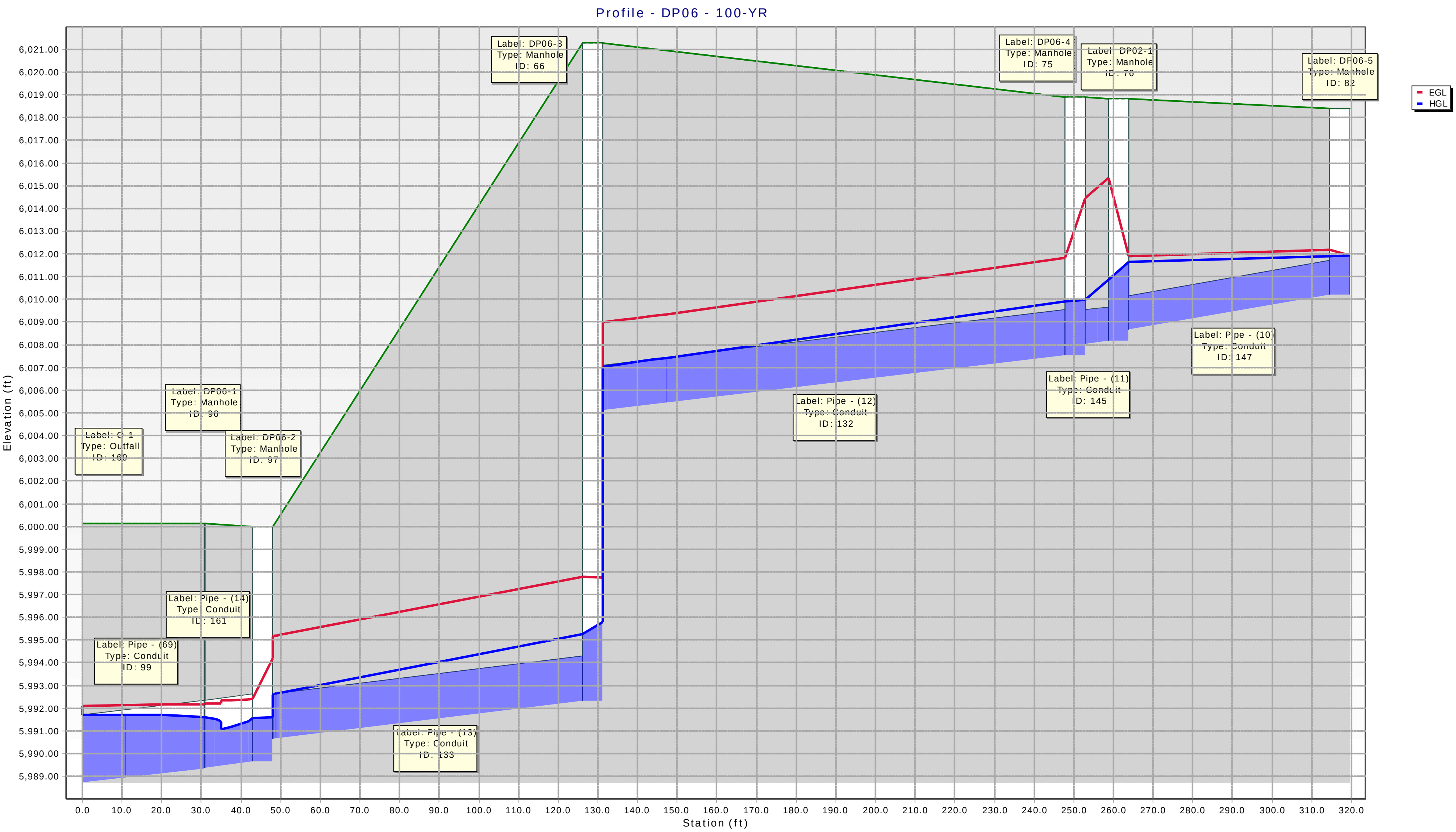
Profile - DP03 - 100-YR
Label: DP03-2
Type: Manhole
ID: 38
Label: DP03-1
Type: Manhole
ID: 34
Label: DP02-8
Type: Manhole
ID: 39
Label: Pipe - (35)
Type: Conduit
ID: 100
Label: Pipe - (35) (1)
Type: Conduit
ID: 101
EGL
HGL
Elevation (ft)
6,041.40
6,041.20
6,041.00
6,040.80
6,040.60
6,040.40
6,040.20
6,040.00
6,039.80
6,039.60
6,039.40
6,039.20
6,039.00
6,038.80
6,038.60
6,038.40
6,038.20
6,038.00
6,037.80
6,037.60
6,037.40
6,037.20
6,037.00
6,036.80
6,036.60
6,036.40
6,036.20
6,036.00
6,035.80
6,035.60
6,035.40
6,035.20
6,035.00
6,034.80
6,034.60
6,034.40
6,034.20
6,034.00
6,033.80
6,033.60
6,033.40
6,033.20
6,033.00
6,032.80
6,032.60
6,032.40
Station (ft)
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
110.0
120.0
130.0
140.0
150.0
160.0
170.0
180.0
190.0
200.0
210.0
220.0
230.0
240.0
250.0



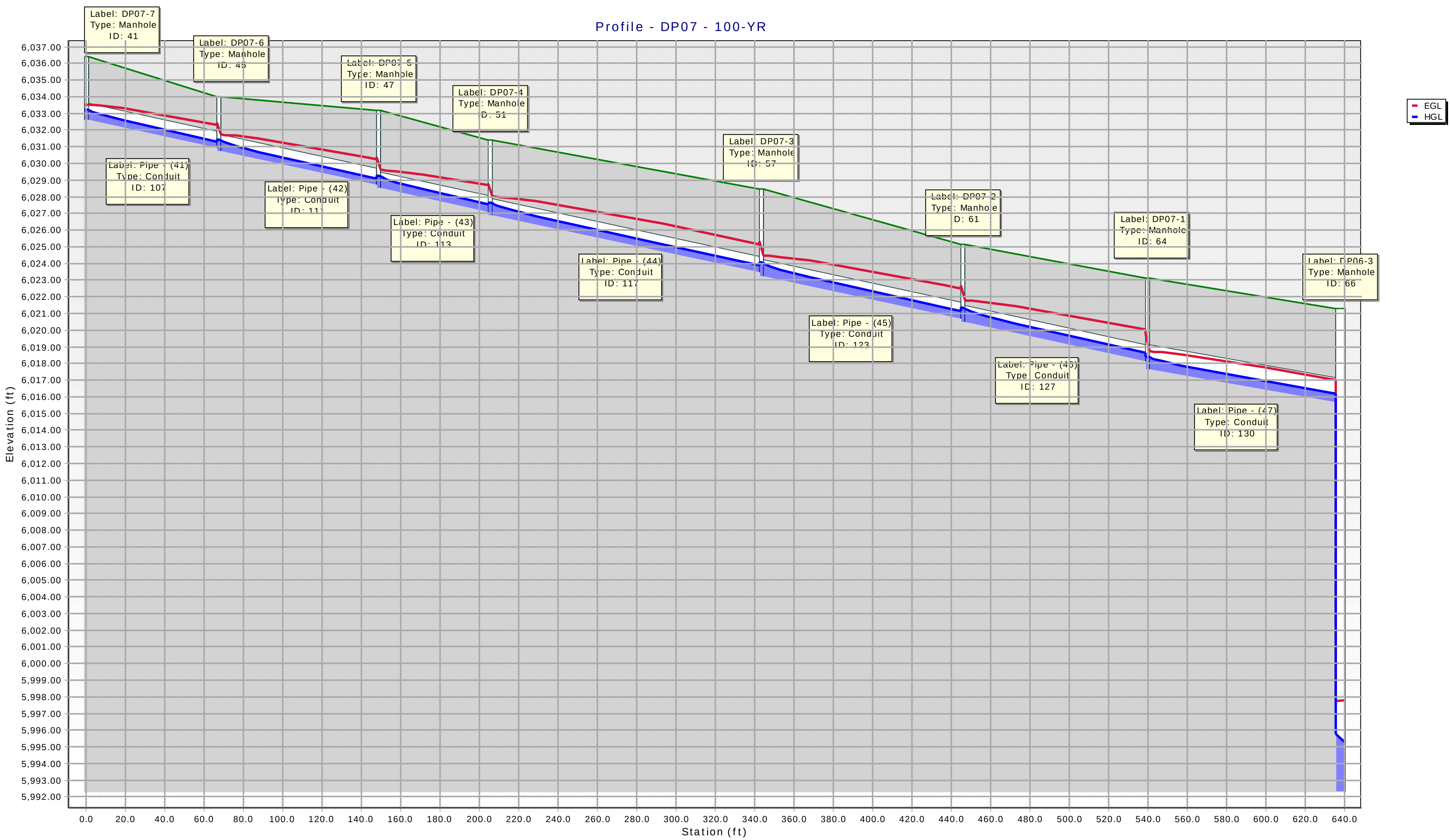
Profile - DP04 - 100-YR
Label: DP04-1
Type: Manhole
ID: 42
Label: DP02-7
Type: Manhole
ID: 43
Label: MH-2
Type: Manhole
ID: 195
Label: Pipe - (36)
Type: Conduit
ID: 108
Label: CO-2
Type: Conduit
ID: 196
EGL
HGL
Elevation (ft)
Station (ft)
6,035.40
6,035.20
6,035.00
6,034.80
6,034.60
6,034.40
6,034.20
6,034.00
6,033.80
6,033.60
6,033.40
6,033.20
6,033.00
6,032.80
6,032.60
6,032.40
6,032.20
6,032.00
6,031.80
6,031.60
6,031.40
6,031.20
6,031.00
6,030.80
6,030.60
6,030.40
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
-4.0 -2.0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 42.0 44.0 46.0



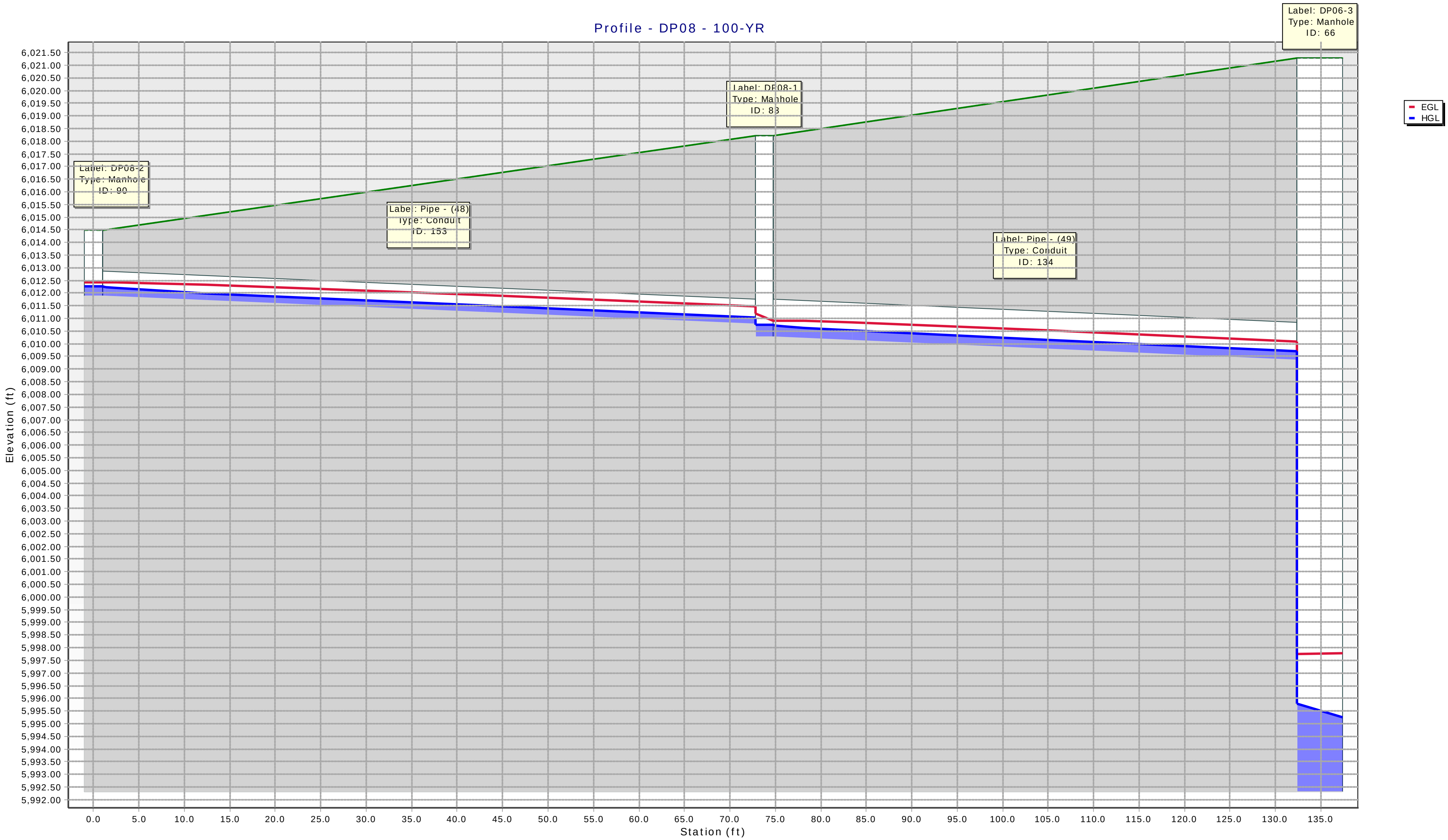
Profile - DP05 - 100-YR
Label: DP05-2
Type: Manhole
ID: 70
Label: DP02-2
Type: Manhole
ID: 71
Label: DP05-1
Type: Manhole
ID: 69
Label: Pipe - (72)
Type: Conduit
ID: 141
Label: Pipe - (73)
Type: Conduit
ID: 140
EGL
HGL
Elevation (ft)
Station (ft)

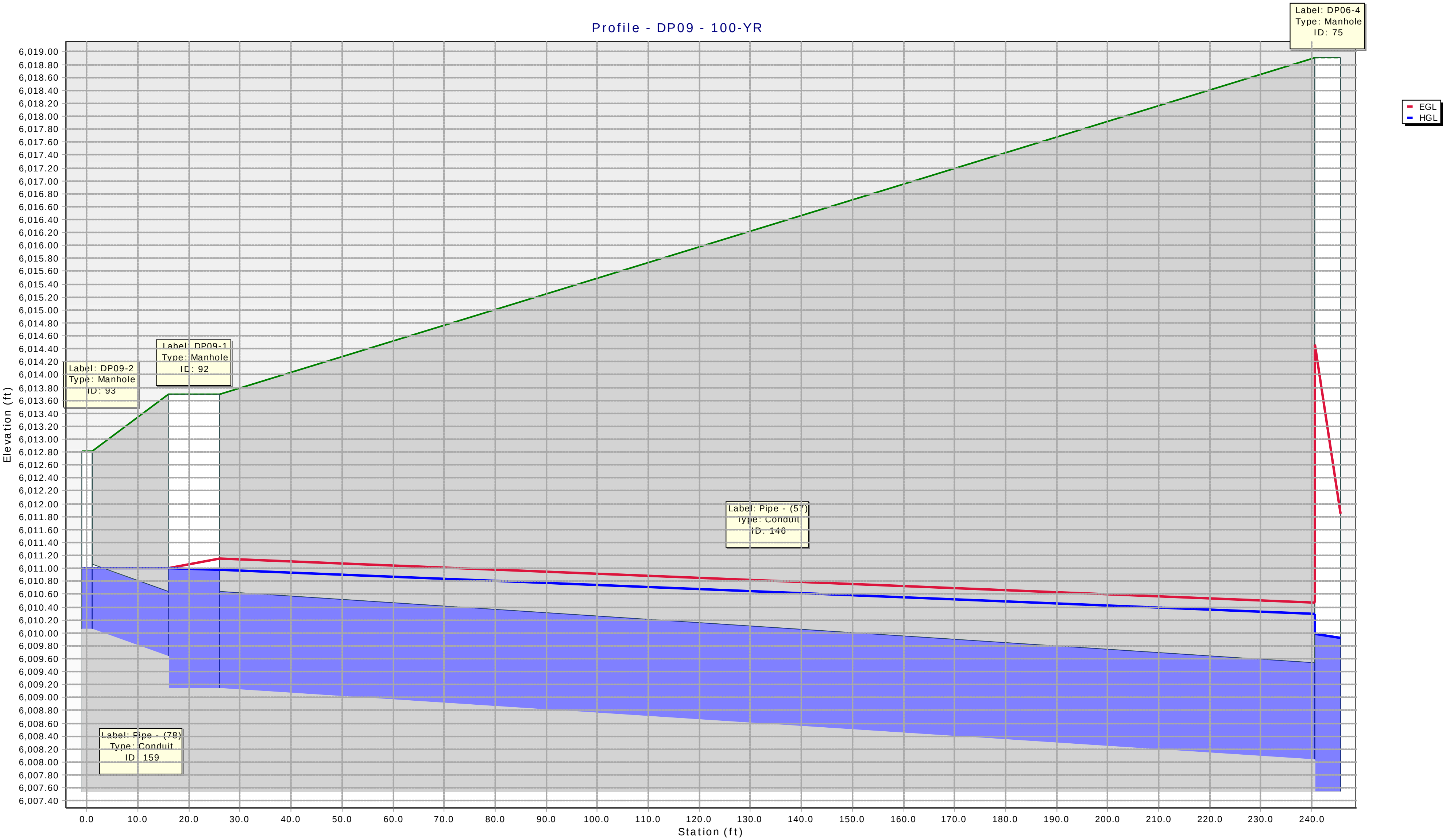


Profile - DP06 - 100-YR
Elevation (ft)
Station (ft)
EGL
HGL
Label: DP06-3
Type: Manhole
ID: 66
Label: DP06-4
Type: Manhole
ID: 75
Label: DP02-1
Type: Manhole
ID: 76
Label: DP06-5
Type: Manhole
ID: 82
Label: DP06-1
Type: Manhole
ID: 96
Label: O-1
Type: Outfall
ID: 160
Label: DP06-2
Type: Manhole
ID: 97
Label: Pipe - (14)
Type: Conduit
ID: 161
Label: Pipe - (69)
Type: Conduit
ID: 99
Label: Pipe - (13)
Type: Conduit
ID: 133
Label: Pipe - (12)
Type: Conduit
ID: 132
Label: Pipe - (11)
Type: Conduit
ID: 145
Label: Pipe - (10
Type: Conduit
ID: 147
6,021.00
6,020.00
6,019.00
6,018.00
6,017.00
6,016.00
6,015.00
6,014.00
6,013.00
6,012.00
6,011.00
6,010.00
6,009.00
6,008.00
6,007.00
6,006.00
6,005.00
6,004.00
6,003.00
6,002.00
6,001.00
6,000.00
5,999.00
5,998.00
5,997.00
5,996.00
5,995.00
5,994.00
5,993.00
5,992.00
5,991.00
5,990.00
5,989.00
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
110.0
120.0
130.0
140.0
150.0
160.0
170.0
180.0
190.0
200.0
210.0
220.0
230.0
240.0
250.0
260.0
270.0
280.0
290.0
300.0
310.0
320.0

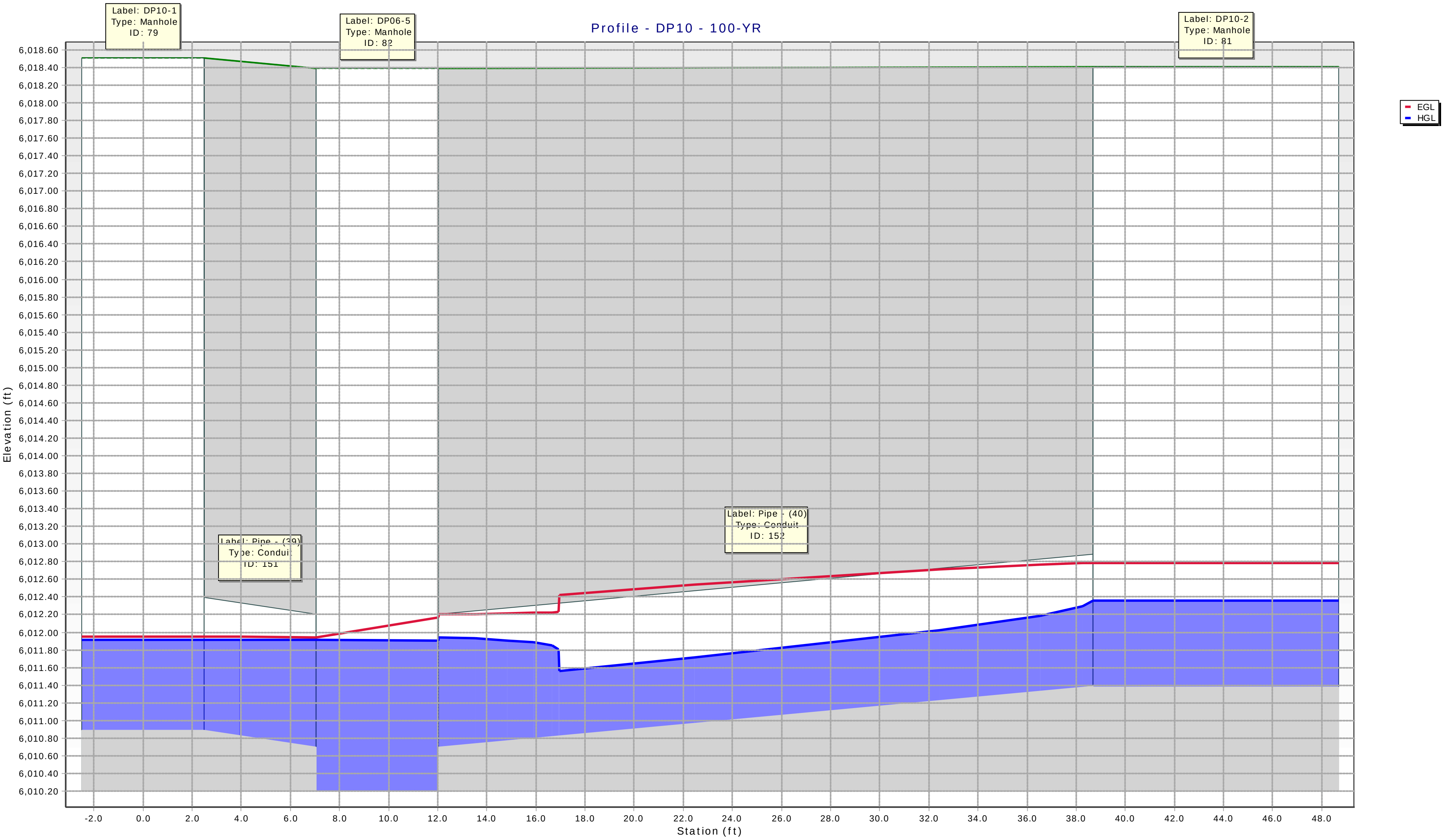


Profile - DP07 - 100-YR
Label: DP07-7
Type: Manhole
ID: 41
Label: DP07-6
Type: Manhole
ID: 45
Label: DP07-5
Type: Manhole
ID: 47
Label: DP07-4
Type: Manhole
ID: 51
Label: DP07-3
Type: Manhole
ID: 57
Label: DP07-2
Type: Manhole
ID: 61
Label: DP07-1
Type: Manhole
ID: 64
Label: DP06-3
Type: Manhole
ID: 66
Label: Pipe - (41)
Type: Conduit
ID: 107
Label: Pipe - (42)
Type: Conduit
Label: Pipe - (43)
Type: Conduit
ID: 113
Label: Pipe - (44)
Type: Conduit
ID: 117
Label: Pipe - (45)
Type: Conduit
ID: 123
Type: Conduit
ID: 127
Label: Pipe - (47)
Type: Conduit
ID: 130
EGL
HGL
Elevation (ft)
Station (ft)

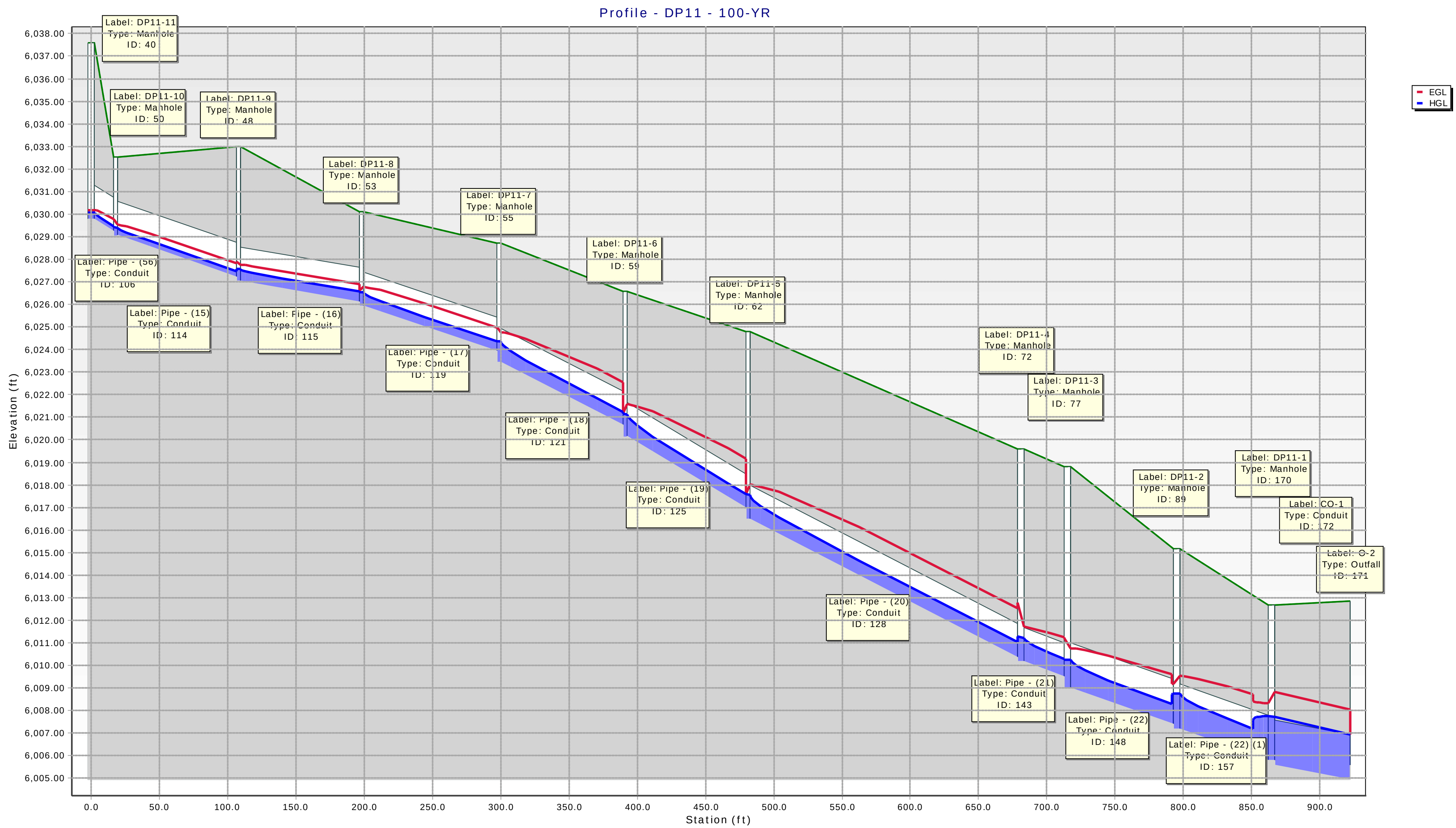

Profile - DP08 - 100-YR
Label: DP08-2
Type: Manhole
ID: 90
Label: Pipe - (48)
Type: Conduit
ID: 153
Label: DP08-1
Type: Manhole
ID: 88
Label: Pipe - (49)
Type: Conduit
ID: 134
Label: DP06-3
Type: Manhole
ID: 66
EGL
HGL
Elevation (ft)
Station (ft)

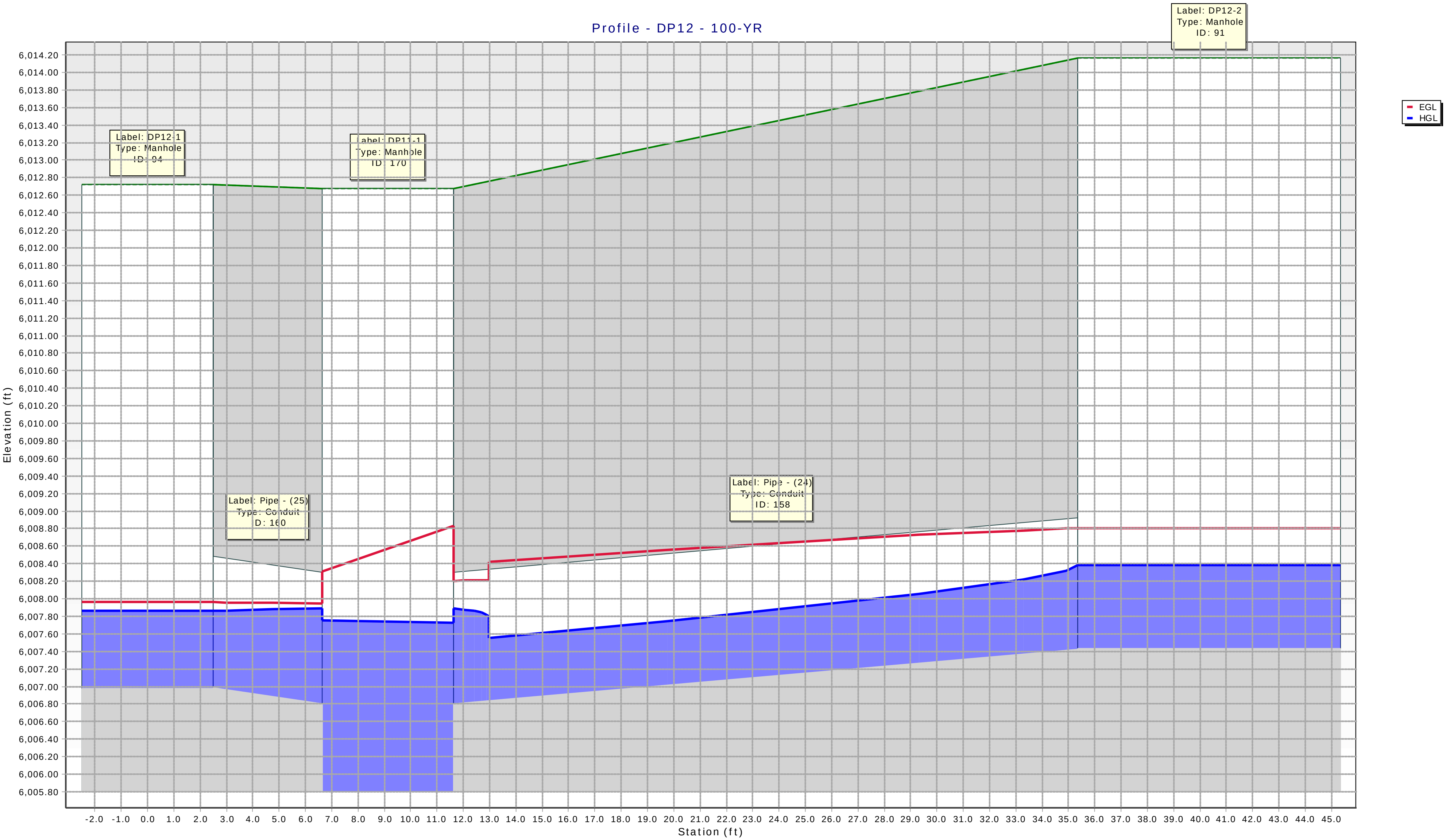


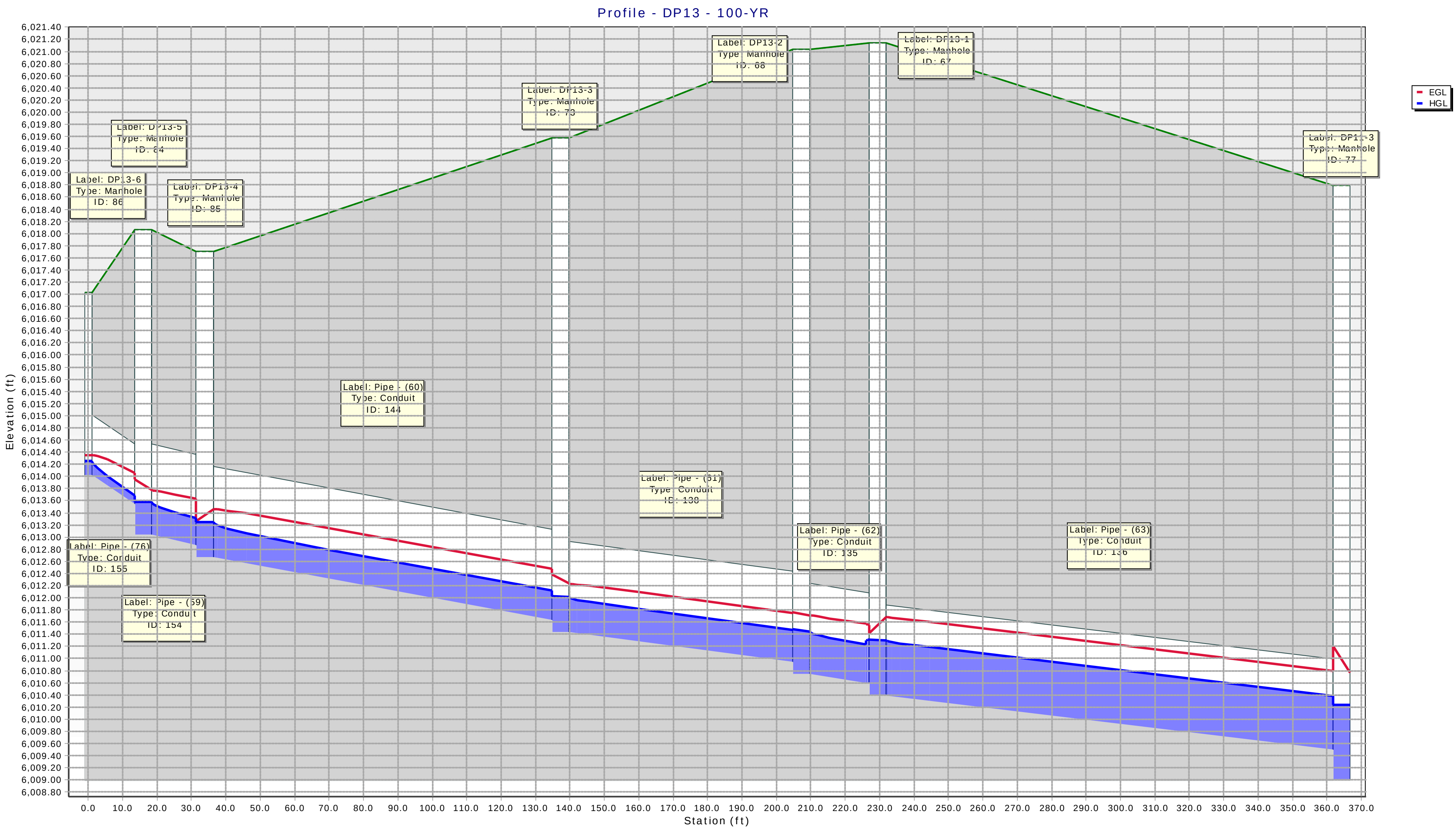
Profile - DP09 - 100-YR
Label: DP06-4
Type: Manhole
ID: 75
Label: DP09-1
Type: Manhole
ID: 92
Label: DP09-2
Type: Manhole
ID: 93
Label: Pipe - (57)
Type: Conduit
ID: 146
Label: Pipe - (78)
Type: Conduit
ID: 159
EGL
HGL
Elevation (ft)
Station (ft)



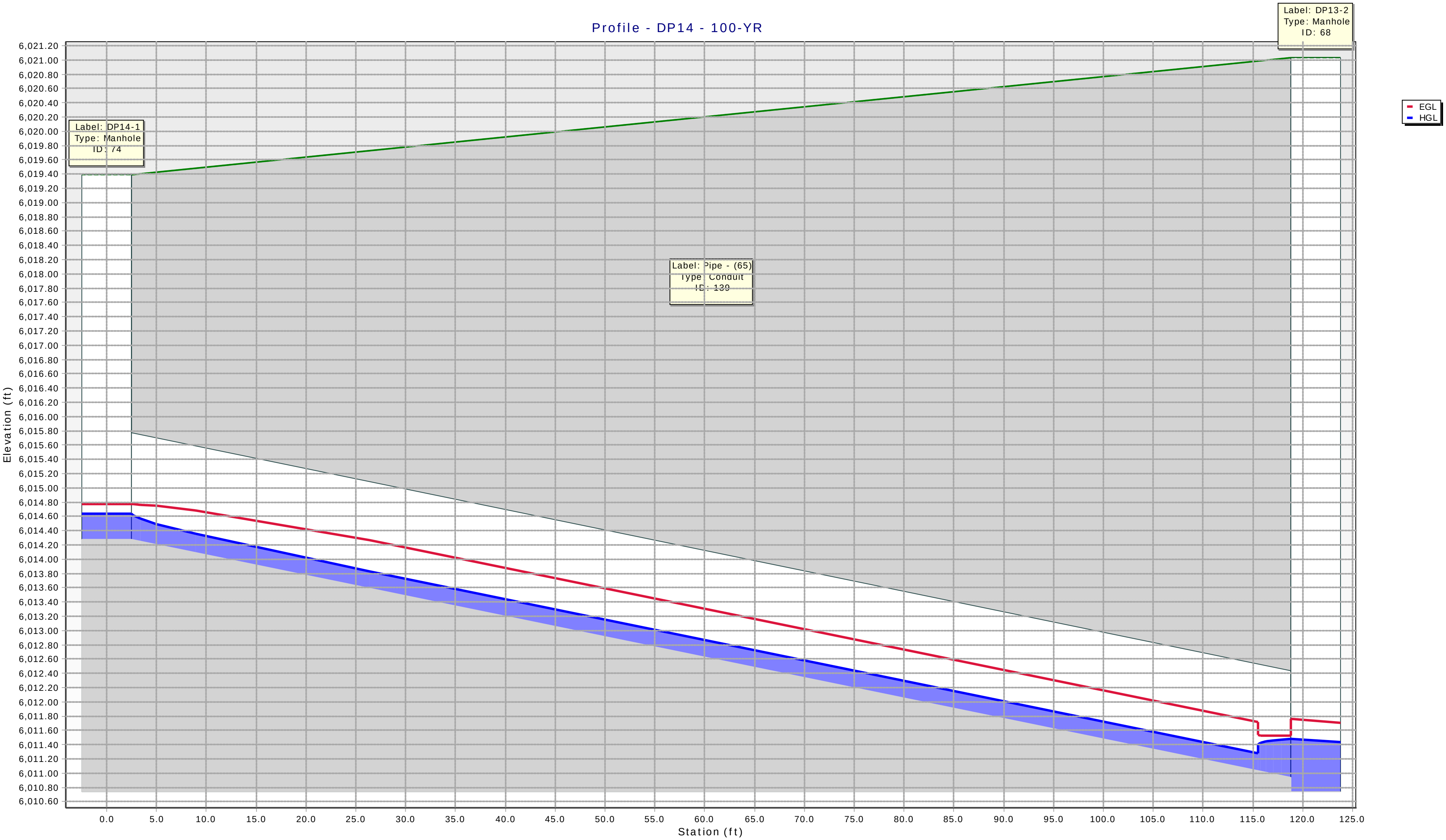
Profile - DP10 - 100-YR
Label: DP10-1
Type: Manhole
ID: 79
Label: DP06-5
Type: Manhole
ID: 82
Label: DP10-2
Type: Manhole
ID: 81
Label: Pipe - (39)
Type: Conduit
ID: 151
Label: Pipe - (40)
Type: Conduit
ID: 152
EGL
HGL
Elevation (ft)
Station (ft)
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
6,016.20
6,016.00
6,015.80
6,015.60
6,015.40
6,015.20
6,015.00
6,014.80
6,014.60
6,014.40
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
6,010.40
6,010.20
-2.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
34.0
36.0
38.0
40.0
42.0
44.0
46.0
48.0


Profile - DP11 - 100-YR
Label: DP11-11 Type: Manhole ID: 40
Label: DP11-10 Type: Manhole ID: 50
Label: DP11-9 Type: Manhole ID: 48
Label: DP11-8 Type: Manhole ID: 53
Label: DP11-7 Type: Manhole ID: 55
Label: DP11-6 Type: Manhole ID: 59
Label: DP11-5 Type: Manhole ID: 62
Label: DP11-4 Type: Manhole ID: 72
Label: DP11-3 Type: Manhole ID: 77
Label: DP11-2 Type: Manhole ID: 89
Label: DP11-1 Type: Manhole ID: 170
Label: CO-1 Type: Conduit ID: 172
Label: O-2 Type: Outfall ID: 171
Label: Pipe - (56) Type: Conduit ID: 106
Label: Pipe - (15) Type: Conduit ID: 114
Label: Pipe - (16) Type: Conduit ID: 115
Label: Pipe - (17) Type: Conduit ID: 119
Label: Pipe - (18) Type: Conduit ID: 121
Label: Pipe - (19) Type: Conduit ID: 125
Label: Pipe - (20) Type: Conduit ID: 128
Label: Pipe - (21) Type: Conduit ID: 143
Label: Pipe - (22) Type: Conduit ID: 148
Label: Pipe - (22) (1) Type: Conduit ID: 157
EGL
HGL
Elevation (ft)
6,038.00
6,037.00
6,036.00
6,035.00
6,034.00
6,033.00
6,032.00
6,031.00
6,030.00
6,029.00
6,028.00
6,027.00
6,026.00
6,025.00
6,024.00
6,023.00
6,022.00
6,021.00
6,020.00
6,019.00
6,018.00
6,017.00
6,016.00
6,015.00
6,014.00
6,013.00
6,012.00
6,011.00
6,010.00
6,009.00
6,008.00
6,007.00
6,006.00
6,005.00
Station (ft)
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
750.0
800.0
850.0
900.0

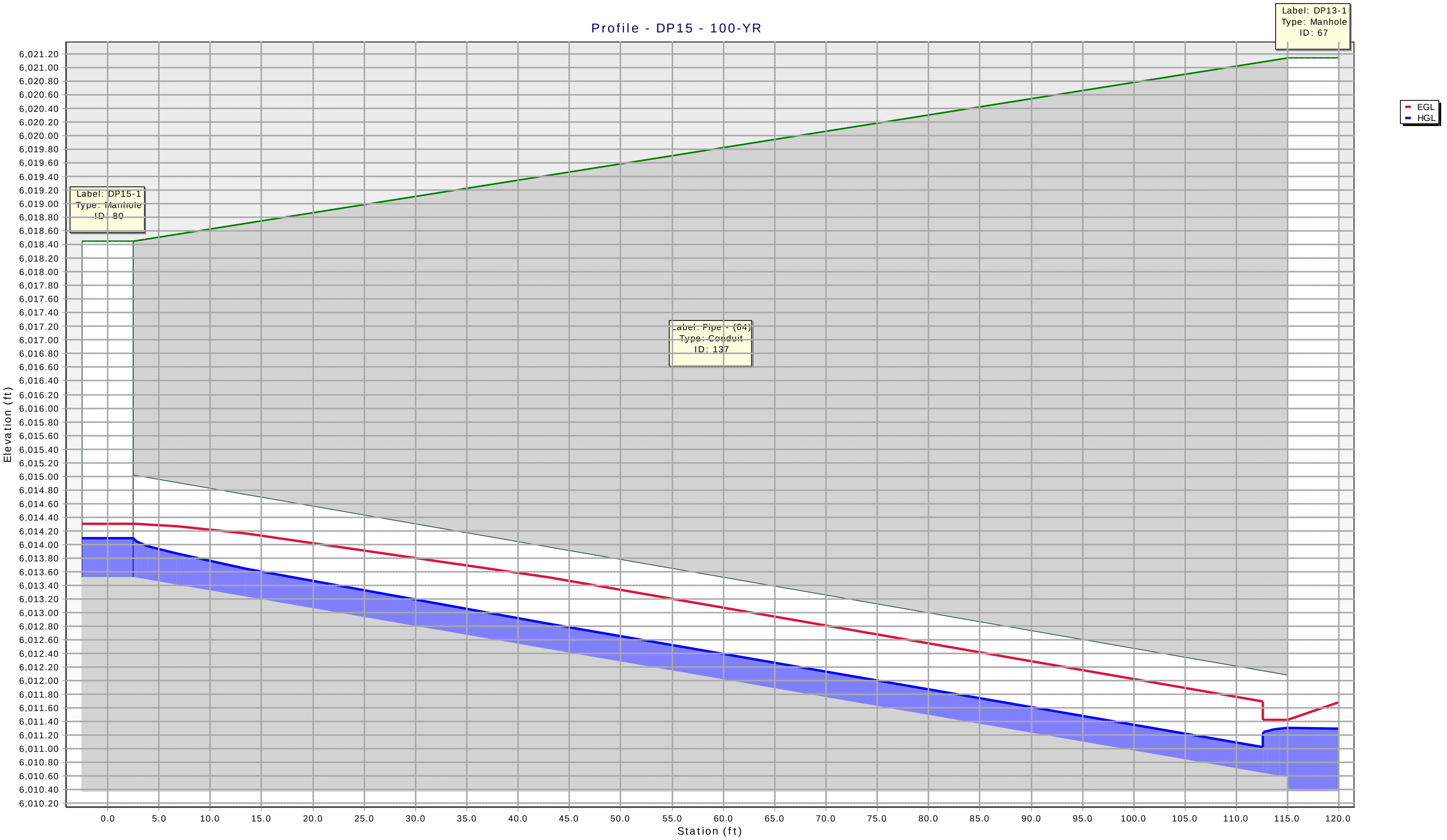

Profile - DP12 - 100-YR
Label: DP12-1
Type: Manhole
ID: 94
Label: DP11-1
Type: Manhole
ID: 170
Label: DP12-2
Type: Manhole
ID: 91
Label: Pipe - (25)
Type: Conduit
ID: 160
Label: Pipe - (24)
Type: Conduit
ID: 158
EGL
HGL
Elevation (ft)
Station (ft)
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
6,010.40
6,010.20
6,010.00
6,009.80
6,009.60
6,009.40
6,009.20
6,009.00
6,008.80
6,008.60
6,008.40
6,008.20
6,008.00
6,007.80
6,007.60
6,007.40
6,007.20
6,007.00
6,006.80
6,006.60
6,006.40
6,006.20
6,006.00
6,005.80
-2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0 41.0 42.0 43.0 44.0 45.0



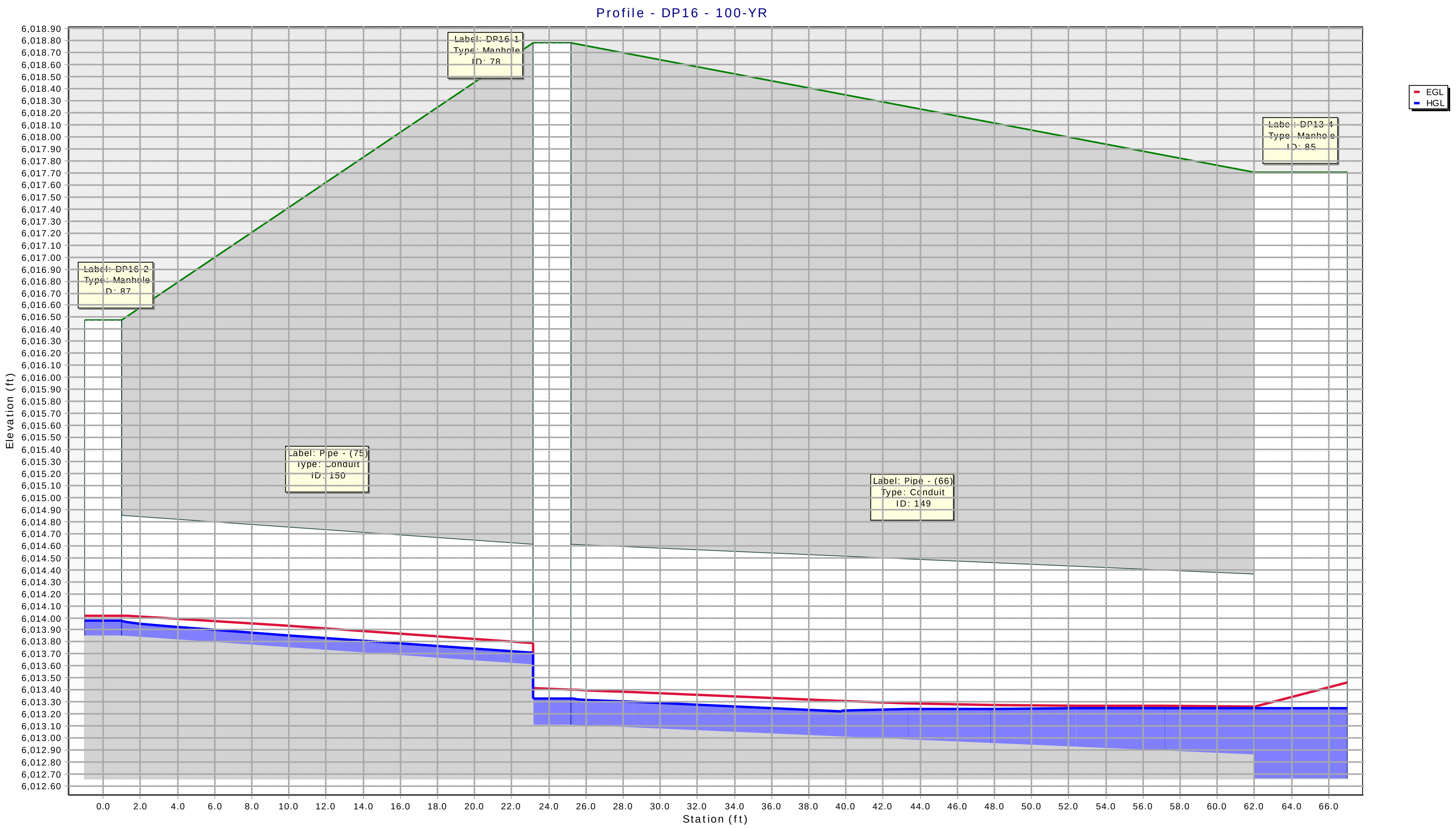
Profile - DP13 - 100-YR
EGL
HGL
Label: DP13-6
Type: Manhole
ID: 86
Label: DP13-5
Type: Manhole
ID: 84
Label: DP13-4
Type: Manhole
ID: 85
Label: DP13-3
Type: Manhole
ID: 73
Label: DP13-2
Type: Manhole
ID: 68
Label: DP13-1
Type: Manhole
ID: 67
Label: DP11-3
Type: Manhole
ID: 77
Label: Pipe - (60)
Type: Conduit
ID: 144
Label: Pipe - (61)
Type: Conduit
ID: 138
Label: Pipe - (62)
Type: Conduit
ID: 135
Label: Pipe - (63)
Type: Conduit
ID: 136
Label: Pipe - (76)
Type: Conduit
ID: 155
Label: Pipe - (59)
Type: Conduit
ID: 154
Elevation (ft)
Station (ft)



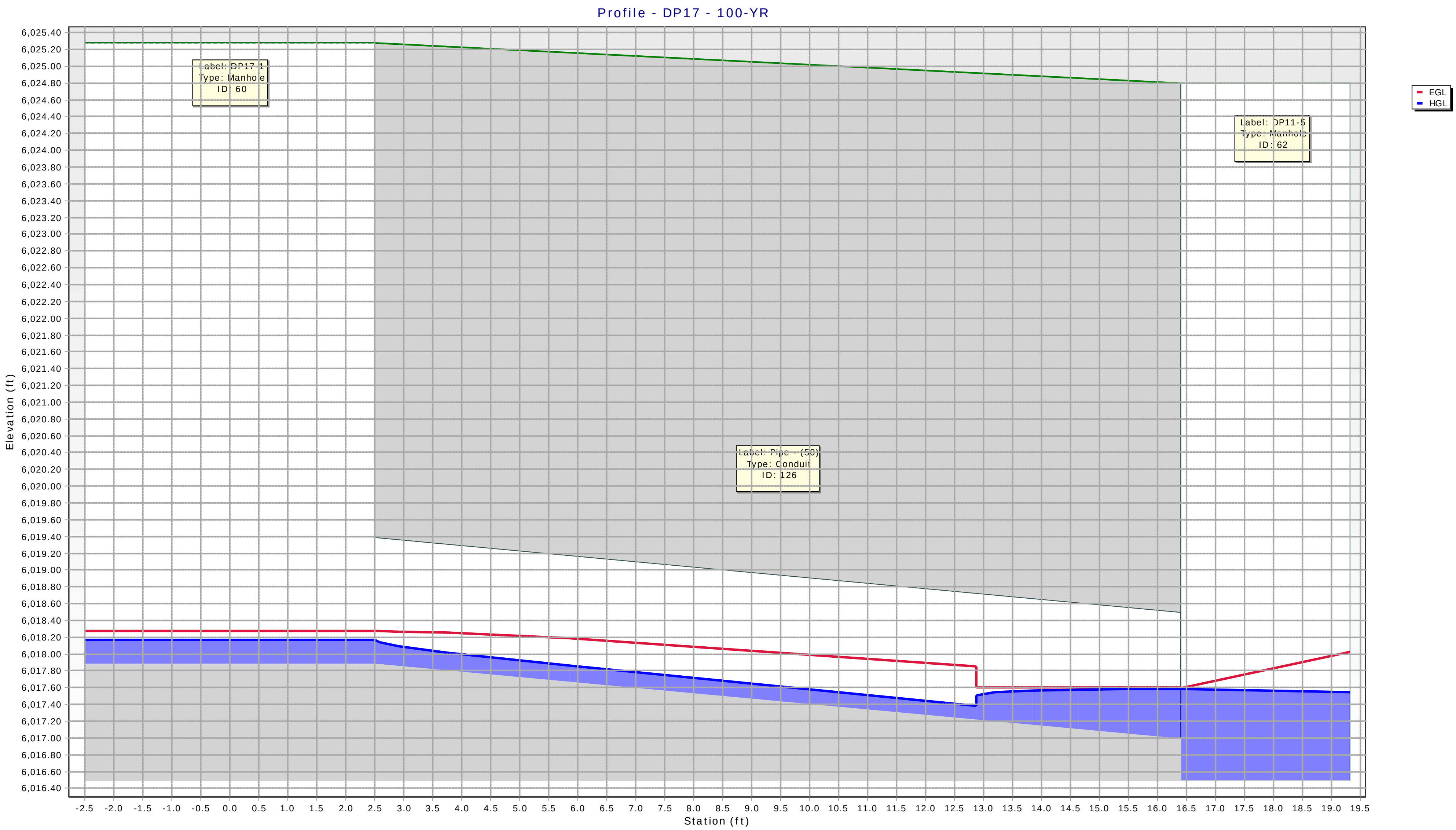
Profile - DP14 - 100-YR
Label: DP13-2
Type: Manhole
ID: 68
Label: DP14-1
Type: Manhole
ID: 74
Label: Pipe - (65)
Type: Conduit
ID: 139
EGL
HGL
Elevation (ft)
Station (ft)
6,021.20
6,021.00
6,020.80
6,020.60
6,020.40
6,020.20
6,020.00
6,019.80
6,019.60
6,019.40
6,019.20
6,019.00
6,018.80
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
6,016.20
6,016.00
6,015.80
6,015.60
6,015.40
6,015.20
6,015.00
6,014.80
6,014.60
6,014.40
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
95.0
100.0
105.0
110.0
115.0
120.0
125.0



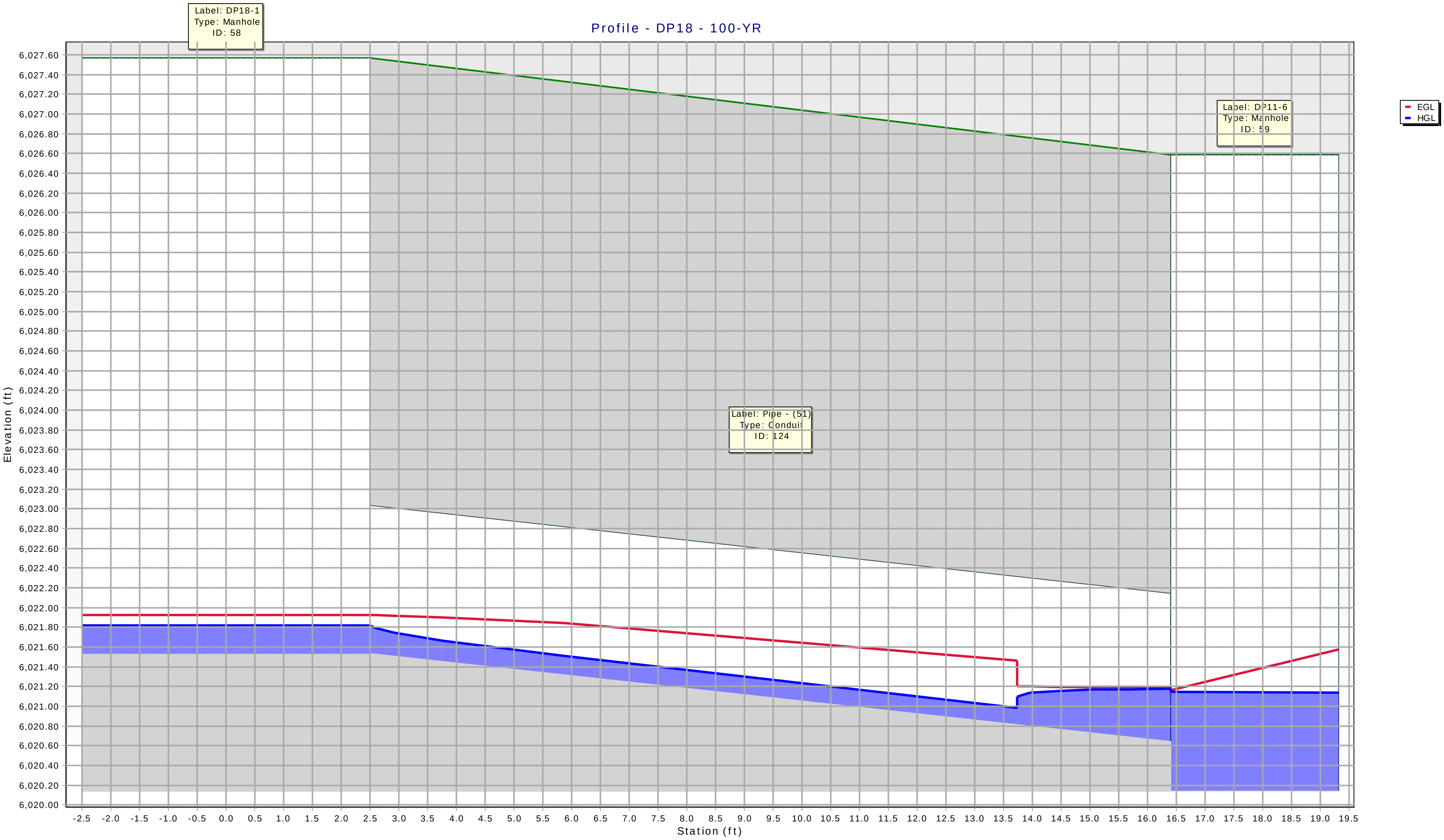
Profile - DP15 - 100-YR
Label: DP13-1
Type: Manhole
ID: 67
Label: DP15-1
Type: Manhole
ID: 80
Label: Pipe - (64)
Type: Conduit
ID: 137
EGL
HGL
Elevation (ft)
Station (ft)
6,021.20
6,021.00
6,020.80
6,020.60
6,020.40
6,020.20
6,020.00
6,019.80
6,019.60
6,019.40
6,019.20
6,019.00
6,018.80
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
6,016.20
6,016.00
6,015.80
6,015.60
6,015.40
6,015.20
6,015.00
6,014.80
6,014.60
6,014.40
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
6,011.20
6,011.00
6,010.80
6,010.60
6,010.40
6,010.20
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
85.0
90.0
95.0
100.0
105.0
110.0
115.0
120.0



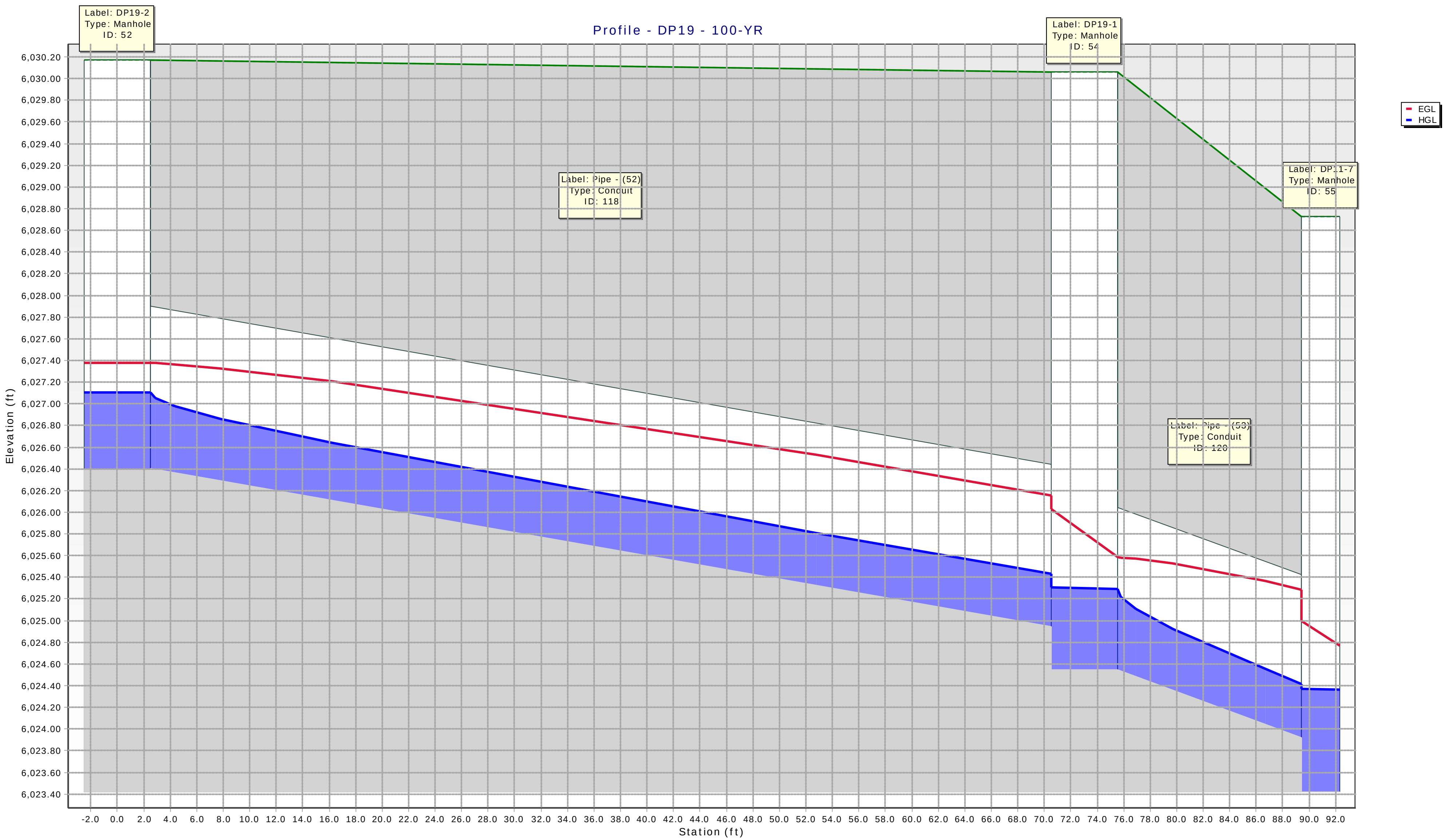
Profile - DP16 - 100-YR
Label: DP16-1
Type: Manhole
ID: 78
Label: DP16-2
Type: Manhole
ID: 87
Label: DP13-4
Type: Manhole
ID: 85
Label: Pipe - (75)
Type: Conduit
ID: 150
Label: Pipe - (66)
Type: Conduit
ID: 149
EGL
HGL
Elevation (ft)
Station (ft)



Profile - DP17 - 100-YR
Label: DP17-1
Type: Manhole
ID: 60
Label: Pipe - (50)
Type: Conduit
ID: 126
Label: DP11-5
Type: Manhole
ID: 62
EGL
HGL
Elevation (ft)
Station (ft)
6,025.40
6,025.20
6,025.00
6,024.80
6,024.60
6,024.40
6,024.20
6,024.00
6,023.80
6,023.60
6,023.40
6,023.20
6,023.00
6,022.80
6,022.60
6,022.40
6,022.20
6,022.00
6,021.80
6,021.60
6,021.40
6,021.20
6,021.00
6,020.80
6,020.60
6,020.40
6,020.20
6,020.00
6,019.80
6,019.60
6,019.40
6,019.20
6,019.00
6,018.80
6,018.60
6,018.40
6,018.20
6,018.00
6,017.80
6,017.60
6,017.40
6,017.20
6,017.00
6,016.80
6,016.60
6,016.40
-2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5



Profile - DP18 - 100-YR
Label: DP18-1
Type: Manhole
ID: 58
Label: DP11-6
Type: Manhole
ID: 59
Label: Pipe - (51)
Type: Conduit
ID: 124
EGL
HGL
Elevation (ft)
Station (ft)
6,027.60
6,027.40
6,027.20
6,027.00
6,026.80
6,026.60
6,026.40
6,026.20
6,026.00
6,025.80
6,025.60
6,025.40
6,025.20
6,025.00
6,024.80
6,024.60
6,024.40
6,024.20
6,024.00
6,023.80
6,023.60
6,023.40
6,023.20
6,023.00
6,022.80
6,022.60
6,022.40
6,022.20
6,022.00
6,021.80
6,021.60
6,021.40
6,021.20
6,021.00
6,020.80
6,020.60
6,020.40
6,020.20
6,020.00
-2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5



Profile - DP19 - 100-YR
Label: DP19-2
Type: Manhole
ID: 52
Label: DP19-1
Type: Manhole
ID: 54
Label: DP11-7
Type: Manhole
ID: 55
Label: Pipe - (52)
Type: Conduit
ID: 118
Label: Pipe - (53)
Type: Conduit
ID: 120
EGL
HGL
Elevation (ft)
Station (ft)

Profile - DP20 - 100-YR
Label: DP20-1
Type: Manhole
ID: 49
Label: DP11-8
Type: Manhole
ID: 53
Label: Pipe - (54)
Type: Conduit
ID: 116
EGL
HGL
Elevation (ft)
Station (ft)
6,032.80
6,032.60
6,032.40
6,032.20
6,032.00
6,031.80
6,031.60
6,031.40
6,031.20
6,031.00
6,030.80
6,030.60
6,030.40
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
6,028.60
6,028.40
6,028.20
6,028.00
6,027.80
6,027.60
6,027.40
6,027.20
6,027.00
6,026.80
6,026.60
6,026.40
6,026.20
6,026.00
6,025.80
-2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5


Profile - DP21 - 100-YR
Label: DP21-1
Type: Manhole
ID: 44
Label: DP11-9
Type: Manhole
ID: 48
Label: Pipe - (55)
Type: Conduit
ID: 110
EGL
HGL
Elevation (ft)
Station (ft)
6,035.20
6,035.00
6,034.80
6,034.60
6,034.40
6,034.20
6,034.00
6,033.80
6,033.60
6,033.40
6,033.20
6,033.00
6,032.80
6,032.60
6,032.40
6,032.20
6,032.00
6,031.80
6,031.60
6,031.40
6,031.20
6,031.00
6,030.80
6,030.60
6,030.40
6,030.20
6,030.00
6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
6,028.60
6,028.40
6,028.20
6,028.00
6,027.80
6,027.60
6,027.40
6,027.20
6,027.00
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
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2.0
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3.0
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4.0
4.5
5.0
5.5
6.0
6.5
7.0
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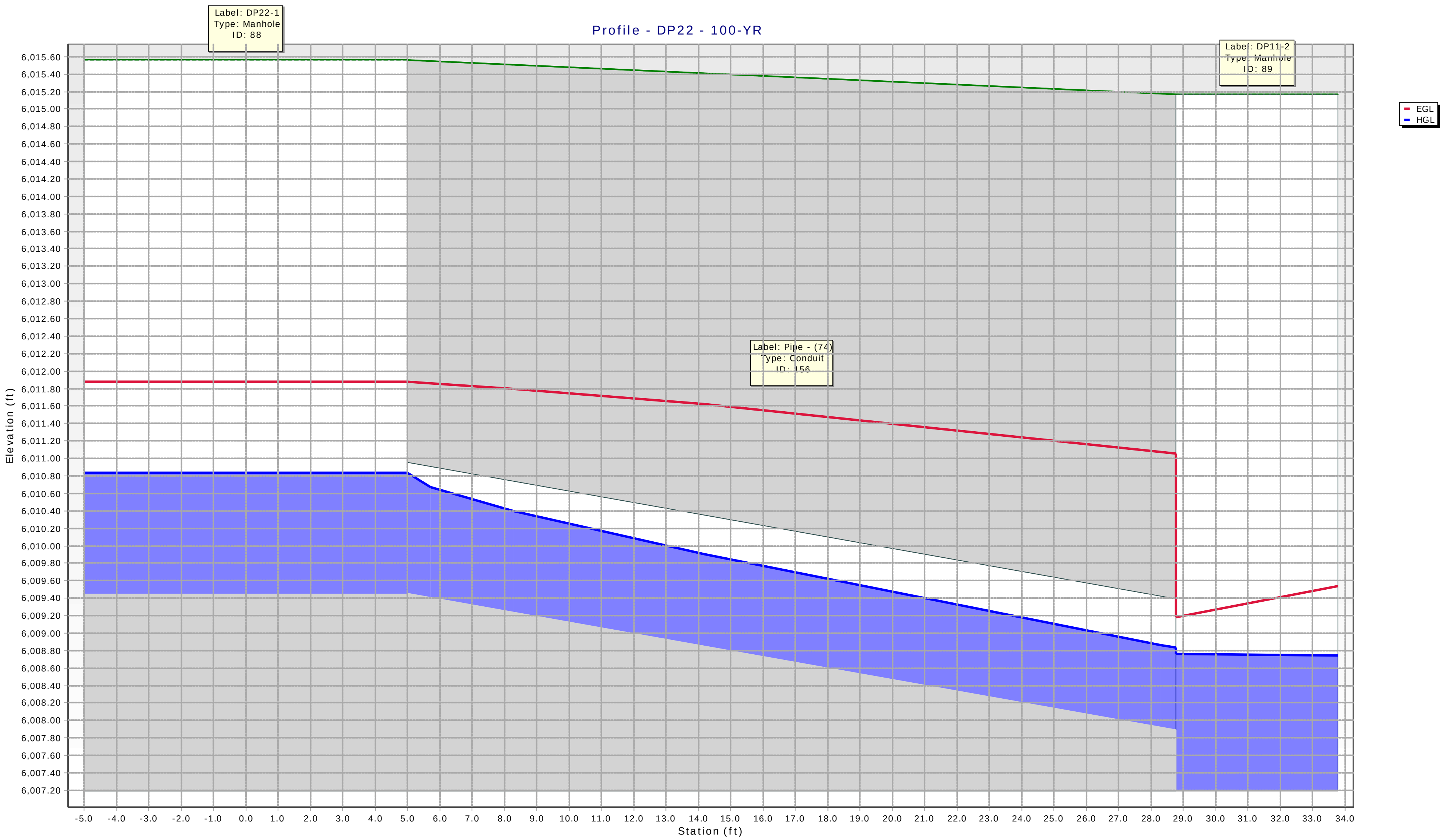
18.5
19.0
19.5


Profile - DP22 - 100-YR
Label: DP22-1
Type: Manhole
ID: 88
Label: DP11-2
Type: Manhole
ID: 89
Label: Pipe - (74)
Type: Conduit
ID: 156
EGL
HGL
Elevation (ft)
Station (ft)
6,015.60
6,015.40
6,015.20
6,015.00
6,014.80
6,014.60
6,014.40
6,014.20
6,014.00
6,013.80
6,013.60
6,013.40
6,013.20
6,013.00
6,012.80
6,012.60
6,012.40
6,012.20
6,012.00
6,011.80
6,011.60
6,011.40
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6,010.80
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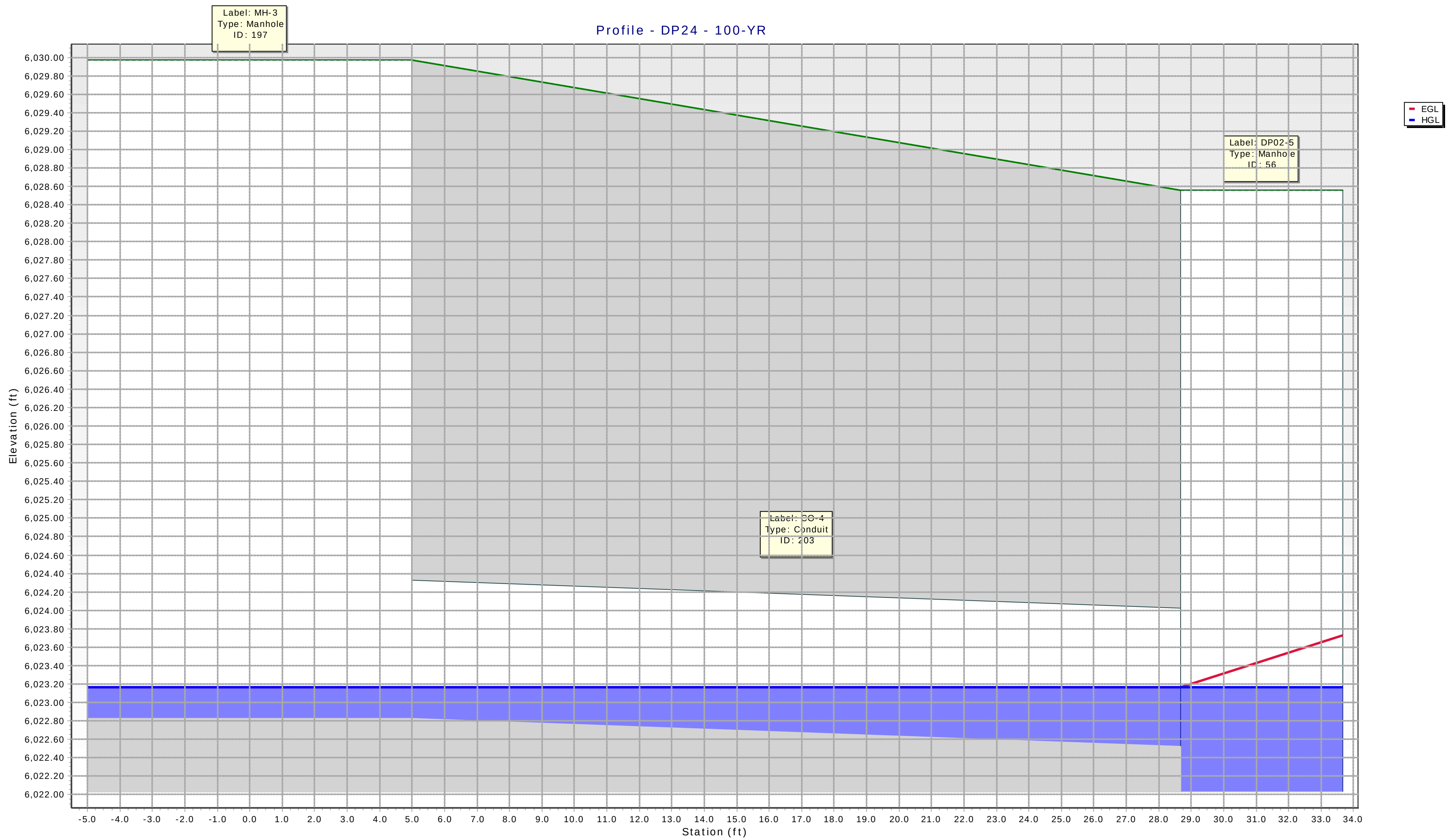
6,007.60
6,007.40
6,007.20
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0


Profile - DP24 - 100-YR
Label: MH-3
Type: Manhole
ID: 197
Label: DP02-5
Type: Manhole
ID: 56
Label: CO-4
Type: Conduit
ID: 203
EGL
HGL
Elevation (ft)
Station (ft)
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6,029.80
6,029.60
6,029.40
6,029.20
6,029.00
6,028.80
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6,028.40
6,028.20
6,028.00
6,027.80
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6,027.40
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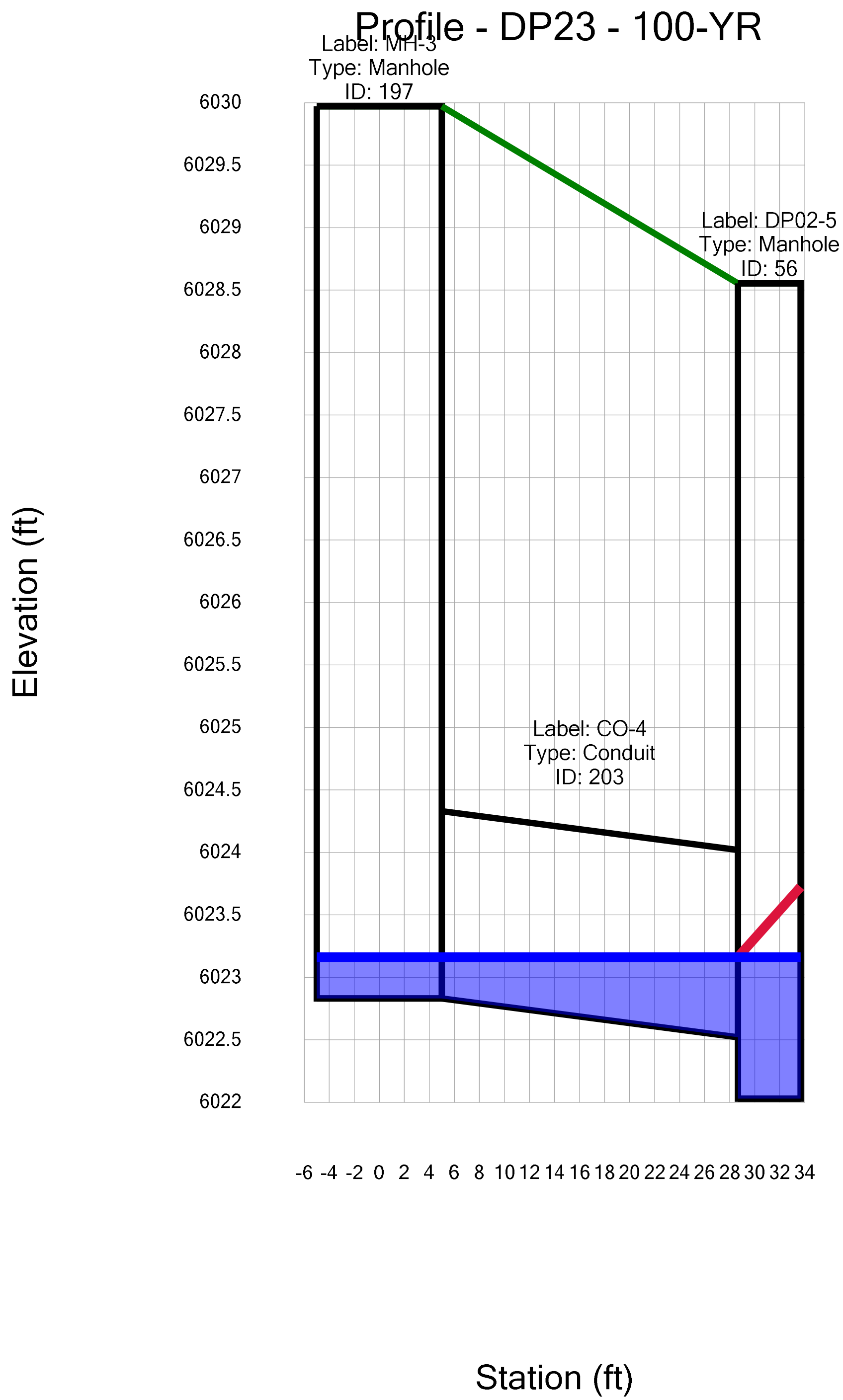
6,022.80
6,022.60
6,022.40
6,022.20
6,022.00
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0

Profile Report
Profile: Profile - DP23



MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP01	Inlet DP02	Inlet DP03
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	1.21	2.08	0.40
Major Q_{Known} (cfs)	2.83	5.38	0.79

Bypass (Carry-Over) Flow from Upstream

Inlets must be organized from upstream (left) to downstream (right) in order for bypass flows to be linked.

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	1.2	2.1	0.4
Major Total Design Peak Flow, Q (cfs)	2.8	5.4	0.8
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	0.0	0.16	N/A

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP05	Inlet DP07	Inlet DP14
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	2.18	1.96	1.88
Major Q_{Known} (cfs)	5.12	4.67	4.59

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	User-Defined	No Bypass Flow Received	User-Defined
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.11
Major Bypass Flow Received, Q_b (cfs)	0.43	0.00	1.78

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	2.2	2.0	1.99
Major Total Design Peak Flow, Q (cfs)	5.55	4.7	6.37
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.11	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	0.20	1.58	N/A

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP15	Inlet DP16	Inlet DP19
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	AREA
Hydraulic Condition	In Sump	In Sump	Swale
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	User-Defined

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	0.84	2.33	0.25
Major Q_{Known} (cfs)	2.03	5.64	4.18

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	User-Defined	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	0.8	2.3	0.3
Major Total Design Peak Flow, Q (cfs)	2.0	5.6	4.2
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	0.0

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP24
Site Type (Urban or Rural)	URBAN
Inlet Application (Street or Area)	STREET
Hydraulic Condition	On Grade
Inlet Type	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	2.62
Major Q_{Known} (cfs)	6.09

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	User-Defined
Minor Bypass Flow Received, Q_b (cfs)	0.0
Major Bypass Flow Received, Q_b (cfs)	0.16

Watershed Characteristics

Subcatchment Area (acres)	
Percent Impervious	
NRCS Soil Type	

Watershed Profile

Overland Slope (ft/ft)	
Overland Length (ft)	
Channel Slope (ft/ft)	
Channel Length (ft)	

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)	
One-Hour Precipitation, P_1 (inches)	

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)	
One-Hour Precipitation, P_1 (inches)	

CALCULATED OUTPUT

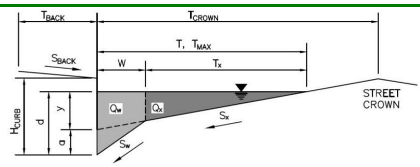
Minor Total Design Peak Flow, Q (cfs)	2.6
Major Total Design Peak Flow, Q (cfs)	6.3
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	0.4

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP01



Gutter Geometry:				
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0		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} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0		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 =	0.025		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} =	18.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	4.32	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.83	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	16.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.330	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	13.3	13.3	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	6.5	6.5	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	1.5	1.5	cfs
Maximum Flow Based On Allowable Spread	Q_T =	21.3	21.3	cfs
Flow Velocity within the Gutter Section	V =	8.1	8.1	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	3.9	3.9	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.560	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	2.4	14.9	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	2.4	14.9	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	3.0	6.9	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	1.9	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	5.3	23.6	cfs
Average Flow Velocity Within the Gutter Section	V =	6.0	8.3	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	2.0	4.1	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	1.00	0.70	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	5.3	16.5	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =	4.00	5.45	inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =	0.00	0.00	inches

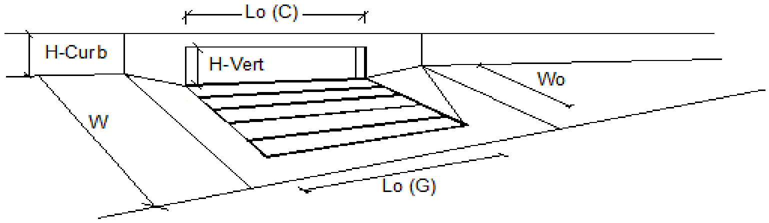
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	5.3	16.5	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 1.21 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 2.83 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.02 (August 2022)



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')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	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	
Design Discharge for Half of Street (from *Inlet Management*)	Q_o =	1.2	2.8	cfs
Water Spread Width	T =	4.6	7.6	ft
Water Depth at Flowline (outside of local depression)	d =	2.6	3.3	inches
Water Depth at Street Crown (or at T_{MAX})	d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow	E_o =	0.917	0.710	
Discharge outside the Gutter Section W, carried in Section T_x	Q_x =	0.1	0.8	cfs
Discharge within the Gutter Section W	Q_W =	1.1	2.0	cfs
Discharge Behind the Curb Face	Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W	A_W =	0.27	0.39	sq ft
Velocity within the Gutter Section W	V_W =	4.1	5.1	fps
Water Depth for Design Condition	d_{LOCAL} =	7.6	8.3	inches

Grate Analysis (Calculated)		MINOR	MAJOR	
Total Length of Inlet Grate Opening	L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow	$E_{o\text{-}GRATE}$ =	N/A	N/A	
Under No-Clogging Condition		MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Interception Capacity	Q_i =	N/A	N/A	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet	GrateCoeff =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet	GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet	L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Actual Interception Capacity	Q_a =	N/A	N/A	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)	Q_b =	N/A	N/A	cfs

Curb Opening or Slotted Inlet Analysis (Calculated)		MINOR	MAJOR	
Equivalent Slope S_e	S_e =	0.269	0.213	ft/ft
Required Length L_T to Have 100% Interception	L_T =	4.15	7.12	ft
Under No-Clogging Condition		MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)	L =	4.15	7.12	ft
Interception Capacity	Q_i =	1.2	2.8	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient	CurbCoeff =	1.25	1.25	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet	CurbClog =	0.06	0.06	
Effective (Unclogged) Length	L_e =	4.15	7.12	ft
Actual Interception Capacity	Q_a =	1.2	2.8	cfs
Carry-Over Flow = $Q_{b(GRATE)}$-Q_a	Q_b =	0.0	0.0	cfs

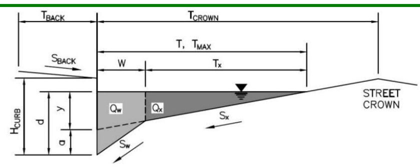
Summary		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	1.21	2.83	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	0.00	0.00	cfs
Capture Percentage = Q_a/Q_o	C% =	100	100	%

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP02



Gutter Geometry:			
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	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 =	0.025	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} =	18.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	4.32	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.83	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	16.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.330	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	13.3	13.3	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	6.5	6.5	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	1.5	1.5	cfs
Maximum Flow Based On Allowable Spread	Q_T =	21.3	21.3	cfs
Flow Velocity within the Gutter Section	V =	8.1	8.1	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	3.9	3.9	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.560	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	2.4	14.9	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	2.4	14.9	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	3.0	6.9	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	1.9	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	5.3	23.6	cfs
Average Flow Velocity Within the Gutter Section	V =	6.0	8.3	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	2.0	4.1	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	1.00	0.70	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	5.3	16.5	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =	4.00	5.45	inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =	0.00	0.00	inches

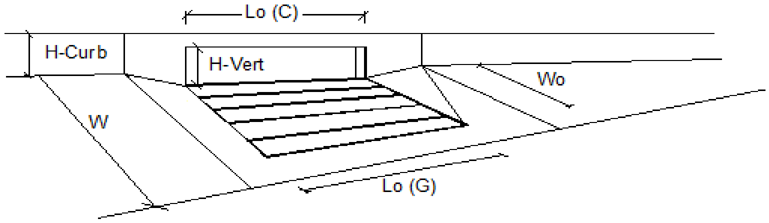
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	5.3	16.5	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.08 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 5.38 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.02 (August 2022)



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')	a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	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	
Design Discharge for Half of Street (from *Inlet Management*)	Q_o =	2.1	5.4	cfs
Water Spread Width	T =	6.5	10.4	ft
Water Depth at Flowline (outside of local depression)	d =	3.1	4.0	inches
Water Depth at Street Crown (or at T_{MAX})	d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow	E_o =	0.789	0.558	
Discharge outside the Gutter Section W, carried in Section T_x	Q_x =	0.4	2.4	cfs
Discharge within the Gutter Section W	Q_w =	1.6	3.0	cfs
Discharge Behind the Curb Face	Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W	A_W =	0.34	0.50	sq ft
Velocity within the Gutter Section W	V_W =	4.8	6.0	fps
Water Depth for Design Condition	d_{LOCAL} =	8.1	9.0	inches
Grate Analysis (Calculated)		MINOR	MAJOR	
Total Length of Inlet Grate Opening	L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow	$E_{o\text{-}GRATE}$ =	N/A	N/A	
Under No-Clogging Condition		MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Interception Capacity	Q_i =	N/A	N/A	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet	GrateCoeff =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet	GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet	L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Actual Interception Capacity	Q_a =	N/A	N/A	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)	Q_b =	N/A	N/A	cfs
Curb Opening or Slotted Inlet Analysis (Calculated)		MINOR	MAJOR	
Equivalent Slope S_e	S_e =	0.234	0.171	ft/ft
Required Length L_T to Have 100% Interception	L_T =	5.83	10.91	ft
Under No-Clogging Condition		MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)	L =	5.83	10.00	ft
Interception Capacity	Q_i =	2.1	5.3	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient	CurbCoeff =	1.25	1.25	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet	CurbClog =	0.06	0.06	
Effective (Unclogged) Length	L_e =	5.83	9.38	ft
Actual Interception Capacity	Q_a =	2.1	5.2	cfs
Carry-Over Flow = $Q_{b(GRATE)}$-Q_a	Q_b =	0.0	0.2	cfs
Summary		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	2.08	5.22	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	0.00	0.16	cfs
Capture Percentage = Q_a/Q_o	C% =	100	97	%

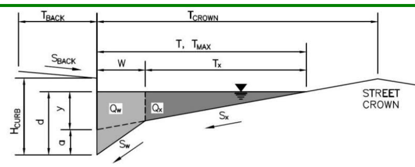
MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP03



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.023	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} =	20.0	20.0	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		☐	☐	

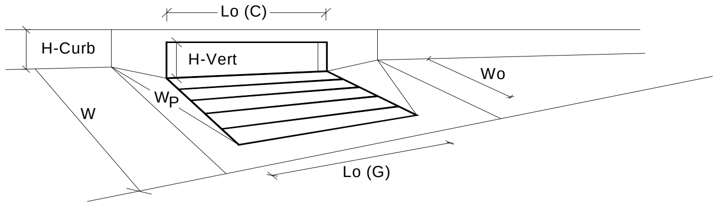
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	5.52	5.52	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.44	1.44	inches
Water Depth at Gutter Flowline (y + a)	d =	6.96	6.96	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	18.0	18.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.288	0.288	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	16.5	16.5	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	14.5	14.5	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.349	0.349	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



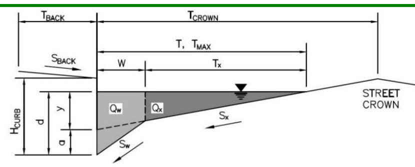
Design Information (Input)	CDOT Type R Curb Opening	MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	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
Open Area 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 =	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} =	0.33	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	5.4	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.40	0.79	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP05



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	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 =	0.024	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} =	18.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	4.32	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.83	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	16.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.330	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	13.0	13.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	6.4	6.4	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	1.4	1.4	cfs
Maximum Flow Based On Allowable Spread	Q_T =	20.8	20.8	cfs
Flow Velocity within the Gutter Section	V =	8.0	8.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	3.9	3.9	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.560	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	2.3	14.6	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	2.3	14.6	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	2.9	6.8	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	1.8	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	5.2	23.2	cfs
Average Flow Velocity Within the Gutter Section	V =	5.9	8.1	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	2.0	4.1	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	1.00	0.72	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	5.2	16.7	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =	4.00	5.50	inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =	0.00	0.00	inches

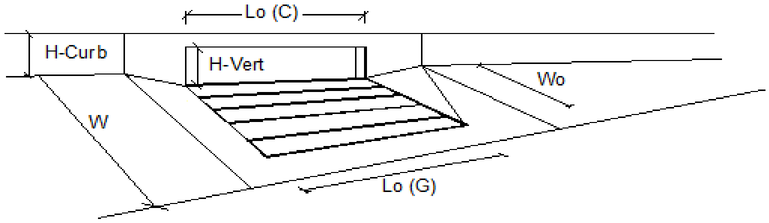
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	5.2	16.7	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.18 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 5.55 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.02 (August 2022)



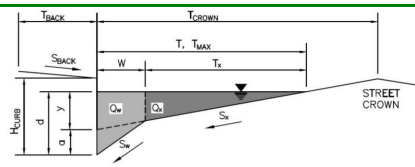
Design Information (Input) — CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	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	
Design Discharge for Half of Street (from *Inlet Management*)	Q_o =	2.2	5.6	cfs
Water Spread Width	T =	6.7	10.6	ft
Water Depth at Flowline (outside of local depression)	d =	3.1	4.1	inches
Water Depth at Street Crown (or at T_{MAX})	d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow	E_o =	0.772	0.547	
Discharge outside the Gutter Section W, carried in Section T_x	Q_x =	0.5	2.5	cfs
Discharge within the Gutter Section W	Q_w =	1.7	3.0	cfs
Discharge Behind the Curb Face	Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W	A_W =	0.35	0.51	sq ft
Velocity within the Gutter Section W	V_W =	4.7	5.9	fps
Water Depth for Design Condition	d_{LOCAL} =	8.1	9.1	inches
Grate Analysis (Calculated)		MINOR	MAJOR	
Total Length of Inlet Grate Opening	L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow	$E_{o\text{-}GRATE}$ =	N/A	N/A	
Under No-Clogging Condition		MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Interception Capacity	Q_i =	N/A	N/A	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet	GrateCoeff =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet	GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet	L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Actual Interception Capacity	Q_a =	N/A	N/A	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)	Q_b =	N/A	N/A	cfs
Curb Opening or Slotted Inlet Analysis (Calculated)		MINOR	MAJOR	
Equivalent Slope S_e	S_e =	0.229	0.169	ft/ft
Required Length L_T to Have 100% Interception	L_T =	6.01	11.15	ft
Under No-Clogging Condition		MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)	L =	6.01	10.00	ft
Interception Capacity	Q_i =	2.2	5.5	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient	CurbCoeff =	1.25	1.25	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet	CurbClog =	0.06	0.06	
Effective (Unclogged) Length	L_e =	6.01	9.38	ft
Actual Interception Capacity	Q_a =	2.2	5.3	cfs
Carry-Over Flow = $Q_{b(GRATE)}$-Q_a	Q_b =	0.0	0.2	cfs
Summary		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	2.2	5.3	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	0.0	0.20	cfs
Capture Percentage = Q_a/Q_o	C% =	100	96	%

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP07



Gutter Geometry:			
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	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 =	0.024	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} =	18.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	4.32	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression ($d_C - (W * S_x * 12)$)	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.83	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	16.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.330	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	13.0	13.0	cfs
Discharge within the Gutter Section ($Q_T - Q_X - Q_{BACK}$)	Q_W =	6.4	6.4	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	1.4	1.4	cfs
Maximum Flow Based On Allowable Spread	Q_T =	20.8	20.8	cfs
Flow Velocity within the Gutter Section	V =	8.0	8.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	3.9	3.9	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.560	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	2.3	14.6	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	2.3	14.6	cfs
Discharge within the Gutter Section ($Q_d - Q_X$)	Q_W =	2.9	6.8	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	1.8	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	5.2	23.2	cfs
Average Flow Velocity Within the Gutter Section	V =	5.9	8.1	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	2.0	4.1	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	1.00	0.72	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	5.2	16.7	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =	4.00	5.50	inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =	0.00	0.00	inches

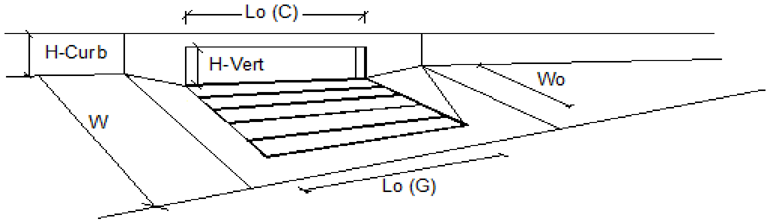
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion MAJOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	5.2	16.7	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 1.96 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 4.67 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.02 (August 2022)



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')	a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
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	
Design Discharge for Half of Street (from *Inlet Management*)	Q_o =	2.0	4.7	cfs
Water Spread Width	T =	6.3	9.8	ft
Water Depth at Flowline (outside of local depression)	d =	3.0	3.9	inches
Water Depth at Street Crown (or at T_{MAX})	d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow	E_o =	0.798	0.585	
Discharge outside the Gutter Section W, carried in Section T_x	Q_x =	0.4	1.9	cfs
Discharge within the Gutter Section W	Q_W =	1.6	2.7	cfs
Discharge Behind the Curb Face	Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W	A_W =	0.34	0.48	sq ft
Velocity within the Gutter Section W	V_W =	4.6	5.7	fps
Water Depth for Design Condition	d_{LOCAL} =	8.0	8.9	inches
Grate Analysis (Calculated)		MINOR	MAJOR	
Total Length of Inlet Grate Opening	L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow	$E_{o\text{-}GRATE}$ =	N/A	N/A	
Under No-Clogging Condition		MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Interception Capacity	Q_i =	N/A	N/A	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet	GrateCoeff =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet	GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet	L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Actual Interception Capacity	Q_a =	N/A	N/A	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)	Q_b =	N/A	N/A	cfs
Curb Opening or Slotted Inlet Analysis (Calculated)		MINOR	MAJOR	
Equivalent Slope S_e	S_e =	0.237	0.179	ft/ft
Required Length L_T to Have 100% Interception	L_T =	5.61	9.94	ft
Under No-Clogging Condition		MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)	L =	5.00	5.00	ft
Interception Capacity	Q_i =	1.9	3.3	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient	CurbCoeff =	1.00	1.00	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet	CurbClog =	0.10	0.10	
Effective (Unclogged) Length	L_e =	4.50	4.50	ft
Actual Interception Capacity	Q_a =	1.9	3.1	cfs
Carry-Over Flow = $Q_{b(GRATE)}$-Q_a	Q_b =	0.1	1.6	cfs
Summary		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	1.9	3.1	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	0.11	1.58	cfs
Capture Percentage = Q_a/Q_o	C% =	95	66	%

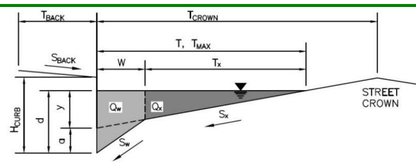
MHFD-Inlet, Version 5.02 (August 2022)

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP14



Gutter Geometry:				
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0		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} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0		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} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	18.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

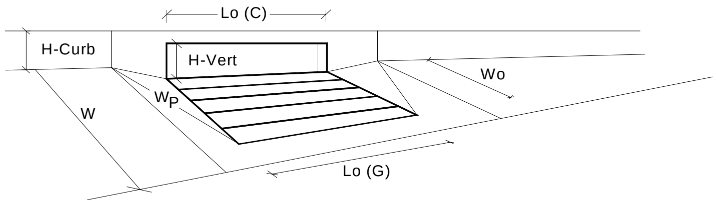
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	4.32	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.83	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	16.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.330	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	43.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	41.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.560	0.130	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



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} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	4.0	5.8	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
Open Area 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	

Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs

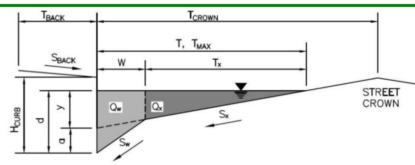
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.25	1.25	
Clogging Factor for Multiple Units	Clog =	0.06	0.06	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	2.6	8.2	cfs
Interception with Clogging	Q_{wa} =	2.5	7.7	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	19.5	22.2	cfs
Interception with Clogging	Q_{oa} =	18.3	20.8	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	6.7	12.5	cfs
Interception with Clogging	Q_{ma} =	6.3	11.7	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	2.5	7.7	cfs

Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	10.00	10.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	10.4	18.0	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.17	0.32	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.79	0.92	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	2.5	7.7	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	6.4	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010
Inlet ID: Inlet DP15



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	18.0	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} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	4.08	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.59	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	15.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.350	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

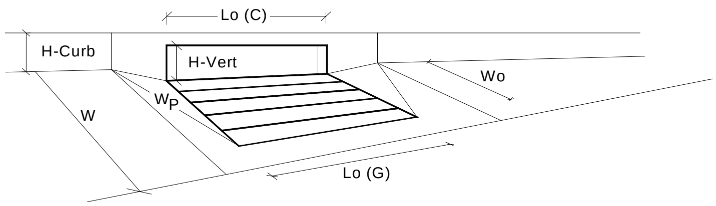
Maximum Capacity for 1/2 Street based on Allowable Depth

		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	14.5	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	12.5	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.409	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d ≥ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



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 =	5.0	5.8	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
Open Area 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 =	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	

Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs

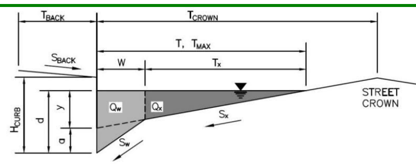
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	5.6	cfs
Interception with Clogging	Q_{wa} =	3.5	5.0	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.6	cfs
Interception with Clogging	Q_{oa} =	8.1	8.7	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	6.8	cfs
Interception with Clogging	Q_{ma} =	4.9	6.1	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.0	cfs

Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	14.5	18.0	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.32	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.0	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.8	2.0	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010
Inlet ID: Inlet DP16



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	20.0	ft
Gutter Width	W =	2.00	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} =	15.0	15.0	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		☐	☐	

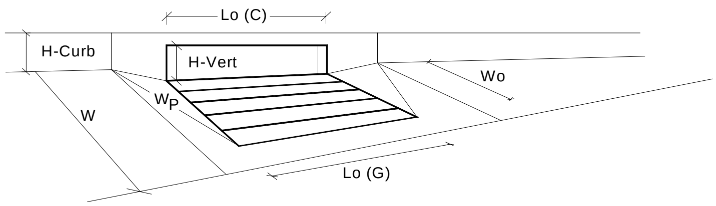
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	5.40	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.67	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	13.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.363	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	13.1	29.8	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	11.1	27.8	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.411	0.184	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLEThT IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet (CDOT Type R Curb Opening)	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	6.7	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
Open Area 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	

Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs

Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.25	1.25	
Clogging Factor for Multiple Units	Clog =	0.06	0.06	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	8.8	11.6	cfs
Interception with Clogging	Q_{wa} =	8.3	10.9	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	19.5	20.5	cfs
Interception with Clogging	Q_{oa} =	18.3	19.2	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	12.2	14.3	cfs
Interception with Clogging	Q_{ma} =	11.4	13.4	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	8.3	10.9	cfs

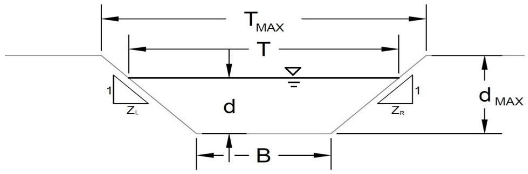
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	10.00	10.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	13.1	15.0	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches

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} =	0.33	0.39	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	0.97	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	

		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	8.3	10.9	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.3	5.6	cfs

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010
Inlet DP19



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.040	
Channel Invert Slope	S_O =	0.0150	ft/ft
Bottom Width	B =	2.00	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Sloe	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ◉ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	11.00	12.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	1.00	1.00	ft

Maximum Channel Capacity Based On Allowable Top Width

		Minor Storm	Major Storm	
Maximum Allowable Top Width	T_{MAX} =	11.00	12.00	ft
Water Depth	d =	1.13	1.25	ft
Flow Area	A =	7.31	8.75	sq ft
Wetted Perimeter	P =	11.28	12.31	ft
Hydraulic Radius	R =	0.65	0.71	ft
Manning's n	n =	0.040	0.040	
Flow Velocity	V =	3.42	3.63	fps
Velocity-Depth Product	VR =	2.22	2.58	ft^2/s
Hydraulic Depth	D =	0.66	0.73	ft
Froude Number	Fr =	0.74	0.75	
Maximum Flow Based on Allowable Water Depth	Q_T =	25.0	31.8	cfs

Maximum Channel Capacity Based On Allowable Water Depth

		Minor Storm	Major Storm	
Maximum Allowable Water Depth	d_{MAX} =	1.00	1.00	ft
Top Width	T =	10.00	10.00	ft
Flow Area	A =	6.00	6.00	sq ft
Wetted Perimeter	P =	10.25	10.25	ft
Hydraulic Radius	R =	0.59	0.59	ft
Manning's n	n =	0.040	0.040	
Flow Velocity	V =	3.19	3.19	fps
Velocity-Depth Product	VR =	1.87	1.87	ft^2/s
Hydraulic Depth	D =	0.60	0.60	ft
Froude Number	Fr =	0.73	0.73	
Maximum Flow Based On Allowable Water Depth	Q_d =	19.2	19.2	cfs

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	19.2	19.2	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	1.00	1.00	ft

Water Depth in Channel Based On Design Peak Flow

		Minor Storm	Major Storm	
Design Peak Flow	Q_o =	0.3	4.2	cfs
Water Depth	d =	0.11	0.49	ft
Top Width	T =	2.88	5.93	ft
Flow Area	A =	0.27	1.95	sq ft
Wetted Perimeter	P =	2.91	6.05	ft
Hydraulic Radius	R =	0.09	0.32	ft
Manning's n	n =	0.040	0.040	
Flow Velocity	V =	0.93	2.14	fps
Velocity-Depth Product	VR =	0.09	0.69	ft^2/s
Hydraulic Depth	D =	0.09	0.33	ft
Froude Number	Fr =	0.54	0.66	

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'

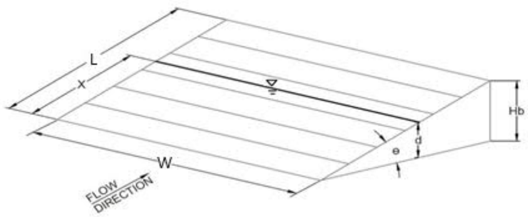
AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP19

Inlet Design Information (Input)

Type of Inlet	User-Defined	Inlet Type =	User-Defined	
Angle of Inclined Grate (must be <= 30 degrees)		θ =	0.00	degrees
Width of Grate		W =	2.00	ft
Length of Grate		L =	2.00	ft
Open Area Ratio		A_{RATIO} =	0.70	
Height of Inclined Grate		H_B =	0.00	ft
Clogging Factor		C_f =	0.50	
Grate Discharge Coefficient		C_d =	N/A	
Orifice Coefficient		C_o =	0.64	
Weir Coefficient		C_w =	2.05	



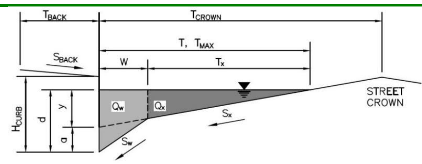
		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.11	0.49	
Grate Capacity as a Weir				
Submerged Side Weir Length	X =	2.00	2.00	ft
Inclined Side Weir Flow	Q_{ws} =	0.3	2.5	cfs
Base Weir Flow	Q_{wb} =	0.4	3.5	cfs
Interception Without Cloggging	Q_{wi} =	0.9	8.5	cfs
Interception With Clogging	Q_{wa} =	0.4	4.2	cfs
Grate Capacity as an Orifice				
Interception Without Clogging	Q_{oi} =	4.8	10.1	cfs
Interception With Clogging	Q_{oa} =	2.4	5.0	cfs
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.45	4.24	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP24



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	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 =	0.024	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} =	18.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	4.32	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression ($d_C - (W * S_x * 12)$)	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.83	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	16.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.330	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	13.0	13.0	cfs
Discharge within the Gutter Section ($Q_T - Q_X - Q_{BACK}$)	Q_W =	6.4	6.4	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	1.4	1.4	cfs
Maximum Flow Based On Allowable Spread	Q_T =	20.8	20.8	cfs
Flow Velocity within the Gutter Section	V =	8.0	8.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	3.9	3.9	

Maximum Capacity for 1/2 Street based on Allowable Depth

		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.560	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	2.3	14.6	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	2.3	14.6	cfs
Discharge within the Gutter Section ($Q_d - Q_X$)	Q_W =	2.9	6.8	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	1.8	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	5.2	23.2	cfs
Average Flow Velocity Within the Gutter Section	V =	5.9	8.1	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	2.0	4.1	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	1.00	0.72	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	5.2	16.7	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =	4.00	5.50	inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =	0.00	0.00	inches

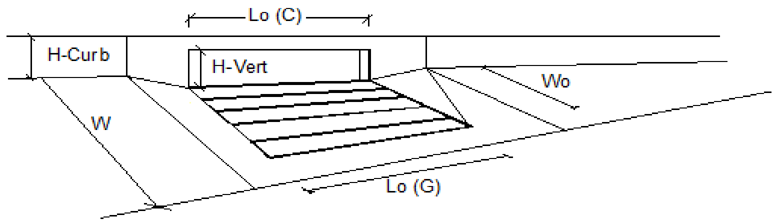
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	5.2	16.7	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.62 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 6.25 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.02 (August 2022)



		MINOR	MAJOR	
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')	a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	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	
Design Discharge for Half of Street (from *Inlet Management*)	Q_o =	2.6	6.3	cfs
Water Spread Width	T =	7.4	11.2	ft
Water Depth at Flowline (outside of local depression)	d =	3.3	4.2	inches
Water Depth at Street Crown (or at T_{MAX})	d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow	E_o =	0.725	0.522	
Discharge outside the Gutter Section W, carried in Section T_x	Q_x =	0.7	3.0	cfs
Discharge within the Gutter Section W	Q_w =	1.9	3.3	cfs
Discharge Behind the Curb Face	Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W	A_W =	0.38	0.53	sq ft
Velocity within the Gutter Section W	V_W =	5.0	6.1	fps
Water Depth for Design Condition	d_{LOCAL} =	8.3	9.2	inches
Grate Analysis (Calculated)		MINOR	MAJOR	
Total Length of Inlet Grate Opening	L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow	$E_{o\text{-}GRATE}$ =	N/A	N/A	
Under No-Clogging Condition		MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Interception Capacity	Q_i =	N/A	N/A	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet	GrateCoeff =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet	GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet	L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Actual Interception Capacity	Q_a =	N/A	N/A	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)	Q_b =	N/A	N/A	cfs
Curb Opening or Slotted Inlet Analysis (Calculated)		MINOR	MAJOR	
Equivalent Slope S_e	S_e =	0.217	0.162	ft/ft
Required Length L_T to Have 100% Interception	L_T =	6.77	12.07	ft
Under No-Clogging Condition		MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)	L =	6.77	10.00	ft
Interception Capacity	Q_i =	2.6	6.0	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient	CurbCoeff =	1.25	1.25	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet	CurbClog =	0.06	0.06	
Effective (Unclogged) Length	L_e =	6.77	9.38	ft
Actual Interception Capacity	Q_a =	2.6	5.8	cfs
Carry-Over Flow = $Q_{b(GRATE)}$-Q_a	Q_b =	0.0	0.4	cfs
Summary		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	2.6	5.8	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	0.0	0.43	cfs
Capture Percentage = Q_a/Q_o	C% =	100	93	%

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP101	Inlet DP103	Inlet DP104
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	AREA	STREET	STREET
Hydraulic Condition	Swale	In Sump	In Sump
Inlet Type	User-Defined	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	2.67	0.25	0.30
Major Q_{Known} (cfs)	6.70	0.62	0.71

Bypass (Carry-Over) Flow from Upstream

Inlets must be organized from upstream (left) to downstream (right) in order for bypass flows to be linked.

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	2.7	0.3	0.3
Major Total Design Peak Flow, Q (cfs)	6.7	0.6	0.7
Minor Flow Bypassed Downstream, Q_b (cfs)	0.93	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	3.78	N/A	N/A

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP105	Inlet DP106	Inlet DP107
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	0.3	0.4	0.3
Major Q_{Known} (cfs)	0.7	0.9	0.6

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	0.3	0.4	0.3
Major Total Design Peak Flow, Q (cfs)	0.7	0.9	0.6
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP108	Inlet DP109	Inlet DP110
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	AREA	AREA
Hydraulic Condition	In Sump	Swale	Swale
Inlet Type	CDOT Type R Curb Opening	CDOT Type C	CDOT Type C

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	0.3	0.08	0.08
Major Q_{Known} (cfs)	0.6	0.38	0.52

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	0.3	0.1	0.1
Major Total Design Peak Flow, Q (cfs)	0.6	0.4	0.5
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	0.0	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	0.0	0.0

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP111	Inlet DP112	Inlet DP113
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	AREA	AREA	AREA
Hydraulic Condition	Swale	Swale	Swale
Inlet Type	CDOT Type C	CDOT Type C	CDOT Type C

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	0.00	0.00	0.0
Major Q_{Known} (cfs)	0.07	0.22	0.1

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	0.0	0.0	0.0
Major Total Design Peak Flow, Q (cfs)	0.1	0.2	0.1
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	0.0

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP114	Inlet DP116	Inlet DP117
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	AREA	STREET	STREET
Hydraulic Condition	Swale	In Sump	In Sump
Inlet Type	CDOT Type C	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	0.0	0.8	0.5
Major Q_{Known} (cfs)	0.2	1.7	1.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	0.0	0.8	0.5
Major Total Design Peak Flow, Q (cfs)	0.2	1.7	1.0
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	0.0	N/A	N/A

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP118	Inlet DP120	Inlet DP119
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	0.9	0.20	1.0
Major Q_{Known} (cfs)	2.3	0.44	2.7

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	User-Defined	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.40	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	5.75	0.0

Watershed Characteristics

Subcatchment Area (acres)			
Percent Impervious			
NRCS Soil Type			

Watershed Profile

Overland Slope (ft/ft)			
Overland Length (ft)			
Channel Slope (ft/ft)			
Channel Length (ft)			

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)			
One-Hour Precipitation, P_1 (inches)			

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	0.9	0.60	1.0
Major Total Design Peak Flow, Q (cfs)	2.3	6.19	2.7
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A

MHFD-Inlet, Version 5.02 (August 2022)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet DP102
Site Type (Urban or Rural)	URBAN
Inlet Application (Street or Area)	STREET
Hydraulic Condition	On Grade
Inlet Type	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	4.32
Major Q_{Known} (cfs)	10.40

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	User-Defined
Minor Bypass Flow Received, Q_b (cfs)	0.93
Major Bypass Flow Received, Q_b (cfs)	3.78

Watershed Characteristics

Subcatchment Area (acres)	
Percent Impervious	
NRCS Soil Type	

Watershed Profile

Overland Slope (ft/ft)	
Overland Length (ft)	
Channel Slope (ft/ft)	
Channel Length (ft)	

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)	
One-Hour Precipitation, P_1 (inches)	

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)	
One-Hour Precipitation, P_1 (inches)	

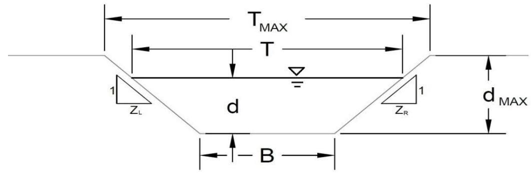
CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	5.25
Major Total Design Peak Flow, Q (cfs)	14.18
Minor Flow Bypassed Downstream, Q_b (cfs)	0.40
Major Flow Bypassed Downstream, Q_b (cfs)	5.75

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP101



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.013	
Channel Invert Slope	S_O =	0.0270	ft/ft
Bottom Width	B =	0.00	ft
Left Side Slope	Z1 =	33.00	ft/ft
Right Side Sloe	Z2 =	33.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ○ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	19.00	20.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	0.70	ft

Maximum Channel Capacity Based On Allowable Top Width

		Minor Storm	Major Storm	
Maximum Allowable Top Width	T_{MAX} =	19.00	20.00	ft
Water Depth	d =	0.29	0.30	ft
Flow Area	A =	2.73	3.03	sq ft
Wetted Perimeter	P =	19.01	20.01	ft
Hydraulic Radius	R =	0.14	0.15	ft
Manning's n	n =	0.013	0.013	
Flow Velocity	V =	5.17	5.35	fps
Velocity-Depth Product	VR =	0.74	0.81	ft^2/s
Hydraulic Depth	D =	0.14	0.15	ft
Froude Number	Fr =	2.40	2.42	
Maximum Flow Based on Allowable Water Depth	Q_T =	14.1	16.2	cfs

Maximum Channel Capacity Based On Allowable Water Depth

		Minor Storm	Major Storm	
Maximum Allowable Water Depth	d_{MAX} =	0.50	0.70	ft
Top Width	T =	33.00	46.20	ft
Flow Area	A =	8.25	16.17	sq ft
Wetted Perimeter	P =	33.02	46.22	ft
Hydraulic Radius	R =	0.25	0.35	ft
Manning's n	n =	0.013	0.013	
Flow Velocity	V =	7.47	9.35	fps
Velocity-Depth Product	VR =	1.87	3.27	ft^2/s
Hydraulic Depth	D =	0.25	0.35	ft
Froude Number	Fr =	2.63	2.79	
Maximum Flow Based On Allowable Water Depth	Q_d =	61.6	151.2	cfs

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Top Width Criterion	Q_{allow} =	14.1	16.2	cfs
MAJOR STORM Allowable Capacity is based on Top Width Criterion	d_{allow} =	0.29	0.30	ft

Water Depth in Channel Based On Design Peak Flow

		Minor Storm	Major Storm	
Design Peak Flow	Q_o =	2.7	6.7	cfs
Water Depth	d =	0.15	0.22	ft
Top Width	T =	10.17	14.36	ft
Flow Area	A =	0.78	1.56	sq ft
Wetted Perimeter	P =	10.17	14.37	ft
Hydraulic Radius	R =	0.08	0.11	ft
Manning's n	n =	0.013	0.013	
Flow Velocity	V =	3.41	4.29	fps
Velocity-Depth Product	VR =	0.26	0.47	ft^2/s
Hydraulic Depth	D =	0.08	0.11	ft
Froude Number	Fr =	2.16	2.29	

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'

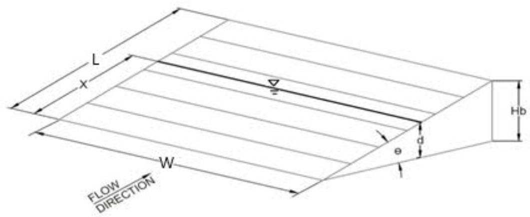
AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP101

Inlet Design Information (Input)

Type of Inlet	User-Defined	Inlet Type =	User-Defined	
Angle of Inclined Grate (must be <= 30 degrees)		θ =	0.00	degrees
Width of Grate		W =	1.92	ft
Length of Grate		L =	6.66	ft
Open Area Ratio		A_{RATIO} =	0.70	
Height of Inclined Grate		H_B =	0.00	ft
Clogging Factor		C_f =	0.50	
Grate Discharge Coefficient		C_d =	N/A	
Orifice Coefficient		C_o =	0.64	
Weir Coefficient		C_w =	2.05	



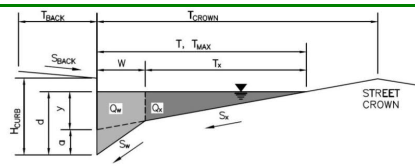
		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.15	0.22	
Grate Capacity as a Weir				
Submerged Side Weir Length	X =	6.66	6.66	ft
Inclined Side Weir Flow	Q_{ws} =	1.4	2.4	cfs
Base Weir Flow	Q_{wb} =	0.6	1.0	cfs
Interception Without Cloggging	Q_{wi} =	3.5	5.8	cfs
Interception With Clogging	Q_{wa} =	1.7	2.9	cfs
Grate Capacity as an Orifice				
Interception Without Clogging	Q_{oi} =	18.0	21.4	cfs
Interception With Clogging	Q_{oa} =	9.0	10.7	cfs
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	1.7	2.9	cfs
Bypassed Flow	Q_b =	0.93	3.78	cfs
Capture Percentage = Qa/Qo	C% =	65	44	%

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP102



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	18.0	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 =	0.038	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} =	17.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	4.08	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.59	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	15.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.350	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	13.8	16.3	cfs
Discharge within the Gutter Section ($Q_T - Q_X - Q_{BACK}$)	Q_W =	7.4	8.1	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	21.2	24.4	cfs
Flow Velocity within the Gutter Section	V =	9.7	10.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	4.5	4.9	

Maximum Capacity for 1/2 Street based on Allowable Depth

		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	14.5	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	12.5	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.409	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	8.5	18.3	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	8.5	18.3	cfs
Discharge within the Gutter Section ($Q_d - Q_X$)	Q_W =	5.9	8.5	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	14.4	26.8	cfs
Average Flow Velocity Within the Gutter Section	V =	8.9	10.2	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	3.7	5.1	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, $d \geq 6"$	R =	1.00	0.54	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	14.4	14.4	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =	5.00	5.00	inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =	0.00	0.00	inches

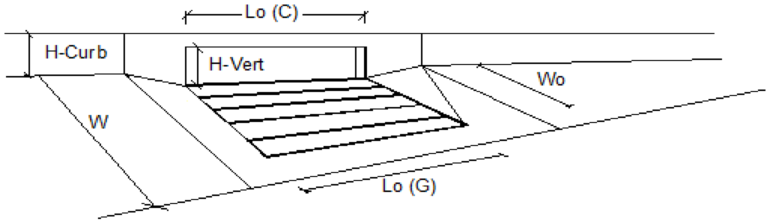
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion MAJOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	14.4	14.4	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 5.25 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 14.18 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.02 (August 2022)

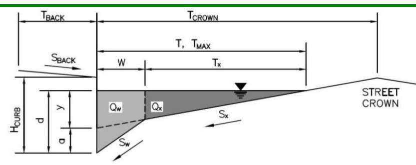


Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	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	
Design Discharge for Half of Street (from *Inlet Management*)		Q_o =	5.3	14.2	cfs
Water Spread Width		T =	9.3	14.4	ft
Water Depth at Flowline (outside of local depression)		d =	3.8	5.0	inches
Water Depth at Street Crown (or at T_{MAX})		d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow		E_o =	0.610	0.412	
Discharge outside the Gutter Section W, carried in Section T_x		Q_x =	2.0	8.3	cfs
Discharge within the Gutter Section W		Q_w =	3.2	5.8	cfs
Discharge Behind the Curb Face		Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W		A_W =	0.46	0.66	sq ft
Velocity within the Gutter Section W		V_W =	7.0	8.8	fps
Water Depth for Design Condition		d_{LOCAL} =	6.8	8.0	inches
Grate Analysis (Calculated)			MINOR	MAJOR	
Total Length of Inlet Grate Opening		L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow		$E_{o-GRATE}$ =	N/A	N/A	
Under No-Clogging Condition			MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins		V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow		R_f =	N/A	N/A	
Interception Rate of Side Flow		R_x =	N/A	N/A	
Interception Capacity		Q_i =	N/A	N/A	cfs
Under Clogging Condition			MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet		GrateCoeff =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet		GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet		L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins		V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow		R_f =	N/A	N/A	
Interception Rate of Side Flow		R_x =	N/A	N/A	
Actual Interception Capacity		Q_a =	N/A	N/A	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)		Q_b =	N/A	N/A	cfs
Curb Opening or Slotted Inlet Analysis (Calculated)			MINOR	MAJOR	
Equivalent Slope S_e		S_e =	0.135	0.097	ft/ft
Required Length L_T to Have 100% Interception		L_T =	12.34	23.77	ft
Under No-Clogging Condition			MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)		L =	10.00	10.00	ft
Interception Capacity		Q_i =	5.0	8.9	cfs
Under Clogging Condition			MINOR	MAJOR	
Clogging Coefficient		CurbCoeff =	1.25	1.25	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet		CurbClog =	0.06	0.06	
Effective (Unclogged) Length		L_e =	9.38	9.38	ft
Actual Interception Capacity		Q_a =	4.8	8.4	cfs
Carry-Over Flow = $Q_{b(GRATE)}$-Q_a		Q_b =	0.4	5.7	cfs
Summary			MINOR	MAJOR	
Total Inlet Interception Capacity		Q =	4.85	8.43	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.40	5.75	cfs
Capture Percentage = Q_a/Q_o		C% =	92	59	%

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

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

Project: Ridgegate - Lyric Condos - 1595010
Inlet ID: Inlet DP103



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth

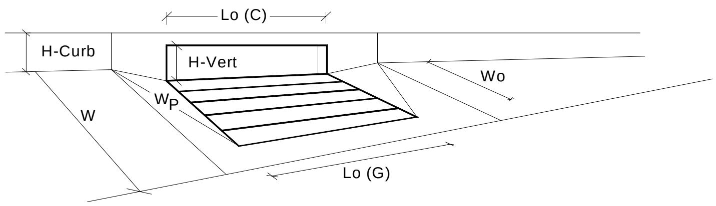
		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



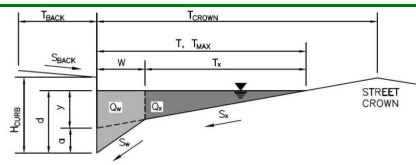
		MINOR	MAJOR	
Design Information (Input) CDOT Type R Curb Opening				
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.0	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
Open Area 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 =	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	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	6.0	cfs
Interception with Clogging	Q_{wa} =	3.5	5.4	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.8	cfs
Interception with Clogging	Q_{oa} =	8.1	8.8	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	7.1	cfs
Interception with Clogging	Q_{ma} =	4.9	6.4	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.4	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	10.4	13.1	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.3	0.6	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP104



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

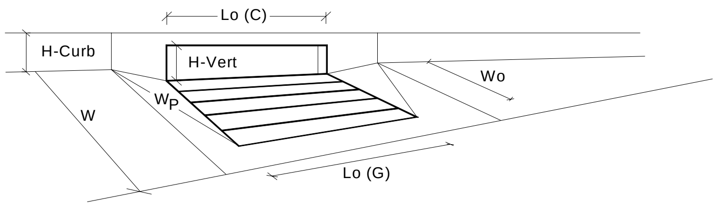
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\,TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\,TH}$	$Q_{X\,TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



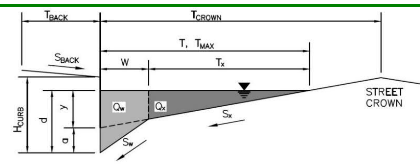
		MINOR	MAJOR	
Design Information (Input) — CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.0	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
Open Area 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 =	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	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	6.0	cfs
Interception with Clogging	Q_{wa} =	3.5	5.4	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.8	cfs
Interception with Clogging	Q_{oa} =	8.1	8.8	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	7.1	cfs
Interception with Clogging	Q_{ma} =	4.9	6.4	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.4	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	10.4	13.1	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.3	0.7	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP105



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

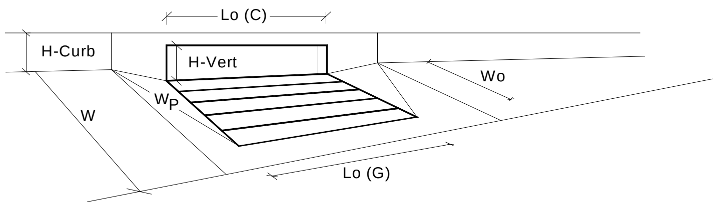
Maximum Capacity for 1/2 Street based on Allowable Depth

		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)

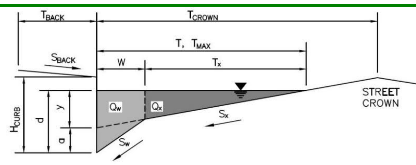


		MINOR	MAJOR	
Design Information (Input) CDOT Type R Curb Opening				
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.0	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
Open Area 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 =	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	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	6.0	cfs
Interception with Clogging	Q_{wa} =	3.5	5.4	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.8	cfs
Interception with Clogging	Q_{oa} =	8.1	8.8	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	7.1	cfs
Interception with Clogging	Q_{ma} =	4.9	6.4	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.4	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	10.4	13.1	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.3	0.7	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010
Inlet ID: Inlet DP106



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

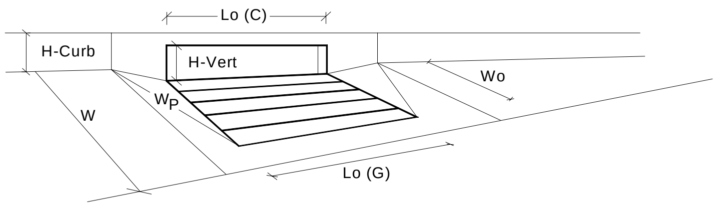
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d ≥ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



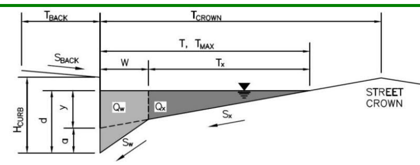
		MINOR	MAJOR	
Design Information (Input) — CDOT Type R Curb Opening				
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.0	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
Open Area 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 =	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	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	6.0	cfs
Interception with Clogging	Q_{wa} =	3.5	5.4	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.8	cfs
Interception with Clogging	Q_{oa} =	8.1	8.8	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	7.1	cfs
Interception with Clogging	Q_{ma} =	4.9	6.4	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.4	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	10.4	13.1	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.4	0.9	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP107



Gutter Geometry:

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} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0		ft
Gutter Width	W =	2.00		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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

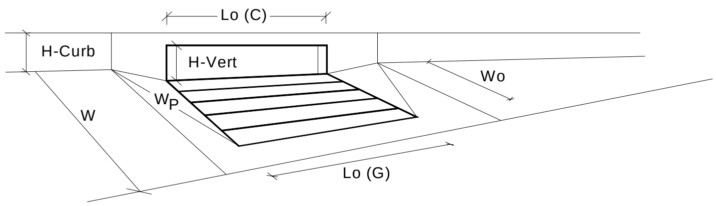
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression (T * S_x * 12)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



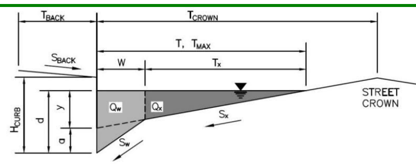
		MINOR	MAJOR	
Design Information (Input) CDOT Type R Curb Opening				
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.0	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
Open Area 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 =	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	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	6.0	cfs
Interception with Clogging	Q_{wa} =	3.5	5.4	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.8	cfs
Interception with Clogging	Q_{oa} =	8.1	8.8	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	7.1	cfs
Interception with Clogging	Q_{ma} =	4.9	6.4	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.4	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	10.4	13.1	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.3	0.6	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP108



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression ($d_C - (W * S_x * 12)$)	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section ($Q_T - Q_X - Q_{BACK}$)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

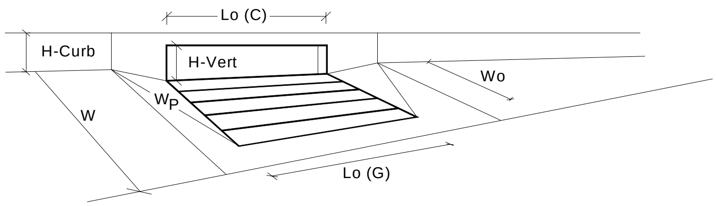
Maximum Capacity for 1/2 Street based on Allowable Depth

		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section ($Q_d - Q_X$)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)

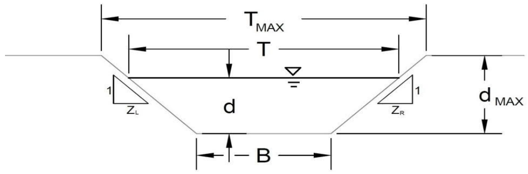


		MINOR	MAJOR	
Design Information (Input) CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.0	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
Open Area 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 =	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	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	6.0	cfs
Interception with Clogging	Q_{wa} =	3.5	5.4	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.8	cfs
Interception with Clogging	Q_{oa} =	8.1	8.8	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	7.1	cfs
Interception with Clogging	Q_{ma} =	4.9	6.4	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.4	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	10.4	13.1	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.3	0.6	cfs

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP109



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.030	
Channel Invert Slope	S_O =	0.0200	ft/ft
Bottom Width	B =	3.92	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Sloe	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ○ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	9.00	10.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.40	0.50	ft

Maximum Channel Capacity Based On Allowable Top Width

		Minor Storm	Major Storm	
Maximum Allowable Top Width	T_{MAX} =	9.00	10.00	ft
Water Depth	d =	0.64	0.76	ft
Flow Area	A =	4.10	5.29	sq ft
Wetted Perimeter	P =	9.16	10.19	ft
Hydraulic Radius	R =	0.45	0.52	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	4.11	4.54	fps
Velocity-Depth Product	VR =	1.84	2.36	ft^2/s
Hydraulic Depth	D =	0.46	0.53	ft
Froude Number	Fr =	1.07	1.10	
Maximum Flow Based on Allowable Water Depth	Q_T =	16.9	24.0	cfs

Maximum Channel Capacity Based On Allowable Water Depth

		Minor Storm	Major Storm	
Maximum Allowable Water Depth	d_{MAX} =	0.40	0.50	ft
Top Width	T =	7.12	7.92	ft
Flow Area	A =	2.21	2.96	sq ft
Wetted Perimeter	P =	7.22	8.04	ft
Hydraulic Radius	R =	0.31	0.37	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	3.19	3.61	fps
Velocity-Depth Product	VR =	0.98	1.33	ft^2/s
Hydraulic Depth	D =	0.31	0.37	ft
Froude Number	Fr =	1.01	1.04	
Maximum Flow Based On Allowable Water Depth	Q_d =	7.0	10.7	cfs

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	7.0	10.7	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.40	0.50	ft

Water Depth in Channel Based On Design Peak Flow

		Minor Storm	Major Storm	
Design Peak Flow	Q_o =	0.1	0.4	cfs
Water Depth	d =	0.03	0.08	ft
Top Width	T =	4.16	4.52	ft
Flow Area	A =	0.12	0.32	sq ft
Wetted Perimeter	P =	4.17	4.54	ft
Hydraulic Radius	R =	0.03	0.07	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	0.66	1.19	fps
Velocity-Depth Product	VR =	0.02	0.08	ft^2/s
Hydraulic Depth	D =	0.03	0.07	ft
Froude Number	Fr =	0.69	0.79	

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'

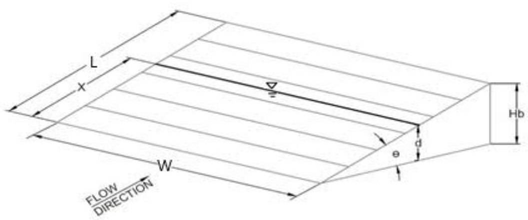
AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP109

Inlet Design Information (Input)

Type of Inlet: CDOT Type C — Inlet Type = CDOT Type C



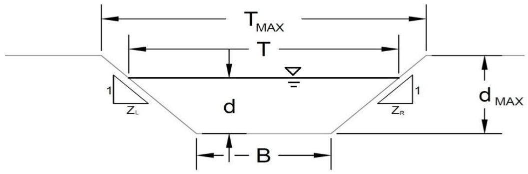
Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	ft
Length of Grate	L =	3.00	ft
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	ft
Clogging Factor	C_f =	0.50	
Grate Discharge Coefficient	C_d =	0.96	
Orifice Coefficient	C_o =	0.64	
Weir Coefficient	C_w =	2.05	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.03	0.08	
Grate Capacity as a Weir				
Submerged Side Weir Length	X =	3.00	3.00	ft
Inclined Side Weir Flow	Q_{ws} =	0.1	0.2	cfs
Base Weir Flow	Q_{wb} =	0.1	0.3	cfs
Interception Without Cloggging	Q_{wi} =	0.2	0.8	cfs
Interception With Clogging	Q_{wa} =	0.1	0.4	cfs
Grate Capacity as an Orifice				
Interception Without Clogging	Q_{oi} =	5.6	8.9	cfs
Interception With Clogging	Q_{oa} =	2.8	4.4	cfs
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.1	0.4	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP110



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.030	
Channel Invert Slope	S_O =	0.0200	ft/ft
Bottom Width	B =	3.92	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Sloe	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ **Non-Cohesive**
- ○ **Cohesive**
- ○ **Paved**

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	9.00	10.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.40	0.50	ft

Maximum Channel Capacity Based On Allowable Top Width

		Minor Storm	Major Storm	
Maximum Allowable Top Width	T_{MAX} =	9.00	10.00	ft
Water Depth	d =	0.64	0.76	ft
Flow Area	A =	4.10	5.29	sq ft
Wetted Perimeter	P =	9.16	10.19	ft
Hydraulic Radius	R =	0.45	0.52	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	4.11	4.54	fps
Velocity-Depth Product	VR =	1.84	2.36	ft^2/s
Hydraulic Depth	D =	0.46	0.53	ft
Froude Number	Fr =	1.07	1.10	
Maximum Flow Based on Allowable Water Depth	Q_T =	16.9	24.0	cfs

Maximum Channel Capacity Based On Allowable Water Depth

		Minor Storm	Major Storm	
Maximum Allowable Water Depth	d_{MAX} =	0.40	0.50	ft
Top Width	T =	7.12	7.92	ft
Flow Area	A =	2.21	2.96	sq ft
Wetted Perimeter	P =	7.22	8.04	ft
Hydraulic Radius	R =	0.31	0.37	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	3.19	3.61	fps
Velocity-Depth Product	VR =	0.98	1.33	ft^2/s
Hydraulic Depth	D =	0.31	0.37	ft
Froude Number	Fr =	1.01	1.04	
Maximum Flow Based On Allowable Water Depth	Q_d =	7.0	10.7	cfs

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	7.0	10.7	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.40	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	0.1	0.5	cfs
Water Depth	d =	0.03	0.09	ft
Top Width	T =	4.16	4.65	ft
Flow Area	A =	0.12	0.39	sq ft
Wetted Perimeter	P =	4.17	4.67	ft
Hydraulic Radius	R =	0.03	0.08	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	0.66	1.34	fps
Velocity-Depth Product	VR =	0.02	0.11	ft^2/s
Hydraulic Depth	D =	0.03	0.08	ft
Warning 04 Froude Number	Fr =	0.69	0.82	

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'

MHFD-Inlet, Version 5.02 (August 2022)

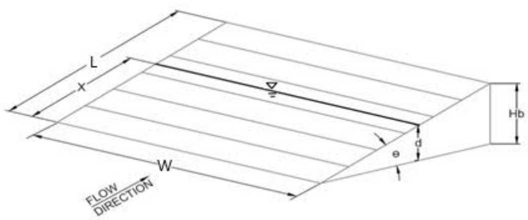
AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP110

Inlet Design Information (Input)

Type of Inlet	CDOT Type C	Inlet Type =	CDOT Type C	
Angle of Inclined Grate (must be <= 30 degrees)		θ =	0.00	degrees
Width of Grate		W =	3.00	ft
Length of Grate		L =	3.00	ft
Open Area Ratio		A_{RATIO} =	0.70	
Height of Inclined Grate		H_B =	0.00	ft
Clogging Factor		C_f =	0.50	
Grate Discharge Coefficient		C_d =	0.96	
Orifice Coefficient		C_o =	0.64	
Weir Coefficient		C_w =	2.05	



		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.03	0.09	
Grate Capacity as a Weir				
Submerged Side Weir Length	X =	3.00	3.00	ft
Inclined Side Weir Flow	Q_{ws} =	0.1	0.3	cfs
Base Weir Flow	Q_{wb} =	0.1	0.4	cfs
Interception Without Cloggging	Q_{wi} =	0.2	1.0	cfs
Interception With Clogging	Q_{wa} =	0.1	0.5	cfs
Grate Capacity as an Orifice				
Interception Without Clogging	Q_{oi} =	5.6	9.7	cfs
Interception With Clogging	Q_{oa} =	2.8	4.9	cfs
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.1	0.5	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	97	%

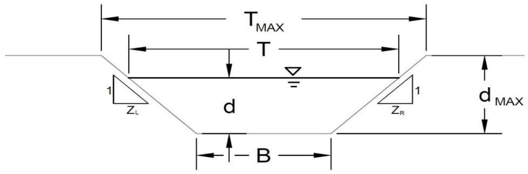
Warning 04: Froude No. exceeds USDCM Volume I recommendation.

MHFD-Inlet, Version 5.02 (August 2022)

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP111



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =			
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.030		
Channel Invert Slope	S_O =	0.0200		ft/ft
Bottom Width	B =	3.92		ft
Left Side Slope	Z1 =	4.00		ft/ft
Right Side Sloe	Z2 =	4.00		ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ **Non-Cohesive**
- ○ **Cohesive**
- ○ **Paved**

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	9.00	10.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.40	0.50	ft

Maximum Channel Capacity Based On Allowable Top Width

		Minor Storm	Major Storm	
Maximum Allowable Top Width	T_{MAX} =	9.00	10.00	ft
Water Depth	d =	0.64	0.76	ft
Flow Area	A =	4.10	5.29	sq ft
Wetted Perimeter	P =	9.16	10.19	ft
Hydraulic Radius	R =	0.45	0.52	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	4.11	4.54	fps
Velocity-Depth Product	VR =	1.84	2.36	ft^2/s
Hydraulic Depth	D =	0.46	0.53	ft
Froude Number	Fr =	1.07	1.10	
Maximum Flow Based on Allowable Water Depth	Q_T =	16.9	24.0	cfs

Maximum Channel Capacity Based On Allowable Water Depth

		Minor Storm	Major Storm	
Maximum Allowable Water Depth	d_{MAX} =	0.40	0.50	ft
Top Width	T =	7.12	7.92	ft
Flow Area	A =	2.21	2.96	sq ft
Wetted Perimeter	P =	7.22	8.04	ft
Hydraulic Radius	R =	0.31	0.37	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	3.19	3.61	fps
Velocity-Depth Product	VR =	0.98	1.33	ft^2/s
Hydraulic Depth	D =	0.31	0.37	ft
Froude Number	Fr =	1.01	1.04	
Maximum Flow Based On Allowable Water Depth	Q_d =	7.0	10.7	cfs

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	7.0	10.7	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.40	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	0.0	0.1	cfs
Water Depth	d =	0.00	0.03	ft
Top Width	T =	3.93	4.14	ft
Flow Area	A =	0.01	0.11	sq ft
Wetted Perimeter	P =	3.93	4.15	ft
Hydraulic Radius	R =	0.00	0.03	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	0.10	0.63	fps
Velocity-Depth Product	VR =	0.00	0.02	ft^2/s
Hydraulic Depth	D =	0.00	0.03	ft
Froude Number	Fr =	0.42	0.68	

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'

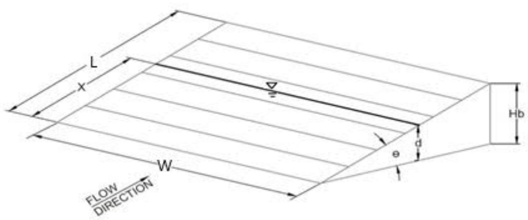
AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP111

Inlet Design Information (Input)

Type of Inlet	CDOT Type C	Inlet Type =	CDOT Type C	
Angle of Inclined Grate (must be <= 30 degrees)		θ =	0.00	degrees
Width of Grate		W =	3.00	ft
Length of Grate		L =	3.00	ft
Open Area Ratio		A_{RATIO} =	0.70	
Height of Inclined Grate		H_B =	0.00	ft
Clogging Factor		C_f =	0.50	
Grate Discharge Coefficient		C_d =	0.96	
Orifice Coefficient		C_o =	0.64	
Weir Coefficient		C_w =	2.05	

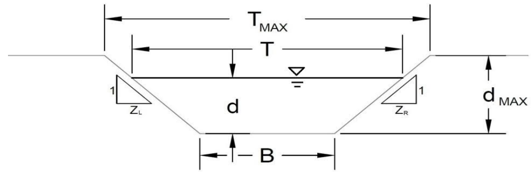


		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.00	0.03	
Grate Capacity as a Weir				
Submerged Side Weir Length	X =	3.00	3.00	ft
Inclined Side Weir Flow	Q_{ws} =	0.0	0.0	cfs
Base Weir Flow	Q_{wb} =	0.0	0.1	cfs
Interception Without Cloggging	Q_{wi} =	0.0	0.2	cfs
Interception With Clogging	Q_{wa} =	0.0	0.1	cfs
Grate Capacity as an Orifice				
Interception Without Clogging	Q_{oi} =	1.3	5.4	cfs
Interception With Clogging	Q_{oa} =	0.7	2.7	cfs
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.0	0.1	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP112



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.030	
Channel Invert Slope	S_O =	0.0200	ft/ft
Bottom Width	B =	3.92	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Sloe	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ◯ **Non-Cohesive**
- ◯ **Cohesive**
- ◯ **Paved**

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	9.00	10.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.40	0.50	ft

Maximum Channel Capacity Based On Allowable Top Width

		Minor Storm	Major Storm	
Maximum Allowable Top Width	T_{MAX} =	9.00	10.00	ft
Water Depth	d =	0.64	0.76	ft
Flow Area	A =	4.10	5.29	sq ft
Wetted Perimeter	P =	9.16	10.19	ft
Hydraulic Radius	R =	0.45	0.52	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	4.11	4.54	fps
Velocity-Depth Product	VR =	1.84	2.36	ft^2/s
Hydraulic Depth	D =	0.46	0.53	ft
Froude Number	Fr =	1.07	1.10	
Maximum Flow Based on Allowable Water Depth	Q_T =	16.9	24.0	cfs

Maximum Channel Capacity Based On Allowable Water Depth

		Minor Storm	Major Storm	
Maximum Allowable Water Depth	d_{MAX} =	0.40	0.50	ft
Top Width	T =	7.12	7.92	ft
Flow Area	A =	2.21	2.96	sq ft
Wetted Perimeter	P =	7.22	8.04	ft
Hydraulic Radius	R =	0.31	0.37	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	3.19	3.61	fps
Velocity-Depth Product	VR =	0.98	1.33	ft^2/s
Hydraulic Depth	D =	0.31	0.37	ft
Froude Number	Fr =	1.01	1.04	
Maximum Flow Based On Allowable Water Depth	Q_d =	7.0	10.7	cfs

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	7.0	10.7	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.40	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	0.0	0.2	cfs
Water Depth	d =	0.00	0.05	ft
Top Width	T =	3.93	4.36	ft
Flow Area	A =	0.01	0.23	sq ft
Wetted Perimeter	P =	3.93	4.37	ft
Hydraulic Radius	R =	0.00	0.05	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	0.10	0.98	fps
Velocity-Depth Product	VR =	0.00	0.05	ft^2/s
Hydraulic Depth	D =	0.00	0.05	ft
Froude Number	Fr =	0.42	0.75	

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'

AREA INLET IN A SWALE

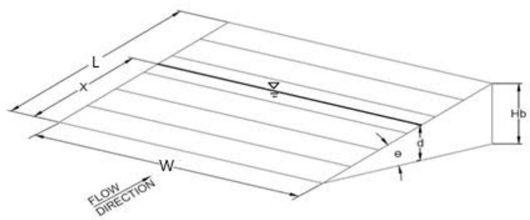
Ridgegate - Lyric Condos - 1595010

Inlet DP112

<u>Inlet Design Information (Input)</u>

Type of Inlet: CDOT Type C — Inlet Type = CDOT Type C

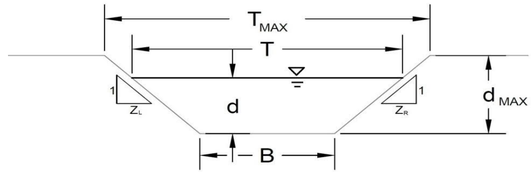
Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	ft
Length of Grate	L =	3.00	ft
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	ft
Clogging Factor	C_f =	0.50	
Grate Discharge Coefficient	C_d =	0.96	
Orifice Coefficient	C_o =	0.64	
Weir Coefficient	C_w =	2.05	



		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.00	0.05	
<u>Grate Capacity as a Weir</u>				
Submerged Side Weir Length	X =	3.00	3.00	ft
Inclined Side Weir Flow	Q_{ws} =	0.0	0.1	cfs
Base Weir Flow	Q_{wb} =	0.0	0.2	cfs
Interception Without Cloggging	Q_{wi} =	0.0	0.5	cfs
Interception With Clogging	Q_{wa} =	0.0	0.2	cfs
<u>Grate Capacity as an Orifice</u>				
Interception Without Clogging	Q_{oi} =	1.3	7.6	cfs
Interception With Clogging	Q_{oa} =	0.7	3.8	cfs
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.0	0.2	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010
Inlet DP113



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =			
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.030		
Channel Invert Slope	S_O =	0.0200		ft/ft
Bottom Width	B =	3.92		ft
Left Side Slope	Z1 =	4.00		ft/ft
Right Side Sloe	Z2 =	4.00		ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ◯ **Non-Cohesive**
- ◯ **Cohesive**
- ◯ **Paved**

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	9.00	10.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.40	0.50	ft

Maximum Channel Capacity Based On Allowable Top Width

		Minor Storm	Major Storm	
Maximum Allowable Top Width	T_{MAX} =	9.00	10.00	ft
Water Depth	d =	0.64	0.76	ft
Flow Area	A =	4.10	5.29	sq ft
Wetted Perimeter	P =	9.16	10.19	ft
Hydraulic Radius	R =	0.45	0.52	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	4.11	4.54	fps
Velocity-Depth Product	VR =	1.84	2.36	ft^2/s
Hydraulic Depth	D =	0.46	0.53	ft
Froude Number	Fr =	1.07	1.10	
Maximum Flow Based on Allowable Water Depth	Q_T =	16.9	24.0	cfs

Maximum Channel Capacity Based On Allowable Water Depth

		Minor Storm	Major Storm	
Maximum Allowable Water Depth	d_{MAX} =	0.40	0.50	ft
Top Width	T =	7.12	7.92	ft
Flow Area	A =	2.21	2.96	sq ft
Wetted Perimeter	P =	7.22	8.04	ft
Hydraulic Radius	R =	0.31	0.37	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	3.19	3.61	fps
Velocity-Depth Product	VR =	0.98	1.33	ft^2/s
Hydraulic Depth	D =	0.31	0.37	ft
Froude Number	Fr =	1.01	1.04	
Maximum Flow Based On Allowable Water Depth	Q_d =	7.0	10.7	cfs

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	7.0	10.7	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.40	0.50	ft

Water Depth in Channel Based On Design Peak Flow

		Minor Storm	Major Storm	
Design Peak Flow	Q_o =	0.0	0.1	cfs
Water Depth	d =	0.00	0.03	ft
Top Width	T =	3.93	4.14	ft
Flow Area	A =	0.01	0.11	sq ft
Wetted Perimeter	P =	3.93	4.15	ft
Hydraulic Radius	R =	0.00	0.03	ft
Manning's n	n =	0.030	0.030	
Flow Velocity	V =	0.10	0.63	fps
Velocity-Depth Product	VR =	0.00	0.02	ft^2/s
Hydraulic Depth	D =	0.00	0.03	ft
Froude Number	Fr =	0.42	0.68	

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'

MHFD-Inlet, Version 5.02 (August 2022)

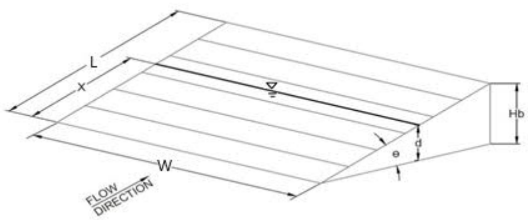
AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP113

Inlet Design Information (Input)

Type of Inlet	CDOT Type C	Inlet Type =	CDOT Type C	
Angle of Inclined Grate (must be <= 30 degrees)		θ =	0.00	degrees
Width of Grate		W =	3.00	ft
Length of Grate		L =	3.00	ft
Open Area Ratio		A_{RATIO} =	0.70	
Height of Inclined Grate		H_B =	0.00	ft
Clogging Factor		C_f =	0.50	
Grate Discharge Coefficient		C_d =	0.96	
Orifice Coefficient		C_o =	0.64	
Weir Coefficient		C_w =	2.05	

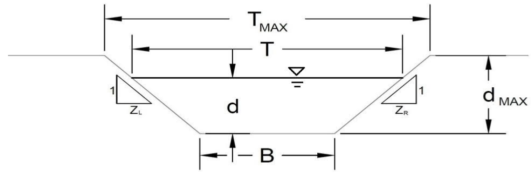


		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.00	0.03	
Grate Capacity as a Weir				
Submerged Side Weir Length	X =	3.00	3.00	ft
Inclined Side Weir Flow	Q_{ws} =	0.0	0.0	cfs
Base Weir Flow	Q_{wb} =	0.0	0.1	cfs
Interception Without Cloggging	Q_{wi} =	0.0	0.2	cfs
Interception With Clogging	Q_{wa} =	0.0	0.1	cfs
Grate Capacity as an Orifice				
Interception Without Clogging	Q_{oi} =	1.3	5.4	cfs
Interception With Clogging	Q_{oa} =	0.7	2.7	cfs
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.0	0.1	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP114



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.030	
Channel Invert Slope	S_O =	0.0200	ft/ft
Bottom Width	B =	3.92	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Sloe	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ◉ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	9.00	10.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.40	0.50	ft

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	7.0	10.7	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.40	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	0.0	0.2	cfs
Water Depth	d =	0.00	0.04	ft

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'

MHFD-Inlet, Version 5.02 (August 2022)

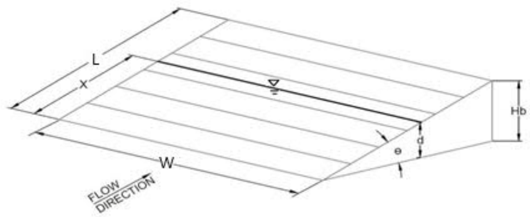
AREA INLET IN A SWALE

Ridgegate - Lyric Condos - 1595010

Inlet DP114

Inlet Design Information (Input)

Type of Inlet	CDOT Type C	Inlet Type =	CDOT Type C



Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	ft
Length of Grate	L =	3.00	ft
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	ft
Clogging Factor	C_f =	0.50	
Grate Discharge Coefficient	C_d =	0.96	
Orifice Coefficient	C_o =	0.64	
Weir Coefficient	C_w =	2.05	

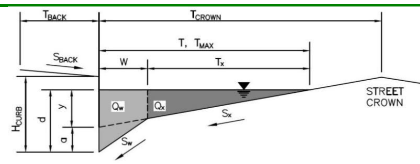
		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.00	0.04	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	0.0	0.2	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP116



Gutter Geometry:

Description	Symbol	Value		Units
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} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0		ft
Gutter Width	W =	2.00		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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

Description	Symbol	Minor Storm	Major Storm	Units
Water Depth without Gutter Depression (T * S_x * 12)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline (W * S_w * 12)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - (W * S_x * 12))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

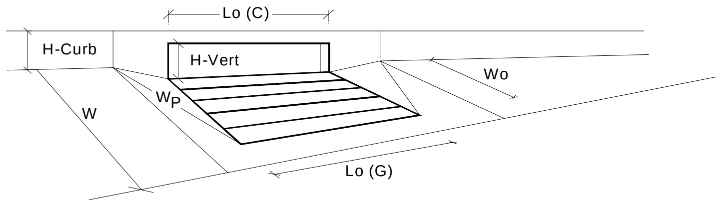
Maximum Capacity for 1/2 Street based on Allowable Depth

Description	Symbol	Minor Storm	Major Storm	Units
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\,TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\,TH}$	$Q_{X\,TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

Description	Symbol	Minor Storm	Major Storm	Units
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



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 =	5.0	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
Open Area 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 =	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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	

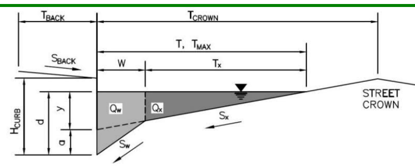
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.8	1.7	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP117



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression ($d_C - (W * S_x * 12)$)	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section ($Q_T - Q_X - Q_{BACK}$)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

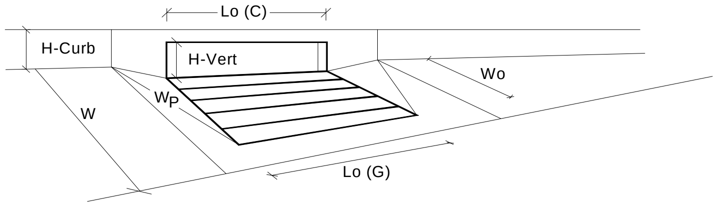
Maximum Capacity for 1/2 Street based on Allowable Depth

		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section ($Q_d - Q_X$)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



			MINOR	MAJOR	
Design Information (Input)	CDOT Type R Curb Opening				
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 =	5.0	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
Open Area 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 =	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	

		MINOR	MAJOR	
Low Head Performance Reduction (Calculated)				
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	

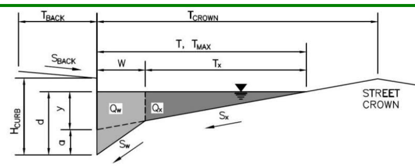
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.5	1.0	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP118



Gutter Geometry:				
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} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0		ft
Gutter Width	W =	2.00		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} =	14.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

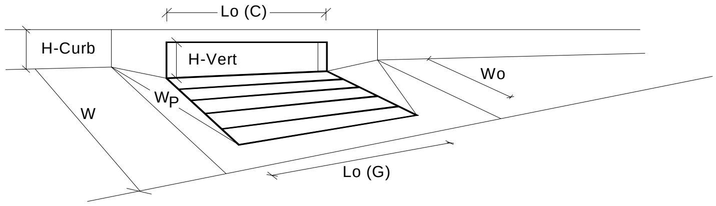
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	5.04	5.40	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.27	1.27	inches
Water Depth at Gutter Flowline (y + a)	d =	6.31	6.67	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	12.0	13.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.387	0.363	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	10.4	13.1	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	8.4	11.1	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.510	0.411	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet (CDOT Type R Curb Opening)	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 =	5.0	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
Open Area 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 =	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} =	0.25	0.33	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	

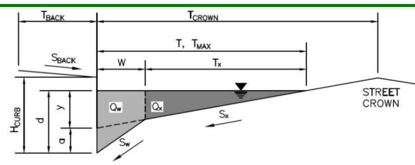
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.9	2.3	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP119



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	18.0	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} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

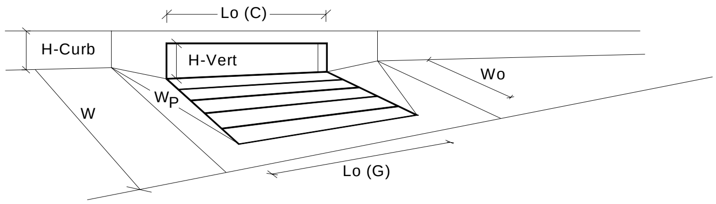
Maximum Capacity for 1/2 Street based On Allowable Spread		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	4.08	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.59	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	15.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.350	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

Maximum Capacity for 1/2 Street based on Allowable Depth		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	14.5	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	12.5	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.409	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



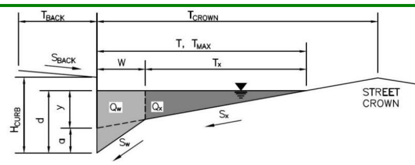
		MINOR	MAJOR	
Design Information (Input) — CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.0	5.8	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
Open Area 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 =	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	
Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs
Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.00	1.00	
Clogging Factor for Multiple Units	Clog =	0.10	0.10	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	3.9	5.6	cfs
Interception with Clogging	Q_{wa} =	3.5	5.0	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	8.9	9.6	cfs
Interception with Clogging	Q_{oa} =	8.1	8.7	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	5.5	6.8	cfs
Interception with Clogging	Q_{ma} =	4.9	6.1	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	3.5	5.0	cfs
Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	5.00	5.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	14.5	18.0	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.32	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	3.5	5.0	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	1.0	2.7	cfs

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

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

Project: Ridgegate - Lyric Condos - 1595010

Inlet ID: Inlet DP120



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	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} =	18.0	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} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	18.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

Maximum Capacity for 1/2 Street based On Allowable Spread

		Minor Storm	Major Storm	
Water Depth without Gutter Depression ($T * S_x * 12$)	y =	4.08	4.32	inches
Vertical Depth between Gutter Lip and Gutter Flowline ($W * S_w * 12$)	d_C =	2.0	2.0	inches
Gutter Depression (d_C - ($W * S_x * 12$))	a =	1.51	1.51	inches
Water Depth at Gutter Flowline (y + a)	d =	5.59	5.83	inches
Allowable Spread for Discharge outside the Gutter Section (T - W)	T_X =	15.0	16.0	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.350	0.330	
Discharge outside the Gutter Section, carried in Section T_X	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_T - Q_X - Q_{BACK})	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Maximum Flow Based On Allowable Spread	Q_T =	SUMP	SUMP	cfs
Flow Velocity within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity times Gutter Flowline Depth	V*d =	0.0	0.0	

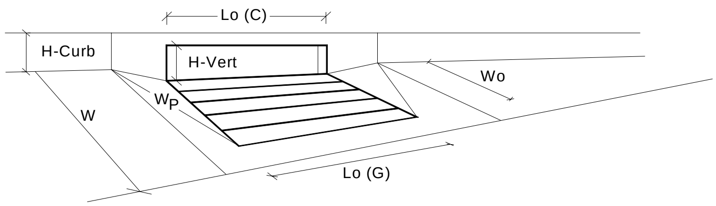
Maximum Capacity for 1/2 Street based on Allowable Depth

		Minor Storm	Major Storm	
Theoretical Water Spread	T_{TH} =	14.5	18.7	ft
Theoretical Spread for Discharge outside the Gutter Section (T - W)	$T_{X\ TH}$ =	12.5	16.7	ft
Gutter Flow to Design Flow Ratio by FHWA HEC-22 method (Eq. 7-7)	E_O =	0.409	0.318	
Theoretical Discharge outside the Gutter Section, carried in Section $T_{X\ TH}$	$Q_{X\ TH}$ =	0.0	0.0	cfs
Actual Discharge outside the Gutter Section, (limited by distance T_{CROWN})	Q_X =	0.0	0.0	cfs
Discharge within the Gutter Section (Q_d - Q_X)	Q_W =	0.0	0.0	cfs
Discharge Behind the Curb (e.g., sidewalk, driveways, & lawns)	Q_{BACK} =	0.0	0.0	cfs
Total Discharge for Major & Minor Storm (Pre-Safety Factor)	Q =	SUMP	SUMP	cfs
Average Flow Velocity Within the Gutter Section	V =	0.0	0.0	fps
V*d Product: Flow Velocity Times Gutter Flowline Depth	V*d =	0.0	0.0	
Slope-Based Safety Factor for Minor/Major Storm depth reduction, d $\geq$ 6"	R =	SUMP	SUMP	
Max Flow based on Allowable Depth (Safety Factor Applied)	Q_d =	SUMP	SUMP	cfs
Resultant Flow Depth at Gutter Flowline (Safety Factor Applied)	d =			inches
Resultant Flow Depth at Street Crown (Safety Factor Applied)	d_{CROWN} =			inches

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	Q_{allow} =	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.02 (August 2022)



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 =	5.0	5.8	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
Open Area 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	

Grate Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	N/A	N/A	
Clogging Factor for Multiple Units	Clog =	N/A	N/A	
Grate Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	N/A	N/A	cfs
Interception with Clogging	Q_{wa} =	N/A	N/A	cfs
Grate Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	N/A	N/A	cfs
Interception with Clogging	Q_{oa} =	N/A	N/A	cfs
Grate Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	N/A	N/A	cfs
Interception with Clogging	Q_{ma} =	N/A	N/A	cfs
Resulting Grate Capacity (assumes clogged condition)	Q_{Grate} =	N/A	N/A	cfs

Curb Opening Flow Analysis (Calculated)		MINOR	MAJOR	
Clogging Coefficient for Multiple Units	Coef =	1.25	1.25	
Clogging Factor for Multiple Units	Clog =	0.06	0.06	
Curb Capacity as a Weir (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{wi} =	5.3	8.2	cfs
Interception with Clogging	Q_{wa} =	5.0	7.7	cfs
Curb Capacity as an Orifice (based on MHFD - CSU 2010 Study)		MINOR	MAJOR	
Interception without Clogging	Q_{oi} =	17.9	19.2	cfs
Interception with Clogging	Q_{oa} =	16.8	18.0	cfs
Curb Opening Capacity as Mixed Flow		MINOR	MAJOR	
Interception without Clogging	Q_{mi} =	9.1	11.7	cfs
Interception with Clogging	Q_{ma} =	8.5	10.9	cfs
Resulting Curb Opening Capacity (assumes clogged condition)	Q_{Curb} =	5.0	7.7	cfs

Resultant Street Conditions		MINOR	MAJOR	
Total Inlet Length	L =	10.00	10.00	feet
Resultant Street Flow Spread (based on street geometry from above)	T =	14.5	18.0	ft
Resultant Flow Depth at Street Crown	d_{CROWN} =	0.0	0.0	inches
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} =	0.25	0.32	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.87	0.92	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	5.0	7.7	cfs
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.6	6.2	cfs

Channel Report

Drainage Swale A-A

Triangular

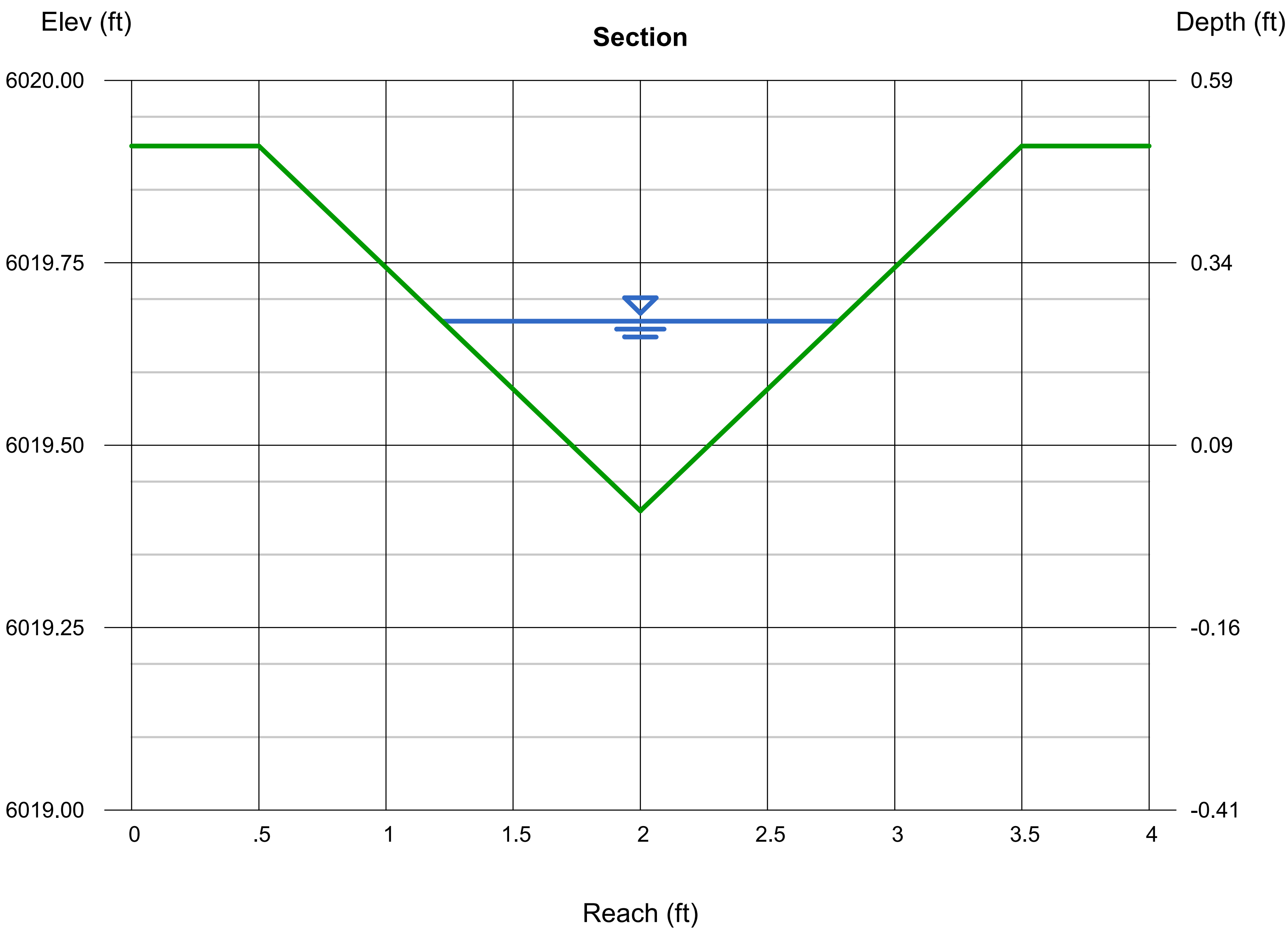
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 0.50
Invert Elev (ft)	= 6019.41
Slope (%)	= 2.20
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.35

Highlighted

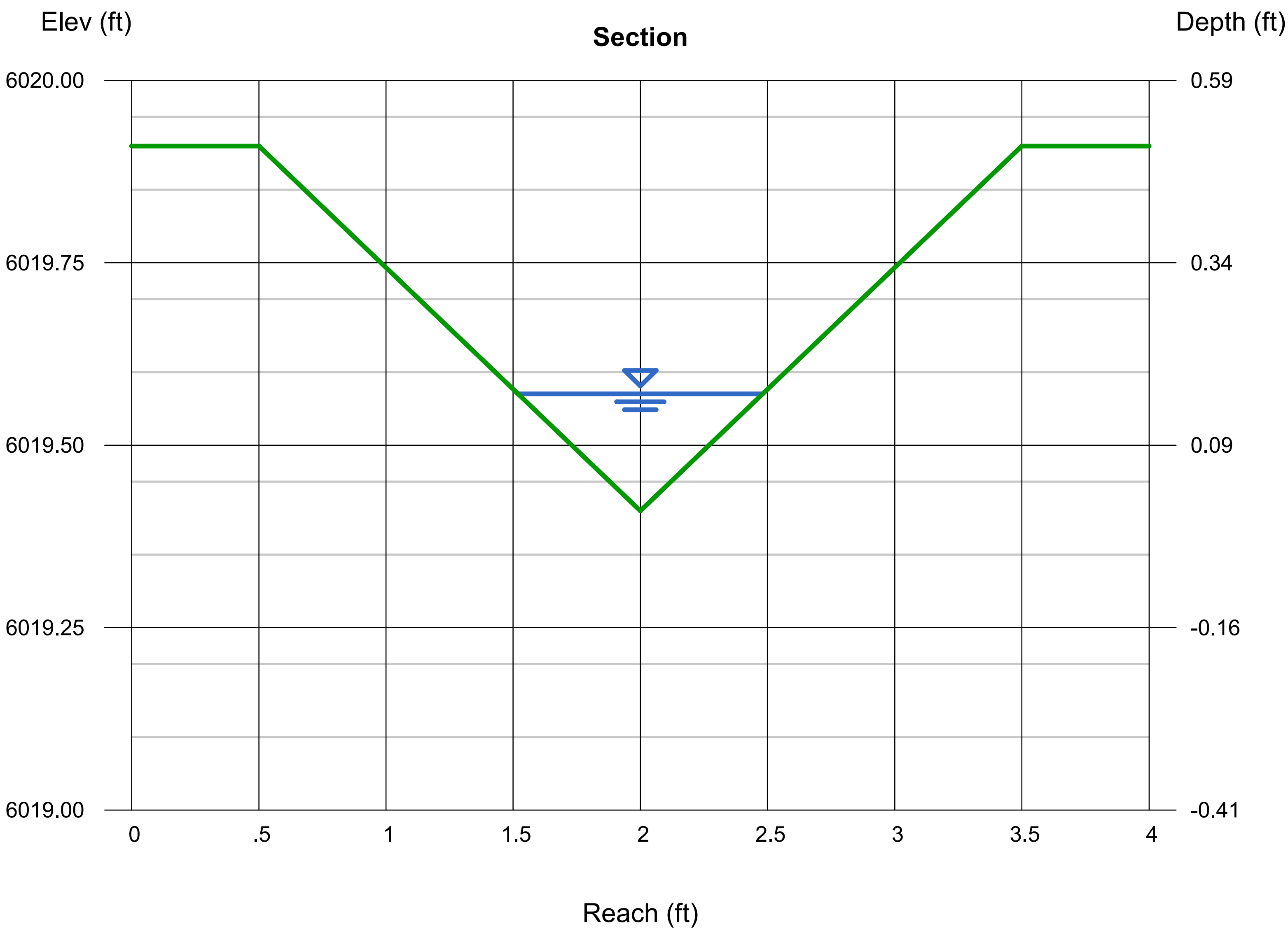
Depth (ft)	= 0.26
Q (cfs)	= 0.350
Area (sqft)	= 0.20
Velocity (ft/s)	= 1.73
Wetted Perim (ft)	= 1.64
Crit Depth, Yc (ft)	= 0.25
Top Width (ft)	= 1.56
EGL (ft)	= 0.31



Channel Report

Drainage Swale B-B

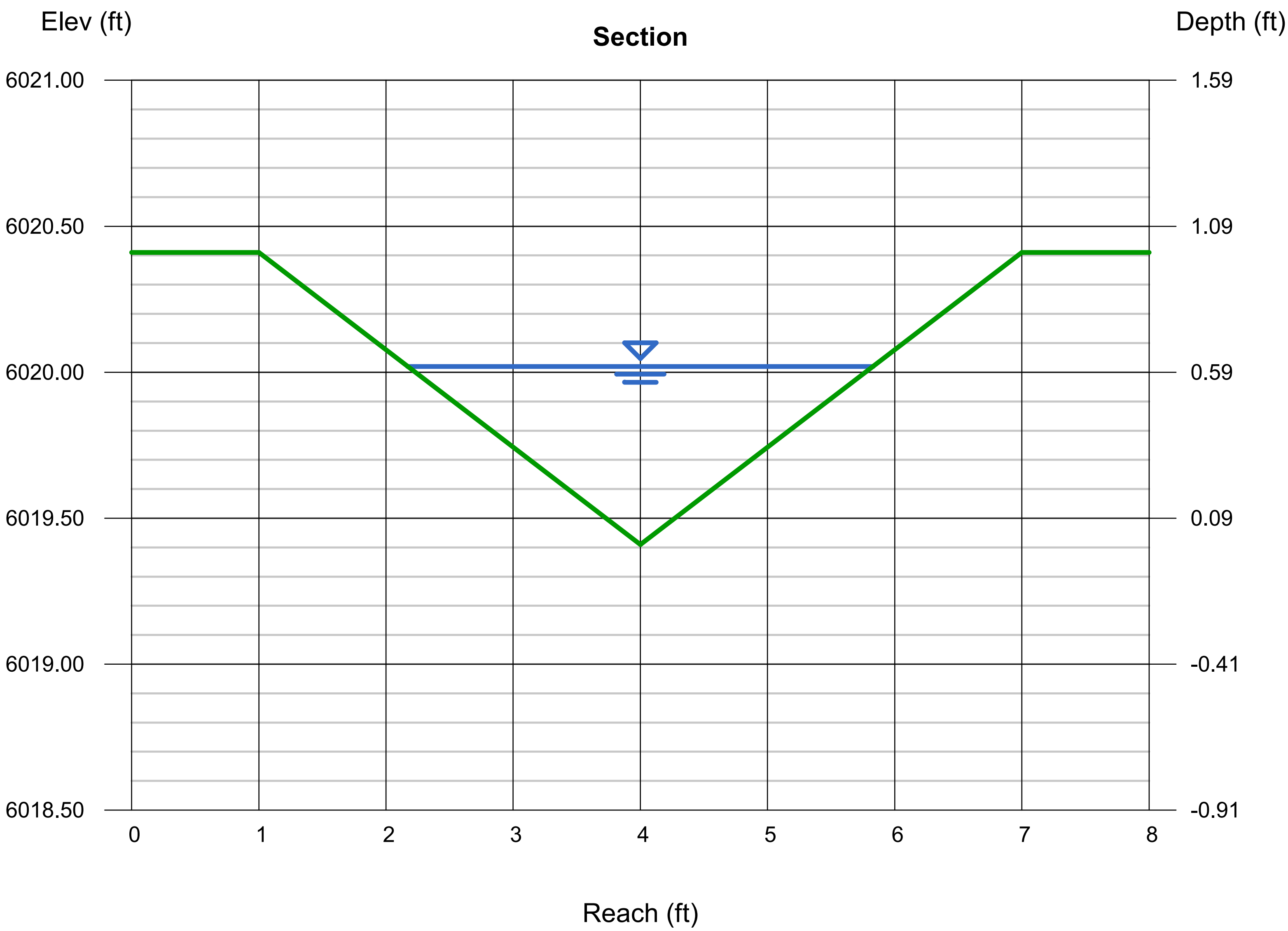
Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 0.16
Total Depth (ft)	= 0.50	Q (cfs)	= 0.180
		Area (sqft)	= 0.08
Invert Elev (ft)	= 6019.41	Velocity (ft/s)	= 2.34
Slope (%)	= 8.00	Wetted Perim (ft)	= 1.01
N-Value	= 0.030	Crit Depth, Yc (ft)	= 0.19
		Top Width (ft)	= 0.96
Calculations		EGL (ft)	= 0.25
Compute by:	Known Q		
Known Q (cfs)	= 0.18		



Channel Report

Drainage Swale C-C

Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 0.61
Total Depth (ft)	= 1.00	Q (cfs)	= 4.180
		Area (sqft)	= 1.12
Invert Elev (ft)	= 6019.41	Velocity (ft/s)	= 3.74
Slope (%)	= 3.00	Wetted Perim (ft)	= 3.86
N-Value	= 0.030	Crit Depth, Yc (ft)	= 0.66
		Top Width (ft)	= 3.66
Calculations		EGL (ft)	= 0.83
Compute by:	Known Q		
Known Q (cfs)	= 4.18		



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Feb 24 2023

Basin T23 Grass Swale

Triangular

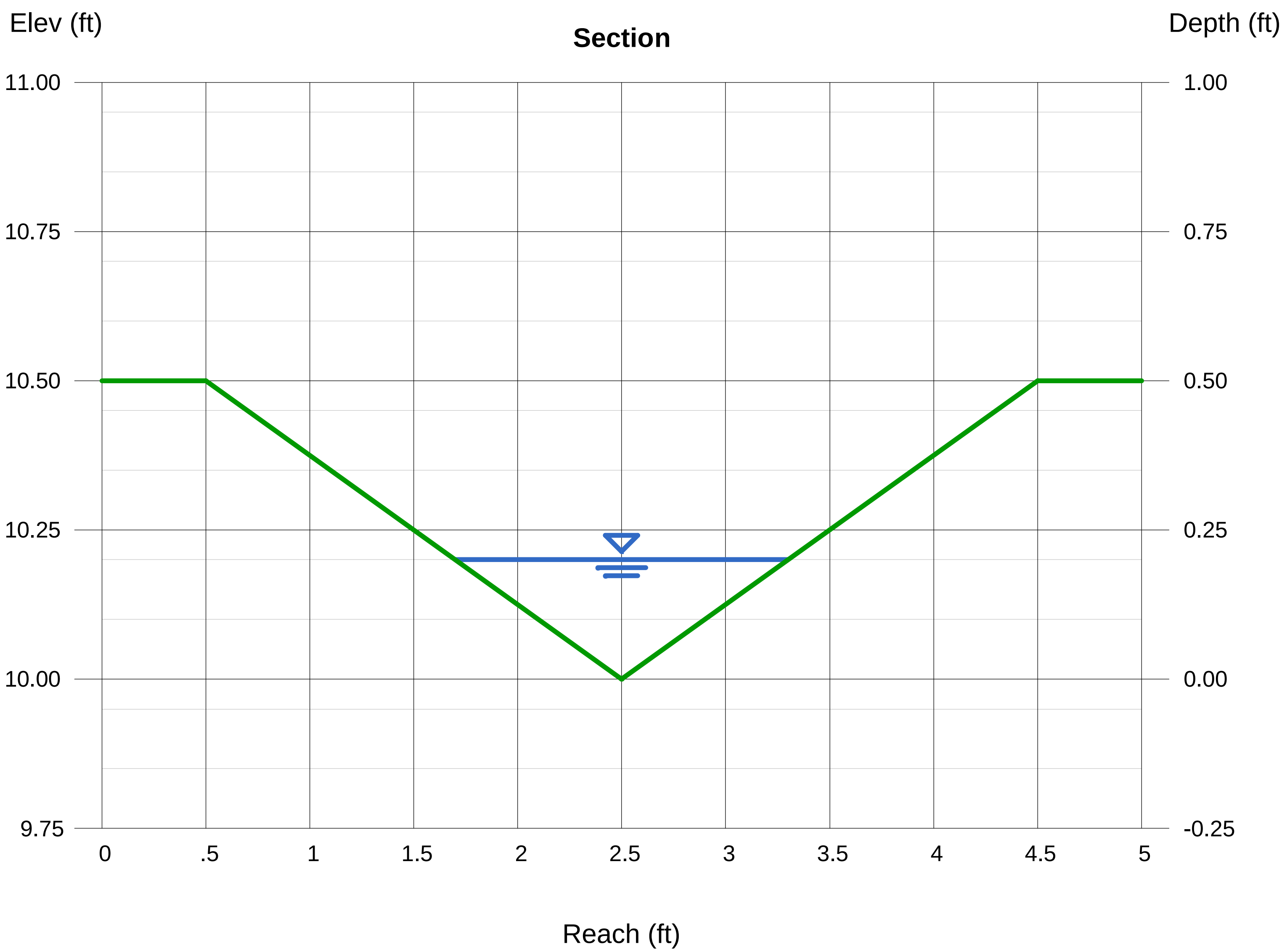
Side Slopes (z:1)	=	4.00, 4.00
Total Depth (ft)	=	0.50
Invert Elev (ft)	=	10.00
Slope (%)	=	5.00
N-Value	=	0.030

Calculations

Compute by:		Known Q
Known Q (cfs)	=	0.37

Highlighted

Depth (ft)	=	0.20
Q (cfs)	=	0.370
Area (sqft)	=	0.16
Velocity (ft/s)	=	2.31
Wetted Perim (ft)	=	1.65
Crit Depth, Yc (ft)	=	0.23
Top Width (ft)	=	1.60
EGL (ft)	=	0.28



ATTACHMENT D

REFERENCED MATERIAL

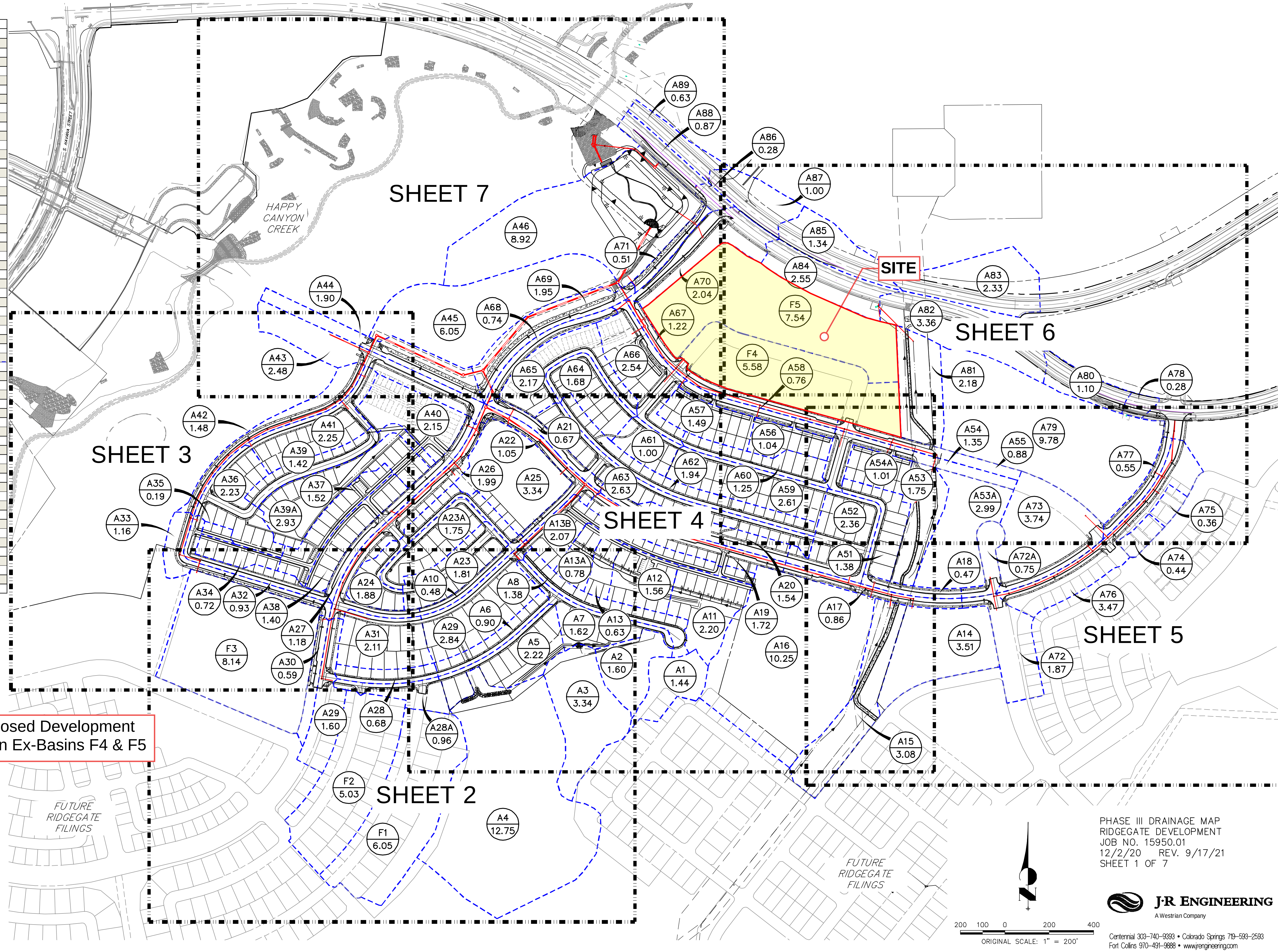
RIDGEGATE FILING 1 DEVELOPMENT

PHASE III DRAINAGE REPORT - ADDENDUM #1

Sub-Basin	Area	Percent Imp.	Q_5	Q_{100}
	(ac)	(%)	(cfs)	(cfs)
A1	1.44	10.1%	0.8	2.6
A2	0.43	2.0%	0.2	0.8
A3	4.45	2.0%	2.8	10.1
A4	12.66	2.0%	5.9	22.5
A5	1.95	43.1%	2.0	5.2
A6	1.06	62.6%	1.2	2.8
A7	2.05	46.9%	2.0	5.1
A8	1.38	70.1%	1.5	3.3
A9	2.83	49.0%	3.0	7.4
A10	0.48	69.4%	0.5	1.1
A11	3.76	18.9%	1.5	4.8
A12	0.13	59.6%	0.2	0.4
A13	3.11	59.9%	3.1	7.2
A14	3.51	74.4%	6.3	13.1
A15	2.79	9.4%	0.7	2.8
A16	10.53	12.6%	6.1	20.3
A17	0.86	76.1%	1.4	2.9
A18	0.47	75.0%	0.7	1.4
A19	1.94	58.6%	1.8	4.2
A20	1.04	68.3%	0.9	2.1
A21	1.86	74.2%	2.7	5.7
A23	1.69	63.9%	2.1	4.7
A23A	1.69	53.1%	1.9	4.5
A24	0.80	72.5%	1.3	2.8
A25	3.36	81.9%	7.0	14.1
A26	0.96	61.5%	1.0	2.3
A26A	2.83	70.5%	3.9	8.5
A27	1.48	57.8%	1.7	4.0
A27A	1.53	59.4%	1.7	3.8
A28	0.50	67.0%	0.7	1.5
A28A	0.81	70.8%	1.0	2.2
A29	1.80	56.4%	1.8	4.2
A30	0.59	76.7%	0.7	1.5
A31	1.56	47.7%	1.6	3.9
A32	1.03	56.6%	1.0	2.4
A33	0.79	70.2%	0.9	2.0
A34	1.56	50.7%	1.5	3.6
A36	1.87	54.3%	1.7	4.0
A37	1.00	52.8%	0.7	1.7
A37A	0.66	40.1%	0.4	1.2
A38	1.61	47.1%	1.2	3.0
A38A	1.07	13.3%	0.4	1.2
A39	1.39	62.0%	1.3	3.0
A40	1.73	75.0%	3.2	6.7
A41	1.88	53.0%	1.9	4.6
A42	2.13	35.1%	1.0	2.9
A43	2.50	49.8%	3.0	7.3
A44	1.66	68.1%	2.2	4.8
A45	1.63	69.9%	1.9	4.1
A45A	1.29	76.4%	1.7	3.7
A46	6.61	49.4%	12.2	28.4
A51	1.02	61.2%	1.1	2.5
A52	2.31	63.1%	2.1	4.8
A53	1.95	14.2%	0.8	2.7
A53A	3.04	75.0%	5.4	11.2
A54	1.37	70.9%	1.9	4.0
A54A	1.17	46.0%	1.4	3.4
A55	0.90	73.9%	1.3	2.7
A56	1.21	52.7%	1.6	3.7
A57	1.54	51.4%	2.1	4.9
A58	0.76	65.2%	0.7	1.6
A59	2.78	48.8%	2.6	6.4
A60	1.02	65.5%	0.9	2.2
A61	1.10	41.1%	1.3	3.3
A62	1.57	68.7%	1.2	2.7
A63	3.10	58.6%	2.4	5.7
A64	1.78	49.9%	2.3	5.6
A65	2.19	71.9%	3.8	8.0
A66	3.77	61.7%	5.3	11.9
A68	0.66	77.7%	0.6	1.4
A69	1.88	59.9%	1.9	4.3
A70	1.71	43.3%	1.9	4.9
A70A	0.33	88.1%	0.5	1.0
A71	0.77	58.0%	1.0	2.2
F1	6.05	41.5%	5.1	13.4
F2	5.03	52.9%	5.1	12.2
F3	8.14	75.0%	15.6	32.3
F4	5.58	66.0%	6.4	14.2
F5	7.54	75.0%	14.8	30.6
R1	0.75	90.0%	1.2	2.4
R2	1.87	70.9%	3.2	6.9
R3	2.46	75.9%	4.5	9.4
R3A	1.20	73.7%	1.8	3.7
R4	0.44	75.0%	1.0	2.1
R5	0.36	75.0%	0.8	1.6
R6	2.90	50.6%	2.7	6.6
R7	0.55	73.3%	0.9	2.0
R8	0.28	60.9%	0.4	0.9
R9	9.78	85.0%	18.9	37.7
R10	1.10	53.1%	1.1	2.6
R11	2.18	10.0%	1.0	3.4
R12	3.36	30.4%	1.5	4.4
R13	2.33	30.3%	1.2	3.5
R14	2.55	34.6%	1.9	5.2
R15	1.34	53.2%	1.7	4.1
R16	0.28	59.2%	0.4	0.8
R17	1.00	51.1%	0.9	2.2
R18	0.87	67.5%	1.0	2.3
R19	0.63	80.8%	0.8	1.7

Proposed Development within Ex-Basins F4 & F5

Design Point	Q_5	Q_{100}
	(cfs)	(cfs)
1	1.0	3.4
1.1	3.7	13.4
1.2	9.0	30.2
1.2A	7.9	27.5
1.3	12.7	43.6
1.4	16.2	51.9
1.4A	14.7	48.6
1.5	19.6	60.3
1.7	21.2	65.2
2	24.3	72.5
2.1	6.9	15.7
2.3	14.8	39.4
2.4	17.5	45.7
2.5	41.7	117.5
2.6	44.3	123.6
2.8	5.3	12.0
2.8A	26.6	62.6
2.9	33.1	75.8
3	35.8	82.1
3.1	79.6	206.2
3.2	44.3	100.9
4	10.2	25.6
4.1	11.9	29.2
4.2	14.3	34.8
4.3	15.9	38.7
4.3A	21.4	50.8
4.6	17.5	36.7
4.7	19.0	40.2
4.8	20.7	44.2
5.1	1.5	4.1
5.1A	3.9	10.0
5.2	24.5	53.8
5.4	30.4	67.4
5.4A	29.5	64.8
5.5	5.3	12.1
5.6	35.6	79.5
5.6A	37.3	83.1
5.6B	116.9	293.8
5.7	162.6	394.6
5.7A	118.8	294.5
6	3.1	7.3
6.1	10.6	23.8
6.1A	6.1	13.6
6.2	13.8	30.8
6.3	15.3	34.5
6.5	18.0	40.8
6.7	4.8	11.7
6.8	29.1	66.7
6.9	3.6	8.4
7.2	38.5	87.8
7.3	43.6	99.5
7.5	164.5	399.1
8	4.5	9.3
8.1	10.7	22.3
8.1A	6.2	13.0
8.2	11.7	24.3
8.3	12.4	25.8
8.4	16.0	34.2
9.4	0.0	92.5
9.5	149.4	436.8



PHASE III DRAINAGE MAP
RIDGEGATE DEVELOPMENT
JOB NO. 15950.01
12/2/20 REV. 9/17/21
SHEET 1 OF 7

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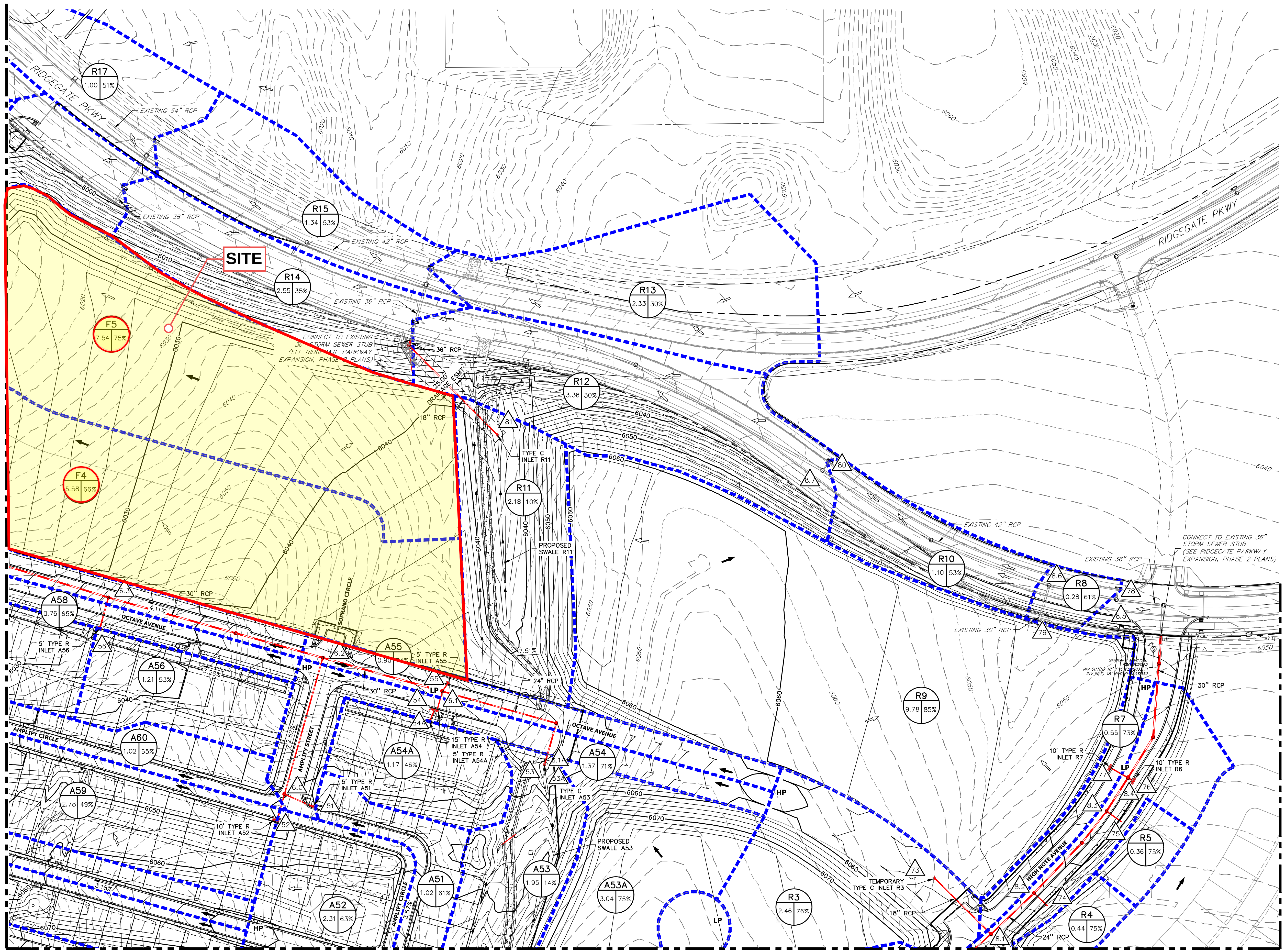
X:\1590000.all\1595001\Drawings\Sheet Dwgs\Drainage\Addendum I\1595001_DR01_Cover Sheet_Addendum.dwg, DR01, 9/16/2021 11:47:46 AM, ParkM

RIDGEGATE FILING 1 DEVELOPMENT

PHASE III DRAINAGE REPORT - ADDENDUM #1



LEGEND:

- PROPOSED STORM SEWER
- 6000 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 6000 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- DRAINAGE BASIN
- A = BASIN DESIGNATION
- B = AREA IN ACRES
- C = PERCENT IMPERVIOUS
- DESIGN POINT
- HP HIGH POINT
- LP LOW POINT
- DRAINAGE ARROW
- EXISTING DRAINAGE ARROW
- PROPOSED DRAINAGE SWALE

PHASE III DRAINAGE MAP
RIDGEGATE DEVELOPMENT
JOB NO. 15950.01
6/4/21 REV. 9/17/21
SHEET 6 OF 7

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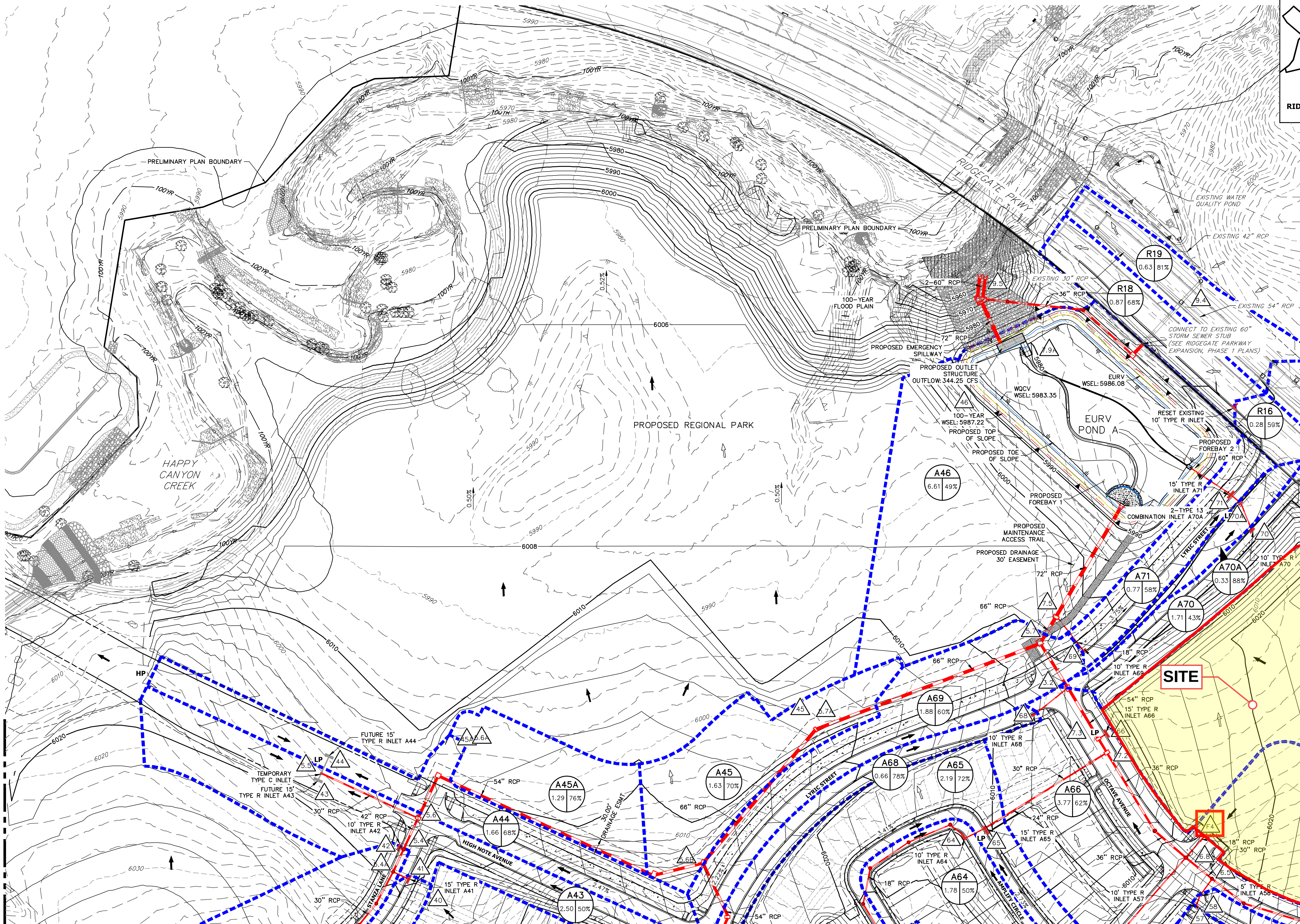
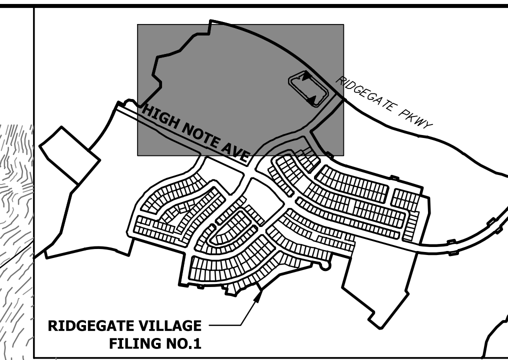
RIDGEGATE FILING 1 DEVELOPMENT

PHASE III DRAINAGE REPORT - ADDENDUM #1





KEYMAP

SCALE: 1"=1000'

EURV POND A		
Tributary Area:	171.50	AC
Percent Impervious:	48.30	%
WQCV:	2.892	AC-FT
WQCV WSEL:	5983.35	FT
EURV:	7.815	AC-FT
EURV WSEL:	5986.08	FT
100-YR VOLUME:	10.145	AC-FT
100-YR WSEL:	5987.22	FT
INFLOW:	430.84	CFS
OUTFLOW:	344.25	CFS

80 40 0 80 160

ORIGINAL SCALE: 1" = 80'

LEGEND:

- PROPOSED STORM SEWER
- 6000 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 6000 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- DRAINAGE BASIN
- A = BASIN DESIGNATION, B = AREA IN ACRES, C = PERCENT IMPERVIOUS
- DESIGN POINT
- HP HIGH POINT
- LP LOW POINT
- DRAINAGE ARROW
- EXISTING DRAINAGE ARROW
- PROPOSED DRAINAGE SWALE

PHASE III DRAINAGE MAP
RIDGEGATE DEVELOPMENT
JOB NO. 15950.01
6/4/21 REV. 9/17/21
SHEET 7 OF 7

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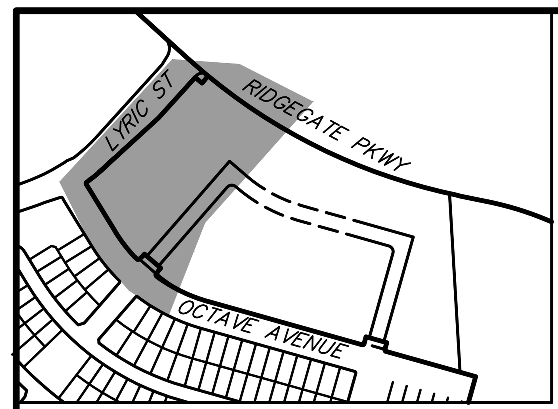
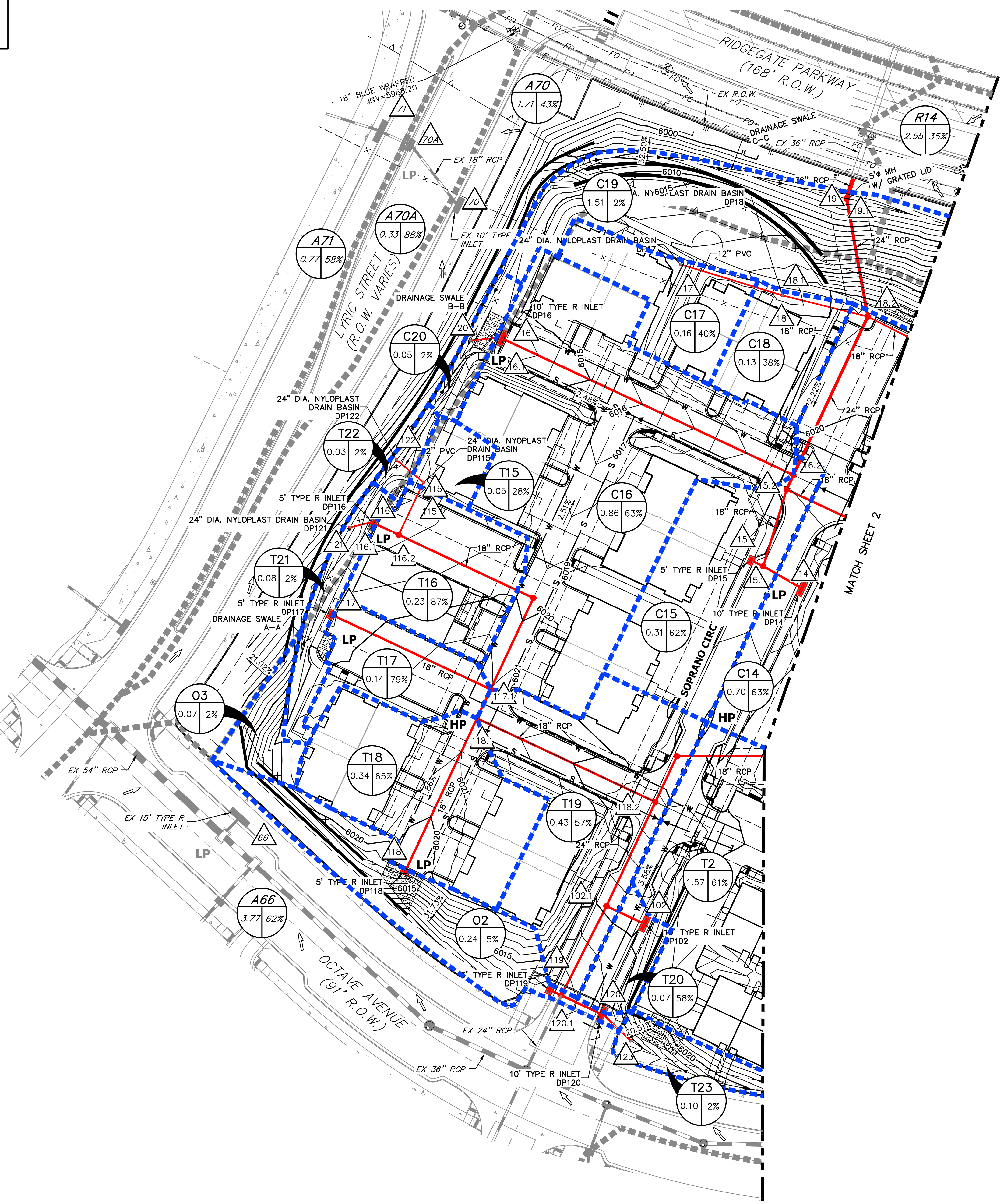
ATTACHMENT E

DRAINAGE MAPS



KEYMAP
SCALE: 1"=500'

LYRIC CONDOS FILING NO. 1
PHASE III DRAINAGE MAP



DESIGN POINT TABLE					
Design Point	Basin	Direct Flow		Cumulative Flow	
		Q5	Q100	Q5	Q100
1	C1	1.21	2.83	---	---
2	C2	2.08	5.38	---	---
3	C2	0.40	0.79	---	---
2.1	---	---	---	3.62	8.69
4	C4	0.28	0.83	---	---
4.1	---	---	---	3.77	9.22
24	C4	2.62	6.09	---	---
24.1	---	---	---	6.23	14.94
21	C4	0.00	0.17	---	---
21.1	---	---	---	6.23	15.10
22	C4	0.20	0.71	---	---
22.1	---	---	---	6.42	15.77
23	C4	0.35	1.50	---	---
23.1	---	---	---	6.74	17.18
5	C5	2.18	5.12	---	---
7	C7	1.96	4.67	---	---
7.1	---	---	---	9.71	22.71
14	C14	1.99	6.37	---	---
15	C15	0.84	2.03	---	---
15.1	---	---	---	2.85	7.30
15.2	---	---	---	12.11	30.01
20	C20	0.00	0.18	---	---
16	C16	2.33	5.64	---	---
16.1	---	---	---	2.33	5.82
16.2	---	---	---	14.06	34.90
6	C6	0.29	2.20	---	---
8	C8	0.10	0.44	---	---
8.1	---	---	---	0.37	2.57
9	C9	0.10	0.62	---	---
9.1	---	---	---	0.45	3.08
10	C10	0.00	0.09	---	---
10.1	---	---	---	0.45	3.16
11	C11	0.15	0.53	---	---
11.1	---	---	---	0.58	3.60
12	C12	0.15	0.44	---	---
12.1	---	---	---	0.70	3.96
13	C13	0.05	0.35	---	---
13.1	---	---	---	0.74	4.26
17	C17	0.30	0.88	---	---
18	C18	0.25	0.71	---	---
18.1	---	---	---	0.54	1.59
18.2	---	---	---	15.12	40.15
19	C19	0.25	4.18	---	---
19.1	---	---	---	11.93	35.09
103	T3	0.25	0.62	---	---
109	T9	0.08	0.38	---	---
109.1	---	---	---	0.30	0.90
104	T4	0.30	0.71	---	---
110	T10	0.08	0.52	---	---
110.1	---	---	---	0.63	2.01
105	T5	0.30	0.71	---	---
111	T11	0.00	0.07	---	---
111.1	---	---	---	0.86	2.61
101	T1	2.67	6.70	---	---
106	T6	0.35	0.88	---	---
106.1	---	---	---	2.09	3.81
112	T12	0.00	0.22	---	---
112.1	---	---	---	2.58	5.96
107	T7	0.25	0.60	---	---
113	T13	0.00	0.07	---	---
113.1	---	---	---	2.82	6.62
108	T8	0.25	0.60	---	---
114	T14	0.00	0.15	---	---
114.1	---	---	---	3.07	7.34
122	T22	0.00	0.09	---	---
115	T15	0.05	0.26	---	---
115.1	---	---	---	0.05	0.35
121	T21	0.00	0.35	---	---
116	T16	0.84	1.68	---	---
116.1	---	---	---	0.84	2.03
116.2	---	---	---	0.89	2.38
117	T17	0.50	0.97	---	---
117.1	---	---	---	1.39	3.35
118	T18	0.94	2.29	---	---
118.1	---	---	---	2.33	5.64
118.2	---	---	---	4.99	11.99
102	T2	5.09	13.92	---	---
102.1	---	---	---	8.85	18.72
119	T19	1.04	2.73	---	---
123	T23	0.04	0.37	---	---
120	T20	0.60	6.19	---	---
120.1	---	---	---	10.24	26.43

BASIN SUMMARY TABLE							
Tributary Sub-basin	Area (acres)	Percent Impervious	C_5	C_{100}	t_c (min)	Q_5 (cfs)	Q_{100} (cfs)
T1	1.06	57%	0.51	0.72	5.0	2.67	6.70
T2	1.57	61%	0.54	0.74	5.0	4.16	10.14
T3	0.10	55%	0.48	0.71	5.0	0.25	0.62
T4	0.12	54%	0.48	0.70	5.0	0.30	0.71
T5	0.12	54%	0.48	0.70	5.0	0.30	0.71
T6	0.14	54%	0.48	0.71	5.0	0.35	0.88
T7	0.12	54%	0.48	0.70	8.3	0.25	0.60
T8	0.12	54%	0.48	0.70	8.3	0.25	0.60
T9	0.09	16%	0.17	0.55	8.4	0.08	0.38
T10	0.13	12%	0.13	0.53	8.6	0.08	0.52
T11	0.02	2%	0.05	0.49	9.2	0.00	0.07
T12	0.06	2%	0.05	0.49	9.2	0.00	0.22
T13	0.03	2%	0.05	0.49	9.2	0.00	0.07
T14	0.04	2%	0.05	0.49	9.2	0.00	0.15
T15	0.05	28%	0.26	0.60	5.0	0.05	0.26
T16	0.23	87%	0.75	0.84	5.0	0.84	1.68
T17	0.14	79%	0.68	0.81	5.0	0.50	0.97
T18	0.34	65%	0.57	0.75	5.0	0.94	2.29
T19	0.43	57%	0.50	0.72	5.0	1.04	2.73
T20	0.07	58%	0.51	0.72	5.0	0.20	0.44
T21	0.08	2%	0.05	0.49	5.0	0.00	0.35
T22	0.03	2%	0.05	0.49	5.0	0.00	0.09
T23	0.10	2%	0.05	0.49	8.5	0.04	0.37
C1	0.44	65%	0.57	0.75	5.5	1.21	2.83
C2	0.86	56%	0.49	0.71	5.0	2.08	5.38
C3	0.11	82%	0.71	0.82	5.0	0.40	0.79
C4	0.14	50%	0.44	0.69	6.2	0.28	0.83
C5	0.77	66%	0.58	0.75	5.0	2.18	5.12
C6	0.57	11%	0.13	0.53	8.9	0.29	2.20
C7	0.84	64%	0.56	0.75	8.7	1.96	4.67
C8	0.09	21%	0.21	0.57	5.0	0.10	0.44
C9	0.12	20%	0.20	0.57	5.0	0.10	0.62
C10	0.02	2%	0.05	0.49	5.0	0.00	0.09
C11	0.11	25%	0.24	0.59	5.0	0.15	0.53
C12	0.09	31%	0.29	0.61	5.0	0.15	0.44
C13	0.07	20%	0.20	0.57	5.0	0.05	0.35
C14	0.70	63%	0.55	0.74	5.0	1.88	4.59
C15	0.31	62%	0.54	0.74	5.0	0.84	2.03
C16	0.86	63%	0.55	0.74	5.0	2.33	5.64
C17	0.16	40%	0.36	0.65	5.0	0.30	0.88
C18	0.13	38%	0.35	0.64	5.0	0.25	0.71
C19	1.51	2%	0.05	0.49	16.4	0.25	4.18
C20	0.05	2%	0.05	0.49	5.0	0.00	0.18
C21	0.04	2%	0.05	0.49	5.9	0.00	0.17
C22	0.13	37%	0.34	0.63	5.0	0.20	0.71
C23	0.28	27%	0.26	0.60	5.0	0.35	1.50
C24	0.91	67%	0.58	0.76	5.0	2.62	6.09
O1	0.13	2%	0.05	0.49	6.3	0.05	0.50
O2	0.24	5%	0.08	0.50	5.0	0.10	1.06
O3	0.07	2%	0.05	0.49	5.0	0.00	0.26

LEGEND:

- PROPOSED STORM SEWER
- 6000 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 6000 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- DRAINAGE BASIN
- A = BASIN DESIGNATION; B = AREA IN ACRES; C = PERCENT IMPERVIOUS
- DESIGN POINT
- HP HIGH POINT
- LP LOW POINT
- DRAINAGE ARROW
- EXISTING DRAINAGE ARROW
- PROPOSED DRAINAGE SWALE

40 20 0 40 80
ORIGINAL SCALE: 1" = 40'

PHASE III DRAINAGE MAP
LYRIC CONDOS FILING NO. 1
JOB NO. 15950.10
03/03/2023
SHEET 1 OF 2

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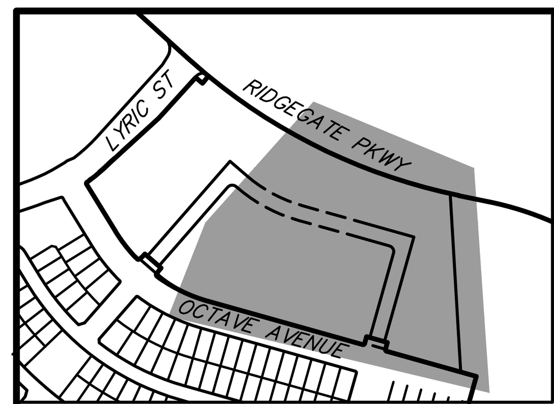
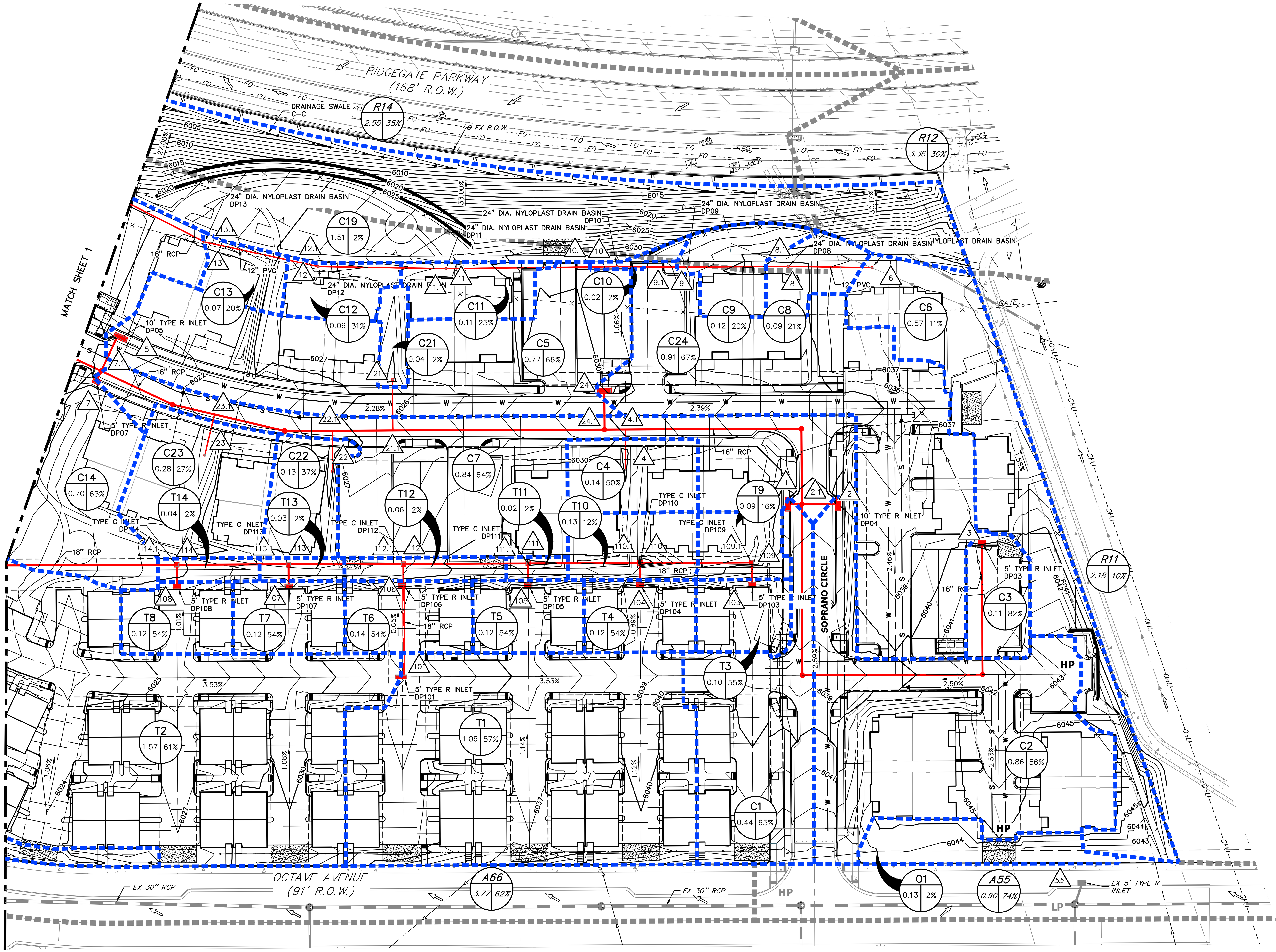
LYRIC CONDOS FILING NO. 1

PHASE III DRAINAGE MAP



KEYMAP
SCALE: 1"=500'



LEGEND:

Symbol	Description
	PROPOSED STORM SEWER
6000	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
6000	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	DRAINAGE BASIN
A / B C	A = BASIN DESIGNATION B = AREA IN ACRES C = PERCENT IMPERVIOUS
1	DESIGN POINT
HP	HIGH POINT
LP	LOW POINT
	DRAINAGE ARROW
	EXISTING DRAINAGE ARROW
	PROPOSED DRAINAGE SWALE

PHASE III DRAINAGE MAP
LYRIC CONDOS FILING NO. 1
JOB NO. 15950.10
03/03/2023
SHEET 2 OF 2

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