

**PHASE III DRAINAGE REPORT  
RIDGEGATE EAST FILING NO. 3 AND 4  
LONE TREE, CO**

**October 2023**

Prepared For:

Rampart Range Metropolitan District No. 5

Prepared By:



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Merrick Job No. 121240

**PHASE III DRAINAGE REPORT  
RIDGEGATE EAST FILING NO. 3 AND 4**

“This report (and plan) for the Phase III drainage design of *RidgeGate East Filing No. 3 and 4* was prepared by me (or under my direct supervision) in accordance with the provisions of the City of Lone Tree Storm Drainage Design and Technical Criteria for the owners thereof. I understand that the City of Lone Tree does not and will not assume liability for drainage facilities designed by others.”

---

Carson Besgrove  
Registered Professional Engineer  
State of Colorado No. 44849

**PHASE III DRAINAGE REPORT  
RIDGEGATE EAST FILING NO. 3 AND 4**

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## **LIST OF ABBREVIATIONS**

cfs	Cubic feet per second
CUHP	Colorado Urban Hydrograph Procedure
DC-DCM	Douglas County Drainage Design and Technical Criteria Manual
DTJ	Downing, Thorpe, & James
EGL	Energy Grade Line
FEMA	Federal Emergency Management Agency
FHAD	Flood Hazard Area Delineation
FIRM	Flood Insurance Rate Map
HGL	Hydraulic Grade Line
HSG	Hydrologic Soil Group
MHFD	Mile High Flood District
MDP-14	<u>Happy Canyon Creek Major Drainageway Plan</u> , March 2014, by Muller Engineering Company, Inc.
MDP-17	<u>Master Drainage Plan for RidgeGate – Happy Canyon Creek and Badger Gulch Drainage Basins</u> , February 2017, by Merrick and Company
NRCS	Natural Resources Conservation Service
OSP	Outfall Systems Plan
Pkwy	Parkway
RG	RidgeGate/Ridgegate
RRMD	Rampart Range Metropolitan District
USDA	United States Department of Agriculture
SF-3	Standard Form 3
SWMM	Stormwater Management Model
WQCV	Water Quality Capture Volume

## I. GENERAL LOCATION AND DESCRIPTION

### A. Site Location

The *RidgeGate East Filing No. 3 and 4* are located within the north half of Section 24, Township 6 South, Range 67 West, 6<sup>th</sup> Principal Meridian, City of Lone Tree, Douglas County, and State of Colorado. The Site is along and surrounded by Ridgegate Parkway east of S Lyric St and west of Badger Gulch. The Project consists of roadway, utility, and drainage improvements to support future development.

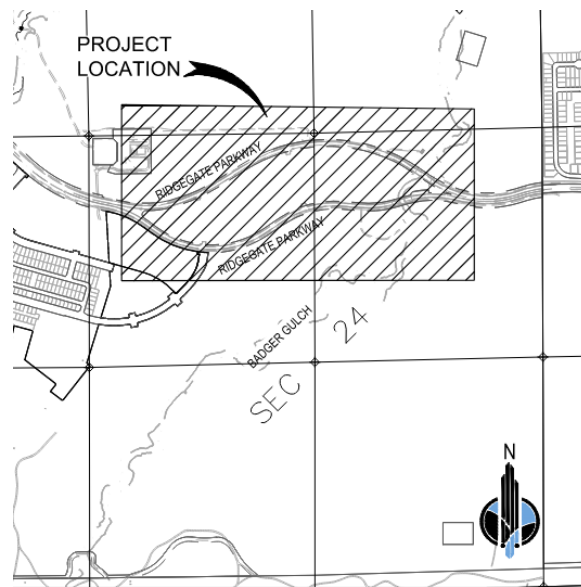


Figure 1-1: Project Vicinity Map

### B. Description of Property

Ridgegate East Filing No. 3 and 4 is approximately 42 acres and is within the Happy Canyon Creek and Badger Gulch Drainage Basins. Both Filings are encompassed by Ridgegate Parkway eastbound and westbound. A majority of the Site drains to Water Quality Pond D (proposed Pond 21) and discharges into Badger Gulch directly north of Ridgegate Parkway. A portion of Ridgegate Parkway (eastbound) on the west side of the Site drains to existing Water Quality Pond B located on the north side of Ridgegate Parkway and directly east of Happy Canyon Creek. A portion of Ridgegate Parkway (eastbound) on the east side of the Site drains to existing Water Quality Pond E located on the south side of Ridgegate Parkway (eastbound) and directly west of Badger Gulch.

Proposed detention pond 21 is located directly north of Ridgegate Parkway (westbound) and west of Badger Gulch. The surrounding ground cover consists of native or re-seeded grasses, and trees and bushes reside along the banks of major drainageways. The topography generally slopes in the direction of Badger Gulch which ultimately flow in a northeasterly direction.

From the Soil Survey of Castle Rock Area, Colorado, performed by the USDA Natural Resources Conversation Service, the site and surrounding area consist of the following soil types:

- “FoB” Fondis clay loam, 1 to 3 percent slopes, HSG C
- “Ma” Manzanola clay loam, HSG C
- “NeE” Newlin gravelly sandy loam, 8 to 30 percent slopes, HSG B
- “RmE” Renohill-Buick complex, 5 to 25 percent slopes, HSG D

For this report and drainage analysis, the site is considered HSG C and D. The soil map can be found in Appendix A.

The FEMA FIRM exhibit in Appendix A shows a Special Flood Hazard Area (SFHA) subject to inundation by the 1% annual chance flood in the Badger Gulch Basin. This SFHA passes underneath the existing bridges and will not be affected by the Project.

No existing irrigation canals or ditches exist within the site. There are no significant geologic features identified within the site.

Although this project is broken up into different phases, the drainage design considers the ultimate build-out of the RidgeGate Development which is anticipated to occur in general conformance with the RidgeGate Planned Development District, 6<sup>th</sup> Amendment provided in Appendix A.

## **II. DRAINAGE BASINS AND SUB-BASINS**

### **A. Major Drainage Basins**

The Site is located within the Badger Gulch Drainage Basin. The Badger Gulch Drainage Basin generally flows from southwest to northeast and joins Happy Canyon Creek downstream of the Site and directly south of Lincoln Avenue.

### **B. Minor Drainage Basins**

The minor drainage basins were established with the Ridgegate Parkway Expansion Drainage Reports (RGPE-I and RGPE-II) as part of the Ridgegate Parkway Expansion Project that constructed the Ridgegate Parkway northbound and southbound lane separation known as the couplet. The Site is broken up into minor basins that are described in the table below and outlined in the drainage map provided in Appendix G.



**Table 2-1: Minor Drainage Basin Summary**

Basin Name	Design Point	Area (ac)	Imperviousness (%)	Collection Point	Q <sub>s</sub> (cfs)	Q <sub>100</sub> (cfs)	Proposed Flow Pattern
Z1 - E	-	4.70	2.0%	Type C Inlet	0.4	8.3	South to North
Z1 - F	-	4.70	85.0%	Future Connection	11.5	26.9	South to North
Z2	-	0.92	80.1%	10' Type R Inlet	2.0	4.8	South to North
	Z1				12.6	29.8	
Z3	-	0.59	78.3%	10' Type R Inlet	1.2	3.1	South to North
	Z2				13.9	32.8	
Y1	-	1.00	77.3%	10' Type R Inlet	2.2	5.4	South to North
	Y1				34.5	81.4	
Y2	-	0.94	79.1%	10' Type R Inlet	2.0	5.0	South to North
	Y1				34.5	81.4	
X1	-	0.56	72.4%	10' Type R Inlet	1.1	2.8	West to East
X2	-	4.46	85.0%	SDMH	10.8	25.3	Southwest to Northeast
X3	-	3.25	85.0%	SDMH	8.0	18.7	West to East
	X1				18.6	43.7	
	X2				18.9	44.6	
X4	-	0.75	68.6%	10' Type R Inlet	1.4	3.7	West to East
	X3				20.0	47.6	
W1	-	2.39	85.0%	Future Connection	6.3	14.8	West to East
W2	-	1.11	66.6%	15' Type R Inlet	2.1	5.8	West to East
W3	-	0.41	71.6%	10' Type R Inlet	0.9	2.3	West to East
	W2				6.8	16.1	
	W1				8.8	21.5	
V2	-	2.15	32.9%	10' Type R Inlet	1.3	5.5	East to West
U1	-	1.37	72.0%	10' Type R Inlet	2.7	6.8	West to East
T1	-	0.57	71.8%	10' Type R Inlet	1.2	3.0	West to East
S1	-	2.64	69.1%	10' Type R Inlet	3.8	10.0	West to East

### **III. DRAINAGE DESIGN CRITERIA**

#### **A. Regulations**

The Mile High Flood District (MHFD) Urban Storm Drainage Criteria Manual, and the Douglas County Drainage Design and Technical Criteria Manual (DC-DCM) were used in the preparation of this report.

## **B. Drainage Studies, Outfall Systems Plans, Site Constraints**

The following drainage studies and reports have been completed for the Site:

- Happy Canyon Creek Flood Hazard Area Delineation, prepared by Muller Engineering Company, dated July 2014 (FHAD-14). The FHAD-14 floodplain information was adopted by the City of Lone Tree effective February 17, 2017.
- Happy Canyon Creek Major Drainageway Plan (MDP-14), dated March 2014, by Muller
- Master Drainage Plan for RidgeGate – Happy Canyon Creek and Badger Gulch Drainage Basins (MDP-17), dated February 2017, by Merrick and Company. This report updated the MDP-14 to provide more detail related to the RidgeGate Development.
- Phase III Drainage Report for Ridgeway Parkway Expansion – Phase I (RGPE-I), dated October 2018, by Merrick & Company.
- Phase III Drainage Report for Ridgeway Parkway Expansion – Phase II (RGPE-II), dated October 2018, by Merrick & Company.

This report is in conformance with the five previously completed drainage reports. The RGPE-II Report was the main governing document for the inlet and storm sewer design. The minor drainage basins established in the RGPE reports were used for this report. The FHAD-14 was used to confirm the pond discharge into Badger Gulch.

Phase III Drainage Reports prepared for future developments and improvements tributary to the couplet area are anticipated to conform to this report and the previous drainage studies.

## **C. Hydrology**

The Point Precipitation Frequency Estimates from the NOAA Atlas 14 were used to determine the 1-hour point rainfall depth for the different recurrence intervals. Based on the 60-minute duration, the 5-year and 100-year depths for Lone Tree are 1.10 inches and 2.27 inches. The same depths from the prior RGPE-I and -II reports were 1.43 inches and 2.60 inches, which accounts for some of the decreases in flows. The Point Precipitation Frequency Estimate for Lone Tree is provided in Appendix A.

The Rational Method was used to calculate runoff for the design of the inlets and storm sewer. Rational Method calculations are provided in Appendix B and excerpts from the RGPE-I and RGPE-II reports are provided in Appendix A.

A comparison table of flows at critical points is provided below:

**Table 3-1: RGPE-II Flow Comparisons at Key Design Points**

Filing No. 3 Design Point	Filing No. 3 100-Yr Storm Event Flow (cfs)	RGPE-II Design Point	RGPE-II 100-Yr Storm Event Flow (cfs)
Z2	32.8	D1 (D4 Inlet Type D)	35.2
Y1	81.4	D5 (D8 Inlet Type D)	96.8
X3	47.6	D10 Inlet Type D	49.0
W1	21.5	D8 (D12 Ex Inlet Type R L 10)	8.0
Inlet S1	10.0	Inlet E1	10.2

At design point W1, the proposed flow is more than the existing flow because of some adjustments made to the proposed developments. The Hydraflow model of RGPE-II Storm D was rerun to confirm the capacity of the existing system to handle the proposed changes. RGPE-II Storm E Hydraflow was rerun as well, since the tie-in points had changed for the flows. See Section III.D Hydraulics for more information.

**Table 3-2: RGPE-I Flow Comparisons at Key Design Points**

Filing No. 3 Design Point	Filing No. 3 100-Yr Storm Event Flow (cfs)	RGPE-I Design Point	RGPE-I 100-Yr Storm Event Flow (cfs)
Inlet V2	5.5	Inlet C3	5.9

The Colorado Urban Hydrograph Procedure (CUHP) was used to calculate runoff for the Badger Gulch Subcatchments to design the detention pond. The CUHP calculations can be found in Appendix F.

## D. Hydraulics

Per Douglas County drainage design criteria, the 5-year and 100-year design storms were used in the design of stormwater conveyance facilities.

Street sections and storm drainage inlet capacities have been determined using the MHFD “MHFD-Inlet\_v5.01” excel spreadsheet (version 5.01, April 2021). Inlet calculations are provided in Appendix C. There are several inlets that were not included in the calculations because flows to these inlets have not increased in the proposed improvements. A table of the inlet flow comparisons is below:

**Table 3-3: Inlet Flow Comparison to RGPE-II and RGPE-I**

Filing No. 3 Inlet	Filing No. 3 Flow (cfs)	Existing Inlet	Existing Flow (cfs)
Inlet W2	3.0	Inlet D12 (RGPE-II)	3.2
Inlet V2	5.5	Inlet C3 (RGPE-I)	5.9
Inlet U1	4.0	Inlet E3 (RGPE-II)	6.9
Inlet S1	10.0	Inlet E1 (RGPE-II)	10.2

Storm sewer capacities and hydraulic grade line (HGL) calculations have been determined using the Hydraflow Storm Sewer Extension for Autodesk. Storm sewer and HGL calculations are provided in Appendix D.

## E. Water Quality Enhancement

Water quality for most of the Site will be provided by proposed Pond 21. Pond 21 is design to provide water quality for the excess urban runoff volume (EURV) for the Site. The EURV for the Site is 3.69 acre-feet.

Pond 21 is designed to release the EURV over a 72-hour period. The MHFD “UD-Detention\_v4-05” excel spreadsheet was used for the pond design. Pond calculations are provided in Appendix E.

WQ Pond B from RGPE-I was analyzed for impacts. Basin V2 corresponds to Basin C3 from the RGPE-I report. With this project, a turn lane is added into the basin V2 area, increasing the

imperviousness of the basin. Also with this project, the inlet capturing flows from Basin C4 from RGPE-I was removed and flows are now captured by Inlet Z2. With all the basin revisions, the water quality volume required for WQ Pond B has been reduced and no improvements are required.

**Table 3-4: WQ Pond B Comparison**

WQ Pond B	RGPE-I	Filing No. 3
Watershed Area (ac)	44.84	44.64
Watershed Imperviousness	15.55%	15.47%

WQ Pond E from RGPE-II was analyzed for impacts as well. Basins S1, T1, and U1 all drain to the existing WQ Pond E. The imperviousness of these basins was increased from the RGPE-II report due to turn lanes and sidewalk improvements. The changes in watershed area and watershed imperviousness are outlined below:

**Table 3-5: WQ Pond E Comparison**

WQ Pond E	RGPE-II	Filing No. 3
Watershed Area (ac)	24.49	24.79
Watershed Imperviousness	73.90%	74.20%

With the change in area and imperviousness, the required water quality capture volume for WQ Pond E increased from the RGPE-II Report. The following table presents the WQCV from the original design, as-built condition, and current report.

**Table 3-6: WQ Pond E Design Summary**

	RGPE-II	As-Built	Filing No. 3
WQCV (ac-ft)	0.522	0.689	0.610

The proposed design does not increase the required water quality volume beyond the existing pond's water quality capture volume. Therefore, there are no proposed improvements to WQ Pond E. WQ Pond E calculations are included in Appendix E.

## **IV. STORMWATER MANAGEMENT FACILITY DESIGN**

### **A. Stormwater Conveyance Facilities**

The proposed drainage improvements will be in either public right-of-way, dedicated tracts of land, or in drainage easements dedicated to the City of Lone Tree. Upon acceptance by the City, in conformance with the terms of the Annexation Agreement, the storm drainage infrastructure (inlets, pipes and manholes) will become the City's responsibility for maintenance.

### **B. Stormwater Storage Facilities**

Proposed detention Pond 21 is designed to provide 100-year detention so that the peak flow rate of Badger Gulch is not increased.

Per the FHAD-14, "All runoff from developing areas within Ridgegate will be captured and attenuated in EURV-only ponds located offline from mainstem Happy Canyon Creek and Badger Gulch." The FHAD-14 goes on to state, "In addition to the sub-regional offline EURV ponds, the conceptual design plans call for 100-year online peak-skimming detention facilities." Since there are no 100-year online peak-skimming detention facilities on Badger Gulch constructed to date Pond 21 will provide flood detention in the interim.

Once 100-year online peak-skimming detention facilities are constructed on Badger Gulch it is anticipated Pond 21 could be modified to provided EURV-only.

To confirm the proposed development and Pond 21 discharge does not increase the 100-year peak flowrate in Badger Gulch the CUHP/SWMM data from the FHAD-14 was used to model the proposed development and pond.

The FHAD-14 used CUHP version 1.3.3. Since 2014 there has been many software updates and the current version of CUHP is version 2.0.1. The original CUHP/SWMM data was entered into the new version of CUHP with the most current rainfall data to determine the 100-year flow in Badger Gulch prior to any improvements. The following Table presents the changes in runoff between versions of CUHP.

**Table 4-1: FHAD-14 SWMM Results by CUHP**

CUHP Version		V1.3.3	V2.0.1
60-Minute Duration, 100-Year Recurrence Depth (in)		2.58	2.27
Location	SWMM Node	(cfs)*	(cfs)
Downstream of Pond 21	BG011	1,489	1,266
Badger Gulch / Pond 21 Junction	BG010	1,362	1,172
Upstream of Pond 21	BG009	1,321	1,142

\*FHAD-14, Appendix B, page B-15

The current version of CUHP combined with the current NOAA Atlas data resulted in a decrease in runoff of approximately 17 percent. Since the completion of the FHAD-14 the Ridgeway Parkway Expansion Project (Couplet) was completed within the Badger Gulch Basin. The Couplet reduced the area draining to Happy Canyon Creek and increased the area draining to the Badger Gulch Basin. The CUHP basins were updated to reflect the existing roadway. The following table presents the changes in runoff between the FHAD-14 (version 2.0.1) and the current existing condition.

**Table 4-2: SWMM Results for the FHAD-14 and Existing Conditions**

Location	SWMM Node	100-YR Existing (cfs)	100-YR Existing Couplet (cfs)
Downstream of Pond 21	BG011	1,266	1,286
Badger Gulch / Pond 21 Junction	BG010	1,172	1,194
Upstream of Pond 21	BG009	1,142	1,168

The Couplet Project increased the runoff in Badger Gulch by approximately two percent. With the 100-year existing couplet baseline flow rate established, the CUHP Couplet Drainage Basin (E190) was then altered to represent the proposed development and Pond 21 was added to the model. Pond 21 discharges to SWMM node BG010, the following table presents the existing and developed runoff.

**Table 4-3: SWMM Results for Existing Couplet and Developed Couplet**

Location	SWMM Node	100-YR Existing Couplet (cfs)	100-YR Developed Couplet (cfs)
Downstream of Pond 21	BG011	1,286	1,282
Badger Gulch / Pond 21 Junction	BG010	1,194	1,193
Upstream of Pond 21	BG009	1,168	1,168

Based on the SWMM results the proposed development will not increase the 100-year peak runoff within Badger Gulch.

**C. Floodplain Modification**

Badger Gulch is located inside a FEMA Zone A designated floodplain. All proposed improvements will remain outside the FEMA designated floodplain; therefore, no modifications are necessary.

**D. Additional Permitting Requirements**

There are wetlands that exist along Badger Gulch; however, no wetlands will be impacted with this project.

**V. CONCLUSIONS**

**A. Compliance with Standards**

This Phase III Drainage Report is in compliance with the Douglas County and Mile High Flood District Standards.

**B. Variances**

The Douglas County Standards specifies drop within a manhole from upstream pipe invert to downstream pipe invert normally not exceed 1-foot. Due to terrain relief across the site and utility crossings, drops greater than 1-foot were utilized along the lateral lines to avoid increasing the depth of the storm sewer network. Therefore, a variance is requested to increase the manhole drop height requirement to greater than 1-foot.



**C. Drainage Concept**

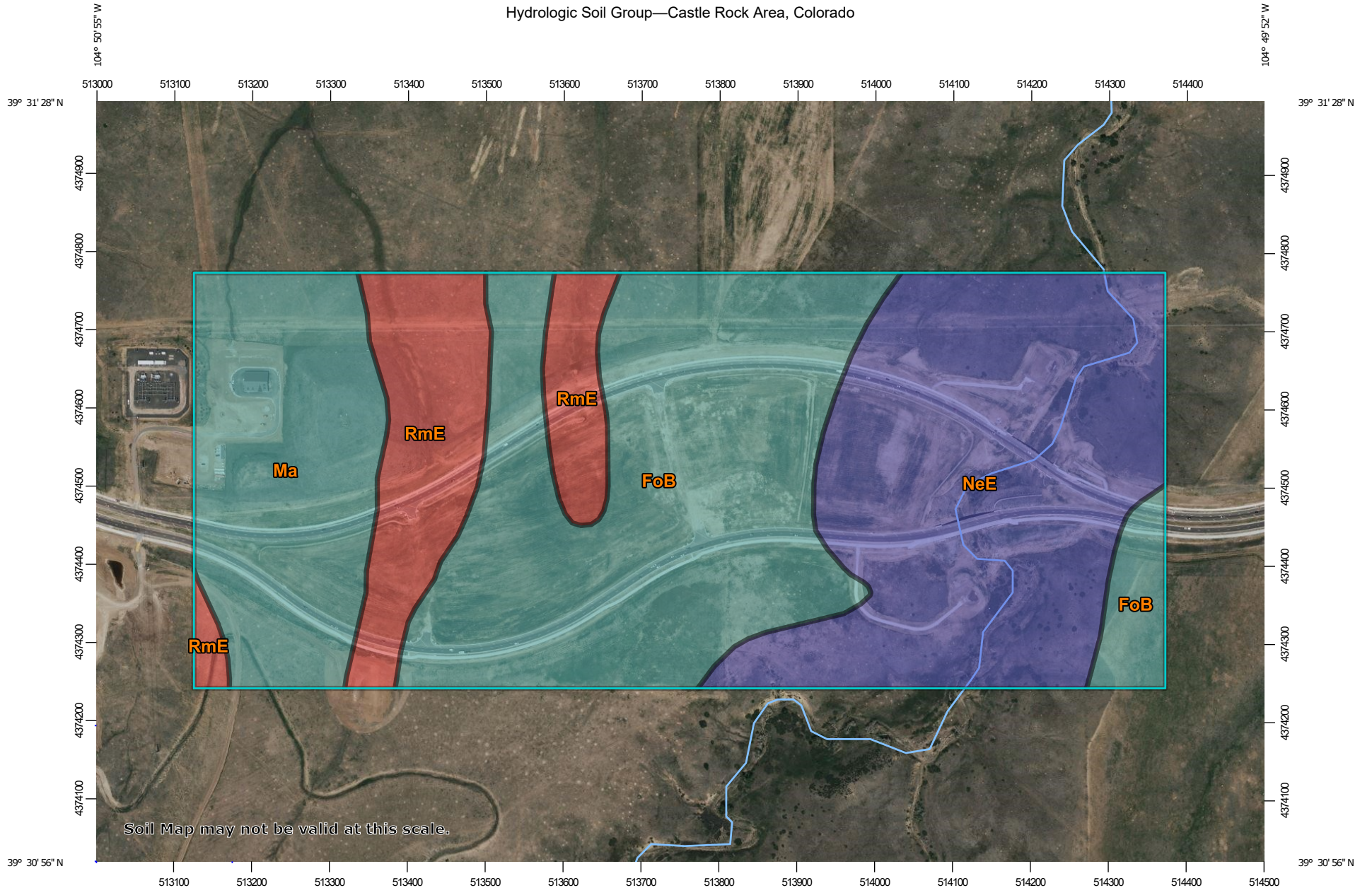
The drainage concept and proposed stormwater facilities are in substantial compliance with the FHAD, MDP-14, MDP-17, RGPE-I and RGPE-II Reports.

## **REFERENCES**

1. Douglas County. Douglas County Storm Drainage Design and Technical Criteria Manual. Amended July 8, 2008.
2. Federal Emergency Management Agency. F.E.M.A Flood Insurance Rate Map (FIRM), Douglas County, Colorado, Map Number 08035C0064J.
3. RidgeGate, 6<sup>th</sup> Amendment, Planned Development District. Recorded March 2018.
4. United States Department of Agriculture Natural Resources Conservation Service. Soil Survey of Castle Rock Area, Colorado.
5. Mile High Flood District. Urban Storm Drainage Criteria Manual Volumes 1-3. Revised March 2017.
6. Muller Engineering Company, Inc. Happy Canyon Flood Hazard Area Delineation. July 2014.
7. Muller Engineering Company, Inc. Happy Canyon Creek Major Drainageway Plan. March 2014.
8. Merrick & Company. Master Drainage Plan for RidgeGate – Happy Canyon Creek and Badger Gulch Drainage Basins. February 2017.
9. Merrick & Company. Phase III Drainage Report for Ridgegate Parkway Expansion – Phase I. October 2018.
10. Merrick & Company. Phase III Drainage Report for Ridgegate Parkway Expansion – Phase II. October 2018.

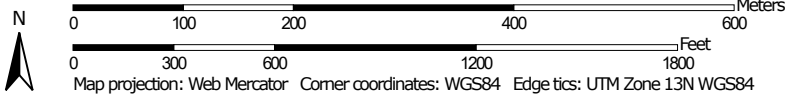
## **APPENDIX A – REFERNCE MATERIALS**

Hydrologic Soil Group—Castle Rock Area, Colorado



Soil Map may not be valid at this scale.

Map Scale: 1:6,860 if printed on A landscape (11" x 8.5") sheet.



## 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
FoB	Fondis clay loam, 1 to 3 percent slopes	C	60.6	36.8%
Ma	Manzanola clay loam	C	28.8	17.5%
NeE	Newlin gravelly sandy loam, 8 to 30 percent slopes	B	53.3	32.4%
RmE	Renohill-Buick complex, 5 to 25 percent slopes	D	21.9	13.3%
<b>Totals for Area of Interest</b>			<b>164.5</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

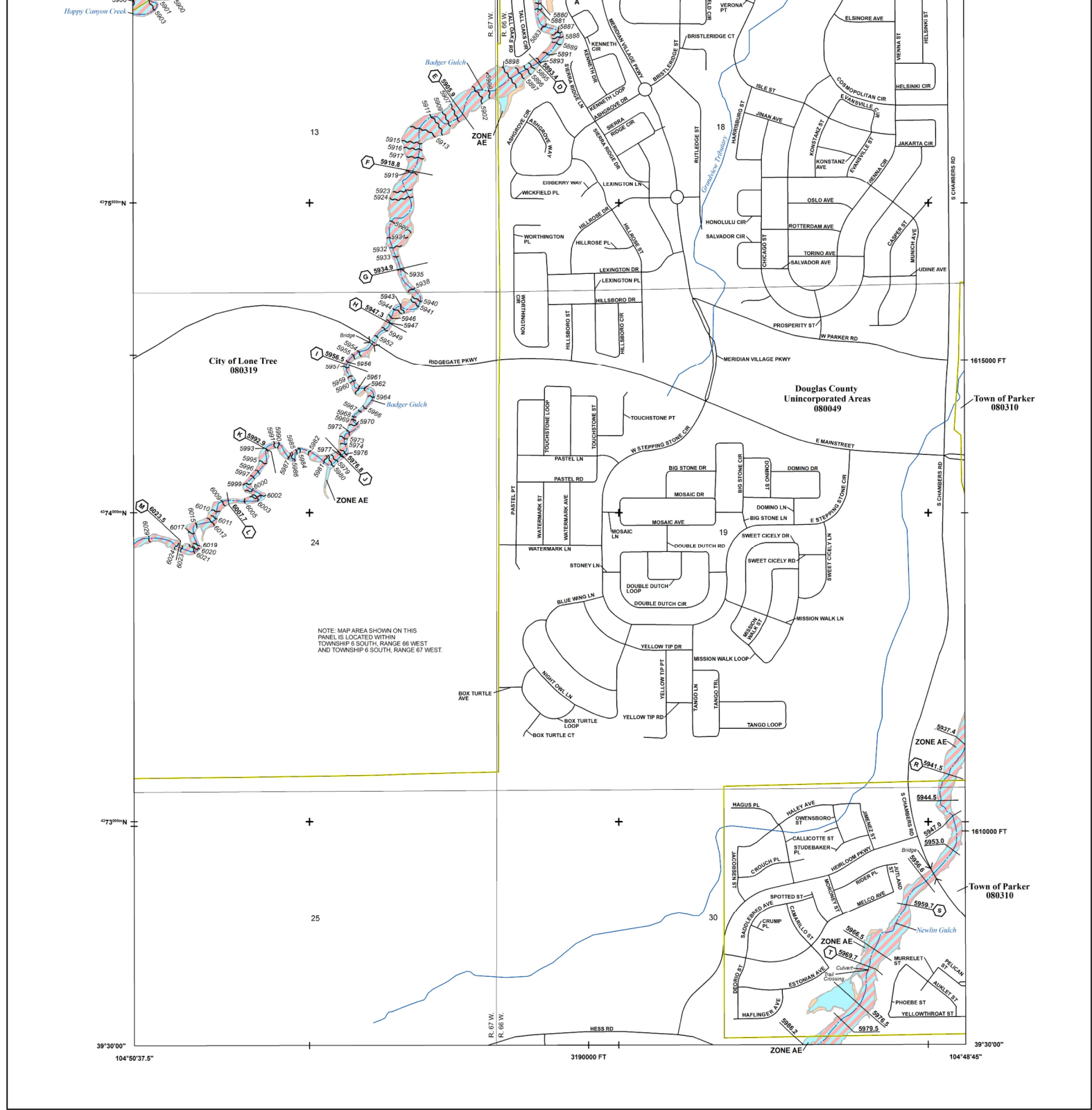
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher



### 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](https://msc.fema.gov)

	Without Base Flood Elevation (BFE) Zone A, V, A99
	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee See Notes. Zone X
	Area with Flood Risk due to Levee Zone D
	NO SCREEN Area of Minimal Flood Hazard Zone X
	Area of Undetermined Flood Hazard Zone D
	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
	Cross Sections with 1% Annual Chance Water Surface Elevation

### 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 Mapping and Insurance eXchange at 1-877-FEMA-XMAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at [fms.msc.fema.gov](http://fms.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.

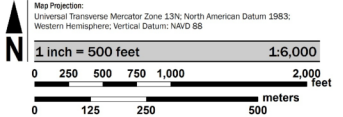
Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

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

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

Base map information shown the FIRM was derived from digital data obtained from Douglas County, Colorado and the U.S. Bureau of Land Management.

### SCALE



### PANEL LOCATOR



## National Flood Insurance Program

**NATIONAL FLOOD INSURANCE PROGRAM**  
**FLOOD INSURANCE RATE MAP**  
**DOUGLAS COUNTY,**  
**COLORADO**  
 UNINCORPORATED AREAS  
 PANEL 64 OF 495

Panel Contains:  
 COMMUNITY: DOUGLAS COUNTY, LONE TREE, CITY OF PARKER, TOWN OF  
 NUMBER: 080049, 080319, 080320  
 PANEL: 0064, 0064, 0064  
 SUFFIX: J, J, J

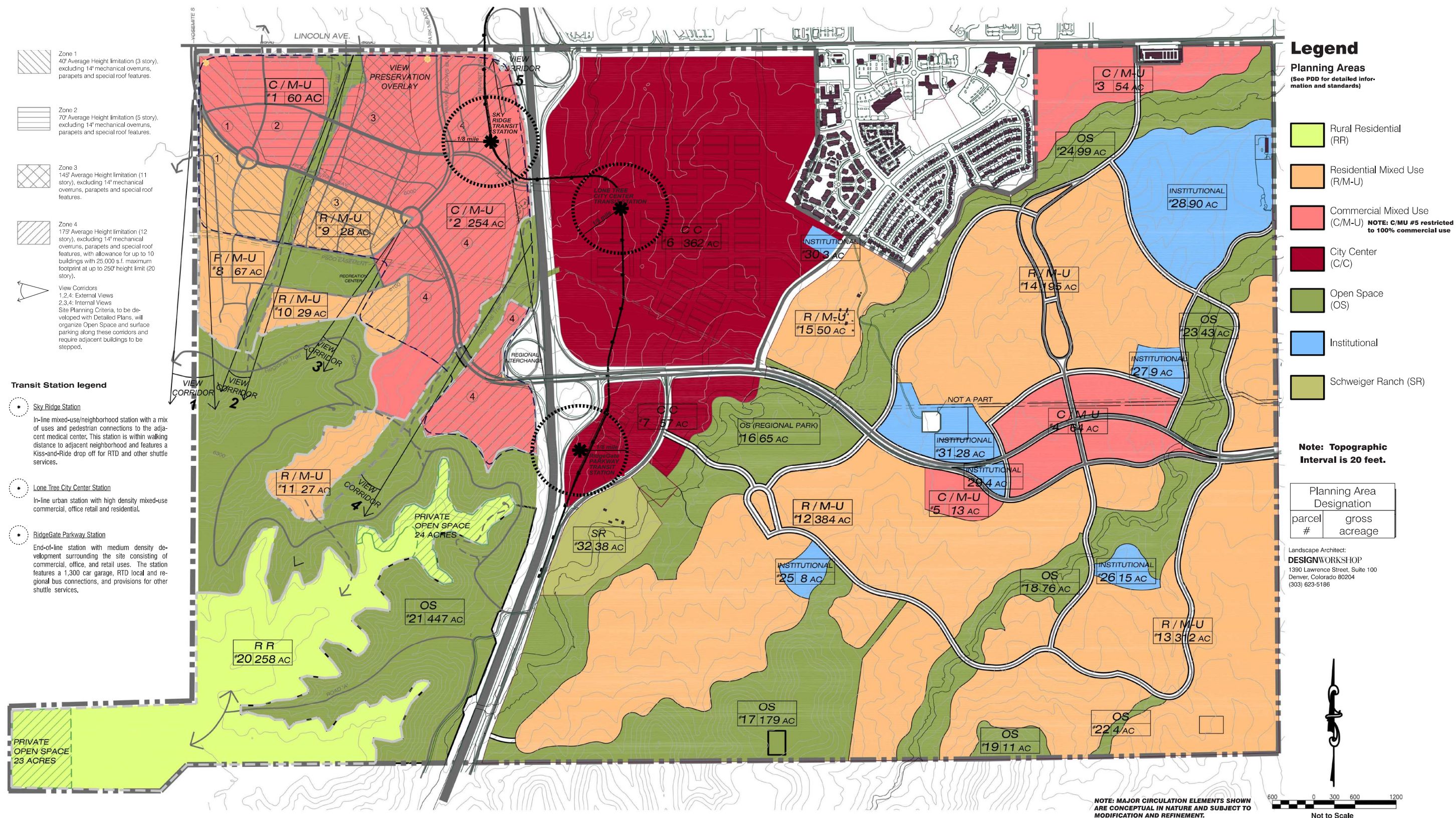


# RIDGEGATE, 6th Amendment

(an amendment to the PDD formerly known as RidgeGate, 5th Amendment, approved by the City of Lone Tree, and recorded at 201818230 on March 28, 2018)  
 Sections 13, 14, 15, 22, 23, 24 and a portion of Section 21, Township 6 South, Range 67 West of the 6th Principal Meridian  
 City of Lone Tree, State of Colorado (3,515 Acres)

Master Developer  
**Coventry Development Corp. – Colorado**  
 10270 Commonwealth Street, Suite B  
 Lone Tree, Colorado 80124

## Planned Development District



- Zone 1**  
40' Average Height limitation (3 story), excluding 14' mechanical overruns, parapets and special roof features.
- Zone 2**  
70' Average Height limitation (5 story), excluding 14' mechanical overruns, parapets and special roof features.
- Zone 3**  
145' Average Height limitation (11 story), excluding 14' mechanical overruns, parapets and special roof features.
- Zone 4**  
175' Average Height limitation (12 story), excluding 14' mechanical overruns, parapets and special roof features, with allowance for up to 10 buildings with 25,000 s.f. maximum footprint at up to 250' height limit (20 story).
- View Corridors**  
1,2,4: External Views  
2,3,4: Internal Views  
Site Planning Criteria, to be developed with Detailed Plans, will organize Open Space and surface parking along these corridors and require adjacent buildings to be stepped.

- Transit Station legend**
- Sky Ridge Station**  
In-line mixed-use/neighborhood station with a mix of uses and pedestrian connections to the adjacent medical center. This station is within walking distance to adjacent neighborhood and features a Kiss-and-Ride drop off for RTD and other shuttle services.
  - Lone Tree City Center Station**  
In-line urban station with high density mixed-use commercial, office retail and residential.
  - RidgeGate Parkway Station**  
End-of-line station with medium density development surrounding the site consisting of commercial, office, and retail uses. The station features a 1,300 car garage, RTD local and regional bus connections, and provisions for other shuttle services.

- Legend**
- Planning Areas**  
 (See PDD for detailed information and standards)
- Rural Residential (RR)
  - Residential Mixed Use (R/M-U)
  - Commercial Mixed Use (C/M-U) **NOTE: C/MU #5 restricted to 100% commercial use**
  - City Center (C/C)
  - Open Space (OS)
  - Institutional
  - Schweiger Ranch (SR)

**Note: Topographic Interval is 20 feet.**

Planning Area Designation	
parcel #	gross acreage

Landscape Architect:  
**DESIGNWORKSHOP**  
 1390 Lawrence Street, Suite 100  
 Denver, Colorado 80204  
 (303) 623-5166

PRIVATE OPEN SPACE  
 23 ACRES

PRIVATE OPEN SPACE  
 24 ACRES

NOTE: MAJOR CIRCULATION ELEMENTS SHOWN ARE CONCEPTUAL IN NATURE AND SUBJECT TO MODIFICATION AND REFINEMENT.

0 300 600 1200  
 Not to Scale



**NOAA Atlas 14, Volume 8, Version 2**  
**Location name: Lone Tree, Colorado, USA\***  
**Latitude: 39.5206°, Longitude: -104.8457°**  
**Elevation: 6041.64 ft\*\***



\* source: ESRI Maps  
 \*\* source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

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

NOAA, National Weather Service, Silver Spring, Maryland

[PF\\_tabular](#) | [PF\\_graphical](#) | [Maps &\\_aerials](#)

**PF tabular**

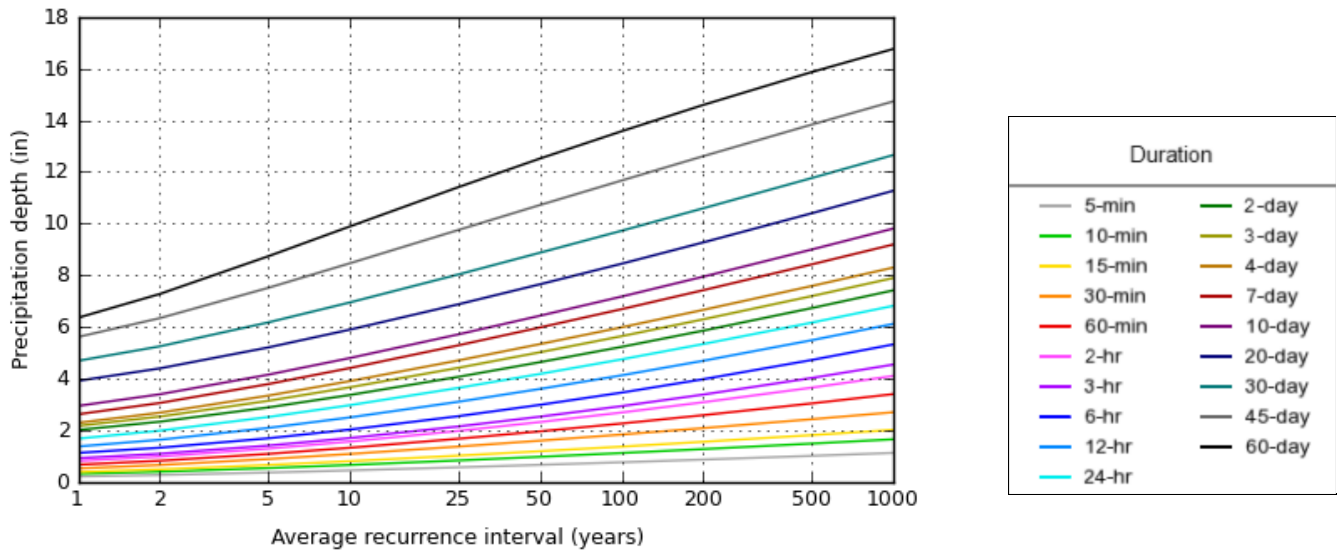
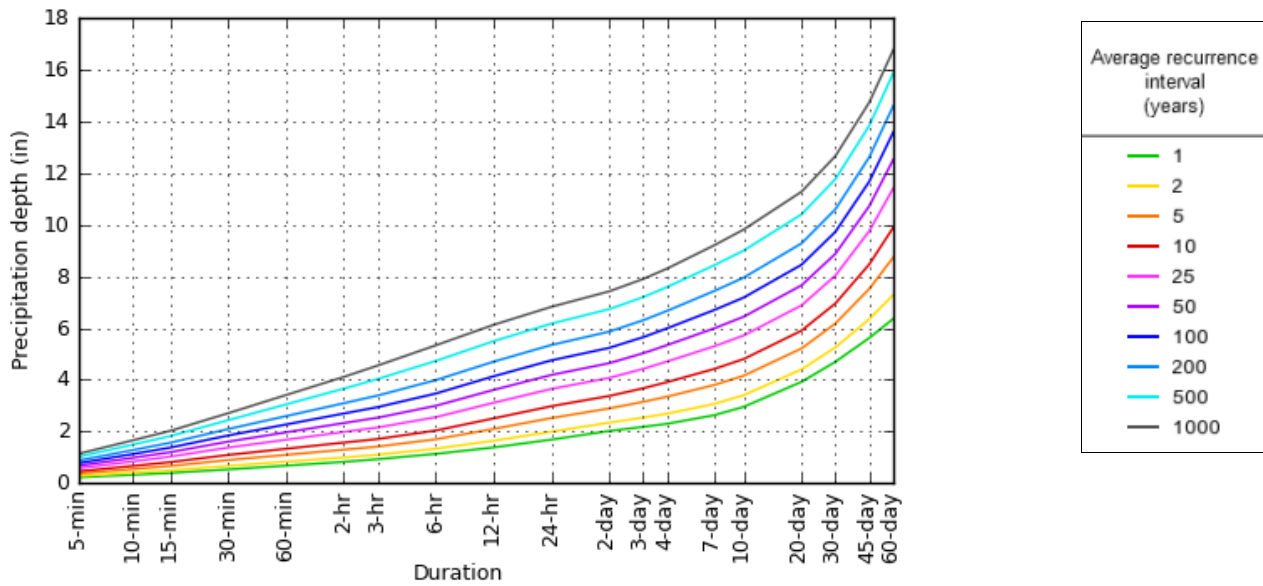
<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min</b>	0.222 (0.179-0.278)	0.278 (0.224-0.348)	0.373 (0.299-0.469)	0.456 (0.363-0.576)	0.575 (0.443-0.760)	0.671 (0.504-0.899)	0.770 (0.558-1.06)	0.875 (0.607-1.24)	1.02 (0.679-1.49)	1.13 (0.733-1.68)
<b>10-min</b>	0.325 (0.262-0.407)	0.407 (0.327-0.510)	0.546 (0.438-0.687)	0.667 (0.532-0.843)	0.841 (0.649-1.11)	0.982 (0.738-1.32)	1.13 (0.818-1.55)	1.28 (0.889-1.82)	1.49 (0.994-2.18)	1.66 (1.07-2.46)
<b>15-min</b>	0.396 (0.319-0.497)	0.496 (0.399-0.622)	0.666 (0.534-0.838)	0.814 (0.648-1.03)	1.03 (0.792-1.36)	1.20 (0.900-1.61)	1.38 (0.997-1.89)	1.56 (1.08-2.22)	1.82 (1.21-2.66)	2.02 (1.31-3.00)
<b>30-min</b>	0.532 (0.428-0.666)	0.666 (0.536-0.836)	0.895 (0.717-1.13)	1.09 (0.870-1.38)	1.38 (1.06-1.82)	1.61 (1.21-2.15)	1.84 (1.34-2.54)	2.09 (1.45-2.97)	2.44 (1.62-3.56)	2.71 (1.75-4.01)
<b>60-min</b>	0.678 (0.546-0.850)	0.830 (0.668-1.04)	1.10 (0.878-1.38)	1.33 (1.06-1.68)	1.68 (1.30-2.23)	1.97 (1.48-2.64)	2.27 (1.65-3.13)	2.59 (1.80-3.69)	3.05 (2.03-4.47)	3.41 (2.21-5.05)
<b>2-hr</b>	0.824 (0.669-1.02)	0.994 (0.805-1.24)	1.30 (1.05-1.62)	1.57 (1.26-1.97)	1.98 (1.55-2.62)	2.33 (1.77-3.11)	2.70 (1.98-3.70)	3.09 (2.17-4.37)	3.66 (2.46-5.31)	4.11 (2.68-6.03)
<b>3-hr</b>	0.928 (0.756-1.15)	1.10 (0.896-1.36)	1.42 (1.15-1.76)	1.71 (1.38-2.13)	2.15 (1.70-2.84)	2.53 (1.94-3.37)	2.94 (2.17-4.02)	3.39 (2.39-4.76)	4.03 (2.73-5.83)	4.55 (2.98-6.63)
<b>6-hr</b>	1.13 (0.929-1.39)	1.33 (1.09-1.64)	1.70 (1.39-2.09)	2.04 (1.65-2.52)	2.55 (2.02-3.33)	2.99 (2.31-3.94)	3.47 (2.58-4.69)	3.98 (2.84-5.54)	4.72 (3.23-6.76)	5.33 (3.53-7.68)
<b>12-hr</b>	1.38 (1.14-1.68)	1.64 (1.35-2.00)	2.10 (1.73-2.56)	2.51 (2.05-3.07)	3.11 (2.47-3.99)	3.61 (2.79-4.69)	4.13 (3.09-5.51)	4.70 (3.36-6.44)	5.49 (3.77-7.74)	6.12 (4.09-8.73)
<b>24-hr</b>	1.69 (1.40-2.03)	1.99 (1.66-2.40)	2.52 (2.09-3.05)	2.98 (2.45-3.62)	3.65 (2.91-4.62)	4.19 (3.26-5.37)	4.75 (3.57-6.25)	5.35 (3.85-7.23)	6.17 (4.27-8.59)	6.82 (4.59-9.61)
<b>2-day</b>	2.02 (1.69-2.41)	2.34 (1.96-2.80)	2.89 (2.41-3.47)	3.37 (2.80-4.06)	4.07 (3.28-5.11)	4.64 (3.64-5.89)	5.23 (3.97-6.82)	5.86 (4.26-7.85)	6.73 (4.70-9.27)	7.42 (5.04-10.3)
<b>3-day</b>	2.18 (1.83-2.59)	2.54 (2.13-3.02)	3.15 (2.64-3.75)	3.67 (3.06-4.40)	4.42 (3.57-5.50)	5.02 (3.96-6.33)	5.65 (4.30-7.30)	6.30 (4.60-8.37)	7.20 (5.05-9.83)	7.90 (5.39-10.9)
<b>4-day</b>	2.30 (1.94-2.72)	2.69 (2.27-3.19)	3.35 (2.81-3.98)	3.91 (3.27-4.67)	4.71 (3.81-5.82)	5.34 (4.22-6.70)	5.99 (4.57-7.70)	6.67 (4.88-8.80)	7.59 (5.34-10.3)	8.30 (5.69-11.4)
<b>7-day</b>	2.63 (2.23-3.09)	3.06 (2.60-3.61)	3.79 (3.21-4.48)	4.41 (3.71-5.23)	5.29 (4.31-6.49)	5.98 (4.76-7.44)	6.69 (5.14-8.52)	7.43 (5.47-9.72)	8.42 (5.97-11.3)	9.19 (6.34-12.5)
<b>10-day</b>	2.95 (2.52-3.46)	3.40 (2.90-3.99)	4.16 (3.53-4.88)	4.80 (4.05-5.67)	5.71 (4.67-6.97)	6.44 (5.14-7.96)	7.18 (5.54-9.10)	7.95 (5.88-10.3)	9.00 (6.41-12.0)	9.81 (6.80-13.3)
<b>20-day</b>	3.92 (3.37-4.55)	4.40 (3.78-5.11)	5.21 (4.45-6.07)	5.90 (5.01-6.90)	6.88 (5.67-8.30)	7.65 (6.16-9.36)	8.45 (6.58-10.6)	9.28 (6.93-11.9)	10.4 (7.47-13.7)	11.3 (7.89-15.1)
<b>30-day</b>	4.70 (4.05-5.42)	5.25 (4.53-6.07)	6.18 (5.30-7.16)	6.95 (5.94-8.09)	8.03 (6.64-9.61)	8.87 (7.17-10.8)	9.72 (7.60-12.1)	10.6 (7.95-13.5)	11.8 (8.49-15.4)	12.7 (8.90-16.8)
<b>45-day</b>	5.62 (4.87-6.45)	6.35 (5.49-7.29)	7.51 (6.48-8.66)	8.47 (7.26-9.80)	9.75 (8.07-11.6)	10.7 (8.68-12.9)	11.7 (9.14-14.4)	12.6 (9.49-15.9)	13.8 (10.0-17.9)	14.7 (10.4-19.5)
<b>60-day</b>	6.36 (5.53-7.28)	7.28 (6.32-8.34)	8.74 (7.56-10.0)	9.89 (8.51-11.4)	11.4 (9.44-13.4)	12.5 (10.2-14.9)	13.6 (10.7-16.6)	14.6 (11.0-18.3)	15.9 (11.5-20.4)	16.8 (11.9-22.0)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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**PF graphical**

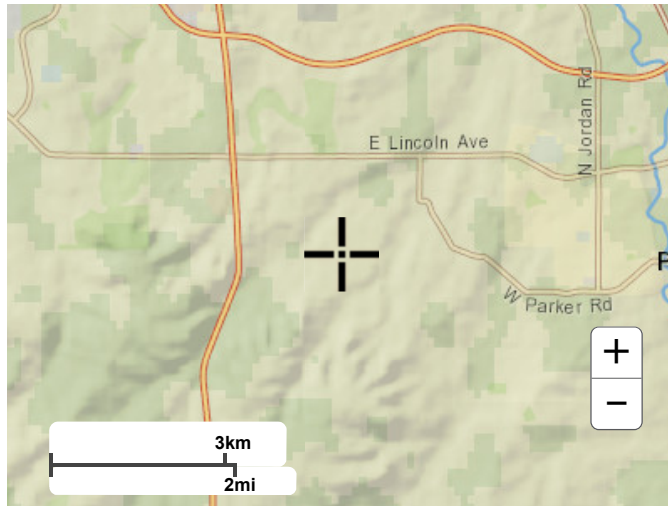
PDS-based depth-duration-frequency (DDF) curves  
 Latitude: 39.5206°, Longitude: -104.8457°



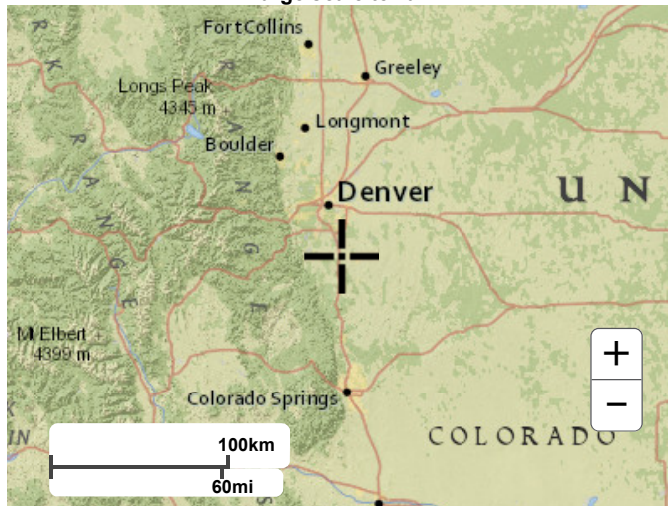
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**Maps & aerials**

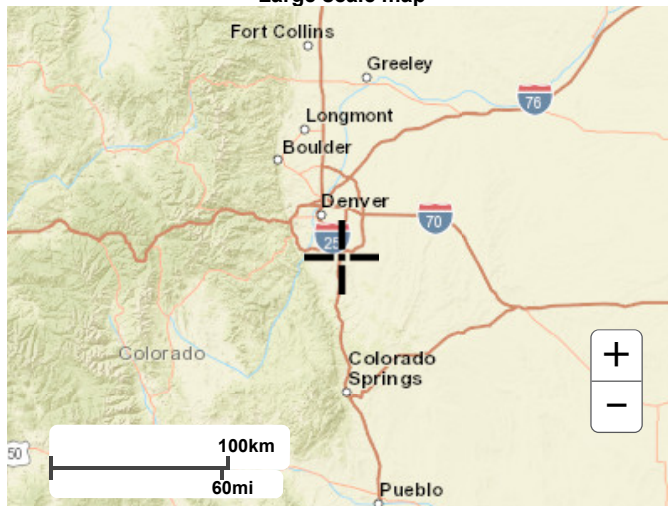
**Small scale terrain**



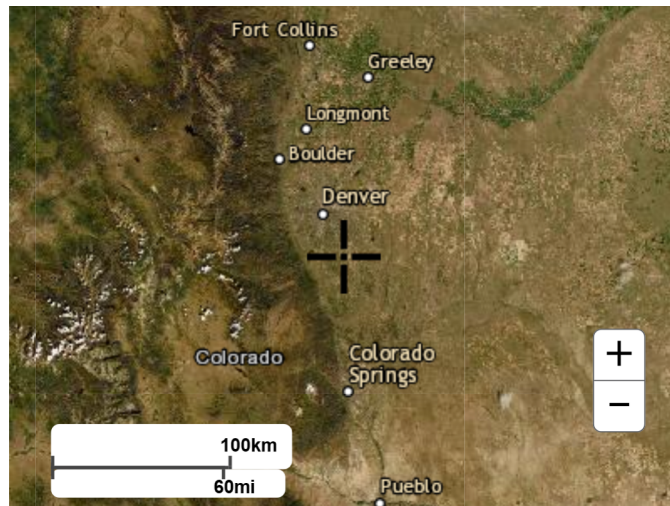
Large scale terrain



Large scale map



Large scale aerial



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[US Department of Commerce](#)  
[National Oceanic and Atmospheric Administration](#)  
[National Weather Service](#)  
[National Water Center](#)  
1325 East West Highway  
Silver Spring, MD 20910  
Questions?: [HDSC.Questions@noaa.gov](mailto:HDSC.Questions@noaa.gov)

[Disclaimer](#)

**PHASE III DRAINAGE REPORT  
FOR  
RIDGEGATE PARKWAY EXPANSION – PHASE I  
LONE TREE, CO**

**October 2018**

Prepared For:

City of Lone Tree  
9220 Kimmer Dr., Suite 100  
Lone Tree, Colorado 80124  
Phone: (303) 708-1818

Prepared By:



5970 Greenwood Plaza Blvd  
Greenwood Village, CO 80111  
Phone: (303) 751-0741

Merrick Job No. 65119564



**Merrick & Company**  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: Ridgeway Parkway Expansion  
 Job Number: 65119564  
 Date: 9/26/2018  
 By: G. LEE

### Ridgeway Parkway Expansion

#### Composite Runoff Coefficient Calculations

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

Runoff Coefficient (UDFCD Vol 1, Chp 6, Sec. 2.5.1)

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

Basin Design Data													Runoff Coeff's			
Basin Name	Design Point	$A_{paved}$ streets (sf)	$A_{drives/walks}$ (sf)	$A_{MU/COM/FIRE}$ (sf)	$A_{MF/RES}$ (sf)	$A_{MD RES}$ (sf)	$A_{LD RES}$ (sf)	$A_{scape (C/D soil)}$ (sf)	$A_{scape (C/D soil)}$ (sf)	$A_{Total}$ (sf)	$A_{Total}$ (ac)	Imp (%)	C2	C5	C10	C100
C1	-	22,367	9,200						70,007	101,574	2.33	31.6%	0.23	0.29	0.37	0.61
C2	-	25,625	19,414						112,011	157,050	3.61	28.9%	0.21	0.27	0.35	0.60
C2-F	-	25,625	19,414						26,025	71,064	1.63	61.4%	0.48	0.54	0.59	0.74
C3	-	13,973	12,356						64,960	91,289	2.10	28.9%	0.21	0.27	0.35	0.60
C3-F	-	13,973	12,356						10,961	37,290	0.86	67.9%	0.54	0.59	0.63	0.76
C4	-	4,250	3,523						3,202	10,975	0.25	68.2%	0.54	0.59	0.64	0.76
C5-O	-								1,217,202	1,217,202	27.94	2.0%	0.01	0.05	0.15	0.49
C6-F	-					260,012	790,290			1,050,302	24.11	47.5%	0.36	0.42	0.48	0.68
C7-F	-			554,627					66,347	620,974	14.26	76.1%	0.61	0.66	0.70	0.80
Pond B		66,215	44,493	0	0	0	0	0	1,467,382	1,578,090	36.23	8.6%	0.05	0.11	0.20	0.52

V2

Z2



**Merrick & Company**  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: Ridgeway Parkway Expansion  
 Job Number: 65119564  
 Date: 9/26/2018  
 By: G. LEE

**Ridgeway Parkway Expansion**  
**Time of Concentration Calculations**

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

$$t_t = (0.395(1.1 - C_s)(L_t^{0.5})) / (S_s^{0.33})$$

$$t_t = L_t / (60V_t)$$

$$\text{Urban } t_c = (26 - 17i) + L_t / (60(14 + 9i)^{0.5})$$

Sub-Basin Data					Initial Overland Time (t <sub>i</sub> )			Travel Time (t <sub>t</sub> ) t <sub>t</sub> =Length/(Velocity x 60)						t <sub>c</sub> Comp	t <sub>c</sub> Urbanized Check ON			t <sub>c</sub> Final
Basin Name	Design Point	A <sub>Total</sub> (ac)	i (%)	C <sub>s</sub>	Upper most Length (ft)	Slope (%)	t <sub>i</sub> (min)	Length (ft)	Slope (%)	Type of Land Surface	C <sub>v</sub>	Velocity (fps)	t <sub>t</sub> (min)	Time of Conc t <sub>i</sub> + t <sub>t</sub> = t <sub>c</sub>	L <sub>t</sub> (ft)	S <sub>t</sub> (%)	Urban t <sub>c</sub>	Min t <sub>c</sub>
C1	-	2.33	31.6%	29.4%	33	3.4%	5.6	699	2.9%	Paved areas & shallow paved swales	20	3.4	3.4	9.1	732.0	2.9%	26.0	9.1
C2	-	3.61	28.9%	0.27	300	6.1%	14.4	755	3.2%	Paved areas & shallow paved swales	20	3.6	3.5	17.9	1055.0	3.9%	27.9	17.9
C2-F	-	1.63	61.4%	0.54	52	2.0%	5.9	755	3.2%	Paved areas & shallow paved swales	20	3.6	3.5	9.4	807.0	3.1%	19.9	9.4
C3	-	2.10	28.9%	0.27	300	2.0%	20.9	434	1.5%	Paved areas & shallow paved swales	20	2.4	3.0	23.8	734.0	1.7%	28.3	23.8
C3-F	-	0.86	67.9%	0.59	47	2.0%	5.1	284	1.5%	Paved areas & shallow paved swales	20	2.4	1.9	7.0	331.0	1.6%	16.8	7.0
C4	-	0.25	68.2%	0.59	74	2.0%	6.3	126	0.8%	Paved areas & shallow paved swales	20	1.8	1.2	7.5	200.0	1.1%	16.1	7.5
C5-O	-	27.94	2.0%	0.05	500	5.0%	25.1	1800	2.7%	Short Pasture and lawns	7	1.2	26.1	51.2	2300.0	3.1%	49.1	49.1
C6-F	-	24.11	47.5%	0.42	100	2.0%	9.8	2247	4.0%	Paved areas & shallow paved swales	20	4.0	9.4	19.2	2347.0	3.9%	30.6	19.2
C7-F	-	14.26	76.1%	0.66	100	2.0%	6.4	1455	4.0%	Paved areas & shallow paved swales	20	4.0	6.1	12.5	1555.0	3.8%	19.8	12.5

V2



**Ridgeway Parkway Expansion**

**Developed Storm Runoff Calculations**

Design Storm :

**5 Year**

Point Hour Rainfall (P<sub>1</sub>): **1.43**

I = (28.5 P<sub>1</sub>) / ((10 + TC)<sup>0.786</sup>)

Basin Name	Design Point	Area (ac)	Direct Runoff					Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Notes			
			Runoff Coeff	tc (min)	C'A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC'A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover (Q <sub>co</sub> )	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)		tt (min)	Total Time (min)	
PHASE II																									
C5-O	-	27.94	0.05	49.1	1.44	1.65	2.4						30" Reinforced Concrete End Section	2.4	0.0	30 in	RCP	2.0%	2.4	58.0	67	1.2	0.92	50.02	
C4	-	0.25	0.59	7.5	0.15	4.30	0.6						Inlet Type R L10	0.6	0.0	18 in	RCP	8.0%	0.6	29.7	139.1	0.5	4.27	11.77	
	C5			Combined Flows (C5-O-C4)				50.02	1.59	1.63	2.6			Manhole Slab Base			36 in	RCP	1.0%	2.6	66.7	454	1.1	6.89	56.92
C3	-	2.10	0.27	23.8	0.57	2.56	1.5						Inlet Type R L10	1.5	0.0	18 in	RCP	8.0%	1.5	29.7	18.5	1.2	0.25	24.05	
	C3			Combined Flows (C5-O, C4, C3)				56.92	2.16	1.50	3.2			Manhole Slab Base			42 in	RCP	3.2%	3.2	180.0	781	1.2	11.09	68.00
C2	-	3.61	0.27	17.9	0.98	2.98	2.9						Inlet Type R L10	2.9	0.0	36 in	RCP	2.2%	2.9	98.3	67.3	1.2	0.91	18.81	
C1	-	2.33	0.29	9.1	0.68	4.01	2.7						Inlet Type R L10	2.7	0.0	18 in	RCP	8.0%	2.7	29.7	29.5	2.3	0.21	9.31	
	C1			Combined Flows (C5-O-C1)				68.00	3.82	1.33	5.1			Manhole Box Base			42 in	RCP	3.3%	5.1	181.7	549	1.8	4.96	72.97
FUTURE																									
C6-F	-	24.11	0.42	19.2	10.23	2.87	29.4						Plug Culvert (Special) (Fut. Connect)	29.4	0.0	36 in	RCP	1.1%	29.4	71.2	148.85	12.5	0.20	19.40	
C4	-	0.25	0.59	7.5	0.15	4.30	0.6						Inlet Type R L10	0.6	0.0	18 in	RCP	8.0%	0.6	29.7	18.5	0.5	0.57	8.07	
	C4			Combined Flows (C6-F-C4)				19.40	10.38	2.86	29.7			Manhole Slab Base			36 in	RCP	1.3%	29.7	74.9	581.5	12.6	0.77	20.17
C3-F	-	0.86	0.59	7.0	0.51	4.40	2.2						Inlet Type R L10	1.5	0.0	18 in	RCP	8.0%	1.5	29.7	18.5	1.2	0.25	7.25	
	C3			Combined Flows (C6-F, C4, C3-F)				20.17	10.89	2.80	30.5			Manhole Slab Base			36 in	RCP	2.8%	30.5	111.6	781	12.9	1.01	21.17
C7-F	-	14.26	0.66	12.50	9.40	3.53	33.1						Plug Culvert (Special) (Fut. Connect)	33.1	0.0	36 in	RCP	2.0%	33.1	94.3	35	14.1	0.04	12.54	
C2-F	-	1.63	0.54	9.40	0.88	3.96	3.5						Inlet Type R L10	2.9	0.0										
	C2			Combined Flows (C7-F,C2-F)				12.54	10.28	3.52	36.2			Inlet Type R L10			36 in	RCP	2.2%	36.2	98.3	79.3	15.4	0.09	12.63
C1	-	2.33	0.29	9.1	0.68	4.01	2.7						Inlet Type R L10	2.7	0.0	18 in	RCP	8.0%	2.7	29.7	30	2.3	0.21	9.31	
	C1			Combined Flows (C7-F-C1)				21.17	21.85	2.73	59.6			Manhole Box Base			42 in	RCP	3.3%	59.6	181.7	549	21.7	0.42	21.60

**Ridgeway Parkway Expansion**

**Developed Storm Runoff Calculations**

Design Storm : **100 Year**

Point Hour Rainfall (P<sub>1</sub>) : **2.60**

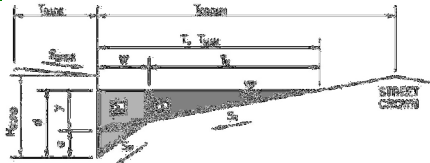
$I = (28.5 P_1) / ((10 + TC)^{0.786})$

Basin Name	Design Point	Area (ac)	Direct Runoff				Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Notes					
			Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover (Qco)	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)		Velocity (fps)	tt (min)	Total Time (min)		
PHASE II																										
C5-O	-	27.94	0.49	49.1	13.75	3.00	41.3						30" Reinforced Concrete End Section	41.3	0.0	30 in	RCP	2.0%	41.3	58.0	67	21.0	0.05	49.15		
C4	-	0.25	0.76	7.5	0.19	7.81	1.5						Inlet Type R L10	1.5	0.0	18 in	RCP	8.0%	1.5	29.7	139.1	1.3	1.82	9.32	Inlet V1	
	C5				Combined Flows (C5-O-C4)			49.15	13.95	3.00	41.8			Manhole Slab Base			36 in	RCP	1.0%	41.8	66.7	454	17.8	0.43	49.58	
C3	-	2.10	0.60	23.8	1.26	4.66	5.9						Inlet Type R L10	4.5	1.3	18 in	RCP	8.0%	4.5	29.7	18.5	3.9	0.08	23.88	Inlet V2	
	C3				Combined Flows (C5-O, C4, C3)			49.58	15.21	2.98	45.4			Manhole Slab Base			42 in	RCP	3.2%	45.4	180.0	781	16.5	0.79	50.37	
C2	-	3.61	0.60	17.9	2.17	5.41	11.8						Inlet Type R L10	8.3	4.8	36 in	RCP	2.2%	8.3	98.3	67.3	3.5	0.32	18.22		
C1	-	2.33	0.61	9.1	1.43	7.29	10.4						Inlet Type R L10	7.4	3.0	18 in	RCP	8.0%	7.4	29.7	29.5	6.3	0.08	9.18		
	C1				Combined Flows (C5-O-C1)			50.37	18.81	2.95	55.5			Manhole Box Base			42 in	RCP	3.3%	55.5	181.7	549	20.2	0.45	50.82	
FUTURE																										
C6-F	-	24.11	0.68	19.2	16.36	5.22	85.5						Plug Culvert (Special) (Fut. Connect)	85.5	0.0	36 in	RCP	1.1%	85.5	71.2	148.85	36.3	0.07	19.27		
C4	-	0.25	0.76	7.5	0.19	7.81	1.5						Inlet Type R L10	1.5	0.0	18 in	RCP	8.0%	1.5	29.7	18.5	1.3	0.24	7.74		
	C4				Combined Flows (C6-F-C4)			19.27	16.56	5.21	86.3			Manhole Slab Base			36 in	RCP	1.3%	86.3	74.9	581.5	36.6	0.26	19.53	
C3-F	-	0.86	0.76	7.0	0.65	7.99	5.2						Inlet Type R L10	4.5	1.3	18 in	RCP	8.0%	4.5	29.7	18.5	3.9	0.08	7.08		
	C3				Combined Flows (C6-F, C4, C3-F)			19.53	17.21	5.18	89.1			Manhole Slab Base			36 in	RCP	2.8%	89.1	111.6	781	37.8	0.34	19.88	
C7-F	-	14.26	0.80	12.50	11.35	6.41	72.8						Plug Culvert (Special) (Fut. Connect)	72.8	0.0	36 in	RCP	2.0%	72.8	94.3	35	30.9	0.02	12.52		
C2-F	-	1.63	0.74	9.40	1.20	7.20	8.6						Inlet Type R L10	8.3	4.8											
	C2				Combined Flows (C7-F,C2-F)			12.52	12.55	6.41	80.4			Inlet Type R L10			36 in	RCP	2.2%	80.4	98.3	79.3	34.1	0.04	12.56	
C1	-	2.33	0.61	9.1	1.43	7.29	10.4						Inlet Type R L10	7.4	3.0	18 in	RCP	8.0%	7.4	29.7	30	6.3	0.08	9.18		
	C1				Combined Flows (C7-F-C1)			19.88	31.19	5.13	160.0			Manhole Box Base			42 in	RCP	3.3%	160.0	181.7	549	58.2	0.16	20.03	

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

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

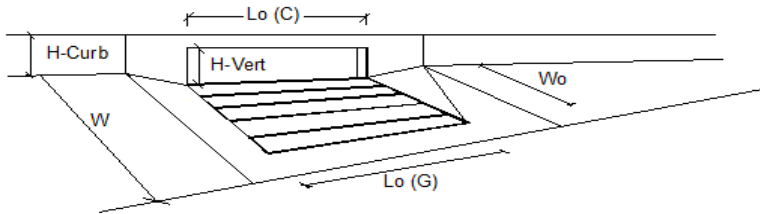
Project: \_\_\_\_\_  
 Inlet ID: \_\_\_\_\_ **BASIN C3**



Gutter Geometry (Enter data in the blue cells)							
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 16.8$ 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	$T_{CROWN} = 37.0$ ft						
Gutter Width	$W = 2.00$ ft						
Street Transverse Slope	$S_x = 0.005$ 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	$S_o = 0.010$ ft/ft						
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.016$						
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <thead> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>ft</th> </tr> </thead> <tbody> <tr> <td>24.0</td> <td>37.0</td> <td></td> </tr> </tbody> </table>	Minor Storm	Major Storm	ft	24.0	37.0	
Minor Storm	Major Storm	ft					
24.0	37.0						
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1"> <thead> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>inches</th> </tr> </thead> <tbody> <tr> <td>6.0</td> <td>10.0</td> <td></td> </tr> </tbody> </table>	Minor Storm	Major Storm	inches	6.0	10.0	
Minor Storm	Major Storm	inches					
6.0	10.0						
Allow Flow Depth at Street Crown (leave blank for no)	<input type="checkbox"/> <input type="checkbox"/> check = yes						
<b>MINOR STORM Allowable Capacity is based on Spread Criterion</b>							
<b>MAJOR STORM Allowable Capacity is based on Spread Criterion</b>							
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'							
	<table border="1"> <thead> <tr> <th>Minor Storm</th> <th>Major Storm</th> <th>cfs</th> </tr> </thead> <tbody> <tr> <td>3.2</td> <td>8.7</td> <td></td> </tr> </tbody> </table>	Minor Storm	Major Storm	cfs	3.2	8.7	
Minor Storm	Major Storm	cfs					
3.2	8.7						

## INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



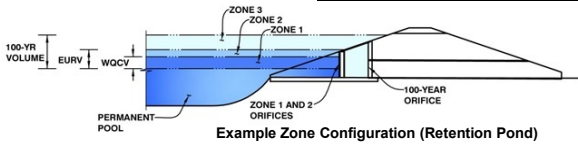
Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity*</b>			
Total Inlet Interception Capacity	1.5	4.5	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	1.3	cfs
Capture Percentage = $Q_i/Q_c$ =	100	77	%



## Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Ridgegate Parkway Expansion  
Basin ID: WQ Pond B



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.94	0.358	Orifice Plate
Zone 2			
Zone 3			
		0.358	Total

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

Underdrain Orifice Invert Depth =  ft (distance below the filtration media surface)  
Underdrain Orifice Diameter =  inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =  ft<sup>2</sup>  
Underdrain Orifice Centroid =  feet

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

Invert of Lowest Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Orifice Plate =  ft (relative to basin bottom at Stage = 0 ft)  
Orifice Plate: Orifice Vertical Spacing =  inches  
Orifice Plate: Orifice Area per Row =  sq. inches (diameter = 1-7/16 inches)

Calculated Parameters for Plate

WQ Orifice Area per Row =  ft<sup>2</sup>  
Elliptical Half-Width =  feet  
Elliptical Slot Centroid =  feet  
Elliptical Slot Area =  ft<sup>2</sup>

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.98	1.96					
Orifice Area (sq. inches)	1.68	1.68	1.68					

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

User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Vertical Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Vertical Orifice Diameter =  inches

Calculated Parameters for Vertical Orifice

Vertical Orifice Area =  ft<sup>2</sup>  
Vertical Orifice Centroid =  feet

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

Overflow Weir Front Edge Height, Ho =  ft (relative to basin bottom at Stage = 0 ft)  
Overflow Weir Front Edge Length =  feet  
Overflow Weir Slope =  H:V (enter zero for flat grate)  
Horiz. Length of Weir Sides =  feet  
Overflow Grate Open Area % =  % grate open area/total area  
Debris Clogging % =  %

Calculated Parameters for Overflow Weir

Height of Grate Upper Edge, H<sub>1</sub> =  feet  
Over Flow Weir Slope Length =  feet  
Grate Open Area / 100-yr Orifice Area =  should be ≥ 4  
Overflow Grate Open Area w/o Debris =  ft<sup>2</sup>  
Overflow Grate Open Area w/ Debris =  ft<sup>2</sup>

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

Depth to Invert of Outlet Pipe =  ft (distance below basin bottom at Stage = 0 ft)  
Circular Orifice Diameter =  inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

Outlet Orifice Area =  ft<sup>2</sup>  
Outlet Orifice Centroid =  feet  
Half-Central Angle of Restrictor Plate on Pipe =  radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

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

Calculated Parameters for Spillway

Spillway Design Flow Depth =  feet  
Stage at Top of Freeboard =  feet  
Basin Area at Top of Freeboard =  acres

### Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period									
One-Hour Rainfall Depth (in)	0.53	1.07	1.06	1.43	1.66	1.68	2.26	2.60	3.07
Calculated Runoff Volume (acre-ft)	0.358	0.601	0.474	1.010	1.738	2.916	4.607	6.205	8.510
OPTIONAL Override Runoff Volume (acre-ft)									
Inflow Hydrograph Volume (acre-ft)	0.358	0.600	0.473	1.009	1.737	2.914	4.604	6.198	8.502
Predevelopment Unit Peak Flow, q (cfs/acre)	0.00	0.00	0.01	0.08	0.21	0.46	0.72	0.98	1.35
Predevelopment Peak Q (cfs)	0.0	0.0	0.4	3.4	9.5	20.5	32.4	44.0	60.7
Peak Inflow Q (cfs)	4.1	6.8	5.4	11.3	19.3	32.2	50.5	67.5	91.8
Peak Outflow Q (cfs)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	0.1	0.0	0.0	0.0	0.0	0.0
Structure Controlling Flow	Plate	Plate	Plate	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Grate 1 (fps)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Grate 2 (fps)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours)	38	46	42	60	85	129	>120	>120	>120
Time to Drain 99% of Inflow Volume (hours)	40	50	45	66	94	140	>120	>120	>120
Maximum Ponding Depth (ft)	2.72	3.82	3.26	4.00	4.00	4.00	4.00	4.00	4.00
Area at Maximum Ponding Depth (acres)	0.19	0.22	0.21	0.23	0.23	0.23	0.23	0.23	0.23
Maximum Volume Stored (acre-ft)	0.316	0.541	0.423	0.584	0.584	0.584	0.584	0.584	0.584



**Merrick & Company**  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: RG Pkwy Expansion  
 Job Number: 65119564  
 Date: 9/26/2018  
 By: Chris Davids

**FLOW CALCULATIONS - GRATE INLET SUMP CONDITION**

(Reference: Urban Drainage and Flood Control District Drainage Criteria Manual, 2016, V.1, Chapter 7)  
 (Note: Spreadsheet assumes orifice condition for fully developed flow.)

**INLET TYPE: Type D Inlet - Standard**

**BASIN: BC**

**Orifice Equation:**

$$Q = Cd * Ao * (2gH)^{0.5}$$

K = Clogging Coefficient value for multiple inlets

Adjust Ao (open area) due to clogging as follows:

Effective Area Opening Ae = (1-C) Ao, where:

$$C = K * Co / N$$

N = Number of Inlets

Co = Single Inlet Clogging Factor:

$$Co(grade) = \frac{0.5}{0.5} \quad (50\% \text{ clogging})$$

N	Grate
1	1
2	1.5
3	1.75
4	1.88
5	1.94
6	1.97
7	1.98
8	1.99

Number of inlets:

<b>N = 1</b>
--------------

Inlet Dimensions and Effective Open Area:

**Grate Opening:**

$$Ao(g) = 11.36 \quad ft^2$$

$$\text{Total } Ao(g) = 11.36 \quad ft^2$$

$$K = 1.00$$

$$C = K * Co / N = 0.50$$

$$Ae(g) = (1-C)Ao = 5.68 \quad ft^2$$

Allowable depth:

$$H = 6.0 \quad in = 0.5 \quad ft$$

Constants:

$$g = 32.20 \quad ft/s^2$$

$$Cd = 0.67$$

Flow Calculations:

**Grate Flow:**

$$Q = Cd * Ae(g) * (2gH)^{0.5}$$

$$Qg = 21.59 \quad CFS$$

**Total Intercepted Flow with an allowable depth of**

<u>1</u>	inlet(s) and	
<u>6</u>	inches is	<u>21.6</u> cfs

**Required Flow (Q Major ) =**

18.60
-------

**cfs**

**Required Flow (Q Minor ) =** **18.60** **cfs**

**Bypass = 0.0 cfs**

**Bypass = 0.0 cfs**

**PHASE III DRAINAGE REPORT  
FOR  
RIDGEGATE PARKWAY EXPANSION – PHASE II  
LONE TREE, CO**

**October 2018**

Prepared For:

City of Lone Tree  
9220 Kimmer Dr., Suite 100  
Lone Tree, Colorado 80124  
Phone: (720) 509-1241

Prepared By:



5970 Greenwood Plaza Blvd  
Greenwood Village, CO 80111  
Phone: (303) 751-0741

Merrick Job No. 65119564

City of Lone Tree Review & Approval is with respect To General Conformance with City Standards. Responsibility for the Design remains with the Professional(s) submitting and stamping the Document(s).



City of Lone Tree

Public Works Department

**APPROVED**

BY:

A handwritten signature in black ink, appearing to read "H. J. [unclear]", is written over the signature line.

DATE: 04/22/2019





**Merrick & Company**  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: Ridgeway Parkway Expansion  
 Job Number: 65119564  
 Date: 10/5/2018  
 By: A. Jenne

### Ridgeway Parkway Expansion

#### Composite Runoff Coefficient Calculations

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

Runoff Coefficient (UDFCD Vol 1, Chp 6, Sec. 2.5.1)

NRCS Soil Group	Storm Return Period					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
A	C=0.84i <sup>1.302</sup>	C=0.86i <sup>1.276</sup>	C=0.87i <sup>1.232</sup>	C=0.84i <sup>1.124</sup>	C=0.85i+0.025	C=0.78i+0.110
B	C=0.84i <sup>1.169</sup>	C=0.86i <sup>1.088</sup>	C=0.81i+0.057	C=0.63i+0.249	C=0.56i+0.328	C=0.47i+0.426
C/D	C=0.83i <sup>1.122</sup>	C=0.82i+0.035	C=0.74i+0.132	C=0.56i+0.319	C=0.49i+0.393	C=0.41i+0.484

#### Basin Design Data

Basin Name	Design Point	I (%) =	100%	90%	85%	75%	55%	45%	2%	2%	Runoff Coeff's		Runoff Coeff's				
											A <sub>paved streets</sub> (sf)	A <sub>drives/walks</sub> (sf)	A <sub>MU/COM/FIRE</sub> (sf)	A <sub>MF/RES</sub> (sf)	A <sub>MD RES</sub> (sf)	A <sub>LD RES</sub> (sf)	A <sub>iscape (C/D soil)</sub> (sf)
D1-O	-									164,822	164,822	3.78	2.0%	0.01	0.05	0.15	0.49
D2	-	28,182	15,185							16,341	59,708	1.37	70.6%	0.56	0.61	0.65	0.77
D3-F	-			209,211							209,211	4.80	85.0%	0.69	0.73	0.76	0.83
D4-F	-	26,651	9,506							14,651	50,808	1.17	69.9%	0.56	0.61	0.65	0.77
D34	-								260,019		260,019	5.97	2.0%	0.01	0.05	0.15	0.49
D5	-	13,370	7,824							8,091	29,285	0.67	70.3%	0.56	0.61	0.65	0.77
D6	-	16,013	9,830							9,963	35,806	0.82	70.0%	0.56	0.61	0.65	0.77
D7	-								520,145		520,145	11.94	2.0%	0.01	0.05	0.15	0.49
D7-F	-			722,994							722,994	16.60	85.0%	0.69	0.73	0.76	0.83
D8-F	-	47,320	21,359							13,491	82,170	1.89	81.3%	0.66	0.70	0.73	0.82
D78	-									303,764	303,764	6.97	2.0%	0.01	0.05	0.15	0.49
D9	-	17,489	10,208							10,616	38,313	0.88	70.2%	0.56	0.61	0.65	0.77
D10	-									325,606	325,606	7.47	2.0%	0.01	0.05	0.15	0.49
D10-F	-			347,081							347,081	7.97	85.0%	0.69	0.73	0.76	0.83
D11	-									342,431	342,431	7.86	2.0%	0.01	0.05	0.15	0.49
D11-F	-			320,956							320,956	7.37	85.0%	0.69	0.73	0.76	0.83
D12	-	11,260	6,145							7,440	24,845	0.57	68.2%	0.54	0.59	0.64	0.76
D13	-	31,807	14,019							15,479	61,305	1.41	73.0%	0.58	0.63	0.67	0.78
D14-O	-									118,859	118,859	2.73	2.0%	0.01	0.05	0.15	0.49
D15	-									114,509	114,509	2.63	2.0%	0.01	0.05	0.15	0.49
WQ Pond D		192,092	94,076	1,600,242	0	0	0	0	0	210,581	2,096,991	48.14	78.3%	0.63	0.68	0.71	0.80

Z1



**Merrick & Company**  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: Ridgegate Parkway Expansion  
 Job Number: 65119564  
 Date: 10/5/2018  
 By: A. Jenne

**Ridgegate Parkway Expansion**  
**Time of Concentration Calculations**

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

$$t_c = (0.395(1.1 - C_s)(L_c^{0.5}) / (S_o^{0.33}))$$

$$t_c = L_c / (60V_c)$$

$$\text{Urban } t_c = (26 - 17i) + L_c / (60(14 + 9i)(S_o^{0.5}))$$

Sub-Basin Data					Initial Overland Time (t <sub>i</sub> )			Travel Time (t <sub>t</sub> ) t <sub>t</sub> = Length / (Velocity x 60)						t <sub>c</sub> Comp	t <sub>c</sub> Urbanized Check ON			t <sub>c</sub> Final
Basin Name	Design Point	A <sub>Total</sub> (ac)	i (%)	C <sub>s</sub>	Upper most Length (ft)	Slope (%)	t <sub>i</sub> (min)	Length (ft)	Slope (%)	Type of Land Surface	C <sub>v</sub>	Velocity (fps)	t <sub>t</sub> (min)	Time of Conc t <sub>i</sub> + t <sub>t</sub> = t <sub>c</sub>	L <sub>t</sub> (ft)	S <sub>T</sub> (%)	Urban t <sub>c</sub>	Min t <sub>c</sub>
D1-O	-	3.78	2.0%	0.05	45	16.0%	5.1	721	1.0%	Short Pasture and lawns	7	0.7	17.2	22.3	766.0	1.2%	38.0	22.3
D2	-	1.37	70.6%	0.61	54	2.0%	5.2	779	0.9%	Paved areas & shallow paved swales	20	1.9	6.7	11.9	833.0	1.0%	21.4	11.9
D3-F	-	4.80	85.0%	0.73	100	2.0%	5.4	394	3.0%	Paved areas & shallow paved swales	20	3.5	1.9	7.3	494.0	2.8%	13.9	7.3
D4-F	-	1.17	69.9%	0.61	81	2.0%	6.4	567	2.5%	Paved areas & shallow paved swales	20	3.2	3.0	9.4	648.0	2.4%	17.8	9.4
D34	-	5.97	2.0%	0.05	81	2.0%	13.7	567	2.5%	Short Pasture and lawns	7	1.1	8.5	22.3	648.0	2.4%	33.1	22.3
D5	-	0.67	70.3%	0.61	61	2.0%	5.6	389	1.0%	Paved areas & shallow paved swales	20	2.0	3.2	8.8	450.0	1.1%	17.8	8.8
D6	-	0.82	70.0%	0.61	58	2.0%	5.5	300	0.6%	Paved areas & shallow paved swales	20	1.5	3.2	8.7	358.0	0.7%	17.8	8.7
D7	-	11.94	2.0%	0.05	459	2.4%	30.8	599	1.4%	Short Pasture and lawns	7	0.8	12.0	42.7	1058.0	1.8%	39.9	39.9
D7-F	-	16.60	85.0%	0.73	100	2.0%	5.4	1213	1.8%	Paved areas & shallow paved swales	20	2.6	7.6	13.0	1313.0	1.8%	19.4	13.0
D8-F	-	1.89	81.3%	0.70	96	2.0%	5.7	590	2.0%	Paved areas & shallow paved swales	20	2.8	3.5	9.2	686.0	2.0%	16.2	9.2
D78	-	6.97	2.0%	0.05	96	2.0%	15.0	590	2.0%	Short Pasture and lawns	7	1.0	10.0	25.0	686.0	2.0%	34.5	25.0
D9	-	0.88	70.2%	0.61	66	2.0%	5.8	536	2.0%	Paved areas & shallow paved swales	20	2.8	3.2	8.9	602.0	2.0%	17.8	8.9
D10	-	7.47	2.0%	0.05	500	3.9%	27.4	335	1.2%	Short Pasture and lawns	7	0.8	7.3	34.7	835.0	2.5%	35.2	34.7
D10-F	-	7.97	85.0%	0.73	100	2.0%	5.4	688	2.7%	Paved areas & shallow paved swales	20	3.3	3.5	8.8	788.0	2.6%	15.5	8.8
D11	-	7.86	2.0%	0.05	500	4.0%	27.1	688	4.3%	Short Pasture and lawns	7	1.4	7.9	35.0	1188.0	4.2%	36.1	35.0
D11-F	-	7.37	85.0%	0.73	100	2.0%	5.4	731	4.0%	Paved areas & shallow paved swales	20	4.0	3.0	8.4	831.0	3.7%	15.0	8.4
D12	-	0.57	68.2%	0.59	110	2.0%	7.7	341	5.0%	Paved areas & shallow paved swales	20	4.5	1.3	9.0	493.0	3.8%	16.7	9.0
D13	-	1.41	73.0%	0.63	152	2.0%	8.4	492	2.5%	Paved areas & shallow paved swales	20	3.2	2.6	11.0	502.0	2.5%	16.4	11.0
D14-O	-	2.73	2.0%	0.05	10	2.0%	4.8	254	8.9%	Short Pasture and lawns	7	2.1	2.0	6.9	601.0	4.0%	31.1	6.9
D15	-	2.63	2.0%	0.05	347	11.5%	15.9	1	11.5%	Short Pasture and lawns	7	2.4	0.0	15.9	1.0	11.5%	25.7	15.9

Z1

**Ridgeway Parkway Expansion**

**Developed Storm Runoff Calculations**

Design Storm : **5 Year**

Point Hour Rainfall (P<sub>1</sub>) : **1.43**

I = (28.5 P<sub>1</sub>) / ((10 + TC)<sup>0.786</sup>)

Basin Name	Design Point	Direct Runoff						Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Notes				
		Area (ac)	Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover (Coo)	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)		tt (min)	Total Time (min)		
<b>FUTURE</b>																										
D1-O	-	3.78	0.05	22.3	0.19	2.65	0.5						Swale	0.5	0.0								Flows conveyed offsite			
D3-F	-	4.80	0.73	7.3	3.52	4.34	15.2						Fut. Connect	15.2	0.0											
D4-F	-	1.17	0.61	9.4	0.71	3.96	2.8						Fut. Connect	2.8	0.0											
	D1	Combined Flows (D3-F-D4-F)						9.40	4.22	3.95	16.7			Fut. Connect			30 in	RCP	1.3%	16.7	47.5	340	9.7	0.59	9.99	
D2	-	1.37	0.61	11.9	0.75	3.60	2.7						Inlet Type R L 10	2.7	0.0	18 in	RCP	8.0%	2.7	29.7	7.5	16.8	0.01	11.91		
	D2	Combined Flows (D3-F-D2)						11.91	4.97	3.59	17.9			Manhole Slab Base			36 in	RCP	1.0%	17.9	66.7	400	9.4	0.71	12.61	
D5	-	0.67	0.61	8.8	0.75	4.06	3.0						Inlet Type R L 10	3.0	0.0	18 in	RCP	8.0%	3.0	29.7	7.5	16.8	0.01	8.81		
	D3	Combined Flows (D3-F-D5)						12.61	5.72	3.51	20.1			Manhole Slab Base			36 in	RCP	1.0%	20.1	66.7	178	9.4	0.31	12.93	
D6	-	0.82	0.61	8.7	0.50	4.08	2.0						Inlet Type R L 5	2.1	SUMP	24 in	RCP	1.0%	2.1	22.6	29.5	7.2	0.07	8.77		
	D4	Combined Flows (D3-F-D6)						12.93	6.23	3.47	21.6			Manhole Slab Base			36 in	RCP	1.0%	21.6	66.7	352	9.4	0.62	13.55	
D7-F	-	16.60	0.73	13.0	12.15	3.47	42.1						Fut. Connect	42.1	0.0											
D8-F	-	1.89	0.70	9.2	1.32	3.99	5.3						Fut. Connect	5.3	0.0									Includes bypass from E1		
	D5	Combined Flows (D7-F-D8-F)						13.00	13.47	3.47	46.7			Fut. Connect			42 in	RCP	1.6%	46.7	126.9	101	13.2	0.13	13.13	
	D6	Combined Flows (D3-F-D8-F)						13.55	19.70	3.40	67.0			Manhole Box Base			42 in	RCP	1.0%	67.0	100.6	690	10.5	1.10	14.65	
D10-F	-	7.97	0.73	8.8	5.83	4.06	23.7						Fut. Connect	23.7	0.0	36 in	RCP	1.5%	23.7	80.9	67	11.4	0.10	8.90		
	D7	Combined Flows (D3-F-D10-F)						14.65	25.53	3.28	83.8			Manhole Box Base			42 in	RCP	4.8%	83.8	221.3	305	23.0	0.22	14.87	
D9	-	0.88	0.61	8.9	0.54	4.04	2.2						Ex. Inlet Type R L 10	2.2	0.0	18 in	RCP	4.7%	2.2	22.8	346	12.9	0.45	9.35	Existing	
D12	-	0.57	0.59	9.0	0.34	4.03	1.4						Ex. Inlet Type R L 10	1.4	0.0									Existing		
	D8	Combined Flows (D9-D12)						9.35	0.88	3.97	3.5			Ex. Inlet Type R L 10			24 in	RCP	4.3%	3.5	46.9	29.7	14.9	0.03	9.38	Existing
	D9	Combined Flows (D3-F-D12)						14.87	26.41	3.26	86.1			Manhole Slab Base			48 in	RCP	2.6%	86.1	229.8	428	18.3	0.39	15.26	
D11-F	-	7.37	0.73	8.4	5.39	4.13	22.3						Fut. Connect	22.3	0.0	36 in	RCP	1.0%	22.3	66.7	67	9.4	0.12	8.52		
	D10	Combined Flows (D3-F-D11-F)						15.26	31.80	3.22	102.4			Manhole Box Base			48 in	RCP	5.8%	102.4	344.7	83	27.4	0.05	15.31	
D13	-	1.41	0.63	11.0	0.89	3.72	3.3						Inlet Type R L 10	3.3	SUMP	18 in	RCP	8.0%	3.3	29.7	30	16.8	0.03	11.03		
	D11	Combined Flows (D3-F-D13)						15.31	32.69	3.21	105.1			Manhole Box Base			54 in	RCP	8.4%	105.1	568.2	190	35.7	0.09	15.40	
D14-O	-	2.73	0.05	6.9	0.14	4.42	0.6						Badger Gulch	0.6	0.0											
D15	-	2.63	0.05	15.9	0.14	3.16	0.4						WQ Pond D	0.4	0.0									Flows to WQ Pond D		

**Ridgegate Parkway Expansion**

**Developed Storm Runoff Calculations**

Design Storm :

**100 Year**

Point Hour Rainfall (P<sub>1</sub>) : **2.60**

I = (28.5 P<sub>1</sub>) / ((10 + TC)<sup>0.786</sup>)

Basin Name	Design Point	Direct Runoff						Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Total Time (min)	Notes	
		Area (ac)	Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover (Coo)	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)			tt (min)
<b>FUTURE</b>																								
D1-O	-	3.78	0.49	22.3	1.86	4.83	9.0					Swale	9.0	0.0									Flows conveyed offsite	
D3-F	-	4.80	0.83	7.3	4.00	7.88	31.5					Fut. Connect	31.5	0.0										
D4-F	-	1.17	0.77	9.4	0.90	7.20	6.5					Fut. Connect	6.5	0.0										
	D1	Combined Flows (D3-F-D4-F)						9.40	4.90	7.19	35.2	Fut. Connect			30 in	RCP	1.3%	35.2	47.5	340	9.7	0.59	9.99	DP Z2
	D2	1.37	0.77	11.9	0.75	6.55	4.9				Inlet Type R L 10	4.6	0.3	18 in	RCP	8.0%	4.6	29.7	7.5	16.8	0.01	11.91		
	D2	Combined Flows (D3-F-D2)						11.91	5.65	6.53	36.9	Manhole Slab Base			36 in	RCP	1.0%	36.9	66.7	400	9.4	0.71	12.61	
	D5	0.67	0.77	8.8	0.75	7.38	5.5				Inlet Type R L 10	4.6	1.2	18 in	RCP	8.0%	4.6	29.7	7.5	16.8	0.01	8.81		
	D3	Combined Flows (D3-F-D5)						12.61	6.40	6.37	40.8	Manhole Slab Base			36 in	RCP	1.0%	40.8	66.7	178	9.4	0.31	12.93	
	D6	0.82	0.77	8.7	0.63	7.42	4.7				Inlet Type R L 5	5.9	SUMP	24 in	RCP	1.0%	5.9	22.6	29.5	7.2	0.07	8.77		
	D4	Combined Flows (D3-F-D6)						12.93	7.03	6.30	44.3	Manhole Slab Base			36 in	RCP	1.0%	44.3	66.7	352	9.4	0.62	13.55	
	D7-F	16.60	0.83	13.0	13.82	6.30	87.1				Fut. Connect	87.1	0.0											
	D8-F	1.89	0.82	9.2	1.54	7.26	11.2				Fut. Connect	11.8	0.0										Includes bypass from E1	
	D5	Combined Flows (D7-F-D8-F)						13.00	15.36	6.30	96.8	Fut. Connect			42 in	RCP	1.6%	96.8	126.9	101	13.2	0.13	13.13	DP Y2
	D6	Combined Flows (D3-F-D8-F)						13.55	22.39	6.19	138.5	Manhole Box Base			42 in	RCP	1.0%	138.5	100.6	690	10.5	1.10	14.65	
	D10-F	7.97	0.83	8.8	6.63	7.38	49.0				Fut. Connect	49.0	0.0	36 in	RCP	1.5%	49.0	80.9	67	11.4	0.10	8.90	DP X3	
	D7	Combined Flows (D3-F-D10-F)						14.65	29.02	5.97	173.2	Manhole Box Base			42 in	RCP	4.8%	173.2	221.3	305	23.0	0.22	14.87	
	D9	0.88	0.77	8.9	0.68	7.35	5.0				Ex. Inlet Type R L 10	4.7	0.2	18 in	RCP	4.7%	4.7	22.8	346	12.9	0.45	9.35	Existing	
	D12	0.57	0.76	9.0	0.44	7.32	3.2				Ex. Inlet Type R L 10	3.4	0.0										Existing	
	D8	Combined Flows (D9-D12)						9.35	1.11	7.22	8.0	Ex. Inlet Type R L 10			24 in	RCP	4.3%	8.0	46.9	29.7	14.9	0.03	9.38	DP W1
	D9	Combined Flows (D3-F-D12)						14.87	30.14	5.93	178.6	Manhole Slab Base			48 in	RCP	2.6%	178.6	229.8	428	18.3	0.39	15.26	
	D11-F	7.37	0.83	8.4	6.13	7.51	46.1				Fut. Connect	46.1	0.0	36 in	RCP	1.0%	46.1	66.7	67	9.4	0.12	8.52		
	D10	Combined Flows (D3-F-D11-F)						15.26	36.27	5.85	212.4	Manhole Box Base			48 in	RCP	5.8%	212.4	344.7	83	27.4	0.05	15.31	
	D13	1.41	0.78	11.0	1.10	6.77	7.5				Inlet Type R L 10	7.5	SUMP	18 in	RCP	8.0%	7.5	29.7	30	16.8	0.03	11.03		
	D11	Combined Flows (D3-F-D13)						15.31	37.37	5.85	218.5	Manhole Box Base			54 in	RCP	8.4%	218.5	568.2	190	35.7	0.09	15.40	
	D14-O	2.73	0.49	6.9	1.34	8.03	10.8				Badger Gulch	10.8	0.0											
	D15	2.63	0.49	15.9	1.29	5.74	7.4				WQ Pond D	7.4	0.0										Flows to WQ Pond D	

### Ridgeway Parkway Expansion

#### Composite Runoff Coefficient Calculations

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

Runoff Coefficient (UDFCD Vol 1, Chp 6, Sec. 2.5.1)

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

Basin Design Data													Runoff Coeff's			
Basin Name	Design Point	$A_{paved}$ streets (sf)	$A_{drives/walks}$ (sf)	$A_{MU/COM/FIRE}$ (sf)	$A_{MF/RES}$ (sf)	$A_{MD RES}$ (sf)	$A_{LD RES}$ (sf)	$A_{iscape (B soil)}$ (sf)	$A_{iscape (C/D soil)}$ (sf)	$A_{Total}$ (sf)	$A_{Total}$ (ac)	Imp (%)	C2	C5	C10	C100
E1	-	39,351	35,526						31,161	106,038	2.43	67.9%	0.54	0.59	0.63	0.76
E2-O	-								694,570	694,570	15.95	2.0%	0.01	0.05	0.15	0.49
E2-F	-				354,703					354,703	8.14	75.0%	0.60	0.65	0.69	0.79
E3	-	21,485	18,372						16,330	56,187	1.29	68.2%	0.54	0.59	0.64	0.76
E4-F	-				178,581					178,581	4.10	75.0%	0.60	0.65	0.69	0.79
E5-F	-				371,373					371,373	8.53	75.0%	0.60	0.65	0.69	0.79
WQ Pond E		60,836	53,898	0	904,657	0	0	0	47,491	1,066,882	24.49	73.9%	0.59	0.64	0.68	0.79



**Merrick & Company**  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: Ridgeway Parkway Expansion  
 Job Number: 65119564  
 Date: 10/5/2018  
 By: G. LEE

**Ridgeway Parkway Expansion**  
**Time of Concentration Calculations**

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

$$t_t = (0.395(1.1 - C_p)(L^{0.5})) / (S_o^{0.33})$$

$$t_t = L_v / (60V_v)$$

$$\text{Urban } t_c = (26 - 17i) + L_v / (60(14i + 9) * (S_o^{0.5}))$$

Sub-Basin Data					Initial Overland Time (t <sub>i</sub> )			Travel Time (t <sub>t</sub> ) t <sub>t</sub> = Length / (Velocity x 60)						t <sub>c</sub> Comp	t <sub>c</sub> Urbanized Check ON			t <sub>c</sub> Final
Basin Name	Design Point	A <sub>Total</sub> (ac)	i (%)	C5	Upper most Length (ft)	Slope (%)	t <sub>i</sub> (min)	Length (ft)	Slope (%)	Type of Land Surface	C <sub>v</sub>	Velocity (fps)	t <sub>t</sub> (min)	Time of Conc t <sub>i</sub> + t <sub>t</sub> = t <sub>c</sub>	L <sub>t</sub> (ft)	S <sub>o</sub> (%)	Urban t <sub>c</sub>	Min t <sub>c</sub>
E1	-	2.43	67.9%	0.59	110	2.0%	7.8	1165	1.0%	Paved areas & shallow paved swales	20	2.0	9.7	17.5	1275.0	1.1%	25.6	17.5
E2-O	-	15.95	2.0%	0.05	500	2.5%	31.7	1608	2.4%	Short Pasture and lawns	7	1.1	24.9	56.6	2108.0	2.4%	50.2	50.2
E2-F	-	8.14	75.0%	0.65	100	2.0%	6.5	1098	2.0%	Paved areas & shallow paved swales	20	2.8	6.5	13.0	1198.0	2.0%	20.5	13.0
E3	-	1.29	68.2%	0.59	97	2.0%	7.2	678	3.7%	Paved areas & shallow paved swales	20	3.8	2.9	10.2	775.0	3.4%	18.2	10.2
E4-F	-	4.10	75.0%	0.65	100	2.0%	6.5	662	4.3%	Paved areas & shallow paved swales	20	4.1	2.7	9.2	762.0	3.9%	16.5	9.2
E5-F	-	8.53	75.0%	0.65	100	2.0%	6.5	1096	6.5%	Paved areas & shallow paved swales	20	5.1	3.6	10.1	1196.0	5.9%	17.4	10.1

**Ridgeway Parkway Expansion**

**Developed Storm Runoff Calculations**

Design Storm : **5 Year**

Point Hour Rainfall (P<sub>1</sub>) : **1.43**

$I = (28.5 P_1) / ((10 + TC)^{0.786})$

Basin Name	Design Point	Area (ac)	Direct Runoff					Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Total Time (min)	Notes			
			Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover (Qco)	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)			tt (min)		
E2-O	-	15.95	0.05	50.2	0.82	1.63	1.3						Swale	1.3	0.0										Diverted offsite runoff	
E1	-	2.43	0.59	17.5	1.44	3.01	4.3						Inlet Type R L 15	4.3	0.0	18 in	RCP	1.0%	4.3	10.5	93.5	3.7	0.42	17.92		
E2-F	-	8.14	0.65	13.0	5.29	3.47	18.3						Fut. Connect	18.3	0.0	30 in	RCP	2.0%	18.3	58.0	53.5	9.3	0.10	13.10		
	E1				Combined Flows (E1-E2-F)			17.92	6.73	2.98	20.0			Manhole Slab Base			30 in	RCP	3.5%	20.0	76.5	710	10.2	1.16	19.08	
E3	-	1.29	0.59	10.2	0.77	3.84	2.9						Inlet Type R L 10	2.9	0.0	18 in	RCP	1.0%	2.9	10.5	18.5	2.5	0.12	10.32		
E4-F	-	4.10	0.65	9.2	2.66	3.99	10.6						Fut. Connect	10.6	0.0	24 in	RCP	2.0%	10.6	32.0	53.5	6.8	0.13	9.33		
	E2				Combined Flows (E1-E4-F)			19.08	10.16	2.88	29.3			Manhole Slab Base			36 in	RCP	8.5%	29.3	194.1	367	12.4	0.49	19.57	
E5-F	-	8.53	0.65	10.1	5.54	3.85	21.4						Future Pond E Outfall	21.4	0.0											
					Combined Flows (E1-E5-F)			19.57	15.71	2.84	44.7			Water Quality Pond E												

**Ridgeway Parkway Expansion**

**Developed Storm Runoff Calculations**

Design Storm : **100 Year**

Point Hour Rainfall (P<sub>1</sub>) : **2.60**

$I = (28.5 P_1) / ((10 + TC)^{0.786})$

Basin Name	Design Point	Direct Runoff						Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Total Time (min)	Notes				
		Area (ac)	Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover (Qco)	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)			tt (min)			
E2-O	-	15.95	0.49	50.2	7.85	2.96	23.2							Swale	23.2	0.0										Diverted offsite runoff	
E1	-	2.43	0.76	17.5	1.86	5.48	10.2							Inlet Type R L 15	9.5	0.6	18 in	RCP	1.0%	9.5	10.5	93.5	8.1	0.19	17.69	Inlet S1	
E2-F	-	8.14	0.79	13.0	6.45	6.30	40.6							Fut. Connect	40.6	0.0	30 in	RCP	2.0%	40.6	58.0	53.5	20.7	0.04	13.04		
	E1				Combined Flows (E1-E2-F)			17.69	8.30	5.45	45.2			Manhole Slab Base			30 in	RCP	3.5%	45.2	76.5	710	23.0	0.51	18.21		
E3	-	1.29	0.76	10.2	0.99	6.98	6.9							Inlet Type R L 10	5.1	1.8	18 in	RCP	1.0%	5.1	10.5	18.5	4.3	0.07	10.27		
E4-F	-	4.10	0.79	9.2	3.24	7.26	23.6							Fut. Connect	23.6	0.0	24 in	RCP	2.0%	23.6	32.0	53.5	15.0	0.06	9.26		
	E2				Combined Flows (E1-E4-F)			18.21	12.53	5.37	67.3			Manhole Slab Base			36 in	RCP	8.5%	67.3	194.1	367	28.5	0.21	18.42		
E5-F	-	8.53	0.79	10.1	6.75	7.01	47.3							Future Pond E Outfall	47.3	0.0											
					Combined Flows (E1-E5-F)			18.42	19.28	5.34	102.9			Water Quality Pond E													



**INLET MANAGEMENT**

Worksheet Protected

INLET NAME	BASIN D2	BASIN D5	BASIN D6	BASIN D9	BASIN D12	BASIN D13
Site Type (Urban or Rural)	URBAN STREET	URBAN STREET	URBAN STREET	URBAN STREET	URBAN STREET	URBAN STREET
Inlet Application (Street or Area)	On Grade	On Grade	On Grade	On Grade	On Grade	On Grade
Hydraulic Condition	On Grade	On Grade	On Grade	On Grade	On Grade	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

**USER-DEFINED INPUT**

User-Defined Design Flows	
Minor $Q_{bypass}$ (cfs)	2.7
Major $Q_{bypass}$ (cfs)	4.9

**Bypass (Carry-Over) Flow from Upstream**

Receive Bypass Flow from:	
Minor Bypass Flow Received, $Q_b$ (cfs)	0.0
Major Bypass Flow Received, $Q_b$ (cfs)	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	2.1	2.2	1.4	3.3
Major Total Design Peak Flow, $Q$ (cfs)	4.9	5.9	5.0	3.4	7.5
Minor Flow Bypassed Downstream, $Q_b$ (cfs)	0.0	N/A	0.0	0.0	N/A
Major Flow Bypassed Downstream, $Q_b$ (cfs)	0.3	N/A	0.2	0.0	N/A

**Minor Storm (Calculated) Analysis of Flow Time**

$C$	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_l$	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_l$	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A	N/A	N/A

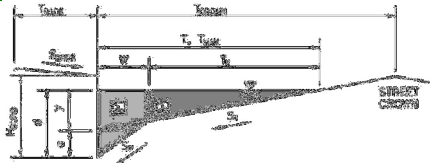
**Major Storm (Calculated) Analysis of Flow Time**

$C$	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_l$	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_l$	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A	N/A	N/A

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

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

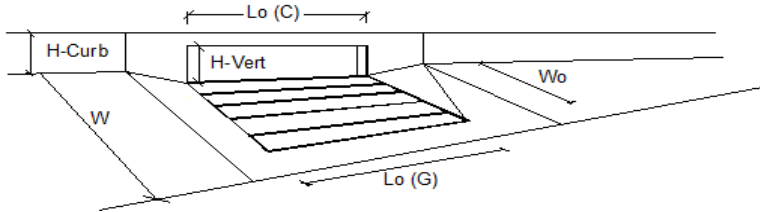
Project: \_\_\_\_\_  
 Inlet ID: \_\_\_\_\_ **BASIN D5**



Gutter Geometry (Enter data in the blue cells)					
Maximum Allowable Width for Spread Behind Curb	T <sub>BACK</sub> = 19.0 ft				
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S <sub>BACK</sub> = 0.020 ft/ft				
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n <sub>BACK</sub> = 0.020				
Height of Curb at Gutter Flow Line	H <sub>CURB</sub> = 6.00 inches				
Distance from Curb Face to Street Crown	T <sub>CROWN</sub> = 37.0 ft				
Gutter Width	W = 2.00 ft				
Street Transverse Slope	S <sub>X</sub> = 0.005 ft/ft				
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S <sub>W</sub> = 0.083 ft/ft				
Street Longitudinal Slope - Enter 0 for sump condition	S <sub>O</sub> = 0.013 ft/ft				
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n <sub>STREET</sub> = 0.016				
Max. Allowable Spread for Minor & Major Storm	T <sub>MAX</sub> = <table border="1"><tr><th>Minor Storm</th><th>Major Storm</th></tr><tr><td>26.0</td><td>37.0</td></tr></table> ft	Minor Storm	Major Storm	26.0	37.0
Minor Storm	Major Storm				
26.0	37.0				
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d <sub>MAX</sub> = <table border="1"><tr><th>Minor Storm</th><th>Major Storm</th></tr><tr><td>6.0</td><td>10.6</td></tr></table> inches	Minor Storm	Major Storm	6.0	10.6
Minor Storm	Major Storm				
6.0	10.6				
Allow Flow Depth at Street Crown (leave blank for no)	<input type="checkbox"/> <input type="checkbox"/> check = yes				
<b>MINOR STORM Allowable Capacity is based on Spread Criterion</b>					
<b>MAJOR STORM Allowable Capacity is based on Spread Criterion</b>					
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	Q <sub>allow</sub> = <table border="1"><tr><th>Minor Storm</th><th>Major Storm</th></tr><tr><td>4.3</td><td>9.9</td></tr></table> cfs	Minor Storm	Major Storm	4.3	9.9
Minor Storm	Major Storm				
4.3	9.9				
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'					

## INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



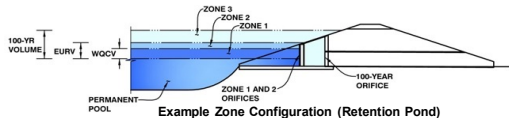
Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	3.0	4.6	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	1.2	cfs
Capture Percentage = $Q_i/Q_c$ =	99	79	%

**DETENTION BASIN STAGE-STORAGE TABLE BUILDER**

UD-Detention, Version 3.07 (February 2017)

Project: Ridgegate Parkway Expansion

Basin ID: WQ Pond D



Example Zone Configuration (Retention Pond)

**Required Volume Calculation**

Selected BMP Type =	<b>EDB</b>	
Watershed Area =	48.14	acres
Watershed Length =	3.533	ft
Watershed Slope =	0.027	ft/ft
Watershed Imperviousness =	78.30%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Lone Tree - Municipal Court	
Water Quality Capture Volume (WQCV) =	1.276	acre-feet
Excess Urban Runoff Volume (EURV) =	3.696	acre-feet
2-yr Runoff Volume (P1 = 1.06 in.) =	3.172	acre-feet
5-yr Runoff Volume (P1 = 1.43 in.) =	4.626	acre-feet
10-yr Runoff Volume (P1 = 1.66 in.) =	5.527	acre-feet
25-yr Runoff Volume (P1 = 1.68 in.) =	5.972	acre-feet
50-yr Runoff Volume (P1 = 2.26 in.) =	8.223	acre-feet
100-yr Runoff Volume (P1 = 2.6 in.) =	9.803	acre-feet
500-yr Runoff Volume (P1 = 3.07 in.) =	12.011	acre-feet
Approximate 2-yr Detention Volume =	2.977	acre-feet
Approximate 5-yr Detention Volume =	4.356	acre-feet
Approximate 10-yr Detention Volume =	4.988	acre-feet
Approximate 25-yr Detention Volume =	4.684	acre-feet
Approximate 50-yr Detention Volume =	5.737	acre-feet
Approximate 100-yr Detention Volume =	6.251	acre-feet

Optional User Override 1-hr Precipitation	
	1.06 inches
	1.43 inches
	1.66 inches
	1.68 inches
	2.26 inches
	2.60 inches

**Stage-Storage Calculation**

Zone 1 Volume (WQCV) =	1.276	acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	1.276	acre-feet
Initial Surcharge Volume (SV) =	user	ft <sup>3</sup>
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H <sub>total</sub> ) =	user	ft
Depth of Trickle Channel (H <sub>TC</sub> ) =	user	ft
Slope of Trickle Channel (S <sub>TC</sub> ) =	user	ft/ft
Slopes of Main Basin Sides (S <sub>main</sub> ) =	user	H:V
Basin Length-to-Width Ratio (R <sub>L/W</sub> ) =	user	
Initial Surcharge Area (A <sub>SV</sub> ) =	user	ft <sup>2</sup>
Surcharge Volume Length (L <sub>SV</sub> ) =	user	ft
Surcharge Volume Width (W <sub>SV</sub> ) =	user	ft
Depth of Basin Floor (H <sub>FLOOR</sub> ) =	user	ft
Length of Basin Floor (L <sub>FLOOR</sub> ) =	user	ft
Width of Basin Floor (W <sub>FLOOR</sub> ) =	user	ft
Area of Basin Floor (A <sub>FLOOR</sub> ) =	user	ft <sup>2</sup>
Volume of Basin Floor (V <sub>FLOOR</sub> ) =	user	ft <sup>3</sup>
Depth of Main Basin (H <sub>MAIN</sub> ) =	user	ft
Length of Main Basin (L <sub>MAIN</sub> ) =	user	ft
Width of Main Basin (W <sub>MAIN</sub> ) =	user	ft
Area of Main Basin (A <sub>MAIN</sub> ) =	user	ft <sup>2</sup>
Volume of Main Basin (V <sub>MAIN</sub> ) =	user	ft <sup>3</sup>
Calculated Total Basin Volume (V <sub>total</sub> ) =	user	acre-feet

Total detention volume is less than 100-year volume.

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft <sup>2</sup> )	Optional Override Area (ft <sup>2</sup> )	Area (acre)	Volume (ft <sup>3</sup> )	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	2,018	0.046		
5952	--	1.00	--	--	--	7,997	0.184	4,928	0.113
5953	--	2.00	--	--	--	15,711	0.361	16,705	0.383
5954	--	3.00	--	--	--	19,393	0.445	34,413	0.790
5955	--	4.00	--	--	--	21,619	0.496	54,919	1.261
5956	--	5.00	--	--	--	23,941	0.550	77,699	1.784
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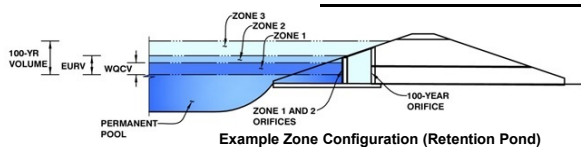


## Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Ridgegate Parkway Expansion

Basin ID: WQ Pond E



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.94	0.600	Orifice Plate
Zone 2			
Zone 3			
		0.600	Total

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

Underdrain Orifice Invert Depth =  ft (distance below the filtration media surface)  
 Underdrain Orifice Diameter =  inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =  ft<sup>2</sup>  
 Underdrain Orifice Centroid =  feet

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

Invert of Lowest Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
 Depth at top of Zone using Orifice Plate =  ft (relative to basin bottom at Stage = 0 ft)  
 Orifice Plate: Orifice Vertical Spacing =  inches  
 Orifice Plate: Orifice Area per Row =  sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =  ft<sup>2</sup>  
 Elliptical Half-Width =  feet  
 Elliptical Slot Centroid =  feet  
 Elliptical Slot Area =  ft<sup>2</sup>

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.00	2.00					
Orifice Area (sq. inches)	3.40	3.40	3.40					

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

User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
 Depth at top of Zone using Vertical Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
 Vertical Orifice Diameter =  inches

Calculated Parameters for Vertical Orifice

Vertical Orifice Area =  ft<sup>2</sup>  
 Vertical Orifice Centroid =  feet

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

Overflow Weir Front Edge Height, Ho =  ft (relative to basin bottom at Stage = 0 ft)  
 Overflow Weir Front Edge Length =  feet  
 Overflow Weir Slope =  H:V (enter zero for flat grate)  
 Horiz. Length of Weir Sides =  feet  
 Overflow Grate Open Area % =  % grate open area/total area  
 Debris Clogging % =  %

Calculated Parameters for Overflow Weir

Height of Grate Upper Edge, H<sub>1</sub> =  feet  
 Over Flow Weir Slope Length =  feet  
 Grate Open Area / 100-yr Orifice Area =  should be ≥ 4  
 Overflow Grate Open Area w/o Debris =  ft<sup>2</sup>  
 Overflow Grate Open Area w/ Debris =  ft<sup>2</sup>

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

Depth to Invert of Outlet Pipe =  ft (distance below basin bottom at Stage = 0 ft)  
 Circular Orifice Diameter =  inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

Outlet Orifice Area =  ft<sup>2</sup>  
 Outlet Orifice Centroid =  feet  
 Half-Central Angle of Restrictor Plate on Pipe =  radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

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

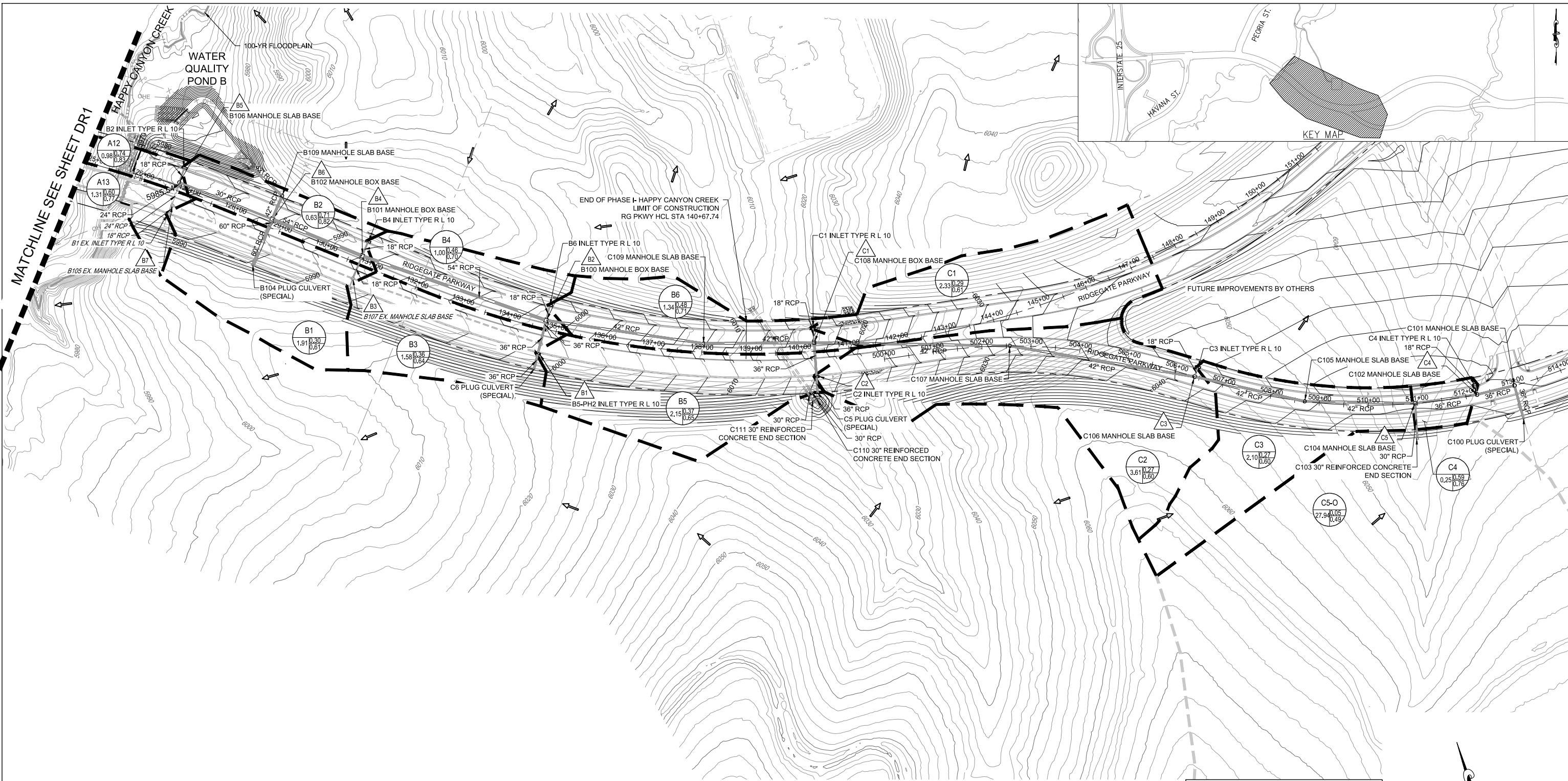
Calculated Parameters for Spillway

Spillway Design Flow Depth =  feet  
 Stage at Top of Freeboard =  feet  
 Basin Area at Top of Freeboard =  acres

### Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =									
One-Hour Rainfall Depth (in) =	0.53	1.07	1.06	1.43	1.66	1.68	2.26	2.60	3.07
Calculated Runoff Volume (acre-ft) =	0.600	1.767	1.512	2.227	2.681	2.937	4.066	4.875	6.008
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.600	1.766	1.510	2.227	2.680	2.937	4.065	4.873	6.001
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.07	0.21	0.44	0.70	0.95	1.31
Predevelopment Peak Q (cfs) =	0.0	0.0	0.2	1.8	5.0	10.8	17.1	23.3	32.2
Peak Inflow Q (cfs) =	6.8	19.8	16.9	24.8	29.8	32.6	44.9	53.7	65.8
Peak Outflow Q (cfs) =	0.4	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.4	0.2	0.1	0.0	0.0	0.0
Structure Controlling Flow =	Plate	Plate	Plate	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	37	53	50	58	64	67	81	92	107
Time to Drain 99% of Inflow Volume (hours) =	40	59	56	65	72	75	91	103	119
Maximum Ponding Depth (ft) =	2.66	5.83	5.22	6.00	6.00	6.00	6.00	6.00	6.00
Area at Maximum Ponding Depth (acres) =	0.28	0.42	0.39	0.43	0.43	0.43	0.43	0.43	0.43
Maximum Volume Stored (acre-ft) =	0.522	1.610	1.369	1.686	1.686	1.686	1.686	1.686	1.686

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NOTE: THE EXISTING STORM SYSTEM IN BASIN B AND A PORTION OF BASIN C WILL CONTINUE TO CONVEY FLOWS UNTIL PHASE II STORM IMPROVEMENTS ARE CONSTRUCTED.

**LEGEND**

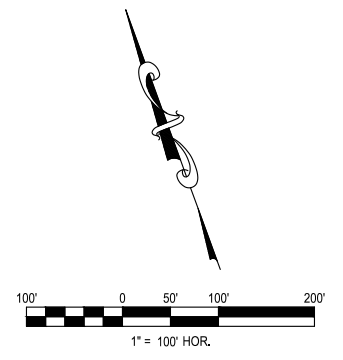
- A3 BASIN ID
- 1.45 5-YEAR RUNOFF COEFFICIENT
- 0.43 100-YEAR RUNOFF COEFFICIENT
- 0.71 BASIN AREA (ACRES)
- A1 DESIGN POINT
- PROPOSED FLOW OF WATER
- EXISTING FLOW OF WATER
- PROPOSED MANHOLE AND STORM SEWER
- EXISTING MANHOLE AND STORM SEWER
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED BASIN BOUNDARY
- EXISTING MAJOR CONTOUR
- INTERIM BASIN BOUNDARY

PRELIMINARY  
NOT FOR CONSTRUCTION

City of Lone Tree

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**CITY OF LONE TREE**

**MERRICK**

5970 GREENWOOD PLAZA BLVD, GREENWOOD VILLAGE, CO 80111  
PH: (303) 751-0741

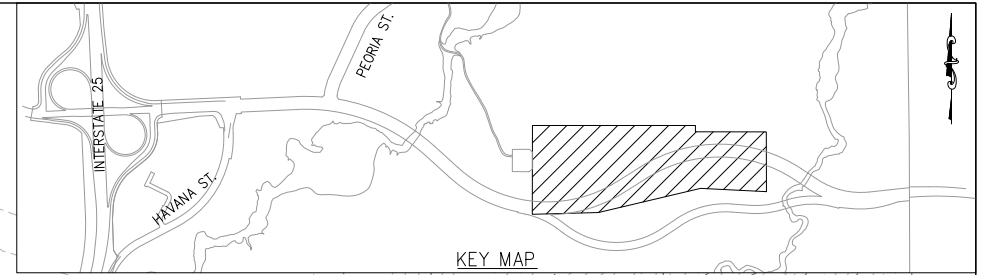
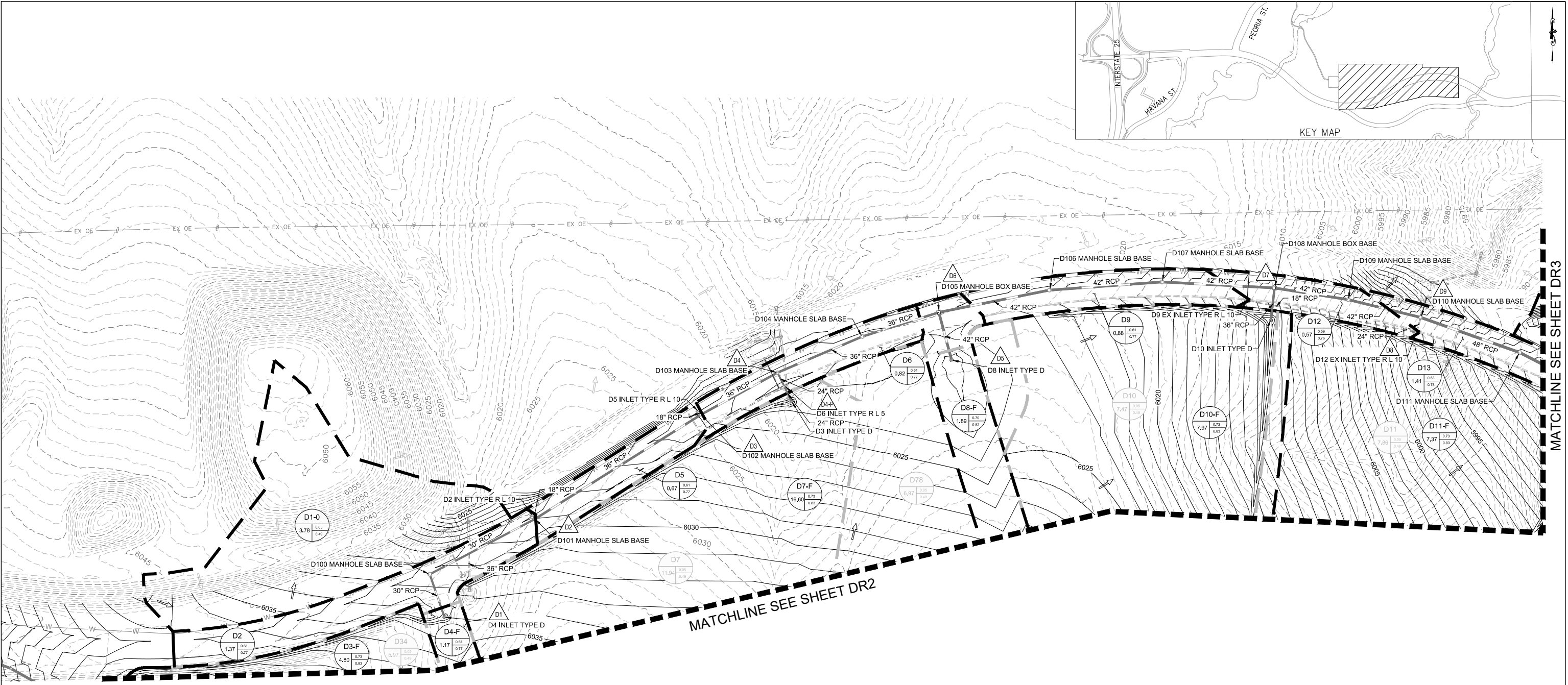
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RIDGEGATE PARKWAY EXPANSION PHASE II DRAINAGE MAP (BASINS FOR INLET SIZING)	
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Detailer:	
Sheet Subset:	
QC Review:	
Approved:	
Subset Sheet:	

Project No./Code	21911
Sheet Number:	DR2-PH2

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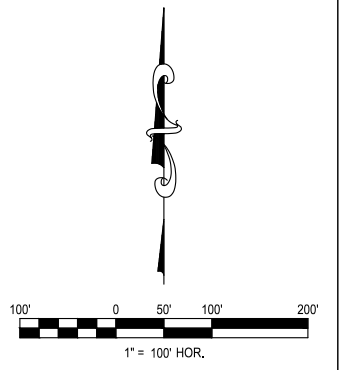


LEGEND			
	BASIN ID		PROPOSED FLOW OF WATER
	5-YEAR RUNOFF COEFFICIENT		EXISTING FLOW OF WATER
	100-YEAR RUNOFF COEFFICIENT		PROPOSED MANHOLE AND STORM SEWER
	BASIN AREA (ACRES)		EXISTING MANHOLE AND STORM SEWER
	DESIGN POINT		EXISTING MAJOR CONTOUR
			PROPOSED MAJOR CONTOUR
			PROPOSED MINOR CONTOUR
			FUTURE BASIN BOUNDARY
			PROPOSED BASIN BOUNDARY



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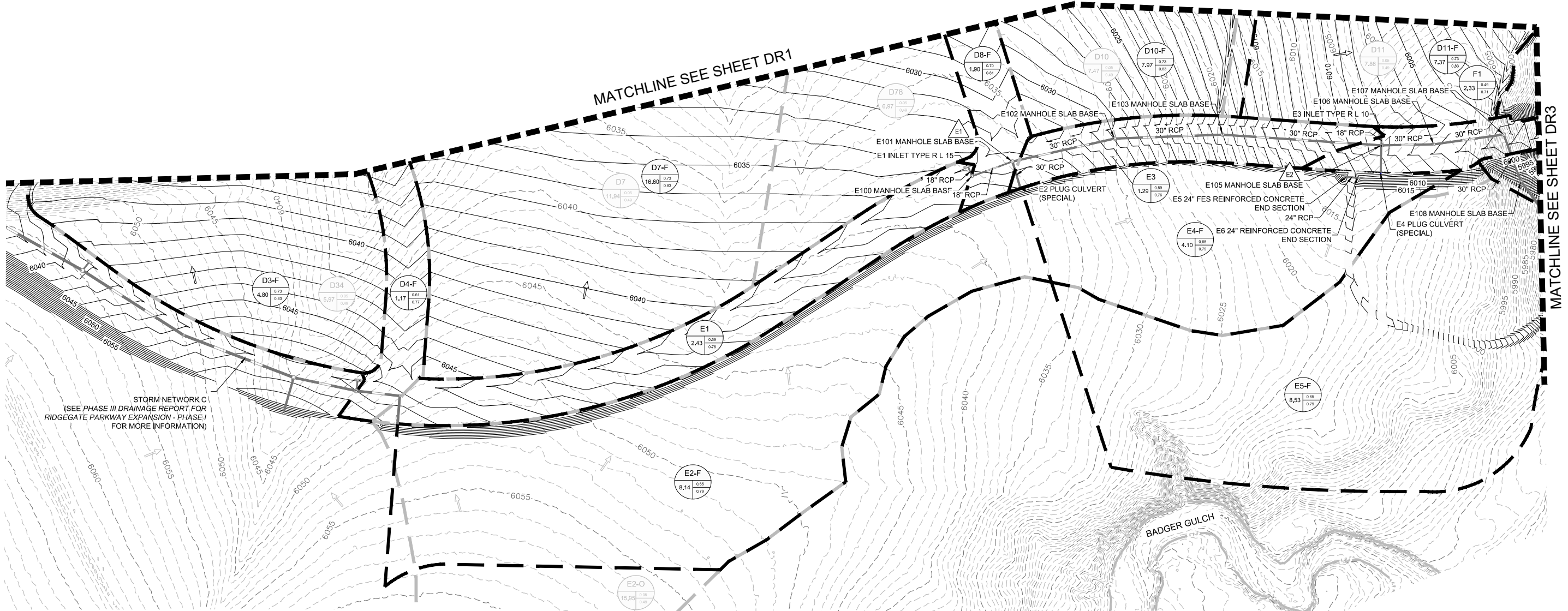
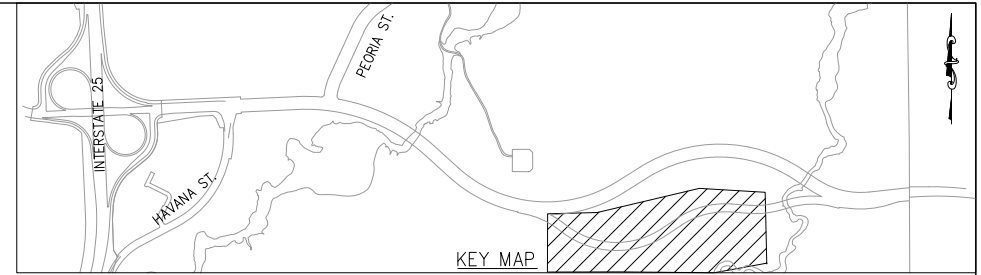
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Detailer:	Approved:
Sheet Subset:	Subset Sheet:

Project No./Code	----
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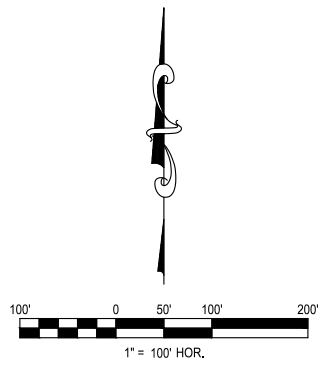


**LEGEND**

B3 1.45 0.43 0.71	→	PROPOSED FLOW OF WATER	- - - -	EXISTING MINOR CONTOUR
A1	→	EXISTING FLOW OF WATER	—4920—	PROPOSED MAJOR CONTOUR
B4 4.80 0.73 0.87		PROPOSED MANHOLE AND STORM SEWER	- - - -	PROPOSED MINOR CONTOUR
B5 5.97 0.88 0.98		EXISTING MANHOLE AND STORM SEWER	- - - -	FUTURE BASIN BOUNDARY
A2	- - - -	EXISTING MAJOR CONTOUR	- - - -	PROPOSED BASIN BOUNDARY

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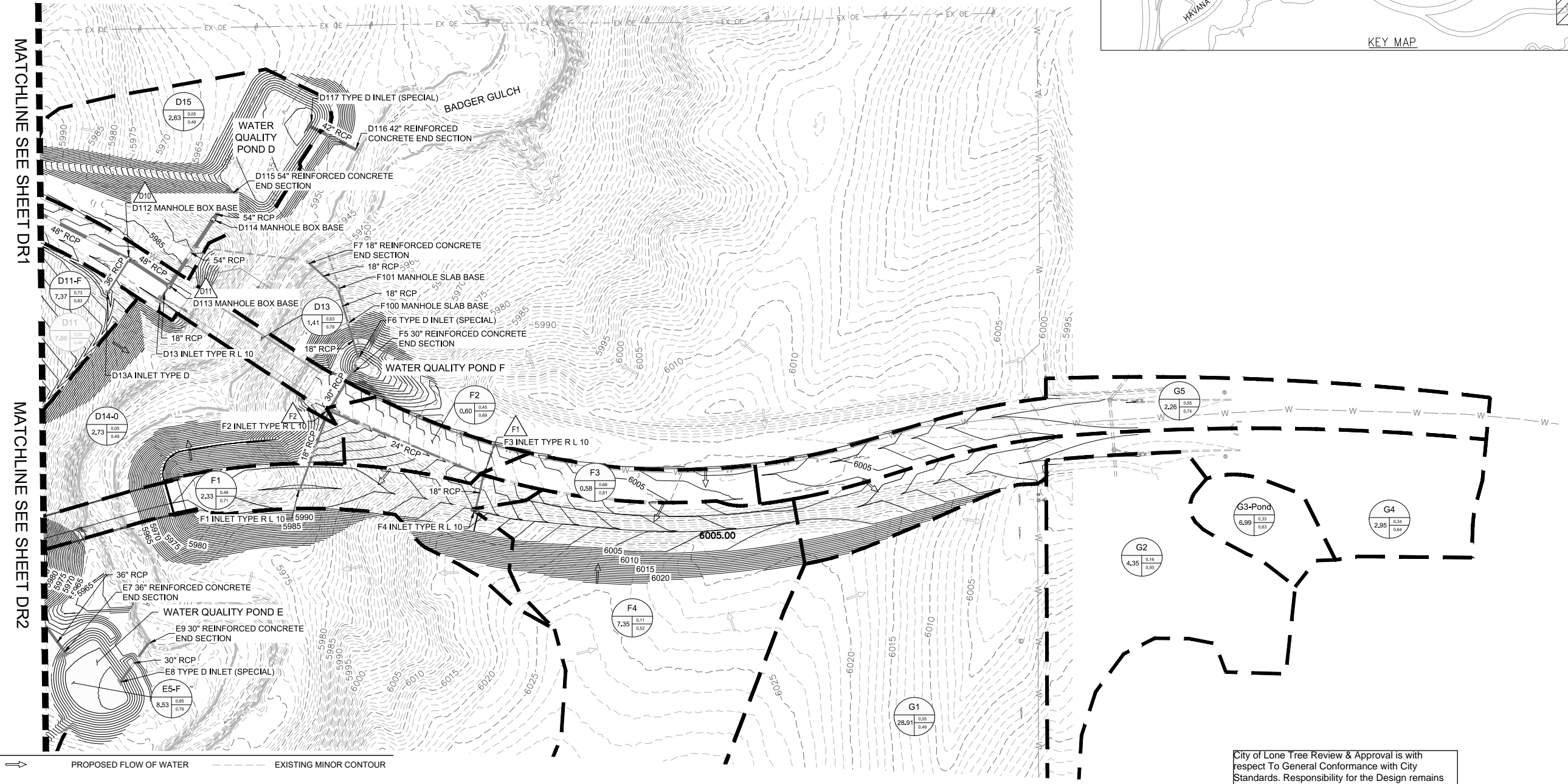
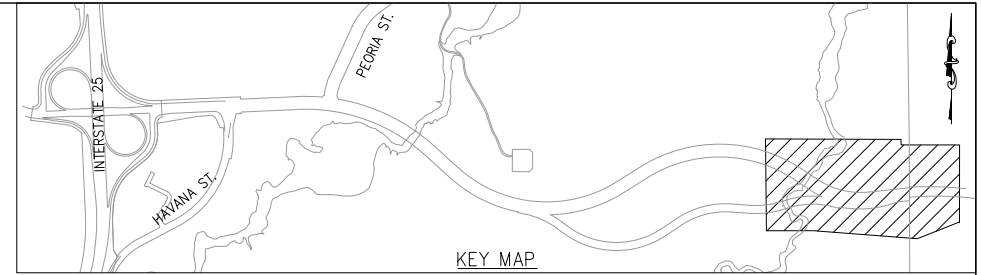
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Sheet Number:	DR2

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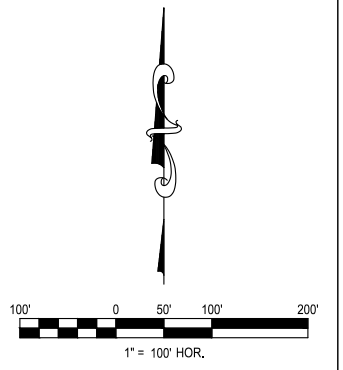
**LEGEND**

B3	5-YEAR RUNOFF COEFFICIENT		PROPOSED FLOW OF WATER		EXISTING MINOR CONTOUR
	100-YEAR RUNOFF COEFFICIENT		EXISTING FLOW OF WATER		PROPOSED MAJOR CONTOUR
	BASIN AREA (ACRES)		PROPOSED MANHOLE AND STORM SEWER		PROPOSED MINOR CONTOUR
	DESIGN POINT		EXISTING MANHOLE AND STORM SEWER		FUTURE BASIN BOUNDARY
			EXISTING MAJOR CONTOUR		PROPOSED BASIN BOUNDARY



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RIDGEGATE PARKWAY EXPANSION DRAINAGE MAP	
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Project No./Code	----
Sheet Number:	DR3

## APPENDIX B – HYDROLOGIC CALCULATIONS



Merrick & Company  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: RidgeGate East Filing No. 3  
 Job Number: 65121240  
 Date: 9/28/2023  
 By: CGB

### RidgeGate East Filing No. 3

#### Composite Runoff Coefficient Calculations

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

Runoff Coefficient (UDFCD Vol 1, Chp 6, Sec. 2.5.1)

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

#### Basin Design Data

Basin Name	Design Point	I (%) =									A <sub>Total</sub> (sf)	A <sub>Total</sub> (ac)	i (%)	Runoff Coeff's				
		100%	90%	85%	40%	10%	25%	2%	2%	Imp (%)				C2	C5	C10	C100	
		A <sub>paved</sub> streets (sf)	A <sub>sidewalk / conc</sub> (sf)	A <sub>MU</sub> (sf)	A <sub>Gravel</sub> (sf)	A <sub>plygnd</sub> (sf)	A <sub>art. turf</sub> (sf)	A <sub>lscape (B soil)</sub> (sf)	A <sub>lscape (C/D soil)</sub> (sf)									
Z1 - E	-								204,849	204,849	4.70	2.0%	0.01	0.05	0.15	0.49		
Z1 - F	-			204,849						204,849	4.70	85.0%	0.69	0.73	0.76	0.83		
Z2	-	26,424	6,237						7,537	40,198	0.92	80.1%	0.65	0.69	0.72	0.81		
Z3	-	16,971	3,439						5,361	25,771	0.59	78.3%	0.63	0.68	0.71	0.80		
Y1	-	27,771	6,192						9,444	43,407	1.00	77.3%	0.62	0.67	0.70	0.80		
Y2	-	27,629	5,201						8,236	41,066	0.94	79.1%	0.64	0.68	0.72	0.81		
X1	-	12,173	5,807						6,233	24,213	0.56	72.4%	0.58	0.63	0.67	0.78		
X2	-			194,278						194,278	4.46	85.0%	0.69	0.73	0.76	0.83		
X3	-			141,570						141,570	3.25	85.0%	0.69	0.73	0.76	0.83		
X4	-	17,033	5,645						9,850	32,528	0.75	68.6%	0.54	0.60	0.64	0.77		
W1	-			104,108						104,108	2.39	85.0%	0.69	0.73	0.76	0.83		
W2	-	23,276	9,537						15,518	48,331	1.11	66.6%	0.53	0.58	0.62	0.76		
W3	-	2,908	10,901						4,071	17,880	0.41	71.6%	0.57	0.62	0.66	0.78		
V2	-	19,904	10,744						62,979	93,627	2.15	32.9%	0.24	0.31	0.38	0.62		
U1	-	28,845	15,369						15,462	59,676	1.37	72.0%	0.57	0.63	0.67	0.78		
T1	-	12,043	6,189						6,463	24,695	0.57	71.8%	0.57	0.62	0.66	0.78		
S1	-	52,812	28,960						33,349	115,121	2.64	69.1%	0.55	0.60	0.64	0.77		
RG PKWY BASINS																		
D2	-	36,682	12,820						15,076	64,577	1.48	75.1%	0.60	0.65	0.69	0.79		
D5	-	13,370	7,824						8,091	29,285	0.67	70.3%	0.56	0.61	0.65	0.77		
D6	-	16,013	9,830						9,963	35,806	0.82	70.0%	0.56	0.61	0.65	0.77		
D7-F	-			701,659						701,659	16.11	85.0%	0.69	0.73	0.76	0.83		
D11-F	-			129,373						129,373	2.97	85.0%	0.69	0.73	0.76	0.83		
D13	-	33,222	14,643						16,168	64,033	1.47	73.0%	0.58	0.63	0.67	0.78		
D15	-								143,352	143,352	3.29	2.0%	0.01	0.05	0.15	0.49		
Pond 21 (Basins D, W, X, Y, Z)		253,472	98,076	1,475,837	0	0	0	0	258,900	2,086,284	47.89	76.8%	0.62	0.66	0.70	0.80		



Merrick & Company  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: RidgeGate East Filing No. 3  
 Job Number: 65121240  
 Date: 9/28/2023  
 By: CGB

**RidgeGate East Filing No. 3**  
**Time of Concentration Calculations**

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

$$t_t = (0.395(1.1 - C_v)(L_t^{0.5}) / (S_o^{0.33}))$$

$$t_t = L_t / (60V_v)$$

$$\text{Urban } t_t = (26 - 17i) + L_t / (60(14 + 9)(S_o^{0.5}))$$

Sub-Basin Data					Initial Overland Time (t <sub>i</sub> )			Travel Time (t <sub>t</sub> ) t <sub>t</sub> = Length / (Velocity x 60)						t <sub>c</sub> Comp	t <sub>c</sub> Urbanized Check ON			t <sub>c</sub> Final	
Basin Name	Design Point	A <sub>Total</sub> (ac)	i (%)	C <sub>S</sub>	Upper most Length (ft)	Slope (%)	t <sub>i</sub> (min)	Length (ft)	Slope (%)	Type of Land Surface	C <sub>v</sub>	Velocity (fps)	t <sub>t</sub> (min)	Time of Conc t <sub>i</sub> + t <sub>t</sub> = t <sub>c</sub>	L <sub>t</sub> (ft)	S <sub>o</sub> (%)	Urban t <sub>c</sub>	Min t <sub>c</sub>	
Z1 - E	-	4.70	2.0%	0.05	300	1.5%	29.1	115	1.5%	Paved areas & shallow paved swales	20	2.4	0.8	29.9	415.0	1.5%	31.8	29.9	
Z1 - F	-	4.70	85.0%	0.73	100	2.0%	5.4	394	3.0%	Paved areas & shallow paved swales	20	3.5	1.9	7.3	494.0	2.8%	13.9	7.3	
Z2	-	0.92	80.1%	0.69	86	2.0%	5.5	671	2.6%	Paved areas & shallow paved swales	20	3.2	3.5	9.0	757.0	2.5%	16.3	9.0	
Z3	-	0.59	78.3%	0.68	117	2.0%	6.7	434	2.6%	Paved areas & shallow paved swales	20	3.2	2.2	8.9	551.0	2.5%	15.6	8.9	
Y1	-	1.00	77.3%	0.67	67	2.8%	4.6	544	2.0%	Paved areas & shallow paved swales	20	2.8	3.2	7.8	611.0	2.1%	16.4	7.8	
Y2	-	0.94	79.1%	0.68	101	2.8%	5.4	499	1.9%	Paved areas & shallow paved swales	20	2.8	3.0	8.5	600.0	2.0%	16.1	8.5	
X1	-	0.56	72.4%	0.63	92	2.0%	6.6	228	1.1%	Paved areas & shallow paved swales	20	2.1	1.8	8.4	320.0	1.3%	16.1	8.4	
X2	-	4.46	85.0%	0.73	50	2.0%	3.8	628	2.0%	Paved areas & shallow paved swales	20	2.8	3.7	7.5	678.0	2.0%	15.4	7.5	
X3	-	3.25	85.0%	0.73	50	2.0%	3.8	572	2.0%	Paved areas & shallow paved swales	20	2.8	3.4	7.2	622.0	2.0%	15.1	7.2	
X4	-	0.75	68.6%	0.60	96	2.0%	7.2	313	2.8%	Paved areas & shallow paved swales	20	3.3	1.6	8.7	409.0	2.6%	16.6	8.7	
W1	-	2.39	85.0%	0.73	50	2.0%	3.8	327	2.0%	Paved areas & shallow paved swales	20	2.8	1.9	5.7	377.0	2.0%	13.7	5.7	
W2	-	1.11	66.6%	0.58	71	2.0%	6.4	284	4.8%	Paved areas & shallow paved swales	20	4.4	1.1	7.4	355.0	4.1%	16.3	7.4	
W3	-	0.41	71.6%	0.62	57	3.0%	4.6	190	1.2%	Paved areas & shallow paved swales	20	2.2	1.4	6.0	247.0	1.5%	15.6	6.0	
V2	-	2.15	32.9%	0.31	300	2.0%	20.0	434	1.5%	Paved areas & shallow paved swales	20	2.4	3.0	23.0	734.0	1.7%	27.3	23.0	
U1	-	1.37	72.0%	0.63	126	2.0%	7.7	324	4.8%	Paved areas & shallow paved swales	20	4.4	1.2	9.0	450.0	3.8%	15.8	9.0	
T1	-	0.57	71.8%	0.62	85	2.0%	6.4	270	4.8%	Paved areas & shallow paved swales	20	4.4	1.0	7.4	355.0	3.9%	15.3	7.4	
S1	-	2.64	69.1%	0.60	100	2.0%	7.3	1125	1.0%	Paved areas & shallow paved swales	20	2.0	9.4	16.6	1225.0	1.1%	24.9	16.6	
RG PKWY BASINS																			
D2	-	1.48	75.1%	0.65	54	2.0%	4.8	779	0.9%	Paved areas & shallow paved swales	20	1.9	6.8	11.6	833.0	0.9%	20.5	11.6	
D5	-	0.67	70.3%	0.61	61	2.0%	5.6	389	1.0%	Paved areas & shallow paved swales	20	2.0	3.2	8.8	450.0	1.1%	17.8	8.8	
D6	-	0.82	70.0%	0.61	58	2.0%	5.4	300	0.6%	Paved areas & shallow paved swales	20	1.5	3.2	8.7	358.0	0.7%	17.8	8.7	
D7-F	-	16.11	85.0%	0.73	100	2.0%	5.4	1213	1.8%	Paved areas & shallow paved swales	20	2.7	7.5	12.9	1313.0	1.8%	19.3	12.9	
D13	-	1.47	73.0%	0.63	80	3.3%	5.1	489	2.4%	Paved areas & shallow paved swales	20	3.1	2.6	7.8	569.0	2.5%	16.7	7.8	
D15	-	3.29	2.0%	0.05	65	8.0%	7.7	450	3.0%	Grassed waterway	15	2.6	2.9	10.6	515.0	3.4%	30.7	10.6	

**RidgeGate East Filing No. 3**

**Developed Storm Runoff Calculations**

Design Storm :

**100 Year**

Point Hour Rainfall (P<sub>1</sub>) : **2.27**

$I = (28.5 P_1) / ((10 + TC)^{0.786})$

Basin Name	Design Point	Area (ac)	Direct Runoff				Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Notes					
			Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover (cfs)	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)		Velocity (fps)	tt (min)	Total Time (min)		
Z1 - E	-	4.70	0.49	29.9	2.31	3.57	8.3																	Used for Swale and Interim Inlet Sizing only		
Z1 - F	-	4.70	0.83	7.3	3.91	6.88	26.9						Type C/Future Conn			24 in	RCP	2.0%	26.9	32.0	28	10.2	0.05	7.35		
Z2	-	0.92	0.81	9.0	0.75	6.39	4.8						Type R Inlet													
	Z1	Inlet Z2 (Combined flow from Basins D3-F-Z1)						9.00	4.66	6.38	29.8						24 in	RCP	2.0%	29.8	32.0	27	10.2	0.04	9.04	
Z3	-	0.59	0.80	8.9	0.48	6.42	3.1						Type R Inlet			18 in	RCP	1.0%	3.1	10.5	27	5.9	0.08	8.98		
	Z2	MH Z100 (Combined flow from Basins D3-F, Z1-Z2)						9.00	5.14	6.38	32.8						30 in	RCP	2.1%	32.8	59.4	93	12.1	0.13	9.13	
D7-F	-	16.11	0.83	12.9	13.41	5.52	74.0						Stub			42 in	RCP	0.6%	74.0	77.9	196	8.1	0.40	13.30		
Y1	-	1.00	0.80	7.8	0.80	6.73	5.4						Type R Inlet			30 in	RCP	5.0%	5.4	91.7	35	18.7	0.03	7.83		
Y2	-	0.94	0.81	8.5	0.76	6.53	5.0						Type R Inlet			18 in	RCP	5.0%	5.0	23.5	27	13.3	0.03	8.53		
	Y1	MH Y100 (Combined flow from Basins D7-F, Y2)						13.30	14.97	5.43	81.4						42 in	RCP	1.0%	81.4	100.6	93	10.5	0.15	13.45	
X1	-	0.56	0.78	8.4	0.43	6.56	2.8						Type R Inlet			18 in	RCP	2.4%	2.8	16.3	66	9.2	0.12	8.52		
X2	-	4.46	0.83	7.5	3.71	6.82	25.3						Stub													
X3	-	3.25	0.83	7.2	2.71	6.91	18.7						Stub													
	X1	MH X100 (Combined flow from Basins X2-X3)						7.50	6.42	6.81	43.7						30 in	RCP	1.8%	43.7	55.0	17	11.2	0.03	7.53	
	X2	MH X101 (Combined flow from Basins X1-X3)						8.52	6.85	6.51	44.6						30 in	RCP	2.1%	44.6	59.4	275	12.1	0.38	8.90	
X4	-	0.75	0.77	8.7	0.57	6.47	3.7																			
	X3	Inlet X4 (Combined flow from Basins X1-X4)						8.90	7.42	6.41	47.6						36 in	RCP	1.5%	47.6	81.7	33	11.6	0.05	8.95	
W1	-	2.39	0.83	5.7	1.99	7.43	14.8						Future Conn			18 in	RCP	2.0%	14.8	14.9	41	8.4	0.08	5.78		
W2	-	1.11	0.76	7.4	0.84	6.85	5.8						Type R Inlet			30 in	RCP	2.9%	5.8	70.0	10	14.3	0.01	7.41		
W3	-	0.41	0.78	6.0	0.32	7.32	2.3						Type R Inlet			24 in	RCP	0.6%	2.3	17.5	342	5.6	1.02	7.02		
	W2	STMH-5 (Combined flow from Basins W1,W3)						7.02	2.31	6.96	16.1						24 in	RCP	5.1%	16.1	51.1	319	16.3	0.33	7.35	
	W1	Inlet W2 (Combined flow from Basins W1-W3)						7.41	3.15	6.84	21.5						30 in	RCP	1.8%	21.5	54.4	32	11.1	0.05	7.46	
V2	-	2.15	0.62	23.0	1.33	4.14	5.5						Type R Inlet			18 in	RCP	8.0%	5.5	29.7	30	16.8	0.03	23.03		
		Flow to existing MH C106 (RG Pkwy Ph 1)						23.03	1.33	4.13	5.5															
S1	-	2.64	0.77	16.6	2.03	4.91	10.0						Type R Inlet			18 in	RCP	1.0%	10.0	10.5	76	5.9	0.21	16.81		
T1	-	0.57	0.78	7.4	0.44	6.85	3.0						Type R Inlet			18 in	RCP	1.0%	3.0	10.5	77	5.9	0.22	7.62		
U1	-	1.37	0.78	9.0	1.07	6.39	6.8						Type R Inlet			18 in	RCP	1.0%	6.8	10.5	78	5.9	0.22	9.22		
D2	-	1.48	0.79	11.6	1.17	5.78	6.8																			

**RidgeGate East Filing No. 3**

**Developed Storm Runoff Calculations**

Design Storm :

**5 Year**

Point Hour Rainfall (P<sub>1</sub>) : **1.10**

I = (28.5 P<sub>1</sub>) / ((10 + TC)<sup>0.786</sup>)

Basin Name	Design Point	Direct Runoff						Total Runoff				Inlets			Pipe				Pipe/Swale Travel Time			Notes			
		Area (ac)	Runoff Coeff	t <sub>c</sub> (min)	C+A (ac)	I (in/hr)	Q (cfs)	Total t <sub>c</sub> (min)	ΣC+A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q Intercepted	Q carryover (Ccs)	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Approx. Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)		t <sub>t</sub> (min)	Total Time (min)	
Z1 - E	-	4.70	0.05	29.9	0.24	1.73	0.4																	Used for Swale Sizing only	
Z1 - F	-	4.70	0.73	7.3	3.44	3.34	11.5							Type C/Future Conn											
Z2	-	0.92	0.69	9.0	0.64	3.10	2.0							Type R Inlet											
	Z1	Inlet Z2 (Combined flow from Basins D3-F-Z1)						9.00	4.08	3.09	12.6				30 in	RCP	1.0%	12.6	41.0	27	8.4	0.05	9.05		
Z3	-	0.59	0.68	8.9	0.40	3.11	1.2							Type R Inlet											
	Z2	MH Z100 (Combined flow from Basins D3-F, Z1-Z2)						9.00	4.48	3.09	13.9				30 in	RCP	2.1%	13.9	59.4	93	12.1	0.13	9.13		
D7-F	-	16.11	0.73	12.9	11.79	2.68	31.5							Stub											
Y1	-	1.00	0.67	7.8	0.67	3.26	2.2							Type R Inlet											
Y2	-	0.94	0.68	8.5	0.64	3.16	2.0							Type R Inlet											
	Y1	MH Y100 (Combined flow from Basins D7-F, Y2)						13.30	13.10	2.63	34.5				42 in	RCP	1.0%	34.5	100.6	93	10.5	0.15	13.45		
X1	-	0.56	0.63	8.4	0.35	3.18	1.1							Type R Inlet											
X2	-	4.46	0.73	7.5	3.26	3.31	10.8							Stub											
X3	-	3.25	0.73	7.2	2.38	3.35	8.0							Stub											
	X1	MH X100 (Combined flow from Basins X2-X3)						7.50	5.64	3.30	18.6				30 in	RCP	1.8%	18.6	55.0	17	11.2	0.03	7.53		
	X2	MH X101 (Combined flow from Basins X1-X3)						8.52	5.99	3.16	18.9				30 in	RCP	2.1%	18.9	59.4	275	12.1	0.38	8.90		
X4	-	0.75	0.60	8.7	0.45	3.14	1.4																		
	X3	Inlet X4 (Combined flow from Basins X1-X4)						8.90	6.44	3.11	20.0				36 in	RCP	1.5%	20.0	81.7	33	11.6	0.05	8.95		
W1	-	2.39	0.73	5.7	1.75	3.60	6.3							Future Conn											
W2	-	1.11	0.58	7.4	0.64	3.32	2.1							Type R Inlet											
W3	-	0.41	0.62	6.0	0.26	3.55	0.9							Type R Inlet											
	W2	STMH-5 (Combined flow from Basins W1,W3)						7.02	2.00	3.37	6.8				24 in	RCP	5.1%	6.8	51.1	319	16.3	0.33	7.35		
	W1	Inlet W2 (Combined flow from Basins W1-W3)						7.41	2.65	3.31	8.8				30 in	RCP	1.8%	8.8	55.0	32	11.2	0.05	7.46		
V2	-	2.15	0.31	23.0	0.66	2.01	1.3							Type R Inlet											
		Flow to existing MH C106 (RG Pkwy Ph 1)						23.03	0.66	2.00	1.3														
S1	-	2.64	0.60	16.6	1.59	2.38	3.8							Type R Inlet											
T1	-	0.57	0.62	7.4	0.35	3.32	1.2							Type R Inlet											
U1	-	1.37	0.63	9.0	0.86	3.10	2.7							Type R Inlet											
D2	-	1.48	0.65	11.6	0.97	2.80	2.7																		

## APPENDIX C – STREET AND INLET CAPACITY CALCULATIONS



# INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet Z3	Inlet Z2	Z1-E	Inlet Y1	Inlet Y2	Inlet X1
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	AREA	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	Swale	In Sump	In Sump	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type C (Depressed)	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

## USER-DEFINED INPUT

User-Defined Design Flows						
Minor $Q_{down}$ (cfs)	0.0	0.9	4.7	0.6	0.0	1.0
Major $Q_{down}$ (cfs)	0.0	0.8	0.0	0.8	0.0	0.8

Bypass (Carry-Over) Flow from Upstream						
Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	User-Defined	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0	0.0	0.6	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	0.9	4.7	0.6	0.0	1.0
Major Total Design Peak Flow, $Q$ (cfs)	0.0	0.8	0.0	1.4	0.0	0.8
Minor Flow Bypassed Downstream, $Q_b$ (cfs)	0.0	0.0	0.0	N/A	N/A	-0.1
Major Flow Bypassed Downstream, $Q_b$ (cfs)	0.0	0.0	0.0	N/A	N/A	-2.1

Minor Storm (Calculated) Analysis of Flow Time						
C	N/A	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_b$	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow Time						
C	N/A	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_b$	N/A	N/A	N/A	N/A	N/A	N/A

# INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet X4	Inlet T1	Ex Inlet D2	Ex Inlet D5	Inlet U1	Inlet W2
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	On Grade	On Grade	On Grade	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

## USER-DEFINED INPUT

User-Defined Design Flows						
Minor $Q_{down}$ (cfs)	0.0	0.7	1.1	3.0	2.7	2.1
Major $Q_{down}$ (cfs)	0.0	0.7	0.7	5.5	6.8	5.8

Bypass (Carry-Over) Flow from Upstream						
Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	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	0.0	0.0	0.0
Major Bypass Flow Received, $Q_b$ (cfs)	0.0	0.0	0.0	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	0.7	1.1	3.0	2.7	2.1
Major Total Design Peak Flow, $Q$ (cfs)	0.0	0.7	0.7	5.5	6.8	5.8
Minor Flow Bypassed Downstream, $Q_b$ (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Flow Bypassed Downstream, $Q_b$ (cfs)	0.0	0.0	0.0	1.1	0.0	0.0

Minor Storm (Calculated) Analysis of Flow						
C	N/A	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow						
C	N/A	N/A	N/A	N/A	N/A	N/A
$C_s$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, $V_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, $V_t$	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, $T_i$	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, $T_t$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Regional $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
Recommended $T_c$	N/A	N/A	N/A	N/A	N/A	N/A
$T_c$ selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, $I$	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, $Q_p$	N/A	N/A	N/A	N/A	N/A	N/A

## INLET MANAGEMENT

Worksheet Protected

<b>INLET NAME</b>	Inlet W3
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

<b>User-Defined Design Flows</b>	
Minor $Q_{down}$ (cfs)	0.9
Major $Q_{down}$ (cfs)	2.3
<b>Bypass (Carry-Over) Flow from Upstream</b>	
Receive Bypass Flow from:	No Bypass Flow Received
Minor Bypass Flow Received, $Q_b$ (cfs)	0.0
Major Bypass Flow Received, $Q_b$ (cfs)	0.0
<b>Watershed Characteristics</b>	
Subcatchment Area (acres)	
Percent Impervious	
NRCS Soil Type	
<b>Watershed Profile</b>	
Overland Slope (ft/ft)	
Overland Length (ft)	
Channel Slope (ft/ft)	
Channel Length (ft)	
<b>Minor Storm Rainfall Input</b>	
Design Storm Return Period, $T_r$ (years)	
One-Hour Precipitation, $P_1$ (inches)	
<b>Major Storm Rainfall Input</b>	
Design Storm Return Period, $T_r$ (years)	
One-Hour Precipitation, $P_1$ (inches)	

### CALCULATED OUTPUT

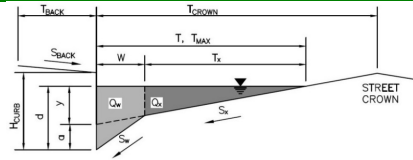
<b>Minor Total Design Peak Flow, Q (cfs)</b>	<b>0.9</b>
<b>Major Total Design Peak Flow, Q (cfs)</b>	<b>2.3</b>
Minor Flow Bypassed Downstream, $Q_b$ (cfs)	0.0
Major Flow Bypassed Downstream, $Q_b$ (cfs)	0.0
<b>Minor Storm (Calculated) Analysis of Flow</b>	
C	N/A
$C_s$	N/A
Overland Flow Velocity, $V_i$	N/A
Channel Flow Velocity, $V_t$	N/A
Overland Flow Time, $T_i$	N/A
Channel Travel Time, $T_t$	N/A
Calculated Time of Concentration, $T_c$	N/A
Regional $T_c$	N/A
Recommended $T_c$	N/A
$T_c$ selected by User	N/A
Design Rainfall Intensity, I	N/A
Calculated Local Peak Flow, $Q_p$	N/A
<b>Major Storm (Calculated) Analysis of Flow</b>	
C	N/A
$C_s$	N/A
Overland Flow Velocity, $V_i$	N/A
Channel Flow Velocity, $V_t$	N/A
Overland Flow Time, $T_i$	N/A
Channel Travel Time, $T_t$	N/A
Calculated Time of Concentration, $T_c$	N/A
Regional $T_c$	N/A
Recommended $T_c$	N/A
$T_c$ selected by User	N/A
Design Rainfall Intensity, I	N/A
Calculated Local Peak Flow, $Q_p$	N/A

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

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

Project: RIDGEGATE FILING NO. 3

Inlet ID: Inlet Z3



**Gutter Geometry:**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK}$ =	16.5	ft
$S_{BACK}$ =	0.020	ft/ft
$n_{BACK}$ =	0.020	

Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB}$ =	6.00	inches
$T_{CROWN}$ =	26.5	ft
$W$ =	2.00	ft
$S_x$ =	0.020	ft/ft
$S_w$ =	0.083	ft/ft
$S_o$ =	0.016	ft/ft
$n_{STREET}$ =	0.016	

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Allow Flow Depth at Street Crown (check box for yes, leave blank for no)

	Minor Storm	Major Storm	
$T_{MAX}$ =	21.5	26.5	ft
$d_{MAX}$ =	6.0	10.4	inches
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

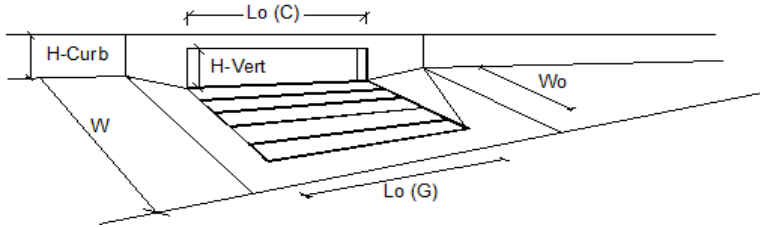
MINOR STORM Allowable Capacity is based on Depth Criterion  
 MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow}$ =	17.4	111.2	cfs

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

# INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.01 (April 2021)



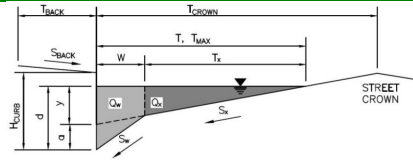
Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	0.0	0.0	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.0	cfs
Capture Percentage = $Q_i/Q_o$ =	0	0	%

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

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

Project: **RIDGEGATE FILING NO. 3**

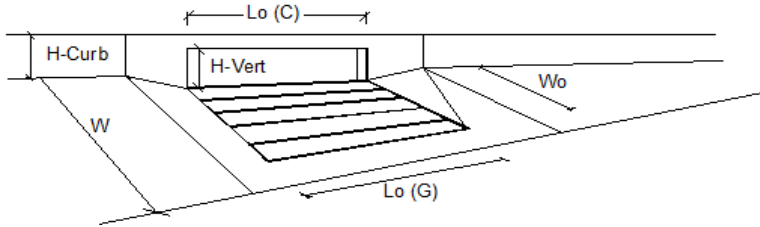
Inlet ID: **Inlet Z2**



<b>Gutter Geometry:</b>									
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 18.5$ 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	$T_{CROWN} = 26.5$ 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	$S_0 = 0.022$ ft/ft								
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.016$								
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>T_{MAX} =</math></td> <td>21.5</td> <td>26.5</td> <td>ft</td> </tr> </table>		Minor Storm	Major Storm		$T_{MAX} =$	21.5	26.5	ft
	Minor Storm	Major Storm							
$T_{MAX} =$	21.5	26.5	ft						
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>d_{MAX} =</math></td> <td>6.0</td> <td>10.0</td> <td>inches</td> </tr> </table>		Minor Storm	Major Storm		$d_{MAX} =$	6.0	10.0	inches
	Minor Storm	Major Storm							
$d_{MAX} =$	6.0	10.0	inches						
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)	<table border="1"> <tr> <td></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> </table>		<input type="checkbox"/>	<input checked="" type="checkbox"/>					
	<input type="checkbox"/>	<input checked="" type="checkbox"/>							
MINOR STORM Allowable Capacity is based on Depth Criterion									
MAJOR STORM Allowable Capacity is based on Depth Criterion									
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>Q_{allow} =</math></td> <td>19.5</td> <td>88.1</td> <td>cfs</td> </tr> </table>		Minor Storm	Major Storm		$Q_{allow} =$	19.5	88.1	cfs
	Minor Storm	Major Storm							
$Q_{allow} =$	19.5	88.1	cfs						
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'									

# INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.01 (April 2021)

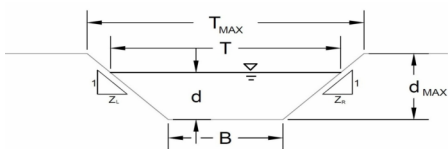


Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	0.9	0.8	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.0	cfs
Capture Percentage = $Q_i/Q_o$ =	100	100	%

## AREA INLET IN A SWALE

**RIDGEGATE FILING NO. 3**

**Z1-E**



This worksheet uses the NRCS vegetative 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)  
Manning's n (Leave cell D16 blank to manually enter an n value)  
Channel Invert Slope  
Bottom Width  
Left Side Slope  
Right Side Slope

A, B, C, D, or E = **E**  
n = see details below  
S<sub>0</sub> = **0.0260** ft/ft  
B = **2.00** ft  
Z1 = **5.00** ft/ft  
Z2 = **5.00** ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V <sub>max</sub> )	Max Froude No. (F <sub>max</sub> )
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:

Maximum Allowable Top Width of Channel for Minor & Major Storm  
Maximum Allowable Water Depth in Channel for Minor & Major Storm

	Minor Storm	Major Storm	
T <sub>MAX</sub>	<b>12.00</b>	<b>12.00</b>	ft
d <sub>MAX</sub>	<b>1.50</b>	<b>1.50</b>	ft

**Maximum Channel Capacity Based On Allowable Top Width**

Maximum Allowable Top Width  
Water Depth  
Flow Area  
Wetted Perimeter  
Hydraulic Radius  
Manning's n based on NRCS Vegetal Retardance  
Flow Velocity  
Velocity-Depth Product  
Hydraulic Depth  
Froude Number  
Maximum Flow Based on Allowable Water Depth

	Minor Storm	Major Storm	
T <sub>MAX</sub>	<b>12.00</b>	<b>12.00</b>	ft
d	1.00	1.00	ft
A	7.00	7.00	sq ft
P	12.20	12.20	ft
R	0.57	0.57	ft
n	0.028	0.028	
V	6.02	6.02	fps
VR	3.46	3.46	ft <sup>2</sup> /s
D	0.58	0.58	ft
Fr	1.39	1.39	
Q <sub>T</sub>	<b>42.2</b>	<b>42.2</b>	cfs

**Maximum Channel Capacity Based On Allowable Water Depth**

Maximum Allowable Water Depth  
Top Width  
Flow Area  
Wetted Perimeter  
Hydraulic Radius  
Manning's n based on NRCS Vegetal Retardance  
Flow Velocity  
Velocity-Depth Product  
Hydraulic Depth  
Froude Number  
Maximum Flow Based on Allowable Water Depth

	Minor Storm	Major Storm	
d <sub>MAX</sub>	<b>1.50</b>	<b>1.50</b>	ft
T	17.00	17.00	ft
A	14.25	14.25	sq ft
P	17.30	17.30	ft
R	0.82	0.82	ft
n	0.024	0.024	
V	8.63	8.63	fps
VR	7.11	7.11	ft <sup>2</sup> /s
D	0.84	0.84	ft
Fr	1.66	1.66	
Q <sub>d</sub>	<b>123.0</b>	<b>123.0</b>	cfs

**Allowable Channel Capacity Based On Channel Geometry**

MINOR STORM Allowable Capacity is based on Top Width Criterion  
MAJOR STORM Allowable Capacity is based on Top Width Criterion

	Minor Storm	Major Storm	
Q <sub>allow</sub>	<b>42.2</b>	<b>42.2</b>	cfs
d <sub>allow</sub>	<b>1.00</b>	<b>1.00</b>	ft

**Water Depth in Channel Based On Design Peak Flow**

Design Peak Flow  
Water Depth  
Top Width  
Flow Area  
Wetted Perimeter  
Hydraulic Radius  
Manning's n based on NRCS Vegetal Retardance  
Flow Velocity  
Velocity-Depth Product  
Hydraulic Depth  
Froude Number

	Minor Storm	Major Storm	
Q <sub>o</sub>	<b>4.7</b>	<b>0.0</b>	cfs
d	<b>0.43</b>	<b>0.03</b>	ft
T	6.33	2.33	ft
A	1.80	0.07	sq ft
P	6.41	2.33	ft
R	0.28	0.03	ft
n	0.040	0.083	
V	2.61	0.28	fps
VR	0.73	0.01	ft <sup>2</sup> /s
D	0.28	0.03	ft
Fr	0.86	0.28	

**Warning 04**

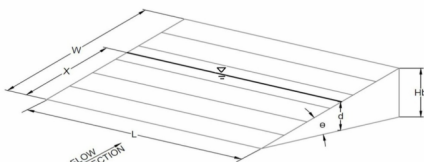
**Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'**  
**Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'**

**Inlet Design Information (Input)**

Type of Inlet  Inlet Type =

Angle of Inclined Grate (must be <= 30 degrees)

Width of Grate  
Length of Grate  
Open Area Ratio  
Height of Inclined Grate  
Clogging Factor  
Grate Discharge Coefficient  
Orifice Coefficient  
Weir Coefficient



θ = **0.00** degrees  
W = **3.00** ft  
L = **3.00** ft  
A<sub>RATIO</sub> = **0.70**  
H<sub>b</sub> = **0.00** ft  
C<sub>f</sub> = **0.50**  
C<sub>d</sub> = **0.84**  
C<sub>o</sub> = **0.56**  
C<sub>w</sub> = **1.81**

Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)  
Total Inlet Interception Capacity (assumes clogged condition)  
Bypassed Flow  
Capture Percentage = Q<sub>a</sub>/Q<sub>o</sub>

	MINOR	MAJOR	
d	1.43	1.03	
Q <sub>a</sub>	<b>17.0</b>	<b>14.5</b>	cfs
Q <sub>b</sub>	<b>0.0</b>	<b>0.0</b>	cfs
C%	<b>100</b>	<b>100</b>	%

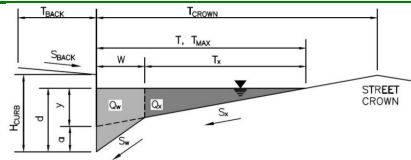


**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**

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

Project: **RIDGEGATE FILING NO. 3**

Inlet ID: **Inlet Y1**



**Gutter Geometry:**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK}$ =	16.5	ft
$S_{BACK}$ =	0.020	ft/ft
$n_{BACK}$ =	0.020	

Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB}$ =	6.00	inches
$T_{CROWN}$ =	32.5	ft
$W$ =	2.00	ft
$S_x$ =	0.020	ft/ft
$S_w$ =	0.083	ft/ft
$S_o$ =	0.000	ft/ft
$n_{STREET}$ =	0.016	

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Check boxes are not applicable in SUMP conditions

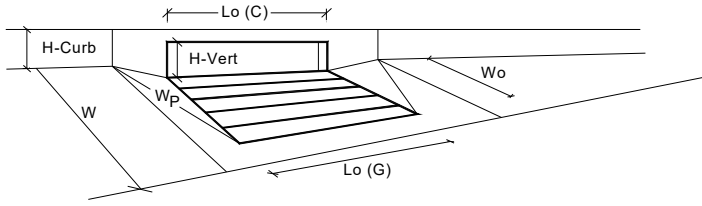
	Minor Storm	Major Storm	
$T_{MAX}$ =	27.5	32.5	ft
$d_{MAX}$ =	6.0	10.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	

MINOR STORM Allowable Capacity is based on Depth Criterion  
 MAJOR STORM Allowable Capacity is based on Depth Criterion

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

# INLET IN A SUMP OR SAG LOCATION

*MHFD-Inlet, Version 5.01 (April 2021)*



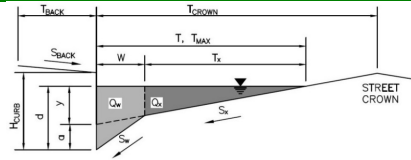
Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	2	2	
Water Depth at Flowline (outside of local depression)	6.0	9.3	inches
<b>Grate Information</b>			
Length of a Unit Grate	N/A	N/A	feet
Width of a Unit Grate	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	N/A	N/A	
<b>Curb Opening Information</b>			
Length of a Unit Curb Opening	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>			
Depth for Grate Midwidth	N/A	N/A	ft
Depth for Curb Opening Weir Equation	0.33	0.61	ft
Combination Inlet Performance Reduction Factor for Long Inlets	0.57	0.88	
Curb Opening Performance Reduction Factor for Long Inlets	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>			
<b>Inlet Capacity IS GOOD for Minor and Major Storms(&gt;Q PEAK)</b>	<b>10.5</b>	<b>22.6</b>	<b>cfs</b>
Q PEAK REQUIRED =	0.6	1.4	cfs

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

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

Project: RIDGEGATE FILING NO. 3

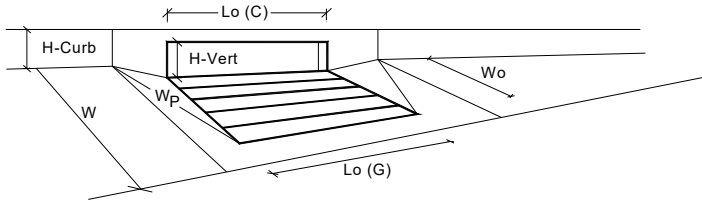
Inlet ID: Inlet Y2



Gutter Geometry:													
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 16.5$ 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	$T_{CROWN} = 32.5$ 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)	$S_y = 0.083$ 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)	$n_{STREET} = 0.016$												
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <thead> <tr> <th></th> <th>Minor Storm</th> <th>Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td><math>T_{MAX} =</math></td> <td>27.5</td> <td>32.5</td> <td>ft</td> </tr> <tr> <td><math>d_{MAX} =</math></td> <td>6.0</td> <td>10.0</td> <td>inches</td> </tr> </tbody> </table>		Minor Storm	Major Storm		$T_{MAX} =$	27.5	32.5	ft	$d_{MAX} =$	6.0	10.0	inches
	Minor Storm	Major Storm											
$T_{MAX} =$	27.5	32.5	ft										
$d_{MAX} =$	6.0	10.0	inches										
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<input type="checkbox"/>												
Check boxes are not applicable in SUMP conditions	<input type="checkbox"/>												
MINOR STORM Allowable Capacity is based on Depth Criterion													
MAJOR STORM Allowable Capacity is based on Depth Criterion													
$Q_{allow} =$	<table border="1"> <thead> <tr> <th></th> <th>Minor Storm</th> <th>Major Storm</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>SUMP</td> <td>SUMP</td> <td>cfs</td> </tr> </tbody> </table>		Minor Storm	Major Storm			SUMP	SUMP	cfs				
	Minor Storm	Major Storm											
	SUMP	SUMP	cfs										

# INLET IN A SUMP OR SAG LOCATION

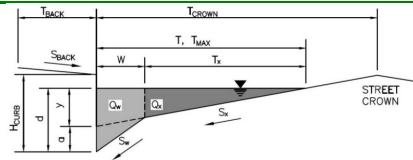
*MHFD-Inlet, Version 5.01 (April 2021)*



Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	1	1	
Water Depth at Flowline (outside of local depression)	6.0	9.3	inches
<input type="checkbox"/> Override Depths			
<b>Grate Information</b>			
Length of a Unit Grate	N/A	N/A	feet
Width of a Unit Grate	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	N/A	N/A	
<b>Curb Opening Information</b>			
Length of a Unit Curb Opening	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	0.67	0.67	
<b>Low Head Performance Reduction (Calculated)</b>			
Depth for Grate Midwidth	N/A	N/A	ft
Depth for Curb Opening Weir Equation	0.33	0.61	ft
Combination Inlet Performance Reduction Factor for Long Inlets	0.57	0.88	
Curb Opening Performance Reduction Factor for Long Inlets	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	N/A	N/A	
<b>Total Inlet Interception Capacity (assumes clogged condition)</b>			
<b>Inlet Capacity IS GOOD for Minor and Major Storms(&gt;Q PEAK)</b>	<b>8.3</b>	<b>20.7</b>	<b>cfs</b>
Q PEAK REQUIRED	0.0	0.0	cfs

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**  
 (Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

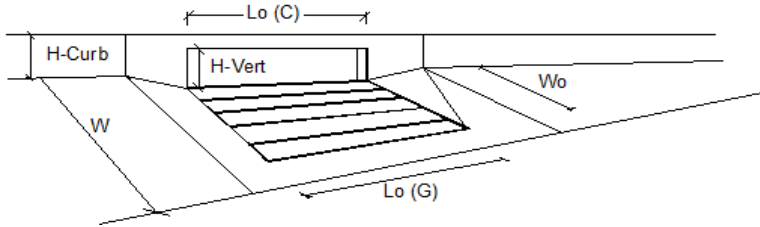
Project: **RIDGEGATE FILING NO. 3**  
 Inlet ID: **Inlet X1**



<b>Gutter Geometry:</b>									
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 17.0$ 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	$T_{CROWN} = 38.0$ 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	$S_o = 0.042$ ft/ft								
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.014$								
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>T_{MAX} =</math></td> <td>27.0</td> <td>38.0</td> <td>ft</td> </tr> </table>		Minor Storm	Major Storm		$T_{MAX} =$	27.0	38.0	ft
	Minor Storm	Major Storm							
$T_{MAX} =$	27.0	38.0	ft						
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>d_{MAX} =</math></td> <td>6.0</td> <td>10.0</td> <td>inches</td> </tr> </table>		Minor Storm	Major Storm		$d_{MAX} =$	6.0	10.0	inches
	Minor Storm	Major Storm							
$d_{MAX} =$	6.0	10.0	inches						
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>d_{MAX} =</math></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> </table>		Minor Storm	Major Storm		$d_{MAX} =$	<input type="checkbox"/>	<input type="checkbox"/>	
	Minor Storm	Major Storm							
$d_{MAX} =$	<input type="checkbox"/>	<input type="checkbox"/>							
MINOR STORM Allowable Capacity is based on Depth Criterion									
MAJOR STORM Allowable Capacity is based on Depth Criterion									
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>Q_{allow} =</math></td> <td>18.3</td> <td>83.8</td> <td>cfs</td> </tr> </table>		Minor Storm	Major Storm		$Q_{allow} =$	18.3	83.8	cfs
	Minor Storm	Major Storm							
$Q_{allow} =$	18.3	83.8	cfs						
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'									

# INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.01 (April 2021)



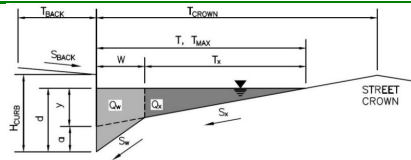
Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	1.1	2.8	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	-0.1	-2.1	cfs
Capture Percentage = $Q_i/Q_o$ =	111	369	%

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

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

Project: **RIDGEGATE FILING NO. 3**

Inlet ID: **Inlet X4**



**Gutter Geometry:**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

T <sub>BACK</sub> =	17.0	ft
S <sub>BACK</sub> =	0.020	ft/ft
n <sub>BACK</sub> =	0.020	

Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

H <sub>CURB</sub> =	6.00	inches
T <sub>CROWN</sub> =	38.0	ft
W =	2.00	ft
S <sub>x</sub> =	0.020	ft/ft
S <sub>w</sub> =	0.083	ft/ft
S <sub>o</sub> =	0.048	ft/ft
n <sub>STREET</sub> =	0.014	

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Allow Flow Depth at Street Crown (check box for yes, leave blank for no)

	Minor Storm	Major Storm	
T <sub>MAX</sub> =	27.0	38.0	ft
d <sub>MAX</sub> =	6.0	10.0	inches
	<input type="checkbox"/>	<input type="checkbox"/>	

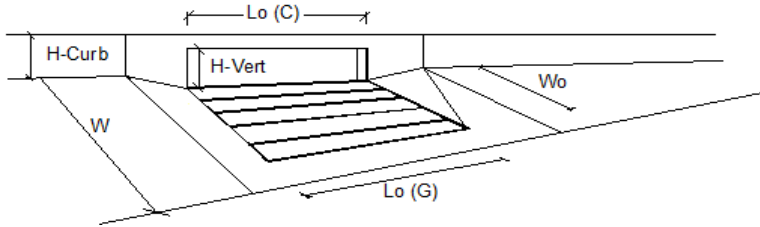
MINOR STORM Allowable Capacity is based on Depth Criterion  
 MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q <sub>allow</sub> =	17.6	80.5	cfs

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

# INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.01 (April 2021)

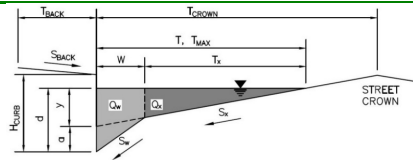


Design Information (Input)	MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a')	a <sub>LOCAL</sub> =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L <sub>o</sub> =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W <sub>o</sub> =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C <sub>r-G</sub> =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C <sub>r-C</sub> =	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>				
Total Inlet Interception Capacity	Q =	0.0	0.0	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q <sub>b</sub> =	0.0	0.0	cfs
Capture Percentage = Q <sub>i</sub> /Q <sub>o</sub> =	C% =	0	0	%



**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**  
 (Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **RIDGEGATE FILING NO. 3**  
 Inlet ID: **Inlet T1**



**Gutter Geometry:**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK}$ =	17.0	ft
$S_{BACK}$ =	0.020	ft/ft
$n_{BACK}$ =	0.020	

Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB}$ =	6.00	inches
$T_{CROWN}$ =	48.0	ft
$W$ =	2.00	ft
$S_x$ =	0.020	ft/ft
$S_w$ =	0.083	ft/ft
$S_o$ =	0.048	ft/ft
$n_{STREET}$ =	0.014	

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Allow Flow Depth at Street Crown (check box for yes, leave blank for no)

	Minor Storm	Major Storm	
$T_{MAX}$ =	38.0	48.0	ft
$d_{MAX}$ =	6.0	10.0	inches
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

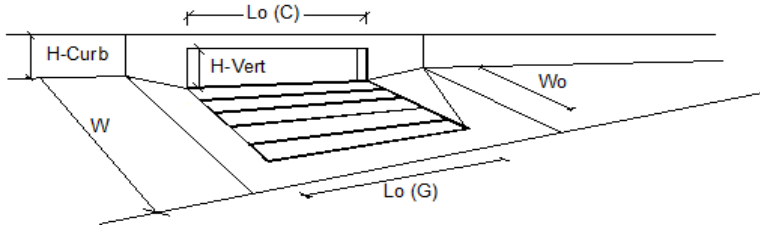
MINOR STORM Allowable Capacity is based on Depth Criterion  
 MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow}$ =	17.6	80.5	cfs

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

# INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.01 (April 2021)



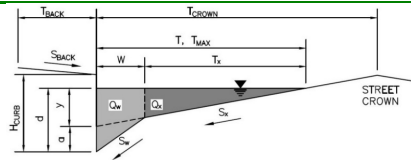
Design Information (Input)	MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a')	a <sub>LOCAL</sub> =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	L <sub>o</sub> =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W <sub>o</sub> =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C <sub>r-G</sub> =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C <sub>r-C</sub> =	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>				
Total Inlet Interception Capacity	Q =	0.7	0.7	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q <sub>b</sub> =	0.0	0.0	cfs
Capture Percentage = Q <sub>i</sub> /Q <sub>o</sub> =	C% =	100	101	%

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

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

Project: RIDGEGATE FILING NO. 3

Inlet ID: Ex Inlet D2



**Gutter Geometry:**

Maximum Allowable Width for Spread Behind Curb  
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)  
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK}$	=	19.0	ft
$S_{BACK}$	=	0.020	ft/ft
$n_{BACK}$	=	0.020	

Height of Curb at Gutter Flow Line  
 Distance from Curb Face to Street Crown  
 Gutter Width  
 Street Transverse Slope  
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)  
 Street Longitudinal Slope - Enter 0 for sump condition  
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB}$	=	6.00	inches
$T_{CROWN}$	=	48.0	ft
$W$	=	2.00	ft
$S_x$	=	0.020	ft/ft
$S_w$	=	0.083	ft/ft
$S_0$	=	0.006	ft/ft
$n_{STREET}$	=	0.016	

Max. Allowable Spread for Minor & Major Storm  
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm  
 Allow Flow Depth at Street Crown (check box for yes, leave blank for no)

	Minor Storm	Major Storm		
$T_{MAX}$	=	23.0	48.0	ft
$d_{MAX}$	=	6.0	10.6	inches
		<input type="checkbox"/>	<input type="checkbox"/>	

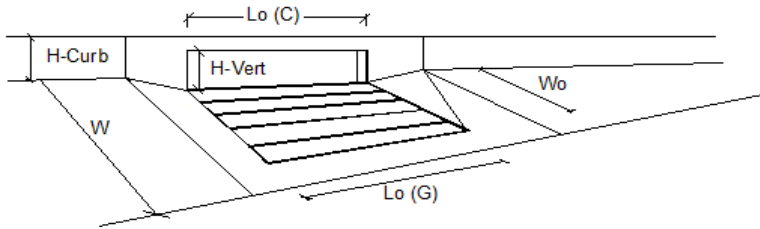
MINOR STORM Allowable Capacity is based on Depth Criterion  
 MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm		
$Q_{allow}$	=	10.7	74.3	cfs

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

# INLET ON A CONTINUOUS GRADE

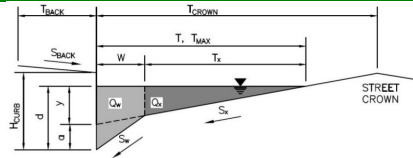
MHFD-Inlet, Version 5.01 (April 2021)



Design Information (Input)	MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>			
Total Inlet Interception Capacity	1.1	0.7	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	0.0	0.0	cfs
Capture Percentage = $Q_i/Q_o$ =	100	101	%

**ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)**  
 (Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

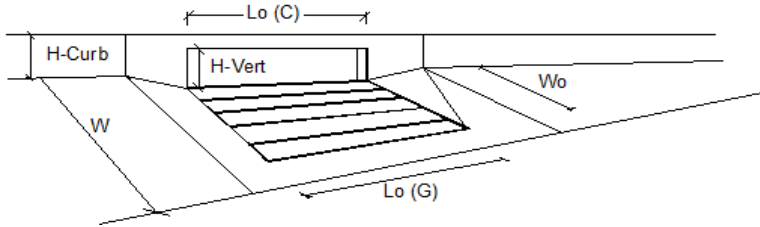
Project: RIDGEGATE FILING NO. 3  
 Inlet ID: Ex Inlet D5



<b>Gutter Geometry:</b>									
Maximum Allowable Width for Spread Behind Curb	$T_{BACK} = 19.0$ 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	$T_{CROWN} = 37.0$ ft								
Gutter Width	$W = 2.00$ ft								
Street Transverse Slope	$S_x = 0.005$ 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	$S_o = 0.013$ ft/ft								
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	$n_{STREET} = 0.016$								
Max. Allowable Spread for Minor & Major Storm	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>T_{MAX} =</math></td> <td>26.0</td> <td>37.0</td> <td>ft</td> </tr> </table>		Minor Storm	Major Storm		$T_{MAX} =$	26.0	37.0	ft
	Minor Storm	Major Storm							
$T_{MAX} =$	26.0	37.0	ft						
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>d_{MAX} =</math></td> <td>6.0</td> <td>10.6</td> <td>inches</td> </tr> </table>		Minor Storm	Major Storm		$d_{MAX} =$	6.0	10.6	inches
	Minor Storm	Major Storm							
$d_{MAX} =$	6.0	10.6	inches						
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)	<table border="1"> <tr> <td></td> <td>Minor Storm</td> <td>Major Storm</td> <td></td> </tr> <tr> <td><math>Q_{allow} =</math></td> <td>4.3</td> <td>9.9</td> <td>cfs</td> </tr> </table>		Minor Storm	Major Storm		$Q_{allow} =$	4.3	9.9	cfs
	Minor Storm	Major Storm							
$Q_{allow} =$	4.3	9.9	cfs						
MINOR STORM Allowable Capacity is based on Spread Criterion									
MAJOR STORM Allowable Capacity is based on Spread Criterion									
<p><b>Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'</b></p> <p><b>Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'</b></p>									

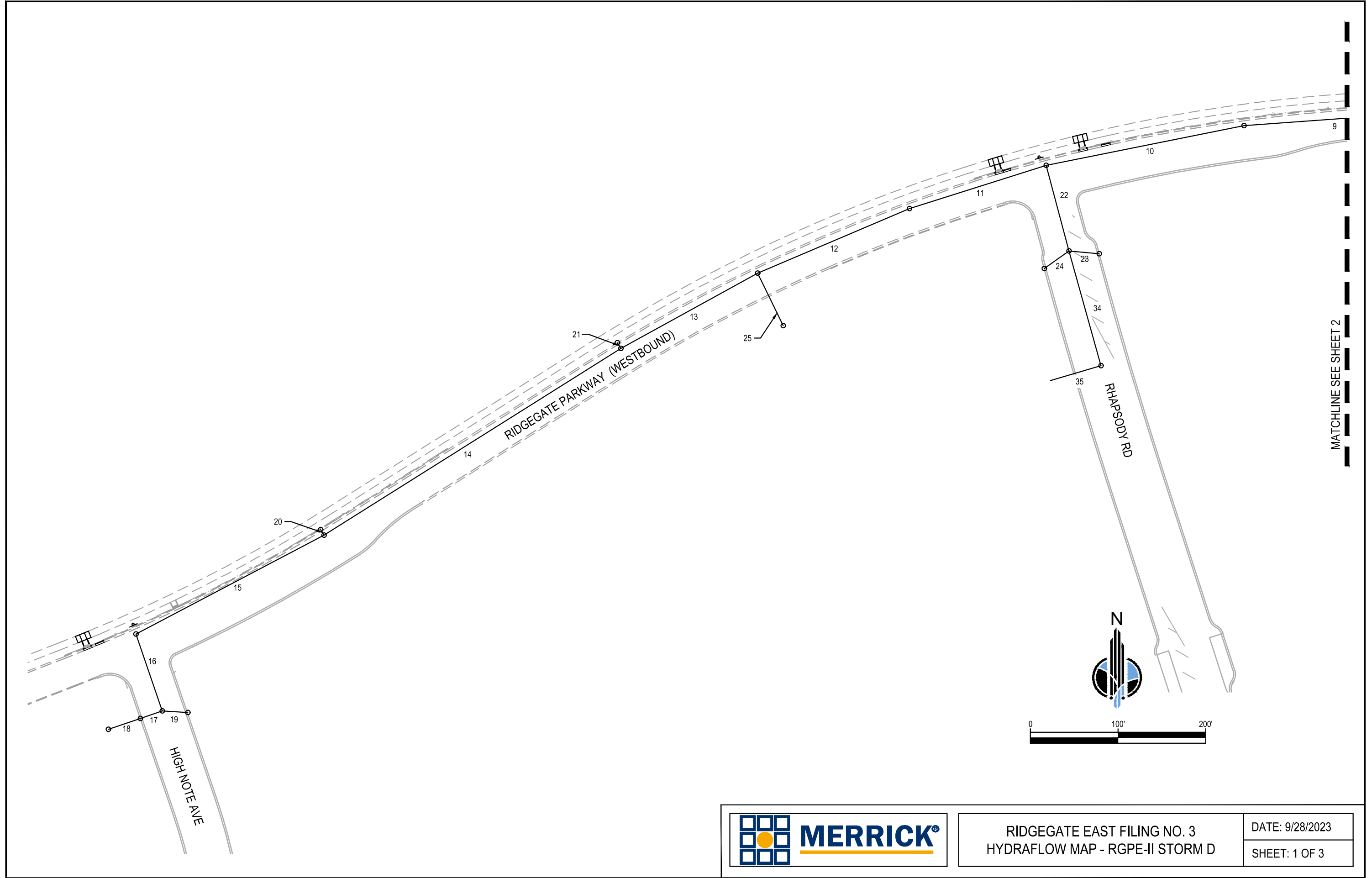
# INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.01 (April 2021)



Design Information (Input)	MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a')	$a_{LOCAL} =$	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)	$L_o =$	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	$W_o =$	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	$C_r-G =$	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	$C_r-C =$	0.10	0.10	
<b>Street Hydraulics: OK - Q &lt; Allowable Street Capacity</b>				
Total Inlet Interception Capacity	$Q =$	3.0	4.4	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)	$Q_o =$	0.0	1.1	cfs
Capture Percentage = $Q_o/Q_o =$	$C\% =$	99	81	%

## APPENDIX D – STORM SEWER CALCULATIONS



MATCHLINE SEE SHEET 2

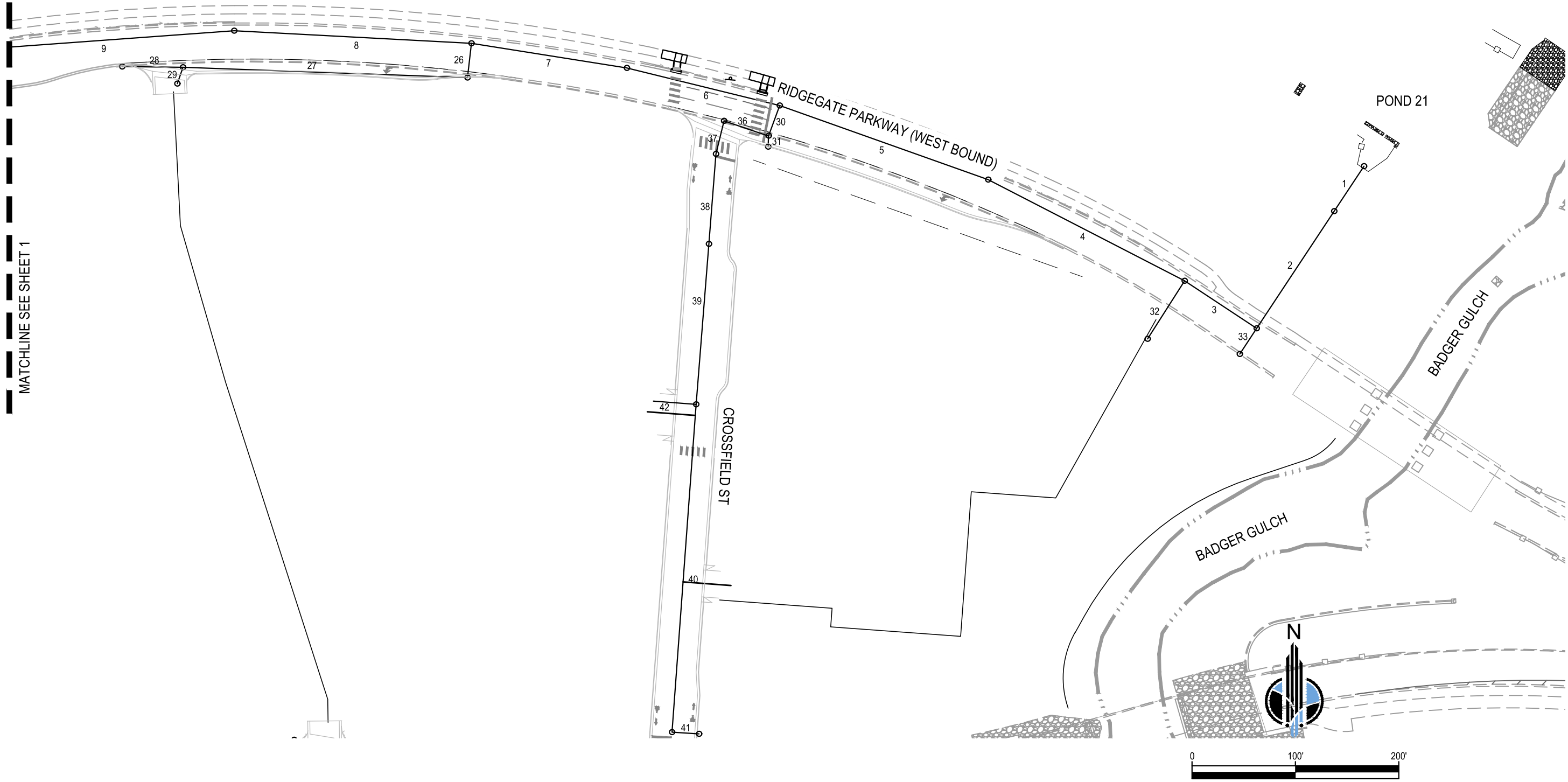


RIDGEGATE EAST FILING NO. 3  
HYDRAFLOW MAP - RGPE-II STORM D

DATE: 9/28/2023  
SHEET: 1 OF 3

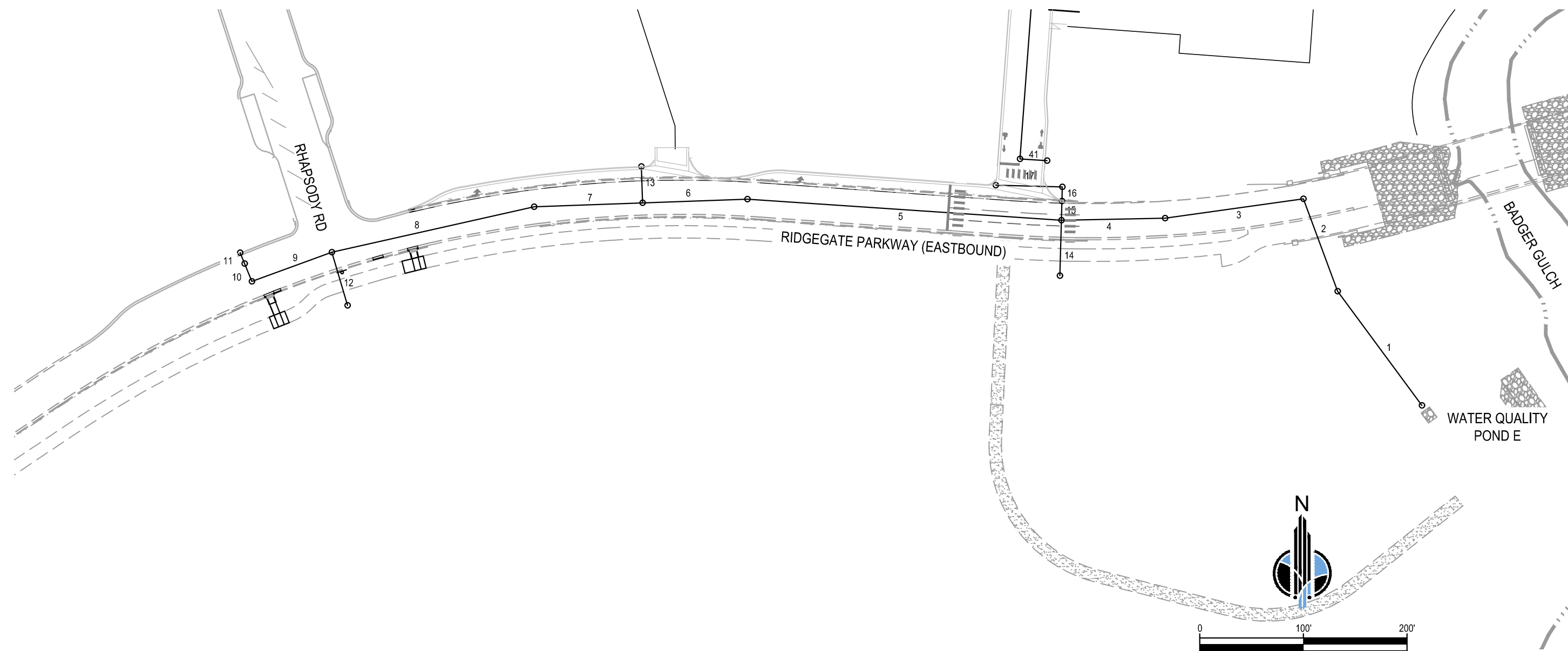


MATCHLINE SEE SHEET 1



RIDGEGATE EAST FILING NO. 3  
HYDRAFLOW MAP - RGPE-II STORM D

DATE: 9/28/2023  
SHEET: 2 OF 3



RIDGEGATE EAST FILING NO. 3  
 HYDRAFLOW MAP - RGPE-II STORM E

DATE: 9/28/2023  
 SHEET: 3 OF 3

# Report

Line No.	Line ID	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	Flow Rate (cfs)	Line Size (in)	Line Slope (%)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	HGL Dn (ft)	Vel Ave (ft/s)
1	EX D114	0.00	0.00	0.00	26.5	75.16	54	0.50	5953.74	5953.48	5973.34	5958.94	5958.04	5957.98	4.76
2	EX D113	0.00	0.00	0.00	26.0	75.93	54	2.00	5965.23	5962.51	5984.60	5973.34	5967.77	5964.12	11.54
3	EX D112	0.00	0.00	0.00	25.8	74.24	48	1.00	5974.14	5973.31	5985.00	5984.60	5976.75	5975.35	10.03
4	EX D111	0.00	0.00	0.00	25.1	63.67	48	1.43	5977.39	5974.34	5988.89	5985.00	5979.80	5976.75	8.07
5	EX D110	0.00	0.00	0.00	24.5	64.62	48	3.61	5985.31	5977.59	5997.01	5988.89	5987.73	5979.80	8.60
6	EX D109	0.00	0.00	0.00	20.3	64.75	42	4.76	5992.92	5985.67	6004.42	5997.01	5995.44	5987.73	9.85
7	EX D108	0.00	0.00	0.00	19.9	65.40	42	4.59	6000.11	5993.12	6011.94	6004.42	6002.64	5995.44	9.22
8	EX D107	0.00	0.00	0.00	19.2	50.35	42	1.00	6002.60	6000.31	6019.33	6011.94	6004.82 j	6002.64	7.62
9	EX D106	0.00	0.00	0.00	18.5	51.34	42	1.00	6005.11	6002.80	6023.25	6019.33	6007.35	6004.82	8.42
10	EX D105	0.00	0.00	0.00	17.8	52.33	42	1.00	6007.61	6005.31	6025.00	6023.25	6009.87	6007.35	8.48
11	EX D104	0.00	0.00	0.00	16.7	17.62	36	1.00	6009.74	6008.11	6024.79	6025.00	6011.08 j	6009.87	4.92
12	EX D103	0.00	0.00	0.00	15.5	18.26	36	1.00	6011.83	6009.94	6023.43	6024.79	6013.20	6011.08	6.61
13	EX D102	0.00	0.00	0.00	14.3	17.35	36	1.00	6013.81	6012.03	6024.93	6023.43	6015.14	6013.20	6.27
14	EX D101	0.00	0.00	0.00	11.7	17.57	36	1.00	6018.01	6014.01	6029.02	6024.93	6019.35	6015.14	6.48
15	EX D100	0.00	0.00	0.00	10.0	15.25	30	1.00	6020.93	6018.51	6031.43	6029.02	6022.25	6019.57	6.78
16	EX PIPE D4/Z100	0.00	0.00	0.00	9.5	15.55	30	2.10	6023.08	6021.13	6033.43	6031.43	6024.41	6022.25	6.59
17	Z2	0.00	0.92	0.81	9.0	14.40	24	2.00	6023.81	6023.28	6033.74	6033.43	6025.18	6024.41	7.08
18	Z1	0.00	4.70	0.83	7.3	13.01	24	1.97	6024.77	6024.01	6034.01	6033.74	6026.07	6025.18	6.44
19	Z3	0.00	0.59	0.80	8.9	1.47	18	0.99	6023.57	6023.28	6033.54	6033.43	6024.02	6024.41	2.14
20	EX D2	0.00	1.48	0.79	11.6	3.28	18	8.00	6023.75	6023.15	6028.75	6029.02	6024.44	6023.49	7.60
21	EX D5	0.00	0.67	0.77	8.8	1.61	18	8.00	6019.89	6019.29	6024.89	6024.93	6020.37	6019.53	6.16
22	EX D8 PIPE/Y100	0.00	0.00	0.00	13.8	39.87	42	1.59	6013.10	6011.49	6023.83	6025.00	6015.06	6012.84	9.43
23	Y2	0.00	0.94	0.81	8.5	2.41	18	5.00	6016.83	6015.10	6023.66	6023.83	6017.42	6015.43	6.16

Project File: Storm D-5yr.stm

Number of lines: 42

Date: 9/28/2023

NOTES: \*\* Critical depth

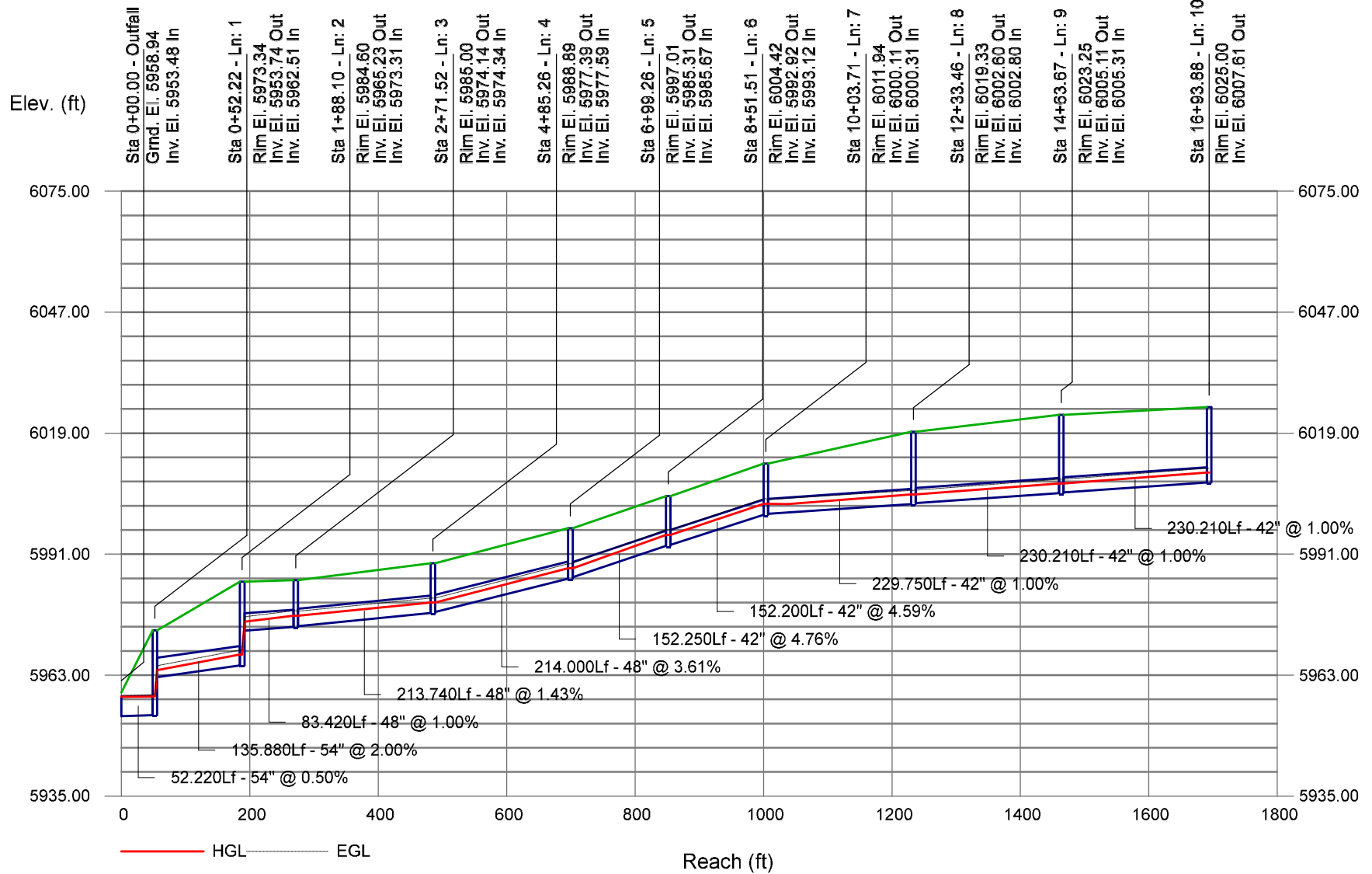
# Report

Line No.	Line ID	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	Flow Rate (cfs)	Line Size (in)	Line Slope (%)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim EI Up (ft)	Gnd/Rim EI Dn (ft)	HGL Up (ft)	HGL Dn (ft)	Vel Ave (ft/s)
24	Y1	0.00	1.00	0.80	7.8	2.61	30	4.97	6015.84	6014.10	6023.53	6023.83	6016.37 j	6015.06	2.48
25	EX D6	0.00	0.82	0.77	8.7	1.98	24	0.98	6013.08	6012.79	6022.72	6023.43	6013.57	6013.20	3.83
26	EX D10/X4	0.00	0.75	0.77	10.7	21.40	36	1.47	6001.30	6000.81	6011.61	6011.94	6002.79 j	6002.64	5.43
27	X101	0.00	0.00	0.00	9.6	20.55	30	2.06	6007.46	6001.80	6020.34	6011.61	6009.00	6002.82	8.70
28	X1	0.00	0.56	0.78	8.4	1.39	18	2.38	6009.86	6008.46	6021.56	6020.34	6010.30 j	6009.00	2.82
29	X100	0.00	7.68	0.83	7.5	21.07	30	1.79	6007.96	6007.66	6011.58	6020.34	6009.52	6009.00	7.21
30	W1	0.00	0.00	0.00	24.2	6.14	30	1.75	5986.79	5986.23	5996.93	5997.01	5987.61 j	5987.73	3.19
31	W2	0.00	1.11	0.76	7.4	2.80	18	2.87	5987.08	5986.79	5996.91	5996.93	5987.72 j	5987.61	3.39
32	EX D11	0.00	7.37	0.83	8.4	19.44	36	1.01	5976.01	5975.34	5984.00	5985.00	5977.42	5976.75	5.96
33	EX D13	0.00	1.41	0.78	11.0	3.15	18	7.93	5978.91	5976.53	5983.89	5984.60	5979.59	5976.86	7.49
34	Y101	0.00	0.00	0.00	13.2	36.54	42	0.60	6014.12	6013.30	6025.36	6023.83	6016.00	6015.06	7.25
35	D7-F	0.00	16.60	0.83	12.9	36.86	42	0.60	6014.58	6014.22	6023.57	6025.36	6016.46	6016.00	7.26
36	W3	0.00	0.00	0.00	23.9	4.53	24	2.43	5987.65	5986.54	5996.82	5996.93	5988.40 j	5987.61	3.44
37	W4	0.00	0.00	0.00	23.6	4.56	24	4.00	5989.12	5987.80	5999.63	5996.82	5989.87	5988.40	5.01
38	W5	0.00	0.00	0.00	23.0	4.63	24	6.22	5994.73	5989.32	6003.10	5999.63	5995.49	5989.87	5.42
39	W6	0.00	0.00	0.00	21.9	4.75	24	0.60	5995.86	5994.93	6009.77	6003.10	5996.63	5995.64	4.51
40	W7	0.00	0.00	0.00	7.1	1.08	24	0.60	5997.98	5996.07	6008.72	6009.77	5998.34 j	5996.63	2.17
41	W8	0.00	0.41	0.78	6.0	1.13	24	1.08	5998.16	5997.90	6008.23	6008.72	5998.53 j	5998.34	2.55
42	W9	0.00	2.39	0.83	5.7	7.14	18	2.00	5996.06	5995.23	6010.75	6009.77	5997.09 j	5996.63	4.83

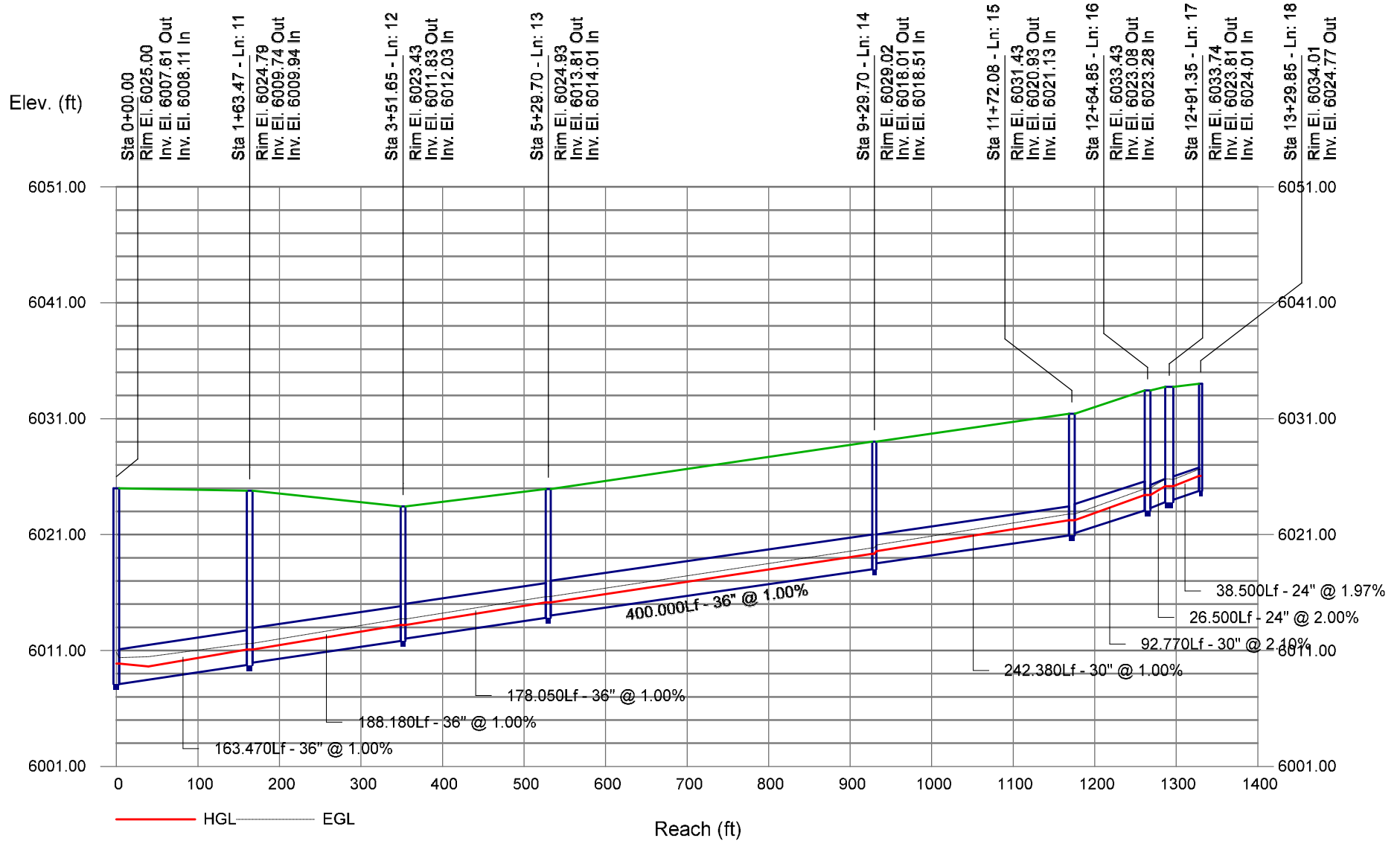
Project File: Storm D-5yr.stm	Number of lines: 42	Date: 9/28/2023
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NOTES: \*\* Critical depth

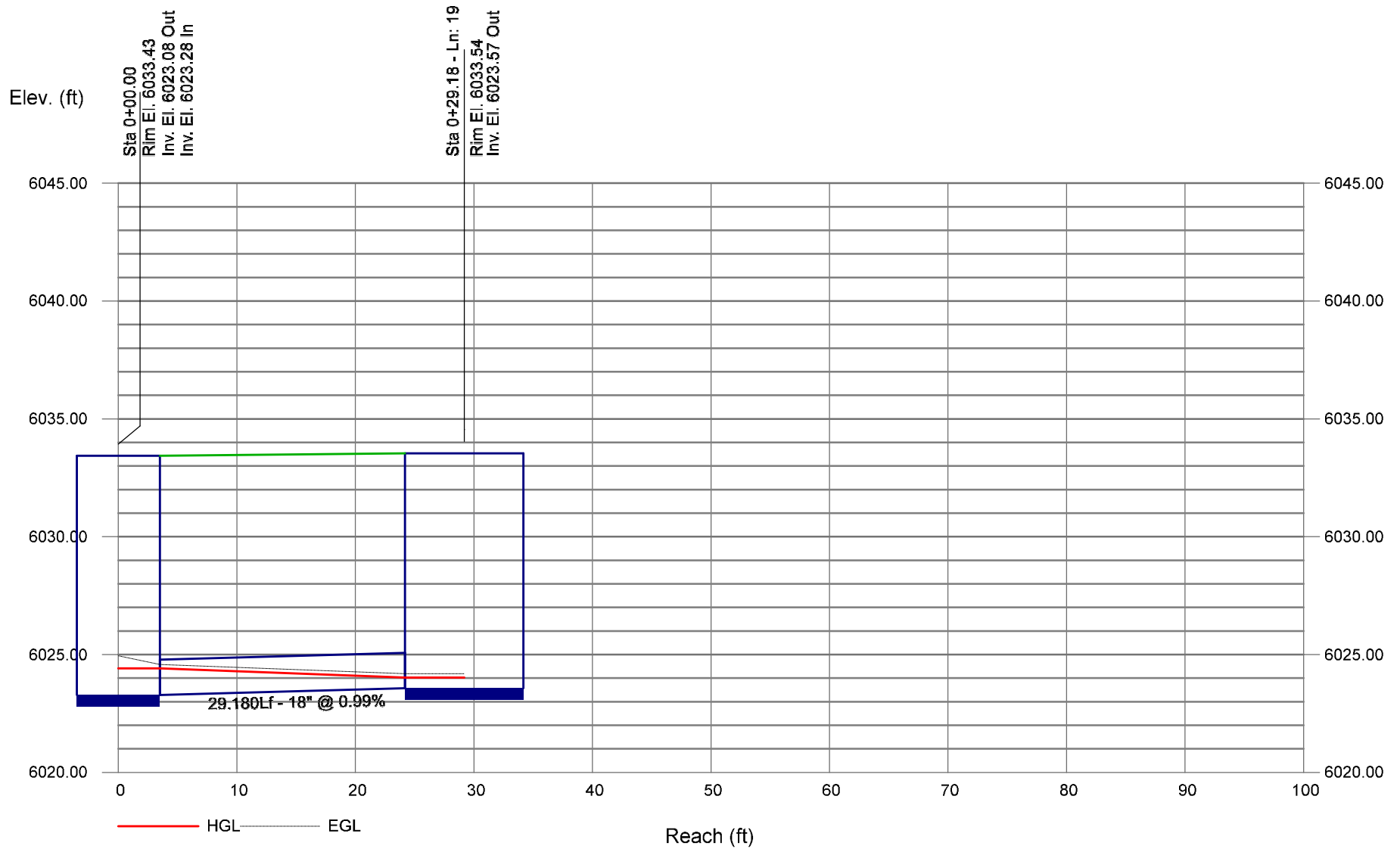
# Storm Sewer Profile



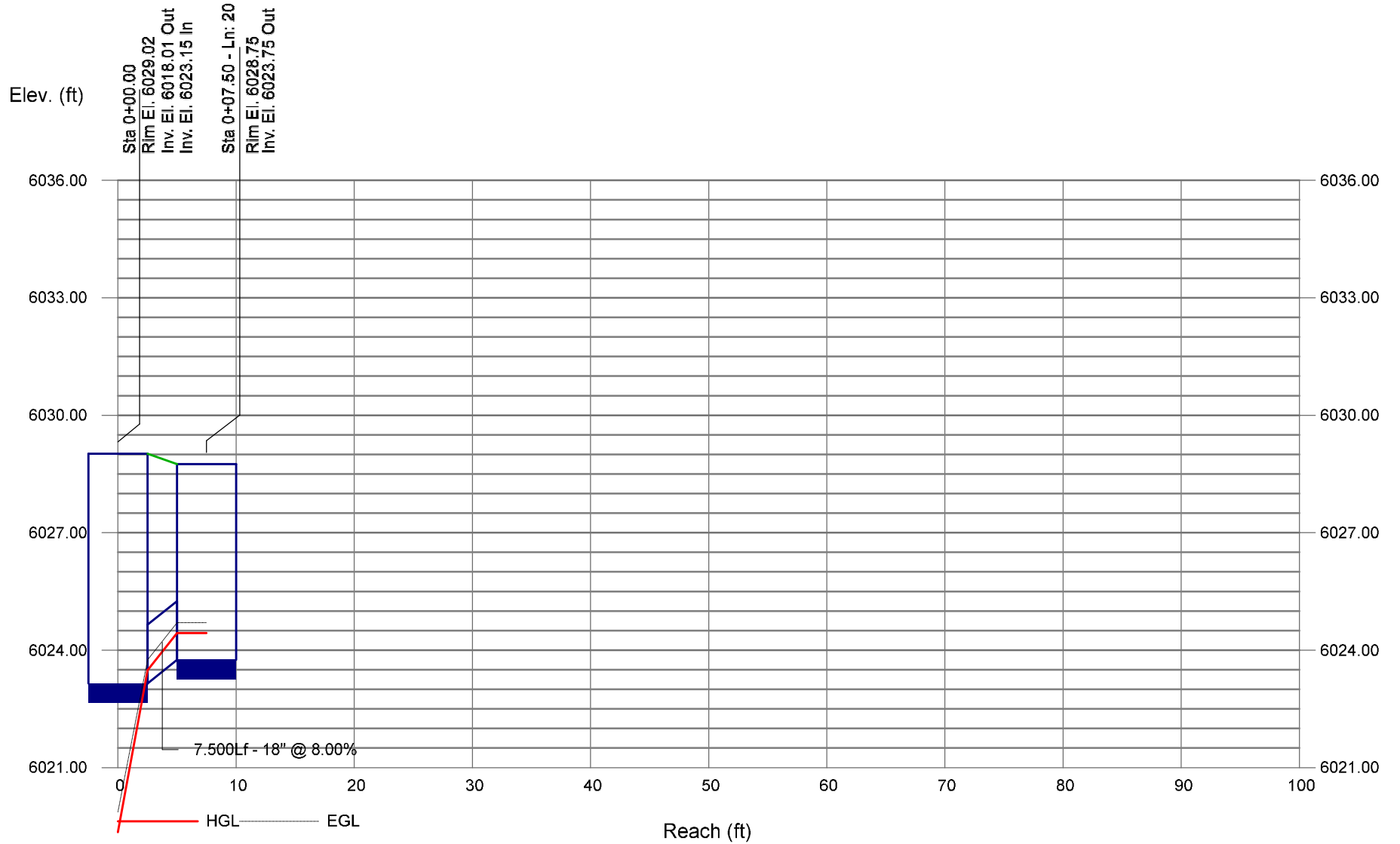
# Storm Sewer Profile



# Storm Sewer Profile

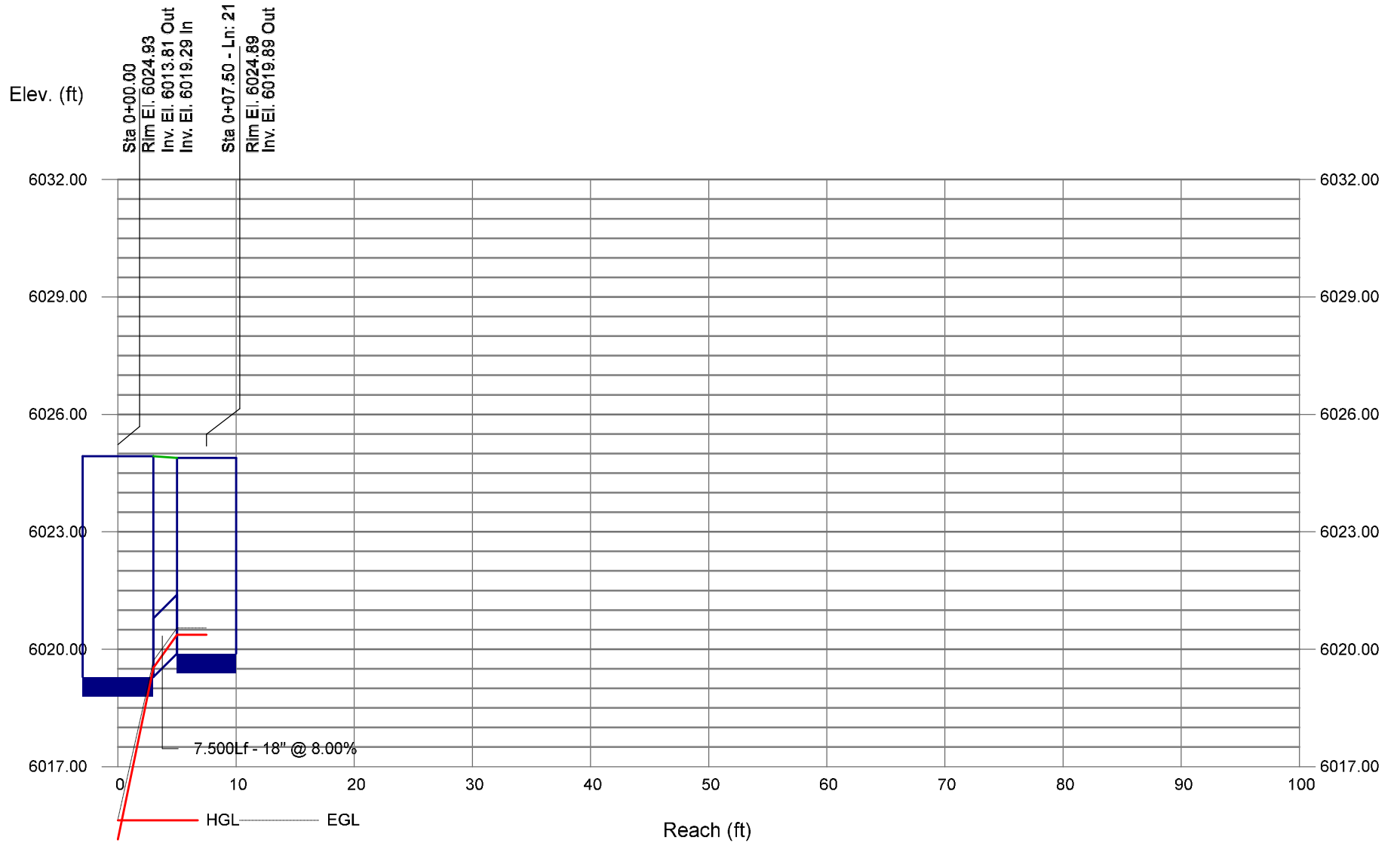


# Storm Sewer Profile

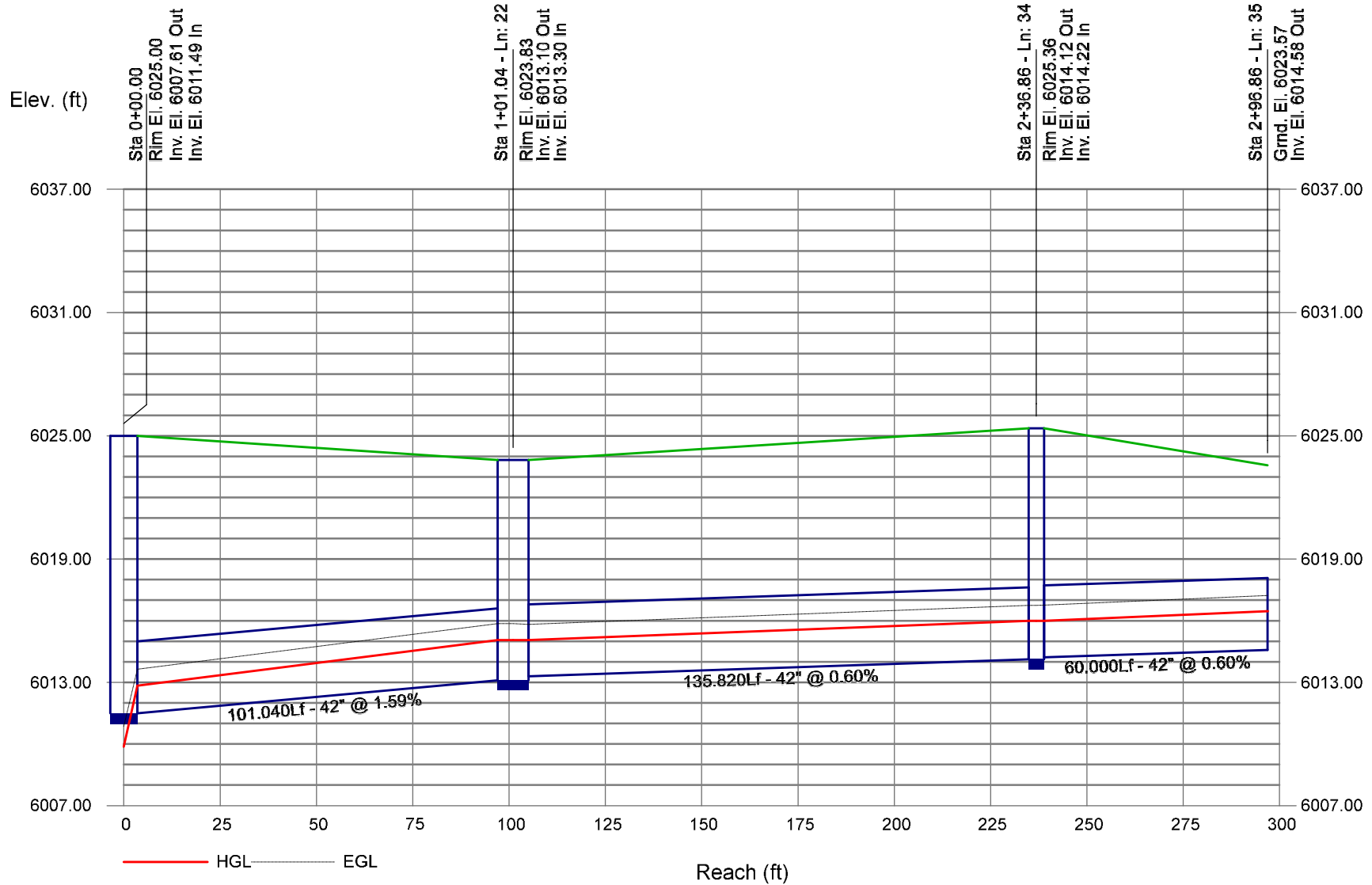




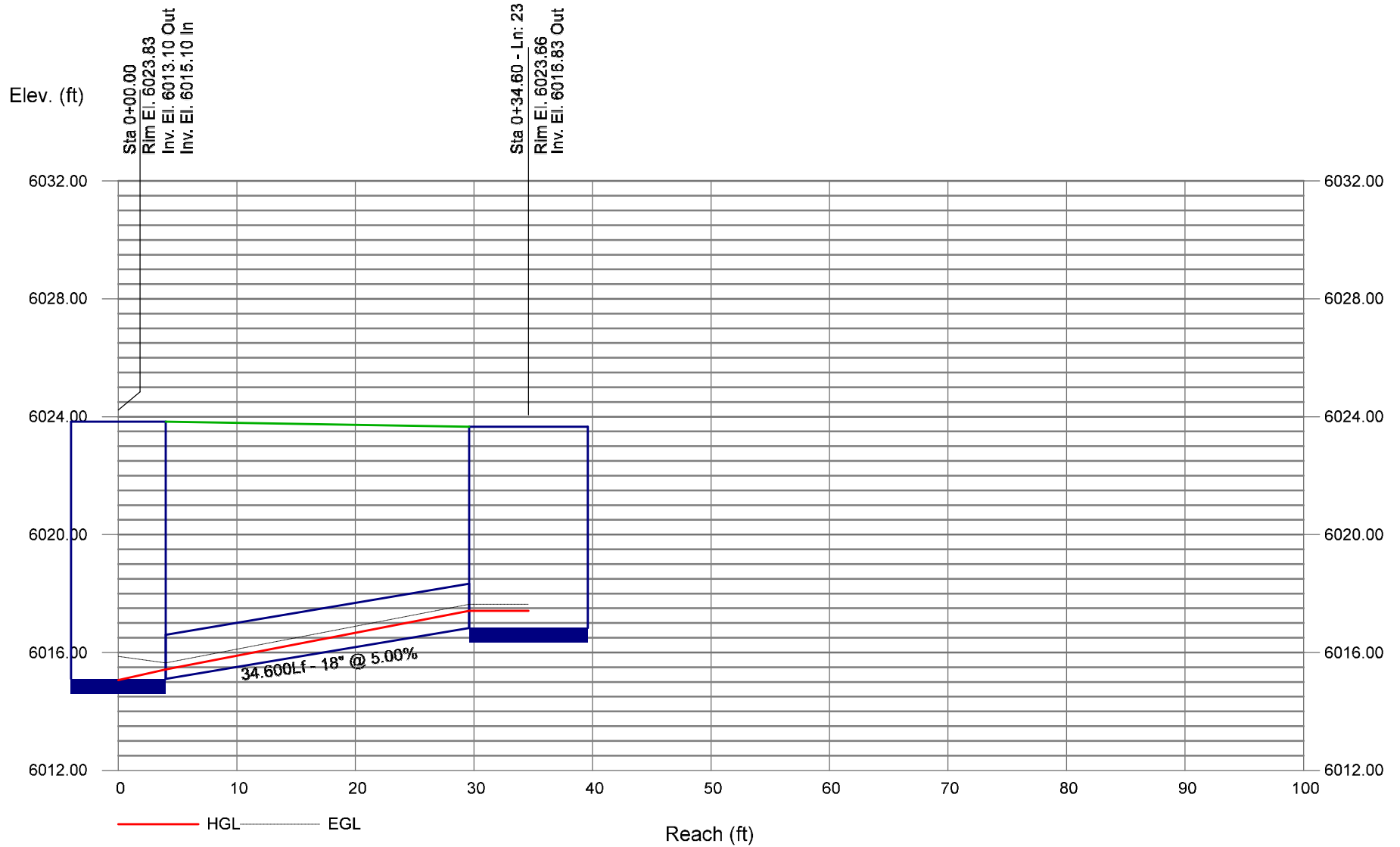
# Storm Sewer Profile



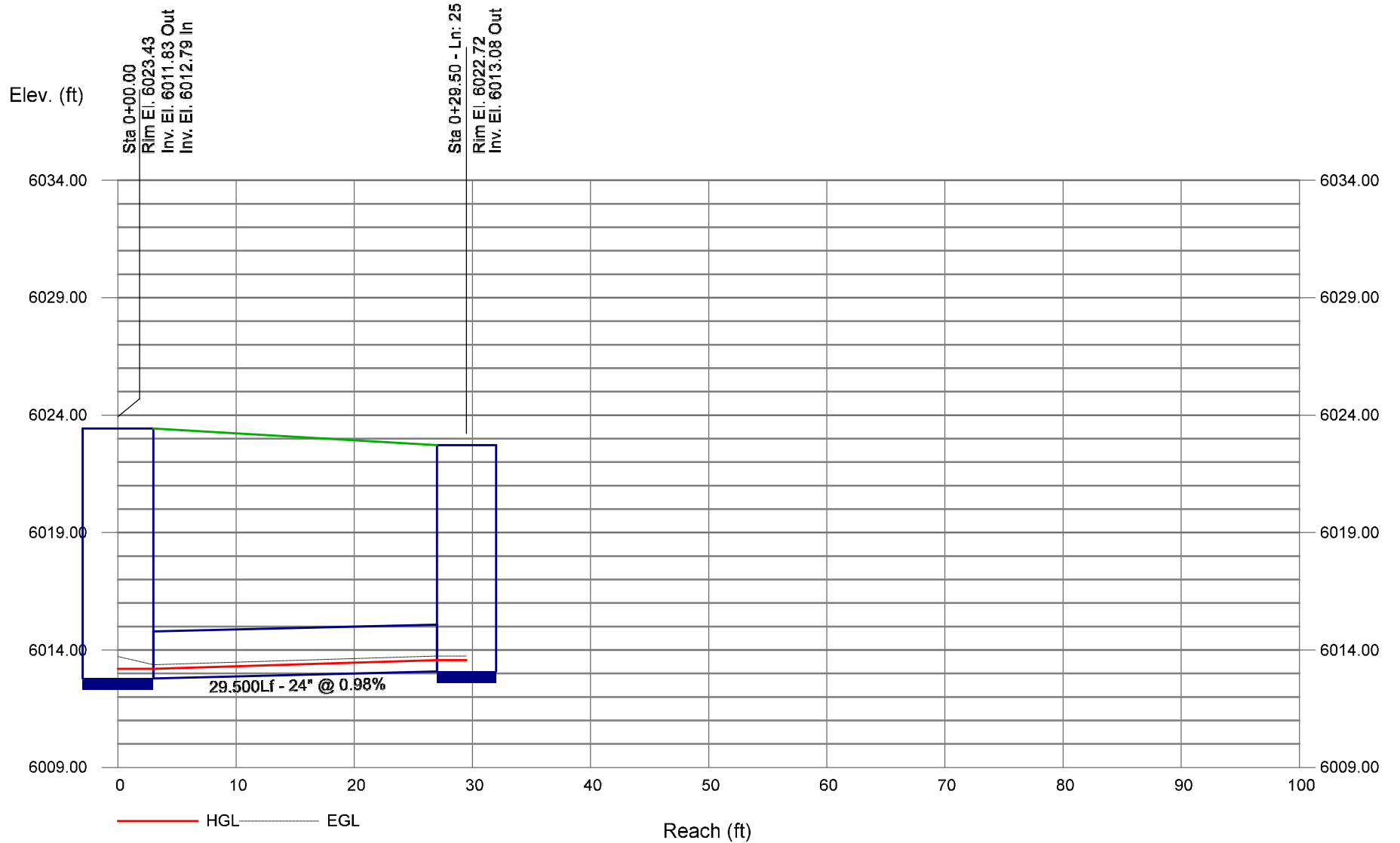
# Storm Sewer Profile



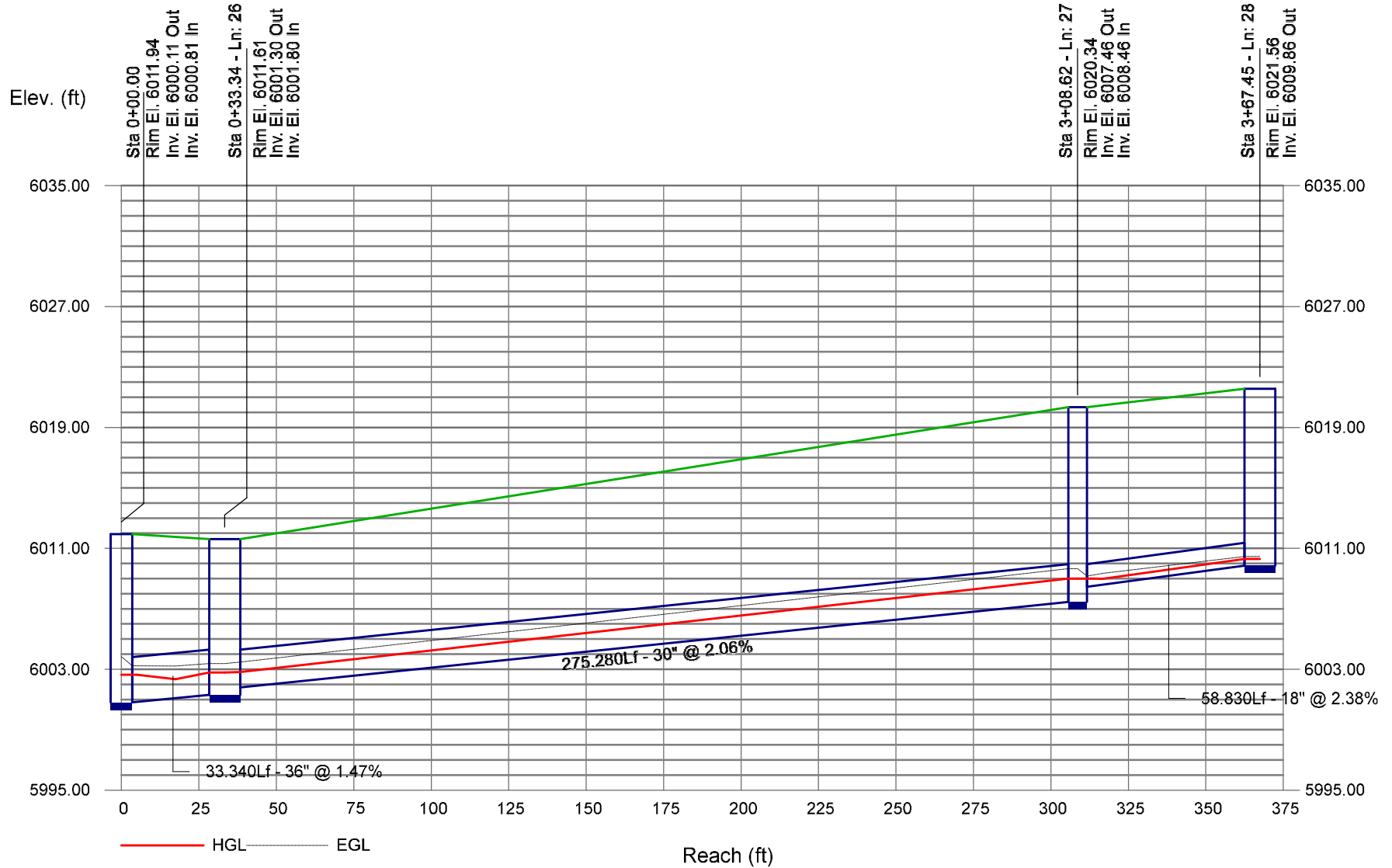
# Storm Sewer Profile



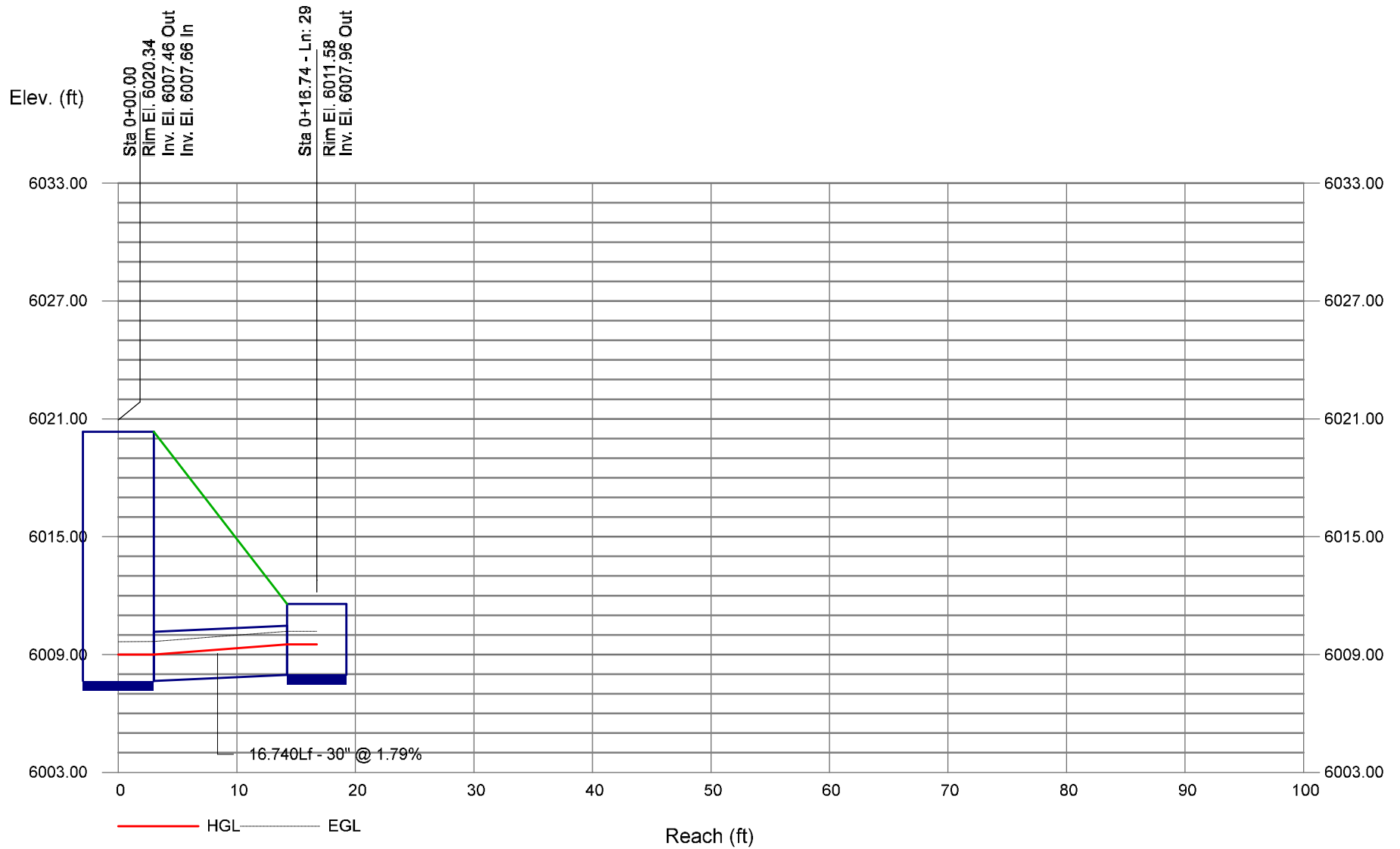
# Storm Sewer Profile



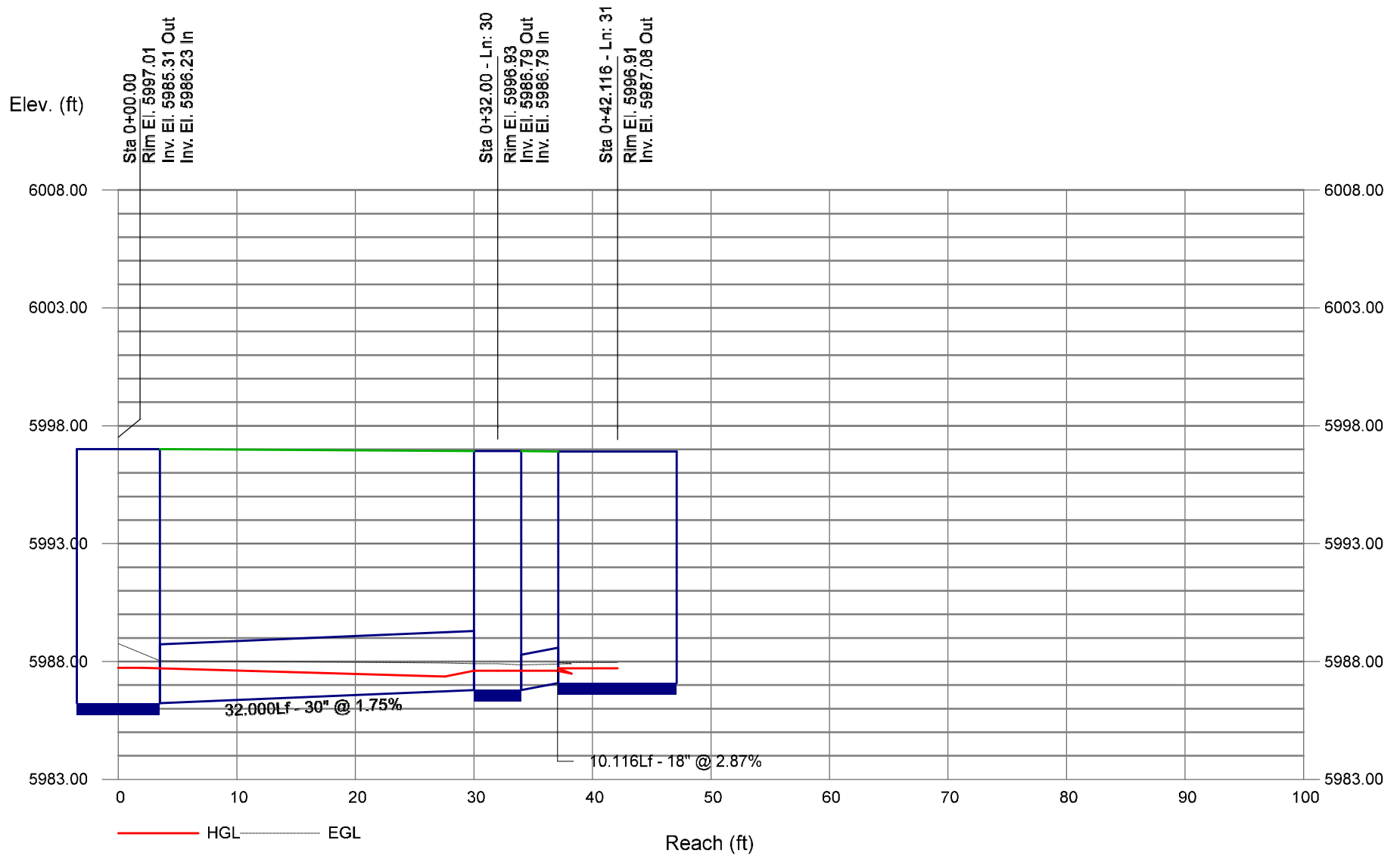
# Storm Sewer Profile



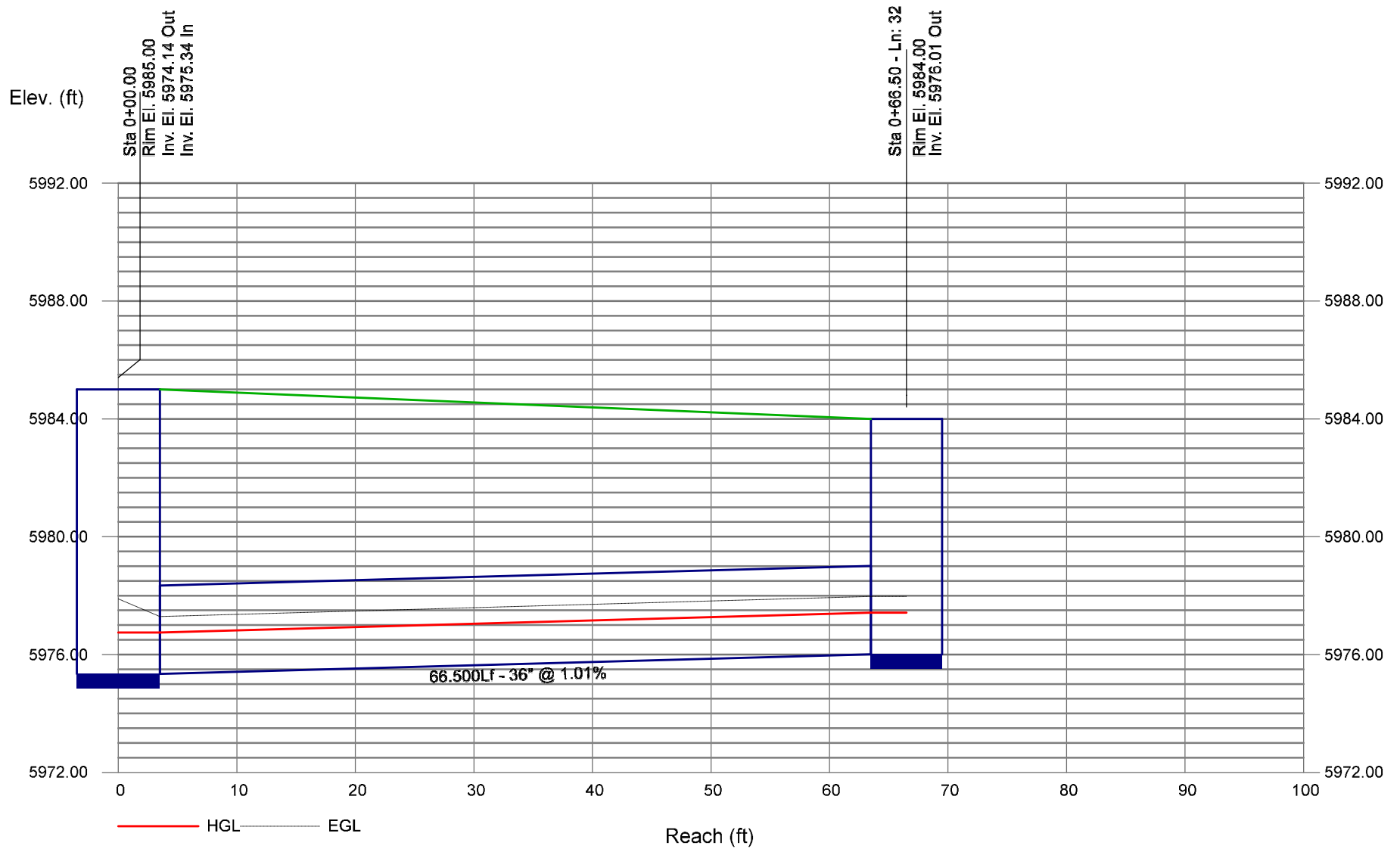
# Storm Sewer Profile



# Storm Sewer Profile

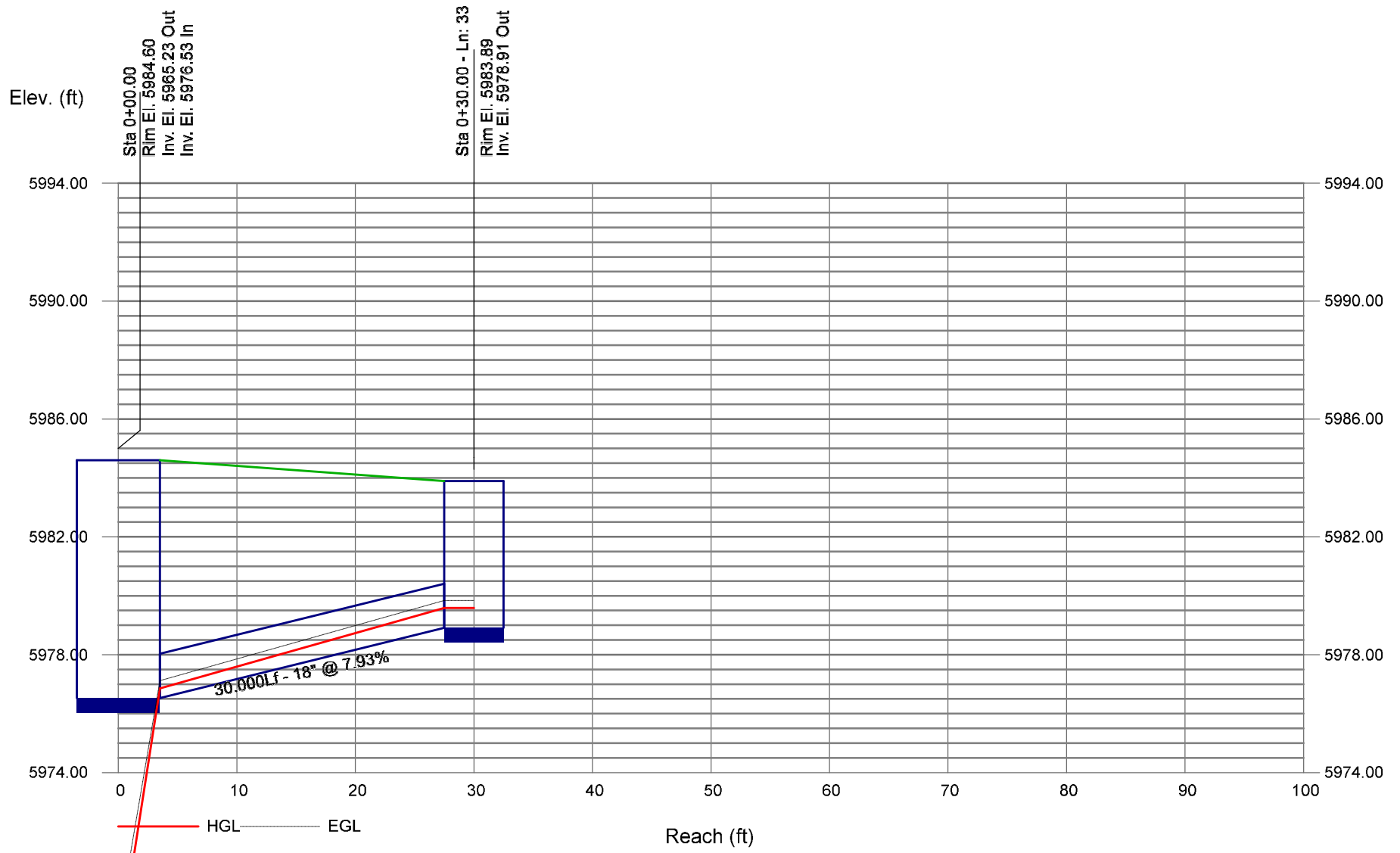


# Storm Sewer Profile

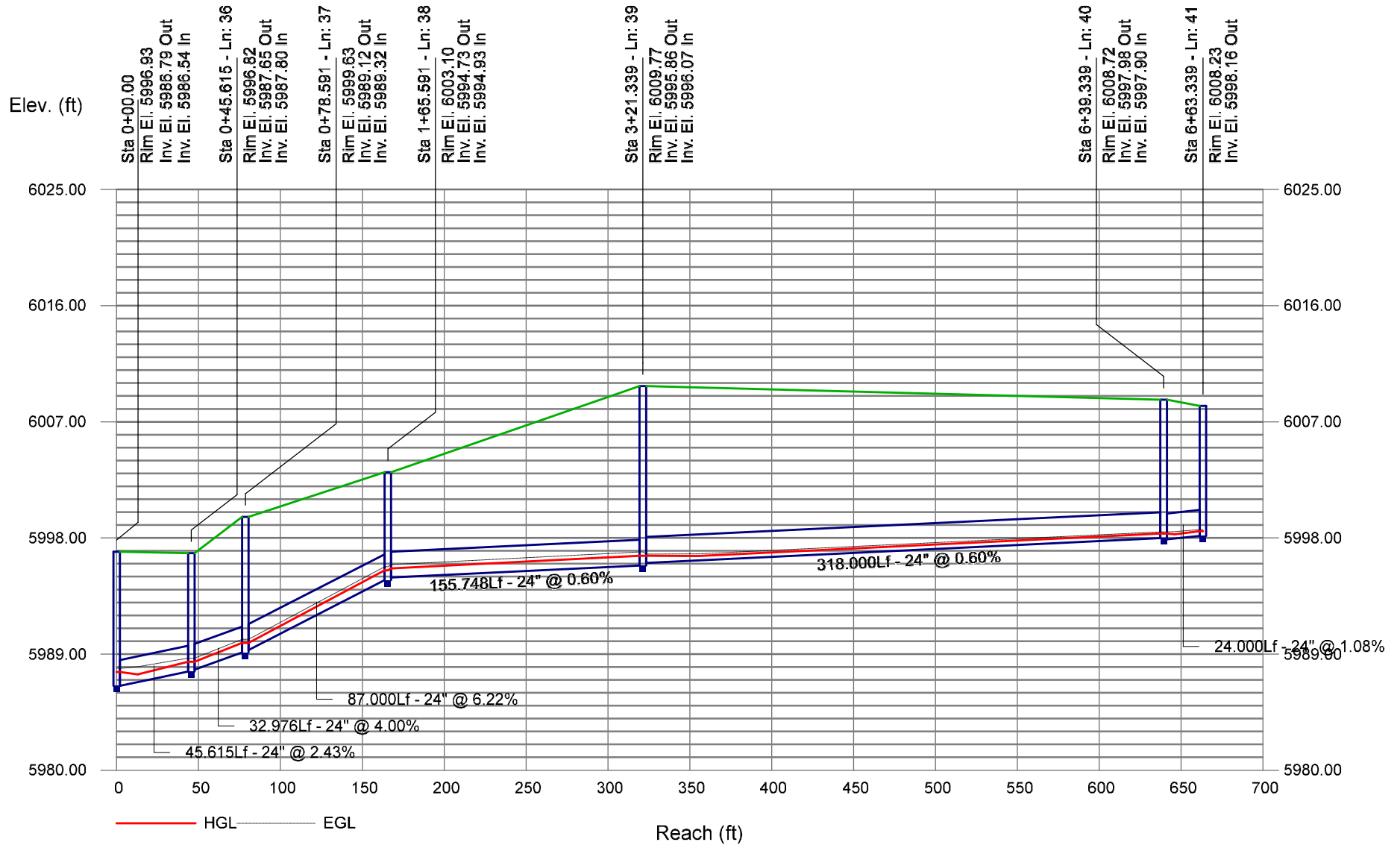




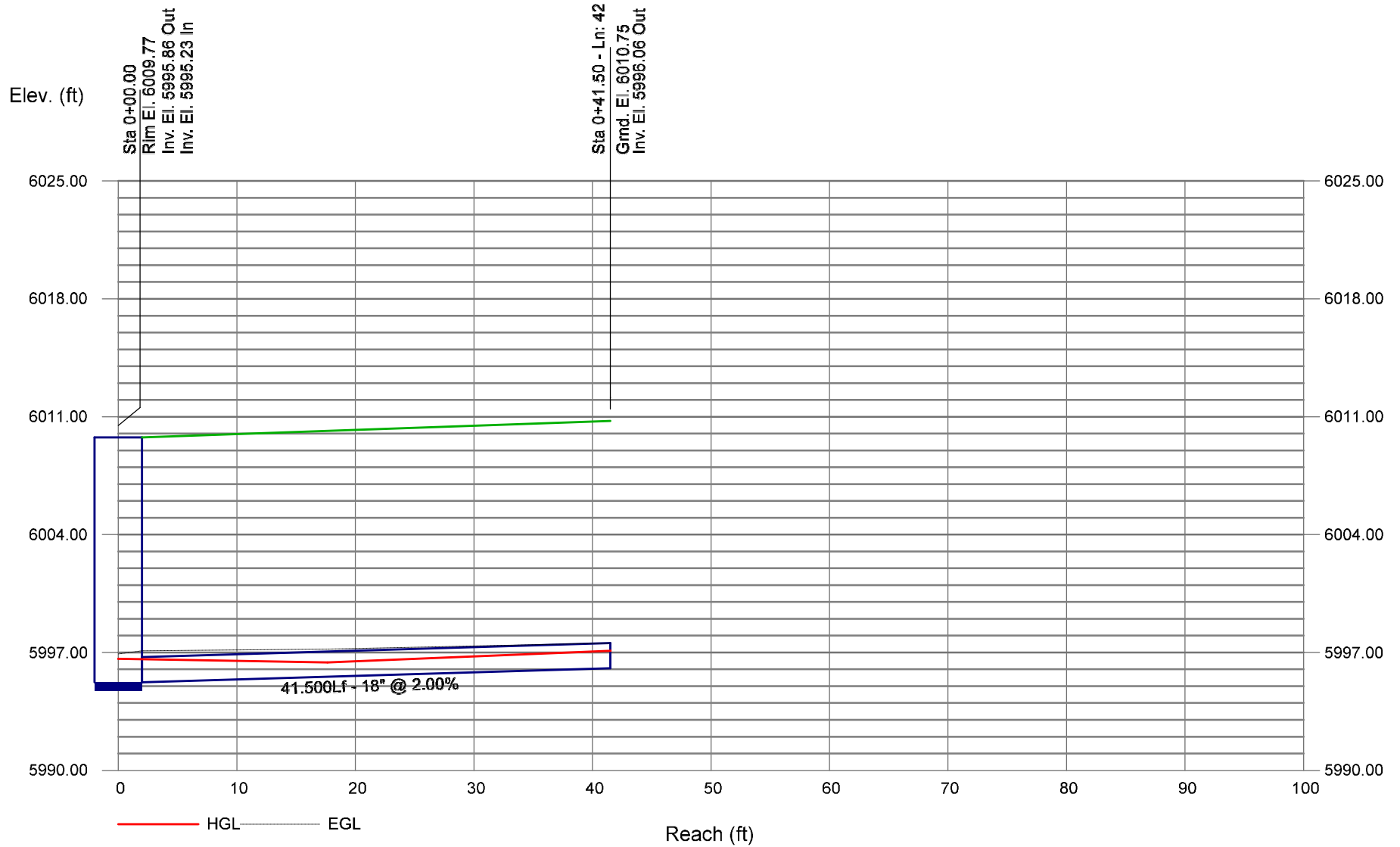
# Storm Sewer Profile



# Storm Sewer Profile



# Storm Sewer Profile



# Report

Line No.	Line ID	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	Flow Rate (cfs)	Line Size (in)	Line Slope (%)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	HGL Dn (ft)	Vel Ave (ft/s)
1	EX D114	0.00	0.00	0.00	17.0	196.64	54	0.50	5953.74	5953.48	5973.34	5958.94	5958.50	5957.98	12.37
2	EX D113	0.00	0.00	0.00	16.8	197.94	54	2.00	5965.23	5962.51	5984.60	5973.34	5969.25	5965.31	16.10
3	EX D112	0.00	0.00	0.00	16.7	193.20	48	1.00	5974.14	5973.31	5985.00	5984.60	5978.82	5977.31	15.38
4	EX D111	0.00	0.00	0.00	16.3	164.82	48	1.43	5977.39	5974.34	5988.89	5985.00	5985.31	5982.50	13.12
5	EX D110	0.00	0.00	0.00	16.0	166.41	48	3.61	5985.31	5977.59	5997.01	5988.89	5989.02	5985.74	13.47
6	EX D109	0.00	0.00	0.00	15.8	151.55	42	4.76	5992.92	5985.67	6004.42	5997.01	5996.31	5989.02	15.95
7	EX D108	0.00	0.00	0.00	15.6	152.41	42	4.59	6000.11	5993.12	6011.94	6004.42	6003.50	5996.31	16.27
8	EX D107	0.00	0.00	0.00	15.3	116.35	42	1.00	6002.60	6000.31	6019.33	6011.94	6006.88	6003.81	12.09
9	EX D106	0.00	0.00	0.00	14.9	117.61	42	1.00	6005.11	6002.80	6023.25	6019.33	6010.37	6007.23	12.23
10	EX D105	0.00	0.00	0.00	14.6	118.86	42	1.00	6007.61	6005.31	6025.00	6023.25	6013.94	6010.72	12.35
11	EX D104	0.00	0.00	0.00	14.1	39.45	36	1.00	6009.74	6008.11	6024.79	6025.00	6016.88	6016.31	5.58
12	EX D103	0.00	0.00	0.00	13.5	40.21	36	1.00	6011.83	6009.94	6023.43	6024.79	6017.64	6016.95	5.69
13	EX D102	0.00	0.00	0.00	12.9	37.52	36	1.00	6013.81	6012.03	6024.93	6023.43	6018.71	6018.14	5.31
14	EX D101	0.00	0.00	0.00	11.6	36.30	36	1.00	6018.01	6014.01	6029.02	6024.93	6020.23	6019.14	5.81
15	EX D100	0.00	0.00	0.00	9.4	32.17	30	1.00	6020.93	6018.51	6031.43	6029.02	6022.86 j	6020.88	7.30
16	EX PIPE D4/Z100	0.00	0.00	0.00	9.2	32.48	30	2.10	6023.08	6021.13	6033.43	6031.43	6025.02	6022.86	8.45
17	Z2	0.00	0.92	0.81	9.0	29.71	24	2.00	6023.81	6023.28	6033.74	6033.43	6025.67	6025.02	10.00
18	Z1	0.00	4.70	0.83	7.3	26.85	24	1.97	6024.77	6024.01	6034.01	6033.74	6026.57	6025.67	9.32
19	Z3	0.00	0.59	0.80	8.9	3.03	18	0.99	6023.57	6023.28	6033.54	6033.43	6025.04	6025.02	1.72
20	EX D2	0.00	1.48	0.79	11.6	6.76	18	8.00	6023.75	6023.15	6028.75	6029.02	6024.76	6023.64	9.48
21	EX D5	0.00	0.67	0.77	8.8	3.33	18	8.00	6019.89	6019.29	6024.89	6024.93	6020.58	6019.63	7.62
22	EX D8 PIPE/Y100	0.00	0.00	0.00	13.3	83.50	42	1.59	6013.10	6011.49	6023.83	6025.00	6017.01	6016.31	8.68
23	Y2	0.00	0.94	0.81	8.5	4.97	18	5.00	6016.83	6015.10	6023.66	6023.83	6018.18	6018.12	2.89

Project File: Storm D-100yr.stm

Number of lines: 42

Date: 9/28/2023

NOTES: \*\* Critical depth

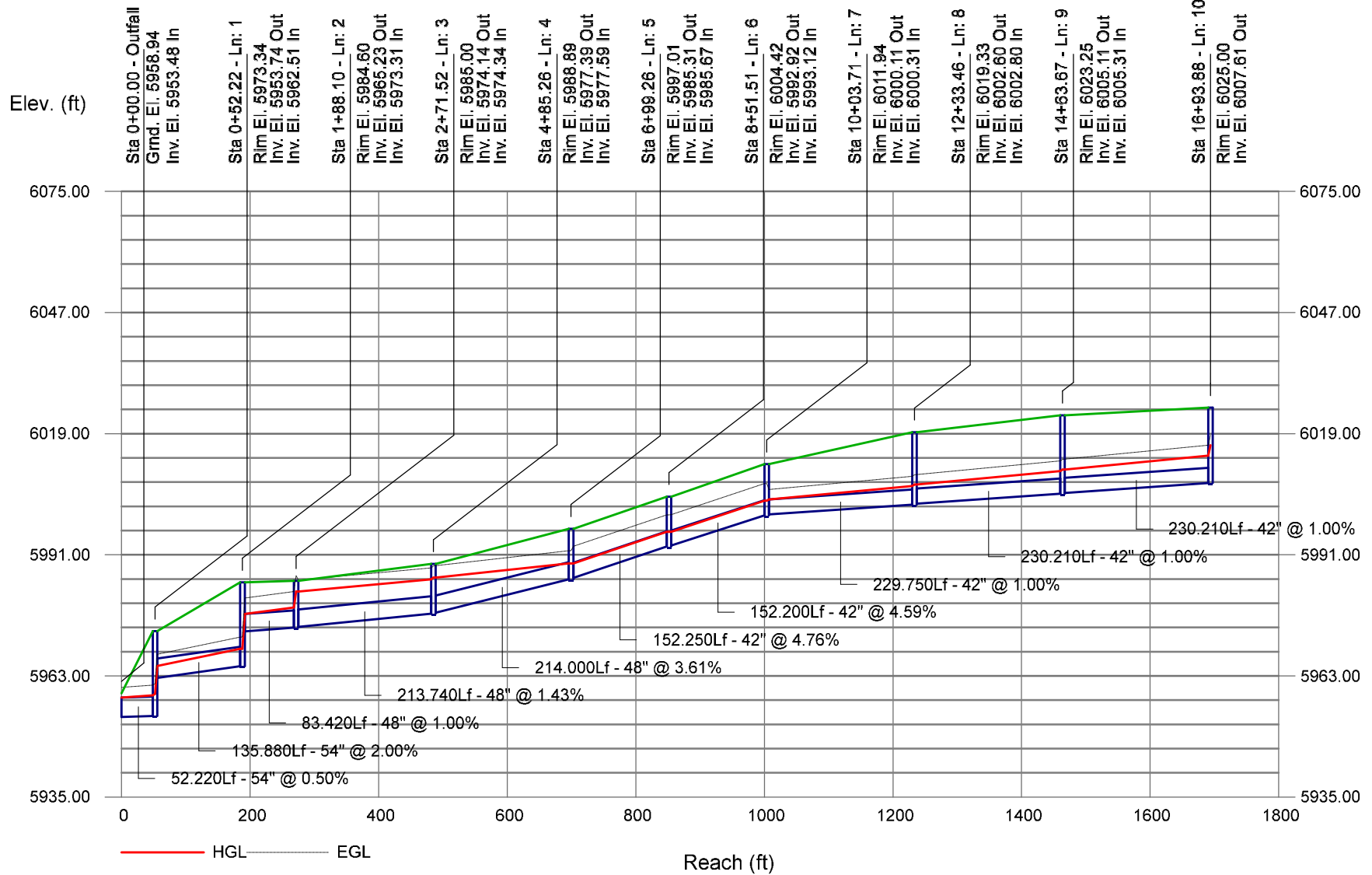
# Report

Line No.	Line ID	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	Flow Rate (cfs)	Line Size (in)	Line Slope (%)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim EI Up (ft)	Gnd/Rim EI Dn (ft)	HGL Up (ft)	HGL Dn (ft)	Vel Ave (ft/s)
24	Y1	0.00	1.00	0.80	7.8	5.38	30	4.97	6015.84	6014.10	6023.53	6023.83	6018.12	6018.12	1.12
25	EX D6	0.00	0.82	0.77	8.7	4.09	24	0.98	6013.08	6012.79	6022.72	6023.43	6018.15	6018.14	1.30
26	EX D10/X4	0.00	0.75	0.77	9.5	46.26	36	1.47	6001.30	6000.81	6011.61	6011.94	6003.51 j	6003.50	7.60
27	X101	0.00	0.00	0.00	9.0	43.54	30	2.06	6007.46	6001.80	6020.34	6011.61	6009.66	6003.51	10.83
28	X1	0.00	0.56	0.78	8.4	2.86	18	2.38	6009.86	6008.46	6021.56	6020.34	6010.50 j	6009.66	2.93
29	X100	0.00	7.68	0.83	7.5	43.48	30	1.79	6007.96	6007.66	6011.58	6020.34	6010.16	6009.66	9.93
30	W1	0.00	0.00	0.00	14.8	16.31	30	1.75	5986.79	5986.23	5996.93	5997.01	5989.04	5989.02	3.41
31	W2	0.00	1.11	0.76	7.4	5.78	18	2.87	5987.08	5986.79	5996.91	5996.93	5989.26	5989.23	3.27
32	EX D11	0.00	7.37	0.83	8.4	40.11	36	1.01	5976.01	5975.34	5984.00	5985.00	5982.74	5982.50	5.68
33	EX D13	0.00	1.41	0.78	11.0	6.50	18	7.93	5978.91	5976.53	5983.89	5984.60	5979.90	5977.01	9.35
34	Y101	0.00	0.00	0.00	13.0	75.74	42	0.60	6014.12	6013.30	6025.36	6023.83	6018.89	6018.12	7.87
35	D7-F	0.00	16.60	0.83	12.9	76.07	42	0.60	6014.58	6014.22	6023.57	6025.36	6020.20	6019.85	7.91
36	W3	0.00	0.00	0.00	14.7	12.00	24	2.43	5987.65	5986.54	5996.82	5996.93	5989.30	5989.23	4.08
37	W4	0.00	0.00	0.00	14.5	12.05	24	4.00	5989.12	5987.80	5999.63	5996.82	5990.37 j	5989.59	4.96
38	W5	0.00	0.00	0.00	14.2	12.17	24	6.22	5994.73	5989.32	6003.10	5999.63	5995.98	5990.37	6.60
39	W6	0.00	0.00	0.00	13.7	12.38	24	0.60	5995.86	5994.93	6009.77	6003.10	5997.12	5996.17	5.98
40	W7	0.00	0.00	0.00	6.5	2.28	24	0.60	5997.98	5996.07	6008.72	6009.77	5998.51 j	5997.12	2.41
41	W8	0.00	0.41	0.78	6.0	2.34	24	1.08	5998.16	5997.90	6008.23	6008.72	5998.69 j	5998.51	3.21
42	W9	0.00	2.39	0.83	5.7	14.74	18	2.00	5996.06	5995.23	6010.75	6009.77	5997.94	5997.12	8.34

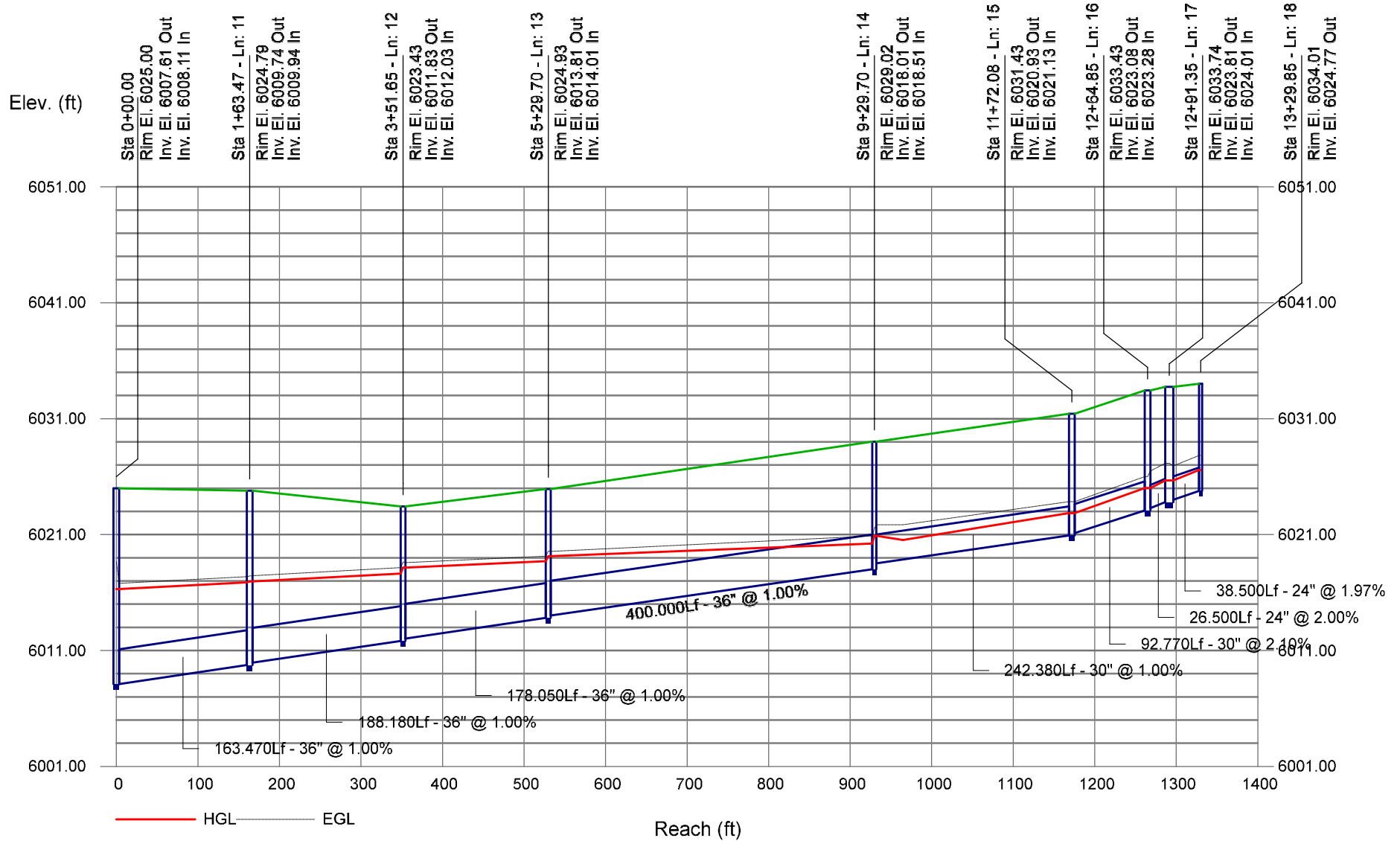
Project File: Storm D-100yr.stm	Number of lines: 42	Date: 9/28/2023
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NOTES: \*\* Critical depth

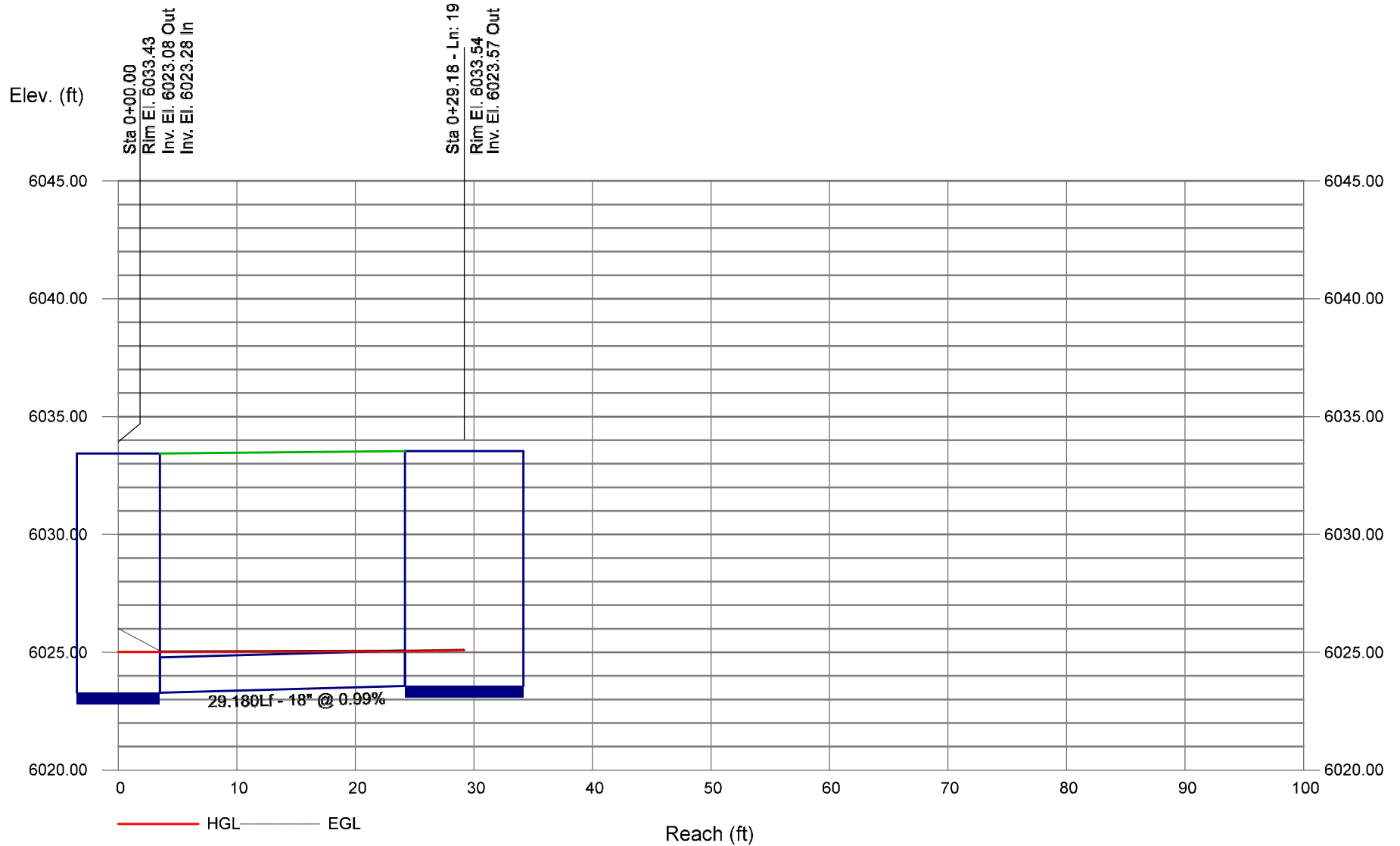
# Storm Sewer Profile



# Storm Sewer Profile

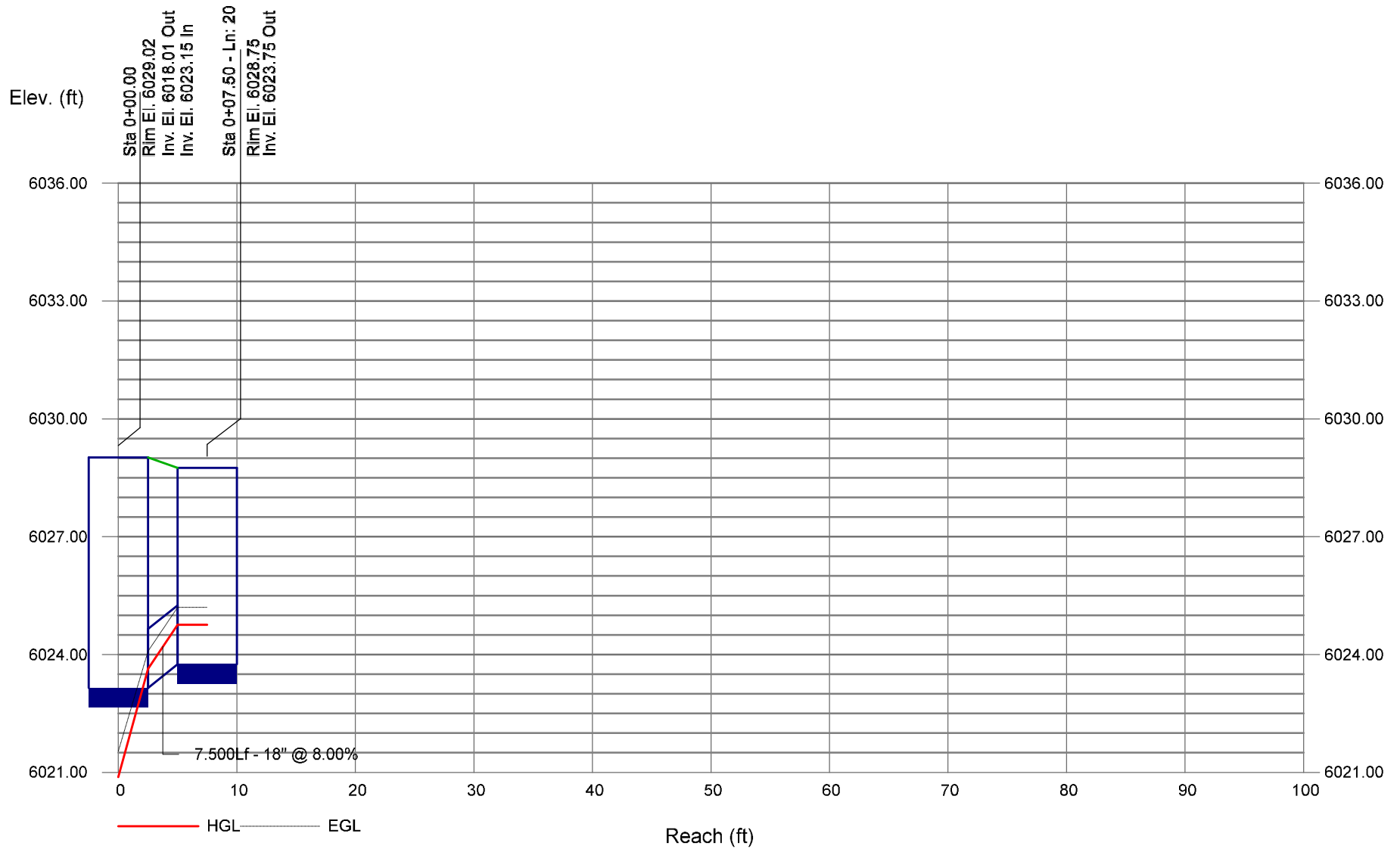


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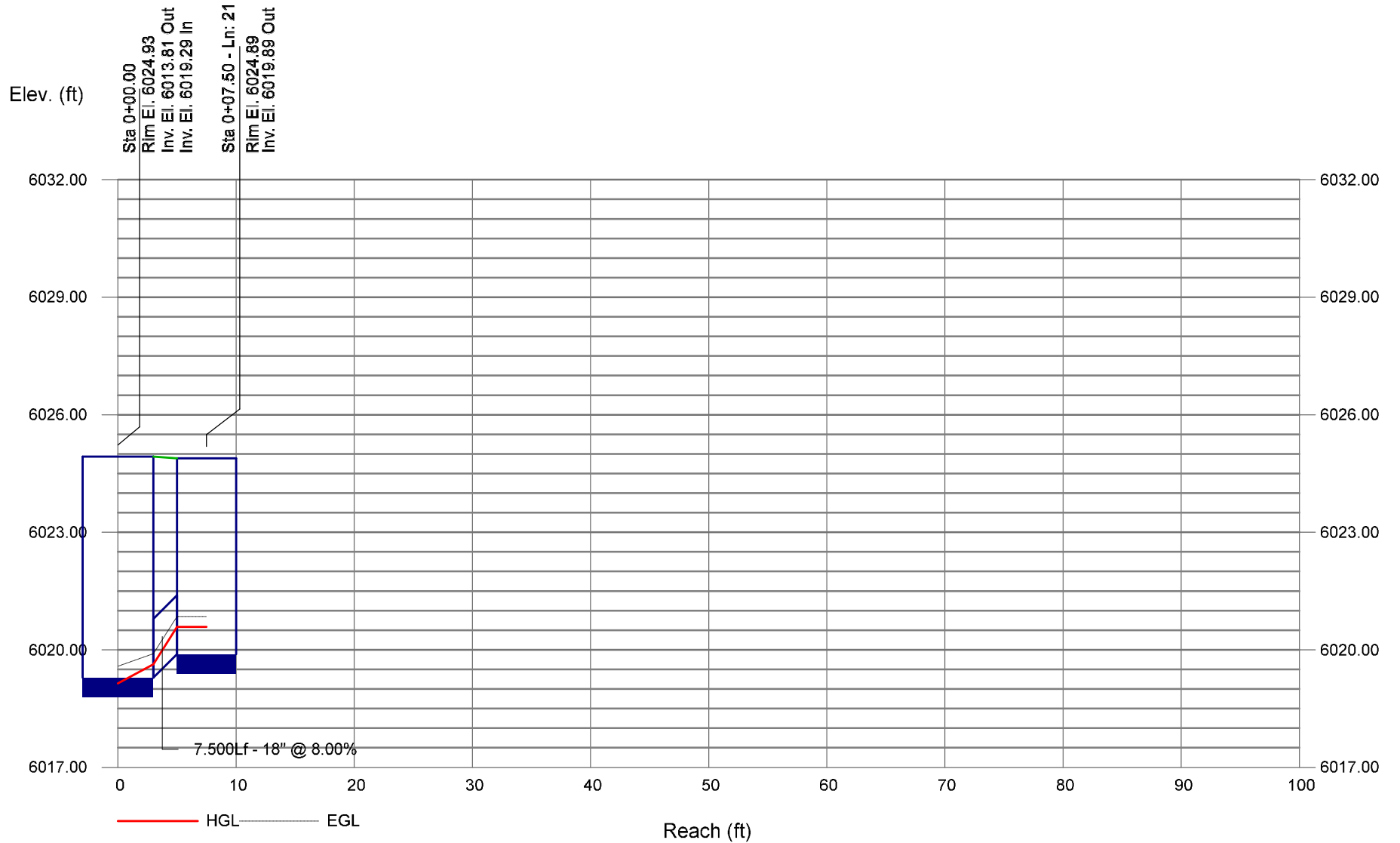




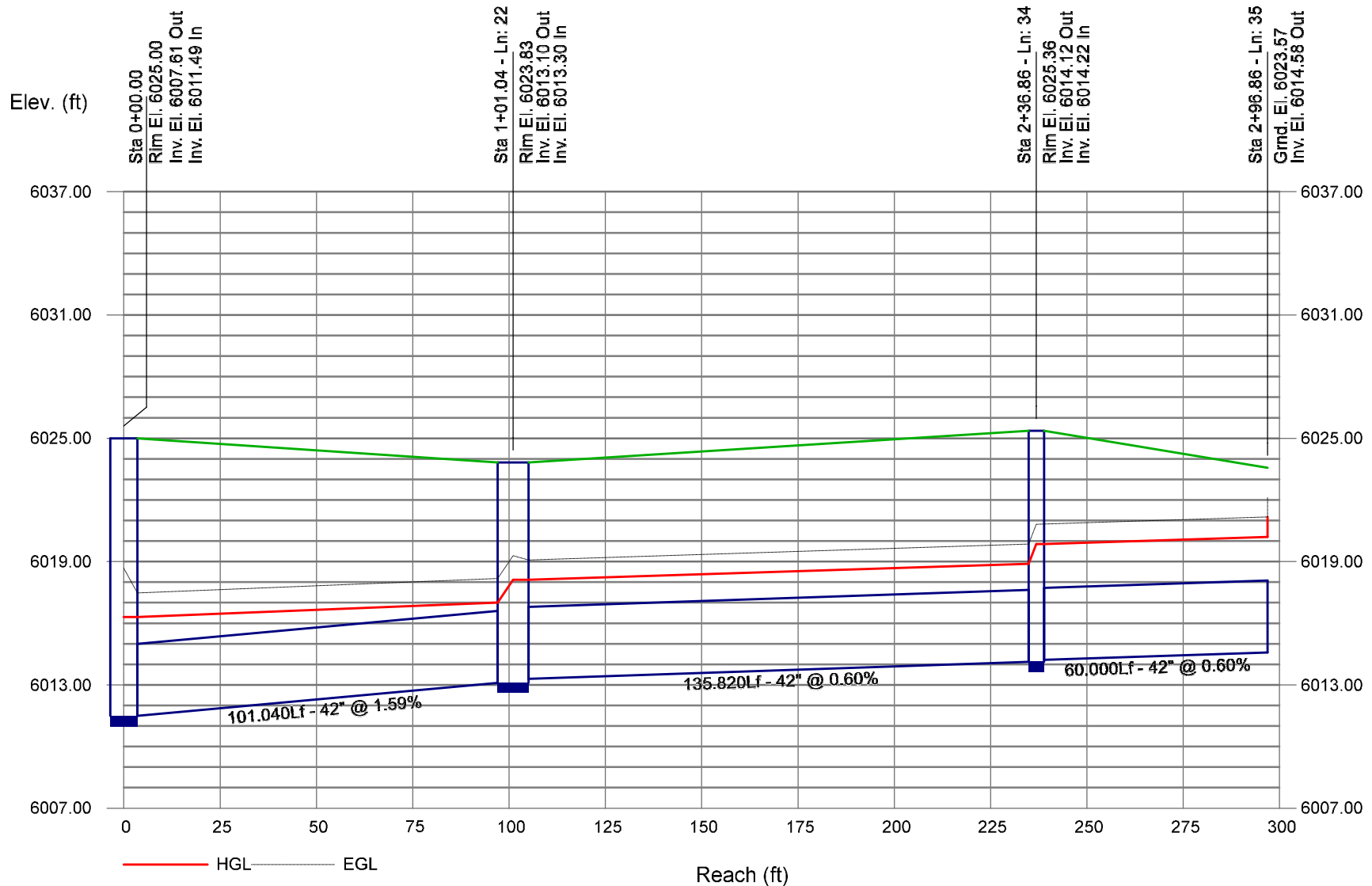
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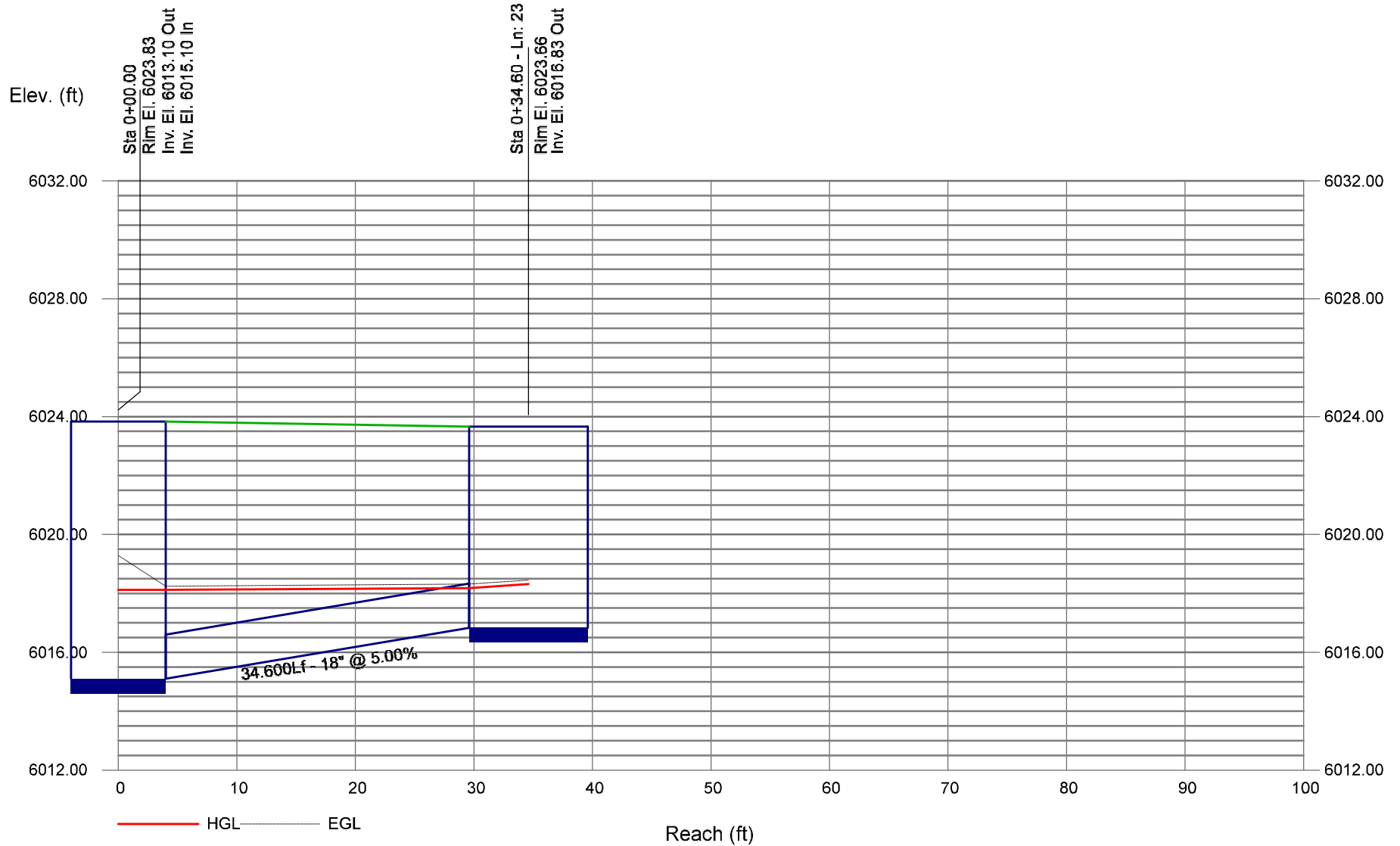
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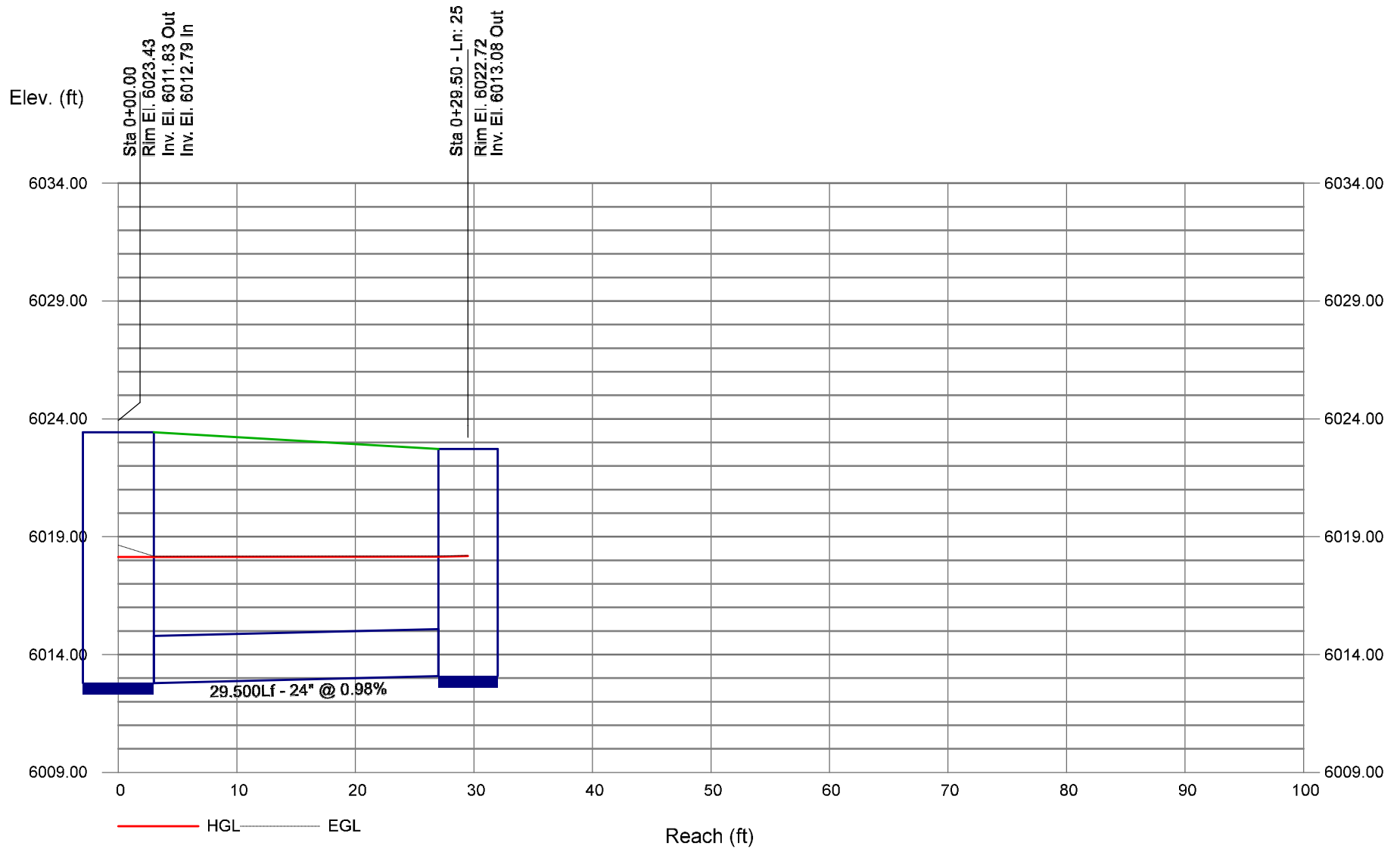
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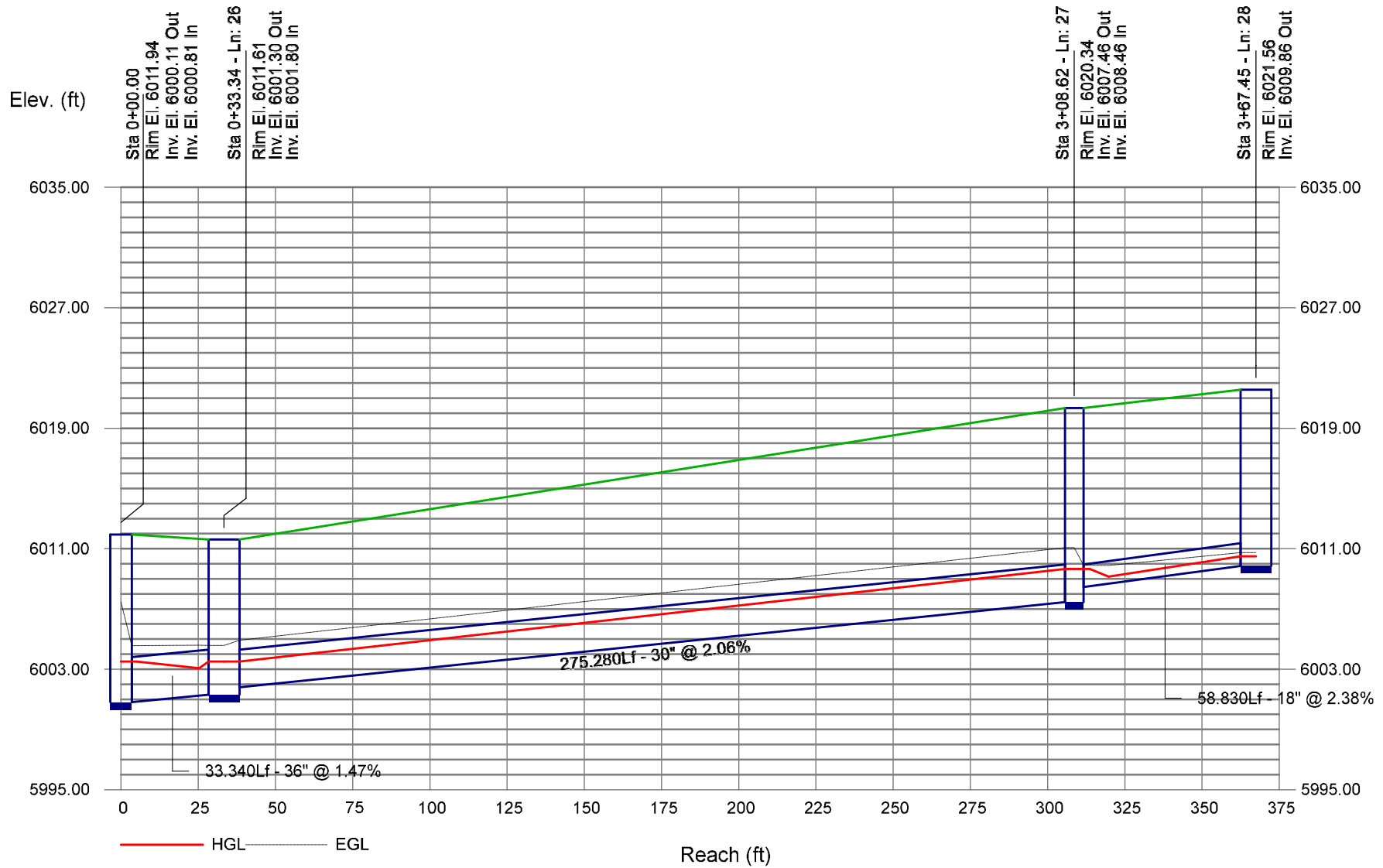
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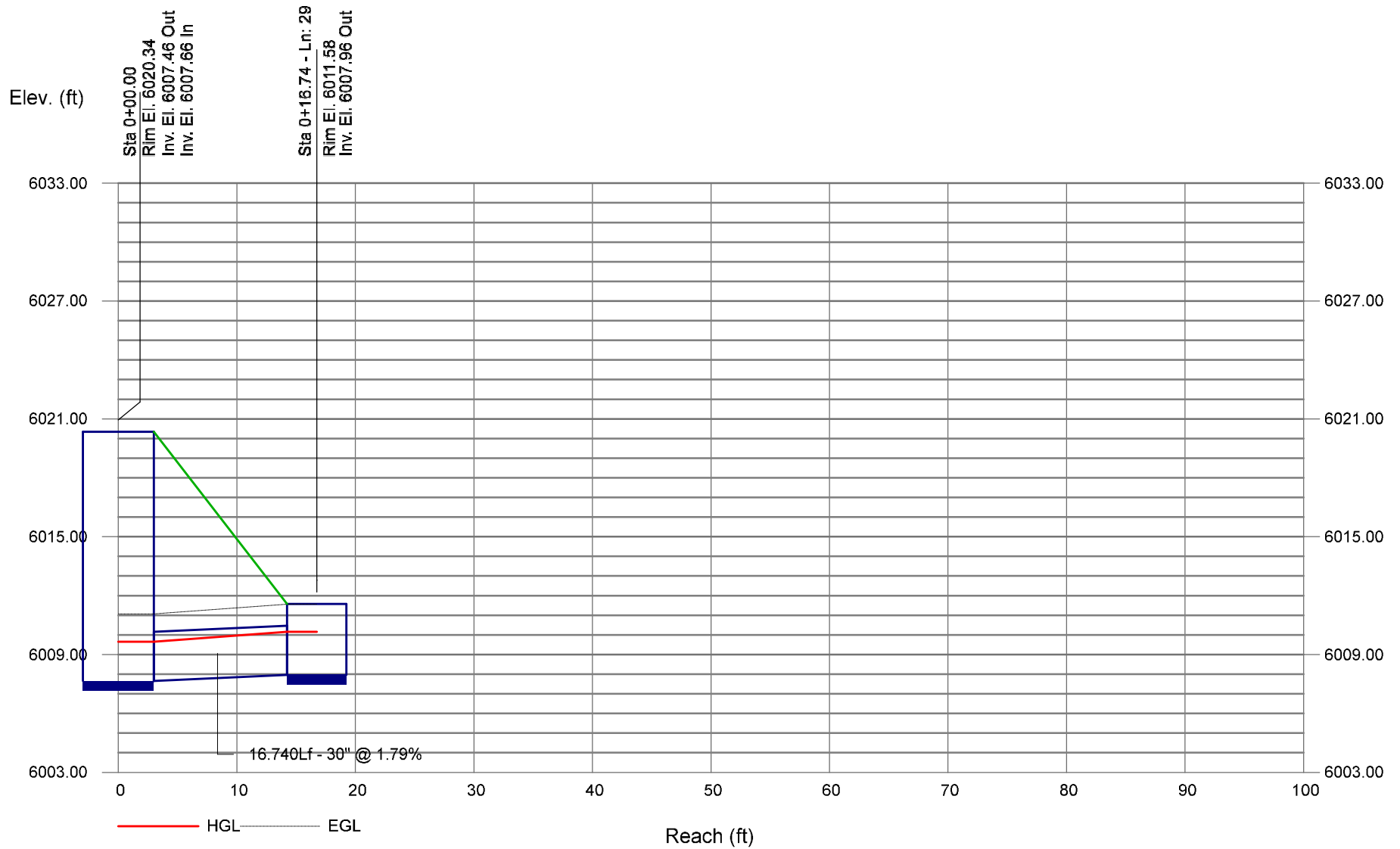
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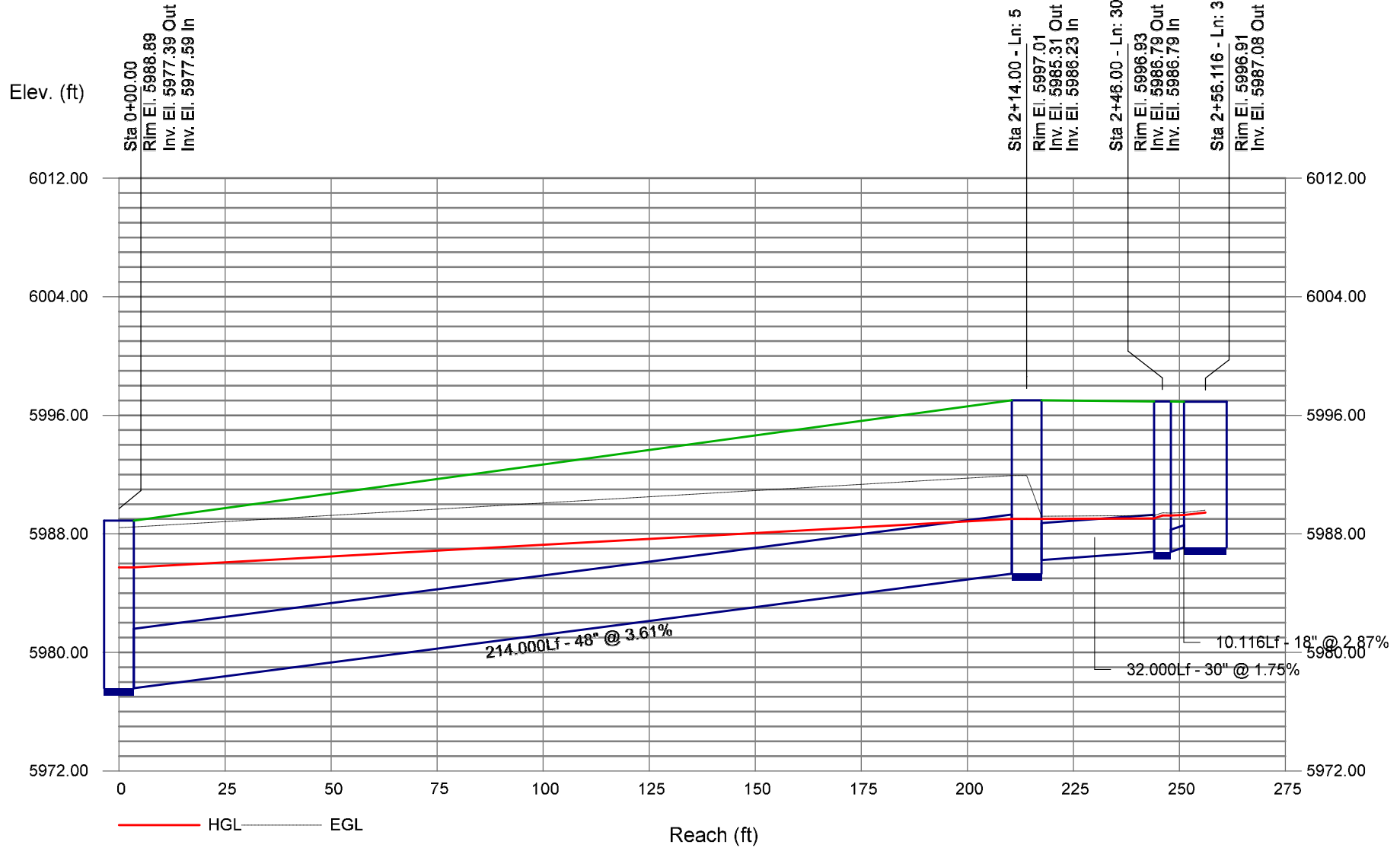
# Storm Sewer Profile



# Storm Sewer Profile

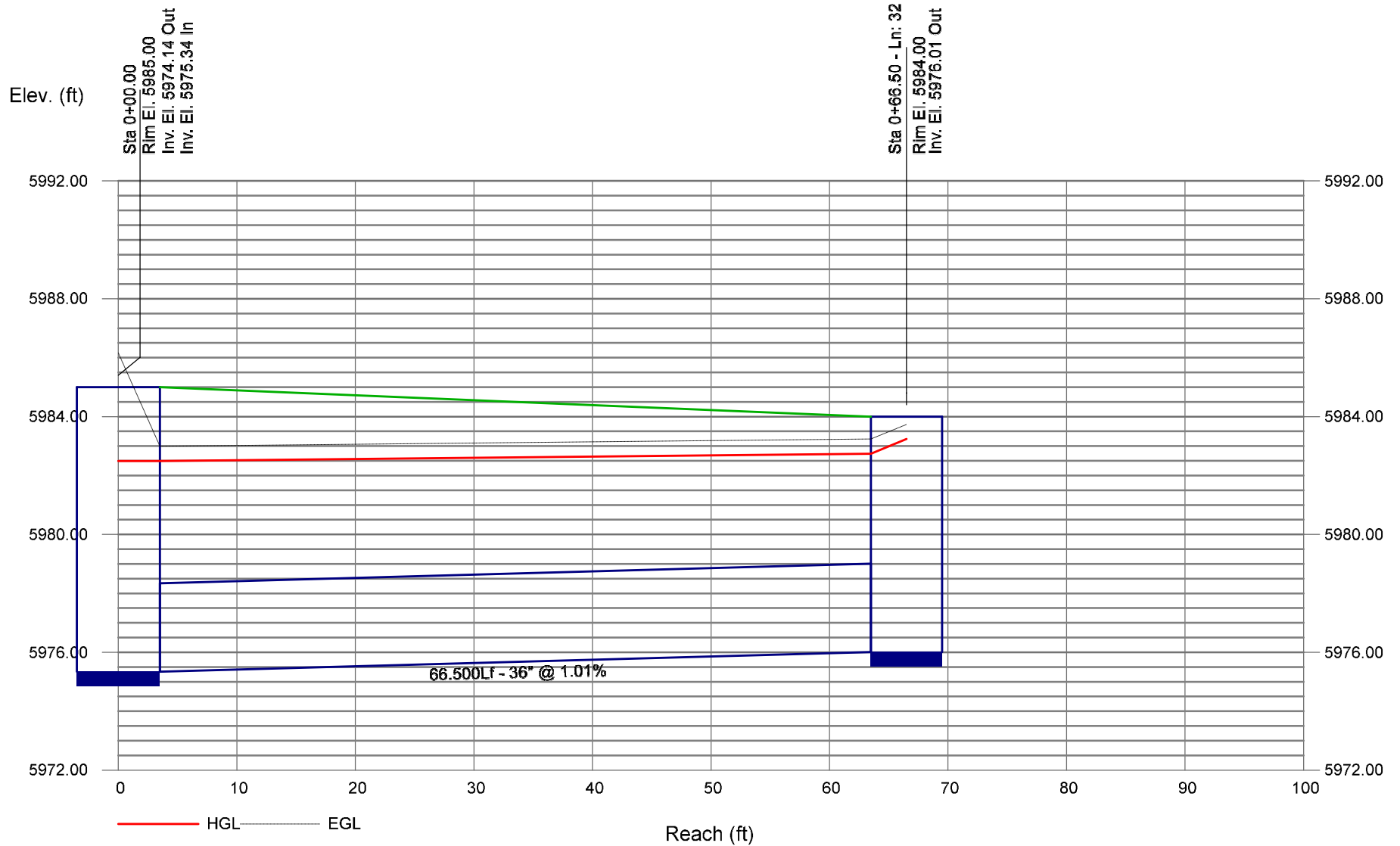


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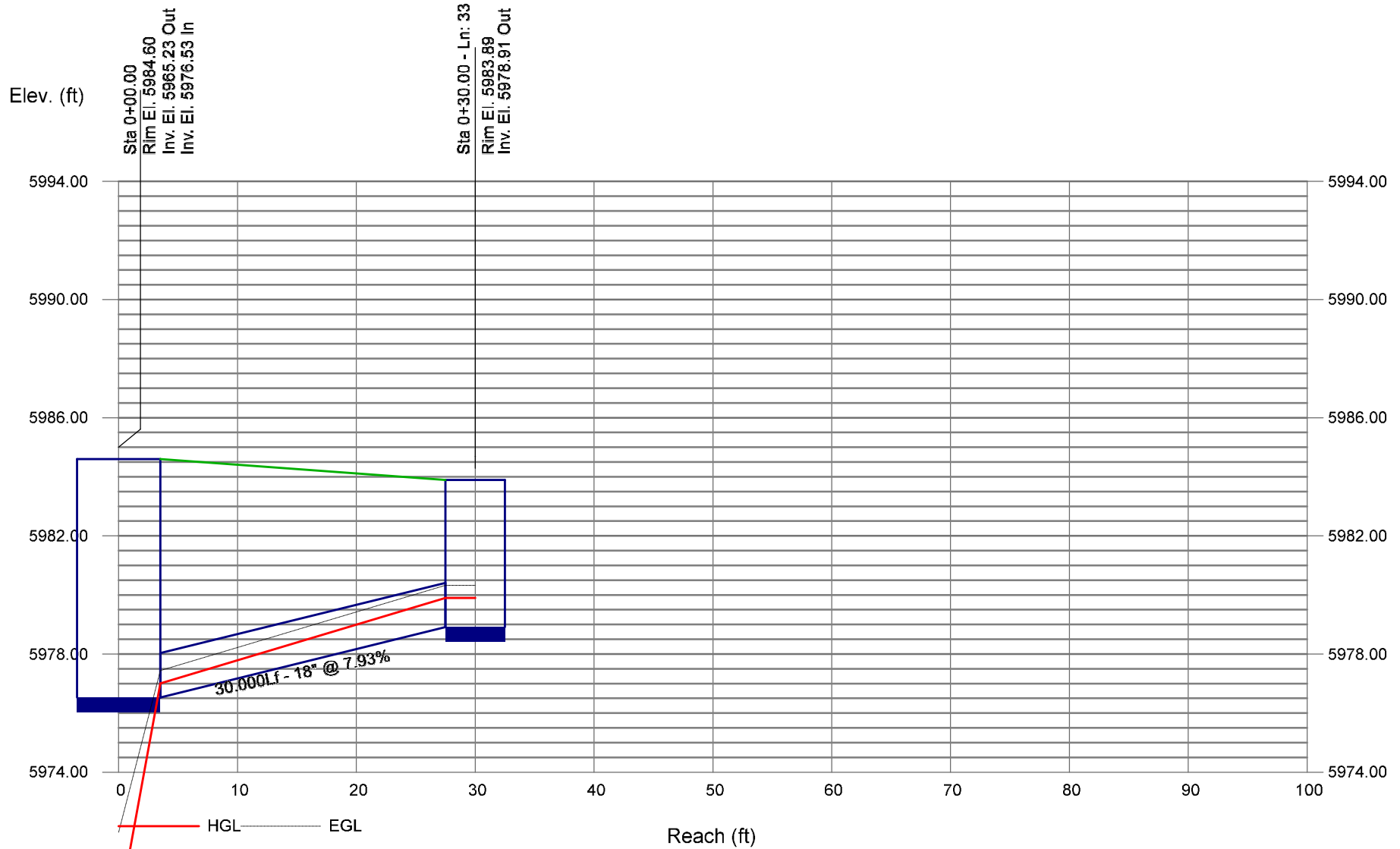




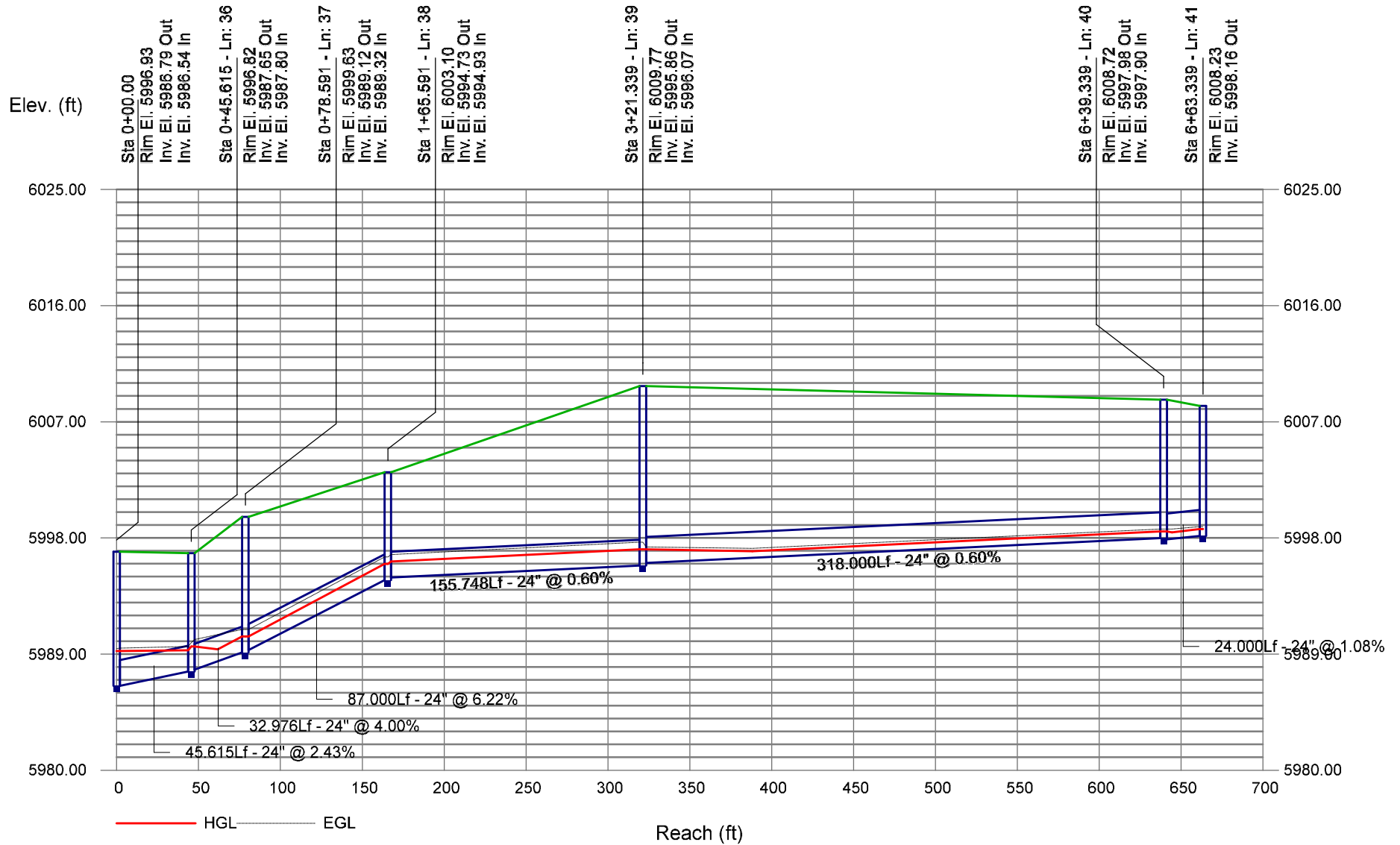
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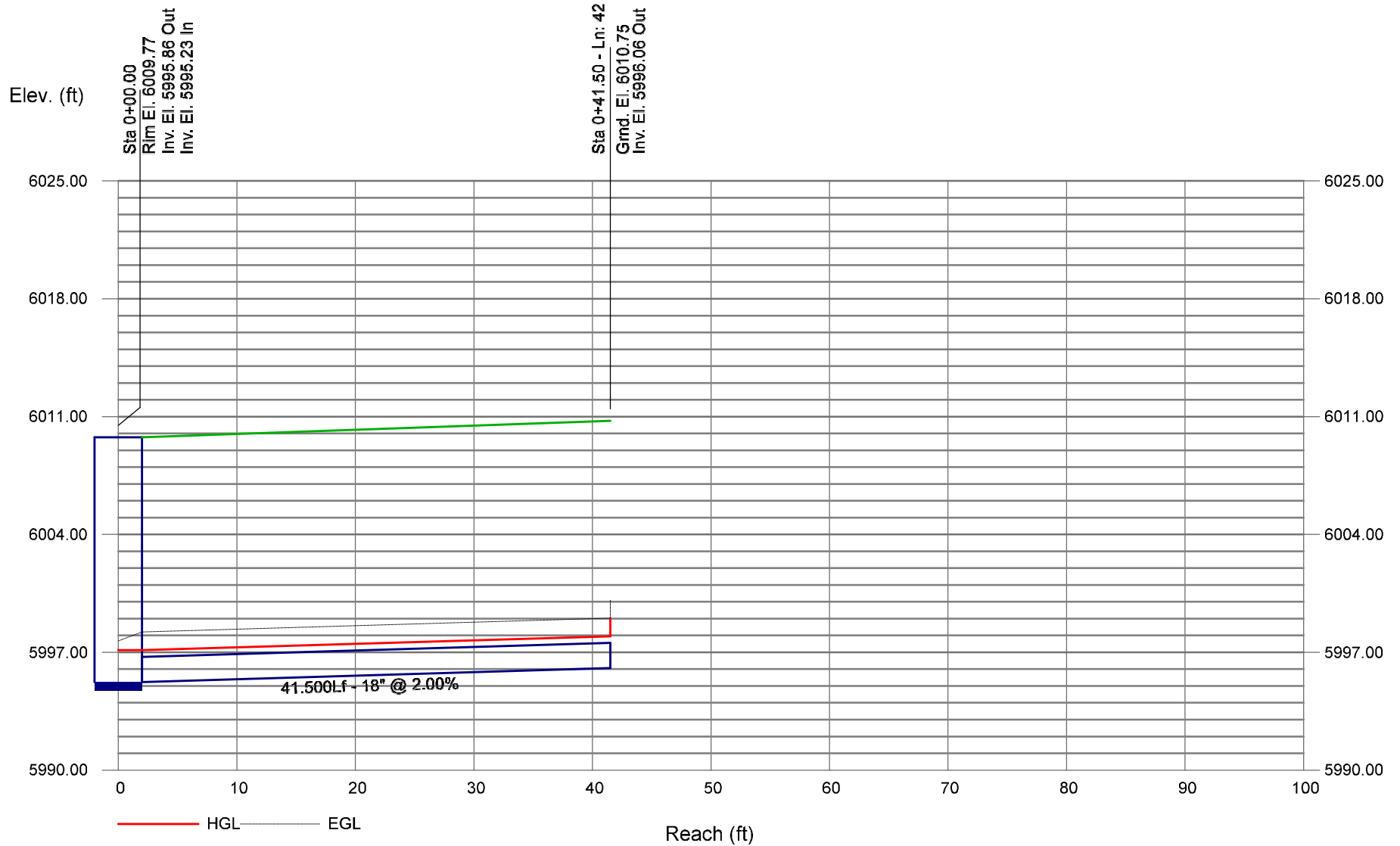
# Storm Sewer Profile



# Storm Sewer Profile



# Storm Sewer Profile



# Report

## RGPE-II STORM E 5-YR

Line No.	Known Q (cfs)	Area (ac)	Runoff Coeff (C)	Tc	Flow Rate (cfs)	Line Size (in)	Line (ft)	Line (%)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	HGL Dn (ft)	Vel Ave (ft/s)
1	0.00	0.00	0.00	19.6	25.42	36	134.49	0.50	5965.94	5965.27	5985.64	5968.68	5968.41	5968.27	3.84
2	0.00	0.00	0.00	19.4	25.51	30	95.01	6.00	5982.55	5976.85	6002.55	5985.64	5984.27	5977.71	12.08
3	0.00	0.00	0.00	19.2	25.70	30	134.81	1.11	5993.89	5992.39	6005.24	6002.55	5995.62	5993.78	8.15
4	0.00	0.00	0.00	18.9	25.85	30	100.09	2.56	5996.65	5994.09	6007.52	6005.24	5998.38	5995.62	7.68
5	0.00	0.00	0.00	18.0	16.49	30	303.63	3.85	6008.53	5996.85	6019.03	6007.52		5998.38	5.61
6	0.00	0.00	0.00	17.8	16.61	30	101.15	4.72	6013.50	6008.73	6024.40	6019.03	6014.88	6009.90	6.68
7	0.00	0.00	0.00	17.5	15.93	30	104.77	4.71	6018.43	6013.50	6028.93	6024.40		6014.88	5.83
8	0.00	0.00	0.00	17.0	16.17	30	200.00	1.47	6021.57	6018.63	6033.39	6028.93	6022.93	6019.78	6.65
9	0.00	0.00	0.00	16.7	3.76	18	82.18	1.01	6023.40	6022.57	6034.35	6033.39	6024.14	6023.19	4.89
10	0.00	0.00	0.00	16.6	3.76	18	18.50	0.97	6023.78	6023.60	6033.73	6034.35	6024.52	6024.23	4.86
11	0.00	2.64	0.60	16.6	3.77	18	11.83	1.02	6023.90	6023.78	6034.22	6033.73	6024.64	6024.52	4.33
12	0.00	8.14	0.65	13.0	14.11	30	53.52	2.02	6022.65	6021.57	6025.94	6033.39		6022.93	5.43
13	0.00	0.57	0.62	7.4	1.17	18	35.16	3.10	6015.59	6014.50	6024.47	6024.40	6015.99	6014.88	3.22
14	0.00	4.10	0.65	9.2	8.19	24	53.50	2.00	5998.42	5997.35	6008.00	6007.52		5998.38	5.05
15	0.00	1.29	0.59	11.9	4.77	18	18.50	1.03	5998.04	5997.85	6007.15	6007.52	5998.88	5998.56	5.27
16	0.00	0.00	0.00	11.8	2.67	18	13.64	0.95	5998.17	5998.04	6008.03	6007.15	5998.79	5998.88	3.25
17	0.00	1.48	0.65	11.6	2.69	18	64.17	1.00	5999.01	5998.37	6009.56	6008.03	5999.63	5998.89	4.43

Project File: Storm E 5yr.stm

Number of lines: 17

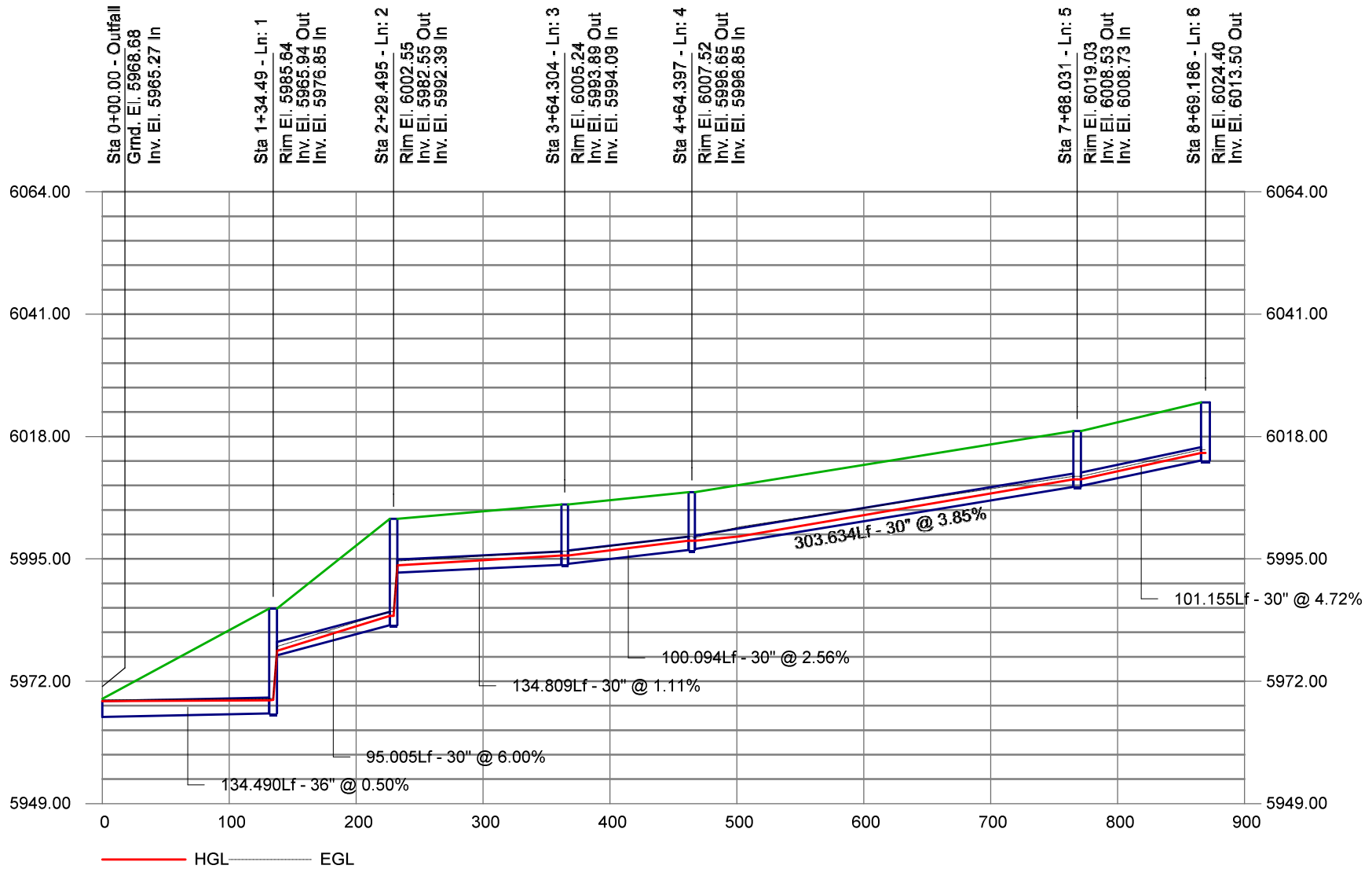
Date: 2/20/2023

NOTES: \*\* Critical depth

# Storm Sewer Profile

RGPE-II STORM E 5-YR

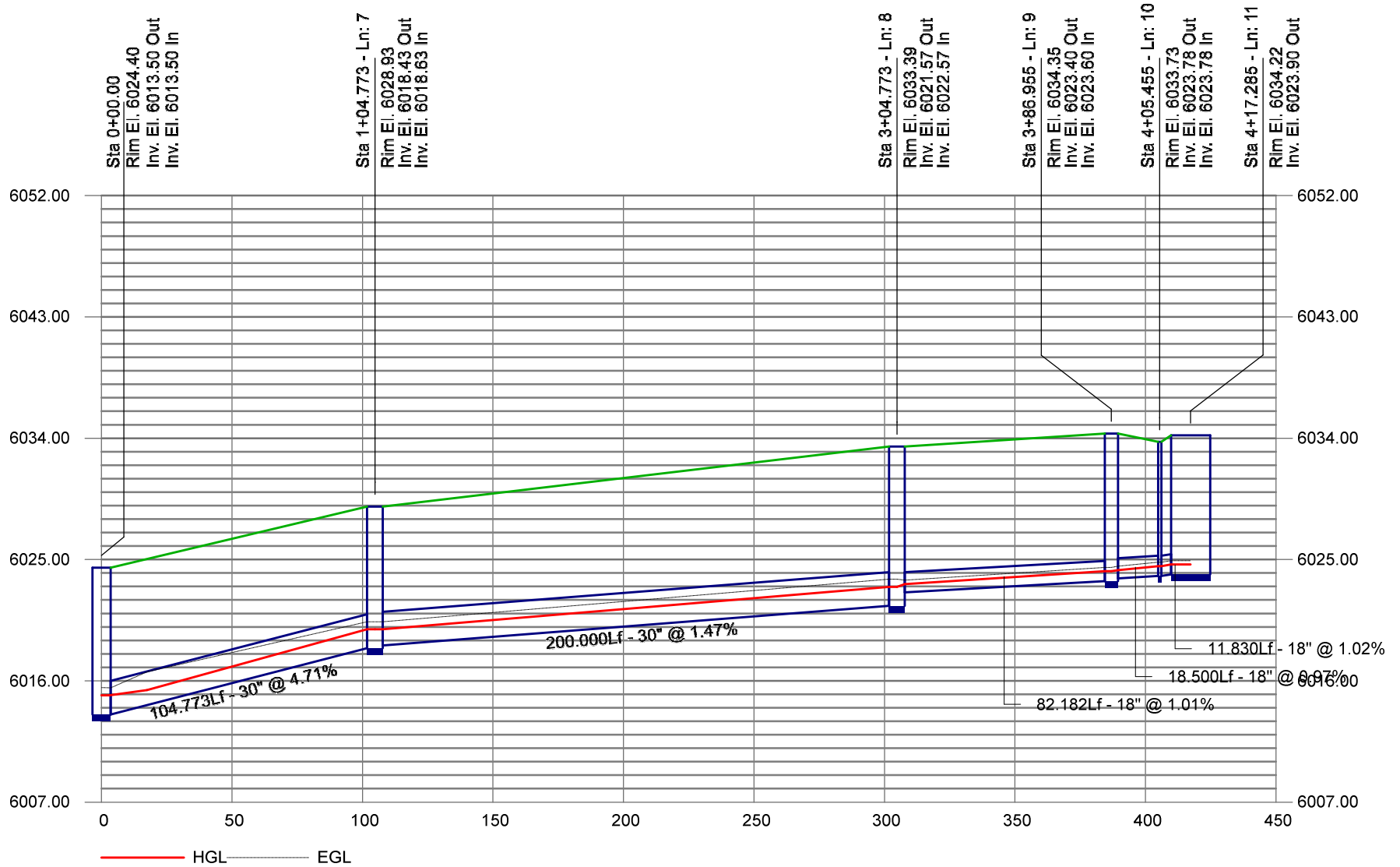
Proj. file: Storm E 5yr.stm



# Storm Sewer Profile

RGPE-II STORM E 5-YR

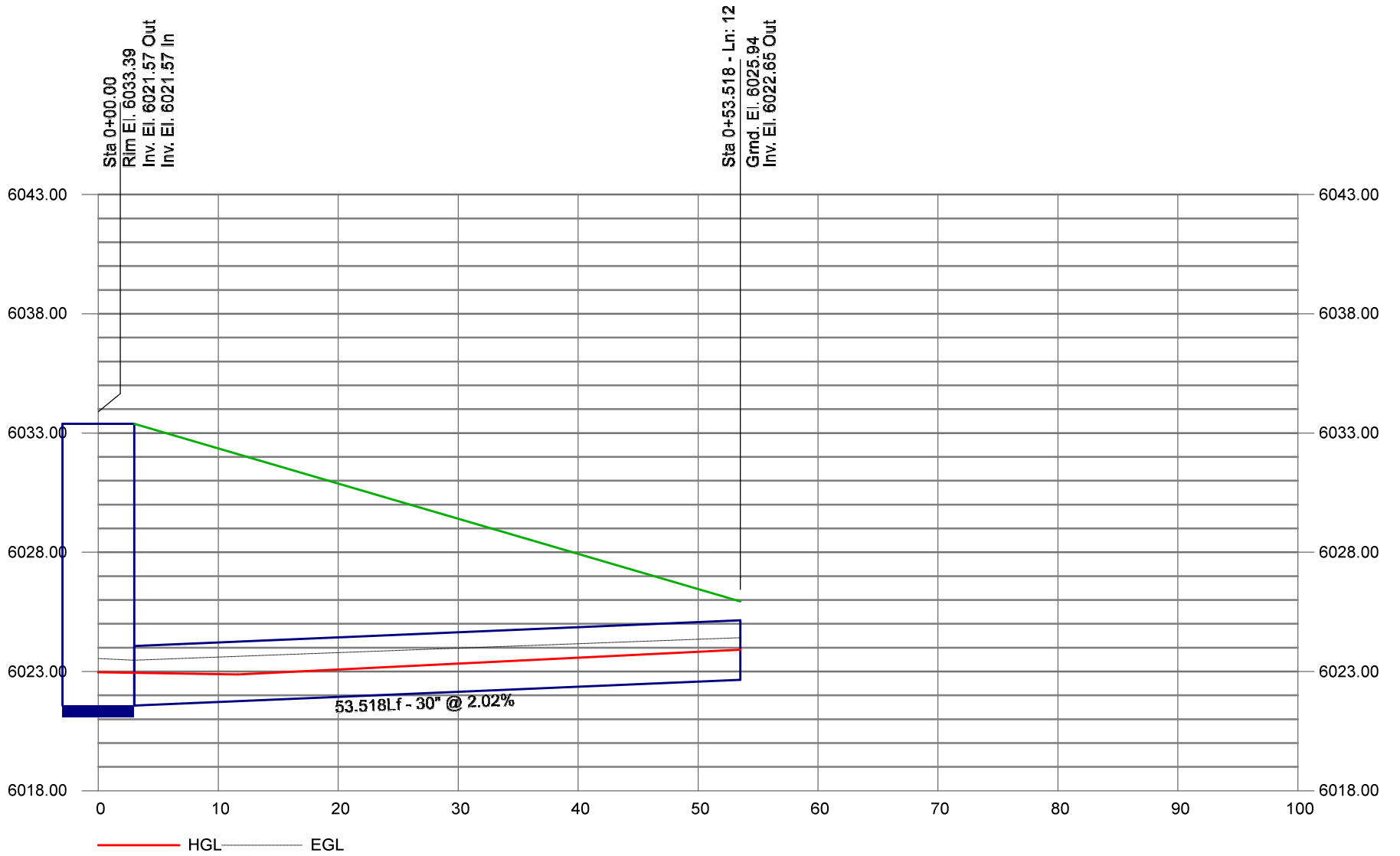
Proj. file: Storm E 5yr.stm



# Storm Sewer Profile

RGPE-II STORM E 5-YR

Proj. file: Storm E 5yr.stm

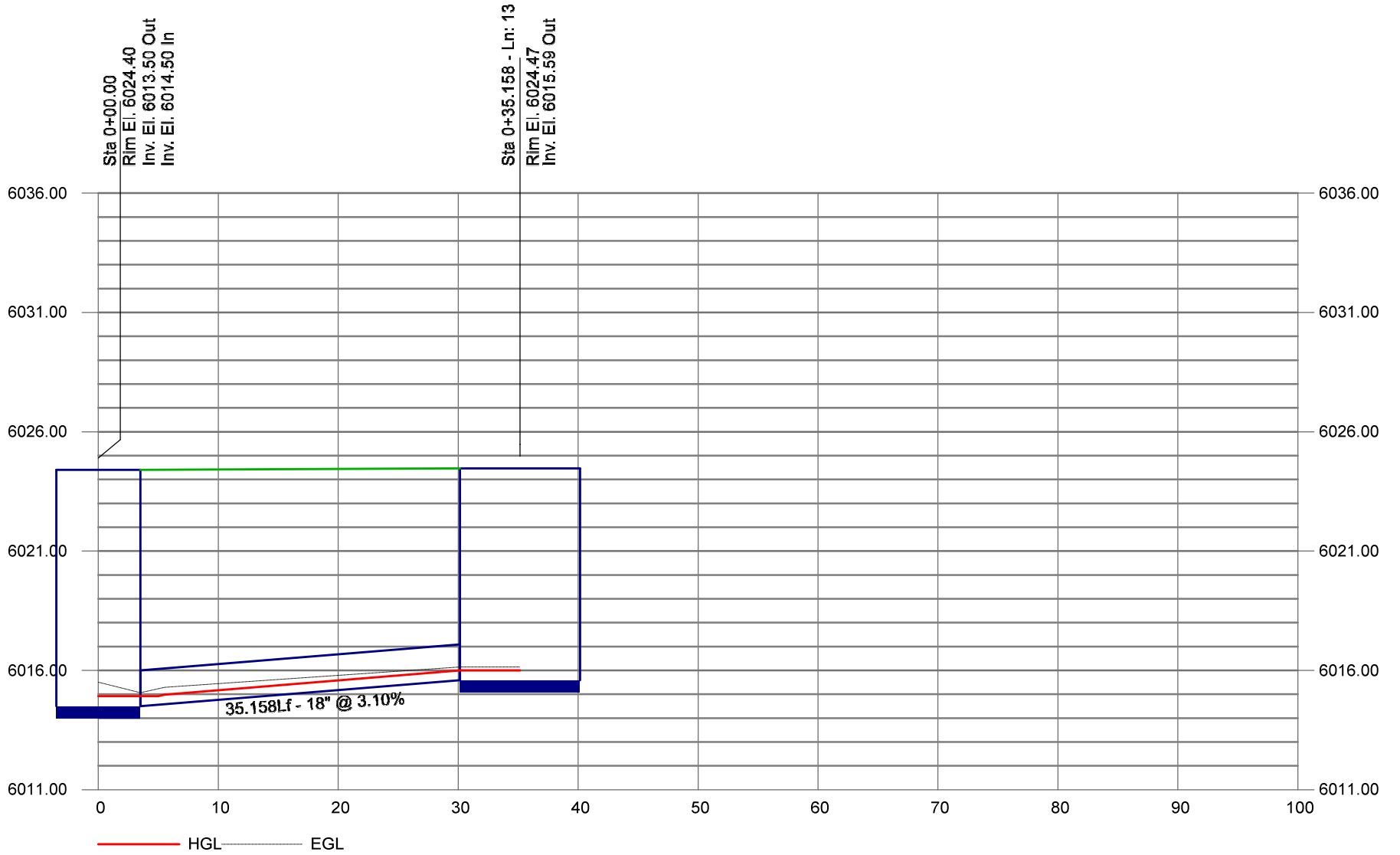




# Storm Sewer Profile

RGPE-II STORM E 5-YR

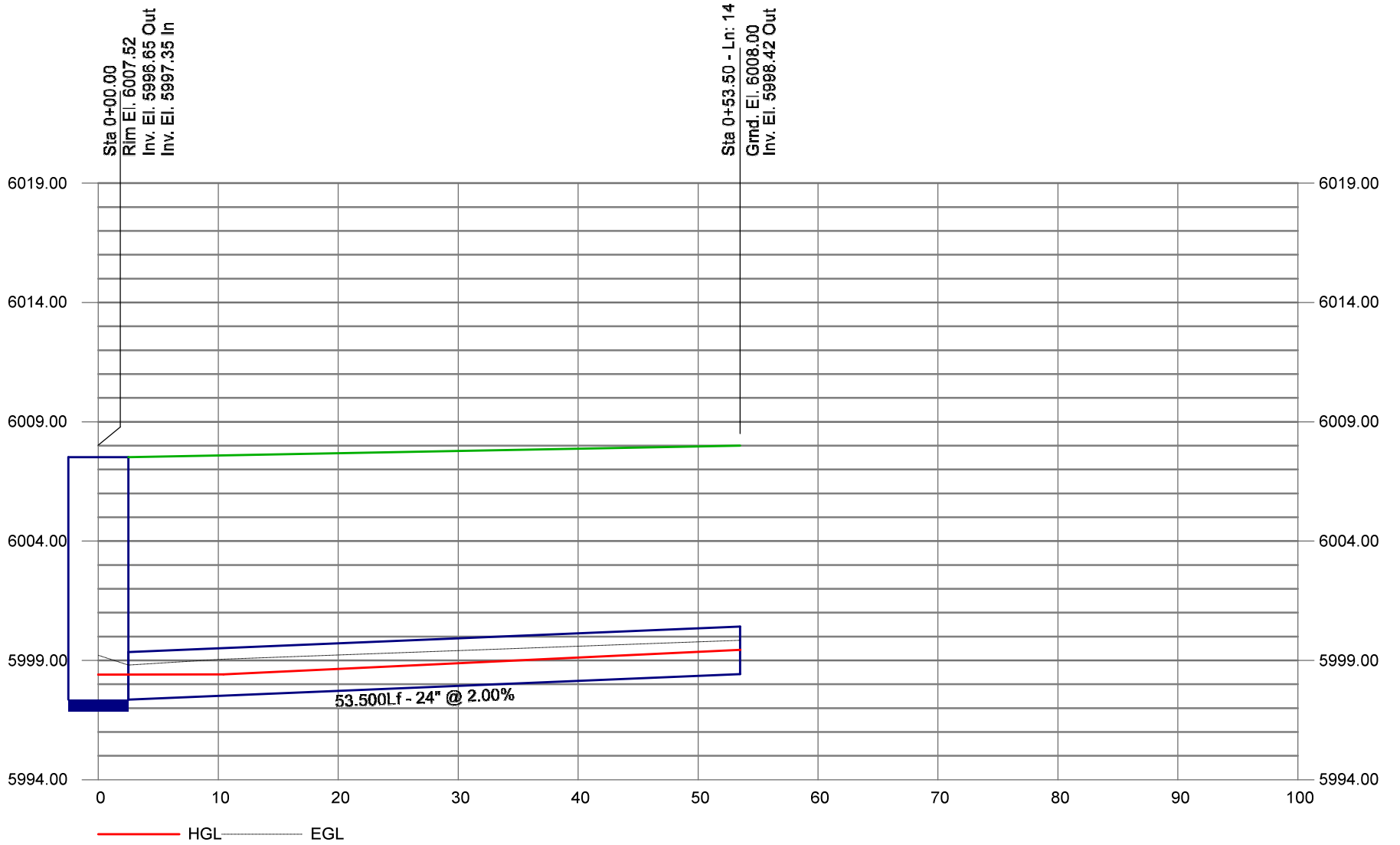
Proj. file: Storm E 5yr.stm



# Storm Sewer Profile

RGPE-II STORM E 5-YR

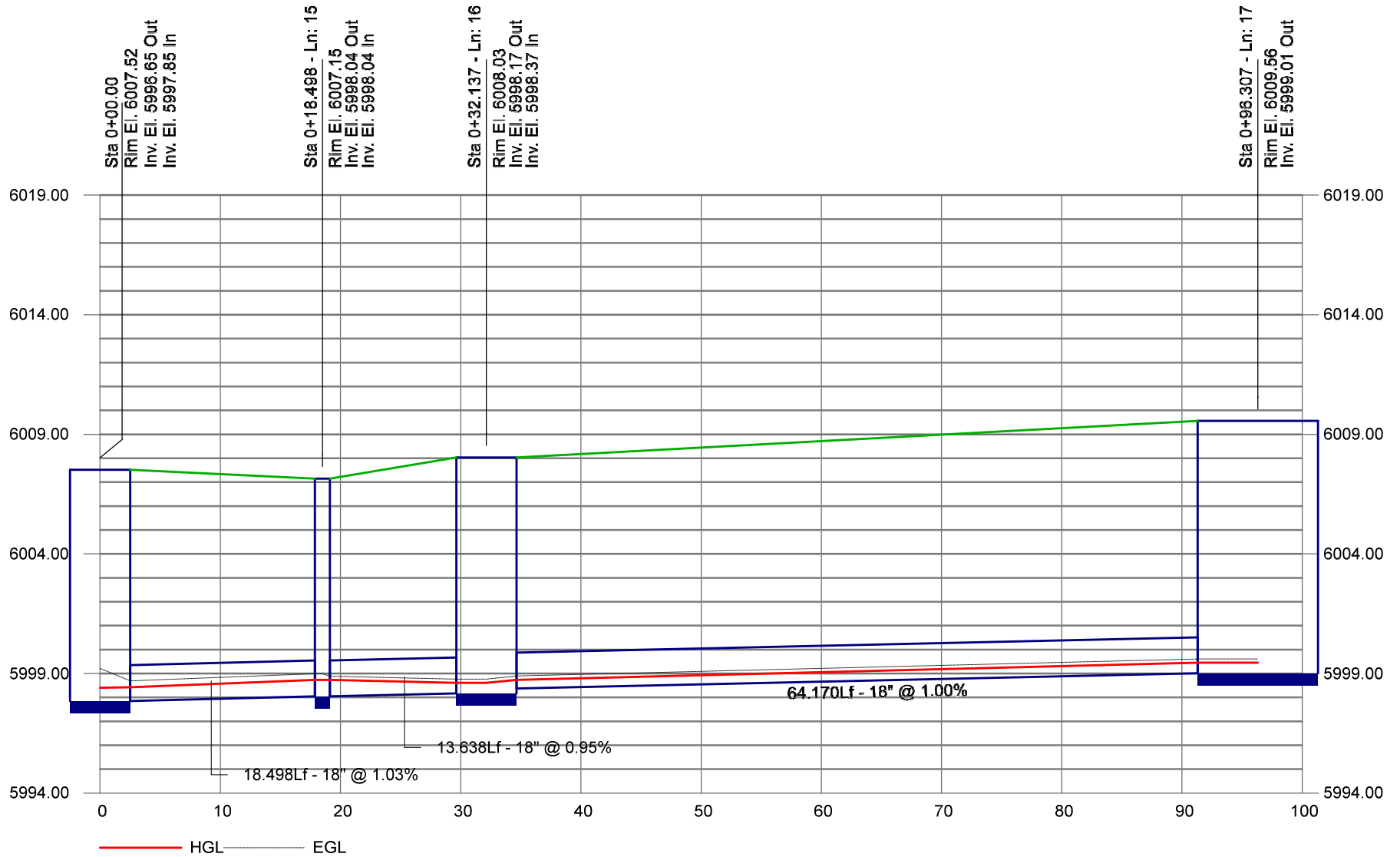
Proj. file: Storm E 5yr.stm



# Storm Sewer Profile

RGPE-II STORM E 5-YR

Proj. file: Storm E 5yr.stm



# Report

## RGPE-II STORM E 100-YR

Line No.	Known Q (cfs)	Area (ac)	Runoff Coeff (C)	Tc	Flow Rate (cfs)	Line Size (in)	Line (ft)	Line (%)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	HGL Dn (ft)	Vel Ave (ft/s)
1	0.00	0.00	0.00	18.5	63.88	36	134.49	0.50	5965.94	5965.27	5985.64	5968.68	5969.51	5968.27	9.04
2	0.00	0.00	0.00	18.5	64.05	30	95.01	6.00	5982.55	5976.85	6002.55	5985.64	5984.97	5978.30	17.43
3	0.00	0.00	0.00	18.3	64.35	30	134.81	1.11	5993.89	5992.39	6005.24	6002.55	5998.21	5994.89	13.11
4	0.00	0.00	0.00	18.2	64.58	30	100.09	2.56	5996.65	5994.09	6007.52	6005.24	6001.10	5998.61	13.16
5	0.00	0.00	0.00	17.6	42.48	30	303.63	3.85	6008.53	5996.85	6019.03	6007.52	6010.71	6003.79	9.01
6	0.00	0.00	0.00	17.4	42.69	30	101.15	4.72	6013.50	6008.73	6024.40	6019.03	6015.68	6010.71	9.82
7	0.00	0.00	0.00	17.2	40.78	30	104.77	4.71	6018.43	6013.50	6028.93	6024.40		6015.68	9.04
8	0.00	0.00	0.00	16.9	41.19	30	200.00	1.47	6021.57	6018.63	6033.39	6028.93	6023.72	6020.57	9.61
9	0.00	0.00	0.00	16.7	9.95	18	82.18	1.01	6023.40	6022.57	6034.35	6033.39	6024.62	6023.73	6.64
10	0.00	0.00	0.00	16.6	9.97	18	18.50	0.97	6023.78	6023.60	6033.73	6034.35	6025.00	6024.78	6.58
11	0.00	2.64	0.77	16.6	9.98	18	11.83	1.02	6023.90	6023.78	6034.22	6033.73	6025.12	6025.00	6.50
12	0.00	8.14	0.79	13.0	35.38	30	53.52	2.02	6022.65	6021.57	6025.94	6033.39		6023.72	8.10
13	0.00	0.57	0.78	7.4	3.05	18	35.16	3.10	6015.59	6014.50	6024.47	6024.40		6015.68	3.04
14	0.00	4.10	0.79	9.2	20.54	24	53.50	2.00	5998.42	5997.35	6008.00	6007.52	6004.23	6003.79	6.54
15	0.00	1.29	0.76	10.2	9.82	18	18.50	1.03	5998.04	5997.85	6007.15	6007.52	6003.95	6003.79	5.56
16	0.00	0.00	0.00	9.5	3.96	18	13.64	0.95	5998.17	5998.04	6008.03	6007.15	6004.04	6004.02	2.24
17	0.00	0.81	0.78	9.0	4.04	18	64.17	1.00	5999.01	5998.37	6009.56	6008.03	6004.21	6004.12	2.29

Project File: Storm E 100yr.stm

Number of lines: 17

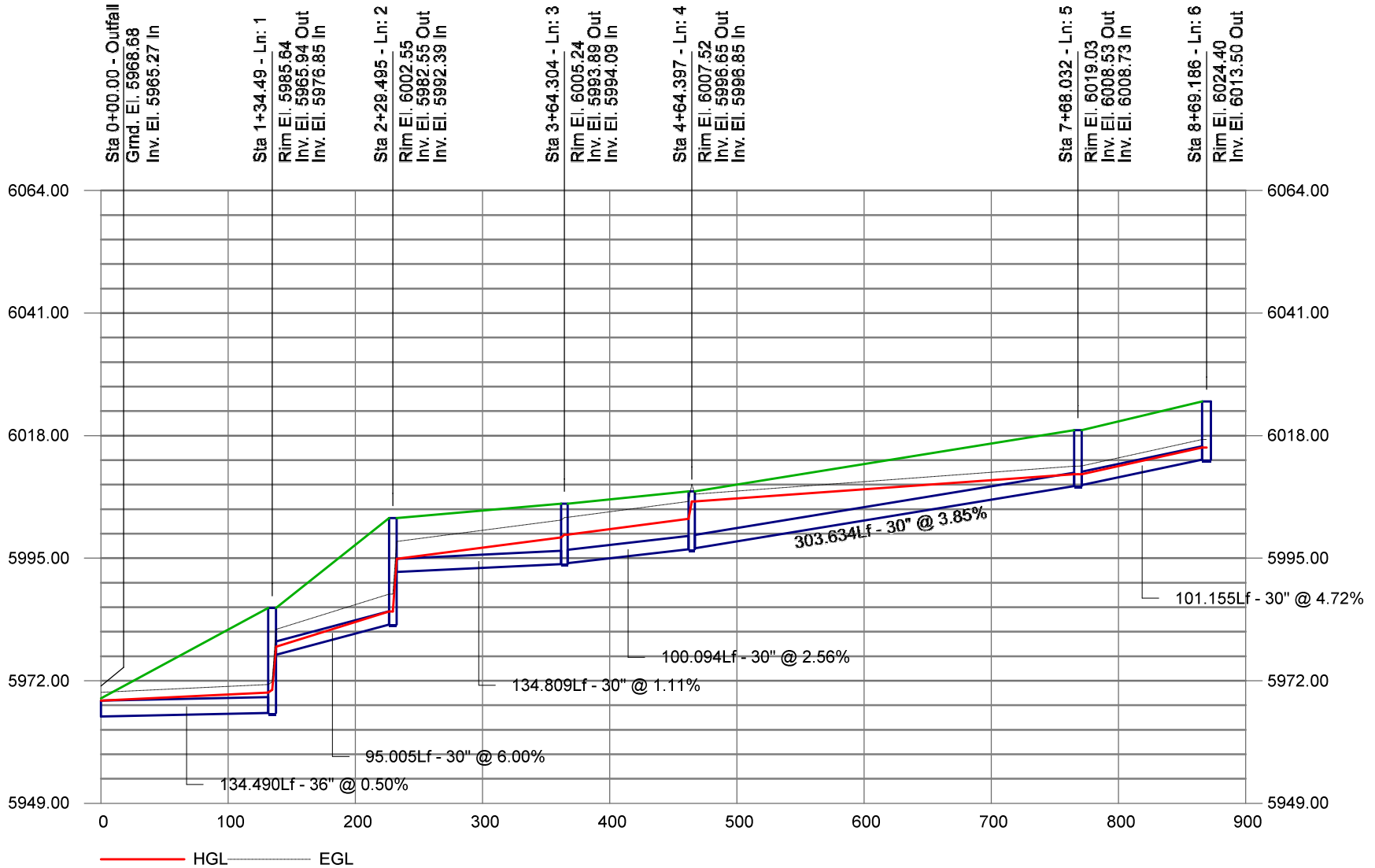
Date: 2/20/2023

NOTES: \*\* Critical depth

# Storm Sewer Profile

RGPE-II STORM E 100-YR

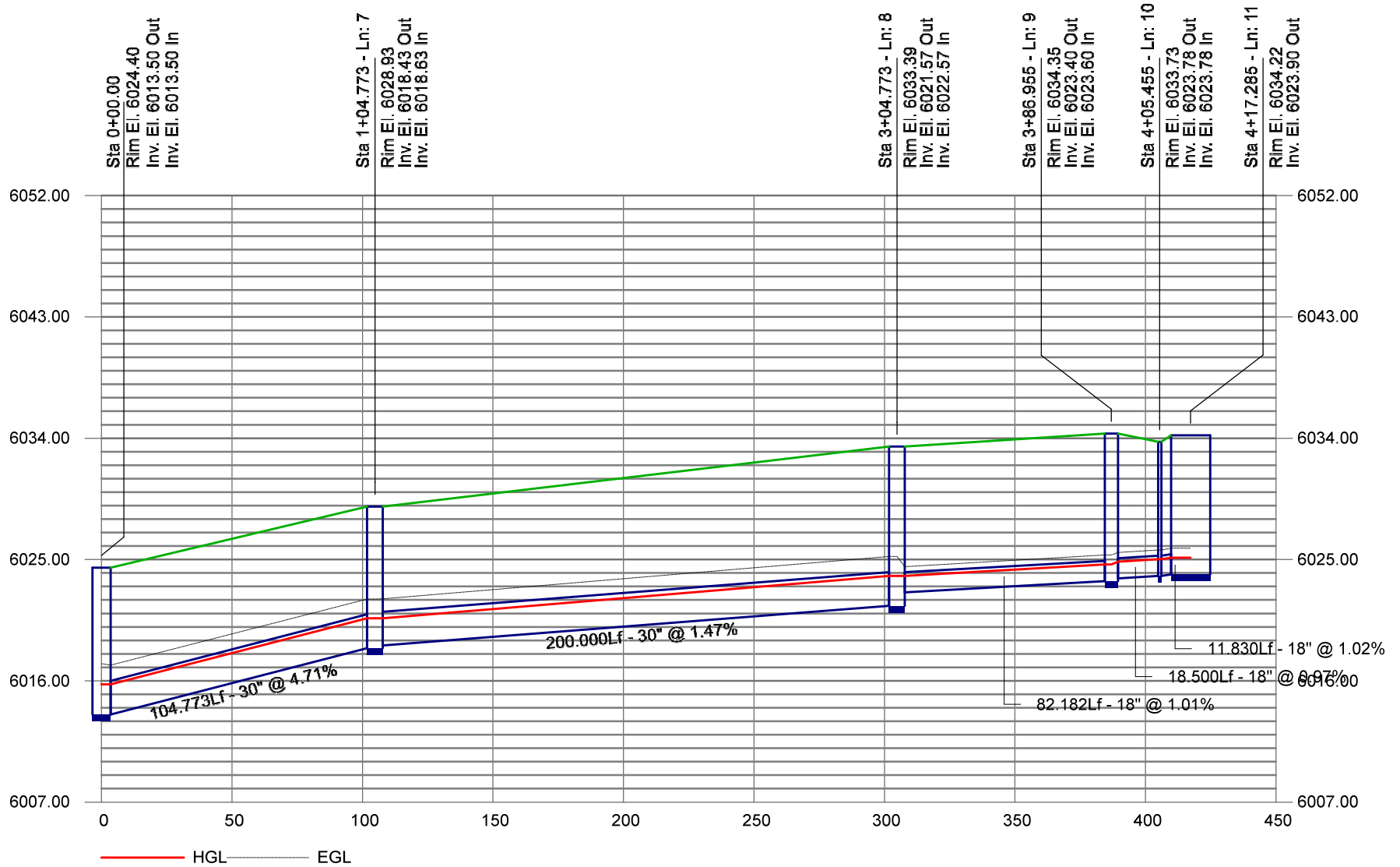
Proj. file: New.stm



# Storm Sewer Profile

RGPE-II STORM E 100-YR

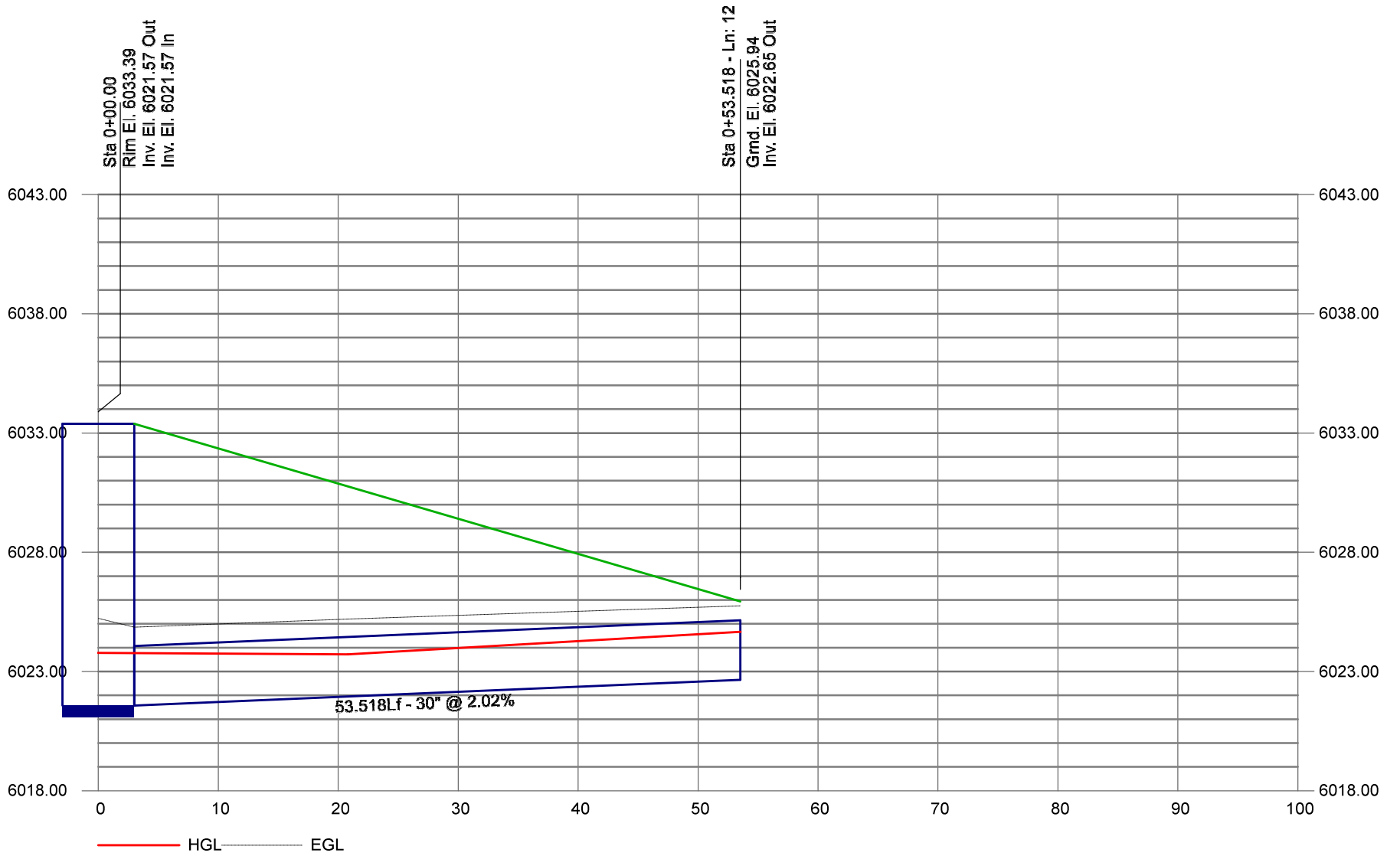
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# Storm Sewer Profile

RGPE-II STORM E 100-YR

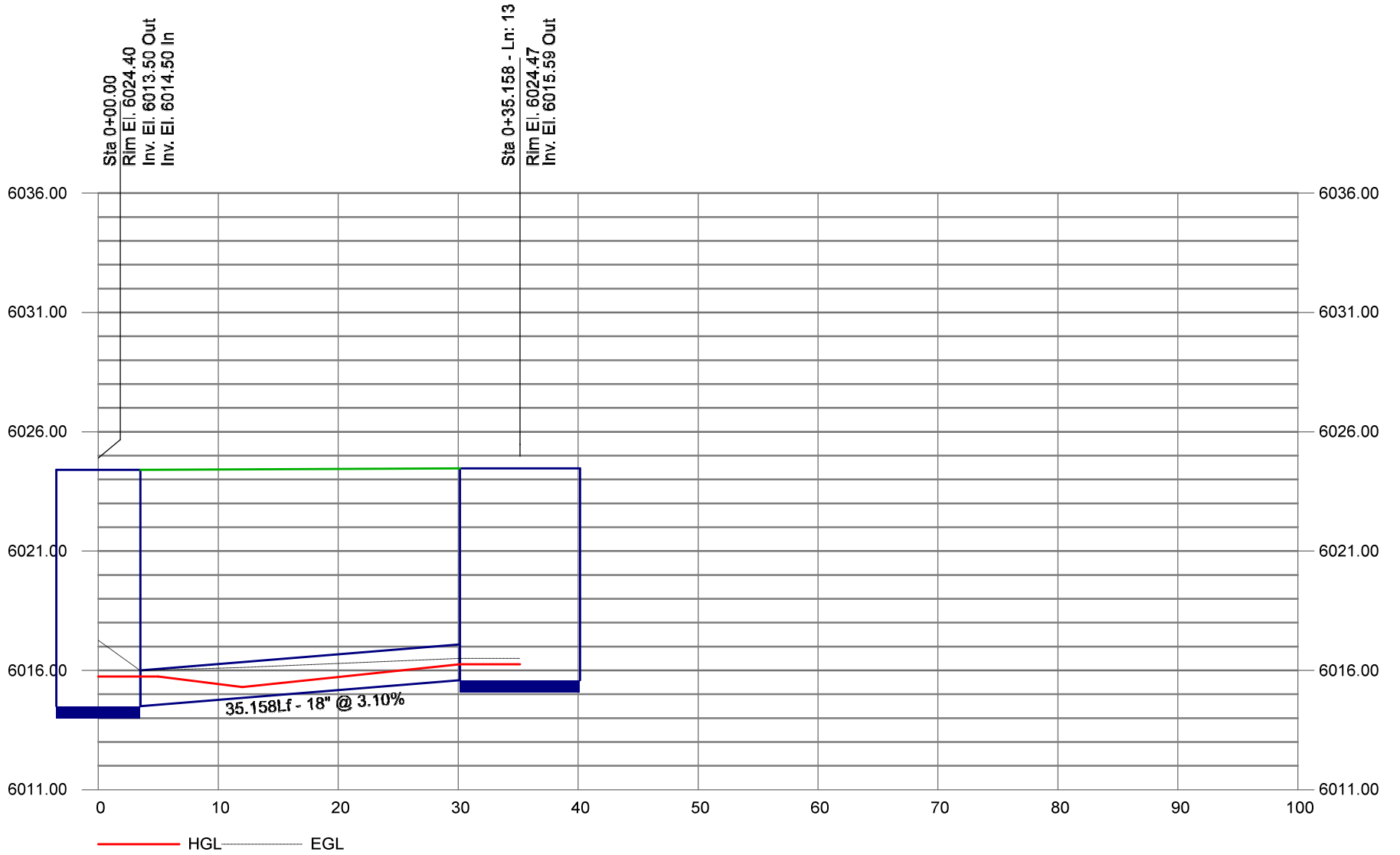
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# Storm Sewer Profile

RGPE-II STORM E 100-YR

Proj. file: New.stm

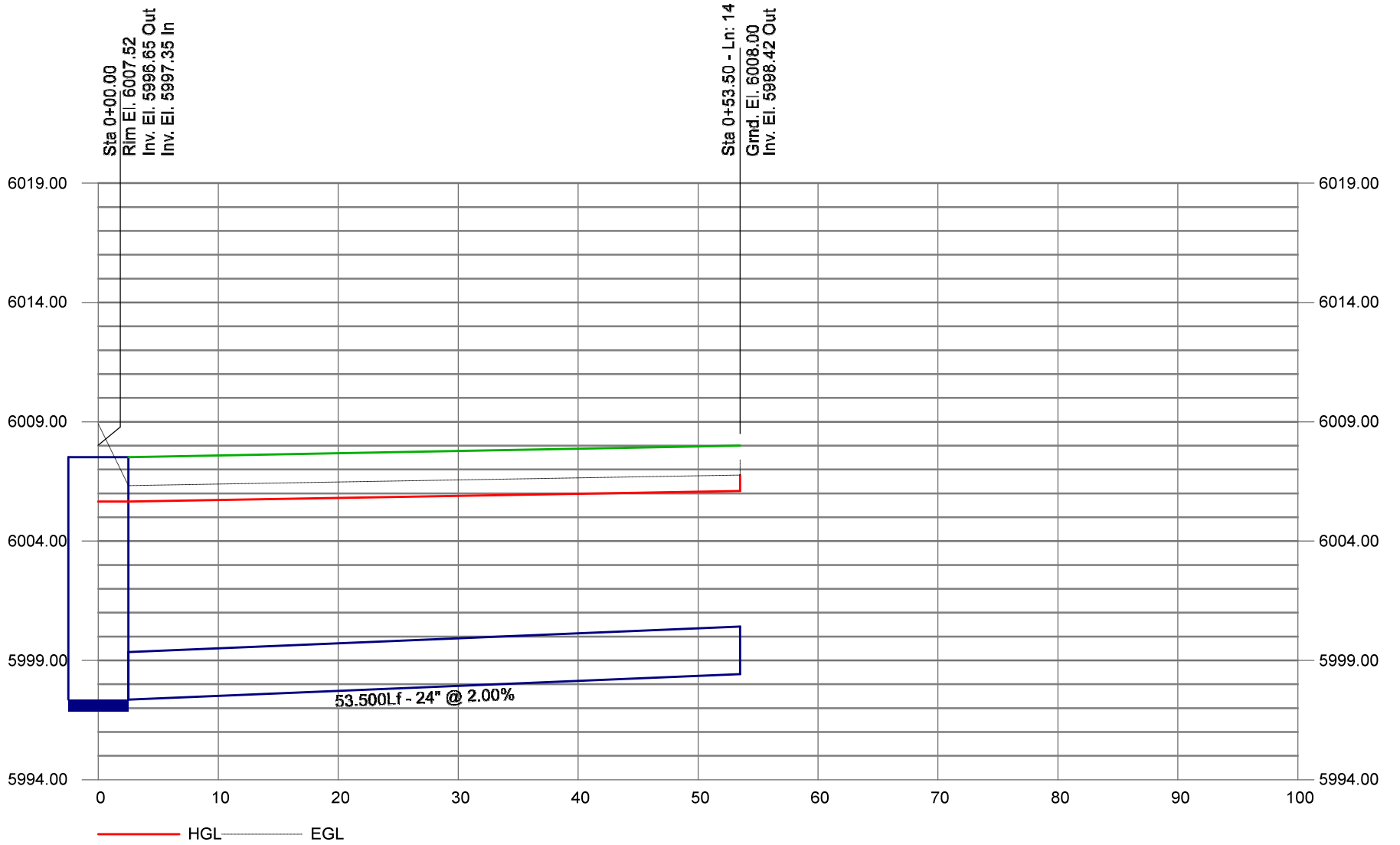




# Storm Sewer Profile

RGPE-II STORM E 100-YR

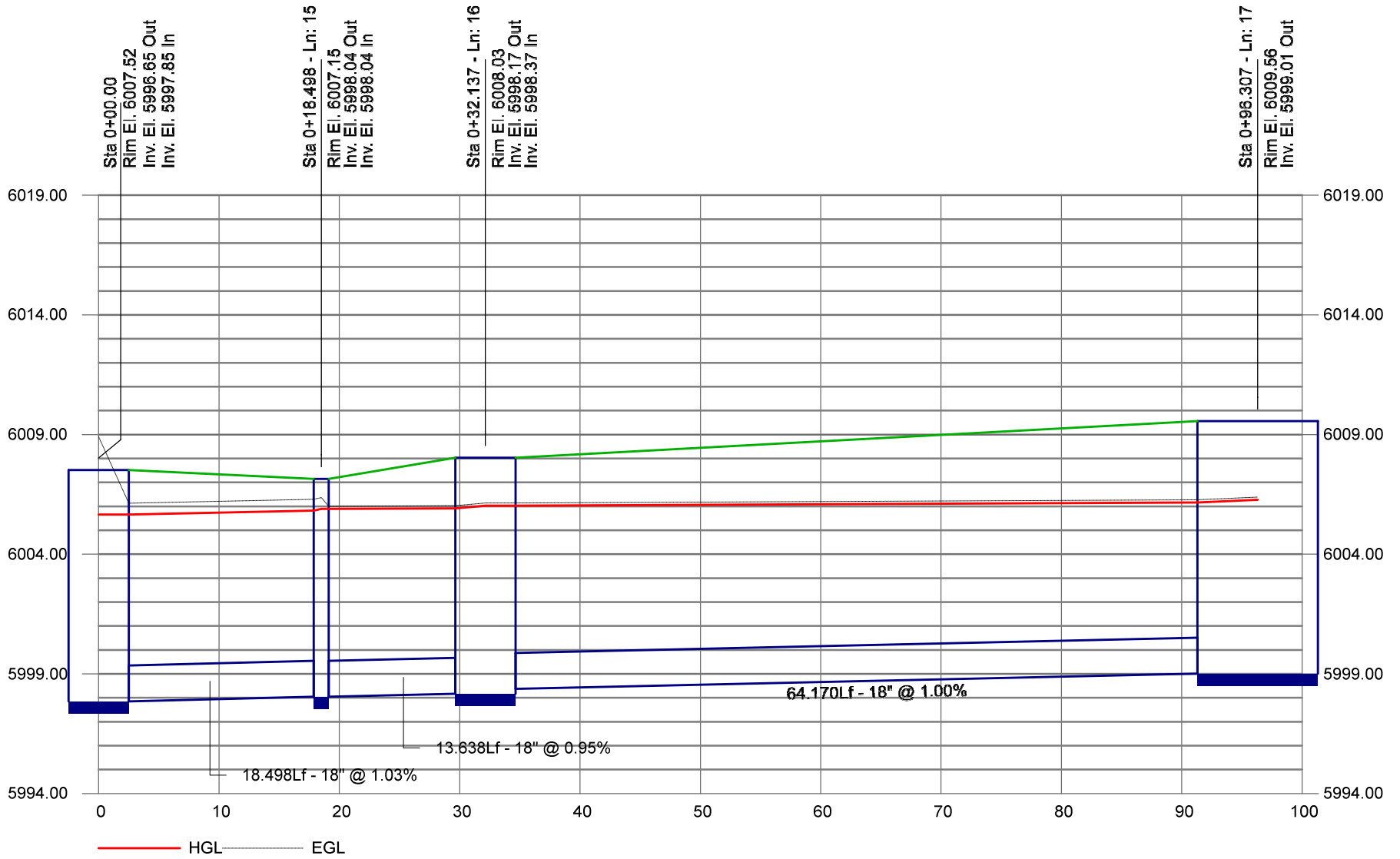
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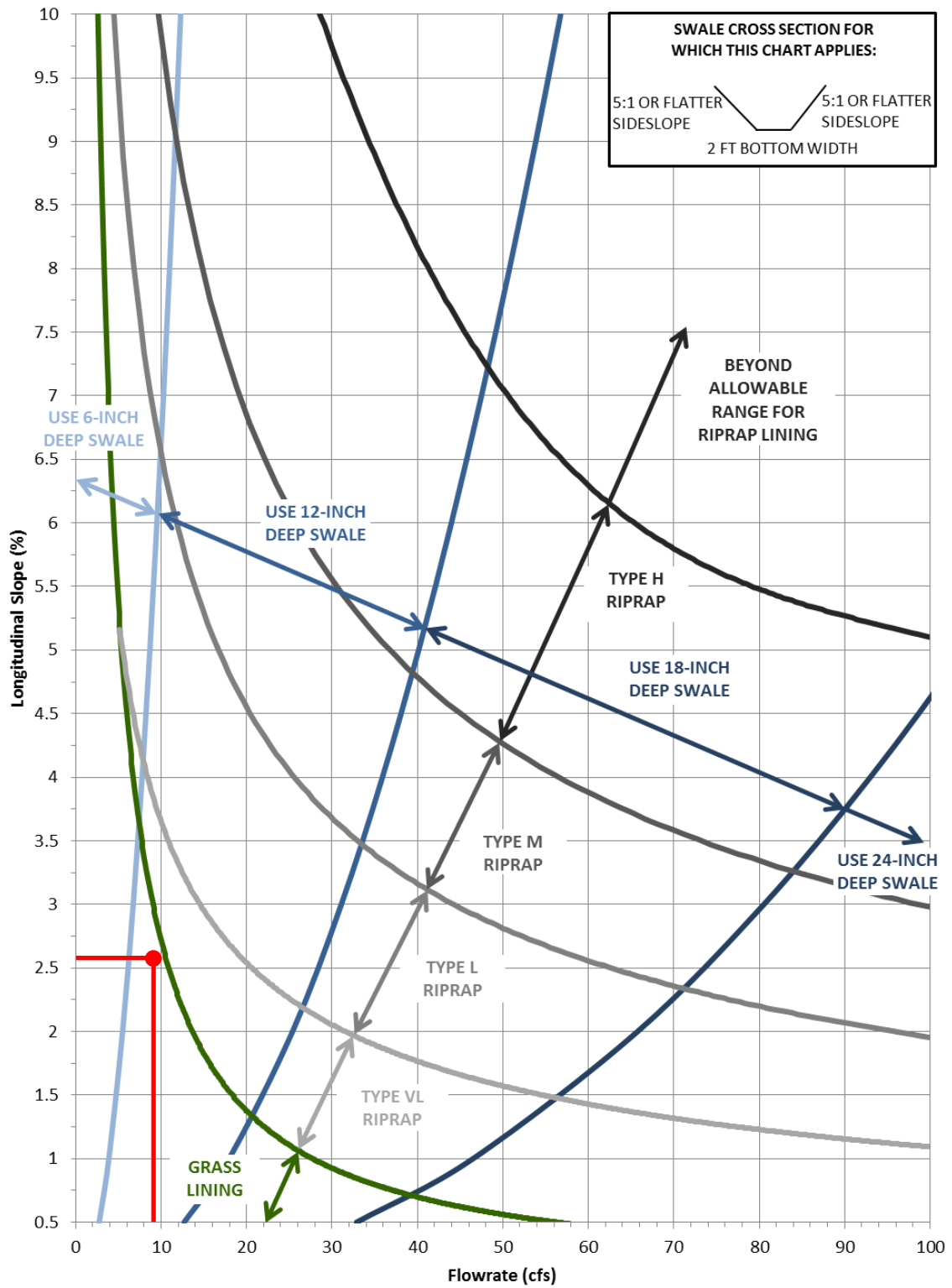


# Storm Sewer Profile

RGPE-II STORM E 100-YR

Proj. file: New.stm





**Figure 8-22. Swale stability chart; 2- to 4-foot bottom width and side slopes between 5:1 and 10:1**  
 (Note: Riprap classifications refer to gradation for riprap used in soil riprap or void-filled riprap. See Figure 8-34 for gradations.) (Source: Muller Engineering Company)

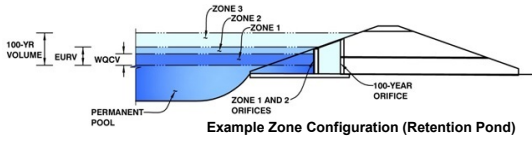
## APPENDIX E – POND DESIGN CALCULATIONS



# DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD- Detention, Version 4.05 (January 2022)

**Project: RidgeGate East Filing No. 3**  
**Basin ID: Pond 21**



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.67	1.269	Orifice Plate
Zone 2 (EURV)	6.48	2.425	Orifice Plate
Zone 3 (100-year)	8.23	1.804	Weir&Pipe (Restrict)
<b>Total (all zones)</b>		<b>5.498</b>	

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

Underdrain Orifice Invert Depth = <input type="text"/> ft (distance below the filtration media surface)	Underdrain Orifice Area = <input type="text"/> ft <sup>2</sup>
Underdrain Orifice Diameter = <input type="text"/> inches	Underdrain Orifice Centroid = <input type="text"/> feet

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

Centroid of Lowest Orifice = <input type="text"/> 0.00 ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row = <input type="text"/> 3.958E-02 ft <sup>2</sup>
Depth at top of Zone using Orifice Plate = <input type="text"/> 6.50 ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width = <input type="text"/> N/A feet
Orifice Plate: Orifice Vertical Spacing = <input type="text"/> 30.40 inches	Elliptical Slot Centroid = <input type="text"/> N/A feet
Orifice Plate: Orifice Area per Row = <input type="text"/> 5.70 sq. inches (use rectangular openings)	Elliptical Slot Area = <input type="text"/> N/A ft <sup>2</sup>

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	2.17	4.33					
Orifice Area (sq. inches)	5.70	5.70	5.70					

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

**User Input: Vertical Orifice (Circular or Rectangular)**

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

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft <sup>2</sup>
Vertical Orifice Centroid =	N/A	N/A	feet

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

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	7.75	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	11.33	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	2.92	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H <sub>1</sub> =	7.75	N/A	feet
Overflow Weir Slope Length =	2.92	N/A	feet
Grate Open Area / 100-yr Orifice Area =	11.47	N/A	
Overflow Grate Open Area w/o Debris =	23.03	N/A	ft <sup>2</sup>
Overflow Grate Open Area w/ Debris =	11.51	N/A	ft <sup>2</sup>

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.20	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	42.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	11.00	N/A	inches

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	2.01	N/A	ft <sup>2</sup>
Outlet Orifice Centroid =	0.54	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	1.07	N/A	radians

**User Input: Emergency Spillway (Rectangular or Trapezoidal)**

	9.00	
Spillway Invert Stage =	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth = <input type="text"/> 1.50 feet
Spillway Crest Length =	15.00 feet	Stage at Top of Freeboard = <input type="text"/> 11.50 feet
Spillway End Slopes =	4.00 H:V	Basin Area at Top of Freeboard = <input type="text"/> 1.37 acres
Freeboard above Max Water Surface =	1.00 feet	Basin Volume at Top of Freeboard = <input type="text"/> 9.55 acre-ft

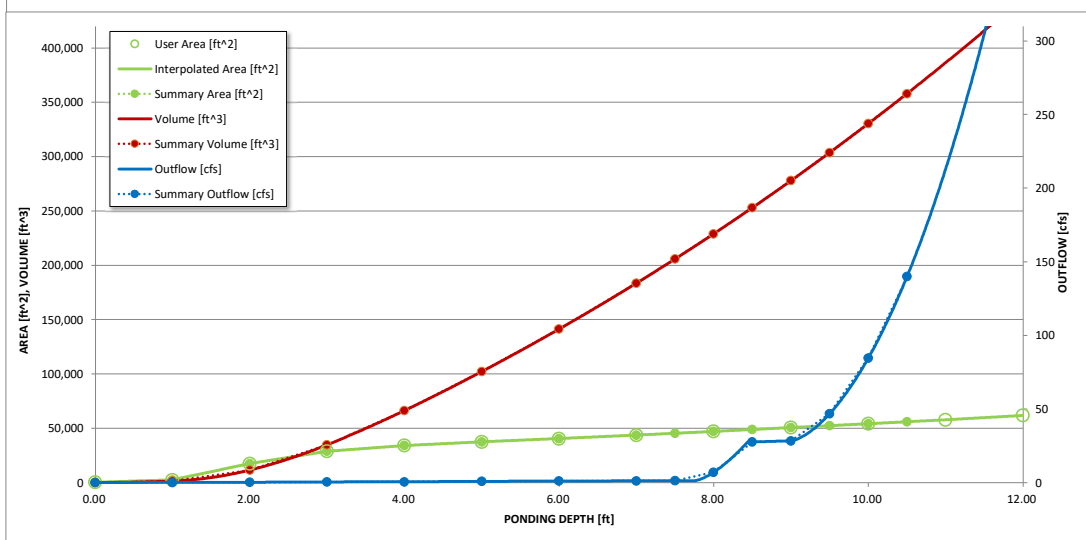
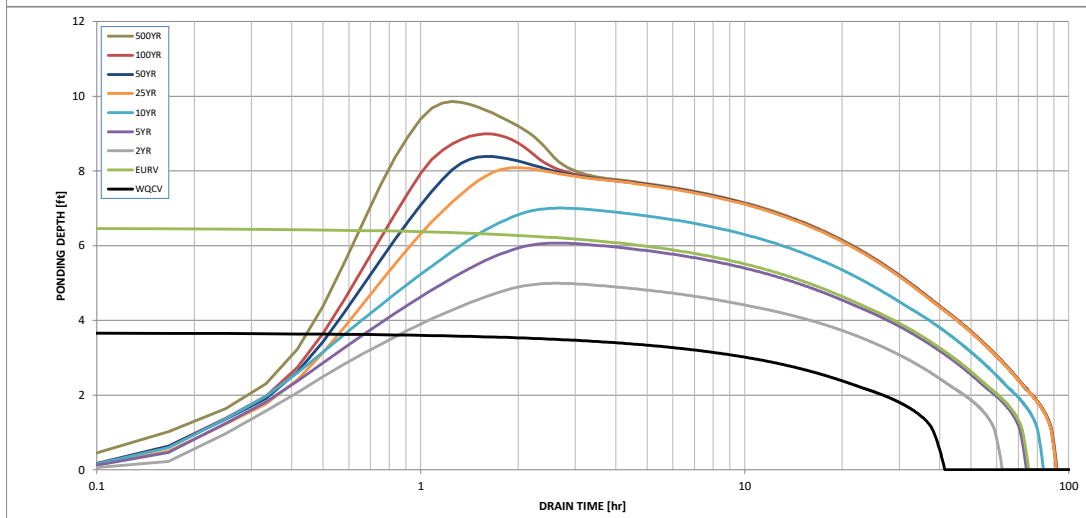
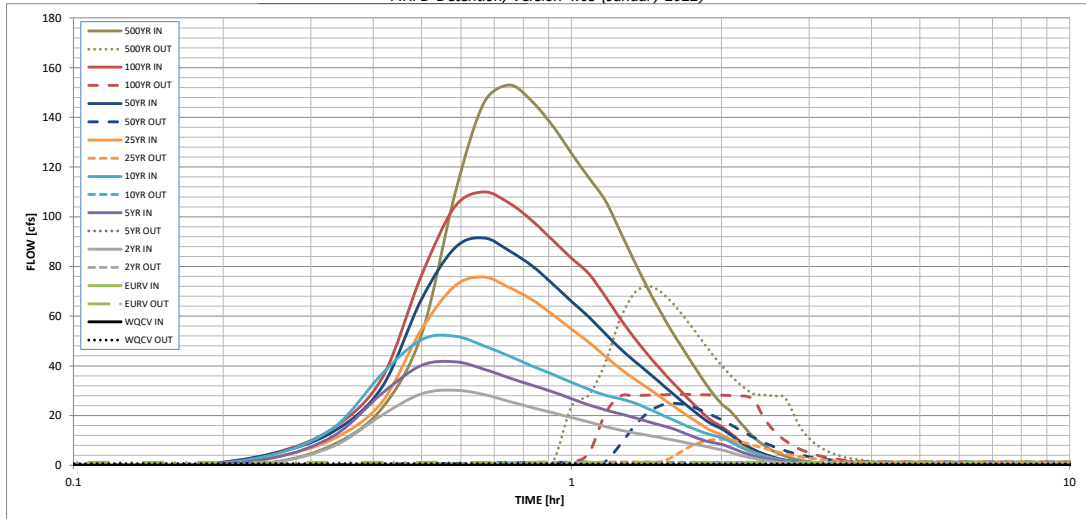
## Routed Hydrograph Results

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

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	0.84	1.10	1.33	1.68	1.97	2.28	3.07
One-Hour Rainfall Depth (in) =	1.269	3.694	2.497	3.504	4.444	6.023	7.277	8.690	12.165
CUHP Runoff Volume (acre-ft) =	N/A	N/A	2.497	3.504	4.444	6.023	7.277	8.690	12.165
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.3	2.8	7.5	20.1	27.7	38.0	59.9
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A							
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.06	0.15	0.41	0.57	0.78	1.23
Peak Inflow Q (cfs) =	N/A	N/A	30.2	41.7	52.0	75.7	91.5	110.0	153.0
Peak Outflow Q (cfs) =	0.6	1.2	0.9	1.1	1.2	10.5	24.9	28.4	72.0
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.4	0.2	0.5	0.9	0.7	1.2
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.4	1.0	1.2	1.2
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	68	57	67	75	81	79	77	73
Time to Drain 99% of Inflow Volume (hours) =	40	72	60	71	80	87	87	86	84
Maximum Ponding Depth (ft) =	3.67	6.48	4.99	6.07	7.00	8.09	8.39	8.99	9.86
Area at Maximum Ponding Depth (acres) =	0.74	0.97	0.86	0.94	1.00	1.09	1.11	1.16	1.23
Maximum Volume Stored (acre-ft) =	1.271	3.700	2.338	3.300	4.213	5.343	5.674	6.368	7.398

# DETENTION BASIN OUTLET STRUCTURE DESIGN

*MHFD-Detention, Version 4.05 (January 2022)*



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

**Design Procedure Form: Extended Detention Basin (EDB)**

UD-BMP (Version 3.07, March 2018)

Sheet 1 of 3

**Designer:** Chris Davids  
**Company:** Merrick & CO  
**Date:** April 6, 2023  
**Project:** Ridgegate East Filing No. 3  
**Location:** Lone Tree, CO

<p>1. Basin Storage Volume</p> <p>A) Effective Imperviousness of Tributary Area, <math>I_a</math></p> <p>B) Tributary Area's Imperviousness Ratio (<math>i = I_a / 100</math>)</p> <p>C) Contributing Watershed Area</p> <p>D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm</p> <p>E) Design Concept (Select EURV when also designing for flood control)</p> <p>F) Design Volume (WQCV) Based on 40-hour Drain Time (<math>V_{DESIGN} = (1.0 * (0.91 * i^2 - 1.19 * i^2 + 0.78 * i) / 12 * \text{Area})</math>)</p> <p>G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume (<math>V_{WQCV\ OTHER} = (d_s * (V_{DESIGN} / 0.43))</math>)</p> <p>H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)</p> <p>I) NRCS Hydrologic Soil Groups of Tributary Watershed              i) Percentage of Watershed consisting of Type A Soils              ii) Percentage of Watershed consisting of Type B Soils              iii) Percentage of Watershed consisting of Type C/D Soils</p> <p>J) Excess Urban Runoff Volume (EURV) Design Volume              For HSG A: <math>EURV_A = 1.68 * i^{1.28}</math>              For HSG B: <math>EURV_B = 1.36 * i^{1.08}</math>              For HSG C/D: <math>EURV_{C/D} = 1.20 * i^{1.08}</math></p> <p>K) User Input of Excess Urban Runoff Volume (EURV) Design Volume (Only if a different EURV Design Volume is desired)</p>	<p><math>I_a = </math> <input type="text" value="77.3"/> %</p> <p><math>i = </math> <input type="text" value="0.773"/></p> <p>Area = <input type="text" value="48.780"/> ac</p> <p><math>d_s = </math> <input type="text" value=""/></p> <p>Choose One</p> <p><input type="radio"/> Water Quality Capture Volume (WQCV)</p> <p><input checked="" type="radio"/> Excess Urban Runoff Volume (EURV)</p> <p><math>V_{DESIGN} = </math> <input type="text" value="1.269"/> ac-ft</p> <p><math>V_{DESIGN\ OTHER} = </math> <input type="text" value=""/> ac-ft</p> <p><math>V_{DESIGN\ USER} = </math> <input type="text" value=""/> ac-ft</p> <p>HSG A = <input type="text" value="0"/> %</p> <p>HSG B = <input type="text" value="0"/> %</p> <p>HSG C/D = <input type="text" value="100"/> %</p> <p>EURV<sub>DESIGN</sub> = <input type="text" value="3.694"/> ac-ft</p> <p>EURV<sub>DESIGN\ USER</sub> = <input type="text" value=""/> ac-ft</p>
<p>2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)</p>	<p>L : W = <input type="text" value="2.0"/> : 1</p>
<p>3. Basin Side Slopes</p> <p>A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p>	<p>Z = <input type="text" value="4.00"/> ft / ft</p>
<p>4. Inlet</p> <p>A) Describe means of providing energy dissipation at concentrated inflow locations:</p>	<p>_____</p> <p>_____</p> <p>_____</p>
<p>5. Forebay</p> <p>A) Minimum Forebay Volume (<math>V_{FMIN} = </math> <input type="text" value="3%"/> of the WQCV)</p> <p>B) Actual Forebay Volume</p> <p>C) Forebay Depth (<math>D_f = </math> <input type="text" value="30"/> inch maximum)</p> <p>D) Forebay Discharge</p> <p>i) Undetained 100-year Peak Discharge</p> <p>ii) Forebay Discharge Design Flow (<math>Q_f = 0.02 * Q_{100}</math>)</p> <p>E) Forebay Discharge Design</p> <p>F) Discharge Pipe Size (minimum 8-inches)</p> <p>G) Rectangular Notch Width</p>	<p><math>V_{FMIN} = </math> <input type="text" value="0.038"/> ac-ft</p> <p><math>V_f = </math> <input type="text" value="0.042"/> ac-ft</p> <p><math>D_f = </math> <input type="text" value="30.0"/> in</p> <p><math>Q_{100} = </math> <input type="text" value="109.00"/> cfs</p> <p><math>Q_f = </math> <input type="text" value="2.18"/> cfs</p> <p>Choose One</p> <p><input type="radio"/> Berm With Pipe</p> <p><input checked="" type="radio"/> Wall with Rect. Notch</p> <p><input type="radio"/> Wall with V-Notch Weir</p> <p>Calculated <math>D_p = </math> <input type="text" value=""/> in</p> <p>Calculated <math>W_N = </math> <input type="text" value="8.0"/> in</p>



**Design Procedure Form: Extended Detention Basin (EDB)**

Sheet 2 of 3

**Designer:** Chris Davids  
**Company:** Merrick & CO  
**Date:** April 6, 2023  
**Project:** Ridgegate East Filing No. 3  
**Location:** Lone Tree, CO

<p>6. Trickle Channel</p> <p>A) Type of Trickle Channel</p> <p>F) Slope of Trickle Channel</p>	<p>Choose One</p> <p><input checked="" type="radio"/> Concrete</p> <p><input type="radio"/> Soft Bottom</p> <p>S = <input type="text" value="0.0050"/> ft / ft</p>
<p>7. Micropool and Outlet Structure</p> <p>A) Depth of Micropool (2.5-foot minimum)</p> <p>B) Surface Area of Micropool (10 ft<sup>2</sup> minimum)</p> <p>C) Outlet Type</p> <p>D) Smallest Dimension of Orifice Opening Based on Hydrograph Routing (Use UD-Detention)</p> <p>E) Total Outlet Area</p>	<p>D<sub>M</sub> = <input type="text" value="2.5"/> ft</p> <p>A<sub>M</sub> = <input type="text" value="335"/> sq ft</p> <p>Choose One</p> <p><input checked="" type="radio"/> Orifice Plate</p> <p><input type="radio"/> Other (Describe):</p> <hr/> <hr/> <p>D<sub>orifice</sub> = <input type="text" value="2.00"/> inches</p> <p>A<sub>orifice</sub> = <input type="text" value="18.18"/> square inches</p>
<p>8. Initial Surcharge Volume</p> <p>A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches)</p> <p>B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV)</p> <p>C) Initial Surcharge Provided Above Micropool</p>	<p>D<sub>IS</sub> = <input type="text" value="6"/> in</p> <p>V<sub>IS</sub> = <input type="text" value="166"/> cu ft</p> <p>V<sub>s</sub> = <input type="text" value="167.5"/> cu ft</p>
<p>9. Trash Rack</p> <p>A) Water Quality Screen Open Area: <math>A_t = A_{or} * 38.5 * (e^{-0.095D})</math></p> <p>B) Type of Screen (If specifying an alternative to the materials recommended in the USDCM, indicate "other" and enter the ratio of the total open area to the total screen area for the material specified.)</p> <p>Other (Y/N): <input type="text" value="N"/></p> <p>C) Ratio of Total Open Area to Total Area (only for type "Other")</p> <p>D) Total Water Quality Screen Area (based on screen type)</p> <p>E) Depth of Design Volume (EURV or WQCV) (Based on design concept chosen under 1E)</p> <p>F) Height of Water Quality Screen (H<sub>TR</sub>)</p> <p>G) Width of Water Quality Screen Opening (W<sub>opening</sub>) (Minimum of 12 inches is recommended)</p>	<p>A<sub>t</sub> = <input type="text" value="579"/> square inches</p> <p><input o.c."="" type="text" value="Aluminum Amico-Klemp SR Series with Cross Rods 2"/></p> <hr/> <hr/> <p>User Ratio = <input type="text"/></p> <p>A<sub>total</sub> = <input type="text" value="815"/> sq. in.</p> <p>H = <input type="text" value="7.61"/> feet</p> <p>H<sub>TR</sub> = <input type="text" value="119.32"/> inches</p> <p>W<sub>opening</sub> = <input type="text" value="12.0"/> inches <b>VALUE LESS THAN RECOMMENDED MIN. WIDTH. WIDTH HAS BEEN SET TO 12 INCHES.</b></p>

Design Procedure Form: Extended Detention Basin (EDB)

Sheet 3 of 3

Designer: Chris Davids  
Company: Merrick & CO  
Date: April 6, 2023  
Project: Ridgegate East Filing No. 3  
Location: Lone Tree, CO

<p>10. Overflow Embankment</p> <p>A) Describe embankment protection for 100-year and greater overtopping:</p> <p>B) Slope of Overflow Embankment (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p>	<p><u>Buried toe wall and soil riprap armored embankment</u></p> <p>Ze = <input type="text" value="4.00"/> ft / ft</p>
<p>11. Vegetation</p>	<p>Choose One</p> <p><input type="radio"/> Irrigated</p> <p><input checked="" type="radio"/> Not Irrigated</p>
<p>12. Access</p> <p>A) Describe Sediment Removal Procedures</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Notes: _____</p> <p>_____</p> <p>_____</p>	



**Merrick & Company**  
 5970 Greenwood Plaza Blvd.  
 Greenwood Village, CO 80111  
 Ph: (303) 751-0741

Job Name: RidgeGate East Filing No. 3  
 Job Number: 65121240  
 Date: 3/4/2023  
 By: CGB

**RidgeGate East Filing No. 3**

**Composite Runoff Coefficient Calculations**

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

Runoff Coefficient (UDFCD Vol 1, Chp 6, Sec. 2.5.1)

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

**Basin Design Data**

Basin Name	Design Point	I (%) =									A <sub>Total</sub> (sf)	A <sub>Total</sub> (ac)	i (%)	Runoff Coeff's			
		100%	90%	85%	40%	10%	25%	2%	2%	Imp (%)				C2	C5	C10	C100
		A <sub>paved streets</sub> (sf)	A <sub>sidewalk / conc</sub> (sf)	A <sub>MU</sub> (sf)	A <sub>Gravel</sub> (sf)	A <sub>plygnd</sub> (sf)	A <sub>art. turf</sub> (sf)	A <sub>iscape (B soil)</sub> (sf)	A <sub>iscape (C/D soil)</sub> (sf)								
RGPE-I	Basins B1-B6	90,947	81,338	0	0	0	0	0	202,883	375,168	8.61	44.8%	0.34	0.40	0.46	0.67	
RGPE-I	Basins C1-C2, C5-O	47,992	28,614	0	0	0	0	0	1,399,220	1,475,826	33.88	6.9%	0.04	0.09	0.18	0.51	
V2	-	19,904	10,744	0	0	0	0	0	62,979	93,627	2.15	32.9%	0.24	0.31	0.38	0.62	
	WQ Pond B	158,843	120,696	0	0	0	0	0	1,665,082	1,944,621	44.64	15.47%	0.10	0.16	0.25	0.55	



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Job Name: RidgeGate East Filing No. 3  
 Job Number: 65121240  
 Date: 3/4/2023  
 By: CGB

### RidgeGate East Filing No. 3

#### Composite Runoff Coefficient Calculations

Location: Douglas County  
 Municipality: Douglas County  
 Minor Design Storm: 5  
 Major Design Storm: 100  
 Soil Type: C/D

Runoff Coefficient (UDFCD Vol 1, Chp 6, Sec. 2.5.1)

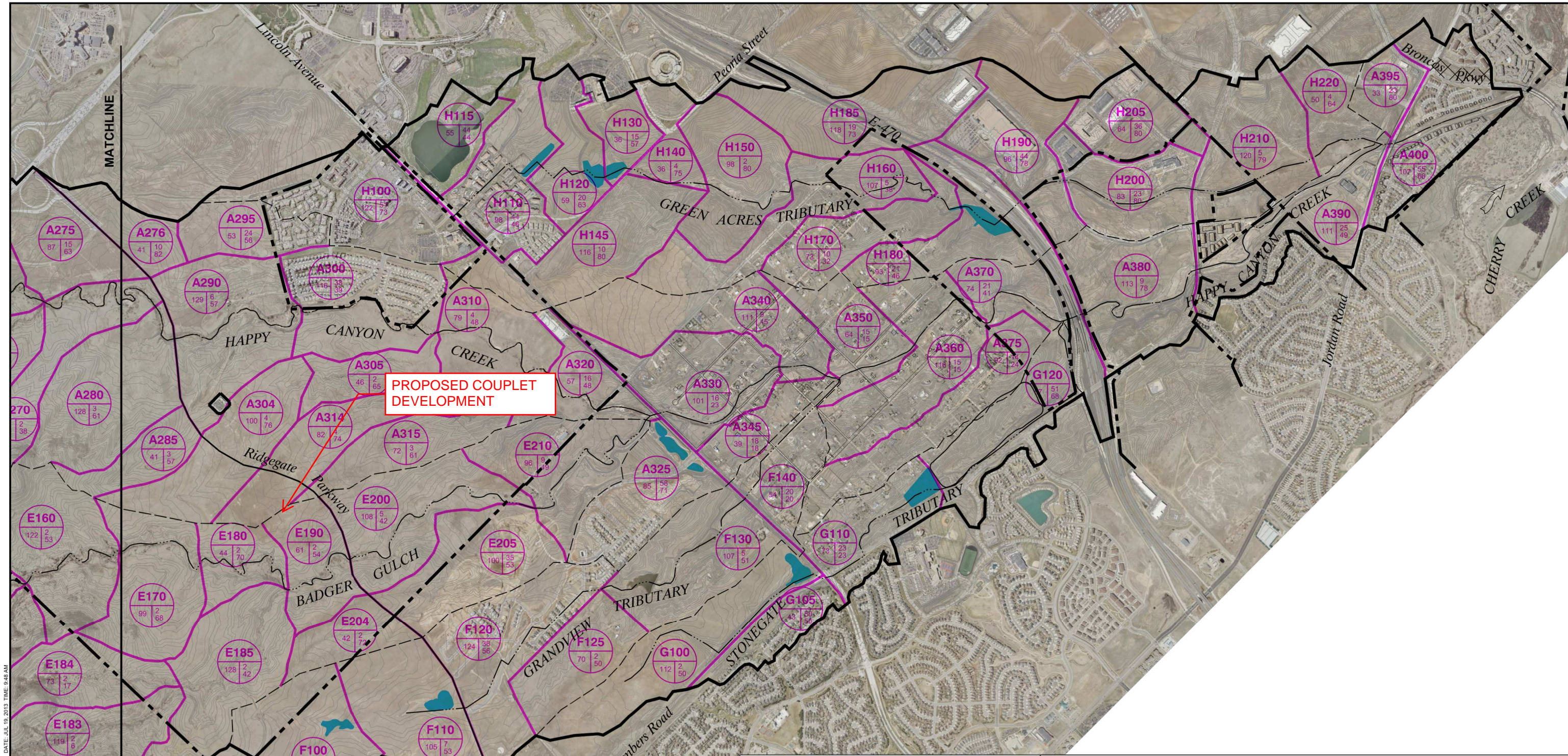
NRCS Soil Group	Storm Return Period					
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
A	$C=0.84i^{1.302}$	$C=0.86i^{1.276}$	$C=0.87i^{1.232}$	$C=0.84i^{1.124}$	$C=0.85i+0.025$	$C=0.78i+0.110$
B	$C=0.84i^{1.169}$	$C=0.86i^{1.088}$	$C=0.81i+0.057$	$C=0.63i+0.249$	$C=0.56i+0.328$	$C=0.47i+0.426$
C/D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

Basin Design Data													Runoff Coeff's			
Basin Name	Design Point	A <sub>paved streets</sub> (sf)	A <sub>sidewalk / conc</sub> (sf)	A <sub>MU/COM</sub> (sf)	A <sub>MF/RES</sub> (sf)	A <sub>plygnd</sub> (sf)	A <sub>art. turf</sub> (sf)	A <sub>iscape (B soil)</sub> (sf)	A <sub>iscape (C/D soil)</sub> (sf)	A <sub>Total</sub> (sf)	A <sub>Total</sub> (ac)	i (%)	C2	C5	C10	C100
RGPE-II	Basin E2-F, E4-F, E5-F	0	0	0	904,627	0	0	0	0	904,627	20.77	75.0%	0.60	0.65	0.69	0.79
U1	-	17,015	9,066	0	0	0	0	0	9,121	35,202	0.81	72.0%	0.57	0.63	0.67	0.78
T1	-	12,043	6,189	0	0	0	0	0	6,463	24,695	0.57	71.8%	0.57	0.62	0.66	0.78
S1	-	52,812	28,960	0	0	0	0	0	33,349	115,121	2.64	69.1%	0.55	0.60	0.64	0.77
	WQ Pond E	81,870	44,215	0	904,627	0	0	0	48,933	1,079,645	24.79	74.20%	0.59	0.64	0.68	0.79





## APPENDIX F – CUHP / SWMM CALCULATIONS



**PROPOSED COUPLET DEVELOPMENT**

**Map Controls (Select from Below):**

- Study Area Map
- Soil Survey Map
- Existing Land Use Map
- Future Land Use Map
- Subwatershed Boundaries Map
- Baseline Hydrology SWMM Routing Map

The Map Controls set the visibility of the layers automatically for the selected map. Additional layer control is available through the "Layers" Navigation Panel which can be accessed from the View Menu under Navigation Panels. In the Panel, the visibility of layers and layer groups can be changed by clicking the square left of the layer/group. An eye in the square indicated that the layer is on. An empty square indicates that the layer is off. Layer groups can be expanded and reduced by clicking the +/- symbol left of the layer/group.

**Map Legend**

- Watershed Boundary
- Major Basin Boundary
- Sub-basin Boundary
- Jurisdiction Boundary
- Existing Regional Detention
- Reach Delimiter
- Subwatershed Label

Imperviousness (%)	
	2
	5
	10
	15
	20
	25
	30
	40
	50
	60
	70
	75
	80
	85
	95
	100

DATE: JUL 19, 2013 TIME: 9:45 AM  
NAME: P:\12\10\01 Happy Canyon Creek MDP & FHAD\DFDCAD\1210-HYDROLOGY MAPS.dwg

No.	DATE	REVISIONS	APPR.

**MULLER ENGINEERING CO., INC.**  
CONSULTING ENGINEERS  
777 SOUTH WADSWORTH BLVD. 4-100  
LAKEWOOD, COLORADO 80226 (303) 988-4939

DESIGN: MDC  
DRAWN: JHK  
CHECK: JTW

**HAPPY CANYON CREEK MAJOR DRAINAGEWAY PLAN**

INTERACTIVE HYDROLOGY MAP  
SUBWATERSHED BOUNDARIES



Comment	Lone Tree, Colorado		
1Hr Depth	2.27	<a href="#">NOAA Atlas 14 Point Precipitation Frequency Estimates: CO (Note: Use 60-minute recur</a>	
Return Period	100	Years	
Time	Depth	CurveValue	
0:05	0.023		0.01
0:10	0.068		0.03
0:15	0.104		0.046
0:20	0.182		0.08
0:25	0.318		0.14
0:30	0.568		0.25
0:35	0.318		0.14
0:40	0.182		0.08
0:45	0.141		0.062
0:50	0.114		0.05
0:55	0.091		0.04
1:00	0.091		0.04
1:05	0.091		0.04
1:10	0.045		0.02
1:15	0.045		0.02
1:20	0.027		0.012
1:25	0.027		0.012
1:30	0.027		0.012
1:35	0.027		0.012
1:40	0.027		0.012
1:45	0.027		0.012
1:50	0.027		0.012
1:55	0.027		0.012
2:00	0.027		0.012
2:05	0		

rence interval depth)





**FHAD-14 Summary of CUHP Input Parameters (Version 2.0.1)**

Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in./hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
G120	G120	100YR-2HR	0.136	0.457	0.934	0.022	50.5	0.50	0.10	4.50	0.60	0.0018	0.00	0.85	0.23	49.21
H100	H100	100YR-2HR	0.191	0.255	1.013	0.012	51.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.86	0.23	50.18
H110	H110	100YR-2HR	0.154	0.240	0.571	0.020	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32
H115	H115	100YR-2HR	0.086	0.131	0.290	0.013	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32
H120	H120	100YR-2HR	0.092	0.290	0.473	0.017	19.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.39	0.13	18.16
H130	H130	100YR-2HR	0.057	0.153	0.400	0.017	15.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.30	0.12	13.98
H140	H140	100YR-2HR	0.056	0.331	0.578	0.024	3.5	0.50	0.10	3.38	0.53	0.0018	0.00	0.07	0.04	3.08
H145	H145	100YR-2HR	0.182	0.465	1.088	0.017	10.2	0.50	0.10	3.08	0.51	0.0018	0.00	0.20	0.10	9.19
H150	H150	100YR-2HR	0.153	0.121	0.491	0.032	2.0	0.50	0.10	3.60	0.54	0.0018	0.00	0.04	0.02	1.74
H160	H160	100YR-2HR	0.167	0.655	1.321	0.017	5.2	0.50	0.10	3.68	0.55	0.0018	0.00	0.10	0.05	4.56
H170	H170	100YR-2HR	0.115	0.360	0.820	0.021	10.0	0.50	0.10	3.75	0.55	0.0018	0.00	0.20	0.10	8.87
H180	H180	100YR-2HR	0.145	0.207	0.744	0.019	21.1	0.50	0.10	3.75	0.55	0.0018	0.00	0.42	0.13	19.53
H185	H185	100YR-2HR	0.185	0.350	0.966	0.022	19.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.38	0.13	17.68
H190	H190	100YR-2HR	0.150	0.106	0.543	0.035	43.8	0.50	0.10	3.38	0.53	0.0018	0.00	0.82	0.21	42.65
H200	H200	100YR-2HR	0.130	0.234	0.691	0.019	23.4	0.50	0.10	3.90	0.56	0.0018	0.00	0.47	0.14	21.75
H205	H205	100YR-2HR	0.101	0.155	0.360	0.035	35.8	0.50	0.10	3.75	0.55	0.0018	0.00	0.72	0.19	34.34
H210	H210	100YR-2HR	0.187	0.288	0.629	0.022	4.9	0.50	0.10	3.80	0.59	0.0017	0.00	0.10	0.05	4.25
H220	H220	100YR-2HR	0.079	0.290	0.472	0.027	4.4	0.50	0.10	3.55	0.61	0.0016	0.00	0.09	0.04	3.80





**FHAD-14 Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)**

Catchment Name/ID	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
G120	0.089	0.160	43.3	5.93	22.5	4.19	9.9	94	316,722	1.67	528,162	50.0	106	528,063	1.22
H100	0.088	0.171	36.4	5.37	18.9	3.79	8.9	158	444,358	1.76	780,692	46.0	176	780,508	1.44
H110	0.091	0.168	25.0	3.83	13.0	2.71	6.4	185	357,448	1.67	596,627	42.0	175	596,456	1.78
H115	0.091	0.151	16.7	2.54	8.7	1.79	4.2	154	199,284	1.67	332,631	38.0	124	332,780	2.25
H120	0.113	0.147	37.1	4.79	19.3	3.39	8.0	74	212,968	1.35	287,846	48.0	69	287,803	1.17
H130	0.119	0.142	27.3	3.58	14.2	2.53	6.0	62	131,400	1.30	170,442	44.0	51	170,364	1.41
H140	0.152	0.142	55.6	6.67	28.9	4.71	11.1	30	130,819	1.12	145,904	56.0	27	145,899	0.76
H145	0.129	0.169	68.7	9.54	35.7	6.74	15.9	79	422,195	1.23	517,711	64.0	82	517,715	0.71
H150	0.157	0.165	26.1	3.91	13.6	2.76	6.5	175	355,031	1.07	381,593	44.0	124	381,510	1.27
H160	0.146	0.166	102.1	13.61	53.1	9.62	22.7	49	387,068	1.11	427,987	74.0	50	427,984	0.47
H170	0.130	0.142	60.0	7.16	31.2	5.06	11.9	57	266,355	1.16	308,103	58.0	54	308,091	0.74
H180	0.111	0.156	35.1	4.81	18.3	3.40	8.0	124	337,840	1.30	440,856	46.0	110	440,848	1.19
H185	0.114	0.170	46.6	6.68	24.2	4.72	11.1	119	429,188	1.35	577,367	52.0	118	577,371	1.00
H190	0.092	0.165	14.9	2.48	7.7	1.75	4.1	304	349,595	1.64	571,850	36.0	229	571,471	2.37
H200	0.108	0.161	34.1	4.81	17.7	3.40	8.0	114	300,878	1.32	398,193	46.0	101	398,164	1.22
H205	0.096	0.155	16.3	2.54	8.5	1.79	4.2	185	233,737	1.50	351,174	40.0	137	351,235	2.12
H210	0.147	0.170	44.6	6.42	23.2	4.54	10.7	126	434,183	1.04	451,589	52.0	102	451,582	0.85
H220	0.149	0.149	42.8	5.51	22.3	3.90	9.2	55	182,813	1.01	184,018	50.0	43	184,002	0.85



**Existing Couplet Summary of CUHP Input Parameters (Version 2.0.1)**

Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in./hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
A100	A100	100YR-2HR	0.114	0.256	0.670	0.053	43.1	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	42.02
A105	A105	100YR-2HR	0.172	0.619	1.018	0.045	20.3	0.50	0.10	3.00	0.50	0.0018	0.00	0.41	0.13	18.95
A110	A110	100YR-2HR	0.121	0.098	0.413	0.046	48.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.84	0.22	46.95
A120	A120	100YR-2HR	0.170	0.130	0.703	0.036	48.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.84	0.22	46.95
A125	A125	100YR-2HR	0.117	0.251	0.534	0.035	48.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.84	0.22	46.95
A130	A130	100YR-2HR	0.073	0.137	0.424	0.034	28.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.56	0.16	26.57
A134	A134	100YR-2HR	0.186	0.295	0.667	0.047	29.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.58	0.17	27.58
A135	A135	100YR-2HR	0.160	0.370	0.835	0.041	32.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.64	0.18	30.62
A140	A140	100YR-2HR	0.182	0.237	0.772	0.045	31.7	0.50	0.10	3.08	0.51	0.0018	0.00	0.63	0.18	30.29
A150	A150	100YR-2HR	0.180	0.144	0.746	0.043	16.0	0.50	0.10	3.15	0.51	0.0018	0.00	0.32	0.12	14.72
A160	A160	100YR-2HR	0.167	0.210	0.598	0.049	11.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.22	0.10	9.91
A170	A170	100YR-2HR	0.136	0.275	0.537	0.041	9.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.18	0.09	8.05
A180	A180	100YR-2HR	0.133	0.158	0.761	0.038	7.2	0.50	0.10	3.38	0.53	0.0018	0.00	0.14	0.07	6.39
A190	A190	100YR-2HR	0.139	0.143	0.595	0.047	8.5	0.50	0.10	3.30	0.52	0.0018	0.00	0.17	0.09	7.58
A195	A195	100YR-2HR	0.118	0.503	0.884	0.040	13.9	0.50	0.10	3.15	0.51	0.0018	0.00	0.28	0.11	12.70
A200	A200	100YR-2HR	0.140	0.171	0.620	0.042	14.0	0.50	0.10	3.15	0.51	0.0018	0.00	0.28	0.11	12.79
A210	A210	100YR-2HR	0.130	0.456	0.808	0.033	19.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.40	0.13	18.46
A215	A215	100YR-2HR	0.184	0.456	0.831	0.052	7.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.14	0.07	6.27
A220	A220	100YR-2HR	0.150	0.203	0.916	0.036	6.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.13	0.06	5.72
A230	A230	100YR-2HR	0.047	0.068	0.329	0.040	10.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.21	0.10	9.39
A234	A234	100YR-2HR	0.133	0.288	0.500	0.054	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
A235	A235	100YR-2HR	0.151	0.255	0.641	0.052	2.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.06	0.03	2.48
A240	A240	100YR-2HR	0.136	0.137	0.756	0.052	10.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.01
A245	A245	100YR-2HR	0.052	0.154	0.339	0.062	10.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.20
A250	A250	100YR-2HR	0.064	0.243	0.526	0.035	11.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.22	0.10	10.15
A260	A260	100YR-2HR	0.144	0.340	0.612	0.023	9.1	0.50	0.10	3.23	0.52	0.0018	0.00	0.18	0.09	8.14
A263	A263	100YR-2HR	0.121	0.405	0.790	0.052	2.0	0.50	0.10	3.15	0.51	0.0018	0.00	0.04	0.02	1.76
A264	A264	100YR-2HR	0.153	0.525	1.027	0.049	2.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.04	0.02	1.76
A265	A265	100YR-2HR	0.080	0.255	0.656	0.053	2.0	0.50	0.10	3.38	0.53	0.0018	0.00	0.04	0.02	1.75
A270	A270	100YR-2HR	0.182	0.538	1.056	0.028	2.4	0.50	0.10	3.08	0.51	0.0018	0.00	0.05	0.02	2.12
A275	A275	100YR-2HR	0.131	0.365	0.631	0.055	53.1	0.50	0.10	3.08	0.51	0.0018	0.00	0.87	0.24	52.10
A276	A276	100YR-2HR	0.060	0.120	0.357	0.039	10.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.01
A280	A280	100YR-2HR	0.200	0.345	0.797	0.051	3.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.06	0.03	2.65
A285	A285	100YR-2HR	0.064	0.227	0.600	0.047	3.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.06	0.03	2.66
A290	A290	100YR-2HR	0.202	0.318	0.745	0.026	6.2	0.50	0.10	3.60	0.54	0.0018	0.00	0.12	0.06	5.47
A295	A295	100YR-2HR	0.083	0.112	0.379	0.034	23.6	0.50	0.10	3.38	0.53	0.0018	0.00	0.47	0.14	22.09
A300	A300	100YR-2HR	0.181	0.316	0.677	0.023	38.0	0.50	0.10	3.53	0.54	0.0018	0.00	0.76	0.19	36.69
A304	A304	100YR-2HR	0.156	0.414	0.972	0.031	4.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.09	0.04	3.92
A305	A305	100YR-2HR	0.072	0.301	0.665	0.031	2.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.04	0.02	1.76
A310	A310	100YR-2HR	0.123	0.250	0.720	0.016	3.7	0.50	0.10	4.05	0.57	0.0018	0.00	0.07	0.04	3.21
A314	A314	100YR-2HR	0.129	0.573	1.055	0.028	4.3	0.50	0.10	3.15	0.51	0.0018	0.00	0.09	0.04	3.81
A315	A315	100YR-2HR	0.112	0.407	1.038	0.030	2.7	0.50	0.10	4.13	0.58	0.0018	0.00	0.05	0.03	2.33
A320	A320	100YR-2HR	0.089	0.277	0.727	0.016	15.8	0.50	0.10	4.05	0.57	0.0018	0.00	0.32	0.12	14.31
A325	A325	100YR-2HR	0.133	0.248	0.650	0.022	58.4	0.50	0.10	3.75	0.55	0.0018	0.00	0.89	0.26	57.38
A330	A330	100YR-2HR	0.158	0.259	0.948	0.019	16.2	0.50	0.10	3.90	0.56	0.0018	0.00	0.32	0.12	14.73
A340	A340	100YR-2HR	0.174	0.555	1.134	0.019	9.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.18	0.09	8.05
A345	A345	100YR-2HR	0.061	0.341	0.662	0.015	17.8	0.50	0.10	4.43	0.60	0.0018	0.00	0.36	0.12	16.15
A350	A350	100YR-2HR	0.100	0.205	0.706	0.020	15.0	0.50	0.10	3.75	0.55	0.0018	0.00	0.30	0.12	13.62
A360	A360	100YR-2HR	0.181	0.390	0.989	0.015	14.6	0.50	0.10	4.20	0.58	0.0018	0.00	0.29	0.11	13.13
A370	A370	100YR-2HR	0.116	0.127	0.657	0.018	20.7	0.50	0.10	4.28	0.59	0.0018	0.00	0.41	0.13	19.01
A375	A375	100YR-2HR	0.143	0.595	1.231	0.022	14.0	0.50	0.10	3.90	0.56	0.0018	0.00	0.28	0.11	12.63
A380	A380	100YR-2HR	0.177	0.268	0.768	0.014	8.6	0.50	0.10	4.53	0.68	0.0016	0.00	0.17	0.09	7.36
A390	A390	100YR-2HR	0.173	0.446	0.963	0.016	24.7	0.50	0.10	4.08	0.65	0.0016	0.00	0.49	0.15	22.79
A395	A395	100YR-2HR	0.051	0.100	0.266	0.026	23.0	0.50	0.10	4.50	0.60	0.0018	0.00	0.46	0.14	21.20
A400	A400	100YR-2HR	0.166	0.281	0.742	0.026	55.4	0.50	0.10	3.60	0.54	0.0018	0.00	0.88	0.25	54.34
B100	B100	100YR-2HR	0.113	0.151	0.376	0.047	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32

**Existing Couplet Summary of CUHP Input Parameters (Version 2.0.1)**

Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in./hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
B110	B110	100YR-2HR	0.129	0.199	0.530	0.048	28.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.57	0.16	27.07
B120	B120	100YR-2HR	0.119	0.199	0.637	0.041	24.8	0.50	0.10	3.08	0.51	0.0018	0.00	0.50	0.15	23.36
B130	B130	100YR-2HR	0.112	0.234	0.911	0.037	9.5	0.50	0.10	3.23	0.52	0.0018	0.00	0.19	0.10	8.51
B134	B134	100YR-2HR	0.038	0.036	0.293	0.015	40.3	0.50	0.10	3.00	0.50	0.0018	0.00	0.80	0.20	39.21
B135	B135	100YR-2HR	0.196	0.416	0.847	0.040	15.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.31	0.12	14.18
C100	C100	100YR-2HR	0.151	0.240	0.508	0.045	2.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.05	0.03	2.22
C110	C110	100YR-2HR	0.164	0.168	0.631	0.050	9.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.18	0.09	8.09
C120	C120	100YR-2HR	0.103	0.275	0.678	0.037	13.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.26	0.11	11.87
C125	C125	100YR-2HR	0.176	0.413	0.859	0.043	8.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.16	0.08	7.18
C130	C130	100YR-2HR	0.174	0.222	0.629	0.033	36.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.72	0.19	34.73
C140	C140	100YR-2HR	0.085	0.117	0.585	0.038	26.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.52	0.15	24.57
C150	C150	100YR-2HR	0.091	0.272	0.631	0.024	2.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.06	0.03	2.48
C153	C153	100YR-2HR	0.195	0.250	0.712	0.044	33.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.66	0.18	31.64
C154	C154	100YR-2HR	0.152	0.212	0.537	0.040	43.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	41.92
C155	C155	100YR-2HR	0.119	0.312	0.651	0.045	31.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.62	0.17	29.60
C159	C159	100YR-2HR	0.172	0.240	0.684	0.049	29.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.58	0.17	27.58
C160	C160	100YR-2HR	0.179	0.123	0.541	0.050	7.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.15	0.08	6.72
C170	C170	100YR-2HR	0.169	0.296	0.865	0.032	11.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.22	0.10	9.96
C175	C175	100YR-2HR	0.157	0.346	0.799	0.045	8.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.16	0.08	7.18
C180	C180	100YR-2HR	0.069	0.129	0.622	0.041	14.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.30	0.11	13.60
C185	C185	100YR-2HR	0.174	0.414	0.816	0.049	7.7	0.50	0.10	3.00	0.50	0.0018	0.00	0.15	0.08	6.90
C190	C190	100YR-2HR	0.119	0.269	0.766	0.031	10.7	0.50	0.10	3.00	0.50	0.0018	0.00	0.21	0.10	9.67
D100	D100	100YR-2HR	0.187	0.282	0.680	0.040	9.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.18	0.09	8.09
D110	D110	100YR-2HR	0.175	0.283	0.619	0.030	11.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.22	0.10	9.96
D120	D120	100YR-2HR	0.115	0.104	0.607	0.047	10.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.01
D130	D130	100YR-2HR	0.125	0.282	0.592	0.050	24.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.48	0.15	22.59
E100	E100	100YR-2HR	0.151	0.294	0.702	0.030	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E105	E105	100YR-2HR	0.082	0.212	0.480	0.039	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E110	E110	100YR-2HR	0.129	0.196	0.468	0.045	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E120	E120	100YR-2HR	0.121	0.202	0.661	0.042	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E125	E125	100YR-2HR	0.115	0.304	0.574	0.050	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E130	E130	100YR-2HR	0.129	0.145	0.691	0.045	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E135	E135	100YR-2HR	0.159	0.329	0.676	0.048	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E140	E140	100YR-2HR	0.142	0.137	0.530	0.034	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E150	E150	100YR-2HR	0.104	0.182	0.537	0.052	2.0	0.50	0.10	3.08	0.51	0.0018	0.00	0.04	0.02	1.77
E155	E155	100YR-2HR	0.198	0.464	0.859	0.051	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E160	E160	100YR-2HR	0.191	0.275	0.659	0.038	2.0	0.50	0.10	3.83	0.56	0.0018	0.00	0.04	0.02	1.74
E170	E170	100YR-2HR	0.155	0.236	0.541	0.060	2.0	0.50	0.10	3.90	0.56	0.0018	0.00	0.04	0.02	1.73
E180	E180	100YR-2HR	0.169	0.694	0.980	0.025	6.2	0.50	0.10	4.20	0.58	0.0018	0.00	0.12	0.06	5.39
E183	E183	100YR-2HR	0.187	0.477	0.855	0.054	2.0	0.50	0.10	3.38	0.53	0.0018	0.00	0.04	0.02	1.75
E184	E184	100YR-2HR	0.114	0.331	0.728	0.053	2.0	0.50	0.10	3.75	0.55	0.0018	0.00	0.04	0.02	1.74
E185	E185	100YR-2HR	0.199	0.358	1.043	0.039	2.0	0.50	0.10	3.60	0.54	0.0018	0.00	0.04	0.02	1.74
E190	E190	100YR-2HR	0.075	0.426	0.685	0.026	10.1	0.50	0.10	3.75	0.55	0.0018	0.00	0.20	0.10	8.97
E200	E200	100YR-2HR	0.168	0.543	0.870	0.023	5.4	0.50	0.10	3.75	0.55	0.0018	0.00	0.11	0.05	4.73
E204	E204	100YR-2HR	0.066	0.202	0.481	0.029	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E205	E205	100YR-2HR	0.156	0.369	0.798	0.032	35.2	0.50	0.10	3.15	0.51	0.0018	0.00	0.70	0.19	33.86
E210	E210	100YR-2HR	0.150	0.507	1.092	0.016	9.2	0.50	0.10	3.83	0.56	0.0018	0.00	0.18	0.09	8.13
F100	F100	100YR-2HR	0.145	0.152	0.511	0.031	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
F110	F110	100YR-2HR	0.164	0.167	0.424	0.023	6.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.13	0.07	5.81
F120	F120	100YR-2HR	0.194	0.377	0.668	0.028	38.3	0.50	0.10	3.08	0.51	0.0018	0.00	0.77	0.19	37.11
F125	F125	100YR-2HR	0.109	0.254	0.623	0.025	2.0	0.50	0.10	3.68	0.55	0.0018	0.00	0.04	0.02	1.74
F130	F130	100YR-2HR	0.167	0.287	0.624	0.022	4.7	0.50	0.10	3.68	0.55	0.0018	0.00	0.09	0.05	4.12
F140	F140	100YR-2HR	0.085	0.380	0.782	0.022	19.6	0.50	0.10	4.05	0.57	0.0018	0.00	0.39	0.13	17.99
G100	G100	100YR-2HR	0.176	0.586	1.270	0.015	2.0	0.50	0.10	3.08	0.51	0.0018	0.00	0.04	0.02	1.77
G105	G105	100YR-2HR	0.067	0.231	0.584	0.019	50.0	0.50	0.10	3.83	0.56	0.0018	0.00	0.85	0.23	48.82
G110	G110	100YR-2HR	0.115	0.302	0.646	0.023	22.8	0.50	0.10	4.05	0.57	0.0018	0.00	0.46	0.14	21.12

**Existing Couplet Summary of CUHP Input Parameters (Version 2.0.1)**

Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in./hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
G120	G120	100YR-2HR	0.136	0.457	0.934	0.022	50.5	0.50	0.10	4.50	0.60	0.0018	0.00	0.85	0.23	49.21
H100	H100	100YR-2HR	0.191	0.255	1.013	0.012	51.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.86	0.23	50.18
H110	H110	100YR-2HR	0.154	0.240	0.571	0.020	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32
H115	H115	100YR-2HR	0.086	0.131	0.290	0.013	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32
H120	H120	100YR-2HR	0.092	0.290	0.473	0.017	19.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.39	0.13	18.16
H130	H130	100YR-2HR	0.057	0.153	0.400	0.017	15.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.30	0.12	13.98
H140	H140	100YR-2HR	0.056	0.331	0.578	0.024	3.5	0.50	0.10	3.38	0.53	0.0018	0.00	0.07	0.04	3.08
H145	H145	100YR-2HR	0.182	0.465	1.088	0.017	10.2	0.50	0.10	3.08	0.51	0.0018	0.00	0.20	0.10	9.19
H150	H150	100YR-2HR	0.153	0.121	0.491	0.032	2.0	0.50	0.10	3.60	0.54	0.0018	0.00	0.04	0.02	1.74
H160	H160	100YR-2HR	0.167	0.655	1.321	0.017	5.2	0.50	0.10	3.68	0.55	0.0018	0.00	0.10	0.05	4.56
H170	H170	100YR-2HR	0.115	0.360	0.820	0.021	10.0	0.50	0.10	3.75	0.55	0.0018	0.00	0.20	0.10	8.87
H180	H180	100YR-2HR	0.145	0.207	0.744	0.019	21.1	0.50	0.10	3.75	0.55	0.0018	0.00	0.42	0.13	19.53
H185	H185	100YR-2HR	0.185	0.350	0.966	0.022	19.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.38	0.13	17.68
H190	H190	100YR-2HR	0.150	0.106	0.543	0.035	43.8	0.50	0.10	3.38	0.53	0.0018	0.00	0.82	0.21	42.65
H200	H200	100YR-2HR	0.130	0.234	0.691	0.019	23.4	0.50	0.10	3.90	0.56	0.0018	0.00	0.47	0.14	21.75
H205	H205	100YR-2HR	0.101	0.155	0.360	0.035	35.8	0.50	0.10	3.75	0.55	0.0018	0.00	0.72	0.19	34.34
H210	H210	100YR-2HR	0.187	0.288	0.629	0.022	4.9	0.50	0.10	3.80	0.59	0.0017	0.00	0.10	0.05	4.25
H220	H220	100YR-2HR	0.079	0.290	0.472	0.027	4.4	0.50	0.10	3.55	0.61	0.0016	0.00	0.09	0.04	3.80

Note: Basins E180 and E190 revised to reflect the Ridgeway Parkway Expansion (Couplet) Project.

**Existing Couplet Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)**

Catchment Name/ID	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f.)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A100	0.092	0.188	19.9	3.48	10.4	2.46	5.8	172	265,542	1.65	438,776	40.0	149	438,325	2.03
A105	0.112	0.166	53.4	7.39	27.8	5.22	12.3	97	400,194	1.36	544,950	56.0	101	544,951	0.92
A110	0.090	0.204	9.3	2.05	4.8	1.45	3.4	391	280,317	1.72	480,910	34.0	247	480,081	3.20
A120	0.090	0.238	12.4	2.87	6.5	2.03	4.8	410	394,526	1.72	676,845	36.0	299	676,905	2.75
A125	0.090	0.201	17.8	3.35	9.2	2.37	5.6	198	271,954	1.72	466,562	40.0	167	466,068	2.23
A130	0.103	0.117	23.8	2.73	12.4	1.93	4.6	92	169,524	1.46	247,327	42.0	77	247,393	1.66
A134	0.102	0.182	25.1	4.10	13.0	2.90	6.8	222	432,231	1.47	636,081	42.0	194	635,885	1.63
A135	0.099	0.181	31.5	4.98	16.4	3.52	8.3	152	371,991	1.51	561,661	46.0	146	561,724	1.43
A140	0.099	0.191	22.7	3.92	11.8	2.77	6.5	241	423,473	1.50	635,177	42.0	205	634,931	1.76
A150	0.118	0.172	23.4	3.69	12.2	2.61	6.2	230	417,549	1.29	539,745	42.0	179	539,484	1.56
A160	0.126	0.173	26.0	4.06	13.5	2.87	6.8	193	388,904	1.22	474,871	44.0	150	474,720	1.40
A170	0.133	0.165	32.5	4.72	16.9	3.33	7.9	125	315,491	1.20	377,423	46.0	103	377,404	1.18
A180	0.139	0.170	30.5	4.59	15.9	3.24	7.6	131	309,985	1.16	359,340	46.0	103	359,271	1.21
A190	0.135	0.168	23.9	3.70	12.4	2.61	6.2	174	323,273	1.18	382,289	42.0	128	382,021	1.44
A195	0.121	0.145	57.6	6.99	29.9	4.94	11.7	62	275,020	1.27	348,114	56.0	62	348,105	0.82
A200	0.121	0.156	26.5	3.78	13.8	2.67	6.3	158	324,737	1.27	411,459	44.0	126	411,395	1.41
A210	0.112	0.146	50.8	6.31	26.4	4.46	10.5	77	301,737	1.36	408,975	54.0	78	408,954	0.94
A215	0.140	0.170	49.4	7.03	25.7	4.97	11.7	112	427,469	1.20	511,329	54.0	104	511,302	0.88
A220	0.142	0.165	40.1	5.67	20.9	4.01	9.5	112	349,316	1.19	415,390	50.0	98	415,288	1.02
A230	0.128	0.138	15.2	2.21	7.9	1.56	3.7	92	108,703	1.24	134,409	40.0	59	134,160	1.96
A234	0.156	0.162	36.1	5.09	18.8	3.59	8.5	111	309,381	1.14	352,051	48.0	90	352,029	1.06
A235	0.154	0.165	37.2	5.31	19.4	3.75	8.8	122	351,616	1.15	403,374	48.0	101	403,354	1.05
A240	0.130	0.162	25.6	3.79	13.3	2.68	6.3	159	316,188	1.23	389,367	44.0	124	389,296	1.42
A245	0.129	0.140	20.3	2.79	10.6	1.97	4.7	76	120,249	1.23	148,383	42.0	54	148,399	1.65
A250	0.126	0.145	33.8	4.36	17.6	3.08	7.3	56	147,546	1.25	183,928	46.0	48	183,889	1.18
A260	0.133	0.166	43.8	6.19	22.8	4.37	10.3	98	333,588	1.20	399,471	52.0	89	399,423	0.96
A263	0.156	0.159	54.3	7.24	28.2	5.12	12.1	67	280,689	1.12	314,877	56.0	61	314,874	0.78
A264	0.156	0.165	68.2	9.24	35.5	6.53	15.4	67	354,497	1.11	394,818	64.0	64	394,806	0.66
A265	0.156	0.150	42.0	5.44	21.9	3.84	9.1	57	185,926	1.10	204,076	50.0	47	204,064	0.92
A270	0.155	0.165	79.5	10.65	41.3	7.52	17.7	69	422,822	1.13	479,697	68.0	69	479,681	0.60
A275	0.087	0.162	25.0	3.71	13.0	2.62	6.2	158	305,268	1.78	542,475	42.0	156	542,302	1.85
A276	0.130	0.145	20.2	2.85	10.5	2.01	4.7	89	139,276	1.23	171,510	42.0	63	171,492	1.65
A280	0.153	0.172	46.0	6.67	23.9	4.72	11.1	130	463,571	1.13	521,726	52.0	113	521,689	0.89
A285	0.153	0.145	39.6	5.00	20.6	3.54	8.3	49	149,335	1.15	171,664	50.0	41	171,673	1.00
A290	0.143	0.172	46.6	6.76	24.2	4.78	11.3	130	468,961	1.12	527,519	54.0	113	527,525	0.88
A295	0.108	0.151	16.6	2.52	8.6	1.78	4.2	151	193,592	1.37	265,154	40.0	106	265,270	1.99
A300	0.095	0.169	31.1	4.64	16.1	3.28	7.7	175	421,266	1.55	652,066	44.0	169	651,936	1.46
A304	0.148	0.166	62.7	8.57	32.6	6.05	14.3	75	362,652	1.17	422,780	62.0	73	422,775	0.73
A305	0.156	0.147	53.1	6.61	27.6	4.67	11.0	41	167,874	1.11	186,969	56.0	36	186,955	0.79
A310	0.151	0.160	52.5	7.03	27.3	4.97	11.7	70	285,707	1.05	300,793	56.0	60	300,771	0.76
A314	0.149	0.161	80.5	10.54	41.9	7.45	17.6	48	298,810	1.15	343,240	68.0	49	343,216	0.59
A315	0.154	0.158	70.6	9.14	36.7	6.46	15.2	48	261,035	1.03	269,857	64.0	43	269,855	0.60
A320	0.119	0.149	47.2	5.98	24.5	4.23	10.0	56	205,696	1.21	248,490	52.0	52	248,455	0.91
A325	0.085	0.162	25.5	3.77	13.3	2.66	6.3	157	309,892	1.82	562,519	42.0	158	562,403	1.85
A330	0.118	0.149	49.0	6.19	25.5	4.37	10.3	97	367,414	1.23	450,619	54.0	91	450,584	0.90
A340	0.133	0.153	84.5	10.53	43.9	7.44	17.6	62	404,446	1.20	483,841	68.0	66	483,811	0.59
A345	0.116	0.126	58.3	6.24	30.3	4.41	10.4	31	141,901	1.20	170,761	56.0	30	170,745	0.77
A350	0.120	0.139	41.2	4.99	21.4	3.52	8.3	73	232,552	1.22	284,503	50.0	65	284,493	1.01
A360	0.121	0.151	64.3	8.08	33.5	5.71	13.5	84	419,663	1.18	494,589	60.0	82	494,552	0.71
A370	0.112	0.142	29.6	3.82	15.4	2.70	6.4	118	270,118	1.26	339,321	44.0	96	339,258	1.29
A375	0.121	0.145	84.6	10.01	44.0	7.07	16.7	51	332,636	1.20	398,097	68.0	54	398,086	0.58
A380	0.136	0.169	48.9	6.94	25.5	4.90	11.6	108	410,695	0.97	396,583	54.0	84	396,546	0.74
A390	0.107	0.168	53.8	7.55	28.0	5.34	12.6	96	401,844	1.24	497,351	56.0	93	497,354	0.84
A395	0.109	0.140	15.3	2.25	8.0	1.59	3.7	100	118,901	1.27	150,952	40.0	64	150,740	1.95
A400	0.086	0.166	27.6	4.11	14.3	2.90	6.8	181	386,673	1.78	688,345	42.0	185	688,090	1.74
B100	0.091	0.190	11.9	2.33	6.2	1.65	3.9	287	263,637	1.67	440,045	34.0	199	439,570	2.74

**Existing Couplet Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)**

Catchment Name/ID	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f.)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
B110	0.102	0.152	22.1	3.19	11.5	2.25	5.3	175	299,948	1.47	439,509	42.0	145	439,228	1.75
B120	0.106	0.139	28.6	3.65	14.9	2.58	6.1	124	275,415	1.41	388,837	44.0	109	388,742	1.44
B130	0.131	0.150	43.2	5.57	22.5	3.93	9.3	78	260,477	1.20	313,161	52.0	70	313,101	0.97
B134	0.094	0.110	12.2	1.63	6.3	1.15	2.7	94	88,677	1.62	143,332	34.0	64	142,740	2.62
B135	0.119	0.177	41.5	6.23	21.6	4.40	10.4	142	455,812	1.30	592,397	50.0	134	592,322	1.06
C100	0.155	0.153	36.2	4.86	18.8	3.44	8.1	125	350,106	1.14	400,423	48.0	102	400,413	1.06
C110	0.133	0.155	28.2	3.95	14.6	2.79	6.6	174	379,959	1.22	463,422	44.0	138	463,299	1.32
C120	0.123	0.145	39.1	4.94	20.3	3.49	8.2	79	239,824	1.27	304,411	48.0	72	304,422	1.08
C125	0.136	0.169	49.1	6.96	25.5	4.92	11.6	108	409,255	1.21	494,342	54.0	101	494,291	0.89
C130	0.096	0.168	23.6	3.65	12.3	2.58	6.1	221	404,678	1.56	631,751	42.0	196	631,368	1.76
C140	0.105	0.151	19.8	2.89	10.3	2.04	4.8	129	196,914	1.43	282,303	40.0	100	282,314	1.85
C150	0.154	0.153	49.5	6.40	25.7	4.52	10.7	55	211,249	1.15	242,344	54.0	50	242,315	0.85
C153	0.098	0.182	23.3	3.87	12.1	2.73	6.4	251	454,046	1.52	691,366	42.0	218	690,963	1.75
C154	0.092	0.141	23.4	3.14	12.2	2.22	5.2	195	353,382	1.65	583,466	42.0	178	583,298	1.83
C155	0.100	0.155	29.5	4.11	15.3	2.91	6.9	121	275,415	1.50	412,321	44.0	112	412,208	1.48
C159	0.102	0.164	25.3	3.78	13.1	2.67	6.3	204	400,311	1.47	589,105	42.0	178	588,945	1.62
C160	0.138	0.159	22.7	3.37	11.8	2.38	5.6	237	416,643	1.20	500,821	42.0	173	500,613	1.51
C170	0.126	0.146	48.1	6.01	25.0	4.24	10.0	105	391,506	1.24	487,055	52.0	99	487,003	0.92
C175	0.136	0.150	48.2	6.16	25.1	4.36	10.3	98	364,557	1.21	440,350	54.0	91	440,310	0.90
C180	0.120	0.130	27.9	3.37	14.5	2.38	5.6	74	159,395	1.29	205,948	44.0	60	205,826	1.38
C185	0.137	0.161	49.1	6.66	25.6	4.71	11.1	106	403,679	1.20	486,185	54.0	99	486,129	0.89
C190	0.127	0.150	42.9	5.53	22.3	3.91	9.2	83	275,299	1.24	341,446	50.0	76	341,413	1.00
D100	0.133	0.170	36.0	5.30	18.7	3.74	8.8	156	435,391	1.22	531,029	48.0	135	530,955	1.12
D110	0.126	0.168	35.3	5.16	18.3	3.65	8.6	149	406,165	1.24	505,292	48.0	129	505,302	1.15
D120	0.130	0.158	21.3	3.18	11.1	2.25	5.3	162	266,773	1.23	328,516	42.0	118	328,273	1.60
D130	0.107	0.160	27.3	3.95	14.2	2.79	6.6	138	290,795	1.41	409,544	44.0	119	409,319	1.49
E100	0.156	0.165	48.3	6.71	25.1	4.74	11.2	94	350,826	1.14	399,213	54.0	84	399,198	0.86
E105	0.156	0.150	35.5	4.70	18.5	3.32	7.8	70	191,501	1.14	217,914	48.0	56	217,915	1.07
E110	0.156	0.161	30.4	4.36	15.8	3.08	7.3	128	300,808	1.14	342,296	46.0	99	342,179	1.19
E120	0.156	0.159	37.5	5.19	19.5	3.67	8.6	97	281,967	1.14	320,856	48.0	80	320,860	1.03
E125	0.156	0.158	41.2	5.60	21.4	3.96	9.3	84	266,727	1.14	303,514	50.0	71	303,484	0.97
E130	0.156	0.161	31.8	4.53	16.5	3.20	7.5	122	299,205	1.14	340,472	46.0	96	340,458	1.16
E135	0.156	0.166	44.5	6.27	23.1	4.43	10.4	107	369,226	1.14	420,151	52.0	93	420,128	0.92
E140	0.156	0.163	28.6	4.19	14.9	2.96	7.0	149	330,243	1.14	375,791	44.0	113	375,726	1.24
E150	0.156	0.156	31.4	4.36	16.3	3.08	7.3	100	242,751	1.13	274,275	46.0	78	274,224	1.16
E155	0.156	0.172	56.1	7.99	29.1	5.64	13.3	106	460,783	1.14	524,336	58.0	98	524,306	0.78
E160	0.157	0.171	41.6	6.06	21.7	4.28	10.1	138	443,522	1.05	467,258	52.0	110	467,196	0.90
E170	0.157	0.165	32.5	4.73	16.9	3.34	7.9	143	360,096	1.05	376,838	46.0	106	376,822	1.07
<b>E180</b>	<b>0.143</b>	<b>0.146</b>	<b>92.0</b>	<b>10.93</b>	<b>47.9</b>	<b>7.72</b>	<b>18.2</b>	<b>55</b>	<b>392,481</b>	<b>1.07</b>	<b>419,581</b>	<b>70.0</b>	<b>54</b>	<b>419,580</b>	<b>0.50</b>
E183	0.156	0.170	56.5	7.97	29.4	5.63	13.3	99	433,649	1.10	475,982	58.0	89	475,954	0.75
E184	0.157	0.158	47.5	6.36	24.7	4.49	10.6	72	264,659	1.06	280,682	54.0	60	280,666	0.82
E185	0.157	0.172	58.1	8.26	30.2	5.84	13.8	103	463,246	1.07	497,904	58.0	92	497,837	0.72
<b>E190</b>	<b>0.130</b>	<b>0.154</b>	<b>52.7</b>	<b>6.82</b>	<b>27.4</b>	<b>4.82</b>	<b>11.4</b>	<b>43</b>	<b>175,086</b>	<b>1.16</b>	<b>202,762</b>	<b>54.0</b>	<b>39</b>	<b>202,746</b>	<b>0.82</b>
E200	0.145	0.167	70.3	9.63	36.5	6.81	16.1	72	391,180	1.10	430,746	64.0	69	430,729	0.64
E204	0.156	0.145	38.4	4.89	20.0	3.45	8.1	52	153,447	1.14	174,611	48.0	43	174,613	1.01
E205	0.097	0.166	34.7	5.01	18.1	3.54	8.4	135	362,884	1.54	558,547	46.0	135	558,561	1.35
E210	0.133	0.164	77.0	10.33	40.0	7.30	17.2	58	347,458	1.14	396,146	66.0	58	396,114	0.61
F100	0.156	0.170	29.1	4.41	15.1	3.11	7.3	149	337,120	1.14	383,616	44.0	114	383,517	1.23
F110	0.141	0.163	28.1	4.12	14.6	2.91	6.9	175	380,494	1.19	452,910	44.0	137	452,760	1.31
F120	0.095	0.171	31.5	4.73	16.4	3.35	7.9	184	449,632	1.59	712,692	44.0	182	712,718	1.47
F125	0.157	0.157	46.7	6.23	24.3	4.40	10.4	70	252,625	1.07	269,694	52.0	58	269,665	0.84
F130	0.148	0.167	45.5	6.44	23.6	4.55	10.7	110	388,369	1.10	427,102	52.0	94	427,054	0.88
F140	0.113	0.132	56.5	6.32	29.4	4.46	10.5	45	197,681	1.26	249,054	56.0	45	249,036	0.82
G100	0.156	0.168	102.9	13.91	53.5	9.83	23.2	51	407,815	1.13	460,774	74.0	54	460,771	0.48
G105	0.089	0.146	28.1	3.75	14.6	2.65	6.2	71	154,655	1.69	262,054	42.0	70	261,952	1.65
G110	0.109	0.146	39.5	5.04	20.6	3.56	8.4	87	266,030	1.30	346,697	48.0	80	346,710	1.09

**Existing Couplet Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)**

Catchment Name/ID	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
G120	0.089	0.160	43.3	5.93	22.5	4.19	9.9	94	316,722	1.67	528,162	50.0	106	528,063	1.22
H100	0.088	0.171	36.4	5.37	18.9	3.79	8.9	158	444,358	1.76	780,692	46.0	176	780,508	1.44
H110	0.091	0.168	25.0	3.83	13.0	2.71	6.4	185	357,448	1.67	596,627	42.0	175	596,456	1.78
H115	0.091	0.151	16.7	2.54	8.7	1.79	4.2	154	199,284	1.67	332,631	38.0	124	332,780	2.25
H120	0.113	0.147	37.1	4.79	19.3	3.39	8.0	74	212,968	1.35	287,846	48.0	69	287,803	1.17
H130	0.119	0.142	27.3	3.58	14.2	2.53	6.0	62	131,400	1.30	170,442	44.0	51	170,364	1.41
H140	0.152	0.142	55.6	6.67	28.9	4.71	11.1	30	130,819	1.12	145,904	56.0	27	145,899	0.76
H145	0.129	0.169	68.7	9.54	35.7	6.74	15.9	79	422,195	1.23	517,711	64.0	82	517,715	0.71
H150	0.157	0.165	26.1	3.91	13.6	2.76	6.5	175	355,031	1.07	381,593	44.0	124	381,510	1.27
H160	0.146	0.166	102.1	13.61	53.1	9.62	22.7	49	387,068	1.11	427,987	74.0	50	427,984	0.47
H170	0.130	0.142	60.0	7.16	31.2	5.06	11.9	57	266,355	1.16	308,103	58.0	54	308,091	0.74
H180	0.111	0.156	35.1	4.81	18.3	3.40	8.0	124	337,840	1.30	440,856	46.0	110	440,848	1.19
H185	0.114	0.170	46.6	6.68	24.2	4.72	11.1	119	429,188	1.35	577,367	52.0	118	577,371	1.00
H190	0.092	0.165	14.9	2.48	7.7	1.75	4.1	304	349,595	1.64	571,850	36.0	229	571,471	2.37
H200	0.108	0.161	34.1	4.81	17.7	3.40	8.0	114	300,878	1.32	398,193	46.0	101	398,164	1.22
H205	0.096	0.155	16.3	2.54	8.5	1.79	4.2	185	233,737	1.50	351,174	40.0	137	351,235	2.12
H210	0.147	0.170	44.6	6.42	23.2	4.54	10.7	126	434,183	1.04	451,589	52.0	102	451,582	0.85
H220	0.149	0.149	42.8	5.51	22.3	3.90	9.2	55	182,813	1.01	184,018	50.0	43	184,002	0.85

**Developed Couplet Summary of CUHP Input Parameters (Version 2.0.1)**

Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in./hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
A100	A100	100YR-2HR	0.114	0.256	0.670	0.053	43.1	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	42.02
A105	A105	100YR-2HR	0.172	0.619	1.018	0.045	20.3	0.50	0.10	3.00	0.50	0.0018	0.00	0.41	0.13	18.95
A110	A110	100YR-2HR	0.121	0.098	0.413	0.046	48.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.84	0.22	46.95
A120	A120	100YR-2HR	0.170	0.130	0.703	0.036	48.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.84	0.22	46.95
A125	A125	100YR-2HR	0.117	0.251	0.534	0.035	48.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.84	0.22	46.95
A130	A130	100YR-2HR	0.073	0.137	0.424	0.034	28.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.56	0.16	26.57
A134	A134	100YR-2HR	0.186	0.295	0.667	0.047	29.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.58	0.17	27.58
A135	A135	100YR-2HR	0.160	0.370	0.835	0.041	32.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.64	0.18	30.62
A140	A140	100YR-2HR	0.182	0.237	0.772	0.045	31.7	0.50	0.10	3.08	0.51	0.0018	0.00	0.63	0.18	30.29
A150	A150	100YR-2HR	0.180	0.144	0.746	0.043	16.0	0.50	0.10	3.15	0.51	0.0018	0.00	0.32	0.12	14.72
A160	A160	100YR-2HR	0.167	0.210	0.598	0.049	11.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.22	0.10	9.91
A170	A170	100YR-2HR	0.136	0.275	0.537	0.041	9.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.18	0.09	8.05
A180	A180	100YR-2HR	0.133	0.158	0.761	0.038	7.2	0.50	0.10	3.38	0.53	0.0018	0.00	0.14	0.07	6.39
A190	A190	100YR-2HR	0.139	0.143	0.595	0.047	8.5	0.50	0.10	3.30	0.52	0.0018	0.00	0.17	0.09	7.58
A195	A195	100YR-2HR	0.118	0.503	0.884	0.040	13.9	0.50	0.10	3.15	0.51	0.0018	0.00	0.28	0.11	12.70
A200	A200	100YR-2HR	0.140	0.171	0.620	0.042	14.0	0.50	0.10	3.15	0.51	0.0018	0.00	0.28	0.11	12.79
A210	A210	100YR-2HR	0.130	0.456	0.808	0.033	19.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.40	0.13	18.46
A215	A215	100YR-2HR	0.184	0.456	0.831	0.052	7.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.14	0.07	6.27
A220	A220	100YR-2HR	0.150	0.203	0.916	0.036	6.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.13	0.06	5.72
A230	A230	100YR-2HR	0.047	0.068	0.329	0.040	10.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.21	0.10	9.39
A234	A234	100YR-2HR	0.133	0.288	0.500	0.054	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
A235	A235	100YR-2HR	0.151	0.255	0.641	0.052	2.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.06	0.03	2.48
A240	A240	100YR-2HR	0.136	0.137	0.756	0.052	10.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.01
A245	A245	100YR-2HR	0.052	0.154	0.339	0.062	10.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.20
A250	A250	100YR-2HR	0.064	0.243	0.526	0.035	11.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.22	0.10	10.15
A260	A260	100YR-2HR	0.144	0.340	0.612	0.023	9.1	0.50	0.10	3.23	0.52	0.0018	0.00	0.18	0.09	8.14
A263	A263	100YR-2HR	0.121	0.405	0.790	0.052	2.0	0.50	0.10	3.15	0.51	0.0018	0.00	0.04	0.02	1.76
A264	A264	100YR-2HR	0.153	0.525	1.027	0.049	2.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.04	0.02	1.76
A265	A265	100YR-2HR	0.080	0.255	0.656	0.053	2.0	0.50	0.10	3.38	0.53	0.0018	0.00	0.04	0.02	1.75
A270	A270	100YR-2HR	0.182	0.538	1.056	0.028	2.4	0.50	0.10	3.08	0.51	0.0018	0.00	0.05	0.02	2.12
A275	A275	100YR-2HR	0.131	0.365	0.631	0.055	53.1	0.50	0.10	3.08	0.51	0.0018	0.00	0.87	0.24	52.10
A276	A276	100YR-2HR	0.060	0.120	0.357	0.039	10.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.01
A280	A280	100YR-2HR	0.200	0.345	0.797	0.051	3.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.06	0.03	2.65
A285	A285	100YR-2HR	0.064	0.227	0.600	0.047	3.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.06	0.03	2.66
A290	A290	100YR-2HR	0.202	0.318	0.745	0.026	6.2	0.50	0.10	3.60	0.54	0.0018	0.00	0.12	0.06	5.47
A295	A295	100YR-2HR	0.083	0.112	0.379	0.034	23.6	0.50	0.10	3.38	0.53	0.0018	0.00	0.47	0.14	22.09
A300	A300	100YR-2HR	0.181	0.316	0.677	0.023	38.0	0.50	0.10	3.53	0.54	0.0018	0.00	0.76	0.19	36.69
A304	A304	100YR-2HR	0.156	0.414	0.972	0.031	4.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.09	0.04	3.92
A305	A305	100YR-2HR	0.072	0.301	0.665	0.031	2.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.04	0.02	1.76
A310	A310	100YR-2HR	0.123	0.250	0.720	0.016	3.7	0.50	0.10	4.05	0.57	0.0018	0.00	0.07	0.04	3.21
A314	A314	100YR-2HR	0.129	0.573	1.055	0.028	4.3	0.50	0.10	3.15	0.51	0.0018	0.00	0.09	0.04	3.81
A315	A315	100YR-2HR	0.112	0.407	1.038	0.030	2.7	0.50	0.10	4.13	0.58	0.0018	0.00	0.05	0.03	2.33
A320	A320	100YR-2HR	0.089	0.277	0.727	0.016	15.8	0.50	0.10	4.05	0.57	0.0018	0.00	0.32	0.12	14.31
A325	A325	100YR-2HR	0.133	0.248	0.650	0.022	58.4	0.50	0.10	3.75	0.55	0.0018	0.00	0.89	0.26	57.38
A330	A330	100YR-2HR	0.158	0.259	0.948	0.019	16.2	0.50	0.10	3.90	0.56	0.0018	0.00	0.32	0.12	14.73
A340	A340	100YR-2HR	0.174	0.555	1.134	0.019	9.0	0.50	0.10	3.23	0.52	0.0018	0.00	0.18	0.09	8.05
A345	A345	100YR-2HR	0.061	0.341	0.662	0.015	17.8	0.50	0.10	4.43	0.60	0.0018	0.00	0.36	0.12	16.15
A350	A350	100YR-2HR	0.100	0.205	0.706	0.020	15.0	0.50	0.10	3.75	0.55	0.0018	0.00	0.30	0.12	13.62
A360	A360	100YR-2HR	0.181	0.390	0.989	0.015	14.6	0.50	0.10	4.20	0.58	0.0018	0.00	0.29	0.11	13.13
A370	A370	100YR-2HR	0.116	0.127	0.657	0.018	20.7	0.50	0.10	4.28	0.59	0.0018	0.00	0.41	0.13	19.01
A375	A375	100YR-2HR	0.143	0.595	1.231	0.022	14.0	0.50	0.10	3.90	0.56	0.0018	0.00	0.28	0.11	12.63
A380	A380	100YR-2HR	0.177	0.268	0.768	0.014	8.6	0.50	0.10	4.53	0.68	0.0016	0.00	0.17	0.09	7.36
A390	A390	100YR-2HR	0.173	0.446	0.963	0.016	24.7	0.50	0.10	4.08	0.65	0.0016	0.00	0.49	0.15	22.79
A395	A395	100YR-2HR	0.051	0.100	0.266	0.026	23.0	0.50	0.10	4.50	0.60	0.0018	0.00	0.46	0.14	21.20
A400	A400	100YR-2HR	0.166	0.281	0.742	0.026	55.4	0.50	0.10	3.60	0.54	0.0018	0.00	0.88	0.25	54.34
B100	B100	100YR-2HR	0.113	0.151	0.376	0.047	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32

Developed Couplet Summary of CUHP Input Parameters (Version 2.0.1)

Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in./hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
B110	B110	100YR-2HR	0.129	0.199	0.530	0.048	28.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.57	0.16	27.07
B120	B120	100YR-2HR	0.119	0.199	0.637	0.041	24.8	0.50	0.10	3.08	0.51	0.0018	0.00	0.50	0.15	23.36
B130	B130	100YR-2HR	0.112	0.234	0.911	0.037	9.5	0.50	0.10	3.23	0.52	0.0018	0.00	0.19	0.10	8.51
B134	B134	100YR-2HR	0.038	0.036	0.293	0.015	40.3	0.50	0.10	3.00	0.50	0.0018	0.00	0.80	0.20	39.21
B135	B135	100YR-2HR	0.196	0.416	0.847	0.040	15.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.31	0.12	14.18
C100	C100	100YR-2HR	0.151	0.240	0.508	0.045	2.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.05	0.03	2.22
C110	C110	100YR-2HR	0.164	0.168	0.631	0.050	9.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.18	0.09	8.09
C120	C120	100YR-2HR	0.103	0.275	0.678	0.037	13.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.26	0.11	11.87
C125	C125	100YR-2HR	0.176	0.413	0.859	0.043	8.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.16	0.08	7.18
C130	C130	100YR-2HR	0.174	0.222	0.629	0.033	36.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.72	0.19	34.73
C140	C140	100YR-2HR	0.085	0.117	0.585	0.038	26.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.52	0.15	24.57
C150	C150	100YR-2HR	0.091	0.272	0.631	0.024	2.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.06	0.03	2.48
C153	C153	100YR-2HR	0.195	0.250	0.712	0.044	33.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.66	0.18	31.64
C154	C154	100YR-2HR	0.152	0.212	0.537	0.040	43.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	41.92
C155	C155	100YR-2HR	0.119	0.312	0.651	0.045	31.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.62	0.17	29.60
C159	C159	100YR-2HR	0.172	0.240	0.684	0.049	29.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.58	0.17	27.58
C160	C160	100YR-2HR	0.179	0.123	0.541	0.050	7.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.15	0.08	6.72
C170	C170	100YR-2HR	0.169	0.296	0.865	0.032	11.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.22	0.10	9.96
C175	C175	100YR-2HR	0.157	0.346	0.799	0.045	8.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.16	0.08	7.18
C180	C180	100YR-2HR	0.069	0.129	0.622	0.041	14.8	0.50	0.10	3.00	0.50	0.0018	0.00	0.30	0.11	13.60
C185	C185	100YR-2HR	0.174	0.414	0.816	0.049	7.7	0.50	0.10	3.00	0.50	0.0018	0.00	0.15	0.08	6.90
C190	C190	100YR-2HR	0.119	0.269	0.766	0.031	10.7	0.50	0.10	3.00	0.50	0.0018	0.00	0.21	0.10	9.67
D100	D100	100YR-2HR	0.187	0.282	0.680	0.040	9.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.18	0.09	8.09
D110	D110	100YR-2HR	0.175	0.283	0.619	0.030	11.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.22	0.10	9.96
D120	D120	100YR-2HR	0.115	0.104	0.607	0.047	10.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.20	0.10	9.01
D130	D130	100YR-2HR	0.125	0.282	0.592	0.050	24.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.48	0.15	22.59
E100	E100	100YR-2HR	0.151	0.294	0.702	0.030	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E105	E105	100YR-2HR	0.082	0.212	0.480	0.039	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E110	E110	100YR-2HR	0.129	0.196	0.468	0.045	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E120	E120	100YR-2HR	0.121	0.202	0.661	0.042	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E125	E125	100YR-2HR	0.115	0.304	0.574	0.050	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E130	E130	100YR-2HR	0.129	0.145	0.691	0.045	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E135	E135	100YR-2HR	0.159	0.329	0.676	0.048	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E140	E140	100YR-2HR	0.142	0.137	0.530	0.034	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E150	E150	100YR-2HR	0.104	0.182	0.537	0.052	2.0	0.50	0.10	3.08	0.51	0.0018	0.00	0.04	0.02	1.77
E155	E155	100YR-2HR	0.198	0.464	0.859	0.051	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E160	E160	100YR-2HR	0.191	0.275	0.659	0.038	2.0	0.50	0.10	3.83	0.56	0.0018	0.00	0.04	0.02	1.74
E170	E170	100YR-2HR	0.155	0.236	0.541	0.060	2.0	0.50	0.10	3.90	0.56	0.0018	0.00	0.04	0.02	1.73
E180	E180	100YR-2HR	0.169	0.694	0.980	0.025	6.2	0.50	0.10	4.20	0.58	0.0018	0.00	0.12	0.06	5.39
E183	E183	100YR-2HR	0.187	0.477	0.855	0.054	2.0	0.50	0.10	3.38	0.53	0.0018	0.00	0.04	0.02	1.75
E184	E184	100YR-2HR	0.114	0.331	0.728	0.053	2.0	0.50	0.10	3.75	0.55	0.0018	0.00	0.04	0.02	1.74
E185	E185	100YR-2HR	0.199	0.358	1.043	0.039	2.0	0.50	0.10	3.60	0.54	0.0018	0.00	0.04	0.02	1.74
<b>E190</b>	<b>E190</b>	<b>100YR-2HR</b>	<b>0.076</b>	<b>0.426</b>	<b>0.685</b>	<b>0.026</b>	<b>77.3</b>	<b>0.50</b>	<b>0.10</b>	<b>3.75</b>	<b>0.55</b>	<b>0.0018</b>	<b>0.00</b>	<b>0.94</b>	<b>0.32</b>	<b>77.55</b>
E200	E200	100YR-2HR	0.168	0.543	0.870	0.023	5.4	0.50	0.10	3.75	0.55	0.0018	0.00	0.11	0.05	4.73
E204	E204	100YR-2HR	0.066	0.202	0.481	0.029	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
E205	E205	100YR-2HR	0.156	0.369	0.798	0.032	35.2	0.50	0.10	3.15	0.51	0.0018	0.00	0.70	0.19	33.86
E210	E210	100YR-2HR	0.150	0.507	1.092	0.016	9.2	0.50	0.10	3.83	0.56	0.0018	0.00	0.18	0.09	8.13
F100	F100	100YR-2HR	0.145	0.152	0.511	0.031	2.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.04	0.02	1.77
F110	F110	100YR-2HR	0.164	0.167	0.424	0.023	6.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.13	0.07	5.81
F120	F120	100YR-2HR	0.194	0.377	0.668	0.028	38.3	0.50	0.10	3.08	0.51	0.0018	0.00	0.77	0.19	37.11
F125	F125	100YR-2HR	0.109	0.254	0.623	0.025	2.0	0.50	0.10	3.68	0.55	0.0018	0.00	0.04	0.02	1.74
F130	F130	100YR-2HR	0.167	0.287	0.624	0.022	4.7	0.50	0.10	3.68	0.55	0.0018	0.00	0.09	0.05	4.12
F140	F140	100YR-2HR	0.085	0.380	0.782	0.022	19.6	0.50	0.10	4.05	0.57	0.0018	0.00	0.39	0.13	17.99
G100	G100	100YR-2HR	0.176	0.586	1.270	0.015	2.0	0.50	0.10	3.08	0.51	0.0018	0.00	0.04	0.02	1.77
G105	G105	100YR-2HR	0.067	0.231	0.584	0.019	50.0	0.50	0.10	3.83	0.56	0.0018	0.00	0.85	0.23	48.82
G110	G110	100YR-2HR	0.115	0.302	0.646	0.023	22.8	0.50	0.10	4.05	0.57	0.0018	0.00	0.46	0.14	21.12



**Developed Couplet Summary of CUHP Input Parameters (Version 2.0.1)**

Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in./hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
G120	G120	100YR-2HR	0.136	0.457	0.934	0.022	50.5	0.50	0.10	4.50	0.60	0.0018	0.00	0.85	0.23	49.21
H100	H100	100YR-2HR	0.191	0.255	1.013	0.012	51.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.86	0.23	50.18
H110	H110	100YR-2HR	0.154	0.240	0.571	0.020	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32
H115	H115	100YR-2HR	0.086	0.131	0.290	0.013	44.4	0.50	0.10	3.00	0.50	0.0018	0.00	0.82	0.21	43.32
H120	H120	100YR-2HR	0.092	0.290	0.473	0.017	19.5	0.50	0.10	3.00	0.50	0.0018	0.00	0.39	0.13	18.16
H130	H130	100YR-2HR	0.057	0.153	0.400	0.017	15.2	0.50	0.10	3.00	0.50	0.0018	0.00	0.30	0.12	13.98
H140	H140	100YR-2HR	0.056	0.331	0.578	0.024	3.5	0.50	0.10	3.38	0.53	0.0018	0.00	0.07	0.04	3.08
H145	H145	100YR-2HR	0.182	0.465	1.088	0.017	10.2	0.50	0.10	3.08	0.51	0.0018	0.00	0.20	0.10	9.19
H150	H150	100YR-2HR	0.153	0.121	0.491	0.032	2.0	0.50	0.10	3.60	0.54	0.0018	0.00	0.04	0.02	1.74
H160	H160	100YR-2HR	0.167	0.655	1.321	0.017	5.2	0.50	0.10	3.68	0.55	0.0018	0.00	0.10	0.05	4.56
H170	H170	100YR-2HR	0.115	0.360	0.820	0.021	10.0	0.50	0.10	3.75	0.55	0.0018	0.00	0.20	0.10	8.87
H180	H180	100YR-2HR	0.145	0.207	0.744	0.019	21.1	0.50	0.10	3.75	0.55	0.0018	0.00	0.42	0.13	19.53
H185	H185	100YR-2HR	0.185	0.350	0.966	0.022	19.0	0.50	0.10	3.00	0.50	0.0018	0.00	0.38	0.13	17.68
H190	H190	100YR-2HR	0.150	0.106	0.543	0.035	43.8	0.50	0.10	3.38	0.53	0.0018	0.00	0.82	0.21	42.65
H200	H200	100YR-2HR	0.130	0.234	0.691	0.019	23.4	0.50	0.10	3.90	0.56	0.0018	0.00	0.47	0.14	21.75
H205	H205	100YR-2HR	0.101	0.155	0.360	0.035	35.8	0.50	0.10	3.75	0.55	0.0018	0.00	0.72	0.19	34.34
H210	H210	100YR-2HR	0.187	0.288	0.629	0.022	4.9	0.50	0.10	3.80	0.59	0.0017	0.00	0.10	0.05	4.25
H220	H220	100YR-2HR	0.079	0.290	0.472	0.027	4.4	0.50	0.10	3.55	0.61	0.0016	0.00	0.09	0.04	3.80

Note: Basin E190 revised to reflect the development of the Ridgeway Parkway Couplet.

**Developed Couplet Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)**

Catchment Name/ID	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f.)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A100	0.092	0.188	19.9	3.48	10.4	2.46	5.8	172	265,542	1.65	438,776	40.0	149	438,325	2.03
A105	0.112	0.166	53.4	7.39	27.8	5.22	12.3	97	400,194	1.36	544,950	56.0	101	544,951	0.92
A110	0.090	0.204	9.3	2.05	4.8	1.45	3.4	391	280,317	1.72	480,910	34.0	247	480,081	3.20
A120	0.090	0.238	12.4	2.87	6.5	2.03	4.8	410	394,526	1.72	676,845	36.0	299	676,905	2.75
A125	0.090	0.201	17.8	3.35	9.2	2.37	5.6	198	271,954	1.72	466,562	40.0	167	466,068	2.23
A130	0.103	0.117	23.8	2.73	12.4	1.93	4.6	92	169,524	1.46	247,327	42.0	77	247,393	1.66
A134	0.102	0.182	25.1	4.10	13.0	2.90	6.8	222	432,231	1.47	636,081	42.0	194	635,885	1.63
A135	0.099	0.181	31.5	4.98	16.4	3.52	8.3	152	371,991	1.51	561,661	46.0	146	561,724	1.43
A140	0.099	0.191	22.7	3.92	11.8	2.77	6.5	241	423,473	1.50	635,177	42.0	205	634,931	1.76
A150	0.118	0.172	23.4	3.69	12.2	2.61	6.2	230	417,549	1.29	539,745	42.0	179	539,484	1.56
A160	0.126	0.173	26.0	4.06	13.5	2.87	6.8	193	388,904	1.22	474,871	44.0	150	474,720	1.40
A170	0.133	0.165	32.5	4.72	16.9	3.33	7.9	125	315,491	1.20	377,423	46.0	103	377,404	1.18
A180	0.139	0.170	30.5	4.59	15.9	3.24	7.6	131	309,985	1.16	359,340	46.0	103	359,271	1.21
A190	0.135	0.168	23.9	3.70	12.4	2.61	6.2	174	323,273	1.18	382,289	42.0	128	382,021	1.44
A195	0.121	0.145	57.6	6.99	29.9	4.94	11.7	62	275,020	1.27	348,114	56.0	62	348,105	0.82
A200	0.121	0.156	26.5	3.78	13.8	2.67	6.3	158	324,737	1.27	411,459	44.0	126	411,395	1.41
A210	0.112	0.146	50.8	6.31	26.4	4.46	10.5	77	301,737	1.36	408,975	54.0	78	408,954	0.94
A215	0.140	0.170	49.4	7.03	25.7	4.97	11.7	112	427,469	1.20	511,329	54.0	104	511,302	0.88
A220	0.142	0.165	40.1	5.67	20.9	4.01	9.5	112	349,316	1.19	415,390	50.0	98	415,288	1.02
A230	0.128	0.138	15.2	2.21	7.9	1.56	3.7	92	108,703	1.24	134,409	40.0	59	134,160	1.96
A234	0.156	0.162	36.1	5.09	18.8	3.59	8.5	111	309,381	1.14	352,051	48.0	90	352,029	1.06
A235	0.154	0.165	37.2	5.31	19.4	3.75	8.8	122	351,616	1.15	403,374	48.0	101	403,354	1.05
A240	0.130	0.162	25.6	3.79	13.3	2.68	6.3	159	316,188	1.23	389,367	44.0	124	389,296	1.42
A245	0.129	0.140	20.3	2.79	10.6	1.97	4.7	76	120,249	1.23	148,383	42.0	54	148,399	1.65
A250	0.126	0.145	33.8	4.36	17.6	3.08	7.3	56	147,546	1.25	183,928	46.0	48	183,889	1.18
A260	0.133	0.166	43.8	6.19	22.8	4.37	10.3	98	333,588	1.20	399,471	52.0	89	399,423	0.96
A263	0.156	0.159	54.3	7.24	28.2	5.12	12.1	67	280,689	1.12	314,877	56.0	61	314,874	0.78
A264	0.156	0.165	68.2	9.24	35.5	6.53	15.4	67	354,497	1.11	394,818	64.0	64	394,806	0.66
A265	0.156	0.150	42.0	5.44	21.9	3.84	9.1	57	185,926	1.10	204,076	50.0	47	204,064	0.92
A270	0.155	0.165	79.5	10.65	41.3	7.52	17.7	69	422,822	1.13	479,697	68.0	69	479,681	0.60
A275	0.087	0.162	25.0	3.71	13.0	2.62	6.2	158	305,268	1.78	542,475	42.0	156	542,302	1.85
A276	0.130	0.145	20.2	2.85	10.5	2.01	4.7	89	139,276	1.23	171,510	42.0	63	171,492	1.65
A280	0.153	0.172	46.0	6.67	23.9	4.72	11.1	130	463,571	1.13	521,726	52.0	113	521,689	0.89
A285	0.153	0.145	39.6	5.00	20.6	3.54	8.3	49	149,335	1.15	171,664	50.0	41	171,673	1.00
A290	0.143	0.172	46.6	6.76	24.2	4.78	11.3	130	468,961	1.12	527,519	54.0	113	527,525	0.88
A295	0.108	0.151	16.6	2.52	8.6	1.78	4.2	151	193,592	1.37	265,154	40.0	106	265,270	1.99
A300	0.095	0.169	31.1	4.64	16.1	3.28	7.7	175	421,266	1.55	652,066	44.0	169	651,936	1.46
A304	0.148	0.166	62.7	8.57	32.6	6.05	14.3	75	362,652	1.17	422,780	62.0	73	422,775	0.73
A305	0.156	0.147	53.1	6.61	27.6	4.67	11.0	41	167,874	1.11	186,969	56.0	36	186,955	0.79
A310	0.151	0.160	52.5	7.03	27.3	4.97	11.7	70	285,707	1.05	300,793	56.0	60	300,771	0.76
A314	0.149	0.161	80.5	10.54	41.9	7.45	17.6	48	298,810	1.15	343,240	68.0	49	343,216	0.59
A315	0.154	0.158	70.6	9.14	36.7	6.46	15.2	48	261,035	1.03	269,857	64.0	43	269,855	0.60
A320	0.119	0.149	47.2	5.98	24.5	4.23	10.0	56	205,696	1.21	248,490	52.0	52	248,455	0.91
A325	0.085	0.162	25.5	3.77	13.3	2.66	6.3	157	309,892	1.82	562,519	42.0	158	562,403	1.85
A330	0.118	0.149	49.0	6.19	25.5	4.37	10.3	97	367,414	1.23	450,619	54.0	91	450,584	0.90
A340	0.133	0.153	84.5	10.53	43.9	7.44	17.6	62	404,446	1.20	483,841	68.0	66	483,811	0.59
A345	0.116	0.126	58.3	6.24	30.3	4.41	10.4	31	141,901	1.20	170,761	56.0	30	170,745	0.77
A350	0.120	0.139	41.2	4.99	21.4	3.52	8.3	73	232,552	1.22	284,503	50.0	65	284,493	1.01
A360	0.121	0.151	64.3	8.08	33.5	5.71	13.5	84	419,663	1.18	494,589	60.0	82	494,552	0.71
A370	0.112	0.142	29.6	3.82	15.4	2.70	6.4	118	270,118	1.26	339,321	44.0	96	339,258	1.29
A375	0.121	0.145	84.6	10.01	44.0	7.07	16.7	51	332,636	1.20	398,097	68.0	54	398,086	0.58
A380	0.136	0.169	48.9	6.94	25.5	4.90	11.6	108	410,695	0.97	396,583	54.0	84	396,546	0.74
A390	0.107	0.168	53.8	7.55	28.0	5.34	12.6	96	401,844	1.24	497,351	56.0	93	497,354	0.84
A395	0.109	0.140	15.3	2.25	8.0	1.59	3.7	100	118,901	1.27	150,952	40.0	64	150,740	1.95
A400	0.086	0.166	27.6	4.11	14.3	2.90	6.8	181	386,673	1.78	688,345	42.0	185	688,090	1.74
B100	0.091	0.190	11.9	2.33	6.2	1.65	3.9	287	263,637	1.67	440,045	34.0	199	439,570	2.74

**Developed Couplet Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)**

Catchment Name/ID	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
B110	0.102	0.152	22.1	3.19	11.5	2.25	5.3	175	299,948	1.47	439,509	42.0	145	439,228	1.75
B120	0.106	0.139	28.6	3.65	14.9	2.58	6.1	124	275,415	1.41	388,837	44.0	109	388,742	1.44
B130	0.131	0.150	43.2	5.57	22.5	3.93	9.3	78	260,477	1.20	313,161	52.0	70	313,101	0.97
B134	0.094	0.110	12.2	1.63	6.3	1.15	2.7	94	88,677	1.62	143,332	34.0	64	142,740	2.62
B135	0.119	0.177	41.5	6.23	21.6	4.40	10.4	142	455,812	1.30	592,397	50.0	134	592,322	1.06
C100	0.155	0.153	36.2	4.86	18.8	3.44	8.1	125	350,106	1.14	400,423	48.0	102	400,413	1.06
C110	0.133	0.155	28.2	3.95	14.6	2.79	6.6	174	379,959	1.22	463,422	44.0	138	463,299	1.32
C120	0.123	0.145	39.1	4.94	20.3	3.49	8.2	79	239,824	1.27	304,411	48.0	72	304,422	1.08
C125	0.136	0.169	49.1	6.96	25.5	4.92	11.6	108	409,255	1.21	494,342	54.0	101	494,291	0.89
C130	0.096	0.168	23.6	3.65	12.3	2.58	6.1	221	404,678	1.56	631,751	42.0	196	631,368	1.76
C140	0.105	0.151	19.8	2.89	10.3	2.04	4.8	129	196,914	1.43	282,303	40.0	100	282,314	1.85
C150	0.154	0.153	49.5	6.40	25.7	4.52	10.7	55	211,249	1.15	242,344	54.0	50	242,315	0.85
C153	0.098	0.182	23.3	3.87	12.1	2.73	6.4	251	454,046	1.52	691,366	42.0	218	690,963	1.75
C154	0.092	0.141	23.4	3.14	12.2	2.22	5.2	195	353,382	1.65	583,466	42.0	178	583,298	1.83
C155	0.100	0.155	29.5	4.11	15.3	2.91	6.9	121	275,415	1.50	412,321	44.0	112	412,208	1.48
C159	0.102	0.164	25.3	3.78	13.1	2.67	6.3	204	400,311	1.47	589,105	42.0	178	588,945	1.62
C160	0.138	0.159	22.7	3.37	11.8	2.38	5.6	237	416,643	1.20	500,821	42.0	173	500,613	1.51
C170	0.126	0.146	48.1	6.01	25.0	4.24	10.0	105	391,506	1.24	487,055	52.0	99	487,003	0.92
C175	0.136	0.150	48.2	6.16	25.1	4.36	10.3	98	364,557	1.21	440,350	54.0	91	440,310	0.90
C180	0.120	0.130	27.9	3.37	14.5	2.38	5.6	74	159,395	1.29	205,948	44.0	60	205,826	1.38
C185	0.137	0.161	49.1	6.66	25.6	4.71	11.1	106	403,679	1.20	486,185	54.0	99	486,129	0.89
C190	0.127	0.150	42.9	5.53	22.3	3.91	9.2	83	275,299	1.24	341,446	50.0	76	341,413	1.00
D100	0.133	0.170	36.0	5.30	18.7	3.74	8.8	156	435,391	1.22	531,029	48.0	135	530,955	1.12
D110	0.126	0.168	35.3	5.16	18.3	3.65	8.6	149	406,165	1.24	505,292	48.0	129	505,302	1.15
D120	0.130	0.158	21.3	3.18	11.1	2.25	5.3	162	266,773	1.23	328,516	42.0	118	328,273	1.60
D130	0.107	0.160	27.3	3.95	14.2	2.79	6.6	138	290,795	1.41	409,544	44.0	119	409,319	1.49
E100	0.156	0.165	48.3	6.71	25.1	4.74	11.2	94	350,826	1.14	399,213	54.0	84	399,198	0.86
E105	0.156	0.150	35.5	4.70	18.5	3.32	7.8	70	191,501	1.14	217,914	48.0	56	217,915	1.07
E110	0.156	0.161	30.4	4.36	15.8	3.08	7.3	128	300,808	1.14	342,296	46.0	99	342,179	1.19
E120	0.156	0.159	37.5	5.19	19.5	3.67	8.6	97	281,967	1.14	320,856	48.0	80	320,860	1.03
E125	0.156	0.158	41.2	5.60	21.4	3.96	9.3	84	266,727	1.14	303,514	50.0	71	303,484	0.97
E130	0.156	0.161	31.8	4.53	16.5	3.20	7.5	122	299,205	1.14	340,472	46.0	96	340,458	1.16
E135	0.156	0.166	44.5	6.27	23.1	4.43	10.4	107	369,226	1.14	420,151	52.0	93	420,128	0.92
E140	0.156	0.163	28.6	4.19	14.9	2.96	7.0	149	330,243	1.14	375,791	44.0	113	375,726	1.24
E150	0.156	0.156	31.4	4.36	16.3	3.08	7.3	100	242,751	1.13	274,275	46.0	78	274,224	1.16
E155	0.156	0.172	56.1	7.99	29.1	5.64	13.3	106	460,783	1.14	524,336	58.0	98	524,306	0.78
E160	0.157	0.171	41.6	6.06	21.7	4.28	10.1	138	443,522	1.05	467,258	52.0	110	467,196	0.90
E170	0.157	0.165	32.5	4.73	16.9	3.34	7.9	143	360,096	1.05	376,838	46.0	106	376,822	1.07
E180	0.143	0.146	92.0	10.93	47.9	7.72	18.2	55	392,481	1.07	419,581	70.0	54	419,580	0.50
E183	0.156	0.170	56.5	7.97	29.4	5.63	13.3	99	433,649	1.10	475,982	58.0	89	475,954	0.75
E184	0.157	0.158	47.5	6.36	24.7	4.49	10.6	72	264,659	1.06	280,682	54.0	60	280,666	0.82
E185	0.157	0.172	58.1	8.26	30.2	5.84	13.8	103	463,246	1.07	497,904	58.0	92	497,837	0.72
<b>E190</b>	<b>0.078</b>	<b>0.199</b>	<b>24.4</b>	<b>4.33</b>	<b>12.7</b>	<b>3.06</b>	<b>7.2</b>	<b>93</b>	<b>175,086</b>	<b>2.09</b>	<b>365,942</b>	<b>42.0</b>	<b>103</b>	<b>365,910</b>	<b>2.13</b>
E200	0.145	0.167	70.3	9.63	36.5	6.81	16.1	72	391,180	1.10	430,746	64.0	69	430,729	0.64
E204	0.156	0.145	38.4	4.89	20.0	3.45	8.1	52	153,447	1.14	174,611	48.0	43	174,613	1.01
E205	0.097	0.166	34.7	5.01	18.1	3.54	8.4	135	362,884	1.54	558,547	46.0	135	558,561	1.35
E210	0.133	0.164	77.0	10.33	40.0	7.30	17.2	58	347,458	1.14	396,146	66.0	58	396,114	0.61
F100	0.156	0.170	29.1	4.41	15.1	3.11	7.3	149	337,120	1.14	383,616	44.0	114	383,517	1.23
F110	0.141	0.163	28.1	4.12	14.6	2.91	6.9	175	380,494	1.19	452,910	44.0	137	452,760	1.31
F120	0.095	0.171	31.5	4.73	16.4	3.35	7.9	184	449,632	1.59	712,692	44.0	182	712,718	1.47
F125	0.157	0.157	46.7	6.23	24.3	4.40	10.4	70	252,625	1.07	269,694	52.0	58	269,665	0.84
F130	0.148	0.167	45.5	6.44	23.6	4.55	10.7	110	388,369	1.10	427,102	52.0	94	427,054	0.88
F140	0.113	0.132	56.5	6.32	29.4	4.46	10.5	45	197,681	1.26	249,054	56.0	45	249,036	0.82
G100	0.156	0.168	102.9	13.91	53.5	9.83	23.2	51	407,815	1.13	460,774	74.0	54	460,771	0.48
G105	0.089	0.146	28.1	3.75	14.6	2.65	6.2	71	154,655	1.69	262,054	42.0	70	261,952	1.65
G110	0.109	0.146	39.5	5.04	20.6	3.56	8.4	87	266,030	1.30	346,697	48.0	80	346,710	1.09

**Developed Couplet Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)**

Catchment Name/ID	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
G120	0.089	0.160	43.3	5.93	22.5	4.19	9.9	94	316,722	1.67	528,162	50.0	106	528,063	1.22
H100	0.088	0.171	36.4	5.37	18.9	3.79	8.9	158	444,358	1.76	780,692	46.0	176	780,508	1.44
H110	0.091	0.168	25.0	3.83	13.0	2.71	6.4	185	357,448	1.67	596,627	42.0	175	596,456	1.78
H115	0.091	0.151	16.7	2.54	8.7	1.79	4.2	154	199,284	1.67	332,631	38.0	124	332,780	2.25
H120	0.113	0.147	37.1	4.79	19.3	3.39	8.0	74	212,968	1.35	287,846	48.0	69	287,803	1.17
H130	0.119	0.142	27.3	3.58	14.2	2.53	6.0	62	131,400	1.30	170,442	44.0	51	170,364	1.41
H140	0.152	0.142	55.6	6.67	28.9	4.71	11.1	30	130,819	1.12	145,904	56.0	27	145,899	0.76
H145	0.129	0.169	68.7	9.54	35.7	6.74	15.9	79	422,195	1.23	517,711	64.0	82	517,715	0.71
H150	0.157	0.165	26.1	3.91	13.6	2.76	6.5	175	355,031	1.07	381,593	44.0	124	381,510	1.27
H160	0.146	0.166	102.1	13.61	53.1	9.62	22.7	49	387,068	1.11	427,987	74.0	50	427,984	0.47
H170	0.130	0.142	60.0	7.16	31.2	5.06	11.9	57	266,355	1.16	308,103	58.0	54	308,091	0.74
H180	0.111	0.156	35.1	4.81	18.3	3.40	8.0	124	337,840	1.30	440,856	46.0	110	440,848	1.19
H185	0.114	0.170	46.6	6.68	24.2	4.72	11.1	119	429,188	1.35	577,367	52.0	118	577,371	1.00
H190	0.092	0.165	14.9	2.48	7.7	1.75	4.1	304	349,595	1.64	571,850	36.0	229	571,471	2.37
H200	0.108	0.161	34.1	4.81	17.7	3.40	8.0	114	300,878	1.32	398,193	46.0	101	398,164	1.22
H205	0.096	0.155	16.3	2.54	8.5	1.79	4.2	185	233,737	1.50	351,174	40.0	137	351,235	2.12
H210	0.147	0.170	44.6	6.42	23.2	4.54	10.7	126	434,183	1.04	451,589	52.0	102	451,582	0.85
H220	0.149	0.149	42.8	5.51	22.3	3.90	9.2	55	182,813	1.01	184,018	50.0	43	184,002	0.85



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Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.000	0.000
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	1195.814	389.674
External Outflow .....	1216.229	396.326
Flooding Loss .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Exfiltration Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.000
Final Stored Volume .....	2.756	0.898
Continuity Error (%) .....	-1.938	

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Highest Flow Instability Indexes

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- Link HC036-DF (49)
- Link H22 (40)
- Link GA999-DF (40)
- Link H20 (39)
- Link H18 (39)

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Routing Time Step Summary

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Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.00
Percent Not Converging	:	0.00

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Node Depth Summary

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Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
A100	JUNCTION	0.00	0.00	6401.00	0 00:00	0.00
A105	JUNCTION	0.00	0.00	6401.00	0 00:00	0.00
A110	JUNCTION	0.00	0.00	6386.00	0 00:00	0.00
A120	JUNCTION	0.00	0.00	6347.00	0 00:00	0.00
A125	JUNCTION	0.00	0.00	6361.00	0 00:00	0.00
A130	JUNCTION	0.00	0.00	6319.00	0 00:00	0.00
A134	JUNCTION	0.00	0.00	6387.00	0 00:00	0.00
A135	JUNCTION	0.00	0.00	6319.00	0 00:00	0.00
A140	JUNCTION	0.00	0.00	6306.00	0 00:00	0.00
A150	JUNCTION	0.00	0.00	6281.00	0 00:00	0.00
A160	JUNCTION	0.00	0.00	6258.00	0 00:00	0.00
A170	JUNCTION	0.00	0.00	6239.00	0 00:00	0.00
A180	JUNCTION	0.00	0.00	6201.00	0 00:00	0.00
A190	JUNCTION	0.00	0.00	6190.00	0 00:00	0.00
A195	JUNCTION	0.00	0.00	6190.00	0 00:00	0.00
A200	JUNCTION	0.00	0.00	6161.00	0 00:00	0.00
A210	JUNCTION	0.00	0.00	6109.00	0 00:00	0.00
A215	JUNCTION	0.00	0.00	6095.00	0 00:00	0.00
A220	JUNCTION	0.00	0.00	6095.00	0 00:00	0.00
A230	JUNCTION	0.00	0.00	6086.00	0 00:00	0.00
A234	JUNCTION	0.00	0.00	6084.00	0 00:00	0.00
A235	JUNCTION	0.00	0.00	6069.00	0 00:00	0.00
A240	JUNCTION	0.00	0.00	6068.00	0 00:00	0.00
A245	JUNCTION	0.00	0.00	6047.00	0 00:00	0.00
A250	JUNCTION	0.00	0.00	6051.00	0 00:00	0.00
A260	JUNCTION	0.00	0.00	5991.00	0 00:00	0.00
A263	JUNCTION	0.00	0.00	6066.00	0 00:00	0.00
A264	JUNCTION	0.00	0.00	6066.00	0 00:00	0.00
A265	JUNCTION	0.00	0.00	6006.00	0 00:00	0.00
A270	JUNCTION	0.00	0.00	5966.00	0 00:00	0.00
A275	JUNCTION	0.00	0.00	5971.00	0 00:00	0.00
A276	JUNCTION	0.00	0.00	5971.00	0 00:00	0.00
A280	JUNCTION	0.00	0.00	5961.00	0 00:00	0.00
A285	JUNCTION	0.00	0.00	6016.00	0 00:00	0.00

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A290	JUNCTION	0.00	0.00	5929.00	0	00:00	0.00
A295	JUNCTION	0.02	1.66	5994.66	0	00:40	1.66
A300	JUNCTION	0.00	0.00	5886.00	0	00:00	0.00
A304	JUNCTION	0.00	0.00	5971.00	0	00:00	0.00
A305	JUNCTION	0.00	0.00	5891.00	0	00:00	0.00
A310	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A314	JUNCTION	0.00	0.00	5916.00	0	00:00	0.00
A315	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A320	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A325	JUNCTION	0.00	0.00	5836.00	0	00:00	0.00
A330	JUNCTION	0.00	0.00	5815.00	0	00:00	0.00
A340	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
A345	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
A350	JUNCTION	0.00	0.00	5795.00	0	00:00	0.00
A360	JUNCTION	0.00	0.00	5781.00	0	00:00	0.00
A370	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
A375	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
A380	JUNCTION	0.00	0.00	5737.00	0	00:00	0.00
A390	JUNCTION	0.00	0.00	5698.00	0	00:00	0.00
A395	JUNCTION	0.00	0.00	5696.00	0	00:00	0.00
A400	JUNCTION	0.00	0.00	5668.00	0	00:00	0.00
B100	JUNCTION	0.00	0.00	6381.00	0	00:00	0.00
B110	JUNCTION	0.00	0.00	6316.00	0	00:00	0.00
B120	JUNCTION	0.00	0.00	6301.00	0	00:00	0.00
B130	JUNCTION	0.00	0.00	6239.00	0	00:00	0.00
B134	JUNCTION	0.00	0.00	6361.00	0	00:00	0.00
B135	JUNCTION	0.00	0.00	6239.00	0	00:00	0.00
BG001	JUNCTION	0.04	2.35	6277.35	0	00:52	2.35
BG002	JUNCTION	0.05	2.84	6242.84	0	00:56	2.84
BG003	JUNCTION	0.07	3.57	6198.57	0	00:59	3.57
BG004	JUNCTION	0.09	4.23	6164.23	0	01:03	4.23
BG005	JUNCTION	0.10	4.49	6129.49	0	01:06	4.48
BG006	JUNCTION	0.11	4.95	6089.95	0	01:09	4.95
BG007	JUNCTION	0.12	5.15	6050.15	0	01:14	5.15
BG008	JUNCTION	0.13	5.34	6020.34	0	01:17	5.33
BG009	JUNCTION	0.15	5.80	5980.80	0	01:22	5.79
BG010	JUNCTION	0.16	5.79	5952.79	0	01:25	5.79
BG011	JUNCTION	0.15	5.27	5890.27	0	01:37	5.27
BG109	JUNCTION	0.06	2.73	6057.73	0	00:56	2.73



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BG111	JUNCTION	0.03	1.81	5948.81	0	00:48	1.81
BG999	JUNCTION	0.16	5.24	5840.24	0	01:45	5.24
BH001	JUNCTION	0.02	2.35	6382.35	0	00:34	2.35
BH002	JUNCTION	0.03	2.27	6317.27	0	00:44	2.26
BH003	JUNCTION	0.04	2.45	6302.45	0	00:48	2.45
BH100	JUNCTION	0.00	0.38	6360.38	0	00:34	0.38
BH999	JUNCTION	0.04	2.38	6240.38	0	00:59	2.38
C100	JUNCTION	0.00	0.00	6441.00	0	00:00	0.00
C110	JUNCTION	0.00	0.00	6396.00	0	00:00	0.00
C120	JUNCTION	0.00	0.00	6351.00	0	00:00	0.00
C125	JUNCTION	0.00	0.00	6351.00	0	00:00	0.00
C130	JUNCTION	0.00	0.00	6311.00	0	00:00	0.00
C140	JUNCTION	0.00	0.00	6283.00	0	00:00	0.00
C150	JUNCTION	0.00	0.00	6246.00	0	00:00	0.00
C153	JUNCTION	0.00	0.00	6376.00	0	00:00	0.00
C154	JUNCTION	0.00	0.00	6307.00	0	00:00	0.00
C155	JUNCTION	0.00	0.00	6256.00	0	00:00	0.00
C159	JUNCTION	0.00	0.00	6246.00	0	00:00	0.00
C160	JUNCTION	0.00	0.00	6216.00	0	00:00	0.00
C170	JUNCTION	0.00	0.00	6171.00	0	00:00	0.00
C175	JUNCTION	0.00	0.00	6171.00	0	00:00	0.00
C180	JUNCTION	0.00	0.00	6150.00	0	00:00	0.00
C185	JUNCTION	0.00	0.00	6150.00	0	00:00	0.00
C190	JUNCTION	0.00	0.00	6109.00	0	00:00	0.00
D100	JUNCTION	0.00	0.00	6281.00	0	00:00	0.00
D110	JUNCTION	0.00	0.00	6221.00	0	00:00	0.00
D120	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
D130	JUNCTION	0.00	0.00	6109.00	0	00:00	0.00
E100	JUNCTION	0.00	0.00	6276.00	0	00:00	0.00
E105	JUNCTION	0.00	0.00	6276.00	0	00:00	0.00
E110	JUNCTION	0.00	0.00	6241.00	0	00:00	0.00
E120	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
E125	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
E130	JUNCTION	0.00	0.00	6161.00	0	00:00	0.00
E135	JUNCTION	0.00	0.00	6161.00	0	00:00	0.00
E140	JUNCTION	0.00	0.00	6126.00	0	00:00	0.00
E150	JUNCTION	0.00	0.00	6086.00	0	00:00	0.00
E155	JUNCTION	0.00	0.00	6086.00	0	00:00	0.00
E160	JUNCTION	0.00	0.00	6046.00	0	00:00	0.00

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E170	JUNCTION	0.00	0.00	6021.00	0	00:00	0.00
E180	JUNCTION	0.00	0.00	5981.00	0	00:00	0.00
E183	JUNCTION	0.00	0.00	6056.00	0	00:00	0.00
E184	JUNCTION	0.00	0.00	6056.00	0	00:00	0.00
E185	JUNCTION	0.00	0.00	5981.00	0	00:00	0.00
E190	JUNCTION	0.00	0.00	5948.00	0	00:00	0.00
E200	JUNCTION	0.00	0.00	5891.00	0	00:00	0.00
E204	JUNCTION	0.00	0.00	5948.00	0	00:00	0.00
E205	JUNCTION	0.00	0.00	5886.00	0	00:00	0.00
E210	JUNCTION	0.00	0.00	5836.00	0	00:00	0.00
F100	JUNCTION	0.00	0.00	6008.00	0	00:00	0.00
F110	JUNCTION	0.00	0.00	5978.00	0	00:00	0.00
F120	JUNCTION	0.00	0.00	5906.00	0	00:00	0.00
F125	JUNCTION	0.00	0.00	5906.00	0	00:00	0.00
F130	JUNCTION	0.00	0.00	5853.00	0	00:00	0.00
F140	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
G100	JUNCTION	0.00	0.00	5887.00	0	00:00	0.00
G105	JUNCTION	0.00	0.00	5885.00	0	00:00	0.00
G110	JUNCTION	0.00	0.00	5842.00	0	00:00	0.00
G120	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
GA001	JUNCTION	0.05	2.63	5952.63	0	00:46	2.62
GA002	JUNCTION	0.07	3.62	5919.62	0	01:13	3.61
GA003	JUNCTION	0.07	1.78	5894.78	0	02:02	1.78
GA004	JUNCTION	0.16	1.98	5889.98	0	02:03	1.98
GA005	JUNCTION	0.18	2.25	5866.25	0	01:38	2.25
GA006	JUNCTION	0.19	2.24	5845.24	0	01:50	2.24
GA007	JUNCTION	0.20	2.60	5794.60	0	02:00	2.60
GA008	JUNCTION	0.15	2.75	5782.75	0	02:03	2.75
GA009	JUNCTION	0.18	3.04	5775.04	0	01:20	3.04
GA010	JUNCTION	0.19	3.23	5765.23	0	01:12	3.23
GA011	JUNCTION	0.20	3.78	5739.78	0	00:56	3.77
GA012	JUNCTION	0.21	3.98	5724.98	0	01:04	3.98
GA999	JUNCTION	0.21	3.98	5710.98	0	01:10	3.98
GV001	JUNCTION	0.03	1.78	6008.78	0	01:17	1.78
GV002	JUNCTION	0.16	1.67	5974.67	0	01:40	1.67
GV003	JUNCTION	0.20	2.84	5907.84	0	00:46	2.83
GV999	JUNCTION	0.27	3.50	5811.50	0	00:43	3.50
H100	JUNCTION	0.00	0.00	5951.00	0	00:00	0.00
H110	JUNCTION	0.00	0.00	5919.00	0	00:00	0.00

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H115	JUNCTION	0.00	0.00	5919.00	0	00:00	0.00
H120	JUNCTION	0.00	0.00	5896.00	0	00:00	0.00
H130	JUNCTION	0.00	0.00	5892.00	0	00:00	0.00
H140	JUNCTION	0.00	0.00	5865.00	0	00:00	0.00
H145	JUNCTION	0.00	0.00	5865.00	0	00:00	0.00
H150	JUNCTION	0.00	0.00	5844.00	0	00:00	0.00
H160	JUNCTION	0.00	0.00	5793.00	0	00:00	0.00
H170	JUNCTION	0.00	0.00	5783.00	0	00:00	0.00
H180	JUNCTION	0.00	0.00	5783.00	0	00:00	0.00
H185	JUNCTION	0.04	2.12	5818.12	0	00:52	2.12
H190	JUNCTION	0.00	0.00	5763.00	0	00:00	0.00
H200	JUNCTION	0.00	0.00	5737.00	0	00:00	0.00
H205	JUNCTION	0.02	1.75	5738.75	0	00:40	1.75
H210	JUNCTION	0.00	0.00	5722.00	0	00:00	0.00
H220	JUNCTION	0.00	0.00	5708.00	0	00:00	0.00
HC001	JUNCTION	0.07	3.37	6403.37	0	00:44	3.37
HC002	JUNCTION	0.07	3.37	6388.37	0	00:48	3.37
HC003	JUNCTION	0.08	3.51	6343.51	0	01:05	3.51
HC004	JUNCTION	0.08	3.52	6321.52	0	00:54	3.51
HC005	JUNCTION	0.13	5.71	6305.71	0	01:09	5.71
HC006	JUNCTION	0.13	5.71	6285.71	0	01:11	5.70
HC007	JUNCTION	0.09	4.34	6261.34	0	01:14	4.33
HC008	JUNCTION	0.05	2.53	6240.53	0	01:17	2.52
HC009	JUNCTION	0.09	4.33	6241.33	0	01:14	4.32
HC010	JUNCTION	0.09	4.31	6204.31	0	01:19	4.31
HC011	JUNCTION	0.11	5.10	6194.10	0	01:20	5.10
HC012	JUNCTION	0.12	5.25	6165.25	0	01:22	5.23
HC013	JUNCTION	0.12	5.24	6113.24	0	01:27	5.23
HC014	JUNCTION	0.33	9.78	6116.78	0	01:26	9.77
HC015	JUNCTION	0.33	9.78	6103.78	0	01:29	9.78
HC016	JUNCTION	0.30	8.53	6093.53	0	01:30	8.53
HC017	JUNCTION	0.27	7.50	6074.50	0	01:32	7.49
HC018	JUNCTION	0.15	5.72	6050.72	0	01:34	5.72
HC019	JUNCTION	0.39	12.01	6012.01	0	01:38	12.00
HC020	JUNCTION	0.41	12.00	5977.00	0	01:42	11.99
HC021	JUNCTION	0.38	10.48	5965.48	0	01:43	10.47
HC022	JUNCTION	0.20	6.59	5929.59	0	01:47	6.59
HC023	JUNCTION	0.18	5.69	5890.69	0	01:51	5.68
HC024	JUNCTION	0.17	5.11	5869.11	0	01:56	5.11

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HC025	JUNCTION	0.16	5.02	5840.02	0	01:59	5.02
HC026	JUNCTION	0.38	9.05	5843.05	0	01:56	9.04
HC027	JUNCTION	0.38	9.04	5823.04	0	02:01	9.04
HC028	JUNCTION	0.35	9.04	5817.04	0	02:02	9.03
HC029	JUNCTION	0.36	9.08	5816.08	0	02:02	9.07
HC030	JUNCTION	0.36	9.08	5803.08	0	02:04	9.08
HC031	JUNCTION	0.32	7.04	5787.04	0	02:08	7.04
HC032	JUNCTION	0.28	6.77	5765.77	0	02:12	6.76
HC033	JUNCTION	0.39	8.02	5766.02	0	02:11	8.01
HC034	JUNCTION	0.40	8.51	5744.51	0	02:17	8.50
HC035	JUNCTION	0.40	8.47	5714.47	0	02:26	8.46
HC036	JUNCTION	0.00	0.00	5698.00	0	00:00	0.00
HC037	JUNCTION	0.33	6.73	5701.73	0	02:25	6.73
HC103	JUNCTION	0.02	1.85	6361.85	0	00:40	1.85
HC104	JUNCTION	0.03	1.97	6387.97	0	00:42	1.96
HC116	JUNCTION	0.04	2.70	6085.70	0	00:48	2.69
HC117	JUNCTION	0.05	2.64	6070.64	0	01:00	2.64
HC119	JUNCTION	0.06	2.51	6067.51	0	01:00	2.51
HC122	JUNCTION	0.03	1.58	6016.58	0	00:50	1.58
HC123	JUNCTION	0.05	2.02	5972.02	0	01:02	2.02
HC124	JUNCTION	0.03	0.95	5915.95	0	01:08	0.95
HC999	JUNCTION	0.33	6.72	5673.72	0	02:30	6.72
MT100	JUNCTION	0.01	0.73	6375.73	0	00:42	0.72
MT110	JUNCTION	0.06	2.21	6302.21	0	01:15	2.21
OH001	JUNCTION	0.02	1.37	6441.37	0	00:48	1.37
OH002	JUNCTION	0.05	2.98	6397.98	0	00:51	2.98
OH003	JUNCTION	0.07	3.74	6353.74	0	00:56	3.73
OH004	JUNCTION	0.08	3.21	6312.21	0	01:29	3.21
OH005	JUNCTION	0.10	3.92	6284.92	0	01:12	3.92
OH006	JUNCTION	0.15	5.05	6260.05	0	01:15	5.05
OH007	JUNCTION	0.15	5.05	6250.05	0	01:18	5.05
OH008	JUNCTION	0.14	4.49	6219.49	0	01:15	4.49
OH009	JUNCTION	0.15	4.58	6174.58	0	01:23	4.58
OH010	JUNCTION	0.14	4.58	6153.58	0	01:25	4.58
OH999	JUNCTION	0.13	3.95	6111.95	0	01:30	3.94
OR001	JUNCTION	0.03	2.15	6282.15	0	00:48	2.15
OR002	JUNCTION	0.04	2.09	6222.09	0	01:03	2.09
OR003	JUNCTION	0.08	4.09	6199.09	0	01:00	4.09
OR999	JUNCTION	0.09	4.05	6112.05	0	01:09	4.05

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SG001	JUNCTION	0.21	0.80	5885.80	0	04:03	0.80
SG002	JUNCTION	0.23	1.83	5885.83	0	00:44	1.83
SG003	JUNCTION	0.24	1.42	5840.42	0	01:50	1.42
SG999	JUNCTION	0.24	1.42	5760.42	0	01:54	1.42
HC-OUTFALL	OUTFALL	0.00	0.00	5666.00	0	00:00	0.00
GV004	DIVIDER	0.27	3.50	5855.50	0	00:39	3.50
GA309	STORAGE	0.15	8.19	5925.19	0	01:13	8.19
GA310	STORAGE	0.29	9.73	5903.73	0	02:02	9.73
GA311	STORAGE	2.57	6.34	5895.34	0	02:03	6.34
GA350	STORAGE	0.08	2.57	5783.57	0	02:03	2.57
HC310	STORAGE	0.18	13.80	6358.80	0	01:05	13.80
HC320	STORAGE	0.14	9.62	6310.62	0	01:09	9.62
MT300	STORAGE	0.33	8.25	6309.25	0	01:15	8.25
OH310	STORAGE	0.40	17.62	6327.62	0	01:29	17.62
OH320	STORAGE	0.31	10.94	6292.94	0	01:12	10.94
SG310	STORAGE	2.68	6.89	5892.89	0	04:03	6.89
SG320	STORAGE	2.18	6.61	5846.61	0	01:50	6.61
HC326	STORAGE	1.01	6.32	5844.32	0	01:55	6.32
GV301	STORAGE	0.08	4.50	6012.00	0	01:17	4.49
GV302	STORAGE	1.13	3.66	5977.16	0	01:40	3.66

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Node Inflow Summary

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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10 <sup>6</sup> gal	Total Inflow Volume 10 <sup>6</sup> gal	Flow Balance Error Percent
A100	JUNCTION	148.50	148.50	0 00:40	3.28	3.28	0.000
A105	JUNCTION	100.98	100.98	0 00:56	4.08	4.08	0.000
A110	JUNCTION	247.47	247.47	0 00:34	3.59	3.59	0.000
A120	JUNCTION	299.29	299.29	0 00:36	5.06	5.06	0.000
A125	JUNCTION	166.94	166.94	0 00:40	3.49	3.49	0.000
A130	JUNCTION	77.45	77.45	0 00:42	1.85	1.85	0.000
A134	JUNCTION	194.13	194.13	0 00:42	4.76	4.76	0.000

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A135	JUNCTION	146.36	146.36	0	00:46	4.2	4.2	0.000
A140	JUNCTION	205.49	205.49	0	00:42	4.75	4.75	0.000
A150	JUNCTION	179.16	179.16	0	00:42	4.04	4.04	0.000
A160	JUNCTION	149.79	149.79	0	00:44	3.55	3.55	0.000
A170	JUNCTION	102.96	102.96	0	00:46	2.82	2.82	0.000
A180	JUNCTION	103.07	103.07	0	00:46	2.69	2.69	0.000
A190	JUNCTION	128.27	128.27	0	00:42	2.86	2.86	0.000
A195	JUNCTION	61.92	61.92	0	00:56	2.6	2.6	0.000
A200	JUNCTION	126.22	126.22	0	00:44	3.08	3.08	0.000
A210	JUNCTION	78.30	78.30	0	00:54	3.06	3.06	0.000
A215	JUNCTION	104.15	104.15	0	00:54	3.82	3.82	0.000
A220	JUNCTION	98.17	98.17	0	00:50	3.11	3.11	0.000
A230	JUNCTION	58.67	58.67	0	00:40	1	1	0.000
A234	JUNCTION	90.39	90.39	0	00:48	2.63	2.63	0.000
A235	JUNCTION	101.28	101.28	0	00:48	3.02	3.02	0.000
A240	JUNCTION	123.72	123.72	0	00:44	2.91	2.91	0.000
A245	JUNCTION	54.50	54.50	0	00:42	1.11	1.11	0.000
A250	JUNCTION	48.07	48.07	0	00:46	1.38	1.38	0.000
A260	JUNCTION	88.62	88.62	0	00:52	2.99	2.99	0.000
A263	JUNCTION	60.53	60.53	0	00:56	2.36	2.36	0.000
A264	JUNCTION	64.26	64.26	0	01:04	2.95	2.95	0.000
A265	JUNCTION	47.33	47.33	0	00:50	1.53	1.53	0.000
A270	JUNCTION	69.36	69.36	0	01:08	3.59	3.59	0.000
A275	JUNCTION	155.93	155.93	0	00:42	4.06	4.06	0.000
A276	JUNCTION	63.38	63.38	0	00:42	1.28	1.28	0.000
A280	JUNCTION	113.33	113.33	0	00:52	3.9	3.9	0.000
A285	JUNCTION	41.12	41.12	0	00:50	1.28	1.28	0.000
A290	JUNCTION	113.44	113.44	0	00:54	3.95	3.95	0.000
A295	JUNCTION	106.03	106.03	0	00:40	1.98	1.98	0.000
A300	JUNCTION	169.32	169.32	0	00:44	4.88	4.88	0.000
A304	JUNCTION	72.54	72.54	0	01:02	3.16	3.16	0.000
A305	JUNCTION	36.49	36.49	0	00:56	1.4	1.4	0.000
A310	JUNCTION	59.87	59.87	0	00:56	2.25	2.25	0.000
A314	JUNCTION	48.92	48.92	0	01:08	2.57	2.57	0.000
A315	JUNCTION	43.11	43.11	0	01:04	2.02	2.02	0.000
A320	JUNCTION	51.57	51.57	0	00:52	1.86	1.86	0.000
A325	JUNCTION	158.08	158.08	0	00:42	4.21	4.21	0.000
A330	JUNCTION	90.66	90.66	0	00:54	3.37	3.37	0.000
A340	JUNCTION	65.70	65.70	0	01:08	3.62	3.62	0.000

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A345	JUNCTION	30.09	30.09	0	00:56	1.28	1.28	0.000
A350	JUNCTION	64.75	64.75	0	00:50	2.13	2.13	0.000
A360	JUNCTION	82.02	82.02	0	01:00	3.7	3.7	0.000
A370	JUNCTION	96.13	96.13	0	00:44	2.54	2.54	0.000
A375	JUNCTION	53.59	53.59	0	01:08	2.98	2.98	0.000
A380	JUNCTION	83.99	83.99	0	00:54	2.97	2.97	0.000
A390	JUNCTION	92.59	92.59	0	00:56	3.72	3.72	0.000
A395	JUNCTION	63.96	63.96	0	00:40	1.13	1.13	0.000
A400	JUNCTION	185.29	185.29	0	00:42	5.15	5.15	0.000
B100	JUNCTION	199.28	199.28	0	00:34	3.29	3.29	0.000
B110	JUNCTION	144.63	144.63	0	00:42	3.29	3.29	0.000
B120	JUNCTION	109.36	109.36	0	00:44	2.91	2.91	0.000
B130	JUNCTION	69.66	69.66	0	00:52	2.34	2.34	0.000
B134	JUNCTION	64.04	64.04	0	00:34	1.07	1.07	0.000
B135	JUNCTION	133.52	133.52	0	00:50	4.43	4.43	0.000
BG001	JUNCTION	0.00	139.10	0	00:52	0	4.62	0.000
BG002	JUNCTION	0.00	226.38	0	00:56	0	7.23	0.000
BG003	JUNCTION	0.00	367.17	0	00:59	0	11.9	0.000
BG004	JUNCTION	0.00	535.15	0	01:03	0	17.7	0.000
BG005	JUNCTION	0.00	621.63	0	01:06	0	20.6	0.000
BG006	JUNCTION	0.00	771.93	0	01:09	0	26.6	0.000
BG007	JUNCTION	0.00	854.01	0	01:14	0	30.2	0.000
BG008	JUNCTION	0.00	918.42	0	01:17	0	33	0.000
BG009	JUNCTION	0.00	1142.41	0	01:22	0	43.8	0.000
BG010	JUNCTION	0.00	1172.00	0	01:25	0	45.6	0.000
BG011	JUNCTION	0.00	1265.59	0	01:37	0	54.7	0.000
BG109	JUNCTION	0.00	148.84	0	00:56	0	5.66	0.000
BG111	JUNCTION	0.00	42.80	0	00:48	0	1.31	0.000
BG999	JUNCTION	0.00	1289.63	0	01:45	0	57.9	0.000
BH001	JUNCTION	0.00	199.28	0	00:34	0	3.29	0.000
BH002	JUNCTION	0.00	330.29	0	00:43	0	6.6	0.000
BH003	JUNCTION	0.00	428.62	0	00:48	0	9.54	0.000
BH100	JUNCTION	0.00	64.04	0	00:34	0	1.07	0.000
BH999	JUNCTION	0.00	632.78	0	00:57	0	17.5	0.000
C100	JUNCTION	102.29	102.29	0	00:48	3	3	0.000
C110	JUNCTION	138.50	138.50	0	00:44	3.47	3.47	0.000
C120	JUNCTION	71.58	71.58	0	00:48	2.28	2.28	0.000
C125	JUNCTION	100.85	100.85	0	00:54	3.7	3.7	0.000
C130	JUNCTION	195.93	195.93	0	00:42	4.72	4.72	0.000

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C140	JUNCTION	100.45	100.45	0	00:40	2.11	2.11	0.000
C150	JUNCTION	49.62	49.62	0	00:54	1.81	1.81	0.000
C153	JUNCTION	218.37	218.37	0	00:42	5.17	5.17	0.000
C154	JUNCTION	178.02	178.02	0	00:42	4.36	4.36	0.000
C155	JUNCTION	112.11	112.11	0	00:44	3.08	3.08	0.000
C159	JUNCTION	178.38	178.38	0	00:42	4.41	4.41	0.000
C160	JUNCTION	173.30	173.30	0	00:42	3.74	3.74	0.000
C170	JUNCTION	99.48	99.48	0	00:52	3.64	3.64	0.000
C175	JUNCTION	90.61	90.61	0	00:54	3.29	3.29	0.000
C180	JUNCTION	60.49	60.49	0	00:44	1.54	1.54	0.000
C185	JUNCTION	99.02	99.02	0	00:54	3.64	3.64	0.000
C190	JUNCTION	75.81	75.81	0	00:50	2.55	2.55	0.000
D100	JUNCTION	134.70	134.70	0	00:48	3.97	3.97	0.000
D110	JUNCTION	129.08	129.08	0	00:48	3.78	3.78	0.000
D120	JUNCTION	117.57	117.57	0	00:42	2.46	2.46	0.000
D130	JUNCTION	119.46	119.46	0	00:44	3.06	3.06	0.000
E100	JUNCTION	83.59	83.59	0	00:54	2.99	2.99	0.000
E105	JUNCTION	56.48	56.48	0	00:48	1.63	1.63	0.000
E110	JUNCTION	98.78	98.78	0	00:46	2.56	2.56	0.000
E120	JUNCTION	80.21	80.21	0	00:48	2.4	2.4	0.000
E125	JUNCTION	71.04	71.04	0	00:50	2.27	2.27	0.000
E130	JUNCTION	95.50	95.50	0	00:46	2.55	2.55	0.000
E135	JUNCTION	93.39	93.39	0	00:52	3.14	3.14	0.000
E140	JUNCTION	113.20	113.20	0	00:44	2.81	2.81	0.000
E150	JUNCTION	77.62	77.62	0	00:46	2.05	2.05	0.000
E155	JUNCTION	98.43	98.43	0	00:58	3.92	3.92	0.000
E160	JUNCTION	110.46	110.46	0	00:52	3.49	3.49	0.000
E170	JUNCTION	106.03	106.03	0	00:46	2.82	2.82	0.000
E180	JUNCTION	32.48	32.48	0	00:54	1.21	1.21	0.000
E183	JUNCTION	89.36	89.36	0	00:58	3.56	3.56	0.000
E184	JUNCTION	60.11	60.11	0	00:54	2.1	2.1	0.000
E185	JUNCTION	91.86	91.86	0	00:58	3.72	3.72	0.000
E190	JUNCTION	67.97	67.97	0	00:46	1.75	1.75	0.000
E200	JUNCTION	68.54	68.54	0	01:04	3.22	3.22	0.000
E204	JUNCTION	42.80	42.80	0	00:48	1.31	1.31	0.000
E205	JUNCTION	135.05	135.05	0	00:46	4.18	4.18	0.000
E210	JUNCTION	58.33	58.33	0	01:06	2.96	2.96	0.000
F100	JUNCTION	114.33	114.33	0	00:44	2.87	2.87	0.000
F110	JUNCTION	136.80	136.80	0	00:44	3.39	3.39	0.000



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F120	JUNCTION	182.47	182.47	0	00:44	5.33	5.33	0.000
F125	JUNCTION	58.37	58.37	0	00:52	2.02	2.02	0.000
F130	JUNCTION	93.92	93.92	0	00:52	3.19	3.19	0.000
F140	JUNCTION	44.52	44.52	0	00:56	1.86	1.86	0.000
G100	JUNCTION	53.92	53.92	0	01:14	3.45	3.45	0.000
G105	JUNCTION	70.26	70.26	0	00:42	1.96	1.96	0.000
G110	JUNCTION	79.63	79.63	0	00:48	2.59	2.59	0.000
G120	JUNCTION	106.27	106.27	0	00:50	3.95	3.95	0.000
GA001	JUNCTION	0.00	176.17	0	00:46	0	5.84	0.000
GA002	JUNCTION	0.00	308.56	0	01:13	0	12.8	0.000
GA003	JUNCTION	0.00	187.82	0	02:02	0	14.9	0.000
GA004	JUNCTION	0.00	193.99	0	02:03	0	16	0.000
GA005	JUNCTION	0.00	260.06	0	01:38	0	21	0.000
GA006	JUNCTION	0.00	281.91	0	01:43	0	23.9	0.000
GA007	JUNCTION	0.00	308.27	0	02:00	0	27.4	0.000
GA008	JUNCTION	0.00	359.29	0	02:03	0	32.9	0.000
GA009	JUNCTION	0.00	432.19	0	01:20	0	37.2	0.000
GA010	JUNCTION	0.00	497.13	0	01:12	0	41.5	-0.000
GA011	JUNCTION	0.00	641.90	0	00:56	0	47.2	0.000
GA012	JUNCTION	0.00	731.69	0	01:04	0	50.7	0.000
GA999	JUNCTION	0.00	768.96	0	01:07	0	52.1	0.000
GV001	JUNCTION	0.00	71.11	0	01:17	0	2.87	0.000
GV002	JUNCTION	0.00	104.00	0	01:40	0	5.79	0.000
GV003	JUNCTION	0.00	237.67	0	00:46	0	13.1	0.000
GV999	JUNCTION	0.00	327.69	0	01:29	0	18.7	0.000
H100	JUNCTION	176.17	176.17	0	00:46	5.84	5.84	0.000
H110	JUNCTION	174.94	174.94	0	00:42	4.46	4.46	0.000
H115	JUNCTION	123.55	123.55	0	00:38	2.49	2.49	0.000
H120	JUNCTION	68.81	68.81	0	00:48	2.15	2.15	0.000
H130	JUNCTION	50.88	50.88	0	00:44	1.27	1.27	0.000
H140	JUNCTION	27.43	27.43	0	00:56	1.09	1.09	0.000
H145	JUNCTION	82.20	82.20	0	01:04	3.87	3.87	0.000
H150	JUNCTION	123.84	123.84	0	00:44	2.85	2.85	0.000
H160	JUNCTION	50.36	50.36	0	01:14	3.2	3.2	0.000
H170	JUNCTION	54.20	54.20	0	00:58	2.3	2.3	0.000
H180	JUNCTION	110.42	110.42	0	00:46	3.3	3.3	0.000
H185	JUNCTION	118.49	118.49	0	00:52	4.32	4.32	0.000
H190	JUNCTION	228.56	228.56	0	00:36	4.27	4.27	0.000
H200	JUNCTION	101.49	101.49	0	00:46	2.98	2.98	0.000

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H205	JUNCTION	136.56	136.56	0	00:40	2.63	2.63	0.000
H210	JUNCTION	101.91	101.91	0	00:52	3.38	3.38	0.000
H220	JUNCTION	42.78	42.78	0	00:50	1.38	1.38	0.000
HC001	JUNCTION	0.00	234.42	0	00:44	0	7.35	0.000
HC002	JUNCTION	0.00	428.19	0	00:40	0	10.9	0.000
HC003	JUNCTION	0.00	436.18	0	01:05	0	16.1	0.000
HC004	JUNCTION	0.00	940.98	0	00:54	0	30.5	0.000
HC005	JUNCTION	0.00	1028.19	0	01:09	0	35.3	0.000
HC006	JUNCTION	0.00	1141.67	0	01:09	0	39.3	0.000
HC007	JUNCTION	0.00	1227.88	0	01:13	0	42.9	0.000
HC008	JUNCTION	0.00	1288.41	0	01:16	0	45.9	0.000
HC009	JUNCTION	0.00	1789.46	0	01:14	0	63.4	0.000
HC010	JUNCTION	0.00	1840.91	0	01:18	0	66.3	0.000
HC011	JUNCTION	0.00	1948.03	0	01:20	0	71.8	0.000
HC012	JUNCTION	0.00	2002.17	0	01:22	0	75	0.000
HC013	JUNCTION	0.00	2053.91	0	01:27	0	78.2	0.000
HC014	JUNCTION	0.00	3546.14	0	01:26	0	149	0.000
HC015	JUNCTION	0.00	3674.40	0	01:28	0	156	0.000
HC016	JUNCTION	0.00	3678.23	0	01:30	0	157	0.000
HC017	JUNCTION	0.00	3826.13	0	01:31	0	165	0.000
HC018	JUNCTION	0.00	3853.26	0	01:34	0	168	0.000
HC019	JUNCTION	0.00	4007.98	0	01:38	0	178	0.000
HC020	JUNCTION	0.00	4104.72	0	01:41	0	187	0.000
HC021	JUNCTION	0.00	4160.60	0	01:42	0	191	0.000
HC022	JUNCTION	0.00	4237.52	0	01:46	0	199	0.000
HC023	JUNCTION	0.00	4343.94	0	01:50	0	209	0.000
HC024	JUNCTION	0.00	4415.14	0	01:55	0	216	0.000
HC025	JUNCTION	0.00	4426.38	0	01:59	0	218	0.000
HC026	JUNCTION	0.00	5650.19	0	01:56	0	280	0.000
HC027	JUNCTION	0.00	5667.62	0	02:01	0	283	0.000
HC028	JUNCTION	0.00	5720.02	0	02:02	0	288	0.000
HC029	JUNCTION	0.00	5995.37	0	02:02	0	307	0.000
HC030	JUNCTION	0.00	6009.66	0	02:04	0	309	0.000
HC031	JUNCTION	0.00	6036.03	0	02:08	0	313	0.000
HC032	JUNCTION	0.00	6064.96	0	02:12	0	318	0.000
HC033	JUNCTION	0.00	6154.79	0	02:11	0	330	0.000
HC034	JUNCTION	0.00	6151.50	0	02:17	0	334	0.000
HC035	JUNCTION	0.00	6110.40	0	02:25	0	338	0.000
HC036	JUNCTION	0.00	6564.42	0	02:25	0	390	0.000

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HC037	JUNCTION	0.00	6564.69	0	02:25	0	391	0.000
HC103	JUNCTION	0.00	166.94	0	00:40	0	3.49	0.000
HC104	JUNCTION	0.00	194.13	0	00:42	0	4.76	0.000
HC116	JUNCTION	0.00	90.39	0	00:48	0	2.63	-0.000
HC117	JUNCTION	0.00	183.31	0	00:56	0	5.71	0.000
HC119	JUNCTION	0.00	123.81	0	01:00	0	5.31	0.000
HC122	JUNCTION	0.00	41.12	0	00:50	0	1.28	0.000
HC123	JUNCTION	0.00	72.54	0	01:02	0	3.16	0.000
HC124	JUNCTION	0.00	48.92	0	01:08	0	2.57	0.000
HC999	JUNCTION	0.00	6555.56	0	02:29	0	396	0.000
MT100	JUNCTION	0.00	218.37	0	00:42	0	5.17	0.000
MT110	JUNCTION	0.00	225.69	0	01:15	0	9.53	0.000
OH001	JUNCTION	0.00	102.29	0	00:48	0	3	0.000
OH002	JUNCTION	0.00	232.80	0	00:51	0	6.49	0.000
OH003	JUNCTION	0.00	399.02	0	00:56	0	12.5	0.000
OH004	JUNCTION	0.00	362.89	0	01:29	0	17.3	0.000
OH005	JUNCTION	0.00	400.93	0	01:12	0	19.4	0.000
OH006	JUNCTION	0.00	694.89	0	01:15	0	32	0.000
OH007	JUNCTION	0.00	840.46	0	01:13	0	38.3	0.000
OH008	JUNCTION	0.00	921.92	0	01:15	0	42	0.000
OH009	JUNCTION	0.00	1040.41	0	01:23	0	49.2	0.000
OH010	JUNCTION	0.00	1139.41	0	01:24	0	54.4	0.000
OH999	JUNCTION	0.00	1177.11	0	01:30	0	57.1	0.000
OR001	JUNCTION	0.00	134.70	0	00:48	0	3.97	0.000
OR002	JUNCTION	0.00	245.62	0	00:58	0	7.86	0.000
OR003	JUNCTION	0.00	330.24	0	01:00	0	10.4	0.000
OR999	JUNCTION	0.00	413.92	0	01:07	0	13.5	0.000
SG001	JUNCTION	0.00	11.94	0	04:03	0	3.45	0.000
SG002	JUNCTION	0.00	70.69	0	00:44	0	5.41	0.000
SG003	JUNCTION	0.00	58.94	0	01:50	0	8.05	0.000
SG999	JUNCTION	0.00	119.33	0	01:23	0	12	0.000
HC-OUTFALL	OUTFALL	0.00	6555.56	0	02:29	0	396	0.000
GV004	DIVIDER	0.00	308.81	0	01:03	0	16.5	0.000
GA309	STORAGE	0.00	460.93	0	00:43	0	12.8	0.016
GA310	STORAGE	0.00	363.28	0	01:12	0	14.9	0.006
GA311	STORAGE	0.00	194.53	0	01:58	0	16.2	0.074
GA350	STORAGE	0.00	360.72	0	01:59	0	33	0.453
HC310	STORAGE	0.00	677.25	0	00:43	0	16.1	-0.001
HC320	STORAGE	0.00	1110.90	0	00:55	0	35.3	0.036

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MT300	STORAGE	0.00	395.32	0	00:43	0	9.53	0.058
OH310	STORAGE	0.00	548.93	0	00:59	0	17.3	0.005
OH320	STORAGE	0.00	401.11	0	01:08	0	19.4	0.044
SG310	STORAGE	0.00	53.92	0	01:14	0	3.45	0.014
SG320	STORAGE	0.00	140.71	0	00:56	0	8.05	0.045
HC326	STORAGE	0.00	158.08	0	00:42	0	4.21	0.055
GV301	STORAGE	0.00	114.33	0	00:44	0	2.87	0.020
GV302	STORAGE	0.00	186.33	0	00:52	0	6.25	0.076

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Node Flooding Summary

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No nodes were flooded.

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Storage Volume Summary

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Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
GA309	5.080	1	0	0	412.453	54	0 01:13	308.56
GA310	19.181	1	0	0	885.762	50	0 02:02	187.82
GA311	86.697	15	0	0	339.651	60	0 02:02	193.99
GA350	0.710	0	0	0	36.229	3	0 02:03	359.29
HC310	3.076	0	0	0	379.456	29	0 01:05	436.18
HC320	7.247	1	0	0	630.401	62	0 01:09	1028.19
MT300	13.268	1	0	0	575.055	45	0 01:14	225.69
OH310	9.363	1	0	0	599.753	72	0 01:28	362.89
OH320	2.234	0	0	0	103.934	12	0 01:11	400.93
SG310	74.411	7	0	0	334.570	29	0 04:03	11.94
SG320	62.062	6	0	0	359.524	34	0 01:49	58.94
HC326	31.234	3	0	0	419.274	38	0 01:55	30.39
GV301	1.516	0	0	0	120.466	26	0 01:17	71.11

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GV302                      121.911              9              0              0              449.575              31              0              01:40              104.00

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 Outfall Loading Summary  
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Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
HC-OUTFALL	99.82	153.58	6555.56	396.297
System	99.82	153.58	6555.56	396.297

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 Link Flow Summary  
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Link	Type	Maximum  Flow  CFS	Time of Max Occurrence days hr:min	Maximum  Veloc  ft/sec	Max/ Full Flow	Max/ Full Depth
A100-DF	DUMMY	148.50	0 00:40			
A105-DF	DUMMY	100.98	0 00:56			
A11	CONDUIT	233.95	0 00:48	3.77	0.07	0.34
A110-DF	DUMMY	247.47	0 00:34			
A12	CONDUIT	417.65	0 00:46	4.06	0.07	0.26
A120-DF	DUMMY	299.29	0 00:36			
A125-DF	DUMMY	166.94	0 00:40			
A13	CONDUIT	435.88	0 01:09	4.43	0.08	0.35
A130	CONDUIT	163.43	0 00:45	3.33	0.03	0.18
A130-DF	DUMMY	77.45	0 00:42			
A134-DF	DUMMY	194.13	0 00:42			
A135	CONDUIT	177.34	0 00:57	2.95	0.02	0.19
A135-DF	DUMMY	146.36	0 00:46			

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A14	CONDUIT	939.12	0	00:57	4.92	0.11	0.35
A140-DF	DUMMY	205.49	0	00:42			
A15	CONDUIT	1027.18	0	01:11	5.89	0.25	0.57
A150-DF	DUMMY	179.16	0	00:42			
A16	CONDUIT	1132.68	0	01:14	5.56	0.19	0.43
A160-DF	DUMMY	149.79	0	00:44			
A17	CONDUIT	1218.15	0	01:17	4.22	0.08	0.25
A170-DF	DUMMY	102.96	0	00:46			
A18	CONDUIT	1777.97	0	01:19	5.85	0.19	0.43
A180-DF	DUMMY	103.07	0	00:46			
A19	CONDUIT	1838.44	0	01:20	5.04	0.14	0.35
A190-DF	DUMMY	128.27	0	00:42			
A195-DF	DUMMY	61.92	0	00:56			
A20	CONDUIT	1943.99	0	01:23	6.64	0.27	0.51
A200-DF	DUMMY	126.22	0	00:44			
A21	CONDUIT	1996.95	0	01:27	6.93	0.29	0.52
A210-DF	DUMMY	78.30	0	00:54			
A215-DF	DUMMY	104.15	0	00:54			
A22	CONDUIT	3543.66	0	01:29	8.23	0.16	0.49
A220-DF	DUMMY	98.17	0	00:50			
A23	CONDUIT	3672.52	0	01:30	7.14	0.11	0.43
A230-DF	DUMMY	58.67	0	00:40			
A234-DF	DUMMY	90.39	0	00:48			
A235	CONDUIT	86.72	0	01:00	3.28	0.05	0.26
A235-DF	DUMMY	101.28	0	00:48			
A24	CONDUIT	3675.58	0	01:32	6.77	0.08	0.38
A240-DF	DUMMY	123.72	0	00:44			
A245-DF	DUMMY	54.50	0	00:42			
A25	CONDUIT	3822.22	0	01:35	6.48	0.06	0.26
A250-DF	DUMMY	48.07	0	00:46			
A26	CONDUIT	3846.77	0	01:39	7.30	0.09	0.29
A260-DF	DUMMY	88.62	0	00:52			
A263-DF	DUMMY	60.53	0	00:56			
A264-DF	DUMMY	64.26	0	01:04			
A265	CONDUIT	123.08	0	01:09	3.33	0.04	0.25
A265-DF	DUMMY	47.33	0	00:50			
A27	CONDUIT	4003.44	0	01:42	9.87	0.30	0.60
A270-DF	DUMMY	69.36	0	01:08			
A275-DF	DUMMY	155.93	0	00:42			

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A276-DF	DUMMY	63.38	0	00:42			
A28	CONDUIT	4103.69	0	01:43	8.40	0.21	0.52
A280-DF	DUMMY	113.33	0	00:52			
A285-DF	DUMMY	41.12	0	00:50			
A29	CONDUIT	4154.43	0	01:47	7.94	0.12	0.33
A290	CONDUIT	37.87	0	01:11	2.41	0.01	0.15
A290-DF	DUMMY	113.44	0	00:54			
A295	CONDUIT	105.93	0	00:41	21.47	0.36	0.42
A30	CONDUIT	4227.64	0	01:51	7.28	0.09	0.28
A300-DF	DUMMY	169.32	0	00:44			
A304-DF	DUMMY	72.54	0	01:02			
A305	CONDUIT	70.43	0	01:15	2.81	0.02	0.20
A305-DF	DUMMY	36.49	0	00:56			
A31	CONDUIT	4331.69	0	01:56	6.06	0.06	0.26
A310-DF	DUMMY	59.87	0	00:56			
A314-DF	DUMMY	48.92	0	01:08			
A315	CONDUIT	48.86	0	01:11	5.86	0.00	0.10
A315-DF	DUMMY	43.11	0	01:04			
A32	CONDUIT	4407.38	0	01:59	6.77	0.08	0.25
A320-DF	DUMMY	51.57	0	00:52			
A325-DF	DUMMY	158.08	0	00:42			
A33	CONDUIT	5633.44	0	02:01	7.54	0.14	0.45
A330-DF	DUMMY	90.66	0	00:54			
A34	CONDUIT	5666.00	0	02:02	7.86	0.16	0.45
A340-DF	DUMMY	65.70	0	01:08			
A345-DF	DUMMY	30.09	0	00:56			
A35	CONDUIT	5991.58	0	02:04	8.66	0.19	0.45
A350-DF	DUMMY	64.75	0	00:50			
A36	CONDUIT	5997.42	0	02:08	6.33	0.08	0.35
A360-DF	DUMMY	82.02	0	01:00			
A37	CONDUIT	6024.70	0	02:12	6.82	0.09	0.34
A370-DF	DUMMY	96.13	0	00:44			
A375-DF	DUMMY	53.59	0	01:08			
A38	CONDUIT	6129.94	0	02:17	7.41	0.12	0.40
A380-DF	DUMMY	83.99	0	00:54			
A39	CONDUIT	6084.41	0	02:26	7.24	0.15	0.42
A390-DF	DUMMY	92.59	0	00:56			
A395-DF	DUMMY	63.96	0	00:40			
A40	CONDUIT	6547.37	0	02:30	7.32	0.10	0.34

## FHAD-14 SWMM Report

A400-DF	DUMMY	185.29	0	00:42			
B100-DF	DUMMY	199.28	0	00:34			
B11	CONDUIT	186.44	0	00:44	3.58	0.04	0.23
B110-DF	DUMMY	144.63	0	00:42			
B12	CONDUIT	321.55	0	00:49	3.05	0.03	0.21
B120-DF	DUMMY	109.36	0	00:44			
B13	CONDUIT	398.15	0	00:59	3.03	0.03	0.24
B130-DF	DUMMY	69.66	0	00:52			
B134-DF	DUMMY	64.04	0	00:34			
B135	CONDUIT	62.64	0	00:39	13.16	0.00	0.04
B135-DF	DUMMY	133.52	0	00:50			
BG999-DF	DUMMY	1289.63	0	01:45			
BH999-DF	DUMMY	632.78	0	00:57			
C100-DF	DUMMY	102.29	0	00:48			
C11	CONDUIT	100.85	0	00:55	2.53	0.01	0.14
C110-DF	DUMMY	138.50	0	00:44			
C12	CONDUIT	229.18	0	00:57	4.16	0.07	0.30
C120-DF	DUMMY	71.58	0	00:48			
C125-DF	DUMMY	100.85	0	00:54			
C13	CONDUIT	393.94	0	01:02	5.07	0.11	0.37
C130-DF	DUMMY	195.93	0	00:42			
C14	CONDUIT	362.84	0	01:31	4.65	0.09	0.32
C140-DF	DUMMY	100.45	0	00:40			
C150-DF	DUMMY	49.62	0	00:54			
C153-DF	DUMMY	218.37	0	00:42			
C154	CONDUIT	217.95	0	00:43	18.98	0.00	0.07
C154-DF	DUMMY	178.02	0	00:42			
C155	CONDUIT	224.55	0	01:21	3.72	0.03	0.22
C155-DF	DUMMY	112.11	0	00:44			
C159-DF	DUMMY	178.38	0	00:42			
C15A	CONDUIT	400.42	0	01:16	4.71	0.12	0.39
C15B	CONDUIT	694.32	0	01:18	5.48	0.21	0.50
C16	CONDUIT	836.80	0	01:17	4.47	0.09	0.36
C160-DF	DUMMY	173.30	0	00:42			
C17	CONDUIT	901.07	0	01:25	5.02	0.14	0.44
C170-DF	DUMMY	99.48	0	00:52			
C175-DF	DUMMY	90.61	0	00:54			
C18	CONDUIT	1039.32	0	01:25	5.94	0.19	0.46
C180-DF	DUMMY	60.49	0	00:44			



FHAD-14 SWMM Report

C185-DF	DUMMY	99.02	0	00:54			
C19	CONDUIT	1130.61	0	01:30	4.65	0.10	0.39
C190-DF	DUMMY	75.81	0	00:50			
D100-DF	DUMMY	134.70	0	00:48			
D11	CONDUIT	126.77	0	01:03	3.09	0.03	0.21
D110-DF	DUMMY	129.08	0	00:48			
D12	CONDUIT	243.76	0	01:04	2.94	0.03	0.21
D120-DF	DUMMY	117.57	0	00:42			
D13	CONDUIT	323.83	0	01:09	4.80	0.12	0.40
D130-DF	DUMMY	119.46	0	00:44			
E100-DF	DUMMY	83.59	0	00:54			
E105-DF	DUMMY	56.48	0	00:48			
E11	CONDUIT	136.50	0	01:00	3.08	0.04	0.23
E110-DF	DUMMY	98.78	0	00:46			
E12	CONDUIT	224.49	0	01:02	3.74	0.06	0.28
E120-DF	DUMMY	80.21	0	00:48			
E125-DF	DUMMY	71.04	0	00:50			
E13	CONDUIT	364.66	0	01:05	4.27	0.09	0.36
E130-DF	DUMMY	95.50	0	00:46			
E135-DF	DUMMY	93.39	0	00:52			
E14	CONDUIT	532.29	0	01:08	4.74	0.14	0.42
E140-DF	DUMMY	113.20	0	00:44			
E15	CONDUIT	618.46	0	01:11	5.00	0.16	0.45
E150-DF	DUMMY	77.62	0	00:46			
E155-DF	DUMMY	98.43	0	00:58			
E16	CONDUIT	765.99	0	01:15	5.30	0.19	0.49
E160-DF	DUMMY	110.46	0	00:52			
E17	CONDUIT	850.12	0	01:18	5.46	0.21	0.51
E170-DF	DUMMY	106.03	0	00:46			
E18	CONDUIT	909.82	0	01:23	5.56	0.23	0.53
E180-DF	DUMMY	32.48	0	00:54			
E183-DF	DUMMY	89.36	0	00:58			
E184-DF	DUMMY	60.11	0	00:54			
E185	CONDUIT	144.97	0	01:09	3.52	0.04	0.27
E185-DF	DUMMY	91.86	0	00:58			
E19	CONDUIT	1138.85	0	01:25	5.97	0.28	0.58
E190-DF	DUMMY	67.97	0	00:46			
E20	CONDUIT	1126.33	0	01:38	4.72	0.12	0.41
E200-DF	DUMMY	68.54	0	01:04			

## FHAD-14 SWMM Report

E204-DF	DUMMY	42.80	0	00:48			
E205	CONDUIT	37.58	0	01:17	2.08	0.02	0.17
E205-DF	DUMMY	135.05	0	00:46			
E21	CONDUIT	1249.10	0	01:45	5.94	0.25	0.52
E210-DF	DUMMY	58.33	0	01:06			
F100-DF	DUMMY	114.33	0	00:44			
F11	CONDUIT	71.09	0	01:20	11.33	0.27	0.36
F110-DF	DUMMY	136.80	0	00:44			
F12	CONDUIT	103.87	0	01:44	12.80	0.08	0.19
F120-DF	DUMMY	182.47	0	00:44			
F125-DF	DUMMY	58.37	0	00:52			
F13	CONDUIT	230.88	0	01:24	3.51	0.05	0.28
F130-DF	DUMMY	93.92	0	00:52			
F14	CONDUIT	108.57	0	02:49	12.59	1.08	1.00
F140-DF	DUMMY	44.52	0	00:56			
F14-Overflow	CONDUIT	195.77	0	01:32	5.56	0.01	0.19
G10	CONDUIT	11.94	0	04:03	5.33	0.04	0.13
G100-DF	DUMMY	53.92	0	01:14			
G105-DF	DUMMY	70.26	0	00:42			
G11	CONDUIT	64.43	0	01:00	2.30	0.02	0.17
G110-DF	DUMMY	79.63	0	00:48			
G12	CONDUIT	58.89	0	01:54	11.52	0.12	0.24
G120-DF	DUMMY	106.27	0	00:50			
GA999-DF	DUMMY	768.96	0	01:07			
GV999-DF	DUMMY	327.69	0	01:29			
H100-DF	DUMMY	176.17	0	00:46			
H11	CONDUIT	175.81	0	00:49	14.76	0.40	0.44
H110-DF	DUMMY	174.94	0	00:42			
H115-DF	DUMMY	123.55	0	00:38			
H12	CONDUIT	308.51	0	01:14	17.34	0.68	0.60
H120-DF	DUMMY	68.81	0	00:48			
H13	CONDUIT	187.79	0	02:05	3.97	0.01	0.18
H130-DF	DUMMY	50.88	0	00:44			
H14	CONDUIT	193.89	0	02:09	2.47	0.02	0.20
H140-DF	DUMMY	27.43	0	00:56			
H145-DF	DUMMY	82.20	0	01:04			
H15	CONDUIT	257.55	0	01:50	2.64	0.02	0.22
H150-DF	DUMMY	123.84	0	00:44			
H16	CONDUIT	273.18	0	02:02	2.52	0.02	0.21

## FHAD-14 SWMM Report

H160-DF	DUMMY	50.36	0	01:14			
H17	CONDUIT	307.82	0	02:05	3.61	0.06	0.26
H170-DF	DUMMY	54.20	0	00:58			
H18	CONDUIT	359.23	0	02:05	17.06	0.22	0.28
H180-DF	DUMMY	110.42	0	00:46			
H185	CONDUIT	118.40	0	00:55	14.96	0.37	0.42
H19	CONDUIT	431.87	0	01:22	4.18	0.10	0.30
H190-DF	DUMMY	228.56	0	00:36			
H20	CONDUIT	495.74	0	01:18	4.48	0.11	0.32
H200-DF	DUMMY	101.49	0	00:46			
H205	CONDUIT	136.26	0	00:41	3.42	0.01	0.17
H21	CONDUIT	640.07	0	01:11	4.70	0.15	0.38
H210-DF	DUMMY	101.91	0	00:52			
H22	CONDUIT	730.68	0	01:10	4.99	0.16	0.40
H220-DF	DUMMY	42.78	0	00:50			
HC008-DF	DUMMY	1288.41	0	01:16			
HC013-DF	DUMMY	2053.91	0	01:27			
HC025-DF	DUMMY	4426.38	0	01:59			
HC028-DF	DUMMY	5720.02	0	02:02			
HC032-DF	DUMMY	6064.96	0	02:12			
HC035-DF	DUMMY	6110.40	0	02:25			
HC036-DF	DUMMY	6564.42	0	02:25			
HC117-DF	DUMMY	183.31	0	00:56			
HC999-DF	DUMMY	6555.56	0	02:29			
OH999-DF	DUMMY	1177.11	0	01:30			
OR999-DF	DUMMY	413.92	0	01:07			
SG999-DF	DUMMY	119.33	0	01:23			
GA309-OUT	DUMMY	308.56	0	01:13			
GA310-OUT	DUMMY	187.82	0	02:02			
GA311-OUT	DUMMY	193.99	0	02:03			
GA350-OUT	DUMMY	359.29	0	02:03			
GV301-OUT	DUMMY	71.11	0	01:17			
GV302-OUT	DUMMY	104.00	0	01:40			
HC310-OUT	DUMMY	436.18	0	01:05			
HC320-OUT	DUMMY	1028.19	0	01:09			
HC326-OUT	DUMMY	30.39	0	01:55			
MT300-OUT	DUMMY	225.69	0	01:15			
OH310-OUT	DUMMY	362.89	0	01:29			
OH320-OUT	DUMMY	400.93	0	01:12			

FHAD-14 SWMM Report

SG310-OUT            DUMMY            11.94            0 04:03  
 SG320-OUT            DUMMY            58.94            0 01:50

\*\*\*\*\*  
 Conduit Surcharge Summary  
 \*\*\*\*\*

-----					
Conduit	----- Hours Full -----			Hours	Hours
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
-----					
F14	2.13	2.13	2.13	2.17	2.13

Analysis begun on: Wed Jul 20 14:49:39 2022  
 Analysis ended on: Wed Jul 20 14:49:39 2022  
 Total elapsed time: < 1 sec

Existing Ridgeway Pkwy (Couplet) SWMM Report

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

-----  
HAPPY CANYON CREEK MDP & FHAD  
BASELINE HYDROLOGY SWMM MODEL  
100-YR, 2-HR STORM, EXISTING COUPLET

WARNING 08: elevation drop exceeds length for Conduit A320-DF

\*\*\*\*\*  
NOTE: The summary statistics displayed in this report are  
based on results found at every computational time step,  
not just on results from each reporting time step.  
\*\*\*\*\*

\*\*\*\*\*  
Analysis Options  
\*\*\*\*\*

Flow Units ..... CFS

Process Models:

- Rainfall/Runoff ..... NO
- RDII ..... NO
- Snowmelt ..... NO
- Groundwater ..... NO
- Flow Routing ..... YES
- Ponding Allowed ..... NO
- Water Quality ..... NO

Flow Routing Method ..... KINWAVE

Starting Date ..... 01/01/2005 00:00:00

Ending Date ..... 01/05/2005 00:00:00

Antecedent Dry Days ..... 0.0

Report Time Step ..... 00:05:00

Routing Time Step ..... 30.00 sec

Existing Ridgeway Pkwy (Couplet) SWMM Report

	Volume acre-feet	Volume 10 <sup>6</sup> gal
*****		
Flow Routing Continuity		
*****	-----	-----
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.000	0.000
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	1201.030	391.373
External Outflow .....	1221.397	398.010
Flooding Loss .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Exfiltration Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.000
Final Stored Volume .....	2.961	0.965
Continuity Error (%) .....	-1.942	

\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*

- Link HC036-DF (50)
- Link H22 (40)
- Link GA999-DF (40)
- Link H20 (39)
- Link H18 (39)

\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.00
Percent Not Converging	:	0.00

Existing Ridgeway Pkwy (Couplet) SWMM Report

\*\*\*\*\*  
Node Depth Summary  
\*\*\*\*\*

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
A100	JUNCTION	0.00	0.00	6401.00	0 00:00	0.00
A105	JUNCTION	0.00	0.00	6401.00	0 00:00	0.00
A110	JUNCTION	0.00	0.00	6386.00	0 00:00	0.00
A120	JUNCTION	0.00	0.00	6347.00	0 00:00	0.00
A125	JUNCTION	0.00	0.00	6361.00	0 00:00	0.00
A130	JUNCTION	0.00	0.00	6319.00	0 00:00	0.00
A134	JUNCTION	0.00	0.00	6387.00	0 00:00	0.00
A135	JUNCTION	0.00	0.00	6319.00	0 00:00	0.00
A140	JUNCTION	0.00	0.00	6306.00	0 00:00	0.00
A150	JUNCTION	0.00	0.00	6281.00	0 00:00	0.00
A160	JUNCTION	0.00	0.00	6258.00	0 00:00	0.00
A170	JUNCTION	0.00	0.00	6239.00	0 00:00	0.00
A180	JUNCTION	0.00	0.00	6201.00	0 00:00	0.00
A190	JUNCTION	0.00	0.00	6190.00	0 00:00	0.00
A195	JUNCTION	0.00	0.00	6190.00	0 00:00	0.00
A200	JUNCTION	0.00	0.00	6161.00	0 00:00	0.00
A210	JUNCTION	0.00	0.00	6109.00	0 00:00	0.00
A215	JUNCTION	0.00	0.00	6095.00	0 00:00	0.00
A220	JUNCTION	0.00	0.00	6095.00	0 00:00	0.00
A230	JUNCTION	0.00	0.00	6086.00	0 00:00	0.00
A234	JUNCTION	0.00	0.00	6084.00	0 00:00	0.00
A235	JUNCTION	0.00	0.00	6069.00	0 00:00	0.00
A240	JUNCTION	0.00	0.00	6068.00	0 00:00	0.00
A245	JUNCTION	0.00	0.00	6047.00	0 00:00	0.00
A250	JUNCTION	0.00	0.00	6051.00	0 00:00	0.00

## Existing Ridgeway Pkwy (Couplet) SWMM Report

A260	JUNCTION	0.00	0.00	5991.00	0	00:00	0.00
A263	JUNCTION	0.00	0.00	6066.00	0	00:00	0.00
A264	JUNCTION	0.00	0.00	6066.00	0	00:00	0.00
A265	JUNCTION	0.00	0.00	6006.00	0	00:00	0.00
A270	JUNCTION	0.00	0.00	5966.00	0	00:00	0.00
A275	JUNCTION	0.00	0.00	5971.00	0	00:00	0.00
A276	JUNCTION	0.00	0.00	5971.00	0	00:00	0.00
A280	JUNCTION	0.00	0.00	5961.00	0	00:00	0.00
A285	JUNCTION	0.00	0.00	6016.00	0	00:00	0.00
A290	JUNCTION	0.00	0.00	5929.00	0	00:00	0.00
A295	JUNCTION	0.02	1.66	5994.66	0	00:40	1.66
A300	JUNCTION	0.00	0.00	5886.00	0	00:00	0.00
A304	JUNCTION	0.00	0.00	5971.00	0	00:00	0.00
A305	JUNCTION	0.00	0.00	5891.00	0	00:00	0.00
A310	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A314	JUNCTION	0.00	0.00	5916.00	0	00:00	0.00
A315	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A320	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A325	JUNCTION	0.00	0.00	5836.00	0	00:00	0.00
A330	JUNCTION	0.00	0.00	5815.00	0	00:00	0.00
A340	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
A345	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
A350	JUNCTION	0.00	0.00	5795.00	0	00:00	0.00
A360	JUNCTION	0.00	0.00	5781.00	0	00:00	0.00
A370	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
A375	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
A380	JUNCTION	0.00	0.00	5737.00	0	00:00	0.00
A390	JUNCTION	0.00	0.00	5698.00	0	00:00	0.00
A395	JUNCTION	0.00	0.00	5696.00	0	00:00	0.00
A400	JUNCTION	0.00	0.00	5668.00	0	00:00	0.00
B100	JUNCTION	0.00	0.00	6381.00	0	00:00	0.00
B110	JUNCTION	0.00	0.00	6316.00	0	00:00	0.00
B120	JUNCTION	0.00	0.00	6301.00	0	00:00	0.00
B130	JUNCTION	0.00	0.00	6239.00	0	00:00	0.00
B134	JUNCTION	0.00	0.00	6361.00	0	00:00	0.00
B135	JUNCTION	0.00	0.00	6239.00	0	00:00	0.00



## Existing Ridgeway Pkwy (Couplet) SWMM Report

BG001	JUNCTION	0.04	2.35	6277.35	0	00:52	2.35
BG002	JUNCTION	0.05	2.84	6242.84	0	00:56	2.84
BG003	JUNCTION	0.07	3.57	6198.57	0	00:59	3.57
BG004	JUNCTION	0.09	4.23	6164.23	0	01:03	4.23
BG005	JUNCTION	0.10	4.49	6129.49	0	01:06	4.48
BG006	JUNCTION	0.11	4.95	6089.95	0	01:09	4.95
BG007	JUNCTION	0.12	5.15	6050.15	0	01:14	5.15
BG008	JUNCTION	0.13	5.34	6020.34	0	01:17	5.33
BG009	JUNCTION	0.16	5.86	5980.86	0	01:22	5.85
BG010	JUNCTION	0.16	5.85	5952.85	0	01:25	5.85
BG011	JUNCTION	0.16	5.32	5890.32	0	01:37	5.31
BG109	JUNCTION	0.06	2.73	6057.73	0	00:56	2.73
BG111	JUNCTION	0.03	1.81	5948.81	0	00:48	1.81
BG999	JUNCTION	0.16	5.28	5840.28	0	01:45	5.28
BH001	JUNCTION	0.02	2.35	6382.35	0	00:34	2.35
BH002	JUNCTION	0.03	2.27	6317.27	0	00:44	2.26
BH003	JUNCTION	0.04	2.45	6302.45	0	00:48	2.45
BH100	JUNCTION	0.00	0.38	6360.38	0	00:34	0.38
BH999	JUNCTION	0.04	2.38	6240.38	0	00:59	2.38
C100	JUNCTION	0.00	0.00	6441.00	0	00:00	0.00
C110	JUNCTION	0.00	0.00	6396.00	0	00:00	0.00
C120	JUNCTION	0.00	0.00	6351.00	0	00:00	0.00
C125	JUNCTION	0.00	0.00	6351.00	0	00:00	0.00
C130	JUNCTION	0.00	0.00	6311.00	0	00:00	0.00
C140	JUNCTION	0.00	0.00	6283.00	0	00:00	0.00
C150	JUNCTION	0.00	0.00	6246.00	0	00:00	0.00
C153	JUNCTION	0.00	0.00	6376.00	0	00:00	0.00
C154	JUNCTION	0.00	0.00	6307.00	0	00:00	0.00
C155	JUNCTION	0.00	0.00	6256.00	0	00:00	0.00
C159	JUNCTION	0.00	0.00	6246.00	0	00:00	0.00
C160	JUNCTION	0.00	0.00	6216.00	0	00:00	0.00
C170	JUNCTION	0.00	0.00	6171.00	0	00:00	0.00
C175	JUNCTION	0.00	0.00	6171.00	0	00:00	0.00
C180	JUNCTION	0.00	0.00	6150.00	0	00:00	0.00
C185	JUNCTION	0.00	0.00	6150.00	0	00:00	0.00
C190	JUNCTION	0.00	0.00	6109.00	0	00:00	0.00

## Existing Ridgeway Pkwy (Couplet) SWMM Report

D100	JUNCTION	0.00	0.00	6281.00	0	00:00	0.00
D110	JUNCTION	0.00	0.00	6221.00	0	00:00	0.00
D120	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
D130	JUNCTION	0.00	0.00	6109.00	0	00:00	0.00
E100	JUNCTION	0.00	0.00	6276.00	0	00:00	0.00
E105	JUNCTION	0.00	0.00	6276.00	0	00:00	0.00
E110	JUNCTION	0.00	0.00	6241.00	0	00:00	0.00
E120	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
E125	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
E130	JUNCTION	0.00	0.00	6161.00	0	00:00	0.00
E135	JUNCTION	0.00	0.00	6161.00	0	00:00	0.00
E140	JUNCTION	0.00	0.00	6126.00	0	00:00	0.00
E150	JUNCTION	0.00	0.00	6086.00	0	00:00	0.00
E155	JUNCTION	0.00	0.00	6086.00	0	00:00	0.00
E160	JUNCTION	0.00	0.00	6046.00	0	00:00	0.00
E170	JUNCTION	0.00	0.00	6021.00	0	00:00	0.00
E180	JUNCTION	0.00	0.00	5981.00	0	00:00	0.00
E183	JUNCTION	0.00	0.00	6056.00	0	00:00	0.00
E184	JUNCTION	0.00	0.00	6056.00	0	00:00	0.00
E185	JUNCTION	0.00	0.00	5981.00	0	00:00	0.00
E190	JUNCTION	0.00	0.00	5953.44	0	00:00	0.00
E200	JUNCTION	0.00	0.00	5891.00	0	00:00	0.00
E204	JUNCTION	0.00	0.00	5948.00	0	00:00	0.00
E205	JUNCTION	0.00	0.00	5886.00	0	00:00	0.00
E210	JUNCTION	0.00	0.00	5836.00	0	00:00	0.00
F100	JUNCTION	0.00	0.00	6008.00	0	00:00	0.00
F110	JUNCTION	0.00	0.00	5978.00	0	00:00	0.00
F120	JUNCTION	0.00	0.00	5906.00	0	00:00	0.00
F125	JUNCTION	0.00	0.00	5906.00	0	00:00	0.00
F130	JUNCTION	0.00	0.00	5853.00	0	00:00	0.00
F140	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
G100	JUNCTION	0.00	0.00	5887.00	0	00:00	0.00
G105	JUNCTION	0.00	0.00	5885.00	0	00:00	0.00
G110	JUNCTION	0.00	0.00	5842.00	0	00:00	0.00
G120	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
GA001	JUNCTION	0.05	2.63	5952.63	0	00:46	2.62

## Existing Ridgeway Pkwy (Couplet) SWMM Report

GA002	JUNCTION	0.07	3.62	5919.62	0	01:13	3.61
GA003	JUNCTION	0.07	1.78	5894.78	0	02:02	1.78
GA004	JUNCTION	0.16	1.98	5889.98	0	02:03	1.98
GA005	JUNCTION	0.18	2.25	5866.25	0	01:38	2.25
GA006	JUNCTION	0.19	2.24	5845.24	0	01:50	2.24
GA007	JUNCTION	0.20	2.60	5794.60	0	02:00	2.60
GA008	JUNCTION	0.15	2.75	5782.75	0	02:03	2.75
GA009	JUNCTION	0.18	3.04	5775.04	0	01:20	3.04
GA010	JUNCTION	0.19	3.23	5765.23	0	01:12	3.23
GA011	JUNCTION	0.20	3.78	5739.78	0	00:56	3.77
GA012	JUNCTION	0.21	3.98	5724.98	0	01:04	3.98
GA999	JUNCTION	0.21	3.98	5710.98	0	01:10	3.98
GV001	JUNCTION	0.03	1.78	6008.78	0	01:17	1.78
GV002	JUNCTION	0.16	1.67	5974.67	0	01:40	1.67
GV003	JUNCTION	0.20	2.84	5907.84	0	00:46	2.83
GV999	JUNCTION	0.27	3.50	5811.50	0	00:43	3.50
H100	JUNCTION	0.00	0.00	5951.00	0	00:00	0.00
H110	JUNCTION	0.00	0.00	5919.00	0	00:00	0.00
H115	JUNCTION	0.00	0.00	5919.00	0	00:00	0.00
H120	JUNCTION	0.00	0.00	5896.00	0	00:00	0.00
H130	JUNCTION	0.00	0.00	5892.00	0	00:00	0.00
H140	JUNCTION	0.00	0.00	5865.00	0	00:00	0.00
H145	JUNCTION	0.00	0.00	5865.00	0	00:00	0.00
H150	JUNCTION	0.00	0.00	5844.00	0	00:00	0.00
H160	JUNCTION	0.00	0.00	5793.00	0	00:00	0.00
H170	JUNCTION	0.00	0.00	5783.00	0	00:00	0.00
H180	JUNCTION	0.00	0.00	5783.00	0	00:00	0.00
H185	JUNCTION	0.04	2.12	5818.12	0	00:52	2.12
H190	JUNCTION	0.00	0.00	5763.00	0	00:00	0.00
H200	JUNCTION	0.00	0.00	5737.00	0	00:00	0.00
H205	JUNCTION	0.02	1.75	5738.75	0	00:40	1.75
H210	JUNCTION	0.00	0.00	5722.00	0	00:00	0.00
H220	JUNCTION	0.00	0.00	5708.00	0	00:00	0.00
HC001	JUNCTION	0.07	3.37	6403.37	0	00:44	3.37
HC002	JUNCTION	0.07	3.37	6388.37	0	00:48	3.37
HC003	JUNCTION	0.08	3.51	6343.51	0	01:05	3.51

## Existing Ridgeway Pkwy (Couplet) SWMM Report

HC004	JUNCTION	0.08	3.52	6321.52	0	00:54	3.51
HC005	JUNCTION	0.13	5.71	6305.71	0	01:09	5.71
HC006	JUNCTION	0.13	5.71	6285.71	0	01:11	5.70
HC007	JUNCTION	0.09	4.34	6261.34	0	01:14	4.33
HC008	JUNCTION	0.05	2.53	6240.53	0	01:17	2.52
HC009	JUNCTION	0.09	4.33	6241.33	0	01:14	4.32
HC010	JUNCTION	0.09	4.31	6204.31	0	01:19	4.31
HC011	JUNCTION	0.11	5.10	6194.10	0	01:20	5.10
HC012	JUNCTION	0.12	5.25	6165.25	0	01:22	5.23
HC013	JUNCTION	0.12	5.24	6113.24	0	01:27	5.23
HC014	JUNCTION	0.33	9.78	6116.78	0	01:26	9.77
HC015	JUNCTION	0.33	9.78	6103.78	0	01:29	9.78
HC016	JUNCTION	0.30	8.53	6093.53	0	01:30	8.53
HC017	JUNCTION	0.27	7.50	6074.50	0	01:32	7.49
HC018	JUNCTION	0.15	5.72	6050.72	0	01:34	5.72
HC019	JUNCTION	0.39	12.01	6012.01	0	01:38	12.00
HC020	JUNCTION	0.47	12.00	5977.00	0	01:42	11.99
HC021	JUNCTION	0.44	10.49	5965.49	0	01:43	10.48
HC022	JUNCTION	0.22	6.60	5929.60	0	01:46	6.59
HC023	JUNCTION	0.20	5.69	5890.69	0	01:51	5.69
HC024	JUNCTION	0.19	5.11	5869.11	0	01:55	5.11
HC025	JUNCTION	0.18	5.02	5840.02	0	01:59	5.02
HC026	JUNCTION	0.43	9.07	5843.07	0	01:56	9.06
HC027	JUNCTION	0.43	9.06	5823.06	0	02:01	9.06
HC028	JUNCTION	0.39	9.06	5817.06	0	02:02	9.05
HC029	JUNCTION	0.38	9.10	5816.10	0	02:02	9.09
HC030	JUNCTION	0.38	9.10	5803.10	0	02:04	9.10
HC031	JUNCTION	0.34	7.06	5787.06	0	02:08	7.05
HC032	JUNCTION	0.30	6.78	5765.78	0	02:12	6.78
HC033	JUNCTION	0.40	8.04	5766.04	0	02:12	8.03
HC034	JUNCTION	0.42	8.53	5744.53	0	02:17	8.52
HC035	JUNCTION	0.41	8.48	5714.48	0	02:26	8.48
HC036	JUNCTION	0.00	0.00	5698.00	0	00:00	0.00
HC037	JUNCTION	0.34	6.74	5701.74	0	02:25	6.74
HC103	JUNCTION	0.02	1.85	6361.85	0	00:40	1.85
HC104	JUNCTION	0.03	1.97	6387.97	0	00:42	1.96

## Existing Ridgeway Pkwy (Couplet) SWMM Report

HC116	JUNCTION	0.04	2.70	6085.70	0	00:48	2.69
HC117	JUNCTION	0.05	2.64	6070.64	0	01:00	2.64
HC119	JUNCTION	0.06	2.51	6067.51	0	01:00	2.51
HC122	JUNCTION	0.03	1.58	6016.58	0	00:50	1.58
HC123	JUNCTION	0.05	2.02	5972.02	0	01:02	2.02
HC124	JUNCTION	0.03	0.95	5915.95	0	01:08	0.95
HC999	JUNCTION	0.34	6.73	5673.73	0	02:30	6.73
MT100	JUNCTION	0.01	0.73	6375.73	0	00:42	0.72
MT110	JUNCTION	0.06	2.21	6302.21	0	01:15	2.21
OH001	JUNCTION	0.02	1.37	6441.37	0	00:48	1.37
OH002	JUNCTION	0.05	2.98	6397.98	0	00:51	2.98
OH003	JUNCTION	0.07	3.74	6353.74	0	00:56	3.73
OH004	JUNCTION	0.08	3.21	6312.21	0	01:29	3.21
OH005	JUNCTION	0.10	3.92	6284.92	0	01:12	3.92
OH006	JUNCTION	0.15	5.05	6260.05	0	01:15	5.05
OH007	JUNCTION	0.15	5.05	6250.05	0	01:18	5.05
OH008	JUNCTION	0.14	4.49	6219.49	0	01:15	4.49
OH009	JUNCTION	0.15	4.58	6174.58	0	01:23	4.58
OH010	JUNCTION	0.14	4.58	6153.58	0	01:25	4.58
OH999	JUNCTION	0.13	3.95	6111.95	0	01:30	3.94
OR001	JUNCTION	0.03	2.15	6282.15	0	00:48	2.15
OR002	JUNCTION	0.04	2.09	6222.09	0	01:03	2.09
OR003	JUNCTION	0.08	4.09	6199.09	0	01:00	4.09
OR999	JUNCTION	0.09	4.05	6112.05	0	01:09	4.05
SG001	JUNCTION	0.21	0.80	5885.80	0	04:03	0.80
SG002	JUNCTION	0.23	1.83	5885.83	0	00:44	1.83
SG003	JUNCTION	0.24	1.42	5840.42	0	01:50	1.42
SG999	JUNCTION	0.24	1.42	5760.42	0	01:54	1.42
HC-OUTFALL	OUTFALL	0.00	0.00	5666.00	0	00:00	0.00
GV004	DIVIDER	0.27	3.50	5855.50	0	00:39	3.50
GA309	STORAGE	0.15	8.19	5925.19	0	01:13	8.19
GA310	STORAGE	0.29	9.73	5903.73	0	02:02	9.73
GA311	STORAGE	2.57	6.34	5895.34	0	02:03	6.34
GA350	STORAGE	0.08	2.57	5783.57	0	02:03	2.57
HC310	STORAGE	0.18	13.80	6358.80	0	01:05	13.80
HC320	STORAGE	0.14	9.62	6310.62	0	01:09	9.62

Existing Ridgeway Pkwy (Couplet) SWMM Report

MT300	STORAGE	0.33	8.25	6309.25	0	01:15	8.25
OH310	STORAGE	0.40	17.62	6327.62	0	01:29	17.62
OH320	STORAGE	0.31	10.94	6292.94	0	01:12	10.94
SG310	STORAGE	2.68	6.89	5892.89	0	04:03	6.89
SG320	STORAGE	2.18	6.61	5846.61	0	01:50	6.61
HC326	STORAGE	1.01	6.32	5844.32	0	01:55	6.32
GV301	STORAGE	0.08	4.50	6012.00	0	01:17	4.49
GV302	STORAGE	1.13	3.66	5977.16	0	01:40	3.66
TOD_Pond	STORAGE	3.44	8.06	5978.06	0	01:07	8.05

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Node Inflow Summary  
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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
A100	JUNCTION	148.50	148.50	0 00:40	3.28	3.28	0.000
A105	JUNCTION	100.98	100.98	0 00:56	4.08	4.08	0.000
A110	JUNCTION	247.47	247.47	0 00:34	3.59	3.59	0.000
A120	JUNCTION	299.29	299.29	0 00:36	5.06	5.06	0.000
A125	JUNCTION	166.94	166.94	0 00:40	3.49	3.49	0.000
A130	JUNCTION	77.45	77.45	0 00:42	1.85	1.85	0.000
A134	JUNCTION	194.13	194.13	0 00:42	4.76	4.76	0.000
A135	JUNCTION	146.36	146.36	0 00:46	4.2	4.2	0.000
A140	JUNCTION	205.49	205.49	0 00:42	4.75	4.75	0.000
A150	JUNCTION	179.16	179.16	0 00:42	4.04	4.04	0.000
A160	JUNCTION	149.79	149.79	0 00:44	3.55	3.55	0.000
A170	JUNCTION	102.96	102.96	0 00:46	2.82	2.82	0.000
A180	JUNCTION	103.07	103.07	0 00:46	2.69	2.69	0.000
A190	JUNCTION	128.27	128.27	0 00:42	2.86	2.86	0.000
A195	JUNCTION	61.92	61.92	0 00:56	2.6	2.6	0.000

## Existing Ridgeway Pkwy (Couplet) SWMM Report

A200	JUNCTION	126.22	126.22	0	00:44	3.08	3.08	0.000
A210	JUNCTION	78.30	78.30	0	00:54	3.06	3.06	0.000
A215	JUNCTION	104.15	104.15	0	00:54	3.82	3.82	0.000
A220	JUNCTION	98.17	98.17	0	00:50	3.11	3.11	0.000
A230	JUNCTION	58.67	58.67	0	00:40	1	1	0.000
A234	JUNCTION	90.39	90.39	0	00:48	2.63	2.63	0.000
A235	JUNCTION	101.28	101.28	0	00:48	3.02	3.02	0.000
A240	JUNCTION	123.72	123.72	0	00:44	2.91	2.91	0.000
A245	JUNCTION	54.50	54.50	0	00:42	1.11	1.11	0.000
A250	JUNCTION	48.07	48.07	0	00:46	1.38	1.38	0.000
A260	JUNCTION	88.62	88.62	0	00:52	2.99	2.99	0.000
A263	JUNCTION	60.53	60.53	0	00:56	2.36	2.36	0.000
A264	JUNCTION	64.26	64.26	0	01:04	2.95	2.95	0.000
A265	JUNCTION	47.33	47.33	0	00:50	1.53	1.53	0.000
A270	JUNCTION	69.36	69.36	0	01:08	3.59	3.59	0.000
A275	JUNCTION	155.93	155.93	0	00:42	4.06	4.06	0.000
A276	JUNCTION	63.38	63.38	0	00:42	1.28	1.28	0.000
A280	JUNCTION	113.33	113.33	0	00:52	3.9	3.9	0.000
A285	JUNCTION	41.12	41.12	0	00:50	1.28	1.28	0.000
A290	JUNCTION	113.44	113.44	0	00:54	3.95	3.95	0.000
A295	JUNCTION	106.03	106.03	0	00:40	1.98	1.98	0.000
A300	JUNCTION	169.32	169.32	0	00:44	4.88	4.88	0.000
A304	JUNCTION	72.54	72.54	0	01:02	3.16	3.16	0.000
A305	JUNCTION	36.49	36.49	0	00:56	1.4	1.4	0.000
A310	JUNCTION	59.87	59.87	0	00:56	2.25	2.25	0.000
A314	JUNCTION	48.92	48.92	0	01:08	2.57	2.57	0.000
A315	JUNCTION	43.11	43.11	0	01:04	2.02	2.02	0.000
A320	JUNCTION	51.57	51.57	0	00:52	1.86	1.86	0.000
A325	JUNCTION	158.08	158.08	0	00:42	4.21	4.21	0.000
A330	JUNCTION	90.66	90.66	0	00:54	3.37	3.37	0.000
A340	JUNCTION	65.70	65.70	0	01:08	3.62	3.62	0.000
A345	JUNCTION	30.09	30.09	0	00:56	1.28	1.28	0.000
A350	JUNCTION	64.75	64.75	0	00:50	2.13	2.13	0.000
A360	JUNCTION	82.02	82.02	0	01:00	3.7	3.7	0.000
A370	JUNCTION	96.13	96.13	0	00:44	2.54	2.54	0.000
A375	JUNCTION	53.59	53.59	0	01:08	2.98	2.98	0.000

## Existing Ridgeway Pkwy (Couplet) SWMM Report

A380	JUNCTION	83.99	83.99	0	00:54	2.97	2.97	0.000
A390	JUNCTION	92.59	92.59	0	00:56	3.72	3.72	0.000
A395	JUNCTION	63.96	63.96	0	00:40	1.13	1.13	0.000
A400	JUNCTION	185.29	185.29	0	00:42	5.15	5.15	0.000
B100	JUNCTION	199.28	199.28	0	00:34	3.29	3.29	0.000
B110	JUNCTION	144.63	144.63	0	00:42	3.29	3.29	0.000
B120	JUNCTION	109.36	109.36	0	00:44	2.91	2.91	0.000
B130	JUNCTION	69.66	69.66	0	00:52	2.34	2.34	0.000
B134	JUNCTION	64.04	64.04	0	00:34	1.07	1.07	0.000
B135	JUNCTION	133.52	133.52	0	00:50	4.43	4.43	0.000
BG001	JUNCTION	0.00	139.10	0	00:52	0	4.62	0.000
BG002	JUNCTION	0.00	226.38	0	00:56	0	7.23	0.000
BG003	JUNCTION	0.00	367.17	0	00:59	0	11.9	0.000
BG004	JUNCTION	0.00	535.15	0	01:03	0	17.7	0.000
BG005	JUNCTION	0.00	621.63	0	01:06	0	20.6	0.000
BG006	JUNCTION	0.00	771.93	0	01:09	0	26.6	0.000
BG007	JUNCTION	0.00	854.01	0	01:14	0	30.2	0.000
BG008	JUNCTION	0.00	918.42	0	01:17	0	33	0.000
BG009	JUNCTION	0.00	1168.27	0	01:22	0	45.7	0.000
BG010	JUNCTION	0.00	1193.90	0	01:25	0	47.3	0.000
BG011	JUNCTION	0.00	1286.26	0	01:37	0	56.5	0.000
BG109	JUNCTION	0.00	148.84	0	00:56	0	5.66	0.000
BG111	JUNCTION	0.00	42.80	0	00:48	0	1.31	0.000
BG999	JUNCTION	0.00	1309.95	0	01:45	0	59.7	0.000
BH001	JUNCTION	0.00	199.28	0	00:34	0	3.29	0.000
BH002	JUNCTION	0.00	330.29	0	00:43	0	6.6	0.000
BH003	JUNCTION	0.00	428.62	0	00:48	0	9.54	0.000
BH100	JUNCTION	0.00	64.04	0	00:34	0	1.07	0.000
BH999	JUNCTION	0.00	632.78	0	00:57	0	17.5	0.000
C100	JUNCTION	102.29	102.29	0	00:48	3	3	0.000
C110	JUNCTION	138.50	138.50	0	00:44	3.47	3.47	0.000
C120	JUNCTION	71.58	71.58	0	00:48	2.28	2.28	0.000
C125	JUNCTION	100.85	100.85	0	00:54	3.7	3.7	0.000
C130	JUNCTION	195.93	195.93	0	00:42	4.72	4.72	0.000
C140	JUNCTION	100.45	100.45	0	00:40	2.11	2.11	0.000
C150	JUNCTION	49.62	49.62	0	00:54	1.81	1.81	0.000



## Existing Ridgeway Pkwy (Couplet) SWMM Report

C153	JUNCTION	218.37	218.37	0	00:42	5.17	5.17	0.000
C154	JUNCTION	178.02	178.02	0	00:42	4.36	4.36	0.000
C155	JUNCTION	112.11	112.11	0	00:44	3.08	3.08	0.000
C159	JUNCTION	178.38	178.38	0	00:42	4.41	4.41	0.000
C160	JUNCTION	173.30	173.30	0	00:42	3.74	3.74	0.000
C170	JUNCTION	99.48	99.48	0	00:52	3.64	3.64	0.000
C175	JUNCTION	90.61	90.61	0	00:54	3.29	3.29	0.000
C180	JUNCTION	60.49	60.49	0	00:44	1.54	1.54	0.000
C185	JUNCTION	99.02	99.02	0	00:54	3.64	3.64	0.000
C190	JUNCTION	75.81	75.81	0	00:50	2.55	2.55	0.000
D100	JUNCTION	134.70	134.70	0	00:48	3.97	3.97	0.000
D110	JUNCTION	129.08	129.08	0	00:48	3.78	3.78	0.000
D120	JUNCTION	117.57	117.57	0	00:42	2.46	2.46	0.000
D130	JUNCTION	119.46	119.46	0	00:44	3.06	3.06	0.000
E100	JUNCTION	83.59	83.59	0	00:54	2.99	2.99	0.000
E105	JUNCTION	56.48	56.48	0	00:48	1.63	1.63	0.000
E110	JUNCTION	98.78	98.78	0	00:46	2.56	2.56	0.000
E120	JUNCTION	80.21	80.21	0	00:48	2.4	2.4	0.000
E125	JUNCTION	71.04	71.04	0	00:50	2.27	2.27	0.000
E130	JUNCTION	95.50	95.50	0	00:46	2.55	2.55	0.000
E135	JUNCTION	93.39	93.39	0	00:52	3.14	3.14	0.000
E140	JUNCTION	113.20	113.20	0	00:44	2.81	2.81	0.000
E150	JUNCTION	77.62	77.62	0	00:46	2.05	2.05	0.000
E155	JUNCTION	98.43	98.43	0	00:58	3.92	3.92	0.000
E160	JUNCTION	110.46	110.46	0	00:52	3.49	3.49	0.000
E170	JUNCTION	106.03	106.03	0	00:46	2.82	2.82	0.000
E180	JUNCTION	53.89	53.89	0	01:10	3.14	3.14	0.000
E183	JUNCTION	89.36	89.36	0	00:58	3.56	3.56	0.000
E184	JUNCTION	60.11	60.11	0	00:54	2.1	2.1	0.000
E185	JUNCTION	91.86	91.86	0	00:58	3.72	3.72	0.000
E190	JUNCTION	39.39	39.39	0	00:54	1.52	1.52	0.000
E200	JUNCTION	68.54	68.54	0	01:04	3.22	3.22	0.000
E204	JUNCTION	42.80	42.80	0	00:48	1.31	1.31	0.000
E205	JUNCTION	135.05	135.05	0	00:46	4.18	4.18	0.000
E210	JUNCTION	58.33	58.33	0	01:06	2.96	2.96	0.000
F100	JUNCTION	114.33	114.33	0	00:44	2.87	2.87	0.000

## Existing Ridgeway Pkwy (Couplet) SWMM Report

F110	JUNCTION	136.80	136.80	0	00:44	3.39	3.39	0.000
F120	JUNCTION	182.47	182.47	0	00:44	5.33	5.33	0.000
F125	JUNCTION	58.37	58.37	0	00:52	2.02	2.02	0.000
F130	JUNCTION	93.92	93.92	0	00:52	3.19	3.19	0.000
F140	JUNCTION	44.52	44.52	0	00:56	1.86	1.86	0.000
G100	JUNCTION	53.92	53.92	0	01:14	3.45	3.45	0.000
G105	JUNCTION	70.26	70.26	0	00:42	1.96	1.96	0.000
G110	JUNCTION	79.63	79.63	0	00:48	2.59	2.59	0.000
G120	JUNCTION	106.27	106.27	0	00:50	3.95	3.95	0.000
GA001	JUNCTION	0.00	176.17	0	00:46	0	5.84	0.000
GA002	JUNCTION	0.00	308.56	0	01:13	0	12.8	0.000
GA003	JUNCTION	0.00	187.82	0	02:02	0	14.9	0.000
GA004	JUNCTION	0.00	193.99	0	02:03	0	16	0.000
GA005	JUNCTION	0.00	260.06	0	01:38	0	21	0.000
GA006	JUNCTION	0.00	281.91	0	01:43	0	23.9	0.000
GA007	JUNCTION	0.00	308.27	0	02:00	0	27.4	0.000
GA008	JUNCTION	0.00	359.29	0	02:03	0	32.9	0.000
GA009	JUNCTION	0.00	432.19	0	01:20	0	37.2	0.000
GA010	JUNCTION	0.00	497.13	0	01:12	0	41.5	-0.000
GA011	JUNCTION	0.00	641.90	0	00:56	0	47.2	0.000
GA012	JUNCTION	0.00	731.69	0	01:04	0	50.7	0.000
GA999	JUNCTION	0.00	768.96	0	01:07	0	52.1	0.000
GV001	JUNCTION	0.00	71.11	0	01:17	0	2.87	0.000
GV002	JUNCTION	0.00	104.00	0	01:40	0	5.79	0.000
GV003	JUNCTION	0.00	237.67	0	00:46	0	13.1	0.000
GV999	JUNCTION	0.00	327.69	0	01:29	0	18.7	0.000
H100	JUNCTION	176.17	176.17	0	00:46	5.84	5.84	0.000
H110	JUNCTION	174.94	174.94	0	00:42	4.46	4.46	0.000
H115	JUNCTION	123.55	123.55	0	00:38	2.49	2.49	0.000
H120	JUNCTION	68.81	68.81	0	00:48	2.15	2.15	0.000
H130	JUNCTION	50.88	50.88	0	00:44	1.27	1.27	0.000
H140	JUNCTION	27.43	27.43	0	00:56	1.09	1.09	0.000
H145	JUNCTION	82.20	82.20	0	01:04	3.87	3.87	0.000
H150	JUNCTION	123.84	123.84	0	00:44	2.85	2.85	0.000
H160	JUNCTION	50.36	50.36	0	01:14	3.2	3.2	0.000
H170	JUNCTION	54.20	54.20	0	00:58	2.3	2.3	0.000

## Existing Ridgeway Pkwy (Couplet) SWMM Report

H180	JUNCTION	110.42	110.42	0	00:46	3.3	3.3	0.000
H185	JUNCTION	118.49	118.49	0	00:52	4.32	4.32	0.000
H190	JUNCTION	228.56	228.56	0	00:36	4.27	4.27	0.000
H200	JUNCTION	101.49	101.49	0	00:46	2.98	2.98	0.000
H205	JUNCTION	136.56	136.56	0	00:40	2.63	2.63	0.000
H210	JUNCTION	101.91	101.91	0	00:52	3.38	3.38	0.000
H220	JUNCTION	42.78	42.78	0	00:50	1.38	1.38	0.000
HC001	JUNCTION	0.00	234.42	0	00:44	0	7.35	0.000
HC002	JUNCTION	0.00	428.19	0	00:40	0	10.9	0.000
HC003	JUNCTION	0.00	436.18	0	01:05	0	16.1	0.000
HC004	JUNCTION	0.00	940.98	0	00:54	0	30.5	0.000
HC005	JUNCTION	0.00	1028.19	0	01:09	0	35.3	0.000
HC006	JUNCTION	0.00	1141.67	0	01:09	0	39.3	0.000
HC007	JUNCTION	0.00	1227.88	0	01:13	0	42.9	0.000
HC008	JUNCTION	0.00	1288.41	0	01:16	0	45.9	0.000
HC009	JUNCTION	0.00	1789.46	0	01:14	0	63.4	0.000
HC010	JUNCTION	0.00	1840.91	0	01:18	0	66.3	0.000
HC011	JUNCTION	0.00	1948.03	0	01:20	0	71.8	0.000
HC012	JUNCTION	0.00	2002.17	0	01:22	0	75	0.000
HC013	JUNCTION	0.00	2053.91	0	01:27	0	78.2	0.000
HC014	JUNCTION	0.00	3546.14	0	01:26	0	149	0.000
HC015	JUNCTION	0.00	3674.40	0	01:28	0	156	0.000
HC016	JUNCTION	0.00	3678.23	0	01:30	0	157	0.000
HC017	JUNCTION	0.00	3826.13	0	01:31	0	165	0.000
HC018	JUNCTION	0.00	3853.26	0	01:34	0	168	0.000
HC019	JUNCTION	0.00	4007.98	0	01:38	0	178	0.000
HC020	JUNCTION	0.00	4108.50	0	01:41	0	187	0.000
HC021	JUNCTION	0.00	4164.43	0	01:42	0	191	0.000
HC022	JUNCTION	0.00	4241.43	0	01:46	0	199	0.000
HC023	JUNCTION	0.00	4347.91	0	01:50	0	209	0.000
HC024	JUNCTION	0.00	4419.12	0	01:55	0	216	0.000
HC025	JUNCTION	0.00	4430.35	0	01:59	0	218	0.000
HC026	JUNCTION	0.00	5678.33	0	01:56	0	282	0.000
HC027	JUNCTION	0.00	5695.67	0	02:01	0	285	0.000
HC028	JUNCTION	0.00	5748.04	0	02:02	0	290	0.000
HC029	JUNCTION	0.00	6023.36	0	02:02	0	309	0.000

## Existing Ridgeway Pkwy (Couplet) SWMM Report

HC030	JUNCTION	0.00	6037.64	0	02:04	0	311	0.000
HC031	JUNCTION	0.00	6063.88	0	02:08	0	315	0.000
HC032	JUNCTION	0.00	6092.71	0	02:12	0	320	0.000
HC033	JUNCTION	0.00	6182.51	0	02:12	0	332	0.000
HC034	JUNCTION	0.00	6178.72	0	02:17	0	335	0.000
HC035	JUNCTION	0.00	6135.20	0	02:26	0	339	0.000
HC036	JUNCTION	0.00	6589.05	0	02:25	0	392	0.000
HC037	JUNCTION	0.00	6589.32	0	02:25	0	393	0.000
HC103	JUNCTION	0.00	166.94	0	00:40	0	3.49	0.000
HC104	JUNCTION	0.00	194.13	0	00:42	0	4.76	0.000
HC116	JUNCTION	0.00	90.39	0	00:48	0	2.63	-0.000
HC117	JUNCTION	0.00	183.31	0	00:56	0	5.71	0.000
HC119	JUNCTION	0.00	123.81	0	01:00	0	5.31	0.000
HC122	JUNCTION	0.00	41.12	0	00:50	0	1.28	0.000
HC123	JUNCTION	0.00	72.54	0	01:02	0	3.16	0.000
HC124	JUNCTION	0.00	48.92	0	01:08	0	2.57	0.000
HC999	JUNCTION	0.00	6579.63	0	02:30	0	398	0.000
MT100	JUNCTION	0.00	218.37	0	00:42	0	5.17	0.000
MT110	JUNCTION	0.00	225.69	0	01:15	0	9.53	0.000
OH001	JUNCTION	0.00	102.29	0	00:48	0	3	0.000
OH002	JUNCTION	0.00	232.80	0	00:51	0	6.49	0.000
OH003	JUNCTION	0.00	399.02	0	00:56	0	12.5	0.000
OH004	JUNCTION	0.00	362.89	0	01:29	0	17.3	0.000
OH005	JUNCTION	0.00	400.93	0	01:12	0	19.4	0.000
OH006	JUNCTION	0.00	694.89	0	01:15	0	32	0.000
OH007	JUNCTION	0.00	840.46	0	01:13	0	38.3	0.000
OH008	JUNCTION	0.00	921.92	0	01:15	0	42	0.000
OH009	JUNCTION	0.00	1040.41	0	01:23	0	49.2	0.000
OH010	JUNCTION	0.00	1139.41	0	01:24	0	54.4	0.000
OH999	JUNCTION	0.00	1177.11	0	01:30	0	57.1	0.000
OR001	JUNCTION	0.00	134.70	0	00:48	0	3.97	0.000
OR002	JUNCTION	0.00	245.62	0	00:58	0	7.86	0.000
OR003	JUNCTION	0.00	330.24	0	01:00	0	10.4	0.000
OR999	JUNCTION	0.00	413.92	0	01:07	0	13.5	0.000
SG001	JUNCTION	0.00	11.94	0	04:03	0	3.45	0.000
SG002	JUNCTION	0.00	70.69	0	00:44	0	5.41	0.000

Existing Ridgeway Pkwy (Couplet) SWMM Report

SG003	JUNCTION	0.00	58.94	0	01:50	0	8.05	0.000
SG999	JUNCTION	0.00	119.33	0	01:23	0	12	0.000
HC-OUTFALL	OUTFALL	0.00	6579.63	0	02:30	0	398	0.000
GV004	DIVIDER	0.00	308.81	0	01:03	0	16.5	0.000
GA309	STORAGE	0.00	460.93	0	00:43	0	12.8	0.016
GA310	STORAGE	0.00	363.28	0	01:12	0	14.9	0.006
GA311	STORAGE	0.00	194.53	0	01:58	0	16.2	0.074
GA350	STORAGE	0.00	360.72	0	01:59	0	33	0.453
HC310	STORAGE	0.00	677.25	0	00:43	0	16.1	-0.001
HC320	STORAGE	0.00	1110.90	0	00:55	0	35.3	0.036
MT300	STORAGE	0.00	395.32	0	00:43	0	9.53	0.058
OH310	STORAGE	0.00	548.93	0	00:59	0	17.3	0.005
OH320	STORAGE	0.00	401.11	0	01:08	0	19.4	0.044
SG310	STORAGE	0.00	53.92	0	01:14	0	3.45	0.014
SG320	STORAGE	0.00	140.71	0	00:56	0	8.05	0.045
HC326	STORAGE	0.00	158.08	0	00:42	0	4.21	0.055
GV301	STORAGE	0.00	114.33	0	00:44	0	2.87	0.020
GV302	STORAGE	0.00	186.33	0	00:52	0	6.25	0.076
TOD_Pond	STORAGE	0.00	155.93	0	00:42	0	4.06	0.264

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Node Flooding Summary

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No nodes were flooded.

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Storage Volume Summary

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Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
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Existing Ridgeway Pkwy (Couplet) SWMM Report

GA309	5.080	1	0	0	412.453	54	0	01:13	308.56
GA310	19.181	1	0	0	885.762	50	0	02:02	187.82
GA311	86.697	15	0	0	339.651	60	0	02:02	193.99
GA350	0.710	0	0	0	36.229	3	0	02:03	359.29
HC310	3.076	0	0	0	379.456	29	0	01:05	436.18
HC320	7.247	1	0	0	630.401	62	0	01:09	1028.19
MT300	13.268	1	0	0	575.055	45	0	01:14	225.69
OH310	9.363	1	0	0	599.753	72	0	01:28	362.89
OH320	2.234	0	0	0	103.934	12	0	01:11	400.93
SG310	74.411	7	0	0	334.570	29	0	04:03	11.94
SG320	62.062	6	0	0	359.524	34	0	01:49	58.94
HC326	31.234	3	0	0	419.274	38	0	01:55	30.39
GV301	1.516	0	0	0	120.466	26	0	01:17	71.11
GV302	121.911	9	0	0	449.575	31	0	01:40	104.00
TOD_Pond	78.297	19	0	0	276.611	69	0	01:06	114.88

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 Outfall Loading Summary  
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Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
HC-OUTFALL	99.82	154.23	6579.63	397.981
System	99.82	154.23	6579.63	397.981

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 Link Flow Summary  
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## Existing Ridgeway Pkwy (Couplet) SWMM Report

Link	Type	Maximum  Flow  CFS	Time of Max Occurrence days hr:min	Maximum  Veloc  ft/sec	Max/ Full Flow	Max/ Full Depth
A100-DF	DUMMY	148.50	0 00:40			
A105-DF	DUMMY	100.98	0 00:56			
A11	CONDUIT	233.95	0 00:48	3.77	0.07	0.34
A110-DF	DUMMY	247.47	0 00:34			
A12	CONDUIT	417.65	0 00:46	4.06	0.07	0.26
A120-DF	DUMMY	299.29	0 00:36			
A125-DF	DUMMY	166.94	0 00:40			
A13	CONDUIT	435.88	0 01:09	4.43	0.08	0.35
A130	CONDUIT	163.43	0 00:45	3.33	0.03	0.18
A130-DF	DUMMY	77.45	0 00:42			
A134-DF	DUMMY	194.13	0 00:42			
A135	CONDUIT	177.34	0 00:57	2.95	0.02	0.19
A135-DF	DUMMY	146.36	0 00:46			
A14	CONDUIT	939.12	0 00:57	4.92	0.11	0.35
A140-DF	DUMMY	205.49	0 00:42			
A15	CONDUIT	1027.18	0 01:11	5.89	0.25	0.57
A150-DF	DUMMY	179.16	0 00:42			
A16	CONDUIT	1132.68	0 01:14	5.56	0.19	0.43
A160-DF	DUMMY	149.79	0 00:44			
A17	CONDUIT	1218.15	0 01:17	4.22	0.08	0.25
A170-DF	DUMMY	102.96	0 00:46			
A18	CONDUIT	1777.97	0 01:19	5.85	0.19	0.43
A180-DF	DUMMY	103.07	0 00:46			
A19	CONDUIT	1838.44	0 01:20	5.04	0.14	0.35
A190-DF	DUMMY	128.27	0 00:42			
A195-DF	DUMMY	61.92	0 00:56			
A20	CONDUIT	1943.99	0 01:23	6.64	0.27	0.51
A200-DF	DUMMY	126.22	0 00:44			
A21	CONDUIT	1996.95	0 01:27	6.93	0.29	0.52
A210-DF	DUMMY	78.30	0 00:54			
A215-DF	DUMMY	104.15	0 00:54			

## Existing Ridgeway Pkwy (Couplet) SWMM Report

A22	CONDUIT	3543.66	0	01:29	8.23	0.16	0.49
A220-DF	DUMMY	98.17	0	00:50			
A23	CONDUIT	3672.52	0	01:30	7.14	0.11	0.43
A230-DF	DUMMY	58.67	0	00:40			
A234-DF	DUMMY	90.39	0	00:48			
A235	CONDUIT	86.72	0	01:00	3.28	0.05	0.26
A235-DF	DUMMY	101.28	0	00:48			
A24	CONDUIT	3675.58	0	01:32	6.77	0.08	0.38
A240-DF	DUMMY	123.72	0	00:44			
A245-DF	DUMMY	54.50	0	00:42			
A25	CONDUIT	3822.22	0	01:35	6.48	0.06	0.26
A250-DF	DUMMY	48.07	0	00:46			
A26	CONDUIT	3846.77	0	01:39	7.30	0.09	0.29
A260-DF	DUMMY	88.62	0	00:52			
A263-DF	DUMMY	60.53	0	00:56			
A264-DF	DUMMY	64.26	0	01:04			
A265	CONDUIT	123.08	0	01:09	3.33	0.04	0.25
A265-DF	DUMMY	47.33	0	00:50			
A27	CONDUIT	4003.44	0	01:42	9.87	0.30	0.60
A270-DF	DUMMY	69.36	0	01:08			
A275-DF	DUMMY	155.93	0	00:42			
A276-DF	DUMMY	63.38	0	00:42			
A28	CONDUIT	4107.49	0	01:43	8.40	0.21	0.52
A280-DF	DUMMY	113.33	0	00:52			
A285-DF	DUMMY	41.12	0	00:50			
A29	CONDUIT	4158.27	0	01:46	7.94	0.12	0.33
A290	CONDUIT	37.87	0	01:11	2.41	0.01	0.15
A290-DF	DUMMY	113.44	0	00:54			
A295	CONDUIT	105.93	0	00:41	21.47	0.36	0.42
A30	CONDUIT	4231.57	0	01:51	7.28	0.09	0.28
A300-DF	DUMMY	169.32	0	00:44			
A304-DF	DUMMY	72.54	0	01:02			
A305	CONDUIT	70.43	0	01:15	2.81	0.02	0.20
A305-DF	DUMMY	36.49	0	00:56			
A31	CONDUIT	4335.66	0	01:55	6.06	0.06	0.26
A310-DF	DUMMY	59.87	0	00:56			



## Existing Ridgeway Pkwy (Couplet) SWMM Report

A314-DF	DUMMY	48.92	0	01:08			
A315	CONDUIT	48.86	0	01:11	5.86	0.00	0.10
A315-DF	DUMMY	43.11	0	01:04			
A32	CONDUIT	4411.35	0	01:59	6.77	0.08	0.25
A320-DF	DUMMY	51.57	0	00:52			
A325-DF	DUMMY	158.08	0	00:42			
A33	CONDUIT	5661.49	0	02:01	7.54	0.15	0.45
A330-DF	DUMMY	90.66	0	00:54			
A34	CONDUIT	5694.02	0	02:02	7.87	0.16	0.45
A340-DF	DUMMY	65.70	0	01:08			
A345-DF	DUMMY	30.09	0	00:56			
A35	CONDUIT	6019.57	0	02:04	8.67	0.19	0.46
A350-DF	DUMMY	64.75	0	00:50			
A36	CONDUIT	6025.31	0	02:08	6.34	0.08	0.35
A360-DF	DUMMY	82.02	0	01:00			
A37	CONDUIT	6052.45	0	02:12	6.82	0.09	0.34
A370-DF	DUMMY	96.13	0	00:44			
A375-DF	DUMMY	53.59	0	01:08			
A38	CONDUIT	6157.16	0	02:17	7.42	0.12	0.40
A380-DF	DUMMY	83.99	0	00:54			
A39	CONDUIT	6109.31	0	02:26	7.25	0.15	0.42
A390-DF	DUMMY	92.59	0	00:56			
A395-DF	DUMMY	63.96	0	00:40			
A40	CONDUIT	6571.55	0	02:30	7.33	0.10	0.34
A400-DF	DUMMY	185.29	0	00:42			
B100-DF	DUMMY	199.28	0	00:34			
B11	CONDUIT	186.44	0	00:44	3.58	0.04	0.23
B110-DF	DUMMY	144.63	0	00:42			
B12	CONDUIT	321.55	0	00:49	3.05	0.03	0.21
B120-DF	DUMMY	109.36	0	00:44			
B13	CONDUIT	398.15	0	00:59	3.03	0.03	0.24
B130-DF	DUMMY	69.66	0	00:52			
B134-DF	DUMMY	64.04	0	00:34			
B135	CONDUIT	62.64	0	00:39	13.16	0.00	0.04
B135-DF	DUMMY	133.52	0	00:50			
BG999-DF	DUMMY	1309.95	0	01:45			

## Existing Ridgeway Pkwy (Couplet) SWMM Report

BH999-DF	DUMMY	632.78	0	00:57			
C100-DF	DUMMY	102.29	0	00:48			
C11	CONDUIT	100.85	0	00:55	2.53	0.01	0.14
C110-DF	DUMMY	138.50	0	00:44			
C12	CONDUIT	229.18	0	00:57	4.16	0.07	0.30
C120-DF	DUMMY	71.58	0	00:48			
C125-DF	DUMMY	100.85	0	00:54			
C13	CONDUIT	393.94	0	01:02	5.07	0.11	0.37
C130-DF	DUMMY	195.93	0	00:42			
C14	CONDUIT	362.84	0	01:31	4.65	0.09	0.32
C140-DF	DUMMY	100.45	0	00:40			
C150-DF	DUMMY	49.62	0	00:54			
C153-DF	DUMMY	218.37	0	00:42			
C154	CONDUIT	217.95	0	00:43	18.98	0.00	0.07
C154-DF	DUMMY	178.02	0	00:42			
C155	CONDUIT	224.55	0	01:21	3.72	0.03	0.22
C155-DF	DUMMY	112.11	0	00:44			
C159-DF	DUMMY	178.38	0	00:42			
C15A	CONDUIT	400.42	0	01:16	4.71	0.12	0.39
C15B	CONDUIT	694.32	0	01:18	5.48	0.21	0.50
C16	CONDUIT	836.80	0	01:17	4.47	0.09	0.36
C160-DF	DUMMY	173.30	0	00:42			
C17	CONDUIT	901.07	0	01:25	5.02	0.14	0.44
C170-DF	DUMMY	99.48	0	00:52			
C175-DF	DUMMY	90.61	0	00:54			
C18	CONDUIT	1039.32	0	01:25	5.94	0.19	0.46
C180-DF	DUMMY	60.49	0	00:44			
C185-DF	DUMMY	99.02	0	00:54			
C19	CONDUIT	1130.61	0	01:30	4.65	0.10	0.39
C190-DF	DUMMY	75.81	0	00:50			
D100-DF	DUMMY	134.70	0	00:48			
D11	CONDUIT	126.77	0	01:03	3.09	0.03	0.21
D110-DF	DUMMY	129.08	0	00:48			
D12	CONDUIT	243.76	0	01:04	2.94	0.03	0.21
D120-DF	DUMMY	117.57	0	00:42			
D13	CONDUIT	323.83	0	01:09	4.80	0.12	0.40

## Existing Ridgeway Pkwy (Couplet) SWMM Report

D130-DF	DUMMY	119.46	0	00:44			
E100-DF	DUMMY	83.59	0	00:54			
E105-DF	DUMMY	56.48	0	00:48			
E11	CONDUIT	136.50	0	01:00	3.08	0.04	0.23
E110-DF	DUMMY	98.78	0	00:46			
E12	CONDUIT	224.49	0	01:02	3.74	0.06	0.28
E120-DF	DUMMY	80.21	0	00:48			
E125-DF	DUMMY	71.04	0	00:50			
E13	CONDUIT	364.66	0	01:05	4.27	0.09	0.36
E130-DF	DUMMY	95.50	0	00:46			
E135-DF	DUMMY	93.39	0	00:52			
E14	CONDUIT	532.29	0	01:08	4.74	0.14	0.42
E140-DF	DUMMY	113.20	0	00:44			
E15	CONDUIT	618.46	0	01:11	5.00	0.16	0.45
E150-DF	DUMMY	77.62	0	00:46			
E155-DF	DUMMY	98.43	0	00:58			
E16	CONDUIT	765.99	0	01:15	5.30	0.19	0.49
E160-DF	DUMMY	110.46	0	00:52			
E17	CONDUIT	850.12	0	01:18	5.46	0.21	0.51
E170-DF	DUMMY	106.03	0	00:46			
E18	CONDUIT	909.82	0	01:23	5.56	0.23	0.53
E180-DF	DUMMY	53.89	0	01:10			
E183-DF	DUMMY	89.36	0	00:58			
E184-DF	DUMMY	60.11	0	00:54			
E185	CONDUIT	144.97	0	01:09	3.52	0.04	0.27
E185-DF	DUMMY	91.86	0	00:58			
E19	CONDUIT	1164.72	0	01:25	6.01	0.28	0.58
E20	CONDUIT	1147.80	0	01:38	4.73	0.12	0.41
E200-DF	DUMMY	68.54	0	01:04			
E204-DF	DUMMY	42.80	0	00:48			
E205	CONDUIT	37.58	0	01:17	2.08	0.02	0.17
E205-DF	DUMMY	135.05	0	00:46			
E21	CONDUIT	1269.56	0	01:45	5.96	0.25	0.53
E210-DF	DUMMY	58.33	0	01:06			
F100-DF	DUMMY	114.33	0	00:44			
F11	CONDUIT	71.09	0	01:20	11.33	0.27	0.36

## Existing Ridgeway Pkwy (Couplet) SWMM Report

F110-DF	DUMMY	136.80	0	00:44			
F12	CONDUIT	103.87	0	01:44	12.80	0.08	0.19
F120-DF	DUMMY	182.47	0	00:44			
F125-DF	DUMMY	58.37	0	00:52			
F13	CONDUIT	230.88	0	01:24	3.51	0.05	0.28
F130-DF	DUMMY	93.92	0	00:52			
F14	CONDUIT	108.57	0	02:49	12.59	1.08	1.00
F140-DF	DUMMY	44.52	0	00:56			
F14-Overflow	CONDUIT	195.77	0	01:32	5.56	0.01	0.19
G10	CONDUIT	11.94	0	04:03	5.33	0.04	0.13
G100-DF	DUMMY	53.92	0	01:14			
G105-DF	DUMMY	70.26	0	00:42			
G11	CONDUIT	64.43	0	01:00	2.30	0.02	0.17
G110-DF	DUMMY	79.63	0	00:48			
G12	CONDUIT	58.89	0	01:54	11.52	0.12	0.24
G120-DF	DUMMY	106.27	0	00:50			
GA999-DF	DUMMY	768.96	0	01:07			
GV999-DF	DUMMY	327.69	0	01:29			
H100-DF	DUMMY	176.17	0	00:46			
H11	CONDUIT	175.81	0	00:49	14.76	0.40	0.44
H110-DF	DUMMY	174.94	0	00:42			
H115-DF	DUMMY	123.55	0	00:38			
H12	CONDUIT	308.51	0	01:14	17.34	0.68	0.60
H120-DF	DUMMY	68.81	0	00:48			
H13	CONDUIT	187.79	0	02:05	3.97	0.01	0.18
H130-DF	DUMMY	50.88	0	00:44			
H14	CONDUIT	193.89	0	02:09	2.47	0.02	0.20
H140-DF	DUMMY	27.43	0	00:56			
H145-DF	DUMMY	82.20	0	01:04			
H15	CONDUIT	257.55	0	01:50	2.64	0.02	0.22
H150-DF	DUMMY	123.84	0	00:44			
H16	CONDUIT	273.18	0	02:02	2.52	0.02	0.21
H160-DF	DUMMY	50.36	0	01:14			
H17	CONDUIT	307.82	0	02:05	3.61	0.06	0.26
H170-DF	DUMMY	54.20	0	00:58			
H18	CONDUIT	359.23	0	02:05	17.06	0.22	0.28

## Existing Ridgeway Pkwy (Couplet) SWMM Report

H180-DF	DUMMY	110.42	0	00:46			
H185	CONDUIT	118.40	0	00:55	14.96	0.37	0.42
H19	CONDUIT	431.87	0	01:22	4.18	0.10	0.30
H190-DF	DUMMY	228.56	0	00:36			
H20	CONDUIT	495.74	0	01:18	4.48	0.11	0.32
H200-DF	DUMMY	101.49	0	00:46			
H205	CONDUIT	136.26	0	00:41	3.42	0.01	0.17
H21	CONDUIT	640.07	0	01:11	4.70	0.15	0.38
H210-DF	DUMMY	101.91	0	00:52			
H22	CONDUIT	730.68	0	01:10	4.99	0.16	0.40
H220-DF	DUMMY	42.78	0	00:50			
HC008-DF	DUMMY	1288.41	0	01:16			
HC013-DF	DUMMY	2053.91	0	01:27			
HC025-DF	DUMMY	4430.35	0	01:59			
HC028-DF	DUMMY	5748.04	0	02:02			
HC032-DF	DUMMY	6092.71	0	02:12			
HC035-DF	DUMMY	6135.20	0	02:26			
HC036-DF	DUMMY	6589.05	0	02:25			
HC117-DF	DUMMY	183.31	0	00:56			
HC999-DF	DUMMY	6579.63	0	02:30			
OH999-DF	DUMMY	1177.11	0	01:30			
OR999-DF	DUMMY	413.92	0	01:07			
SG999-DF	DUMMY	119.33	0	01:23			
E190-DF	DUMMY	39.39	0	00:54			
GA309-OUT	DUMMY	308.56	0	01:13			
GA310-OUT	DUMMY	187.82	0	02:02			
GA311-OUT	DUMMY	193.99	0	02:03			
GA350-OUT	DUMMY	359.29	0	02:03			
GV301-OUT	DUMMY	71.11	0	01:17			
GV302-OUT	DUMMY	104.00	0	01:40			
HC310-OUT	DUMMY	436.18	0	01:05			
HC320-OUT	DUMMY	1028.19	0	01:09			
HC326-OUT	DUMMY	30.39	0	01:55			
MT300-OUT	DUMMY	225.69	0	01:15			
OH310-OUT	DUMMY	362.89	0	01:29			
OH320-OUT	DUMMY	400.93	0	01:12			

Existing Ridgeway Pkwy (Couplet) SWMM Report

SG310-OUT	DUMMY	11.94	0	04:03
SG320-OUT	DUMMY	58.94	0	01:50
TOD_Pond_Outlet	DUMMY	114.88	0	01:07

\*\*\*\*\*  
 Conduit Surcharge Summary  
 \*\*\*\*\*

Conduit	Hours Full			Hours	Hours
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
F14	2.13	2.13	2.13	2.17	2.13

Analysis begun on: Wed Jul 20 15:20:57 2022  
 Analysis ended on: Wed Jul 20 15:20:57 2022  
 Total elapsed time: < 1 sec

Proposed Couplet Development SWMM Report

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.0)

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HAPPY CANYON CREEK MDP & FHAD  
BASELINE HYDROLOGY SWMM MODEL  
xxx-YR, x-HR STORM, EXISTING/FUTURE DEVELOPMENT  
WARNING 08: elevation drop exceeds length for Conduit A320-DF  
WARNING 10: crest elevation is below downstream invert for regulator Link Pond\_21\_Outfall

\*\*\*\*\*

Analysis Options

\*\*\*\*\*

Flow Units ..... CFS  
Process Models:  
  Rainfall/Runoff ..... NO  
  RDII ..... NO  
  Snowmelt ..... NO  
  Groundwater ..... NO  
  Flow Routing ..... YES  
  Ponding Allowed ..... NO  
  Water Quality ..... NO  
Flow Routing Method ..... KINWAVE  
Starting Date ..... 01/01/2005 00:00:00  
Ending Date ..... 01/05/2005 00:00:00  
Antecedent Dry Days ..... 0.0  
Report Time Step ..... 00:05:00  
Routing Time Step ..... 30.00 sec

*****	Volume	Volume
Flow Routing Continuity	acre-feet	10 <sup>6</sup> gal
*****	-----	-----
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.000	0.000
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	1204.775	392.594

Proposed Couplet Development SWMM Report

External Outflow .....	1225.186	399.245
Flooding Loss .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Exfiltration Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.000
Final Stored Volume .....	3.185	1.038
Continuity Error (%) .....	-1.959	

\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*

Link HC036-DF (52)  
Link H22 (40)  
Link GA999-DF (40)  
Link H20 (39)  
Link H18 (39)

\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	1.00
% of Steps Not Converging	:	0.00

\*\*\*\*\*  
Node Depth Summary  
\*\*\*\*\*

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
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Proposed Couplet Development SWMM Report

A100	JUNCTION	0.00	0.00	6401.00	0	00:00	0.00
A105	JUNCTION	0.00	0.00	6401.00	0	00:00	0.00
A110	JUNCTION	0.00	0.00	6386.00	0	00:00	0.00
A120	JUNCTION	0.00	0.00	6347.00	0	00:00	0.00
A125	JUNCTION	0.00	0.00	6361.00	0	00:00	0.00
A130	JUNCTION	0.00	0.00	6319.00	0	00:00	0.00
A134	JUNCTION	0.00	0.00	6387.00	0	00:00	0.00
A135	JUNCTION	0.00	0.00	6319.00	0	00:00	0.00
A140	JUNCTION	0.00	0.00	6306.00	0	00:00	0.00
A150	JUNCTION	0.00	0.00	6281.00	0	00:00	0.00
A160	JUNCTION	0.00	0.00	6258.00	0	00:00	0.00
A170	JUNCTION	0.00	0.00	6239.00	0	00:00	0.00
A180	JUNCTION	0.00	0.00	6201.00	0	00:00	0.00
A190	JUNCTION	0.00	0.00	6190.00	0	00:00	0.00
A195	JUNCTION	0.00	0.00	6190.00	0	00:00	0.00
A200	JUNCTION	0.00	0.00	6161.00	0	00:00	0.00
A210	JUNCTION	0.00	0.00	6109.00	0	00:00	0.00
A215	JUNCTION	0.00	0.00	6095.00	0	00:00	0.00
A220	JUNCTION	0.00	0.00	6095.00	0	00:00	0.00
A230	JUNCTION	0.00	0.00	6086.00	0	00:00	0.00
A234	JUNCTION	0.00	0.00	6084.00	0	00:00	0.00
A235	JUNCTION	0.00	0.00	6069.00	0	00:00	0.00
A240	JUNCTION	0.00	0.00	6068.00	0	00:00	0.00
A245	JUNCTION	0.00	0.00	6047.00	0	00:00	0.00
A250	JUNCTION	0.00	0.00	6051.00	0	00:00	0.00
A260	JUNCTION	0.00	0.00	5991.00	0	00:00	0.00
A263	JUNCTION	0.00	0.00	6066.00	0	00:00	0.00
A264	JUNCTION	0.00	0.00	6066.00	0	00:00	0.00
A265	JUNCTION	0.00	0.00	6006.00	0	00:00	0.00
A270	JUNCTION	0.00	0.00	5966.00	0	00:00	0.00
A275	JUNCTION	0.00	0.00	5971.00	0	00:00	0.00
A276	JUNCTION	0.00	0.00	5971.00	0	00:00	0.00
A280	JUNCTION	0.00	0.00	5961.00	0	00:00	0.00
A285	JUNCTION	0.00	0.00	6016.00	0	00:00	0.00
A290	JUNCTION	0.00	0.00	5929.00	0	00:00	0.00
A295	JUNCTION	0.02	1.66	5994.66	0	00:40	1.66
A300	JUNCTION	0.00	0.00	5886.00	0	00:00	0.00

Proposed Couplet Development SWMM Report

A304	JUNCTION	0.00	0.00	5971.00	0	00:00	0.00
A305	JUNCTION	0.00	0.00	5891.00	0	00:00	0.00
A310	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A314	JUNCTION	0.00	0.00	5916.00	0	00:00	0.00
A315	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A320	JUNCTION	0.00	0.00	5870.00	0	00:00	0.00
A325	JUNCTION	0.00	0.00	5836.00	0	00:00	0.00
A330	JUNCTION	0.00	0.00	5815.00	0	00:00	0.00
A340	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
A345	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
A350	JUNCTION	0.00	0.00	5795.00	0	00:00	0.00
A360	JUNCTION	0.00	0.00	5781.00	0	00:00	0.00
A370	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
A375	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
A380	JUNCTION	0.00	0.00	5737.00	0	00:00	0.00
A390	JUNCTION	0.00	0.00	5698.00	0	00:00	0.00
A395	JUNCTION	0.00	0.00	5696.00	0	00:00	0.00
A400	JUNCTION	0.00	0.00	5668.00	0	00:00	0.00
B100	JUNCTION	0.00	0.00	6381.00	0	00:00	0.00
B110	JUNCTION	0.00	0.00	6316.00	0	00:00	0.00
B120	JUNCTION	0.00	0.00	6301.00	0	00:00	0.00
B130	JUNCTION	0.00	0.00	6239.00	0	00:00	0.00
B134	JUNCTION	0.00	0.00	6361.00	0	00:00	0.00
B135	JUNCTION	0.00	0.00	6239.00	0	00:00	0.00
BG001	JUNCTION	0.04	2.35	6277.35	0	00:52	2.35
BG002	JUNCTION	0.05	2.84	6242.84	0	00:56	2.84
BG003	JUNCTION	0.07	3.57	6198.57	0	00:59	3.57
BG004	JUNCTION	0.09	4.23	6164.23	0	01:03	4.23
BG005	JUNCTION	0.10	4.49	6129.49	0	01:06	4.48
BG006	JUNCTION	0.11	4.95	6089.95	0	01:09	4.95
BG007	JUNCTION	0.12	5.15	6050.15	0	01:14	5.15
BG008	JUNCTION	0.13	5.34	6020.34	0	01:17	5.33
BG009	JUNCTION	0.16	5.86	5980.86	0	01:22	5.85
BG010	JUNCTION	0.21	5.85	5952.85	0	01:25	5.85
BG011	JUNCTION	0.21	5.31	5890.31	0	01:37	5.30
BG109	JUNCTION	0.06	2.73	6057.73	0	00:56	2.73
BG111	JUNCTION	0.03	1.81	5948.81	0	00:48	1.81
BG999	JUNCTION	0.22	5.27	5840.27	0	01:46	5.27

Proposed Couplet Development SWMM Report

BH001	JUNCTION	0.02	2.35	6382.35	0	00:34	2.35
BH002	JUNCTION	0.03	2.27	6317.27	0	00:44	2.26
BH003	JUNCTION	0.04	2.45	6302.45	0	00:48	2.45
BH100	JUNCTION	0.00	0.38	6360.38	0	00:34	0.38
BH999	JUNCTION	0.04	2.38	6240.38	0	00:59	2.38
C100	JUNCTION	0.00	0.00	6441.00	0	00:00	0.00
C110	JUNCTION	0.00	0.00	6396.00	0	00:00	0.00
C120	JUNCTION	0.00	0.00	6351.00	0	00:00	0.00
C125	JUNCTION	0.00	0.00	6351.00	0	00:00	0.00
C130	JUNCTION	0.00	0.00	6311.00	0	00:00	0.00
C140	JUNCTION	0.00	0.00	6283.00	0	00:00	0.00
C150	JUNCTION	0.00	0.00	6246.00	0	00:00	0.00
C153	JUNCTION	0.00	0.00	6376.00	0	00:00	0.00
C154	JUNCTION	0.00	0.00	6307.00	0	00:00	0.00
C155	JUNCTION	0.00	0.00	6256.00	0	00:00	0.00
C159	JUNCTION	0.00	0.00	6246.00	0	00:00	0.00
C160	JUNCTION	0.00	0.00	6216.00	0	00:00	0.00
C170	JUNCTION	0.00	0.00	6171.00	0	00:00	0.00
C175	JUNCTION	0.00	0.00	6171.00	0	00:00	0.00
C180	JUNCTION	0.00	0.00	6150.00	0	00:00	0.00
C185	JUNCTION	0.00	0.00	6150.00	0	00:00	0.00
C190	JUNCTION	0.00	0.00	6109.00	0	00:00	0.00
D100	JUNCTION	0.00	0.00	6281.00	0	00:00	0.00
D110	JUNCTION	0.00	0.00	6221.00	0	00:00	0.00
D120	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
D130	JUNCTION	0.00	0.00	6109.00	0	00:00	0.00
E100	JUNCTION	0.00	0.00	6276.00	0	00:00	0.00
E105	JUNCTION	0.00	0.00	6276.00	0	00:00	0.00
E110	JUNCTION	0.00	0.00	6241.00	0	00:00	0.00
E120	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
E125	JUNCTION	0.00	0.00	6196.00	0	00:00	0.00
E130	JUNCTION	0.00	0.00	6161.00	0	00:00	0.00
E135	JUNCTION	0.00	0.00	6161.00	0	00:00	0.00
E140	JUNCTION	0.00	0.00	6126.00	0	00:00	0.00
E150	JUNCTION	0.00	0.00	6086.00	0	00:00	0.00
E155	JUNCTION	0.00	0.00	6086.00	0	00:00	0.00
E160	JUNCTION	0.00	0.00	6046.00	0	00:00	0.00
E170	JUNCTION	0.00	0.00	6021.00	0	00:00	0.00

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E180	JUNCTION	0.00	0.00	5981.00	0	00:00	0.00
E183	JUNCTION	0.00	0.00	6056.00	0	00:00	0.00
E184	JUNCTION	0.00	0.00	6056.00	0	00:00	0.00
E185	JUNCTION	0.00	0.00	5981.00	0	00:00	0.00
E190	JUNCTION	0.00	0.00	5953.44	0	00:00	0.00
E200	JUNCTION	0.00	0.00	5891.00	0	00:00	0.00
E204	JUNCTION	0.00	0.00	5948.00	0	00:00	0.00
E205	JUNCTION	0.00	0.00	5886.00	0	00:00	0.00
E210	JUNCTION	0.00	0.00	5836.00	0	00:00	0.00
F100	JUNCTION	0.00	0.00	6008.00	0	00:00	0.00
F110	JUNCTION	0.00	0.00	5978.00	0	00:00	0.00
F120	JUNCTION	0.00	0.00	5906.00	0	00:00	0.00
F125	JUNCTION	0.00	0.00	5906.00	0	00:00	0.00
F130	JUNCTION	0.00	0.00	5853.00	0	00:00	0.00
F140	JUNCTION	0.00	0.00	5809.00	0	00:00	0.00
G100	JUNCTION	0.00	0.00	5887.00	0	00:00	0.00
G105	JUNCTION	0.00	0.00	5885.00	0	00:00	0.00
G110	JUNCTION	0.00	0.00	5842.00	0	00:00	0.00
G120	JUNCTION	0.00	0.00	5760.00	0	00:00	0.00
GA001	JUNCTION	0.05	2.63	5952.63	0	00:46	2.62
GA002	JUNCTION	0.07	3.62	5919.62	0	01:13	3.61
GA003	JUNCTION	0.07	1.78	5894.78	0	02:02	1.78
GA004	JUNCTION	0.16	1.98	5889.98	0	02:03	1.98
GA005	JUNCTION	0.18	2.25	5866.25	0	01:38	2.25
GA006	JUNCTION	0.19	2.24	5845.24	0	01:50	2.24
GA007	JUNCTION	0.20	2.60	5794.60	0	02:00	2.60
GA008	JUNCTION	0.15	2.75	5782.75	0	02:03	2.75
GA009	JUNCTION	0.18	3.04	5775.04	0	01:20	3.04
GA010	JUNCTION	0.19	3.23	5765.23	0	01:12	3.23
GA011	JUNCTION	0.20	3.77	5739.77	0	00:56	3.77
GA012	JUNCTION	0.21	3.98	5724.98	0	01:04	3.98
GA999	JUNCTION	0.21	3.98	5710.98	0	01:10	3.98
GV001	JUNCTION	0.03	1.78	6008.78	0	01:17	1.78
GV002	JUNCTION	0.16	1.67	5974.67	0	01:40	1.67
GV003	JUNCTION	0.20	2.84	5907.84	0	00:46	2.83
GV999	JUNCTION	0.27	3.50	5811.50	0	00:43	3.50
H100	JUNCTION	0.00	0.00	5951.00	0	00:00	0.00
H110	JUNCTION	0.00	0.00	5919.00	0	00:00	0.00

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H115	JUNCTION	0.00	0.00	5919.00	0	00:00	0.00
H120	JUNCTION	0.00	0.00	5896.00	0	00:00	0.00
H130	JUNCTION	0.00	0.00	5892.00	0	00:00	0.00
H140	JUNCTION	0.00	0.00	5865.00	0	00:00	0.00
H145	JUNCTION	0.00	0.00	5865.00	0	00:00	0.00
H150	JUNCTION	0.00	0.00	5844.00	0	00:00	0.00
H160	JUNCTION	0.00	0.00	5793.00	0	00:00	0.00
H170	JUNCTION	0.00	0.00	5783.00	0	00:00	0.00
H180	JUNCTION	0.00	0.00	5783.00	0	00:00	0.00
H185	JUNCTION	0.04	2.12	5818.12	0	00:52	2.12
H190	JUNCTION	0.00	0.00	5763.00	0	00:00	0.00
H200	JUNCTION	0.00	0.00	5737.00	0	00:00	0.00
H205	JUNCTION	0.02	1.75	5738.75	0	00:40	1.75
H210	JUNCTION	0.00	0.00	5722.00	0	00:00	0.00
H220	JUNCTION	0.00	0.00	5708.00	0	00:00	0.00
HC001	JUNCTION	0.07	3.37	6403.37	0	00:44	3.37
HC002	JUNCTION	0.07	3.37	6388.37	0	00:48	3.37
HC003	JUNCTION	0.08	3.51	6343.51	0	01:05	3.51
HC004	JUNCTION	0.08	3.52	6321.52	0	00:54	3.51
HC005	JUNCTION	0.13	5.71	6305.71	0	01:09	5.71
HC006	JUNCTION	0.13	5.71	6285.71	0	01:11	5.70
HC007	JUNCTION	0.09	4.34	6261.34	0	01:14	4.33
HC008	JUNCTION	0.05	2.53	6240.53	0	01:17	2.52
HC009	JUNCTION	0.09	4.33	6241.33	0	01:14	4.32
HC010	JUNCTION	0.09	4.31	6204.31	0	01:19	4.31
HC011	JUNCTION	0.11	5.10	6194.10	0	01:20	5.10
HC012	JUNCTION	0.12	5.25	6165.25	0	01:22	5.23
HC013	JUNCTION	0.12	5.24	6113.24	0	01:27	5.23
HC014	JUNCTION	0.33	9.78	6116.78	0	01:26	9.77
HC015	JUNCTION	0.33	9.78	6103.78	0	01:29	9.78
HC016	JUNCTION	0.30	8.53	6093.53	0	01:30	8.53
HC017	JUNCTION	0.27	7.50	6074.50	0	01:32	7.49
HC018	JUNCTION	0.15	5.72	6050.72	0	01:34	5.72
HC019	JUNCTION	0.39	12.01	6012.01	0	01:38	12.00
HC020	JUNCTION	0.47	12.00	5977.00	0	01:42	11.99
HC021	JUNCTION	0.44	10.49	5965.49	0	01:43	10.48
HC022	JUNCTION	0.22	6.60	5929.60	0	01:46	6.59
HC023	JUNCTION	0.20	5.69	5890.69	0	01:51	5.69

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HC024	JUNCTION	0.19	5.11	5869.11	0	01:55	5.11
HC025	JUNCTION	0.18	5.02	5840.02	0	01:59	5.02
HC026	JUNCTION	0.45	9.07	5843.07	0	01:56	9.06
HC027	JUNCTION	0.46	9.07	5823.07	0	02:01	9.06
HC028	JUNCTION	0.41	9.06	5817.06	0	02:03	9.06
HC029	JUNCTION	0.39	9.11	5816.11	0	02:02	9.09
HC030	JUNCTION	0.40	9.10	5803.10	0	02:04	9.10
HC031	JUNCTION	0.36	7.06	5787.06	0	02:08	7.05
HC032	JUNCTION	0.31	6.79	5765.79	0	02:12	6.78
HC033	JUNCTION	0.42	8.04	5766.04	0	02:12	8.03
HC034	JUNCTION	0.43	8.53	5744.53	0	02:17	8.52
HC035	JUNCTION	0.42	8.48	5714.48	0	02:26	8.48
HC036	JUNCTION	0.00	0.00	5698.00	0	00:00	0.00
HC037	JUNCTION	0.34	6.74	5701.74	0	02:25	6.74
HC103	JUNCTION	0.02	1.85	6361.85	0	00:40	1.85
HC104	JUNCTION	0.03	1.97	6387.97	0	00:42	1.96
HC116	JUNCTION	0.04	2.70	6085.70	0	00:48	2.69
HC117	JUNCTION	0.05	2.64	6070.64	0	01:00	2.64
HC119	JUNCTION	0.06	2.51	6067.51	0	01:00	2.51
HC122	JUNCTION	0.03	1.58	6016.58	0	00:50	1.58
HC123	JUNCTION	0.05	2.02	5972.02	0	01:02	2.02
HC124	JUNCTION	0.03	0.95	5915.95	0	01:08	0.95
HC999	JUNCTION	0.34	6.73	5673.73	0	02:30	6.73
MT100	JUNCTION	0.01	0.73	6375.73	0	00:42	0.72
MT110	JUNCTION	0.06	2.21	6302.21	0	01:15	2.21
OH001	JUNCTION	0.02	1.37	6441.37	0	00:48	1.37
OH002	JUNCTION	0.05	2.98	6397.98	0	00:51	2.98
OH003	JUNCTION	0.07	3.74	6353.74	0	00:56	3.73
OH004	JUNCTION	0.08	3.21	6312.21	0	01:29	3.21
OH005	JUNCTION	0.10	3.92	6284.92	0	01:12	3.92
OH006	JUNCTION	0.15	5.05	6260.05	0	01:15	5.05
OH007	JUNCTION	0.15	5.05	6250.05	0	01:18	5.05
OH008	JUNCTION	0.14	4.49	6219.49	0	01:15	4.49
OH009	JUNCTION	0.15	4.58	6174.58	0	01:23	4.58
OH010	JUNCTION	0.14	4.58	6153.58	0	01:25	4.58
OH999	JUNCTION	0.13	3.95	6111.95	0	01:30	3.94
OR001	JUNCTION	0.03	2.15	6282.15	0	00:48	2.15
OR002	JUNCTION	0.04	2.09	6222.09	0	01:03	2.09

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OR003	JUNCTION	0.08	4.09	6199.09	0	01:00	4.09
OR999	JUNCTION	0.09	4.05	6112.05	0	01:09	4.05
SG001	JUNCTION	0.21	0.80	5885.80	0	04:03	0.80
SG002	JUNCTION	0.23	1.83	5885.83	0	00:44	1.83
SG003	JUNCTION	0.24	1.42	5840.42	0	01:50	1.42
SG999	JUNCTION	0.24	1.42	5760.42	0	01:54	1.42
HC-OUTFALL	OUTFALL	0.00	0.00	5666.00	0	00:00	0.00
GV004	DIVIDER	0.27	3.50	5855.50	0	00:39	3.50
GA309	STORAGE	0.15	8.19	5925.19	0	01:13	8.19
GA310	STORAGE	0.29	9.73	5903.73	0	02:02	9.73
GA311	STORAGE	2.57	6.34	5895.34	0	02:03	6.34
GA350	STORAGE	0.08	2.57	5783.57	0	02:03	2.57
HC310	STORAGE	0.18	13.80	6358.80	0	01:05	13.80
HC320	STORAGE	0.14	9.62	6310.62	0	01:09	9.62
MT300	STORAGE	0.33	8.25	6309.25	0	01:15	8.25
OH310	STORAGE	0.40	17.62	6327.62	0	01:29	17.62
OH320	STORAGE	0.31	10.94	6292.94	0	01:12	10.94
SG310	STORAGE	2.68	6.89	5892.89	0	04:03	6.89
SG320	STORAGE	2.18	6.61	5846.61	0	01:50	6.61
HC326	STORAGE	1.01	6.32	5844.32	0	01:55	6.32
GV301	STORAGE	0.08	4.50	6012.00	0	01:17	4.49
GV302	STORAGE	1.13	3.66	5977.16	0	01:40	3.66
Pond_21	STORAGE	3.84	8.83	5954.83	0	01:43	8.83
TOD_Pond	STORAGE	3.44	8.06	5978.06	0	01:07	8.05

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Node Inflow Summary

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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
A100	JUNCTION	148.50	148.50	0 00:40	3.28	3.28	0.000
A105	JUNCTION	100.98	100.98	0 00:56	4.08	4.08	0.000

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A110	JUNCTION	247.47	247.47	0	00:34	3.59	3.59	0.000
A120	JUNCTION	299.29	299.29	0	00:36	5.06	5.06	0.000
A125	JUNCTION	166.94	166.94	0	00:40	3.49	3.49	0.000
A130	JUNCTION	77.45	77.45	0	00:42	1.85	1.85	0.000
A134	JUNCTION	194.13	194.13	0	00:42	4.76	4.76	0.000
A135	JUNCTION	146.36	146.36	0	00:46	4.2	4.2	0.000
A140	JUNCTION	205.49	205.49	0	00:42	4.75	4.75	0.000
A150	JUNCTION	179.16	179.16	0	00:42	4.04	4.04	0.000
A160	JUNCTION	149.79	149.79	0	00:44	3.55	3.55	0.000
A170	JUNCTION	102.96	102.96	0	00:46	2.82	2.82	0.000
A180	JUNCTION	103.07	103.07	0	00:46	2.69	2.69	0.000
A190	JUNCTION	128.27	128.27	0	00:42	2.86	2.86	0.000
A195	JUNCTION	61.92	61.92	0	00:56	2.6	2.6	0.000
A200	JUNCTION	126.22	126.22	0	00:44	3.08	3.08	0.000
A210	JUNCTION	78.30	78.30	0	00:54	3.06	3.06	0.000
A215	JUNCTION	104.15	104.15	0	00:54	3.82	3.82	0.000
A220	JUNCTION	98.17	98.17	0	00:50	3.11	3.11	0.000
A230	JUNCTION	58.67	58.67	0	00:40	1	1	0.000
A234	JUNCTION	90.39	90.39	0	00:48	2.63	2.63	0.000
A235	JUNCTION	101.28	101.28	0	00:48	3.02	3.02	0.000
A240	JUNCTION	123.72	123.72	0	00:44	2.91	2.91	0.000
A245	JUNCTION	54.50	54.50	0	00:42	1.11	1.11	0.000
A250	JUNCTION	48.07	48.07	0	00:46	1.38	1.38	0.000
A260	JUNCTION	88.62	88.62	0	00:52	2.99	2.99	0.000
A263	JUNCTION	60.53	60.53	0	00:56	2.36	2.36	0.000
A264	JUNCTION	64.26	64.26	0	01:04	2.95	2.95	0.000
A265	JUNCTION	47.33	47.33	0	00:50	1.53	1.53	0.000
A270	JUNCTION	69.36	69.36	0	01:08	3.59	3.59	0.000
A275	JUNCTION	155.93	155.93	0	00:42	4.06	4.06	0.000
A276	JUNCTION	63.38	63.38	0	00:42	1.28	1.28	0.000
A280	JUNCTION	113.33	113.33	0	00:52	3.9	3.9	0.000
A285	JUNCTION	41.12	41.12	0	00:50	1.28	1.28	0.000
A290	JUNCTION	113.44	113.44	0	00:54	3.95	3.95	0.000
A295	JUNCTION	106.03	106.03	0	00:40	1.98	1.98	0.000
A300	JUNCTION	169.32	169.32	0	00:44	4.88	4.88	0.000
A304	JUNCTION	72.54	72.54	0	01:02	3.16	3.16	0.000
A305	JUNCTION	36.49	36.49	0	00:56	1.4	1.4	0.000
A310	JUNCTION	59.87	59.87	0	00:56	2.25	2.25	0.000



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A314	JUNCTION	48.92	48.92	0	01:08	2.57	2.57	0.000
A315	JUNCTION	43.11	43.11	0	01:04	2.02	2.02	0.000
A320	JUNCTION	51.57	51.57	0	00:52	1.86	1.86	0.000
A325	JUNCTION	158.08	158.08	0	00:42	4.21	4.21	0.000
A330	JUNCTION	90.66	90.66	0	00:54	3.37	3.37	0.000
A340	JUNCTION	65.70	65.70	0	01:08	3.62	3.62	0.000
A345	JUNCTION	30.09	30.09	0	00:56	1.28	1.28	0.000
A350	JUNCTION	64.75	64.75	0	00:50	2.13	2.13	0.000
A360	JUNCTION	82.02	82.02	0	01:00	3.7	3.7	0.000
A370	JUNCTION	96.13	96.13	0	00:44	2.54	2.54	0.000
A375	JUNCTION	53.59	53.59	0	01:08	2.98	2.98	0.000
A380	JUNCTION	83.99	83.99	0	00:54	2.97	2.97	0.000
A390	JUNCTION	92.59	92.59	0	00:56	3.72	3.72	0.000
A395	JUNCTION	63.96	63.96	0	00:40	1.13	1.13	0.000
A400	JUNCTION	185.29	185.29	0	00:42	5.15	5.15	0.000
B100	JUNCTION	199.28	199.28	0	00:34	3.29	3.29	0.000
B110	JUNCTION	144.63	144.63	0	00:42	3.29	3.29	0.000
B120	JUNCTION	109.36	109.36	0	00:44	2.91	2.91	0.000
B130	JUNCTION	69.66	69.66	0	00:52	2.34	2.34	0.000
B134	JUNCTION	64.04	64.04	0	00:34	1.07	1.07	0.000
B135	JUNCTION	133.52	133.52	0	00:50	4.43	4.43	0.000
BG001	JUNCTION	0.00	139.10	0	00:52	0	4.62	0.000
BG002	JUNCTION	0.00	226.38	0	00:56	0	7.23	0.000
BG003	JUNCTION	0.00	367.17	0	00:59	0	11.9	0.000
BG004	JUNCTION	0.00	535.15	0	01:03	0	17.7	0.000
BG005	JUNCTION	0.00	621.63	0	01:06	0	20.6	0.000
BG006	JUNCTION	0.00	771.93	0	01:09	0	26.6	0.000
BG007	JUNCTION	0.00	854.01	0	01:14	0	30.2	0.000
BG008	JUNCTION	0.00	918.42	0	01:17	0	33	0.000
BG009	JUNCTION	0.00	1168.27	0	01:22	0	45.7	0.000
BG010	JUNCTION	0.00	1192.60	0	01:25	0	48.5	0.000
BG011	JUNCTION	0.00	1281.77	0	01:37	0	57.8	0.000
BG109	JUNCTION	0.00	148.84	0	00:56	0	5.66	0.000
BG111	JUNCTION	0.00	42.80	0	00:48	0	1.31	0.000
BG999	JUNCTION	0.00	1304.72	0	01:46	0	61	0.000
BH001	JUNCTION	0.00	199.28	0	00:34	0	3.29	0.000
BH002	JUNCTION	0.00	330.29	0	00:43	0	6.6	0.000
BH003	JUNCTION	0.00	428.62	0	00:48	0	9.54	0.000

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BH100	JUNCTION	0.00	64.04	0	00:34	0	1.07	0.000
BH999	JUNCTION	0.00	632.78	0	00:57	0	17.5	0.000
C100	JUNCTION	102.29	102.29	0	00:48	3	3	0.000
C110	JUNCTION	138.50	138.50	0	00:44	3.47	3.47	0.000
C120	JUNCTION	71.58	71.58	0	00:48	2.28	2.28	0.000
C125	JUNCTION	100.85	100.85	0	00:54	3.7	3.7	0.000
C130	JUNCTION	195.93	195.93	0	00:42	4.72	4.72	0.000
C140	JUNCTION	100.45	100.45	0	00:40	2.11	2.11	0.000
C150	JUNCTION	49.62	49.62	0	00:54	1.81	1.81	0.000
C153	JUNCTION	218.37	218.37	0	00:42	5.17	5.17	0.000
C154	JUNCTION	178.02	178.02	0	00:42	4.36	4.36	0.000
C155	JUNCTION	112.11	112.11	0	00:44	3.08	3.08	0.000
C159	JUNCTION	178.38	178.38	0	00:42	4.41	4.41	0.000
C160	JUNCTION	173.30	173.30	0	00:42	3.74	3.74	0.000
C170	JUNCTION	99.48	99.48	0	00:52	3.64	3.64	0.000
C175	JUNCTION	90.61	90.61	0	00:54	3.29	3.29	0.000
C180	JUNCTION	60.49	60.49	0	00:44	1.54	1.54	0.000
C185	JUNCTION	99.02	99.02	0	00:54	3.64	3.64	0.000
C190	JUNCTION	75.81	75.81	0	00:50	2.55	2.55	0.000
D100	JUNCTION	134.70	134.70	0	00:48	3.97	3.97	0.000
D110	JUNCTION	129.08	129.08	0	00:48	3.78	3.78	0.000
D120	JUNCTION	117.57	117.57	0	00:42	2.46	2.46	0.000
D130	JUNCTION	119.46	119.46	0	00:44	3.06	3.06	0.000
E100	JUNCTION	83.59	83.59	0	00:54	2.99	2.99	0.000
E105	JUNCTION	56.48	56.48	0	00:48	1.63	1.63	0.000
E110	JUNCTION	98.78	98.78	0	00:46	2.56	2.56	0.000
E120	JUNCTION	80.21	80.21	0	00:48	2.4	2.4	0.000
E125	JUNCTION	71.04	71.04	0	00:50	2.27	2.27	0.000
E130	JUNCTION	95.50	95.50	0	00:46	2.55	2.55	0.000
E135	JUNCTION	93.39	93.39	0	00:52	3.14	3.14	0.000
E140	JUNCTION	113.20	113.20	0	00:44	2.81	2.81	0.000
E150	JUNCTION	77.62	77.62	0	00:46	2.05	2.05	0.000
E155	JUNCTION	98.43	98.43	0	00:58	3.92	3.92	0.000
E160	JUNCTION	110.46	110.46	0	00:52	3.49	3.49	0.000
E170	JUNCTION	106.03	106.03	0	00:46	2.82	2.82	0.000
E180	JUNCTION	53.89	53.89	0	01:10	3.14	3.14	0.000
E183	JUNCTION	89.36	89.36	0	00:58	3.56	3.56	0.000
E184	JUNCTION	60.11	60.11	0	00:54	2.1	2.1	0.000

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E185	JUNCTION	91.86	91.86	0	00:58	3.72	3.72	0.000
E190	JUNCTION	102.62	102.62	0	00:42	2.74	2.74	0.000
E200	JUNCTION	68.54	68.54	0	01:04	3.22	3.22	0.000
E204	JUNCTION	42.80	42.80	0	00:48	1.31	1.31	0.000
E205	JUNCTION	135.05	135.05	0	00:46	4.18	4.18	0.000
E210	JUNCTION	58.33	58.33	0	01:06	2.96	2.96	0.000
F100	JUNCTION	114.33	114.33	0	00:44	2.87	2.87	0.000
F110	JUNCTION	136.80	136.80	0	00:44	3.39	3.39	0.000
F120	JUNCTION	182.47	182.47	0	00:44	5.33	5.33	0.000
F125	JUNCTION	58.37	58.37	0	00:52	2.02	2.02	0.000
F130	JUNCTION	93.92	93.92	0	00:52	3.19	3.19	0.000
F140	JUNCTION	44.52	44.52	0	00:56	1.86	1.86	0.000
G100	JUNCTION	53.92	53.92	0	01:14	3.45	3.45	0.000
G105	JUNCTION	70.26	70.26	0	00:42	1.96	1.96	0.000
G110	JUNCTION	79.63	79.63	0	00:48	2.59	2.59	0.000
G120	JUNCTION	106.27	106.27	0	00:50	3.95	3.95	0.000
GA001	JUNCTION	0.00	176.17	0	00:46	0	5.84	0.000
GA002	JUNCTION	0.00	308.56	0	01:13	0	12.8	0.000
GA003	JUNCTION	0.00	187.82	0	02:02	0	14.9	0.000
GA004	JUNCTION	0.00	193.99	0	02:03	0	16	0.000
GA005	JUNCTION	0.00	260.06	0	01:38	0	21	0.000
GA006	JUNCTION	0.00	281.91	0	01:43	0	23.9	0.000
GA007	JUNCTION	0.00	308.27	0	02:00	0	27.4	0.000
GA008	JUNCTION	0.00	359.29	0	02:03	0	32.9	0.000
GA009	JUNCTION	0.00	432.03	0	01:20	0	37.2	-0.000
GA010	JUNCTION	0.00	496.85	0	01:12	0	41.5	0.000
GA011	JUNCTION	0.00	641.75	0	00:56	0	47.2	0.000
GA012	JUNCTION	0.00	731.51	0	01:04	0	50.7	0.000
GA999	JUNCTION	0.00	768.80	0	01:07	0	52.1	0.000
GV001	JUNCTION	0.00	71.11	0	01:17	0	2.87	0.000
GV002	JUNCTION	0.00	104.00	0	01:40	0	5.79	0.000
GV003	JUNCTION	0.00	237.67	0	00:46	0	13.1	0.000
GV999	JUNCTION	0.00	327.69	0	01:29	0	18.7	0.000
H100	JUNCTION	176.17	176.17	0	00:46	5.84	5.84	0.000
H110	JUNCTION	174.94	174.94	0	00:42	4.46	4.46	0.000
H115	JUNCTION	123.55	123.55	0	00:38	2.49	2.49	0.000
H120	JUNCTION	68.81	68.81	0	00:48	2.15	2.15	0.000
H130	JUNCTION	50.88	50.88	0	00:44	1.27	1.27	0.000

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H140	JUNCTION	27.43	27.43	0	00:56	1.09	1.09	0.000
H145	JUNCTION	82.20	82.20	0	01:04	3.87	3.87	0.000
H150	JUNCTION	123.84	123.84	0	00:44	2.85	2.85	0.000
H160	JUNCTION	50.36	50.36	0	01:14	3.2	3.2	0.000
H170	JUNCTION	54.20	54.20	0	00:58	2.3	2.3	0.000
H180	JUNCTION	110.42	110.42	0	00:46	3.3	3.3	0.000
H185	JUNCTION	118.49	118.49	0	00:52	4.32	4.32	0.000
H190	JUNCTION	228.56	228.56	0	00:36	4.27	4.27	0.000
H200	JUNCTION	101.49	101.49	0	00:46	2.98	2.98	0.000
H205	JUNCTION	136.56	136.56	0	00:40	2.63	2.63	0.000
H210	JUNCTION	101.91	101.91	0	00:52	3.38	3.38	0.000
H220	JUNCTION	42.78	42.78	0	00:50	1.38	1.38	0.000
HC001	JUNCTION	0.00	234.42	0	00:44	0	7.35	0.000
HC002	JUNCTION	0.00	428.19	0	00:40	0	10.9	0.000
HC003	JUNCTION	0.00	436.18	0	01:05	0	16.1	0.000
HC004	JUNCTION	0.00	940.98	0	00:54	0	30.5	0.000
HC005	JUNCTION	0.00	1028.19	0	01:09	0	35.3	0.000
HC006	JUNCTION	0.00	1141.67	0	01:09	0	39.3	0.000
HC007	JUNCTION	0.00	1227.88	0	01:13	0	42.9	0.000
HC008	JUNCTION	0.00	1288.41	0	01:16	0	45.9	0.000
HC009	JUNCTION	0.00	1789.46	0	01:14	0	63.4	0.000
HC010	JUNCTION	0.00	1840.91	0	01:18	0	66.3	0.000
HC011	JUNCTION	0.00	1948.03	0	01:20	0	71.8	0.000
HC012	JUNCTION	0.00	2002.17	0	01:22	0	75	0.000
HC013	JUNCTION	0.00	2053.91	0	01:27	0	78.2	0.000
HC014	JUNCTION	0.00	3546.14	0	01:26	0	149	0.000
HC015	JUNCTION	0.00	3674.40	0	01:28	0	156	0.000
HC016	JUNCTION	0.00	3678.23	0	01:30	0	157	0.000
HC017	JUNCTION	0.00	3826.13	0	01:31	0	165	0.000
HC018	JUNCTION	0.00	3853.26	0	01:34	0	168	-0.000
HC019	JUNCTION	0.00	4007.98	0	01:38	0	178	0.000
HC020	JUNCTION	0.00	4108.50	0	01:41	0	187	0.000
HC021	JUNCTION	0.00	4164.43	0	01:42	0	191	0.000
HC022	JUNCTION	0.00	4241.43	0	01:46	0	199	0.000
HC023	JUNCTION	0.00	4347.91	0	01:50	0	209	0.000
HC024	JUNCTION	0.00	4419.12	0	01:55	0	216	0.000
HC025	JUNCTION	0.00	4430.35	0	01:59	0	218	0.000
HC026	JUNCTION	0.00	5680.44	0	01:56	0	283	0.000

Proposed Couplet Development SWMM Report

HC027	JUNCTION	0.00	5697.90	0	02:01	0	286	0.000
HC028	JUNCTION	0.00	5750.06	0	02:02	0	291	0.000
HC029	JUNCTION	0.00	6025.20	0	02:02	0	310	0.000
HC030	JUNCTION	0.00	6039.55	0	02:04	0	312	0.000
HC031	JUNCTION	0.00	6065.80	0	02:08	0	316	0.000
HC032	JUNCTION	0.00	6094.54	0	02:12	0	321	0.000
HC033	JUNCTION	0.00	6184.33	0	02:12	0	333	0.000
HC034	JUNCTION	0.00	6180.29	0	02:17	0	337	0.000
HC035	JUNCTION	0.00	6136.65	0	02:26	0	341	0.000
HC036	JUNCTION	0.00	6590.17	0	02:25	0	393	0.000
HC037	JUNCTION	0.00	6590.44	0	02:25	0	394	0.000
HC103	JUNCTION	0.00	166.94	0	00:40	0	3.49	0.000
HC104	JUNCTION	0.00	194.13	0	00:42	0	4.76	0.000
HC116	JUNCTION	0.00	90.39	0	00:48	0	2.63	-0.000
HC117	JUNCTION	0.00	183.31	0	00:56	0	5.71	0.000
HC119	JUNCTION	0.00	123.81	0	01:00	0	5.31	0.000
HC122	JUNCTION	0.00	41.12	0	00:50	0	1.28	0.000
HC123	JUNCTION	0.00	72.54	0	01:02	0	3.16	0.000
HC124	JUNCTION	0.00	48.92	0	01:08	0	2.57	0.000
HC999	JUNCTION	0.00	6580.71	0	02:30	0	399	0.000
MT100	JUNCTION	0.00	218.37	0	00:42	0	5.17	0.000
MT110	JUNCTION	0.00	225.69	0	01:15	0	9.53	0.000
OH001	JUNCTION	0.00	102.29	0	00:48	0	3	0.000
OH002	JUNCTION	0.00	232.80	0	00:51	0	6.49	0.000
OH003	JUNCTION	0.00	399.02	0	00:56	0	12.5	0.000
OH004	JUNCTION	0.00	362.89	0	01:29	0	17.3	0.000
OH005	JUNCTION	0.00	400.93	0	01:12	0	19.4	0.000
OH006	JUNCTION	0.00	694.89	0	01:15	0	32	0.000
OH007	JUNCTION	0.00	840.46	0	01:13	0	38.3	0.000
OH008	JUNCTION	0.00	921.92	0	01:15	0	42	0.000
OH009	JUNCTION	0.00	1040.41	0	01:23	0	49.2	0.000
OH010	JUNCTION	0.00	1139.41	0	01:24	0	54.4	0.000
OH999	JUNCTION	0.00	1177.11	0	01:30	0	57.1	0.000
OR001	JUNCTION	0.00	134.70	0	00:48	0	3.97	0.000
OR002	JUNCTION	0.00	245.62	0	00:58	0	7.86	0.000
OR003	JUNCTION	0.00	330.24	0	01:00	0	10.4	0.000
OR999	JUNCTION	0.00	413.92	0	01:07	0	13.5	0.000
SG001	JUNCTION	0.00	11.94	0	04:03	0	3.45	0.000

Proposed Couplet Development SWMM Report

SG002	JUNCTION	0.00	70.69	0	00:44	0	5.41	0.000
SG003	JUNCTION	0.00	58.94	0	01:50	0	8.05	0.000
SG999	JUNCTION	0.00	119.33	0	01:23	0	12	0.000
HC-OUTFALL	OUTFALL	0.00	6580.71	0	02:30	0	399	0.000
GV004	DIVIDER	0.00	308.81	0	01:03	0	16.5	0.000
GA309	STORAGE	0.00	460.93	0	00:43	0	12.8	0.016
GA310	STORAGE	0.00	363.28	0	01:12	0	14.9	0.006
GA311	STORAGE	0.00	194.53	0	01:58	0	16.2	0.074
GA350	STORAGE	0.00	360.72	0	01:59	0	33	0.453
HC310	STORAGE	0.00	677.25	0	00:43	0	16.1	-0.001
HC320	STORAGE	0.00	1110.90	0	00:55	0	35.3	0.036
MT300	STORAGE	0.00	395.32	0	00:43	0	9.53	0.058
OH310	STORAGE	0.00	548.93	0	00:59	0	17.3	0.005
OH320	STORAGE	0.00	401.11	0	01:08	0	19.4	0.044
SG310	STORAGE	0.00	53.92	0	01:14	0	3.45	0.014
SG320	STORAGE	0.00	140.71	0	00:56	0	8.05	0.045
HC326	STORAGE	0.00	158.08	0	00:42	0	4.21	0.055
GV301	STORAGE	0.00	114.33	0	00:44	0	2.87	0.020
GV302	STORAGE	0.00	186.33	0	00:52	0	6.25	0.076
Pond_21	STORAGE	0.00	102.62	0	00:42	0	2.74	0.059
TOD_Pond	STORAGE	0.00	155.93	0	00:42	0	4.06	0.264

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Node Flooding Summary

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No nodes were flooded.

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Storage Volume Summary

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Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
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Proposed Couplet Development SWMM Report

GA309	5.080	1	0	0	412.453	54	0	01:13	308.56
GA310	19.181	1	0	0	885.762	50	0	02:02	187.82
GA311	86.697	15	0	0	339.651	60	0	02:02	193.99
GA350	0.710	0	0	0	36.229	3	0	02:03	359.29
HC310	3.076	0	0	0	379.456	29	0	01:05	436.18
HC320	7.247	1	0	0	630.401	62	0	01:09	1028.19
MT300	13.268	1	0	0	575.055	45	0	01:14	225.69
OH310	9.363	1	0	0	599.753	72	0	01:28	362.89
OH320	2.234	0	0	0	103.934	12	0	01:11	400.93
SG310	74.411	7	0	0	334.570	29	0	04:03	11.94
SG320	62.062	6	0	0	359.524	34	0	01:49	58.94
HC326	31.234	3	0	0	419.274	38	0	01:55	30.39
GV301	1.516	0	0	0	120.466	26	0	01:17	71.11
GV302	121.911	9	0	0	449.575	31	0	01:40	104.00
Pond_21	74.393	19	0	0	269.295	70	0	01:42	28.17
TOD_Pond	78.297	19	0	0	276.611	69	0	01:06	114.88

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Outfall Loading Summary

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Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10 <sup>6</sup> gal
HC-OUTFALL	99.82	154.71	6580.71	399.216
System	99.82	154.71	6580.71	399.216

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Link Flow Summary

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Proposed Couplet Development SWMM Report

Link	Type	Maximum  Flow  CFS	Time of Max Occurrence days hr:min	Maximum  Veloc  ft/sec	Max/ Full Flow	Max/ Full Depth
A100-DF	DUMMY	148.50	0 00:40			
A105-DF	DUMMY	100.98	0 00:56			
A11	CONDUIT	233.95	0 00:48	3.77	0.07	0.34
A110-DF	DUMMY	247.47	0 00:34			
A12	CONDUIT	417.65	0 00:46	4.06	0.07	0.26
A120-DF	DUMMY	299.29	0 00:36			
A125-DF	DUMMY	166.94	0 00:40			
A13	CONDUIT	435.88	0 01:09	4.43	0.08	0.35
A130	CONDUIT	163.43	0 00:45	3.33	0.03	0.18
A130-DF	DUMMY	77.45	0 00:42			
A134-DF	DUMMY	194.13	0 00:42			
A135	CONDUIT	177.34	0 00:57	2.95	0.02	0.19
A135-DF	DUMMY	146.36	0 00:46			
A14	CONDUIT	939.12	0 00:57	4.92	0.11	0.35
A140-DF	DUMMY	205.49	0 00:42			
A15	CONDUIT	1027.18	0 01:11	5.89	0.25	0.57
A150-DF	DUMMY	179.16	0 00:42			
A16	CONDUIT	1132.68	0 01:14	5.56	0.19	0.43
A160-DF	DUMMY	149.79	0 00:44			
A17	CONDUIT	1218.15	0 01:17	4.22	0.08	0.25
A170-DF	DUMMY	102.96	0 00:46			
A18	CONDUIT	1777.97	0 01:19	5.85	0.19	0.43
A180-DF	DUMMY	103.07	0 00:46			
A19	CONDUIT	1838.44	0 01:20	5.04	0.14	0.35
A190-DF	DUMMY	128.27	0 00:42			
A195-DF	DUMMY	61.92	0 00:56			
A20	CONDUIT	1943.99	0 01:23	6.64	0.27	0.51
A200-DF	DUMMY	126.22	0 00:44			
A21	CONDUIT	1996.95	0 01:27	6.93	0.29	0.52
A210-DF	DUMMY	78.30	0 00:54			
A215-DF	DUMMY	104.15	0 00:54			
A22	CONDUIT	3543.66	0 01:29	8.23	0.16	0.49
A220-DF	DUMMY	98.17	0 00:50			
A23	CONDUIT	3672.52	0 01:30	7.14	0.11	0.43



Proposed Couplet Development SWMM Report

A230-DF	DUMMY	58.67	0	00:40			
A234-DF	DUMMY	90.39	0	00:48			
A235	CONDUIT	86.72	0	01:00	3.28	0.05	0.26
A235-DF	DUMMY	101.28	0	00:48			
A24	CONDUIT	3675.58	0	01:32	6.77	0.08	0.38
A240-DF	DUMMY	123.72	0	00:44			
A245-DF	DUMMY	54.50	0	00:42			
A25	CONDUIT	3822.22	0	01:35	6.48	0.06	0.26
A250-DF	DUMMY	48.07	0	00:46			
A26	CONDUIT	3846.77	0	01:39	7.30	0.09	0.29
A260-DF	DUMMY	88.62	0	00:52			
A263-DF	DUMMY	60.53	0	00:56			
A264-DF	DUMMY	64.26	0	01:04			
A265	CONDUIT	123.08	0	01:09	3.33	0.04	0.25
A265-DF	DUMMY	47.33	0	00:50			
A27	CONDUIT	4003.44	0	01:42	9.87	0.30	0.60
A270-DF	DUMMY	69.36	0	01:08			
A275-DF	DUMMY	155.93	0	00:42			
A276-DF	DUMMY	63.38	0	00:42			
A28	CONDUIT	4107.49	0	01:43	8.40	0.21	0.52
A280-DF	DUMMY	113.33	0	00:52			
A285-DF	DUMMY	41.12	0	00:50			
A29	CONDUIT	4158.27	0	01:46	7.94	0.12	0.33
A290	CONDUIT	37.87	0	01:11	2.41	0.01	0.15
A290-DF	DUMMY	113.44	0	00:54			
A295	CONDUIT	105.93	0	00:41	21.47	0.36	0.42
A30	CONDUIT	4231.57	0	01:51	7.28	0.09	0.28
A300-DF	DUMMY	169.32	0	00:44			
A304-DF	DUMMY	72.54	0	01:02			
A305	CONDUIT	70.43	0	01:15	2.81	0.02	0.20
A305-DF	DUMMY	36.49	0	00:56			
A31	CONDUIT	4335.66	0	01:55	6.06	0.06	0.26
A310-DF	DUMMY	59.87	0	00:56			
A314-DF	DUMMY	48.92	0	01:08			
A315	CONDUIT	48.86	0	01:11	5.86	0.00	0.10
A315-DF	DUMMY	43.11	0	01:04			
A32	CONDUIT	4411.35	0	01:59	6.77	0.08	0.25
A320-DF	DUMMY	51.57	0	00:52			

Proposed Couplet Development SWMM Report

A325-DF	DUMMY	158.08	0	00:42			
A33	CONDUIT	5663.72	0	02:01	7.55	0.15	0.45
A330-DF	DUMMY	90.66	0	00:54			
A34	CONDUIT	5696.28	0	02:03	7.88	0.16	0.45
A340-DF	DUMMY	65.70	0	01:08			
A345-DF	DUMMY	30.09	0	00:56			
A35	CONDUIT	6021.47	0	02:04	8.67	0.19	0.46
A350-DF	DUMMY	64.75	0	00:50			
A36	CONDUIT	6027.27	0	02:08	6.34	0.08	0.35
A360-DF	DUMMY	82.02	0	01:00			
A37	CONDUIT	6054.28	0	02:12	6.82	0.09	0.34
A370-DF	DUMMY	96.13	0	00:44			
A375-DF	DUMMY	53.59	0	01:08			
A38	CONDUIT	6158.83	0	02:17	7.42	0.12	0.40
A380-DF	DUMMY	83.99	0	00:54			
A39	CONDUIT	6110.77	0	02:26	7.25	0.15	0.42
A390-DF	DUMMY	92.59	0	00:56			
A395-DF	DUMMY	63.96	0	00:40			
A40	CONDUIT	6572.63	0	02:30	7.33	0.10	0.34
A400-DF	DUMMY	185.29	0	00:42			
B100-DF	DUMMY	199.28	0	00:34			
B11	CONDUIT	186.44	0	00:44	3.58	0.04	0.23
B110-DF	DUMMY	144.63	0	00:42			
B12	CONDUIT	321.55	0	00:49	3.05	0.03	0.21
B120-DF	DUMMY	109.36	0	00:44			
B13	CONDUIT	398.15	0	00:59	3.03	0.03	0.24
B130-DF	DUMMY	69.66	0	00:52			
B134-DF	DUMMY	64.04	0	00:34			
B135	CONDUIT	62.64	0	00:39	13.16	0.00	0.04
B135-DF	DUMMY	133.52	0	00:50			
BG999-DF	DUMMY	1304.72	0	01:46			
BH999-DF	DUMMY	632.78	0	00:57			
C100-DF	DUMMY	102.29	0	00:48			
C11	CONDUIT	100.85	0	00:55	2.53	0.01	0.14
C110-DF	DUMMY	138.50	0	00:44			
C12	CONDUIT	229.18	0	00:57	4.16	0.07	0.30
C120-DF	DUMMY	71.58	0	00:48			
C125-DF	DUMMY	100.85	0	00:54			

Proposed Couplet Development SWMM Report

C13	CONDUIT	393.94	0	01:02	5.07	0.11	0.37
C130-DF	DUMMY	195.93	0	00:42			
C14	CONDUIT	362.84	0	01:31	4.65	0.09	0.32
C140-DF	DUMMY	100.45	0	00:40			
C150-DF	DUMMY	49.62	0	00:54			
C153-DF	DUMMY	218.37	0	00:42			
C154	CONDUIT	217.95	0	00:43	18.98	0.00	0.07
C154-DF	DUMMY	178.02	0	00:42			
C155	CONDUIT	224.55	0	01:21	3.72	0.03	0.22
C155-DF	DUMMY	112.11	0	00:44			
C159-DF	DUMMY	178.38	0	00:42			
C15A	CONDUIT	400.42	0	01:16	4.71	0.12	0.39
C15B	CONDUIT	694.32	0	01:18	5.48	0.21	0.50
C16	CONDUIT	836.80	0	01:17	4.47	0.09	0.36
C160-DF	DUMMY	173.30	0	00:42			
C17	CONDUIT	901.07	0	01:25	5.02	0.14	0.44
C170-DF	DUMMY	99.48	0	00:52			
C175-DF	DUMMY	90.61	0	00:54			
C18	CONDUIT	1039.32	0	01:25	5.94	0.19	0.46
C180-DF	DUMMY	60.49	0	00:44			
C185-DF	DUMMY	99.02	0	00:54			
C19	CONDUIT	1130.61	0	01:30	4.65	0.10	0.39
C190-DF	DUMMY	75.81	0	00:50			
D100-DF	DUMMY	134.70	0	00:48			
D11	CONDUIT	126.77	0	01:03	3.09	0.03	0.21
D110-DF	DUMMY	129.08	0	00:48			
D12	CONDUIT	243.76	0	01:04	2.94	0.03	0.21
D120-DF	DUMMY	117.57	0	00:42			
D13	CONDUIT	323.83	0	01:09	4.80	0.12	0.40
D130-DF	DUMMY	119.46	0	00:44			
E100-DF	DUMMY	83.59	0	00:54			
E105-DF	DUMMY	56.48	0	00:48			
E11	CONDUIT	136.50	0	01:00	3.08	0.04	0.23
E110-DF	DUMMY	98.78	0	00:46			
E12	CONDUIT	224.49	0	01:02	3.74	0.06	0.28
E120-DF	DUMMY	80.21	0	00:48			
E125-DF	DUMMY	71.04	0	00:50			
E13	CONDUIT	364.66	0	01:05	4.27	0.09	0.36

Proposed Couplet Development SWMM Report

E130-DF	DUMMY	95.50	0	00:46			
E135-DF	DUMMY	93.39	0	00:52			
E14	CONDUIT	532.29	0	01:08	4.74	0.14	0.42
E140-DF	DUMMY	113.20	0	00:44			
E15	CONDUIT	618.46	0	01:11	5.00	0.16	0.45
E150-DF	DUMMY	77.62	0	00:46			
E155-DF	DUMMY	98.43	0	00:58			
E16	CONDUIT	765.99	0	01:15	5.30	0.19	0.49
E160-DF	DUMMY	110.46	0	00:52			
E17	CONDUIT	850.12	0	01:18	5.46	0.21	0.51
E170-DF	DUMMY	106.03	0	00:46			
E18	CONDUIT	909.82	0	01:23	5.56	0.23	0.53
E180-DF	DUMMY	53.89	0	01:10			
E183-DF	DUMMY	89.36	0	00:58			
E184-DF	DUMMY	60.11	0	00:54			
E185	CONDUIT	144.97	0	01:09	3.52	0.04	0.27
E185-DF	DUMMY	91.86	0	00:58			
E19	CONDUIT	1164.72	0	01:25	6.01	0.28	0.58
E20	CONDUIT	1144.58	0	01:39	4.72	0.12	0.41
E200-DF	DUMMY	68.54	0	01:04			
E204-DF	DUMMY	42.80	0	00:48			
E205	CONDUIT	37.58	0	01:17	2.08	0.02	0.17
E205-DF	DUMMY	135.05	0	00:46			
E21	CONDUIT	1264.62	0	01:46	5.95	0.25	0.53
E210-DF	DUMMY	58.33	0	01:06			
F100-DF	DUMMY	114.33	0	00:44			
F11	CONDUIT	71.09	0	01:20	11.33	0.27	0.36
F110-DF	DUMMY	136.80	0	00:44			
F12	CONDUIT	103.87	0	01:44	12.80	0.08	0.19
F120-DF	DUMMY	182.47	0	00:44			
F125-DF	DUMMY	58.37	0	00:52			
F13	CONDUIT	230.88	0	01:24	3.51	0.05	0.28
F130-DF	DUMMY	93.92	0	00:52			
F14	CONDUIT	108.57	0	02:49	12.59	1.08	1.00
F140-DF	DUMMY	44.52	0	00:56			
F14-Overflow	CONDUIT	195.77	0	01:32	5.56	0.01	0.19
G10	CONDUIT	11.94	0	04:03	5.33	0.04	0.13
G100-DF	DUMMY	53.92	0	01:14			

Proposed Couplet Development SWMM Report

G105-DF	DUMMY	70.26	0	00:42			
G11	CONDUIT	64.43	0	01:00	2.30	0.02	0.17
G110-DF	DUMMY	79.63	0	00:48			
G12	CONDUIT	58.89	0	01:54	11.52	0.12	0.24
G120-DF	DUMMY	106.27	0	00:50			
GA999-DF	DUMMY	768.80	0	01:07			
GV999-DF	DUMMY	327.69	0	01:29			
H100-DF	DUMMY	176.17	0	00:46			
H11	CONDUIT	175.81	0	00:49	14.76	0.40	0.44
H110-DF	DUMMY	174.94	0	00:42			
H115-DF	DUMMY	123.55	0	00:38			
H12	CONDUIT	308.51	0	01:14	17.34	0.68	0.60
H120-DF	DUMMY	68.81	0	00:48			
H13	CONDUIT	187.79	0	02:05	3.97	0.01	0.18
H130-DF	DUMMY	50.88	0	00:44			
H14	CONDUIT	193.89	0	02:09	2.47	0.02	0.20
H140-DF	DUMMY	27.43	0	00:56			
H145-DF	DUMMY	82.20	0	01:04			
H15	CONDUIT	257.55	0	01:50	2.64	0.02	0.22
H150-DF	DUMMY	123.84	0	00:44			
H16	CONDUIT	273.18	0	02:02	2.52	0.02	0.21
H160-DF	DUMMY	50.36	0	01:14			
H17	CONDUIT	307.82	0	02:05	3.61	0.06	0.26
H170-DF	DUMMY	54.20	0	00:58			
H18	CONDUIT	359.23	0	02:05	17.06	0.22	0.28
H180-DF	DUMMY	110.42	0	00:46			
H185	CONDUIT	118.25	0	00:55	14.95	0.37	0.42
H19	CONDUIT	431.78	0	01:22	4.18	0.10	0.30
H190-DF	DUMMY	228.56	0	00:36			
H20	CONDUIT	495.66	0	01:18	4.48	0.11	0.32
H200-DF	DUMMY	101.49	0	00:46			
H205	CONDUIT	136.26	0	00:41	3.42	0.01	0.17
H21	CONDUIT	640.04	0	01:11	4.70	0.15	0.38
H210-DF	DUMMY	101.91	0	00:52			
H22	CONDUIT	730.53	0	01:10	4.99	0.16	0.40
H220-DF	DUMMY	42.78	0	00:50			
HC008-DF	DUMMY	1288.41	0	01:16			
HC013-DF	DUMMY	2053.91	0	01:27			

Proposed Couplet Development SWMM Report

HC025-DF	DUMMY	4430.35	0	01:59
HC028-DF	DUMMY	5750.06	0	02:02
HC032-DF	DUMMY	6094.54	0	02:12
HC035-DF	DUMMY	6136.65	0	02:26
HC036-DF	DUMMY	6590.17	0	02:25
HC117-DF	DUMMY	183.31	0	00:56
HC999-DF	DUMMY	6580.71	0	02:30
OH999-DF	DUMMY	1177.11	0	01:30
OR999-DF	DUMMY	413.92	0	01:07
SG999-DF	DUMMY	119.33	0	01:23
E190-DF	DUMMY	102.62	0	00:42
GA309-OUT	DUMMY	308.56	0	01:13
GA310-OUT	DUMMY	187.82	0	02:02
GA311-OUT	DUMMY	193.99	0	02:03
GA350-OUT	DUMMY	359.29	0	02:03
GV301-OUT	DUMMY	71.11	0	01:17
GV302-OUT	DUMMY	104.00	0	01:40
HC310-OUT	DUMMY	436.18	0	01:05
HC320-OUT	DUMMY	1028.19	0	01:09
HC326-OUT	DUMMY	30.39	0	01:55
MT300-OUT	DUMMY	225.69	0	01:15
OH310-OUT	DUMMY	362.89	0	01:29
OH320-OUT	DUMMY	400.93	0	01:12
SG310-OUT	DUMMY	11.94	0	04:03
SG320-OUT	DUMMY	58.94	0	01:50
TOD_Pond_Outlet	DUMMY	114.88	0	01:07
Pond_21_Outfall	DUMMY	28.17	0	01:43

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Conduit Surcharge Summary

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Conduit	----- Hours Full -----		Hours	Hours	
	Both Ends	Upstream	Dnstream	Above Full	Capacity
				Normal Flow	Limited
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Proposed Couplet Development SWMM Report

F14	2.12	2.12	2.12	2.17	2.12
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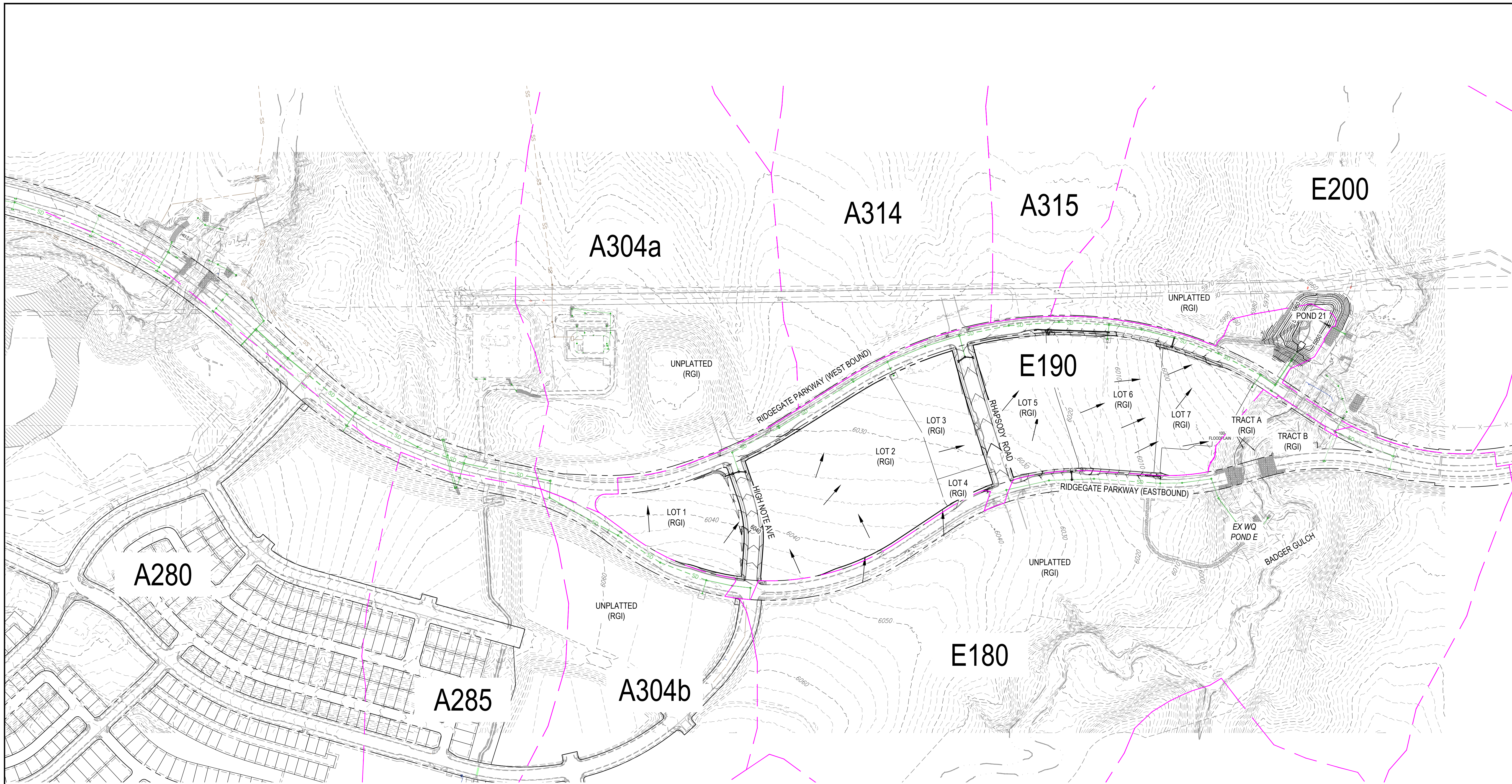
Analysis begun on: Fri Apr 7 08:50:11 2023

Analysis ended on: Fri Apr 7 08:50:12 2023

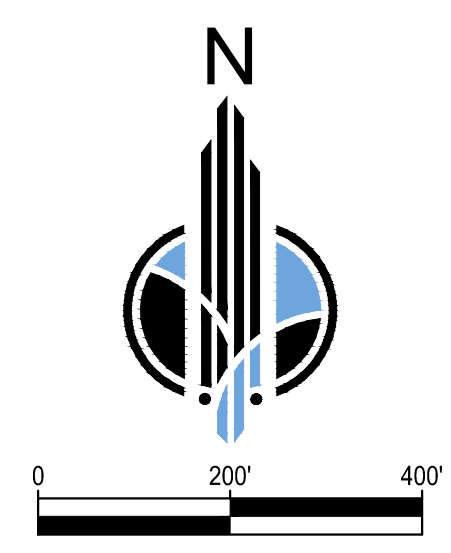
Total elapsed time: 00:00:01

## APPENDIX G – DRAINAGE MAPS



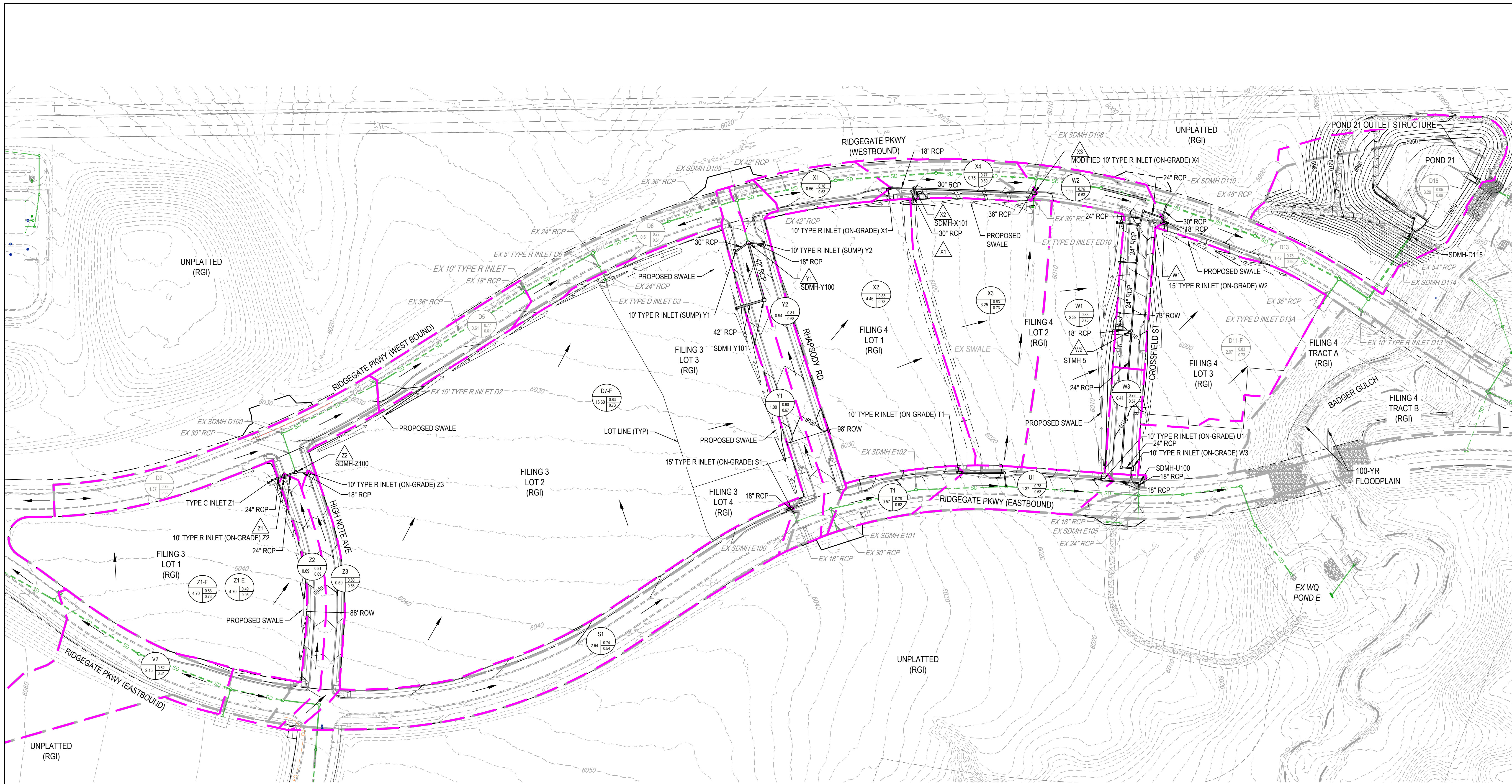


**DRAINAGE LEGEND**  
 — CUHP BASIN LIMITS  
 ← FLOW DIRECTION



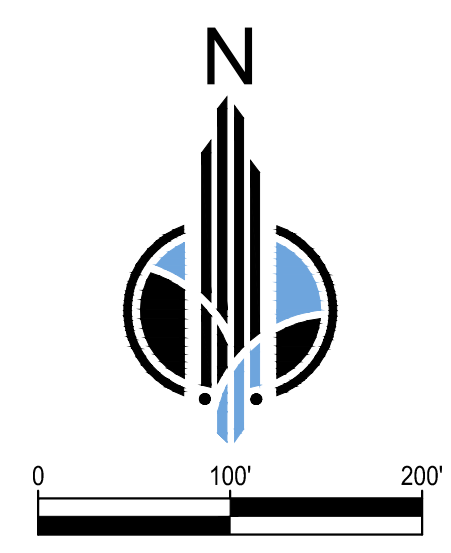
RIDGEGATE EAST FILING NO. 3  
 CUHP DRAINAGE MAP

DATE: 3/3/2023  
 SHEET: 1 OF 1



**DRAINAGE LEGEND**

- DESIGN POINT
- BASIN NAME
- 100 YEAR RUNOFF COEFFICIENT
- 5 YEAR RUNOFF COEFFICIENT
- AREA, IN ACRES
- PROPOSED BASIN LIMITS
- EXISTING BASIN LIMITS
- FLOW DIRECTION



RIDGEGATE EAST FILING NO. 3 AND 4  
DRAINAGE MAP

DATE: 9/28/2023  
SHEET: 1 OF 1