



PHASE III DRAINAGE REPORT

FOR

Canyonside Filing 1 - 3rd Amendment
City of Castle Pines, Colorado

Prepared for:

North Canyons Development Company
3033 E. 1st Avenue, Suite 725
Denver, CO 80206
Contact: Skyler Hager
Phone: 720-737-5221

Prepared by:

Terracina Design
10200 E. Girard Ave., Suite A-314
Denver, CO 80231
Contact: Boston Blake, PE
Phone: 303-632-8867

August 13, 2026

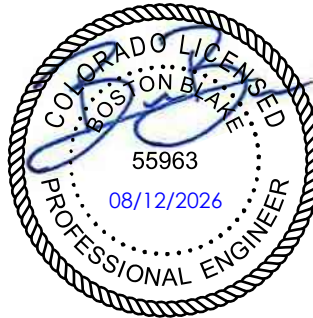
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Engineer's Statement:

I affirm that this report and plan for the Phase III drainage design of Canyonside Filing 1 - 3rd Amendment, was prepared by me (or under my direct supervision) in accordance with the provisions of the Douglas County Drainage Design and Technical Criteria for the owners thereof. I understand that the City of Castle Pines does not and will not assume liability for drainage facilities designed by others.

Boston Blake, P.E.
Colorado Professional Engineer
License #55963



Owner/Developer's Statement:

North Canyons Development Company hereby certifies that the drainage facilities for Canyonside Filing 1 - 3rd Amendment, will be constructed according to the design presented in this report. I understand that The City of Castle Pines does not and will not assume liability for the drainage facilities designed and/or certified by my engineer. The City of Castle Pines reviews drainage plans pursuant to Colorado Revised Statutes Title 30, Article 28; but cannot, on behalf of Canyonside Filing 1 - 3rd Amendment, guarantee that final drainage design review will absolve North Canyons Development Company and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

North Canyons Development Company

Skyler Hager

Printed Name

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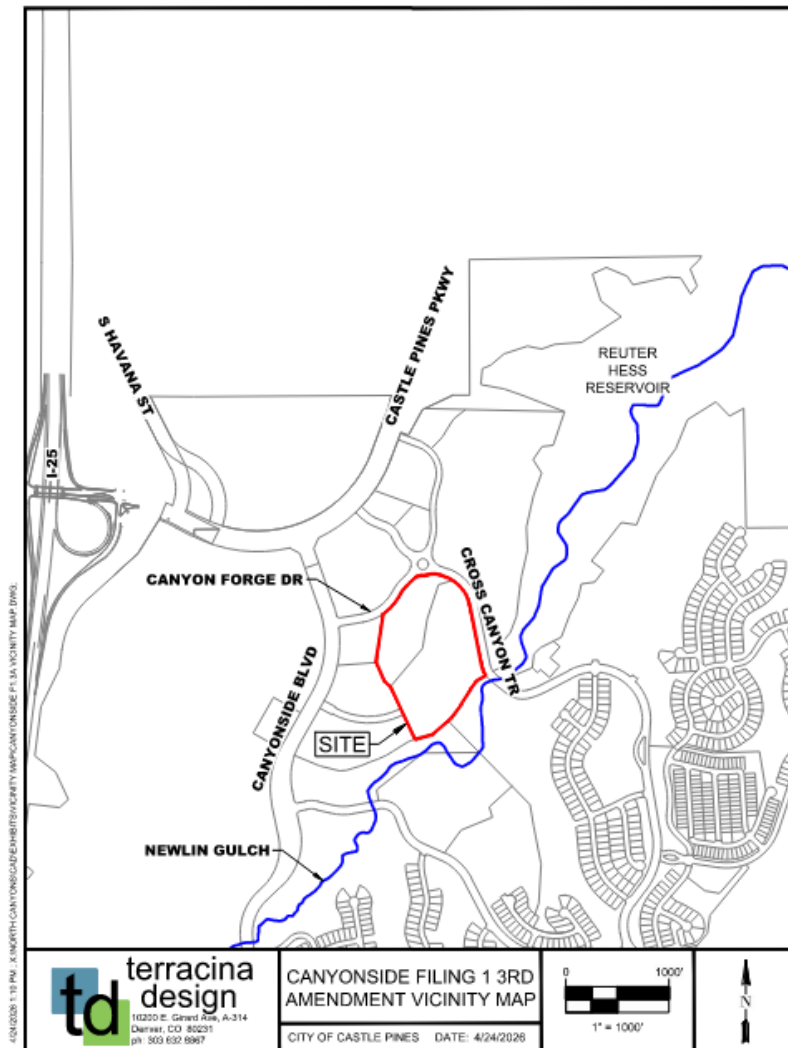
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I. GENERAL LOCATION AND DESCRIPTION

A. Site Location

This Phase III Drainage Report provides remediation for changes in the drainage patterns resulting from the construction of Canyonside Filing 1 - 3rd Amendment, from here on known as "Site". The Site is currently undeveloped and future development will include single family residential lots, open space, local residential roads, and utility infrastructure.

Canyonside Filing 1 - 3rd Amendment is bound to the north by Canyon Forge Drive, Canyonside Boulevard to the west, Cross Canyon Trail to the east, and Newlin Gulch to the south. It is located within portions of Planning Areas 3 and C within Section 2, Township 7 South, Range 67 West of the 6th Principal Meridian, City of Castle Pines, Colorado. Tract A, Canyonside Filing No.1, 2nd Amendment, together with Lot 3, Canyonside Filing No.1 was platted with the Canyonside Filing No.1 Plat, reception No, 2021054776. A vicinity map for the Site can be found in Appendix A.



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B. Description of Property

The Site is approximately 26.67 acres of undeveloped land, and according to the approved Canyons PD Amendment 5, the land use is mixed use and open space. The Site has been previously included in The Canyons, Preliminary Plan No. 1. Soils located throughout the Site are primarily, Fondis-Kutch association (Fu). This soil type is a part of the Type C hydrologic soil group. A soils map has been provided and can be found in Appendix A. A geological investigation was performed by CTL Thompson and summarized in a report named "Geological and Preliminary Geotechnical investigation – Soil Suitability Report; The Canyons PA-1, PA-2, and PA-3; Southeast of I-25 and Hess Road, Castle Pines, Colorado dated August 16, 2018 (Ref. B). This report states there were no geological hazards identified on Site.

Newlin Gulch is the major drainageway that bounds the site to the south. Newlin Gulch runs from south to north and outfalls into Reuter-Hess reservoir. No modifications or improvements to the floodplain are proposed with the development of the Site to Newlin Gulch. The Site drainage should not be impacted by any irrigation facilities.

II. DRAINAGE BASINS AND SUB-BASINS

A. Major Drainage Basins

A majority of the existing drainage patterns within the major basins will generally follow historic patterns. The development lies within Newlin Gulch Basin. Once the overland discharge from the Extended Detention Basins (EDB) reaches Newlin Gulch, the flows will be conveyed through Newlin Gulch to Reuter-Hess Reservoir then, to Cherry Creek and eventually they will become a part of the South Platte River.

Historically, the H-Basins, identified in the Canyonside Preliminary Plan No. 1 Phase II Drainage Report, dated December 18, 2020, contained approximately 26.2 acres draining to Newlin Gulch. Canyonside Filing 1, 3rd Amendment accounts for 26.67 acres which includes 0.28 acres from Basin OS1 from the Peak at Canyons Phase III Drainage Report Dated November 5, 2025. This runoff will be captured by Pond H which will be discharged through an outfall pipe to the south to Newlin Gulch. Offsite basins account for 2.86 acres which will directly sheet flow into Newlin Gulch. The studies and analysis can be found in Appendix B. Refer to Appendix G for the proposed drainage map.

Basin H01

Basin H01 is 4.13 acres comprised of open space which was a part of OS1 from The Peaks at Canyons, Phase III Drainage Report dated November 05, 2025. Runoff generated within the basin will sheet flow to Swale H01, a grass-lined swale, that conveys flows east to a Type C Inlet at Design Point H01 (Inlet-01) where flows will be fully captured. Subsurface flows will then be conveyed southeast to Design Point H02 and ultimately to Pond H.

In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed south towards Inlet-02 where it will be fully captured.

Basin H01.1

Basin H01.1 is 1.62 acres comprised of open space. Runoff generated within the basin will sheet flow to Swale H01.1, a grass-lined swale. Swale H01.1 joins Swale H01 at design point H01.1 and conveys flows south to a Type C Inlet at Design Point H01 (Inlet-01) where flows will be fully captured. Subsurface flows will then be conveyed southeast to Design Point H02 and ultimately to Pond H.

In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed south towards Inlet-02 where it will be fully captured.

Basin H02

Basin H02 is 2.91 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed east to an on-grade Type R inlet at Design Point H02 (Inlet-02). Subsurface flows will then be conveyed south to Design Point H03 and ultimately to Pond H. Bypass flows will be received by Inlet-05 at Design Point H05.

Basin H03

Basin H03 is 1.83 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed east to an on-grade Type R inlet at Design Point H03 (Inlet-03). Subsurface flows will then be conveyed east to Design Point H05 and ultimately to Pond H. Bypass flows will be received by Inlet-05 at Design Point H05.

Basin H04

Basin H04 is 0.42 acres comprised of single family lots and open space. Runoff generated within the basin will sheet flow east to Swale H04, a grass-lined swale, that conveys flows south to a Type C Inlet at Design Point H04 (Inlet-04) where flows will be fully captured. Subsurface flows will then be conveyed south to Design Point H05 and ultimately to Pond H.

Basin H05

Basin H05 is 0.19 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed east to an on-grade Type R inlet at Design Point H05 (Inlet-05). Subsurface flows will then be conveyed south to Design Point H06 and ultimately to Pond H. All flows will be captured and there will be no bypass flows.

Basin H06

Basin H06 is 0.60 acres comprised of single family lots and open space. Runoff generated within the basin will sheet flow to Swale H06, a grass-lined swale, that conveys flows south to a Type C Inlet at Design Point H06 (Inlet-06) where flows will be fully captured. Subsurface flows will then be conveyed south to Design Point H07 and ultimately to Pond H.

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Basin H07

Basin H07 is 0.71 acres comprised of single family lots and open space. Runoff generated within the basin will sheet flow to Swale H07, a grass-lined swale, that conveys flows south to a Type D Inlet at Design Point H07 (Inlet-07) where flows will be fully captured. Subsurface flows will then be conveyed south to Design Point H16 and ultimately to Pond H.

Basin H08.1

Basin H08.1 is 1.36 acres comprised of open space. Runoff generated within the basin will sheet flow southeast to U-channel H08, a 2-foot-wide concrete u-channel, that conveys flows north to a Type C Inlet at Design Point H08.1 (Inlet-10) where flows will be fully captured. Subsurface flows will then be conveyed southeast to Design Point H09 and ultimately to Pond H.

In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed south towards Inlet-11 where it will be fully captured.

Basin H08.2

Basin H08.2 is 0.13 acres comprised of open space. Runoff generated within the basin will sheet flow southeast to U-channel H08, a 2-foot-wide concrete u-channel, that conveys flows south to a Type C Inlet at Design Point H08.2 (Inlet-10) where flows will be fully captured. Subsurface flows will then be conveyed southeast to Design Point H09 and ultimately to Pond H.

In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed south towards Inlet-11 where it will be fully captured.

Basin H09

Basin H09 is 1.41 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed to a sump Type R inlet at Design Point H09 (Inlet-11) where it will be fully captured. Subsurface flows will then be conveyed southeast to Design Point H10 and ultimately to Pond H.

In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed east towards Inlet-12 and ultimately through Tract E. This overflow path will be graded to ensure positive drainage away from adjacent lots.

Basin H10

Basin H10 is 0.70 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed to a sump Type R inlet at Design Point H10 (Inlet-12) where it will be fully captured. Subsurface flows will then be conveyed southeast to Design Point H14 and ultimately to Pond H.

In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed east through Tract E and towards Inlet-14. This overflow path will be graded to ensure positive drainage away from adjacent lots.

Basin H11

Basin H11 is 0.25 acres comprised of open space which was part of Basin 39 from the Canyonside Subdivision Filing No.1, Amendment No. 1 Phase III Drainage Report, dated

June 17, 2021. Basin H11 is a buffer between Filing No. 1, Amendment No. 1 to the west and proposed single family lots to the east.

Runoff generated within the basin will sheet flow to Swale H11, a grass lined swale, that conveys flows south to a Type C Inlet at Design Point H11 (Inlet-18) where flows will be fully captured. The runoff will then be conveyed south to Design Point H12 and ultimately to Pond H.

Basin H12

Basin H12 is 0.05 acres comprised of roadways which was part of Basin 39 from the Canyonside Subdivision Filing No.1, Amendment No.1 Phase III Drainage Report, dated June 17, 2021. Runoff generated within the basin will be conveyed to an on-grade Type R inlet at Design Point H12 (Inlet-19) where it will be fully captured. Subsurface flows will then be conveyed south to Design Point H14 and ultimately to Pond H.

Basin H13

Basin H13 is 0.70 acres comprised of single family lots and roadways which a portion was part of Basin 39 from the Canyonside Subdivision Filing No.1, Amendment No.1 Phase III Drainage Report, dated June 17, 2021. Runoff generated within the basin will be conveyed to an on-grade Type R inlet at Design Point H13 (Inlet-11) where it will be captured. Bypass flows will be conveyed south to Design Point H14(Inlet-20) where flows will be fully captured. Subsurface flows will then be conveyed south to Design Point H16 and ultimately to Pond H.

Basin H14

Basin H14 is 0.17 acres comprised of roadways which a portion was part of Basin 39 from the Canyonside Subdivision Filing No.1, Amendment No.1 Phase III Drainage Report, dated June 17, 2021. Runoff generated within the basin will be conveyed to an on-grade Type R inlet at Design Point H14 (Inlet-20) where it will be fully captured. Subsurface flows will then be conveyed southeast to Design Point H14 and ultimately to Pond H.

Basin H15

Basin H15 is 0.96 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed east to an on-grade Type R inlet at Design Point H12 (Inlet-15). Subsurface flows will then be conveyed east to Design Point H11 and ultimately to Pond H. Bypass flows will be received by Inlet-14 at Design Point H14.

Basin H16

Basin H16 is 1.63 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed east to an on-grade Type R inlet at Design Point H11 (Inlet-16). Subsurface flows will then be conveyed north to Design Point H15 and ultimately to Pond H. Bypass flows will be received by Inlet-17 at Design Point H15.

Basin H17

Basin H17 is 1.04 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed south to an on-grade Type R inlet at Design Point H13 (Inlet-13). Subsurface flows will then be conveyed south to Design Point H18 and ultimately to Pond H. Bypass flows will be received by Inlet-14 at Design Point H18.

Basin H18

Basin H18 is 1.35 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed to a sump Type R inlet at Design Point H18 (Inlet-14) where it will be fully captured. Subsurface flows will then be conveyed east to Design Point H15 and ultimately to Pond H.

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In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed south towards Inlet-17 and ultimately through Tract G. This overflow path will be graded to ensure positive drainage away from adjacent lots.

Basin H19

Basin H19 is 0.45 acres comprised of single family lots and roadways. Runoff generated within the basin will be conveyed to a sump Type R inlet at Design Point H19 (Inlet-17) where it will be fully captured. Subsurface flows will then be conveyed east to Design Point H20 and ultimately to Pond H.

In the event of the inlet clogging and exceeding the inlet's maximum ponding depth, the overflow from the basin will be routed east towards Tract G. This overflow path will be graded to ensure positive drainage away from adjacent lots.

Basin H20

Basin H20 is 1.65 acres comprised of open space for proposed EDB Pond H. Runoff generated within the basin will drain east towards the outlet structure of EDB Pond H.

Pond H has been designed to store the runoff generated from the proposed basins H01 through H20. Pond H is required to store 2.17 acre-feet. The pond has been designed to store 2.45 acre-feet with a maximum depth of 8 feet.

The 100-Year storm predeveloped peak flow is 37.30 cfs, the pond outlet structure has been sized to release at 32.10 cfs. The MHFD detention basin design workbook (MHFD-Detention, Version 4.07, June 2025) was used to design EDB Pond H, and output files for EDB Pond H have been included in appendix D.

Basin OS1

Basin OS1 is 2.61 acres comprised of single family lots and open space. Runoff generated within the basin will sheet flow south through open space and ultimately to Newlin Gulch, following historic drainage patterns.

Basin OS2

Basin OS2 is 0.25 acres comprised of open space. Runoff generated within the basin will sheet flow east to the existing swale included in The Canyons Superblock Plat No.2 Phase III Drainage Report. Subsurface flows will then be conveyed south, following the existing swale, and ultimately to Newlin Gulch.

DRAINAGE DESIGN CRITERIA

C. Regulations

This Phase III Drainage Report is in accordance with the Douglas County Storm Drainage Design and Technical Criteria Manual (Ref. E), adopted by the City of Castle Pines, and the Mile High Flood District (MHFD) Storm Drainage Criteria Manual (Ref. F, G, H). These manuals were used as a basis of design for the Site. The drainage design also complies with the Cherry Creek Basin Water Quality Authority (CCBWQA) regulations (Ref. A). All EDBs have been designed in accordance with regulation 72 of CCBWQA to provide adequate WQCV for the entire Site. All applicable figures, tables, and graphs from these manuals have been included in Appendix D. The report will analyze the minor (5-year) and major (100-year) storm events.

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D. Drainage Studies, Master Plans, Site Constraints

The Site was previously analyzed in the "Phase II Drainage Report for Canyonside Preliminary Plan No. 1" by Core Consultants Engineering dated August 28, 2020 (Ref. C). This report anticipated the Site's development and planned for proposed Pond H.

A portion of the site was previously analyzed in the "Phase III Drainage Report for The Peaks at Canyons" by Terracina Design dated November 5, 2025. This report analyzed offsite flows to be released onto the existing open space for this Site.

The existing storm infrastructure, west of the site, was designed based on the "Phase III Drainage Report for Canyonside Subdivision Filing No. 1, Amendment No. 1" by Core Consultants Engineering dated June 17, 2021 (Ref. D). The aforementioned report anticipated The Site's development.

E. Hydrology

All the proposed minor drainage basins within The Project are less than 160 acres; therefore, the rational method can be used in determining the flow rates for the Site. The sub-basins were delineated based on the existing and proposed topography developed for the project. Impervious calculations were based on the values from the Mile High Flood District's Street Drainage Criteria Manual Volume 1, which can be found in Appendix B.

The intensity-frequency curves used in the rational method calculations were taken from the Douglas County Storm Drainage Design and Technical Criteria Manual (See Figure 6-2). All drainage facilities were analyzed and designed for both the minor (5-year) and major (100-year) storm events using the one-hour rainfall values from Zone 1 (See Table 6-1). Time of concentration calculations were used to determine the rainfall intensity, and these calculations can also be found in Appendix B.

F. Hydraulics

Hydraulic calculations for EDB sizing were based on MHFD design spreadsheets and can be found in Appendix D. Street and inlet capacity design were performed and based on Chapter 8 of the County's Drainage Criteria and design spreadsheets provided by the MHFD, which can be found in Appendix C. Area inlet calculations were performed using the Hydraflow Express add-on for the Civil3D program, and the results can be found in Appendix C.

Hydraulic calculations for swale capacity, swale velocity, and area inlet capacities were performed using the Hydraflow Express add-on for the Civil3D program. Hydraflow Express uses the Manning's equation to compute flow at a known depth or a depth at a known flow. All results from these calculations can be found in Appendix C.

Hydraulic grade lines and storm pipe capacities were designed and modeled using StormCAD. StormCAD uses the routed hydrograph method and the Manning's equation to compute the hydraulic grade line throughout a pipe network. See Appendix E for the StormCAD Output Tables.

G. Water Quality Enhancement

Water quality measures have been included with design of forebays for the proposed EDB and the forebay calculations can be found in Appendix D. The pond in the developed area was designed as an EDB which incorporated structures that release flows for the

water quality capture volume (WQCV), Excess Urban Runoff Volume (EURV), and the 100-year storm event.

III. STORMWATER MANAGEMENT FACILITY DESIGN

A. Stormwater Conveyance Facilities

Low Impact Development (LID) practices and strategies have been applied to the comprehensive land planning and engineering design approach to managing stormwater runoff. The primary objective of the Project is the preservation of the property's natural features by arranging the development to minimize site grading, impacts to existing vegetation and wetlands, as well as providing large open space areas. The drainage design will generally maintain the historic drainage patterns and release rates for the Site. The EDB's on Site have been located to minimize subsurface systems and control the developed discharge prior to entering the established waterways thus reducing the impact to Newlin Gulch.

Runoff will be captured by 5-foot, 10-foot, and 15-foot Type R inlets at on-grade and in sump locations, along with Type C & D inlets for area drains. The runoff will then be conveyed via a subsurface system toward the proposed EDB. The EDB will discharge less than historical rates via a pipe from the outlet structure to Newlin Gulch.

B. Stormwater Storage Facilities

The Site will utilize one proposed EDB (Pond H) for water quality and detention storage. The basin was designed as an EDB (WQCV, EURV, 100-year) and will be released at 90% or less of historic rates per the criteria. EDB and 100-year detention pond volumes were calculated using the MHFD detention basin design workbook (MHFD-Detention, Version 4.07, June 2025). A copy of the output file for the ponds has been included in Appendix D.

The proposed EDB, Pond H, includes two designed forebays that will improve the pond's water quality. Forebay Calculations can be found in Appendix D. The proposed grading and outlet structure design of EDB Pond H, that can be found in Appendix D, will support the basin delineation and discharge going into Newlin Gulch. Based on the Rational Method calculations for predevelopment conditions, the historic peak flow into Newlin Gulch from the H basins was calculated at 37.30 cfs for the 100-year storm event. Pond H and the outlet structure are now designed to release a peak flow of 32.10 cfs during the 100-year storm event. Downstream protection of the spillway shall be included in the form of a rip rap rundown to reinforce the embankment of the ponds spillway. As a result, the EDB Pond H outfall should not cause any impacts to Newlin Gulch, since the proposed conditions will detain more flow than was historically released.

The design of the EDB is compliant with the Colorado Revised Statute 37-92-602 (8) pertaining to stormwater and detention facilities. The applicable MHFD spreadsheet and calculations are in Appendix D. In addition, per the new statute, the maximum micropool volume will be no greater than 1% of the 100-year volume including water quality.

C. Water Quality Enhancement Control Measures

Water quality measures have been included in the design of the proposed EDB. The basin has been designed to incorporate a structure that releases flows for the water quality capture volume (WQCV), excess urban runoff volume (EURV), and the 100-year storm event. The design of these structures has been provided in Appendix D.

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D. Floodplain Modification

This project is not adjacent to a FEMA floodplain, see Appendix A for FEMA map 08035C0180G.

E. Additional Permitting Requirements

The drainage design of The Project adheres to the requirements of Section 404 of the Clean Water Act, Section 106 of the National Historic Preservation Act of 1966 and the Endangered Species Act. Additionally, the drainage design conforms to all applicable local, state, and federal requirements for drainage design and stormwater discharge.

IV. CONCLUSIONS

A. Compliance with Standards

The drainage design for the Site conforms to the Douglas County Storm Drainage Design and Technical Criteria Manual, the adopted criteria for The City of Castle Pines and the Mile High Flood Districts' Drainage Criteria Manual where applicable. The report outlines the required design and construction of offline extended detention basins within each sub-basin. This report conforms to the Cherry Creek Reservoir Control Regulation No. 72.

B. Variances

No variances associated with the proposed drainage design have been requested.

C. Drainage Concept

The rational method was used to determine the developed runoff values for the minor drainage basins throughout the Site. These basins were delineated based on the natural Site topography and the developed Site plan. The proposed extended detention basin was sized for a 100-yr storm and will be released below historic rates. The storm sewer system will be designed to capture the minor (5-year) and major (100-year) storm events.

V. REFERENCES

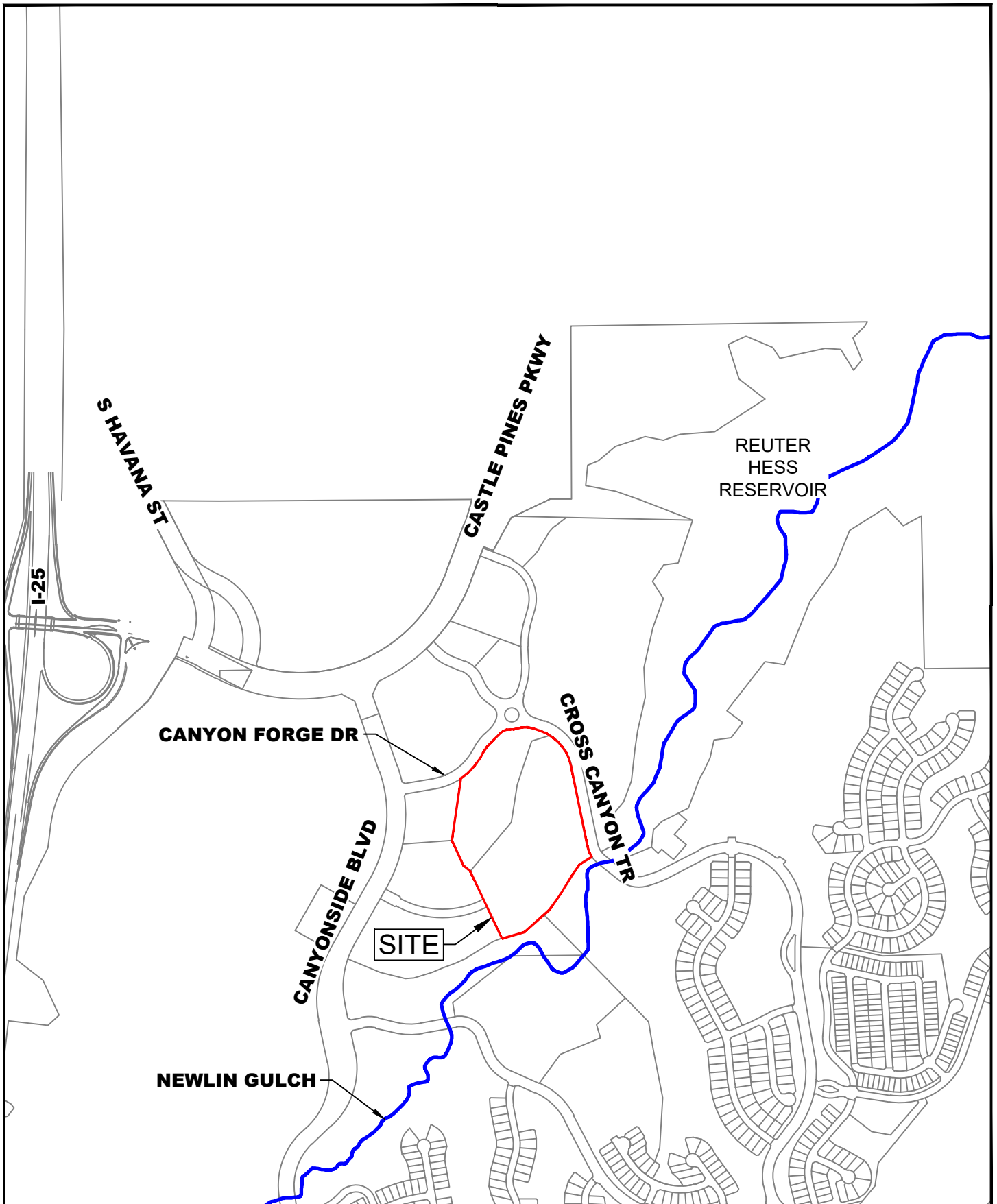
- A) Cherry Creek Basin Water Quality Authority. 2022. Regulation No. 72 – Cherry Creek Reservoir Control Regulation. Revised June 2022.
- B) CTL Thompson. August 16, 2018. "Geologic and Preliminary Geotechnical Investigation – Soil Suitability Report; The Canyons PA-1, PA-2, and PA-3; Southeast of I-25 and Hess Road, Castle Pines, Colorado". Project No. DN49,582-115-R1.
- C) Core Consultants. August 28, 2020. "Phase II Drainage Report for Canyonside Preliminary Plan No. 1, Castle Pines, Colorado." Case No. PP20-XXX.
- D) Core Consultants. June 7, 2021. "Phase III Drainage Report for Canyonside Subdivision Filing No. 1, Amendment No. 1, Castle Pines, Colorado." Case No. SIP-005-2020.
- E) Douglas County. July 2008. Storm Drainage Design and Technical Criteria Manual for Douglas County, Colorado. Department of Public Works.
- F) MHFD (Mile High Flood District). 2024. Urban Storm Drainage Criteria Manual. Volume 1: Management, Hydrology and Hydraulics. Revised March 2024. <https://www.mhfd.org/criteria-manual>.
- G) MHFD. 2017. Urban Storm Drainage Criteria Manual. Volume 2: Structures, Storage and Recreation. Revised September 2017. <https://www.mhfd.org/criteria-manual>.
- H) MHFD. 2024 Urban Storm Drainage Criteria Manual. Volume 3: Stormwater Best Management Practices. Revised March 2024. <https://www.mhfd.org/criteria-manual>.
- I) Terracina Design. November 5, 2025. "Phase III Drainage Report for The Peaks at Canyons, Castle Pines, Colorado." Case No. SIP-2025-002
- J) Computer Programs:
 - Detention Basin Design Workbook by MHFD, V.4.07, June 2025.
 - Street and Inlet Hydraulics Workbook by MHFD, V.6.00, August 2025.
 - Stormwater Control Measure Design Workbook by MHFD, V.4.02 June 2025.
 - AutoCAD Civil3D Hydraflow Express Extension by Autodesk Inc. April 2010.
 - OpenFlows StormCAD CONNECT Edition 4 by Bentley Systems. February 2023.

APPENDIX A

GENERAL MAPS

Vicinity Map
Soil Map
Firm Map

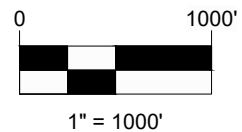
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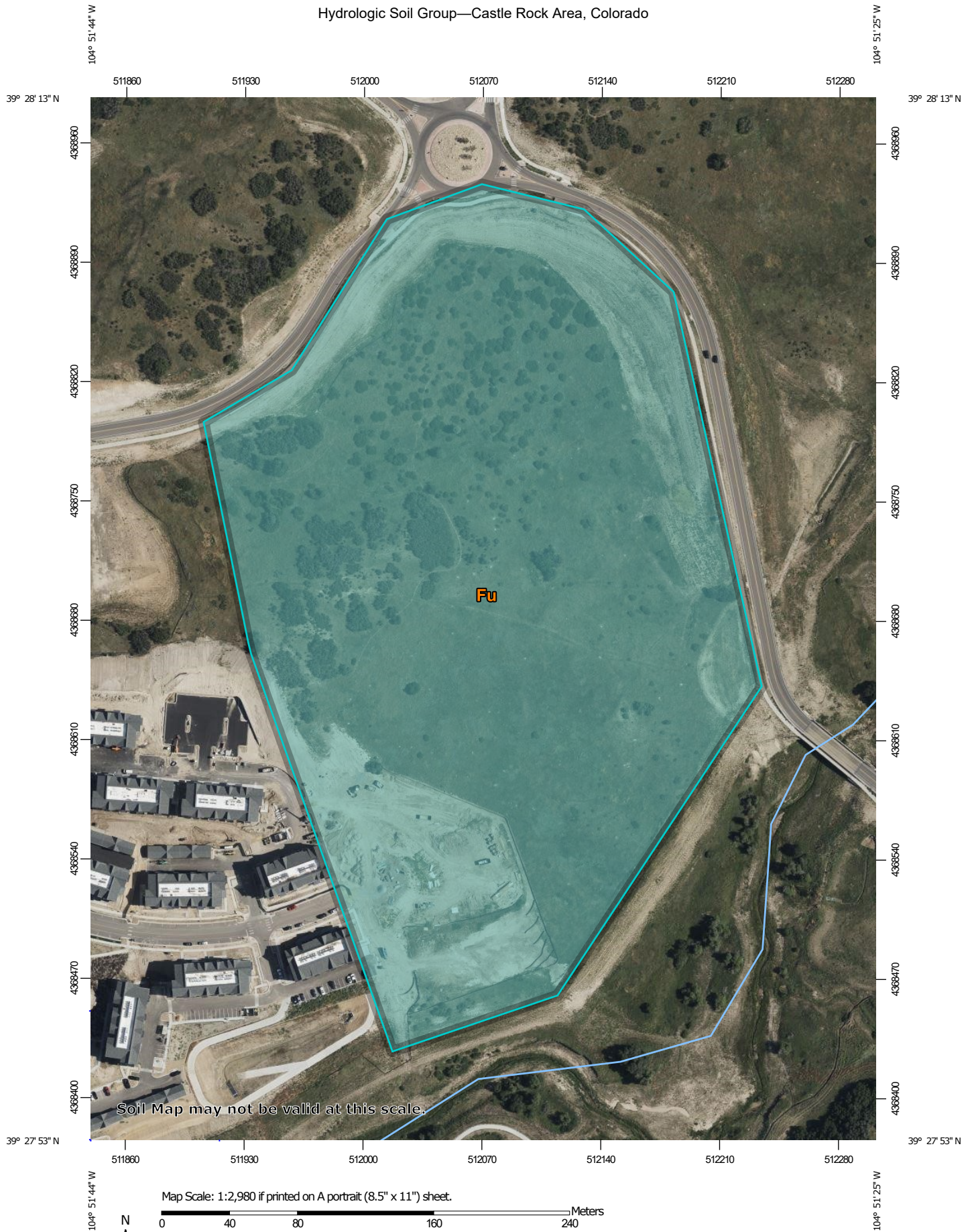
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design**
10200 E. Girard Ave, A-314
Denver, CO 80231
ph: 303.632.8867

CANYONSIDE FILING 1 3RD AMENDMENT VICINITY MAP

CITY OF CASTLE PINES DATE: 4/24/2026



Hydrologic Soil Group—Castle Rock Area, Colorado



Soil Map may not be valid at this scale.

Map Scale: 1:2,980 if printed on A portrait (8.5" x 11") sheet.



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



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

4/13/2026
Page 1 of 4

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 18, Aug 29, 2025

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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
Fu	Fondis-Kutch association	C	27.3	100.0%
Totals for Area of Interest			27.3	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified



Tie-break Rule: Higher



APPENDIX B

HYDROLOGIC COMPUTATIONS

Percent Imperviousness
Runoff Coefficient
Time of Concentration
Minor Storm Rational Method
Major Storm Rational Method

Project Name: Canyonside Filing 1, 3rd Amendment

Prepared By: JV



Percent Impervious Calculations

Basin Id	Design Point	Basin Area (Ac)	Historic	Paved Street,	Single Family Lot Area	Disturbed Soil Area	EDBs Area	Weighted % Impervious
			Flow Area	Roof, Drives, Walks Area				
			5%	95%	65%	20%	25%	
H01	H01	4.40	3.31			1.09		8.7%
H01.1	H01.1	1.62	0.62			1.01		14.3%
H02	H02	2.91	0.29	0.49	2.09	0.05		63.4%
H03	H03	1.83	0.13	0.45	1.25			68.1%
H04	H04	0.42	0.10		0.16	0.17		33.4%
H05	H05	0.19	0.03	0.11	0.05			71.4%
H06	H06	0.60	0.00		0.32	0.28		43.8%
H07	H07	0.71	0.00		0.36	0.35		42.9%
H08.1	H08.1	1.36	1.09			0.27		7.9%
H08.2	H08.2	0.13	0.04			0.09		15.0%
H09	H09	1.41	0.19	0.22	0.92	0.08		58.8%
H10	H10	0.70	0.07	0.22	0.39	0.02		67.0%
H11	H11	0.25				0.25		20.0%
H12	H12	0.05	0.02	0.03				57.9%
H13	H13	0.70	0.04	0.08	0.58			65.3%
H14	H14	0.17	0.05	0.12				69.2%
H15	H15	0.96	0.07	0.26	0.63			68.5%
H16	H16	0.88	0.07	0.19	0.62			67.1%
H17	H17	1.04	0.04	0.13	0.87			66.6%
H18	H18	1.35	0.03	0.10	1.10	0.11		62.0%
H19	H19	0.45	0.07	0.24	0.14			71.0%
H20	H20	1.65			0.11	0.77	0.78	25.3%
OS1	OS1	2.61			0.85	1.75		34.7%
OS2	OS2	0.25				0.25		20.0%

Project Name: Canyonside Filing 1, 3rd Amendment
Prepared By: JV

Runoff Coefficient (C)

Runoff Coefficient calculations based on MHFD Volume 1: Chapter 6, Table 6-4 equations

Basin Id	Weighted % Impervious	i	Soil Type	Soil Type Area	Basin Area (Ac)	Runoff Coefficients, C		Weighted	
						5-Year	100-Year	5-Year	100-Year
H01	8.7%	0.09	A	0.00	4.40	0.04	0.18	0.11	0.52
			B	0.00		0.06	0.47		
			C/D	4.40		0.11	0.52		
H01.1	14.3%	0.14	A	0.00	1.62	0.07	0.22	0.15	0.54
			B	0.00		0.10	0.49		
			C/D	1.62		0.15	0.54		
H02	63.4%	0.63	A	0.00	2.91	0.48	0.60	0.55	0.74
			B	0.00		0.52	0.72		
			C/D	2.91		0.55	0.74		
H03	68.1%	0.68	A	0.00	1.83	0.53	0.64	0.59	0.76
			B	0.00		0.56	0.74		
			C/D	1.83		0.59	0.76		
H04	33.4%	0.33	A	0.00	0.42	0.21	0.37	0.31	0.62
			B	0.00		0.26	0.58		
			C/D	0.42		0.31	0.62		
H05	71.4%	0.71	A	0.00	0.19	0.56	0.67	0.62	0.78
			B	0.00		0.59	0.76		
			C/D	0.19		0.62	0.78		
H06	43.8%	0.44	A	0.00	0.60	0.30	0.45	0.39	0.66
			B	0.00		0.35	0.63		
			C/D	0.60		0.39	0.66		
H07	42.9%	0.43	A	0.00	0.71	0.29	0.44	0.38	0.66
			B	0.00		0.34	0.63		
			C/D	0.71		0.38	0.66		
H08.1	7.9%	0.08	A	0.00	1.36	0.03	0.17	0.10	0.52
			B	0.00		0.05	0.46		
			C/D	1.36		0.10	0.52		
H08.2	15.0%	0.15	A	0.00	0.13	0.08	0.23	0.16	0.55
			B	0.00		0.11	0.50		
			C/D	0.13		0.16	0.55		
H09	58.8%	0.59	A	0.00	1.41	0.44	0.57	0.51	0.72
			B	0.00		0.48	0.70		
			C/D	1.41		0.51	0.72		
H10	67.0%	0.67	A	0.00	0.70	0.52	0.63	0.58	0.76
			B	0.00		0.55	0.74		
			C/D	0.70		0.58	0.76		
H11	20.0%	0.20	A	0.00	0.25	0.11	0.27	0.20	0.57
			B	0.00		0.15	0.52		
			C/D	0.25		0.20	0.57		
H12	57.9%	0.58	A	0.00	0.05	0.43	0.56	0.51	0.72
			B	0.00		0.47	0.70		
			C/D	0.05		0.51	0.72		
H13	65.3%	0.65	A	0.00	0.70	0.50	0.62	0.57	0.75
			B	0.00		0.54	0.73		
			C/D	0.70		0.57	0.75		
H14	69.2%	0.69	A	0.00	0.17	0.54	0.65	0.60	0.77
			B	0.00		0.57	0.75		
			C/D	0.17		0.60	0.77		
H15	68.5%	0.69	A	0.00	0.96	0.53	0.64	0.59	0.76
			B	0.00		0.57	0.74		
			C/D	0.96		0.59	0.76		
H16	67.1%	0.67	A	0.00	0.88	0.52	0.63	0.58	0.76
			B	0.00		0.56	0.74		
			C/D	0.88		0.58	0.76		
H17	66.6%	0.67	A	0.00	1.04	0.51	0.63	0.58	0.76
			B	0.00		0.55	0.74		
			C/D	1.04		0.58	0.76		
H18	62.0%	0.62	A	0.00	1.35	0.47	0.59	0.54	0.74
			B	0.00		0.51	0.71		
			C/D	1.35		0.54	0.74		
H19	71.0%	0.71	A	0.00	0.45	0.56	0.66	0.61	0.77
			B	0.00		0.59	0.76		
			C/D	0.45		0.61	0.77		
H20	25.3%	0.25	A	0.00	1.65	0.15	0.31	0.24	0.59
			B	0.00		0.19	0.54		
			C/D	1.65		0.24	0.59		
OS1	34.7%	0.35	A	0.00	2.61	0.22	0.38	0.32	0.63
			B	0.00		0.27	0.59		
			C/D	2.61		0.32	0.63		
OS2	20.0%	0.20	A	0.00	0.25	0.11	0.27	0.20	0.57
			B	0.00		0.15	0.52		
			C/D	0.25		0.20	0.57		

Project Name: Canyonside Filing 1, 3rd Amendment
Prepared By: JV



Time of Concentration Calculations (T_c)

Sub-Basin Data			Initial or Overland Flow Time				Channelized Flow Time				T _c Check (Urbanized Basins)					
Basin Id	Basin Area (Ac)	C(5)	Length (ft)	Elev Change	Slope (%)	T _i (min)	Length (ft)	Elev Change	Slope (%)	NRCS Coeff. K	Velocity (FPS)	T _t (min)	Comp. T _c	Percent Imperv.	MHFD Eq. 6.5	Final T _c (min)
H01	4.40	0.11	300	35	11.7	13.81	481	31	6.5	15.0	3.81	2.1	15.9	8.7%	27.6	15.9
H01.1	1.62	0.15	18	5	26.3	2.47	309	2	0.7	15.0	1.21	4.3	6.7	14.3%	29.4	6.7
H02	2.91	0.55	116	6	5.3	6.15	466	17	3.6	20.0	3.82	2.0	8.2	63.4%	17.5	8.2
H03	1.83	0.59	36	1	2.3	4.21	400	17	4.2	20.0	4.10	1.6	5.8	68.1%	16.2	5.8
H04	0.42	0.31	29	5	16.3	3.07	184	16	8.5	15.0	4.37	0.7	3.8	33.4%	21.1	5.0
H05	0.19	0.62	48	2	3.3	4.07	70	2	3.1	20.0	3.54	0.3	4.4	71.4%	14.2	5.0
H06	0.60	0.39	136	13	9.7	7.04	91	10	11.1	15.0	5.00	0.3	7.3	43.8%	18.8	7.3
H07	0.71	0.38	92	25	27.5	4.15	124	3	2.2	15.0	2.24	0.9	5.1	42.9%	19.6	5.1
H08.1	1.36	0.10	300	45	15.1	12.76	63	4	6.0	20.0	4.91	0.2	13.0	7.9%	25.1	13.0
H08.2	0.13	0.16	100	15	14.5	7.04	72	18	25.7	20.0	10.14	0.1	7.2	15.0%	23.7	7.2
H09	1.41	0.51	116	6	5.3	6.57	232	7	2.8	20.0	3.35	1.2	7.7	58.8%	17.4	7.7
H10	0.70	0.58	29	1	2.3	3.83	237	2	0.9	20.0	1.91	2.1	5.9	67.0%	16.9	5.9
H11	0.25	0.20	35	8	21.6	3.50	242	11	4.7	15.0	3.25	1.2	4.7	20.0%	24.2	5.0
H12	0.05	0.51	19	1	5.2	2.72	57	1	1.5	20.0	2.46	0.4	3.1	57.9%	16.6	5.0
H13	0.70	0.57	120	6	4.7	6.32	163	5	3.3	20.0	3.63	0.7	7.1	65.3%	15.7	7.1
H14	0.17	0.60	18	1	5.2	2.22	123	2	1.4	20.0	2.36	0.9	3.1	69.2%	15.2	5.0
H15	0.96	0.59	21	1	6.5	2.26	508	17	3.4	20.0	3.67	2.3	4.6	68.5%	16.8	5.0
H16	0.88	0.58	14	0	3.0	2.44	389	11	2.8	20.0	3.34	1.9	4.4	67.1%	16.7	5.0
H17	1.04	0.58	174	12	6.9	6.59	281	3	1.1	20.0	2.11	2.2	8.8	66.6%	17.1	8.8
H18	1.35	0.54	159	16	10.4	5.89	216	3	1.2	20.0	2.18	1.7	7.5	62.0%	17.3	7.5
H19	0.45	0.61	24	1	2.7	3.09	366	4	1.0	20.0	2.02	3.0	6.1	71.0%	17.1	6.1
H20	1.65	0.24	88	10	11.8	6.44	237	25	10.5	20.0	6.48	0.6	7.1	25.3%	22.7	7.1
OS1	2.61	0.32	74	10	13.4	5.15	82	20	24.4	10.0	4.94	0.3	5.4	34.7%	20.3	5.4
OS2	0.25	0.20	22	4	19.3	2.88	145	3	2.3	10.0	1.53	1.6	4.5	20.0%	23.9	5.0

Project Name: Canyonside Filing 1, 3rd Amendment

Prepared By: JV

Peak Runoff Rational Method (5-Year)

Rainfall Depth-Duration-Frequency (1-hr) =							1.43
Design Point	Basin ID	Basin Area (Ac)	Runoff Coeff (5-Year)	T_c (min)	C X A	I (in/hr)	Q (cfs)
H01	H01	4.40	0.11	15.9	0.47	3.16	1.47
H01.1	H01.1	1.62	0.15	6.7	0.25	4.45	1.10
H02	H02	2.91	0.55	8.2	1.61	4.17	6.70
H03	H03	1.83	0.59	5.8	1.08	4.65	5.02
H04	H04	0.42	0.31	5.0	0.13	4.85	0.63
H05	H05	0.19	0.62	5.0	0.12	4.85	0.57
H06	H06	0.60	0.39	7.3	0.24	4.33	1.02
H07	H07	0.71	0.38	5.1	0.27	4.83	1.31
H08.1	H08.1	1.36	0.10	13.0	0.14	3.47	0.47
H08.2	H08.2	0.13	0.16	7.2	0.02	4.36	0.09
H09	H09	1.41	0.51	7.7	0.72	4.25	3.08
H10	H10	0.70	0.58	5.9	0.41	4.63	1.90
H11	H11	0.25	0.20	5.0	0.05	4.85	0.24
H12	H12	0.05	0.51	5.0	0.03	4.85	0.13
H13	H13	0.70	0.57	7.1	0.40	4.38	1.74
H14	H14	0.17	0.60	5.0	0.10	4.85	0.51
H15	H15	0.96	0.59	5.0	0.57	4.85	2.77
H16	H16	0.88	0.58	5.0	0.51	4.85	2.47
H17	H17	1.04	0.58	8.8	0.60	4.06	2.44
H18	H18	1.35	0.54	7.5	0.73	4.29	3.12
H19	H19	0.45	0.61	6.1	0.28	4.59	1.27
H20	H20	1.65	0.24	7.1	0.40	4.38	1.75
OS1	OS1	2.61	0.32	5.4	0.83	4.74	3.94
OS2	OS2	0.25	0.20	5.0	0.05	4.85	0.24

Project Name: Canyonside Filing 1, 3rd Amendment

Prepared By: JV

Peak Runoff Rational Method (100-Year)

Rainfall Depth-Duration-Frequency (1-hr) =							2.60
Design Point	Basin ID	Basin Area (Ac)	Runoff Coeff (100-Year)	T_c (min)	C X A	I (in/hr)	Q (cfs)
H01	H01	4.40	0.52	15.9	2.29	5.74	13.13
H01.1	H01.1	1.62	0.54	6.7	0.88	8.09	7.13
H02	H02	2.91	0.74	8.2	2.16	7.58	16.40
H03	H03	1.83	0.76	5.8	1.40	8.45	11.80
H04	H04	0.42	0.62	5.0	0.26	8.82	2.33
H05	H05	0.19	0.78	5.0	0.15	8.82	1.31
H06	H06	0.60	0.66	7.3	0.40	7.87	3.15
H07	H07	0.71	0.66	5.1	0.47	8.78	4.09
H08.1	H08.1	1.36	0.52	13.0	0.70	6.31	4.43
H08.2	H08.2	0.13	0.55	7.2	0.07	7.94	0.58
H09	H09	1.41	0.72	7.7	1.02	7.73	7.89
H10	H10	0.70	0.76	5.9	0.53	8.43	4.50
H11	H11	0.25	0.57	5.0	0.14	8.82	1.27
H12	H12	0.05	0.72	5.0	0.04	8.82	0.33
H13	H13	0.70	0.75	7.1	0.52	7.97	4.18
H14	H14	0.17	0.77	5.0	0.13	8.82	1.18
H15	H15	0.96	0.76	5.0	0.74	8.82	6.48
H16	H16	0.88	0.76	5.0	0.66	8.82	5.86
H17	H17	1.04	0.76	8.8	0.79	7.38	5.81
H18	H18	1.35	0.74	7.5	0.99	7.80	7.75
H19	H19	0.45	0.77	6.1	0.35	8.34	2.91
H20	H20	1.65	0.59	7.1	0.97	7.97	7.75
OS1	OS1	2.61	0.63	5.4	1.63	8.63	14.08
OS2	OS2	0.25	0.57	5.0	0.14	8.82	1.26

APPENDIX C

HYDRAULIC CALCULATIONS

Inlet Management
Inlet Calculations

Swale Calculations

INLET MANAGEMENT

Project: Canyonside Filing 1 3rd Amendment

Minor: 5-year

Major: 100-year

Worksheet Protected

INLET NAME	Inlet H02	Inlet H03	Inlet H05
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	3	3	3

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	6.70	5.02	0.57
Major Peak Flow, Q (cfs)	16.40	11.80	1.31

Bypass (Carry-Over) Flow from Upstream

Inlets must be organized from upstream (left) to downstream (right)

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	User-Defined
Bypass Flow Description (Optional):			Inlet H02 & H03
Minor Bypass Flow Received, Q_b (cfs)			0.00
Major Bypass Flow Received, Q_b (cfs)			4.44

CALCULATED OUTPUT

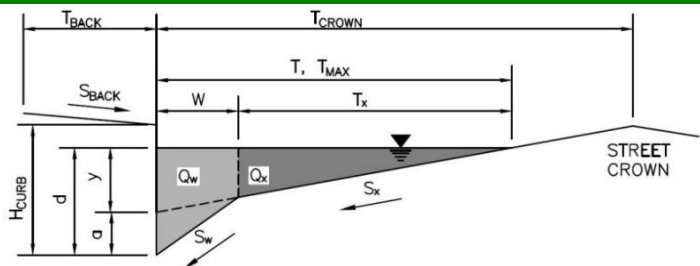
Minor Total Design Peak Flow, Q (cfs)	6.70	5.02	0.57
Major Total Design Peak Flow, Q (cfs)	16.40	11.80	5.75
Minor Inlet Interception Capacity, Q_a (cfs)	6.70	5.02	0.57
Major Inlet Interception Capacity, Q_a (cfs)	13.07	10.69	5.75
Minor Flow Bypassed Downstream, Q_b (cfs)	0.00	0.00	0.00
Major Flow Bypassed Downstream, Q_b (cfs)	3.33	1.11	0.00
Minor Flow Capture Percentage, C%	100%	100%	100%
Major Flow Capture Percentage, C%	80%	91%	100%

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

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

Project: Canyonside Filing 1 3rd Amendment

Inlet ID: Inlet H02



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)

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)

T_{BACK} = 12.0 ft
S_{BACK} = 0.020 ft/ft
n_{BACK} = 0.015

H_{CURB} = 5.00 inches
T_{CROWN} = 14.0 ft
W = 2.00 ft
S_x = 0.020 ft/ft
S_w = 0.083 ft/ft
S_o = 0.031 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} =	14.0	14.0
d _{MAX} =	5.0	7.9
	☒	☒

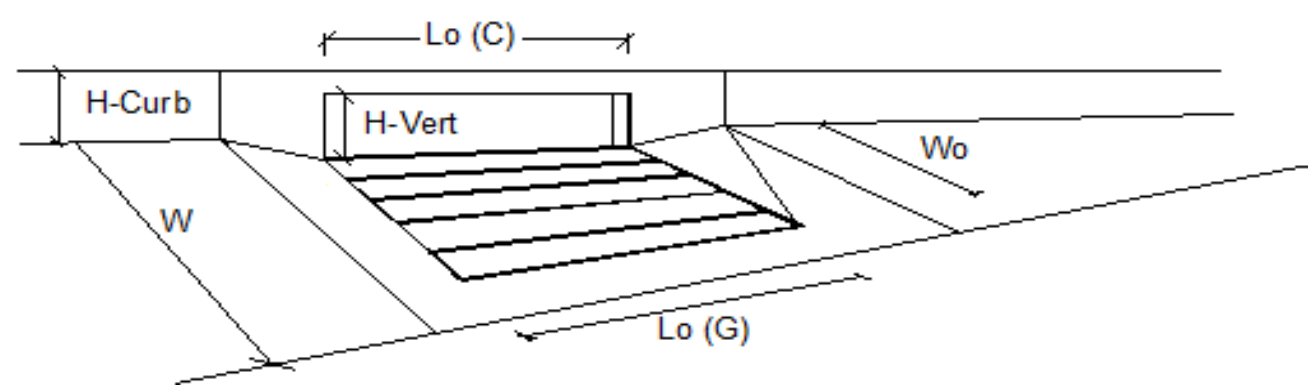
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

Q_{allow} = 13.0 34.6 cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 6.70 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 16.40 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



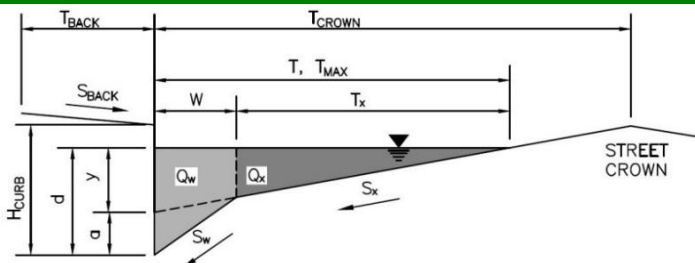
Design Information (Input)		MINOR		MAJOR
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening	
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	4.0	4.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	3	3
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_f (G)$ =	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_f (C)$ =	0.10	0.10
Street Hydraulics: OK - Q < Allowable Street Capacity		MINOR		MAJOR
Total Inlet Interception Capacity		Q_a =	6.7	13.1 cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	3.3 cfs
Capture Percentage = Q_a/Q_o		$C\%$ =	100	80 %

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

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

Project: Canyonside Filing 1 3rd Amendment

Inlet ID: Inlet H03



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)

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)

TBACK = 12.0 ft
SBACK = 0.020 ft/ft
nBACK = 0.015

HCURB = 5.00 inches
TCROWN = 14.0 ft
W = 2.00 ft
SX = 0.020 ft/ft
SW = 0.083 ft/ft
SO = 0.031 ft/ft
nSTREET = 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
TMAX =	14.0	14.0
dMAX =	5.0	7.9
	☒	☒

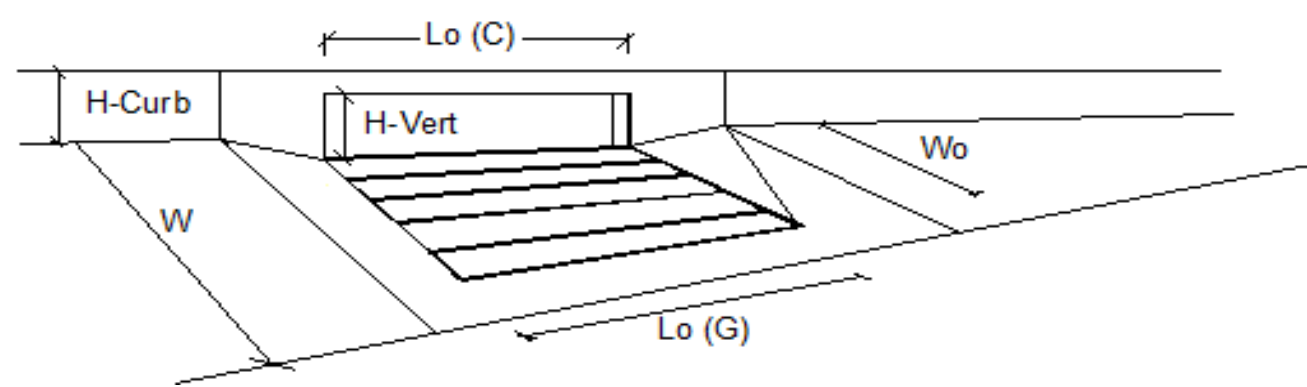
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

Qallow = 13.0 34.6 cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 5.02 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 11.80 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



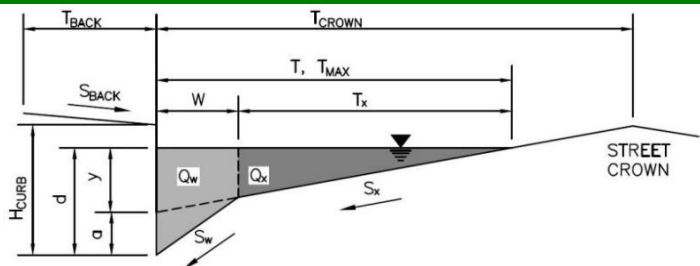
Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a _{LOCAL} =	4.0	4.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	3	3	
Length of a Single Unit Inlet (Grate or Curb Opening)		L _o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W _o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C _f (G) =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C _f (C) =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity			MINOR		MAJOR
Total Inlet Interception Capacity		Q _a =	5.0	10.7	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q _b =	0.0	1.1	cfs
Capture Percentage = Q _a /Q _o		C% =	100	91	%

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

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

Project: Canyonside Filing 1 3rd Amendment

Inlet ID: Inlet H05



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)

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)

$T_{BACK} = 12.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.015$

$H_{CURB} = 5.00$ inches
 $T_{CROWN} = 14.0$ ft
 $W = 2.00$ ft
 $S_x = 0.020$ ft/ft
 $S_w = 0.083$ ft/ft
 $S_o = 0.031$ 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
$T_{MAX} =$	14.0	14.0
$d_{MAX} =$	5.0	7.9
	☒	☒

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

$Q_{allow} =$

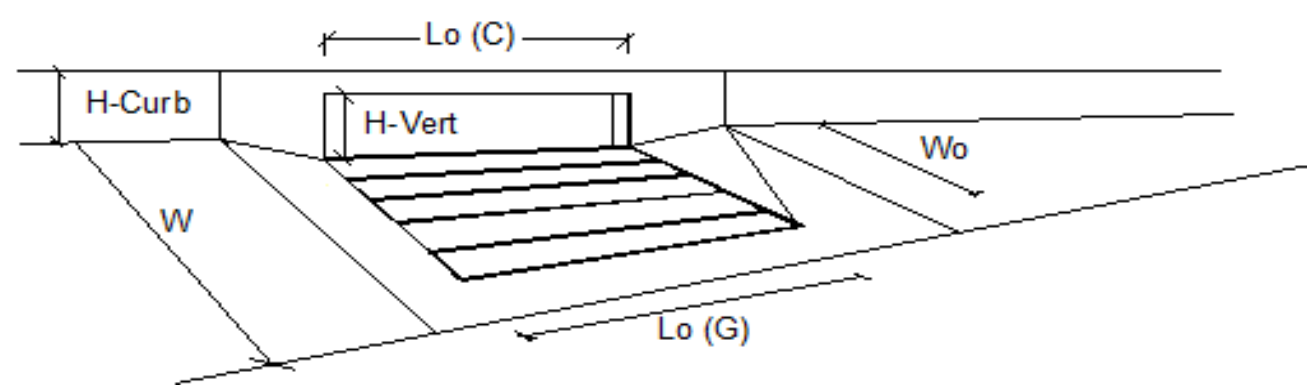
Minor Storm	Major Storm
13.0	34.6

 cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 0.57 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 5.75 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR
Type of Inlet	CDOT Type R Curb Opening	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		$a_{LOCAL} =$	4.0	4.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	3	3
Length of a Single Unit Inlet (Grate or Curb Opening)		$L_o =$	5.00	5.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		$W_o =$	N/A	N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_f (G) =$	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_f (C) =$	0.10	0.10
Street Hydraulics: OK - $Q < \text{Allowable Street Capacity}$		MINOR		MAJOR
Total Inlet Interception Capacity		$Q_a =$	0.6	5.7 cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		$Q_b =$	0.0	0.0 cfs
Capture Percentage = Q_a/Q_o		$C\% =$	100	100 %

INLET MANAGEMENT

Project: Canyonside Filing 1 3rd Amendment

Minor: 5-year

Major: 100-year

Worksheet Protected

INLET NAME	Inlet H09	Inlet H10	Inlet H12	Inlet H13	Inlet H14
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	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
Number of Inlet Units	2	2	1	1	2

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	3.08	1.90	0.13	1.74	0.51
Major Peak Flow, Q (cfs)	7.89	4.50	0.33	4.18	1.18

Bypass (Carry-Over) Flow from Upstream

Inlets must be organized from upstream (left) to downstream (right)

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	Inlet H13
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	0.09
Major Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	1.40

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	3.08	1.90	0.13	1.74	0.60
Major Total Design Peak Flow, Q (cfs)	7.89	4.50	0.33	4.18	2.58
Minor Inlet Interception Capacity, Q_a (cfs)	5.01	5.01	0.13	1.65	0.60
Major Inlet Interception Capacity, Q_a (cfs)	15.78	15.78	0.33	2.78	2.58
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	0.00	0.09	0.00
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	0.00	1.40	0.00
Minor Flow Capture Percentage, C%	100%	100%	100%	95%	100%
Major Flow Capture Percentage, C%	100%	100%	100%	66%	100%

INLET MANAGEMENT

Project: Canyonside Filing 1 3rd Amendment

Minor: 5-year

Major: 100-year

Worksheet Protected

INLET NAME	Inlet H15	Inlet H16	Inlet H17	Inlet H18	Inlet H19
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	On Grade	In Sump	In Sump
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
Number of Inlet Units	1	1	1	2	2

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	2.77	3.74	2.44	3.12	1.37
Major Peak Flow, Q (cfs)	6.48	8.89	5.81	7.75	3.03

Bypass (Carry-Over) Flow from Upstream [right\) in order for bypass flows to be linked.](#)

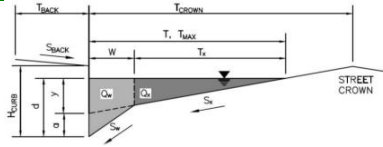
Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	User-Defined	Inlet H16
Bypass Flow Description (Optional):				Inlet H15 & H17	
Minor Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	1.41	1.12
Major Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	6.38	4.99

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	2.77	3.74	2.44	4.53	2.49
Major Total Design Peak Flow, Q (cfs)	6.48	8.89	5.81	14.13	8.02
Minor Inlet Interception Capacity, Q_a (cfs)	2.23	2.62	1.57	5.01	5.01
Major Inlet Interception Capacity, Q_a (cfs)	3.40	3.90	2.50	15.78	15.78
Minor Flow Bypassed Downstream, Q_b (cfs)	0.54	1.12	0.87	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	3.08	4.99	3.31	N/A	N/A
Minor Flow Capture Percentage, C%	80%	70%	64%	100%	100%
Major Flow Capture Percentage, C%	53%	44%	43%	100%	100%

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H09****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)

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)

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 Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} = 12.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.015$

$H_{CURB} = 5.00$ inches
 $T_{CROWN} = 14.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.083$ ft/ft
 $S_O = 0.000$ ft/ft
 $n_{STREET} = 0.016$

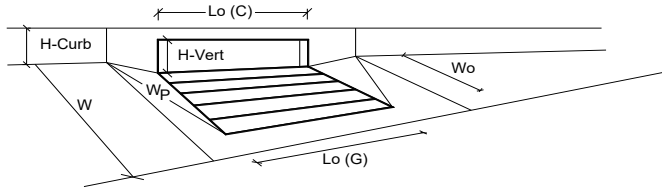
	Minor Storm	Major Storm	
$T_{MAX} =$	14.0	14.0	ft
$d_{MAX} =$	5.0	7.9	inches
	☐	☐	

$Q_{allow} =$

Minor Storm	Major Storm	
SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

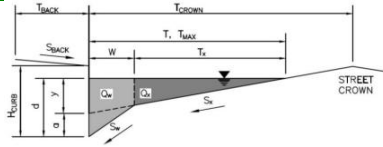
MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	5.0	7.9	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		$L_o (G)$ =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		$C_r (G)$ =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		$C_w (G)$ =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		$C_o (G)$ =	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		$L_o (C)$ =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		$C_r (C)$ =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		$C_w (C)$ =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		$C_o (C)$ =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.25	0.49	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.87	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		Q_a =	5.0	15.8	cfs
		$Q_{PEAK REQUIRED}$ =	3.1	7.9	cfs

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H10****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)

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)

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 Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} = 12.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.015$

$H_{CURB} = 5.00$ inches
 $T_{CROWN} = 14.0$ ft
 $W = 2.00$ ft
 $S_x = 0.020$ ft/ft
 $S_w = 0.083$ ft/ft
 $S_o = 0.000$ ft/ft
 $n_{STREET} = 0.016$

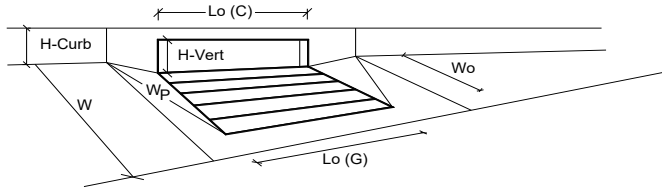
	Minor Storm	Major Storm	
$T_{MAX} =$	14.0	14.0	ft
$d_{MAX} =$	5.0	7.9	inches
	☐	☐	

$Q_{allow} =$

	Minor Storm	Major Storm	
	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

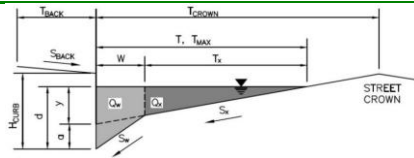
MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	4.00	4.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	5.0	7.9	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		$L_o (G)$ =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		$C_r (G)$ =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		$C_w (G)$ =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		$C_o (G)$ =	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		$L_o (C)$ =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		$C_r (C)$ =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		$C_w (C)$ =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		$C_o (C)$ =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.25	0.49	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.87	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		Q_a =	5.0	15.8	cfs
		$Q_{PEAK REQUIRED}$ =	1.9	4.5	cfs

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H12****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)

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)

$T_{BACK} =$	17.5	ft
$S_{BACK} =$	0.020	ft/ft
$n_{BACK} =$	0.013	

$H_{CURB} =$	6.00	inches
$T_{CROWN} =$	15.0	ft
$W =$	2.00	ft
$S_x =$	0.020	ft/ft
$S_w =$	0.083	ft/ft
$S_o =$	0.010	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	
$T_{MAX} =$	15.0	15.0	ft
$d_{MAX} =$	6.0	10.2	inches
	☒	☒	

MINOR STORM Allowable Capacity is based on Depth Criterion

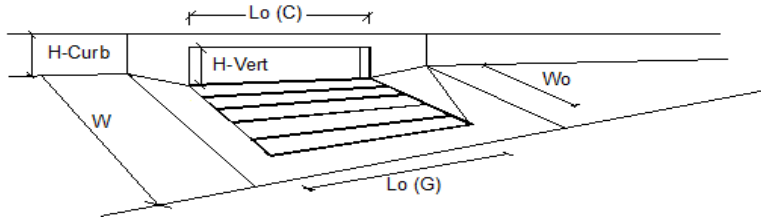
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	13.6	70.9	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 0.13 cfs on sheet 'Inlet Management'**Major storm max. allowable capacity GOOD - greater than the design peak flow of 0.33 cfs on sheet 'Inlet Management'**

INLET ON A CONTINUOUS GRADE

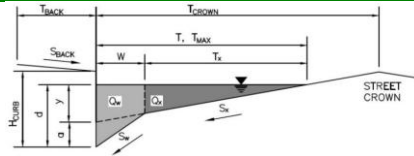
MHH-D-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR
Type of Inlet	CDOT Type R Curb Opening	Type =		CDOT Type R Curb Opening
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	1	1
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_f (G)$ =	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_f (C)$ =	0.10	0.10
Street Hydraulics: OK - $Q < \text{Allowable Street Capacity}$		MINOR		MAJOR
Total Inlet Interception Capacity		Q_a =	0.1	0.3 cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	0.0 cfs
Capture Percentage = Q_a/Q_o		$C\%$ =	100	100 %

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H13****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)

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)

$T_{BACK} =$	12.0	ft
$S_{BACK} =$	0.020	ft/ft
$n_{BACK} =$	0.013	

$H_{CURB} =$	5.00	inches
$T_{CROWN} =$	14.0	ft
$W =$	2.00	ft
$S_x =$	0.020	ft/ft
$S_w =$	0.083	ft/ft
$S_o =$	0.023	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	
$T_{MAX} =$	14.0	14.0	ft
$d_{MAX} =$	5.0	7.9	inches
	☒	☒	

MINOR STORM Allowable Capacity is based on Depth Criterion

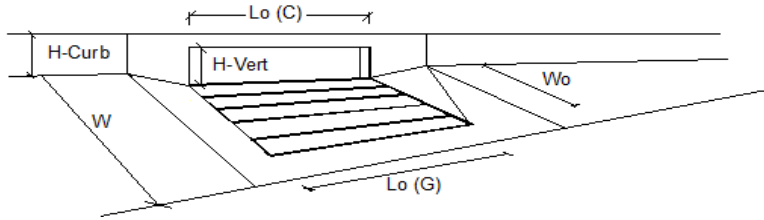
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	11.2	38.6	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 1.74 cfs on sheet 'Inlet Management'**Major storm max. allowable capacity GOOD - greater than the design peak flow of 4.18 cfs on sheet 'Inlet Management'**

INLET ON A CONTINUOUS GRADE

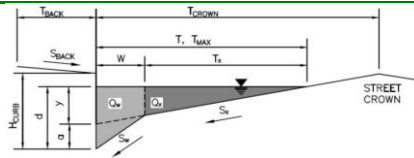
MHH-D-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	4.0	4.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_f (G)$ =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_f (C)$ =	0.10	0.10	
Street Hydraulics: OK - $Q < \text{Allowable Street Capacity}$					
Total Inlet Interception Capacity		Q_a =	1.7	2.8	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.1	1.4	cfs
Capture Percentage = Q_a/Q_o		C% =	95	66	%

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H14****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)

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)

$T_{BACK} =$	17.5	ft
$S_{BACK} =$	0.020	ft/ft
$n_{BACK} =$	0.013	

$H_{CURB} =$	6.00	inches
$T_{CROWN} =$	15.0	ft
$W =$	2.00	ft
$S_X =$	0.020	ft/ft
$S_W =$	0.083	ft/ft
$S_O =$	0.010	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	
$T_{MAX} =$	15.0	15.0	ft
$d_{MAX} =$	6.0	10.2	inches
	☒	☒	

MINOR STORM Allowable Capacity is based on Depth Criterion

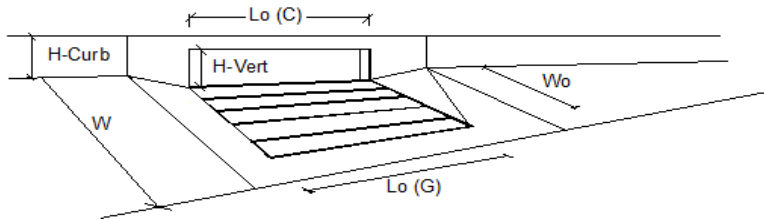
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	13.6	70.9	cfs

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 0.60 cfs on sheet 'Inlet Management'**Major storm max. allowable capacity GOOD - greater than the design peak flow of 2.58 cfs on sheet 'Inlet Management'**

INLET ON A CONTINUOUS GRADE

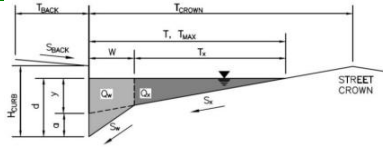
MHH-D-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_f (G)$ =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_f (C)$ =	0.10	0.10	
Street Hydraulics: OK - $Q < \text{Allowable Street Capacity}$					
Total Inlet Interception Capacity		Q_a =	0.6	2.6	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	0.0	cfs
Capture Percentage = Q_a/Q_o		C% =	100	100	%

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H15****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)

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)

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)

$T_{BACK} =$	12.0	ft
$S_{BACK} =$	0.020	ft/ft
$n_{BACK} =$	0.015	

$H_{CURB} =$	5.00	inches
$T_{CROWN} =$	14.0	ft
$W =$	2.00	ft
$S_X =$	0.020	ft/ft
$S_W =$	0.083	ft/ft
$S_O =$	0.020	ft/ft
$n_{STREET} =$	0.016	

	Minor Storm	Major Storm	
$T_{MAX} =$	14.0	14.0	ft
$d_{MAX} =$	5.0	7.9	inches
	☒	☒	

	Minor Storm	Major Storm	
$Q_{allow} =$	10.4	39.7	cfs

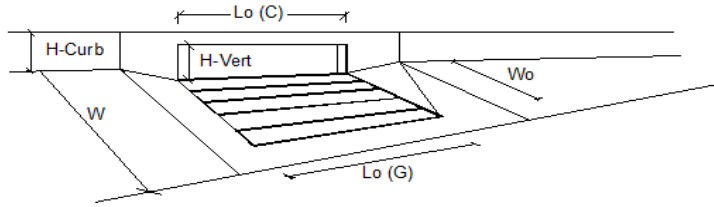
MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.77 cfs on sheet 'Inlet Management'**Major storm max. allowable capacity GOOD - greater than the design peak flow of 6.48 cfs on sheet 'Inlet Management'**

INLET ON A CONTINUOUS GRADE

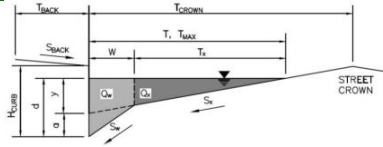
MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening	
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	4.0	4.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_r (G)$ =	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_r (C)$ =	0.10	0.10
Street Hydraulics: OK - $Q < \text{Allowable Street Capacity}$		MINOR		MAJOR
Total Inlet Interception Capacity		Q_a =	2.2	3.4 cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.5	3.1 cfs
Capture Percentage = Q_a/Q_o		$C\%$ =	80	53 %

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H16****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)

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)

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)

T_{BACK}	=	12.0	ft
S_{BACK}	=	0.020	ft/ft
n_{BACK}	=	0.015	

H_{CURB}	=	5.00	inches
T_{CROWN}	=	14.0	ft
W	=	2.00	ft
S_x	=	0.020	ft/ft
S_w	=	0.083	ft/ft
S_o	=	0.020	ft/ft
n_{STREET}	=	0.016	

	Minor Storm	Major Storm	
T_{MAX}	=	14.0	ft
d_{MAX}	=	5.0	inches
	☒	☒	

	Minor Storm	Major Storm	
Q_{allow}	=	10.4	cfs
		39.7	

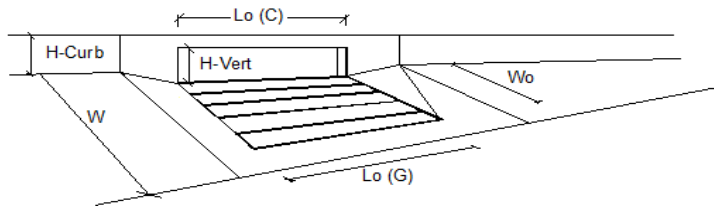
MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 3.74 cfs on sheet 'Inlet Management'**Major storm max. allowable capacity GOOD - greater than the design peak flow of 8.89 cfs on sheet 'Inlet Management'**

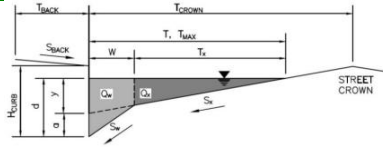
INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	4.0	4.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_r (G)$ =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_r (C)$ =	0.10	0.10	
Street Hydraulics: OK - $Q < \text{Allowable Street Capacity}$					
Total Inlet Interception Capacity		Q_a =	2.6	3.9	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	1.1	5.0	cfs
Capture Percentage = Q_a/Q_o		$C\%$ =	70	44	%

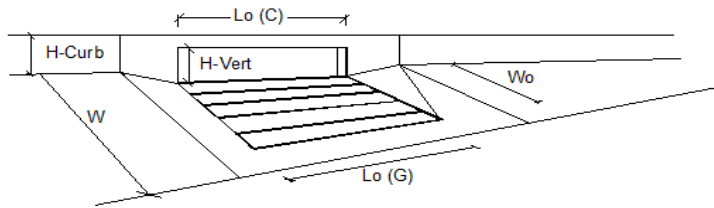
Inlet ID: Inlet H17



Major storm max. allowable capacity GOOD - greater than the design peak flow of 5.81 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

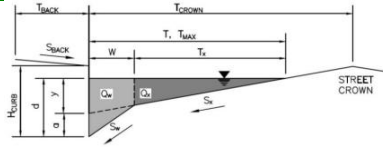
MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	4.0	4.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		$C_r (G)$ =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		$C_r (C)$ =	0.10	0.10	
Street Hydraulics: OK - $Q < \text{Allowable Street Capacity}$					
Total Inlet Interception Capacity		Q_a =	1.6	2.5	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.9	3.3	cfs
Capture Percentage = Q_a/Q_o		$C\%$ =	64	43	%

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H18****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)

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)

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 Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} = 12.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.015$

$H_{CURB} = 5.00$ inches
 $T_{CROWN} = 14.0$ ft
 $W = 2.00$ ft
 $S_x = 0.020$ ft/ft
 $S_w = 0.083$ ft/ft
 $S_o = 0.000$ ft/ft
 $n_{STREET} = 0.016$

	Minor Storm	Major Storm
$T_{MAX} =$	14.0	14.0
$d_{MAX} =$	5.0	7.9
	☐	☐

ft
inches

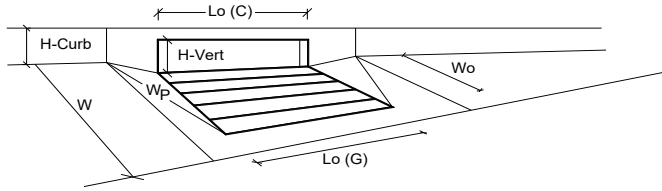
$Q_{allow} =$

	Minor Storm	Major Storm
	SUMP	SUMP

cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)

Type of Inlet CDOT Type R Curb Opening

Local Depression (additional to continuous gutter depression 'a' from above)

Number of Unit Inlets (Grate or Curb Opening)

Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate

Width of a Unit Grate

Open Area Ratio for a Grate (typical values 0.15-0.90)

Clogging Factor for a Single Grate (typical value 0.50 - 0.70)

Grate Weir Coefficient (typical value 2.15 - 3.60)

Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening

Height of Vertical Curb Opening in Inches

Height of Curb Orifice Throat in Inches

Angle of Throat

Side Width for Depression Pan (typically the gutter width of 2 feet)

Clogging Factor for a Single Curb Opening (typical value 0.10)

Curb Opening Weir Coefficient (typical value 2.3-3.7)

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth

Depth for Curb Opening Weir Equation

Grated Inlet Performance Reduction Factor for Long Inlets

Curb Opening Performance Reduction Factor for Long Inlets

Combination Inlet Performance Reduction Factor for Long Inlets

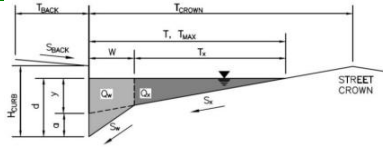
Total Inlet Interception Capacity (assumes clogged condition)

Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)

	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
a _{local} =	4.00	4.00	inches
No =	2	2	
Ponding Depth =	5.0	7.9	inches
	MINOR	MAJOR	☒ Override Depths
L _o (G) =	N/A	N/A	feet
W _o =	N/A	N/A	feet
A _{ratio} =	N/A	N/A	
C _r (G) =	N/A	N/A	
C _w (G) =	N/A	N/A	
C _o (G) =	N/A	N/A	
	MINOR	MAJOR	
L _o (C) =	5.00	5.00	feet
H _{vert} =	6.00	6.00	inches
H _{throat} =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W _d =	2.00	2.00	feet
C _r (C) =	0.10	0.10	
C _w (C) =	3.60	3.60	
C _o (C) =	0.67	0.67	
	MINOR	MAJOR	
d _{Grate} =	N/A	N/A	ft
d _{Curb} =	0.25	0.49	ft
RF _{Grate} =	N/A	N/A	
RF _{Curb} =	0.87	1.00	
RF _{Combination} =	N/A	N/A	
	MINOR	MAJOR	
Q _a =	5.0	15.8	cfs
Q _{PEAK REQUIRED} =	4.5	14.1	cfs

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

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

Project: **Canyonside Filing 1 3rd Amendment**Inlet ID: **Inlet H19****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)

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)

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 Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} = 12.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.015$

$H_{CURB} = 5.00$ inches
 $T_{CROWN} = 14.0$ ft
 $W = 2.00$ ft
 $S_x = 0.020$ ft/ft
 $S_w = 0.083$ ft/ft
 $S_o = 0.000$ ft/ft
 $n_{STREET} = 0.016$

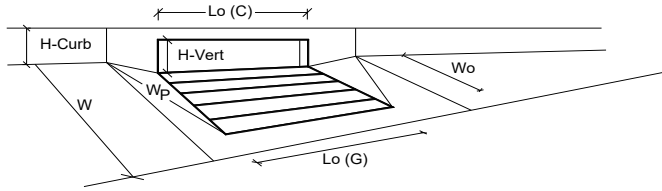
	Minor Storm	Major Storm	
$T_{MAX} =$	14.0	14.0	ft
$d_{MAX} =$	5.0	7.9	inches
	☐	☐	

$Q_{allow} =$

	Minor Storm	Major Storm	
	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)

Type of Inlet CDOT Type R Curb Opening
 Local Depression (additional to continuous gutter depression 'a' from above)
 Number of Unit Inlets (Grate or Curb Opening)
 Water Depth at Flowline (outside of local depression)
Grate Information
 Length of a Unit Grate
 Width of a Unit Grate
 Open Area Ratio for a Grate (typical values 0.15-0.90)
 Clogging Factor for a Single Grate (typical value 0.50 - 0.70)
 Grate Weir Coefficient (typical value 2.15 - 3.60)
 Grate Orifice Coefficient (typical value 0.60 - 0.80)
Curb Opening Information
 Length of a Unit Curb Opening
 Height of Vertical Curb Opening in Inches
 Height of Curb Orifice Throat in Inches
 Angle of Throat
 Side Width for Depression Pan (typically the gutter width of 2 feet)
 Clogging Factor for a Single Curb Opening (typical value 0.10)
 Curb Opening Weir Coefficient (typical value 2.3-3.7)
 Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth
 Depth for Curb Opening Weir Equation
 Grated Inlet Performance Reduction Factor for Long Inlets
 Curb Opening Performance Reduction Factor for Long Inlets
 Combination Inlet Performance Reduction Factor for Long Inlets

Total Inlet Interception Capacity (assumes clogged condition)

Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)

	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
a_{local} =	4.00	4.00	inches
No =	2	2	
Ponding Depth =	5.0	7.9	inches
	MINOR	MAJOR	☒ Override Depths
$L_o (G)$ =	N/A	N/A	feet
W_o =	N/A	N/A	feet
A_{ratio} =	N/A	N/A	
$C_r (G)$ =	N/A	N/A	
$C_w (G)$ =	N/A	N/A	
$C_o (G)$ =	N/A	N/A	
	MINOR	MAJOR	
$L_o (C)$ =	5.00	5.00	feet
H_{vert} =	6.00	6.00	inches
H_{throat} =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W_p =	2.00	2.00	feet
$C_r (C)$ =	0.10	0.10	
$C_w (C)$ =	3.60	3.60	
$C_o (C)$ =	0.67	0.67	
	MINOR	MAJOR	
d_{Grate} =	N/A	N/A	ft
d_{Curb} =	0.25	0.49	ft
RF_{Grate} =	N/A	N/A	
RF_{Curb} =	0.87	1.00	
$RF_{Combination}$ =	N/A	N/A	
	MINOR	MAJOR	
Q_a =	5.0	15.8	cfs
$Q_{PEAK REQUIRED}$ =	2.5	8.0	cfs

INLET MANAGEMENT

Project: Canyonside Filing 1 3rd Amendment

Minor: 5-year

Major: 100-year

Worksheet Protected

INLET NAME	Inlet H01	Inlet H04	Inlet H06	Inlet H07	Inlet H11
Inlet Application (Street or Area)	AREA	AREA	AREA	AREA	AREA
Hydraulic Condition	Swale	Swale	Swale	Swale	Swale
Inlet Type	CDOT Type C (Depressed)	CDOT Type C (Depressed)	CDOT Type C (Depressed)	CDOT TYPE D (Parallel & Depressed)	CDOT Type C (Depressed)
Number of Inlet Units	1	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	1.47	0.63	1.02	1.31	0.24
Major Peak Flow, Q (cfs)	13.13	2.33	3.15	4.09	1.27

Bypass (Carry-Over) Flow from Upstream

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

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	Inlet H06	No Bypass Flow Received
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	
Major Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	

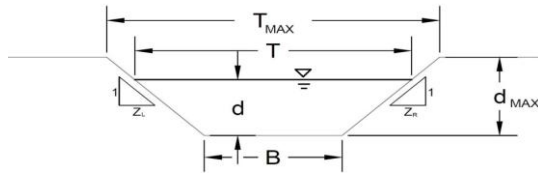
CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	1.47	0.63	1.02	1.31	0.24
Major Total Design Peak Flow, Q (cfs)	13.13	2.33	3.15	4.09	1.27
Minor Inlet Interception Capacity, Q_a (cfs)	17.45	16.89	16.42	34.42	16.05
Major Inlet Interception Capacity, Q_a (cfs)	19.05	17.62	16.94	35.79	17.02
Minor Flow Bypassed Downstream, Q_b (cfs)	0.00	0.00	0.00	0.00	0.00
Major Flow Bypassed Downstream, Q_b (cfs)	0.00	0.00	0.00	0.00	0.00
Minor Flow Capture Percentage, C%	100%	100%	100%	100%	100%
Major Flow Capture Percentage, C%	100%	100%	100%	100%	100%

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

Inlet H01



This worksheet uses the NRCS vegetal retardance method to determine Manning's n for grass-lined channels.

An override Manning's n can be entered for other channel materials.

Analysis of Trapezoidal Channel (Grass-Lined uses 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

Check one of the following soil types:

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

A, B, C, D, or E =

C	
n =	see details below
S_o =	0.0522 ft/ft
B =	2.00 ft
Z_L =	4.00 ft/ft
Z_R =	4.00 ft/ft

Choose One:

- ☐ Non-Cohesive
☒ Cohesive
☐ Paved

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_{MAX} =	16.00	16.00	ft
d_{MAX} =	2.00	2.00	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_{MAX} =	16.00	16.00	ft
d =	1.75	1.75	ft
A =	15.75	15.75	sq ft
P =	16.43	16.43	ft
R =	0.96	0.96	ft
n =	0.034	0.034	
V =	9.87	9.87	fps
VR =	9.46	9.46	ft ² /s
D =	0.98	0.98	ft
Fr =	1.75	1.75	
Q_T =	155.4	155.4	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_{MAX} =	2.00	2.00	ft
T =	18.00	18.00	ft
A =	20.00	20.00	sq ft
P =	18.49	18.49	ft
R =	1.08	1.08	ft
n =	0.033	0.033	
V =	11.00	11.00	fps
VR =	11.89	11.89	ft ² /s
D =	1.11	1.11	ft
Fr =	1.84	1.84	
Q_d =	219.9	219.9	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_{allow} =	155.4	155.4	cfs
d_{allow} =	1.75	1.75	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

Q_o =	1.5	13.1	cfs
d =	0.50	0.79	ft
T =	6.04	8.35	ft
A =	2.03	4.10	sq ft
P =	6.16	8.54	ft
R =	0.33	0.48	ft
n =	0.224	0.065	
V =	0.73	3.20	fps
VR =	0.24	1.54	ft ² /s
D =	0.34	0.49	ft
Fr =	0.22	0.80	

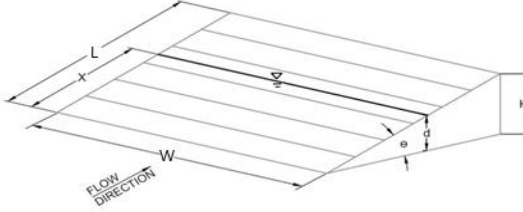
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

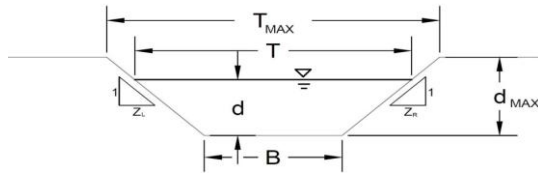
Inlet H01

Inlet Design Information (Input)							
Type of Inlet	CDOT Type C (Depressed)						
Inlet Type = CDOT Type C (Depressed)							
Angle of Inclined Grate (must be <= 30 degrees)	$\theta = 0.00$ degrees						
Width of Grate	$W = 3.00$ ft						
Length of Grate	$L = 3.00$ ft						
Open Area Ratio	$A_{RATIO} = 0.70$						
Height of Inclined Grate	$H_b = 0.00$ ft						
Clogging Factor	$C_f = 0.50$						
Grate Discharge Coefficient	$C_d = 0.84$						
Orifice Coefficient	$C_o = 0.56$						
Weir Coefficient	$C_w = 1.81$						
							
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	<table border="1"> <thead> <tr> <th></th> <th>MINOR</th> <th>MAJOR</th> </tr> </thead> <tbody> <tr> <td>d =</td> <td>1.50</td> <td>1.79</td> </tr> </tbody> </table>		MINOR	MAJOR	d =	1.50	1.79
	MINOR	MAJOR					
d =	1.50	1.79					
Grate Capacity as a Weir							
Submerged Side Weir Length	$X = 3.00$ ft						
Inclined Side Weir Flow	$Q_{ws} = 17.5$ cfs						
Base Weir Flow	$Q_{wb} = 25.0$ cfs						
Interception Without Clogging	$Q_{wi} = 60.0$ cfs						
Interception With Clogging	$Q_{wa} = 30.0$ cfs						
Grate Capacity as an Orifice							
Interception Without Clogging	$Q_{oi} = 34.9$ cfs						
Interception With Clogging	$Q_{oa} = 17.4$ cfs						
Total Inlet Interception Capacity (assumes clogged condition)	$Q_a = 17.4$ cfs						
Bypassed Flow	$Q_b = 0.0$ cfs						
Capture Percentage = Q_a/Q_o	$C\% = 100$ %						

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

Inlet H04



This worksheet uses the NRCS vegetal retardance method to determine Manning's n for grass-lined channels.

An override Manning's n can be entered for other channel materials.

Analysis of Trapezoidal Channel (Grass-Lined uses 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

Check one of the following soil types:

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

A, B, C, D, or E =

n =	C
S_o =	0.0913 ft/ft
B =	1.00 ft
Z1 =	10.00 ft/ft
Z2 =	4.00 ft/ft

Choose One:

- ☐ Non-Cohesive
☒ Cohesive
☐ Paved

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_{MAX} =	9.00	9.00	ft
d_{MAX} =	2.00	2.00	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_{MAX} =	9.00	9.00	ft
d =	0.57	0.57	ft
A =	2.86	2.86	sq ft
P =	9.10	9.10	ft
R =	0.31	0.31	ft
n =	0.137	0.137	
V =	1.51	1.51	fps
VR =	0.48	0.48	ft ² /s
D =	0.32	0.32	ft
Fr =	0.47	0.47	
Q_T =	4.3	4.3	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_{MAX} =	2.00	2.00	ft
T =	29.00	29.00	ft
A =	30.00	30.00	sq ft
P =	29.35	29.35	ft
R =	1.02	1.02	ft
n =	0.032	0.032	
V =	14.24	14.24	fps
VR =	14.56	14.56	ft ² /s
D =	1.03	1.03	ft
Fr =	2.47	2.47	
Q_d =	427.1	427.1	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_{allow} =	4.3	4.3	cfs
d_{allow} =	0.57	0.57	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_o =	0.6	2.3	cfs
d =	0.41	0.53	ft
T =	6.75	8.48	ft
A =	1.59	2.53	sq ft
P =	6.82	8.57	ft
R =	0.23	0.30	ft
n =	0.430	0.217	
V =	0.40	0.92	fps
VR =	0.09	0.27	ft ² /s
D =	0.24	0.30	ft
Fr =	0.14	0.30	

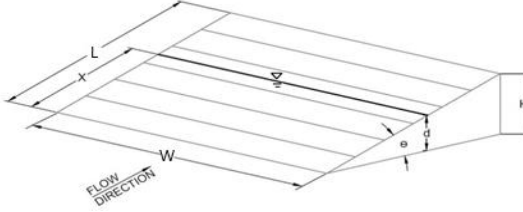
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

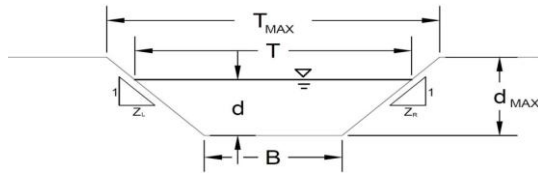
Inlet H04

Inlet Design Information (Input)							
Type of Inlet	CDOT Type C (Depressed)						
Inlet Type = CDOT Type C (Depressed)							
Angle of Inclined Grate (must be <= 30 degrees)	$\theta = 0.00$ degrees						
Width of Grate	$W = 3.00$ ft						
Length of Grate	$L = 3.00$ ft						
Open Area Ratio	$A_{RATIO} = 0.70$						
Height of Inclined Grate	$H_b = 0.00$ ft						
Clogging Factor	$C_f = 0.50$						
Grate Discharge Coefficient	$C_d = 0.84$						
Orifice Coefficient	$C_o = 0.56$						
Weir Coefficient	$C_w = 1.81$						
							
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	<table border="1"> <thead> <tr> <th></th> <th>MINOR</th> <th>MAJOR</th> </tr> </thead> <tbody> <tr> <td>$d =$</td> <td>1.41</td> <td>1.53</td> </tr> </tbody> </table>		MINOR	MAJOR	$d =$	1.41	1.53
	MINOR	MAJOR					
$d =$	1.41	1.53					
Grate Capacity as a Weir							
Submerged Side Weir Length	$X = 3.00$ ft						
Inclined Side Weir Flow	$Q_{ws} = 15.9$ cfs						
Base Weir Flow	$Q_{wb} = 22.7$ cfs						
Interception Without Clogging	$Q_{wi} = 54.5$ cfs						
Interception With Clogging	$Q_{wa} = 27.2$ cfs						
Grate Capacity as an Orifice							
Interception Without Clogging	$Q_{oi} = 33.8$ cfs						
Interception With Clogging	$Q_{oa} = 16.9$ cfs						
Total Inlet Interception Capacity (assumes clogged condition)	$Q_a = 16.9$ cfs						
Bypassed Flow	$Q_b = 0.0$ cfs						
Capture Percentage = Q_a/Q_o	$C\% = 100$ %						

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

Inlet H06



This worksheet uses the NRCS vegetal retardance method to determine Manning's n for grass-lined channels.

An override Manning's n can be entered for other channel materials.

Analysis of Trapezoidal Channel (Grass-Lined uses 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

Check one of the following soil types:

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

A, B, C, D, or E =

C	
n =	see details below
S_o =	0.1569 ft/ft
B =	2.00 ft
Z_L =	4.00 ft/ft
Z_R =	4.00 ft/ft

Choose One:

- ☐ Non-Cohesive
☒ Cohesive
☐ Paved

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_{MAX} =	16.00	16.00	ft
d_{MAX} =	1.00	1.00	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_{MAX} =	16.00	16.00	ft
d =	1.75	1.75	ft
A =	15.75	15.75	sq ft
P =	16.43	16.43	ft
R =	0.96	0.96	ft
n =	0.032	0.032	
V =	18.21	18.21	fps
VR =	17.46	17.46	ft ² /s
D =	0.98	0.98	ft
Fr =	3.23	3.23	
Q_T =	286.8	286.8	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_{MAX} =	1.00	1.00	ft
T =	10.00	10.00	ft
A =	6.00	6.00	sq ft
P =	10.25	10.25	ft
R =	0.59	0.59	ft
n =	0.036	0.036	
V =	11.37	11.37	fps
VR =	6.66	6.66	ft ² /s
D =	0.60	0.60	ft
Fr =	2.59	2.59	
Q_d =	68.2	68.2	cfs

Allowable Channel Capacity Based On Channel Geometry

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	68.2	68.2	cfs
d_{allow} =	1.00	1.00	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

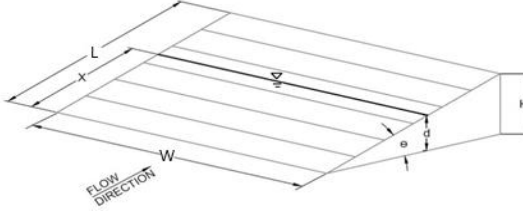
	Minor Storm	Major Storm	
Q_o =	1.0	3.1	cfs
d =	0.33	0.42	ft
T =	4.66	5.35	ft
A =	1.11	1.54	sq ft
P =	4.74	5.45	ft
R =	0.23	0.28	ft
n =	0.243	0.124	
V =	0.92	2.05	fps
VR =	0.22	0.58	ft ² /s
D =	0.24	0.29	ft
Fr =	0.33	0.67	

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

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

AREA INLET IN A SWALE

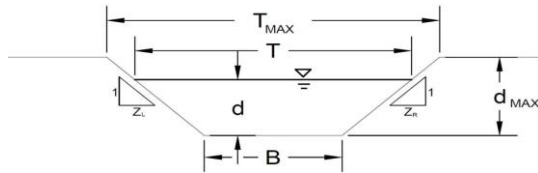
Canyonside Filing 1 3rd Amendment
Inlet H06

Inlet Design Information (Input)							
Type of Inlet	CDOT Type C (Depressed)						
Inlet Type = CDOT Type C (Depressed)							
Angle of Inclined Grate (must be <= 30 degrees)	$\theta = 0.00$ degrees						
Width of Grate	$W = 3.00$ ft						
Length of Grate	$L = 3.00$ ft						
Open Area Ratio	$A_{RATIO} = 0.70$						
Height of Inclined Grate	$H_b = 0.00$ ft						
Clogging Factor	$C_f = 0.50$						
Grate Discharge Coefficient	$C_d = 0.84$						
Orifice Coefficient	$C_o = 0.56$						
Weir Coefficient	$C_w = 1.81$						
							
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	<table border="1"> <thead> <tr> <th></th> <th>MINOR</th> <th>MAJOR</th> </tr> </thead> <tbody> <tr> <td>$d =$</td> <td>1.33</td> <td>1.42</td> </tr> </tbody> </table>		MINOR	MAJOR	$d =$	1.33	1.42
	MINOR	MAJOR					
$d =$	1.33	1.42					
Grate Capacity as a Weir							
Submerged Side Weir Length	$X = 3.00$ ft						
Inclined Side Weir Flow	$Q_{ws} = 14.6$ cfs						
Base Weir Flow	$Q_{wb} = 20.8$ cfs						
Interception Without Clogging	$Q_{wi} = 50.0$ cfs						
Interception With Clogging	$Q_{wa} = 25.0$ cfs						
Grate Capacity as an Orifice							
Interception Without Clogging	$Q_{oi} = 32.8$ cfs						
Interception With Clogging	$Q_{ob} = 16.4$ cfs						
Total Inlet Interception Capacity (assumes clogged condition)	$Q_a = 16.4$ cfs						
Bypassed Flow	$Q_b = 0.0$ cfs						
Capture Percentage = Q_a/Q_o	$C\% = 100$ %						

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

Inlet H07



This worksheet uses the NRCS vegetal retardance method to determine Manning's n for grass-lined channels.

An override Manning's n can be entered for other channel materials.

Analysis of Trapezoidal Channel (Grass-Lined uses 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

Check one of the following soil types:

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

A, B, C, D, or E =

n =	C
S_o =	see details below
B =	0.0742 ft/ft
Z1 =	2.00 ft
Z2 =	4.00 ft/ft

Choose One:

- ☐ Non-Cohesive
☒ Cohesive
☐ Paved

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_{MAX} =	8.00	8.00	ft
d_{MAX} =	1.25	1.25	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_{MAX} =	8.00	8.00	ft
d =	0.75	0.75	ft
A =	3.75	3.75	sq ft
P =	8.18	8.18	ft
R =	0.46	0.46	ft
n =	0.058	0.058	
V =	4.18	4.18	fps
VR =	1.92	1.92	ft ² /s
D =	0.47	0.47	ft
Fr =	1.08	1.08	
Q_T =	15.7	15.7	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_{MAX} =	1.25	1.25	ft
T =	12.00	12.00	ft
A =	8.75	8.75	sq ft
P =	12.31	12.31	ft
R =	0.71	0.71	ft
n =	0.037	0.037	
V =	8.80	8.80	fps
VR =	6.26	6.26	ft ² /s
D =	0.73	0.73	ft
Fr =	1.82	1.82	
Q_d =	77.0	77.0	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_{allow} =	15.7	15.7	cfs
d_{allow} =	0.75	0.75	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_o =	1.3	4.1	cfs
d =	0.44	0.56	ft
T =	5.54	6.48	ft
A =	1.67	2.37	sq ft
P =	5.65	6.61	ft
R =	0.30	0.36	ft
n =	0.229	0.119	
V =	0.78	1.72	fps
VR =	0.23	0.62	ft ² /s
D =	0.30	0.37	ft
Fr =	0.25	0.50	

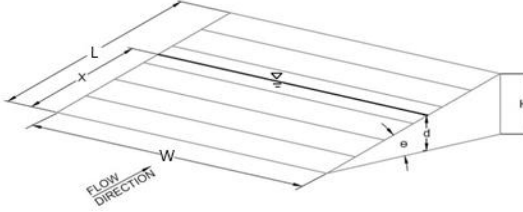
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

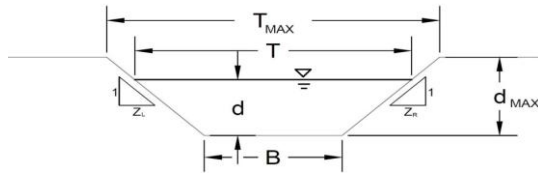
Inlet H07

Inlet Design Information (Input)							
Type of Inlet	CDOT TYPE D (Parallel & Depressed)						
Inlet Type =	CDOT TYPE D (Parallel & Depressed)						
Angle of Inclined Grate (must be <= 30 degrees)	$\theta = 0.00$ degrees						
Width of Grate	$W = 6.00$ ft						
Length of Grate	$L = 3.00$ ft						
Open Area Ratio	$A_{RATIO} = 0.70$						
Height of Inclined Grate	$H_b = 0.00$ ft						
Clogging Factor	$C_f = 0.38$						
Grate Discharge Coefficient	$C_d = 0.68$						
Orifice Coefficient	$C_o = 0.45$						
Weir Coefficient	$C_w = 1.46$						
							
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	<table border="1"> <thead> <tr> <th></th> <th>MINOR</th> <th>MAJOR</th> </tr> </thead> <tbody> <tr> <td>d =</td> <td>1.44</td> <td>1.56</td> </tr> </tbody> </table>		MINOR	MAJOR	d =	1.44	1.56
	MINOR	MAJOR					
d =	1.44	1.56					
Grate Capacity as a Weir							
Submerged Side Weir Length	$X = 3.00$ ft						
Inclined Side Weir Flow	$Q_{ws} = 13.2$ cfs						
Base Weir Flow	$Q_{wb} = 37.8$ cfs						
Interception Without Clogging	$Q_{wi} = 64.3$ cfs						
Interception With Clogging	$Q_{wa} = 40.2$ cfs						
Grate Capacity as an Orifice							
Interception Without Clogging	$Q_{oi} = 55.1$ cfs						
Interception With Clogging	$Q_{ob} = 34.4$ cfs						
Total Inlet Interception Capacity (assumes clogged condition)	$Q_a = 34.4$ cfs						
Bypassed Flow	$Q_b = 0.0$ cfs						
Capture Percentage = Q_a/Q_o	$C\% = 100$ %						

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

Inlet H11



This worksheet uses the NRCS vegetal retardance method to determine Manning's n for grass-lined channels.

An override Manning's n can be entered for other channel materials.

Analysis of Trapezoidal Channel (Grass-Lined uses 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

Check one of the following soil types:

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

A, B, C, D, or E =

C	
n =	see details below
S_o =	0.1500 ft/ft
B =	1.00 ft
Z_L =	4.00 ft/ft
Z_R =	4.00 ft/ft

Choose One:

- ☐ Non-Cohesive
☒ Cohesive
☐ Paved

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_{MAX} =	10.00	10.00	ft
d_{MAX} =	1.00	1.00	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_{MAX} =	10.00	10.00	ft
d =	1.13	1.13	ft
A =	6.19	6.19	sq ft
P =	10.28	10.28	ft
R =	0.60	0.60	ft
n =	0.036	0.036	
V =	11.38	11.38	fps
VR =	6.85	6.85	ft ² /s
D =	0.62	0.62	ft
Fr =	2.55	2.55	
Q_T =	70.4	70.4	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_{MAX} =	1.00	1.00	ft
T =	9.00	9.00	ft
A =	5.00	5.00	sq ft
P =	9.25	9.25	ft
R =	0.54	0.54	ft
n =	0.038	0.038	
V =	10.04	10.04	fps
VR =	5.43	5.43	ft ² /s
D =	0.56	0.56	ft
Fr =	2.37	2.37	
Q_d =	50.2	50.2	cfs

Allowable Channel Capacity Based On Channel Geometry

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	50.2	50.2	cfs
d_{allow} =	1.00	1.00	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_o =	0.2	1.3	cfs
d =	0.27	0.43	ft
T =	3.18	4.46	ft
A =	0.57	1.18	sq ft
P =	3.25	4.57	ft
R =	0.18	0.26	ft
n =	0.430	0.218	
V =	0.42	1.08	fps
VR =	0.07	0.28	ft ² /s
D =	0.18	0.26	ft
Fr =	0.18	0.37	

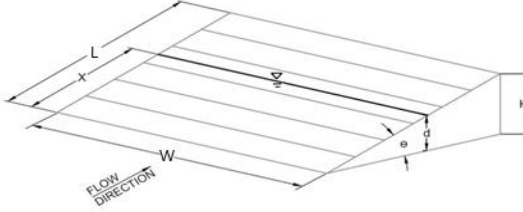
Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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

AREA INLET IN A SWALE

Canyonside Filing 1 3rd Amendment

Inlet H11

Inlet Design Information (Input)							
Type of Inlet	CDOT Type C (Depressed)						
Inlet Type =	CDOT Type C (Depressed)						
Angle of Inclined Grate (must be <= 30 degrees)	$\theta = 0.00$ degrees						
Width of Grate	$W = 3.00$ ft						
Length of Grate	$L = 3.00$ ft						
Open Area Ratio	$A_{RATIO} = 0.70$						
Height of Inclined Grate	$H_b = 0.00$ ft						
Clogging Factor	$C_f = 0.50$						
Grate Discharge Coefficient	$C_d = 0.84$						
Orifice Coefficient	$C_o = 0.56$						
Weir Coefficient	$C_w = 1.81$						
							
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	<table border="1"> <thead> <tr> <th></th> <th>MINOR</th> <th>MAJOR</th> </tr> </thead> <tbody> <tr> <td>d =</td> <td>1.27</td> <td>1.43</td> </tr> </tbody> </table>		MINOR	MAJOR	d =	1.27	1.43
	MINOR	MAJOR					
d =	1.27	1.43					
Grate Capacity as a Weir							
Submerged Side Weir Length	$X = 3.00$ ft						
Inclined Side Weir Flow	$Q_{ws} = 13.6$ cfs						
Base Weir Flow	$Q_{wb} = 19.5$ cfs						
Interception Without Clogging	$Q_{wi} = 46.7$ cfs						
Interception With Clogging	$Q_{wa} = 23.3$ cfs						
Grate Capacity as an Orifice							
Interception Without Clogging	$Q_{oi} = 32.1$ cfs						
Interception With Clogging	$Q_{ob} = 16.0$ cfs						
Total Inlet Interception Capacity (assumes clogged condition)	$Q_a = 16.0$ cfs						
Bypassed Flow	$Q_b = 0.0$ cfs						
Capture Percentage = Q_a/Q_o	$C\% = 100$ %						

Inlet Report

Basin H08 - Area Inlet

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 4.50
Grate Width (ft)	= 3.00
Grate Length (ft)	= 3.00

Gutter

Slope, Sw (ft/ft)	= 0.250
Slope, Sx (ft/ft)	= 0.250
Local Depr (in)	= -0-
Gutter Width (ft)	= 3.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

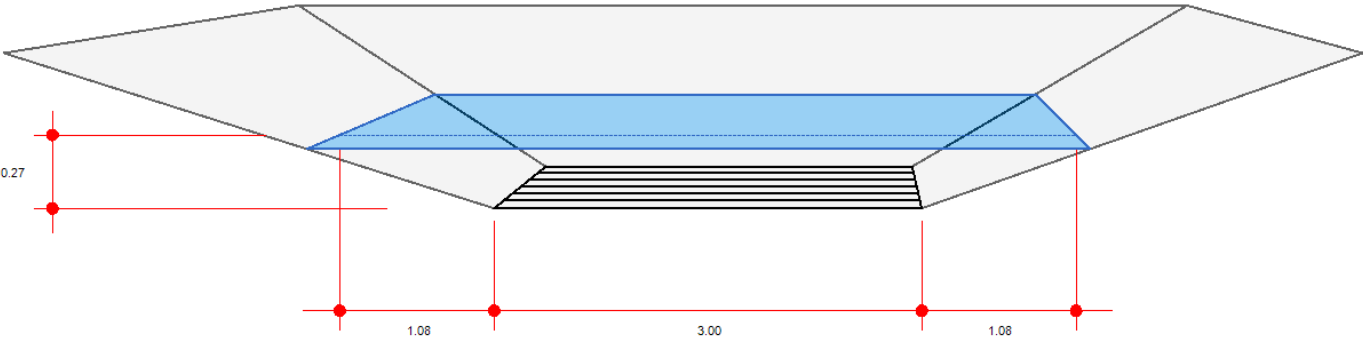
Calculations

Compute by:	Known Q
Q (cfs)	= 5.08

Highlighted

Q Total (cfs)	= 5.08
Q Capt (cfs)	= 5.08
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 3.25
Efficiency (%)	= 100
Gutter Spread (ft)	= 5.17
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

All dimensions in feet



Einstein-Horton Swale Roughness Calculator		
LONGITUDINAL SWALE PARAMETERS		
Base Swale Roughness (n ₁)	0.030	Mowed grass boundary coefficient
Rock Berm/Check Dam Roughness (n ₂)	0.040	Typical riprap/stone check dam coefficient
Berm Length along Flowline (PI)	1.00	Feet (Thickness of rock structure)
Total Berm Spacing (P)	100.00	Feet (Distance center-to-center)
EINSTEIN-HORTON WEIGHTED TERMS		
Swale Length	99.00	Feet (P - PI)
Swale Term	0.514	Segment wetted weight (swale)
RRB Term (PI * n ₂ ^{1.5})	0.008	Segment wetted weight (RRB)
Summed Weighted Terms	0.522	Total integrated channel shear resistance
COMPOSITE ROUGHNESS OUTPUTS		
Einstein-Horton Composite Roughness (n)	0.030	$n = (\sum P_i * n_i^{1.5}) / P ^{(2/3)}$

$$n = \left(\frac{\sum_1^N (P_i n_i^{1.5})}{P} \right)^{2/3} = \frac{(P_1 n_1^{1.5} + P_2 n_2^{1.5} + \dots + P_N n_N^{1.5})^{2/3}}{P^{2/3}}$$

Channel Report

Basin H01 - Swale @ 3.05%

Trapezoidal

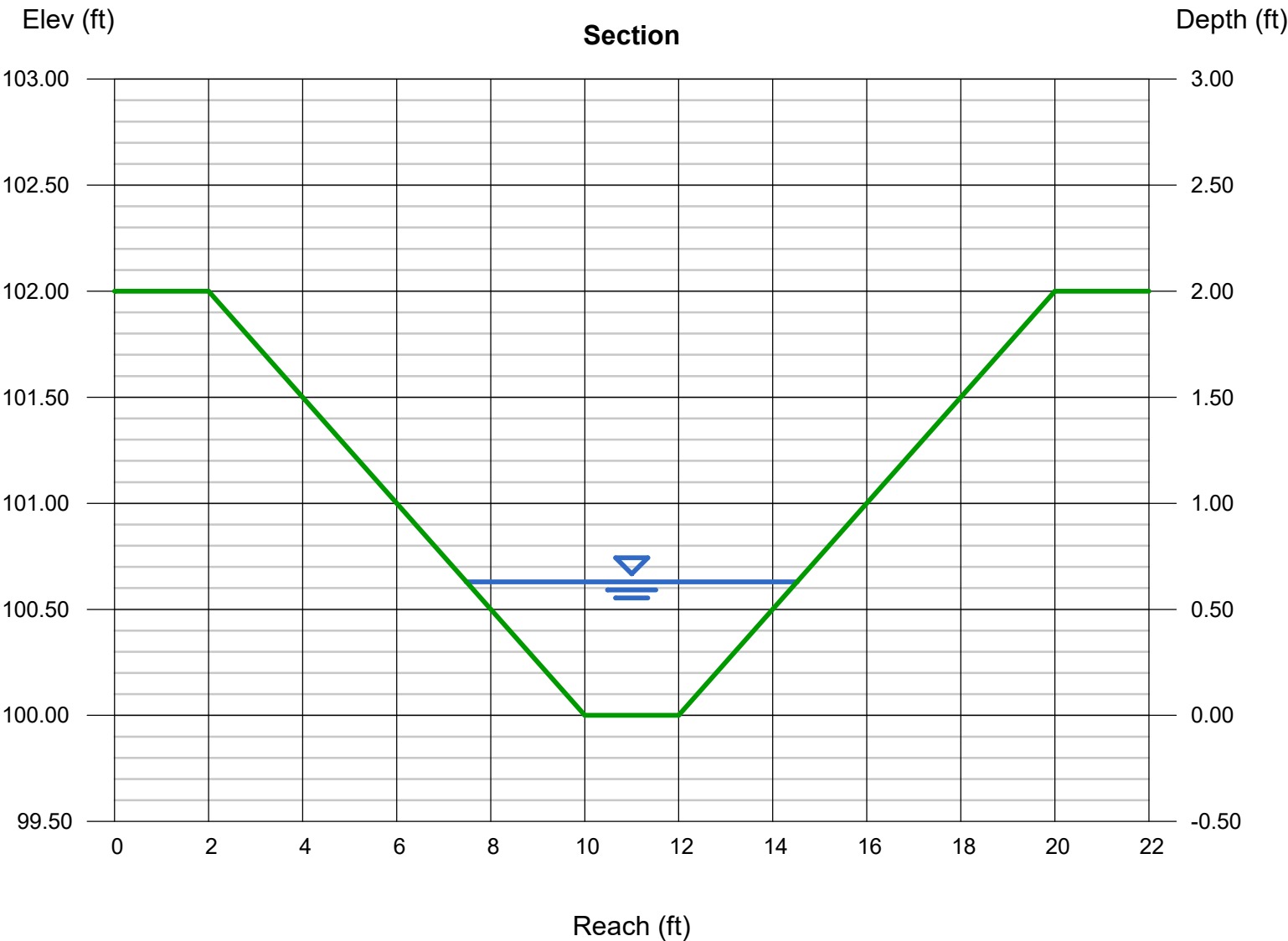
Bottom Width (ft) = 2.00
Side Slopes (z:1) = 4.00, 4.00
Total Depth (ft) = 2.00
Invert Elev (ft) = 100.00
Slope (%) = 3.05
N-Value = 0.030

Highlighted

Depth (ft) = 0.63
Q (cfs) = 13.13
Area (sqft) = 2.85
Velocity (ft/s) = 4.61
Wetted Perim (ft) = 7.20
Crit Depth, Yc (ft) = 0.72
Top Width (ft) = 7.04
EGL (ft) = 0.96

Calculations

Compute by: Known Q
Known Q (cfs) = 13.13



Channel Report

Basin H01 - Swale @ 5.22%

Trapezoidal

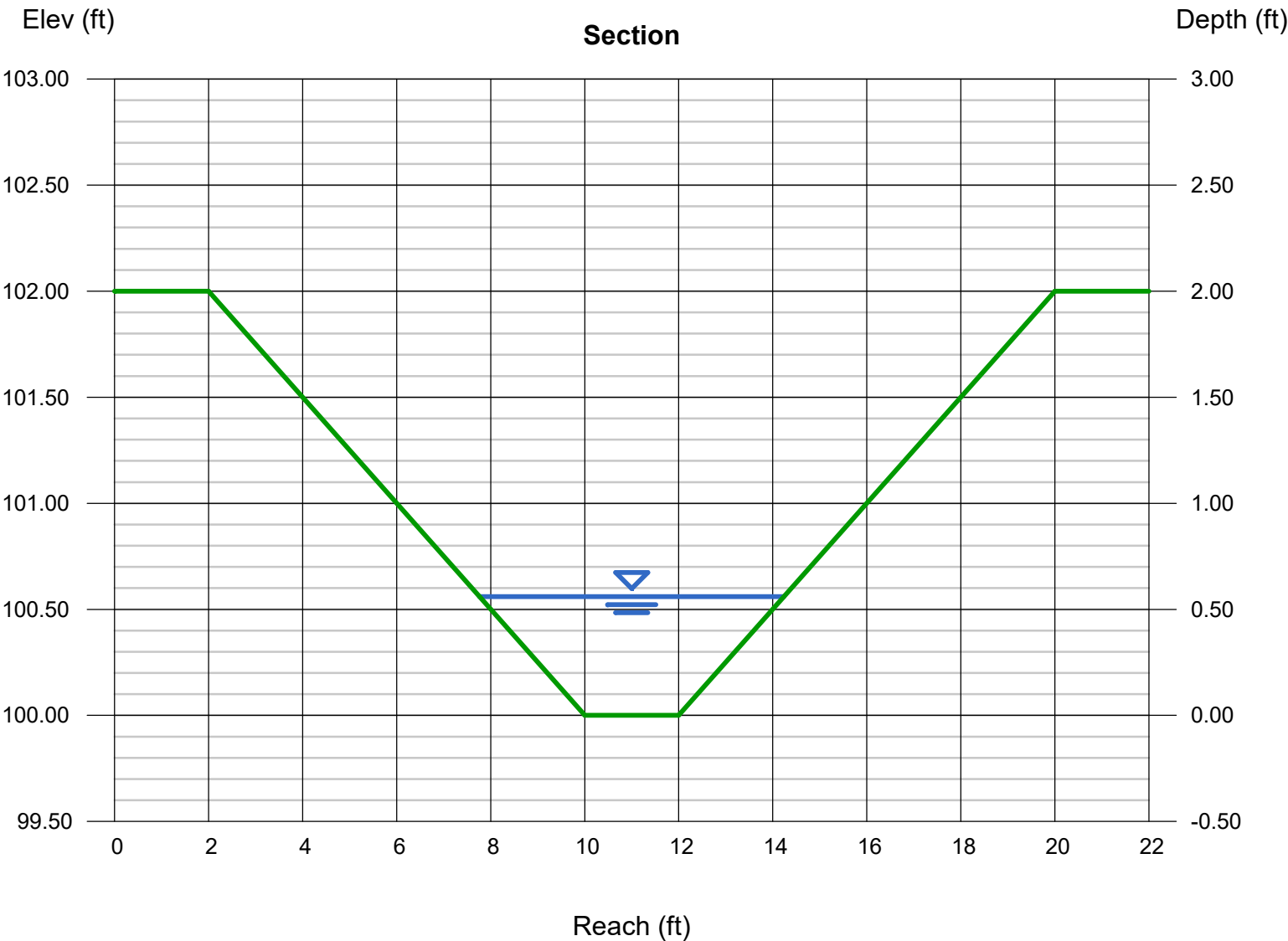
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 5.22
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.56
Q (cfs)	= 13.13
Area (sqft)	= 2.37
Velocity (ft/s)	= 5.53
Wetted Perim (ft)	= 6.62
Crit Depth, Yc (ft)	= 0.72
Top Width (ft)	= 6.48
EGL (ft)	= 1.04

Calculations

Compute by:	Known Q
Known Q (cfs)	= 13.13



Channel Report

Basin H01.1 - Swale @ 0.50%

Trapezoidal

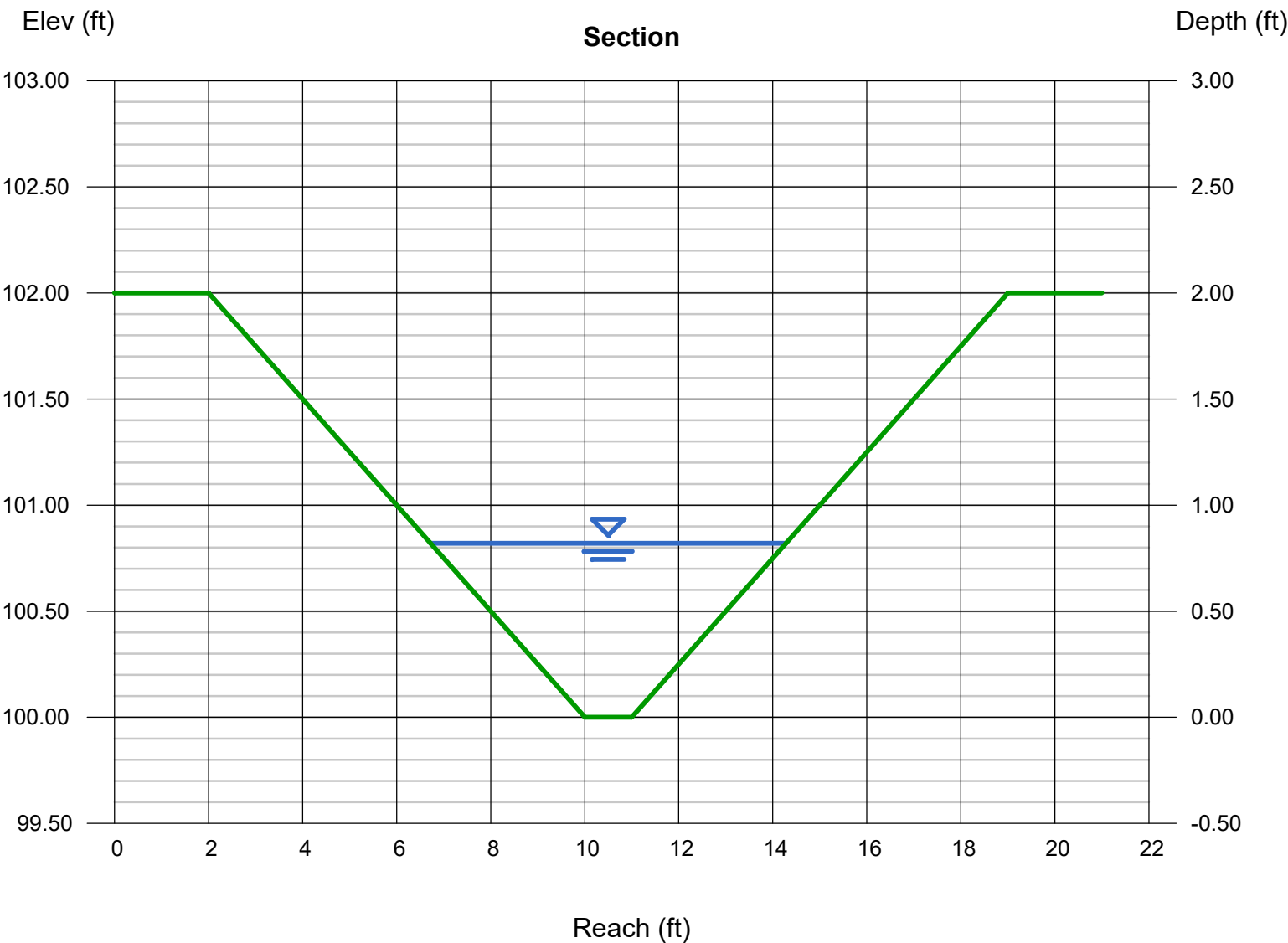
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 0.50
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.82
Q (cfs)	= 7.130
Area (sqft)	= 3.51
Velocity (ft/s)	= 2.03
Wetted Perim (ft)	= 7.76
Crit Depth, Yc (ft)	= 0.62
Top Width (ft)	= 7.56
EGL (ft)	= 0.88

Calculations

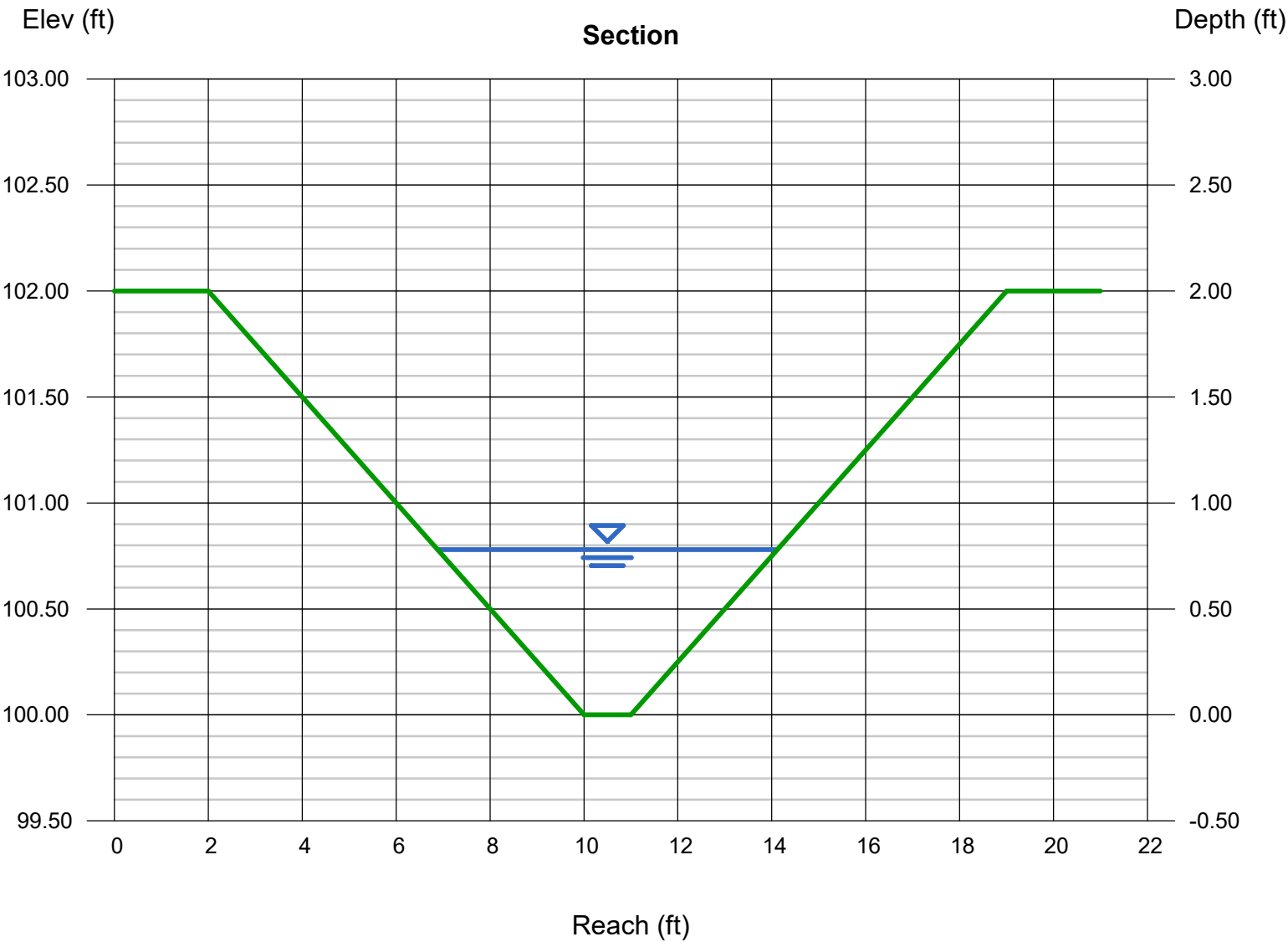
Compute by:	Known Q
Known Q (cfs)	= 7.13



Channel Report

Basin H01.1 - Swale @ 0.65%

Trapezoidal		Highlighted	
Bottom Width (ft)	= 1.00	Depth (ft)	= 0.78
Side Slopes (z:1)	= 4.00, 4.00	Q (cfs)	= 7.130
Total Depth (ft)	= 2.00	Area (sqft)	= 3.21
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 2.22
Slope (%)	= 0.65	Wetted Perim (ft)	= 7.43
N-Value	= 0.030	Crit Depth, Yc (ft)	= 0.62
Calculations		Top Width (ft)	= 7.24
Compute by:	Known Q	EGL (ft)	= 0.86
Known Q (cfs)	= 7.13		



Channel Report

Basin H04 - Swale @ 8.83%

Trapezoidal

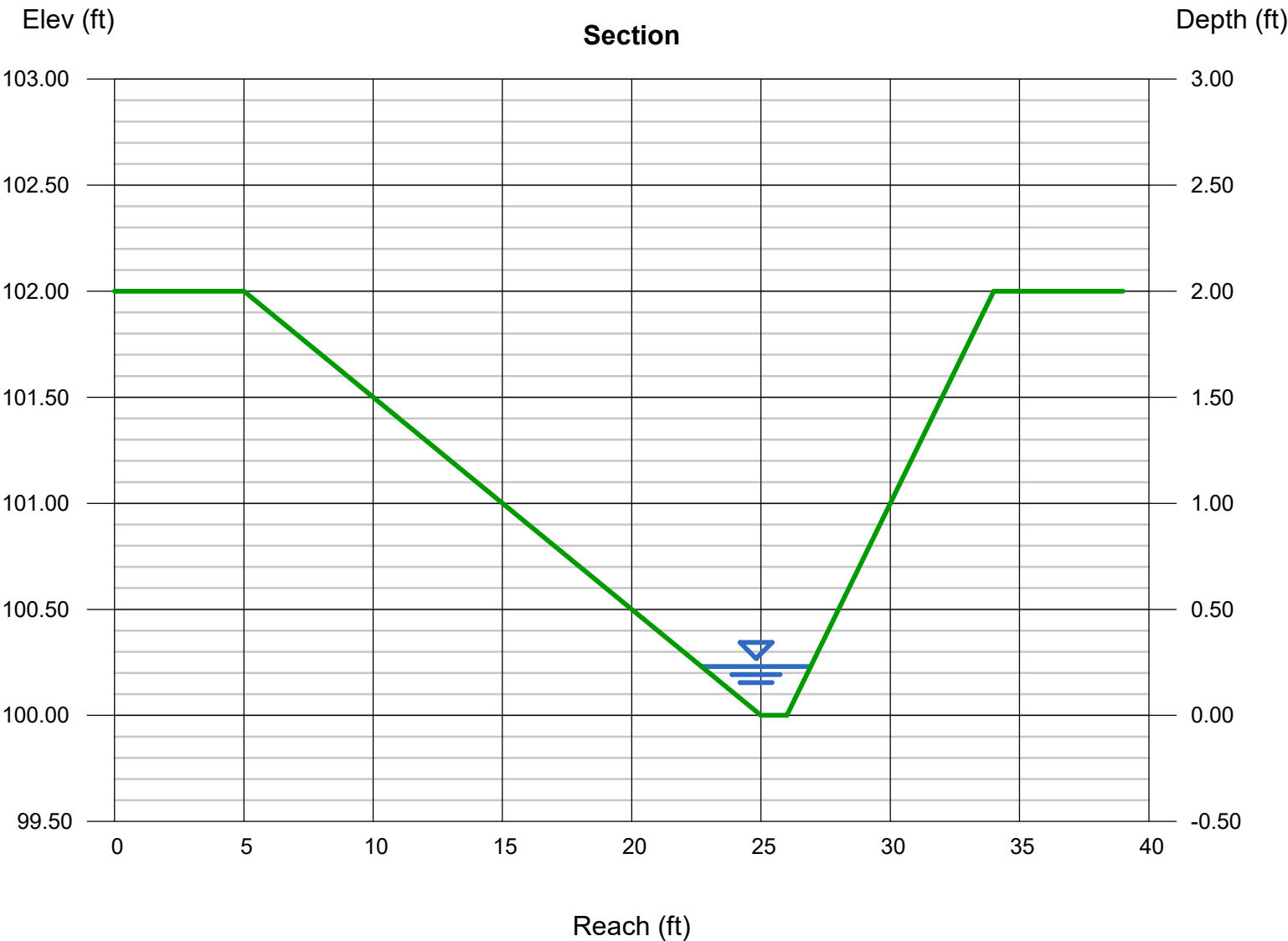
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 10.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 8.83
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.23
Q (cfs)	= 2.330
Area (sqft)	= 0.60
Velocity (ft/s)	= 3.88
Wetted Perim (ft)	= 4.26
Crit Depth, Yc (ft)	= 0.31
Top Width (ft)	= 4.22
EGL (ft)	= 0.46

Calculations

Compute by:	Known Q
Known Q (cfs)	= 2.33



Channel Report

Basin H04 - Swale @ 9.13%

Trapezoidal

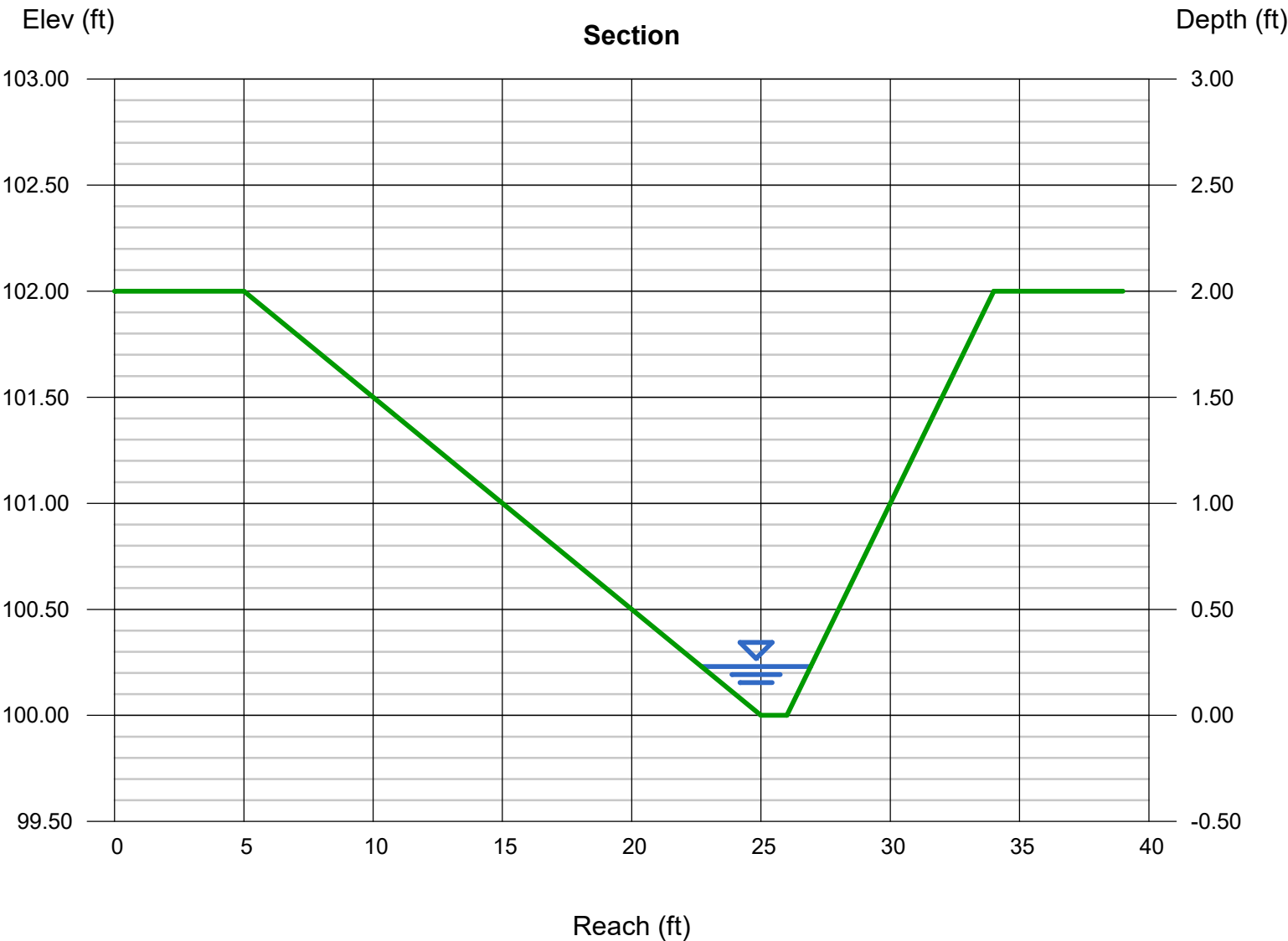
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 10.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 9.13
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.23
Q (cfs)	= 2.330
Area (sqft)	= 0.60
Velocity (ft/s)	= 3.88
Wetted Perim (ft)	= 4.26
Crit Depth, Yc (ft)	= 0.31
Top Width (ft)	= 4.22
EGL (ft)	= 0.46

Calculations

Compute by:	Known Q
Known Q (cfs)	= 2.33



Channel Report

Basin H06 - Swale @ 5.50%

Trapezoidal

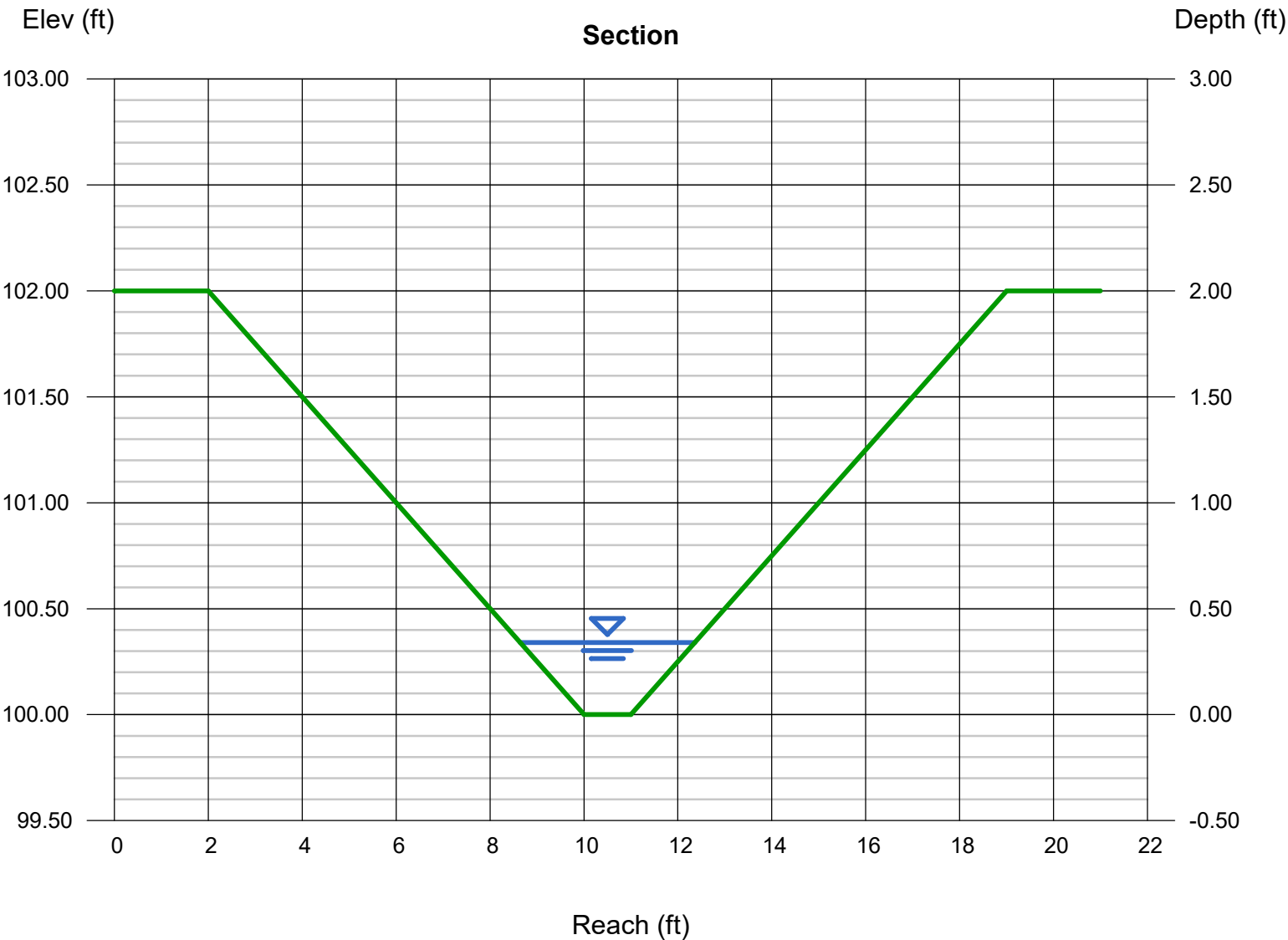
Bottom Width (ft) = 1.00
Side Slopes (z:1) = 4.00, 4.00
Total Depth (ft) = 2.00
Invert Elev (ft) = 100.00
Slope (%) = 5.50
N-Value = 0.030

Highlighted

Depth (ft) = 0.34
Q (cfs) = 3.150
Area (sqft) = 0.80
Velocity (ft/s) = 3.93
Wetted Perim (ft) = 3.80
Crit Depth, Yc (ft) = 0.42
Top Width (ft) = 3.72
EGL (ft) = 0.58

Calculations

Compute by: Known Q
Known Q (cfs) = 3.15



Channel Report

Basin H06 - Swale @ 15.69%

Trapezoidal

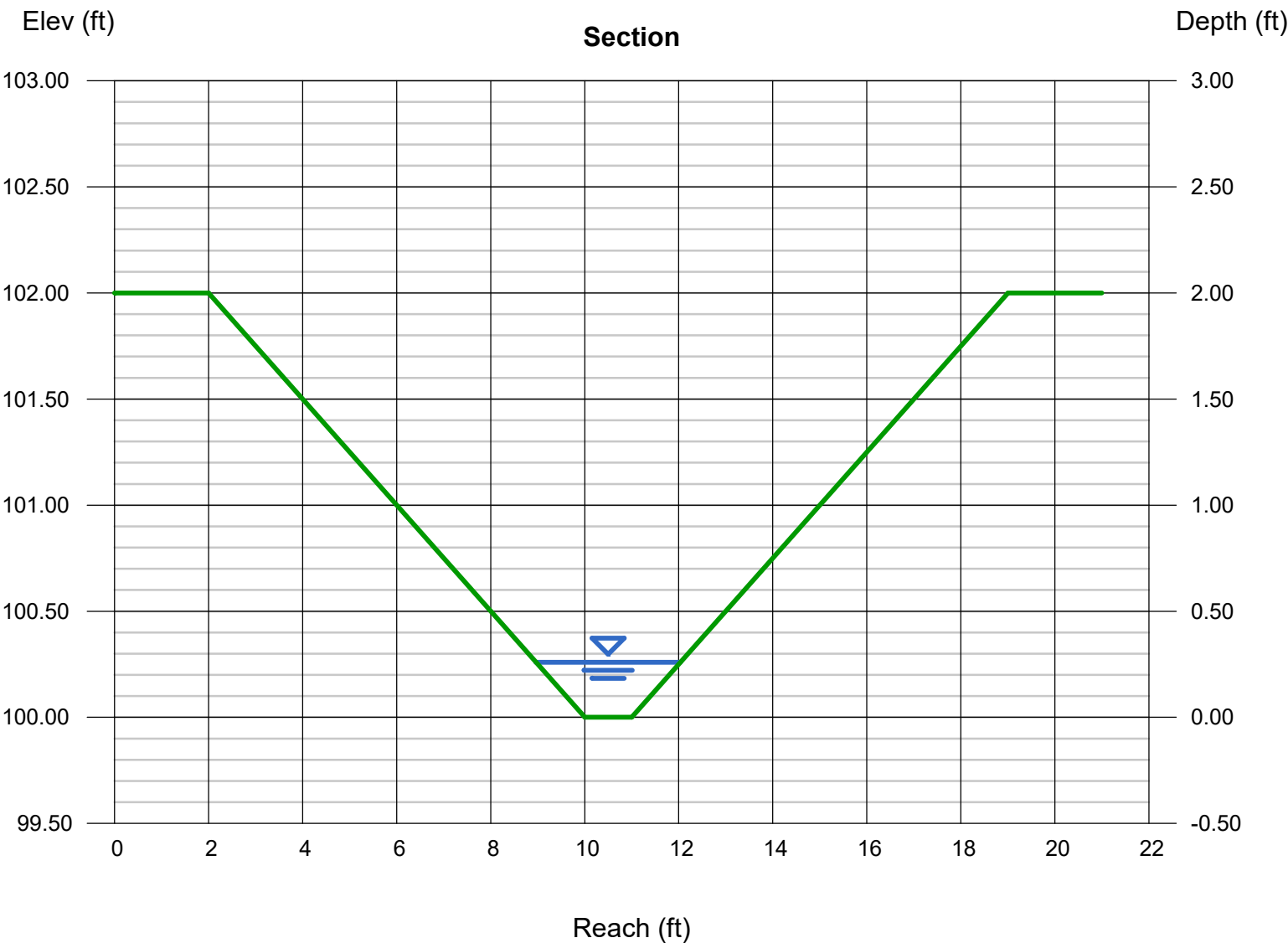
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 15.69
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.26
Q (cfs)	= 3.150
Area (sqft)	= 0.53
Velocity (ft/s)	= 5.94
Wetted Perim (ft)	= 3.14
Crit Depth, Yc (ft)	= 0.42
Top Width (ft)	= 3.08
EGL (ft)	= 0.81

Calculations

Compute by:	Known Q
Known Q (cfs)	= 3.15



Channel Report

Basin H07 - Swale @ 1.00%

Trapezoidal

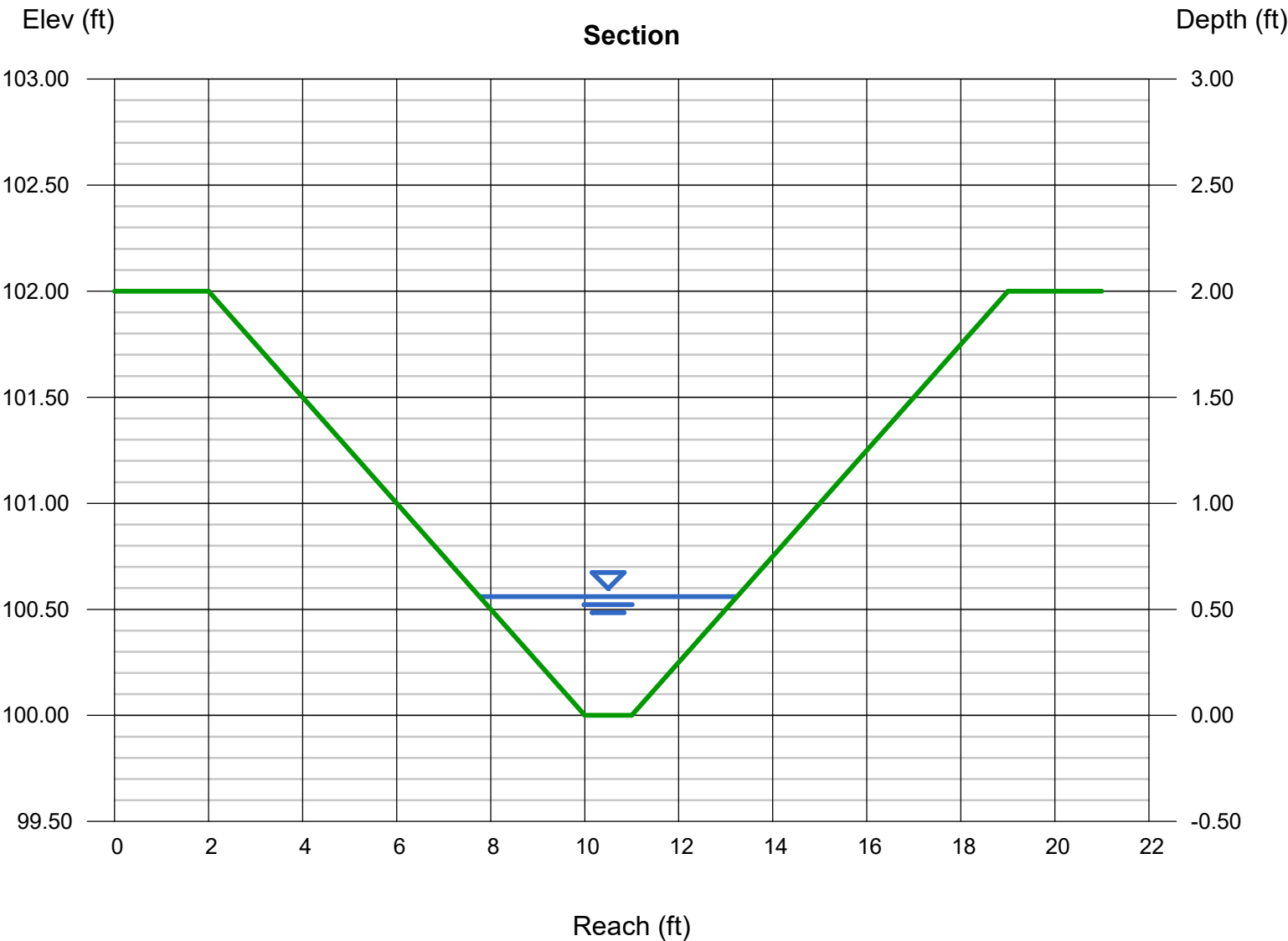
Bottom Width (ft) = 1.00
Side Slopes (z:1) = 4.00, 4.00
Total Depth (ft) = 2.00
Invert Elev (ft) = 100.00
Slope (%) = 1.00
N-Value = 0.030

Highlighted

Depth (ft) = 0.56
Q (cfs) = 4.090
Area (sqft) = 1.81
Velocity (ft/s) = 2.25
Wetted Perim (ft) = 5.62
Crit Depth, Yc (ft) = 0.47
Top Width (ft) = 5.48
EGL (ft) = 0.64

Calculations

Compute by: Known Q
Known Q (cfs) = 4.09



Channel Report

Basin H07 - Swale @ 7.42%

Trapezoidal

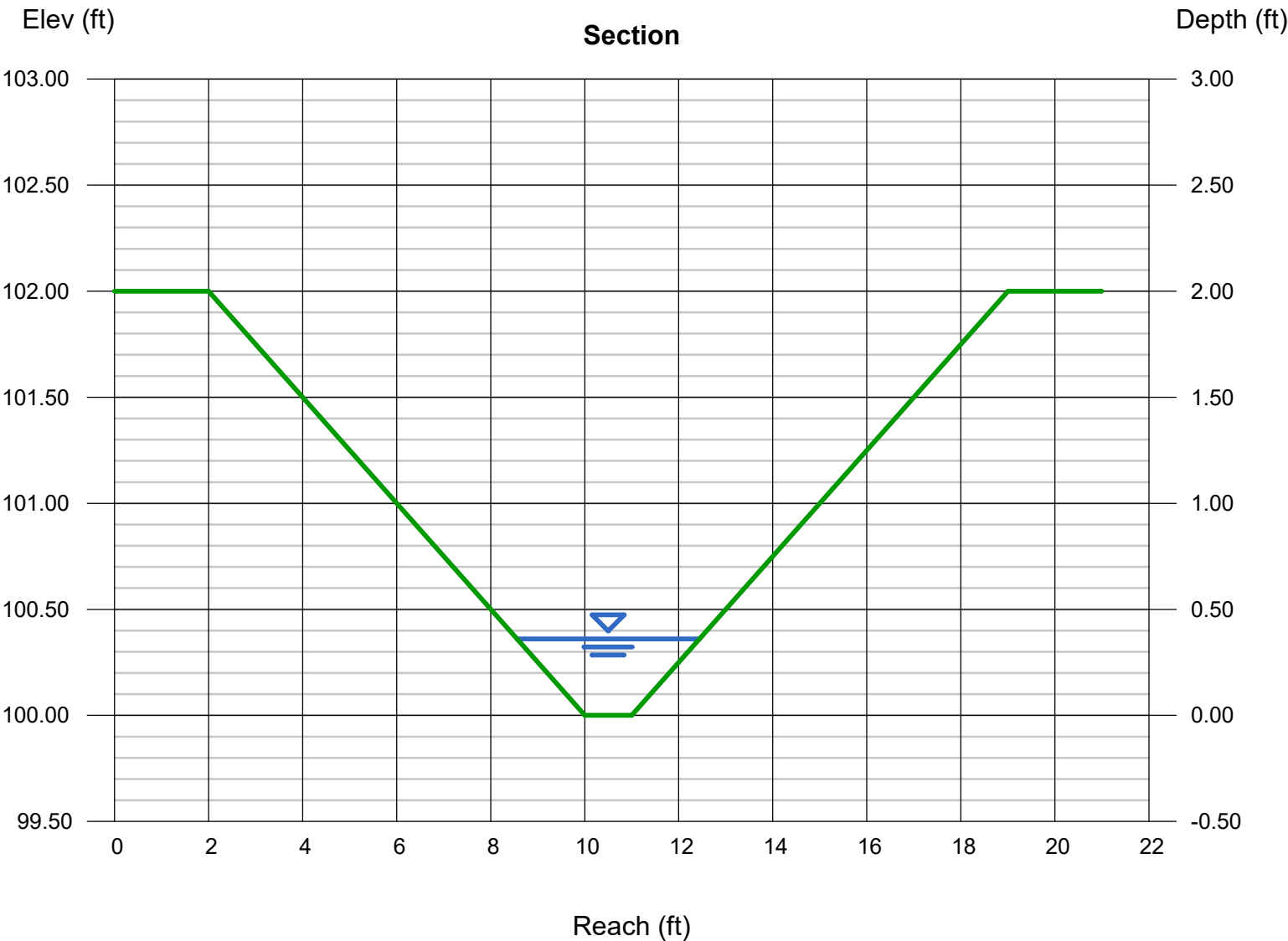
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 7.42
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.36
Q (cfs)	= 4.090
Area (sqft)	= 0.88
Velocity (ft/s)	= 4.66
Wetted Perim (ft)	= 3.97
Crit Depth, Yc (ft)	= 0.47
Top Width (ft)	= 3.88
EGL (ft)	= 0.70

Calculations

Compute by:	Known Q
Known Q (cfs)	= 4.09



Channel Report

Basin H08.1 - U-channel

User-defined

Invert Elev (ft) = 100.00
Slope (%) = 6.13
N-Value = 0.013

Calculations

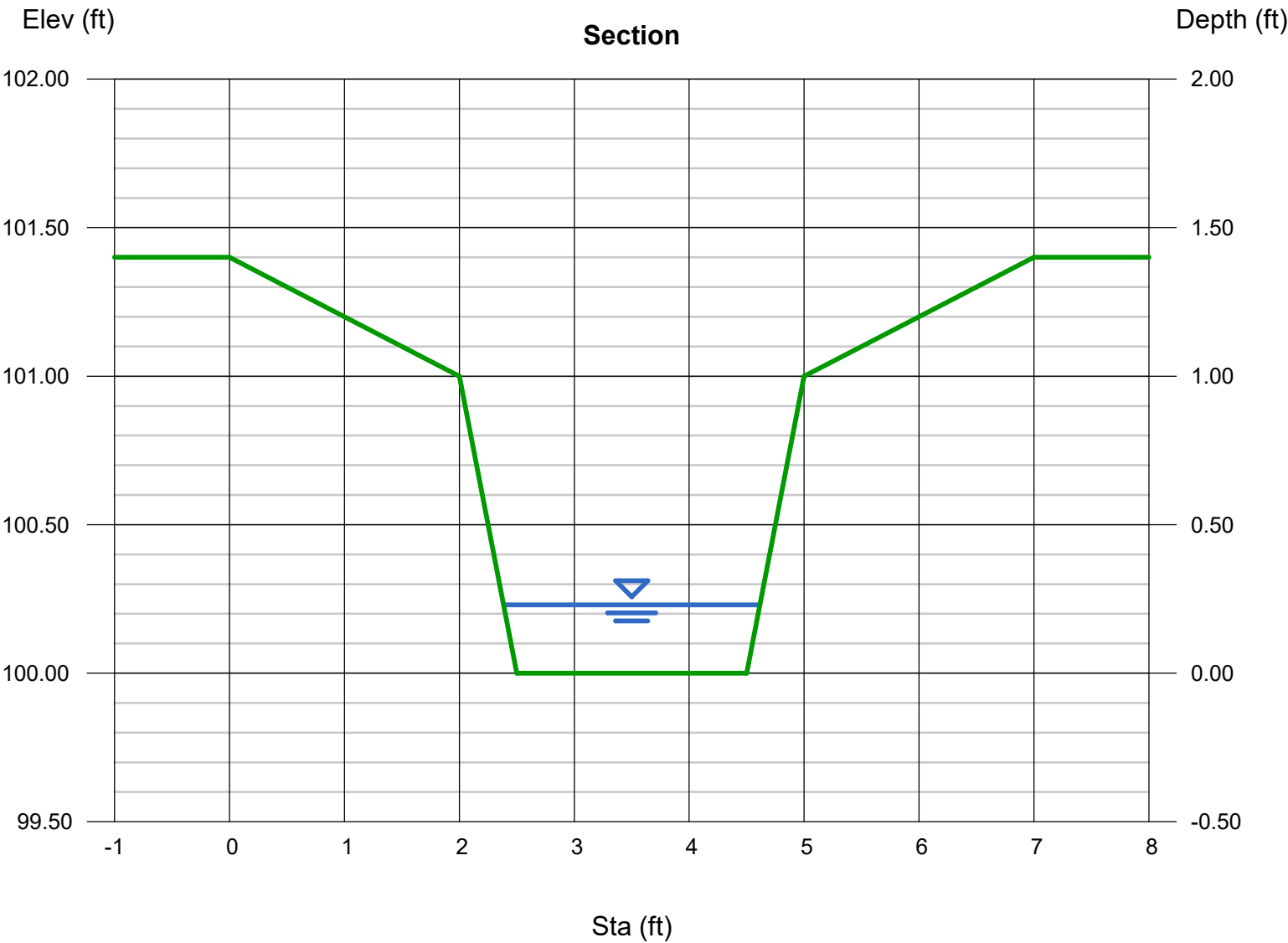
Compute by: Known Q
Known Q (cfs) = 4.43

Highlighted

Depth (ft) = 0.23
Q (cfs) = 4.430
Area (sqft) = 0.49
Velocity (ft/s) = 9.11
Wetted Perim (ft) = 2.51
Crit Depth, Yc (ft) = 0.52
Top Width (ft) = 2.23
EGL (ft) = 1.52

(Sta, El, n)-(Sta, El, n)...

(0.00, 101.40)-(2.00, 101.00, 0.013)-(2.50, 100.00, 0.013)-(4.50, 100.00, 0.013)-(5.00, 101.00, 0.013)-(7.00, 101.40, 0.013)



Channel Report

Basin H08.2 - U-channel

User-defined

Invert Elev (ft) = 100.00
Slope (%) = 9.44
N-Value = 0.013

Highlighted

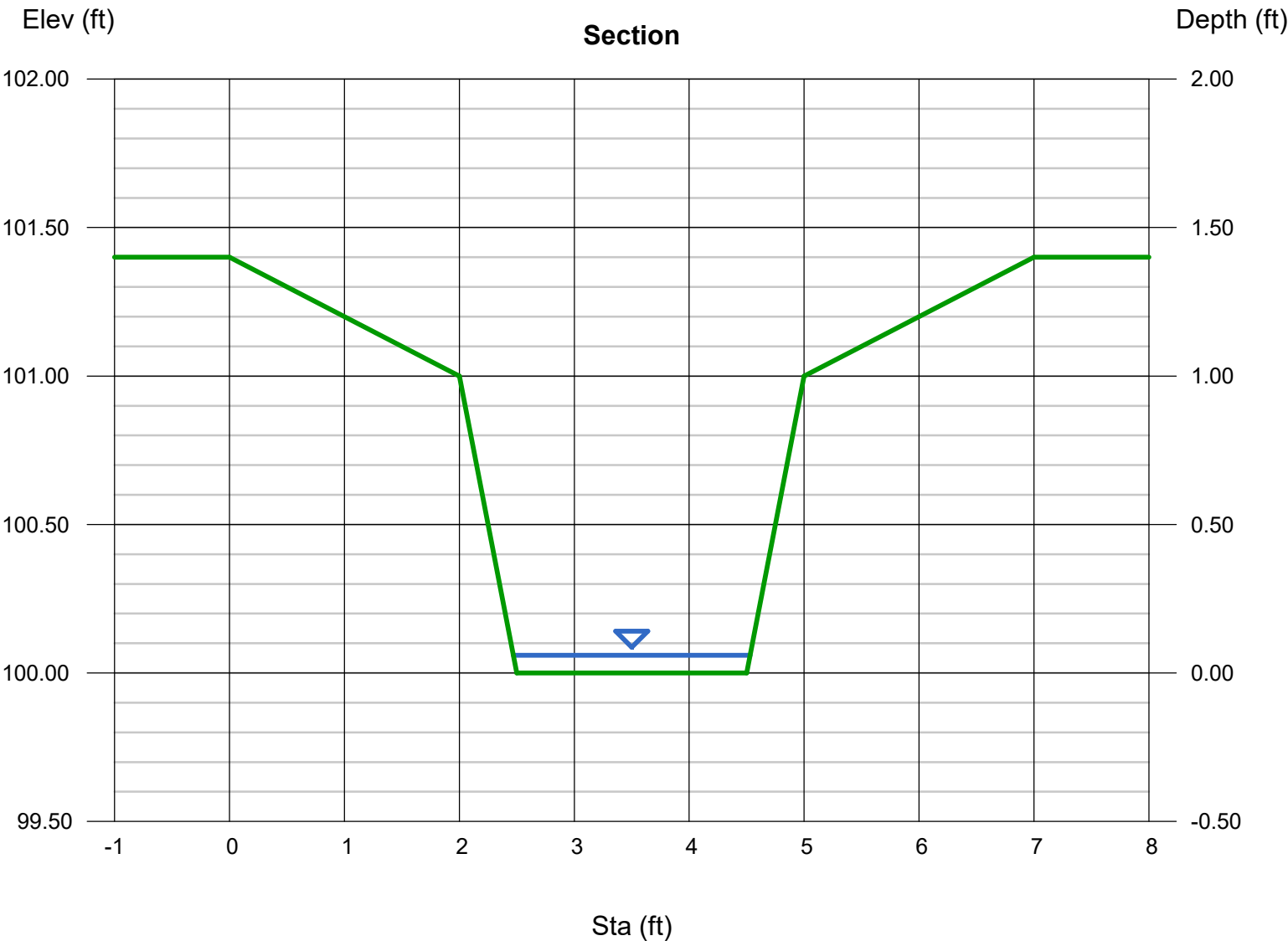
Depth (ft) = 0.06
Q (cfs) = 0.580
Area (sqft) = 0.12
Velocity (ft/s) = 4.76
Wetted Perim (ft) = 2.13
Crit Depth, Yc (ft) = 0.14
Top Width (ft) = 2.06
EGL (ft) = 0.41

Calculations

Compute by: Known Q
Known Q (cfs) = 0.58

(Sta, El, n)-(Sta, El, n)...

(0.00, 101.40)-(2.00, 101.00, 0.013)-(2.50, 100.00, 0.013)-(4.50, 100.00, 0.013)-(5.00, 101.00, 0.013)-(7.00, 101.40, 0.013)



Channel Report

Basin H11 - Swale J01 @ 1.85%

Trapezoidal

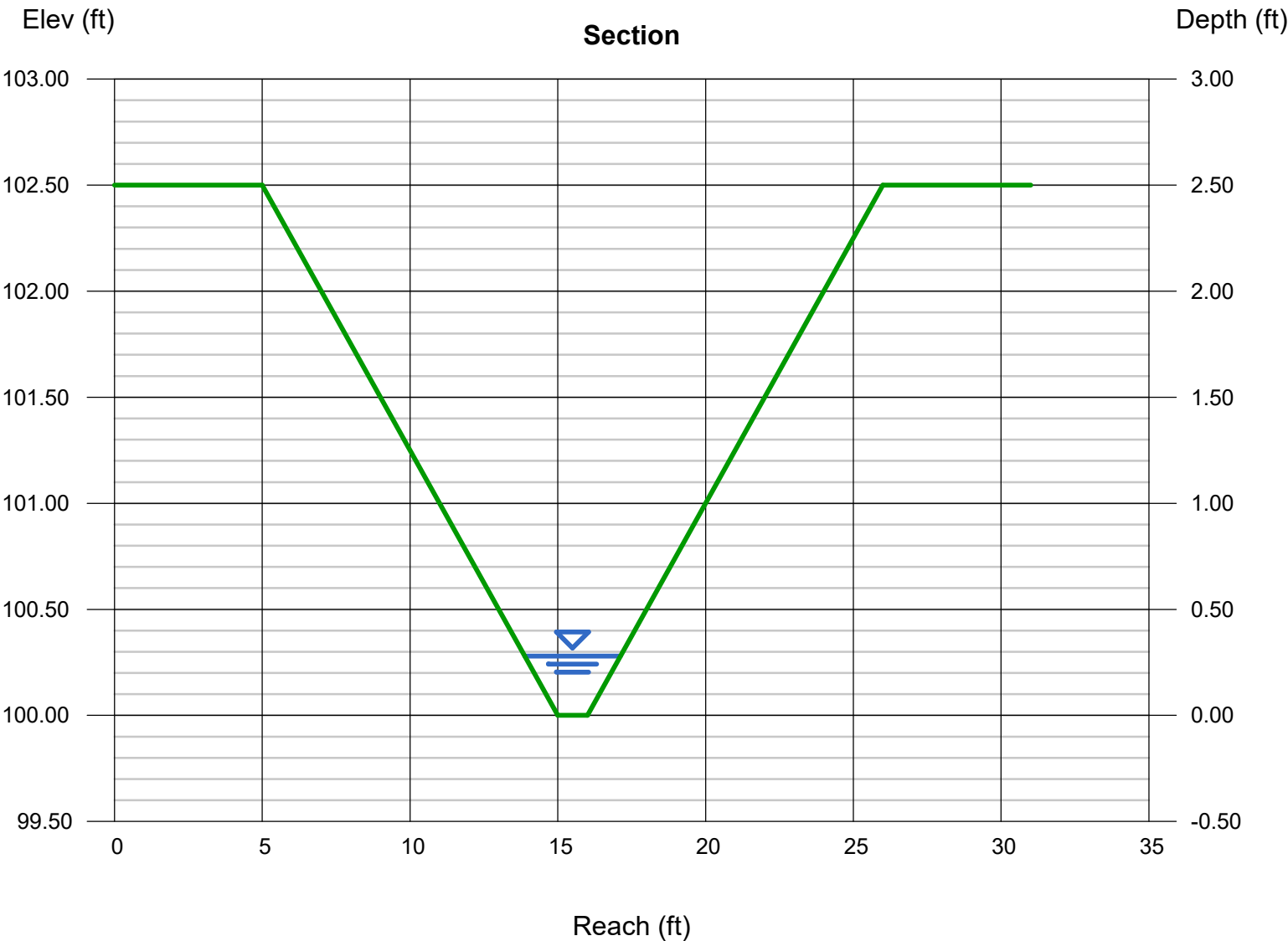
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 100.00
Slope (%)	= 1.85
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.28
Q (cfs)	= 1.270
Area (sqft)	= 0.59
Velocity (ft/s)	= 2.14
Wetted Perim (ft)	= 3.31
Crit Depth, Yc (ft)	= 0.27
Top Width (ft)	= 3.24
EGL (ft)	= 0.35

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.27



Channel Report

Basin H11 - Swale J01 @ 15.00%

Trapezoidal

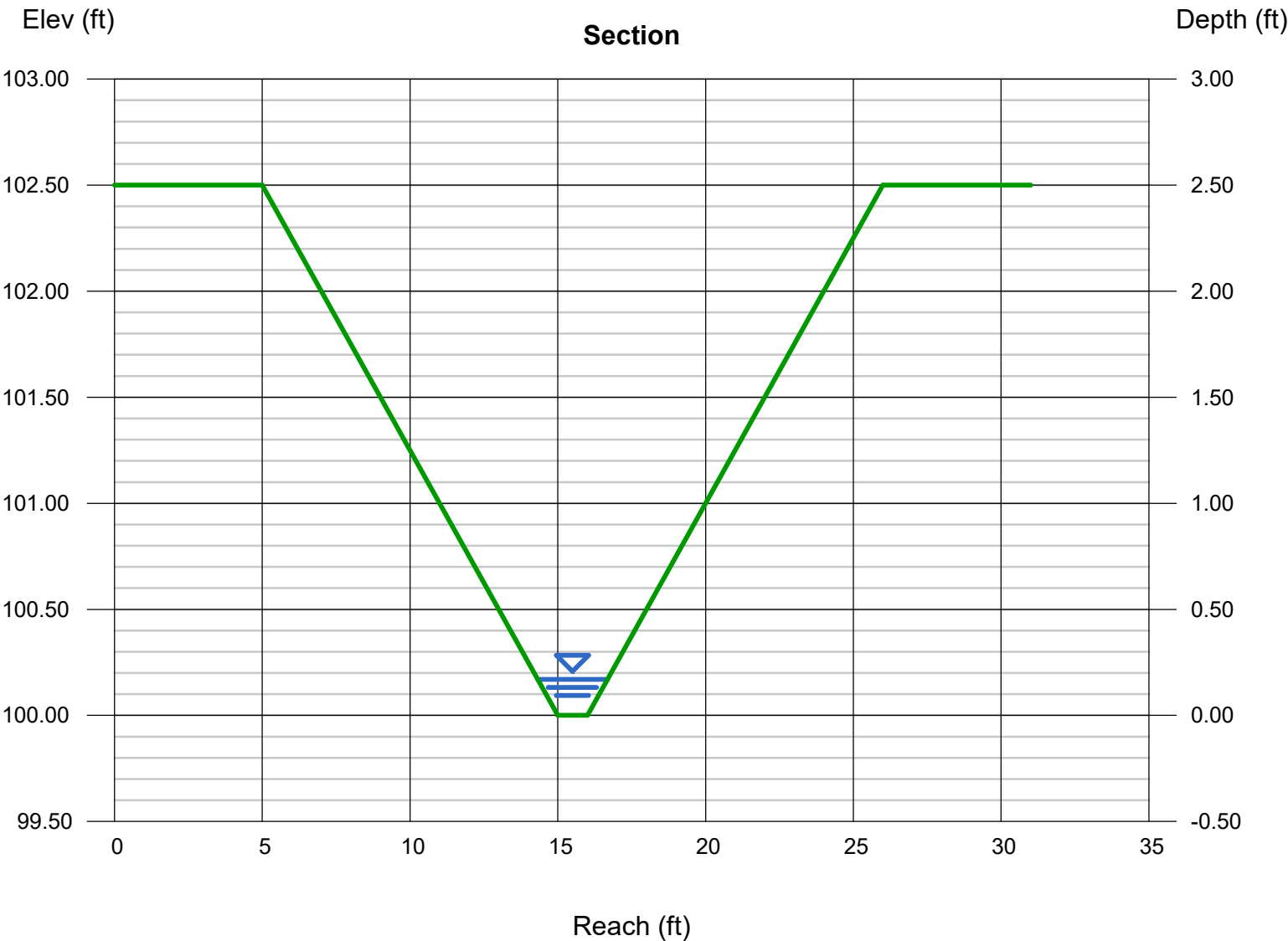
Bottom Width (ft)	= 1.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 100.00
Slope (%)	= 15.00
N-Value	= 0.030

Highlighted

Depth (ft)	= 0.17
Q (cfs)	= 1.270
Area (sqft)	= 0.29
Velocity (ft/s)	= 4.45
Wetted Perim (ft)	= 2.40
Crit Depth, Yc (ft)	= 0.27
Top Width (ft)	= 2.36
EGL (ft)	= 0.48

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.27



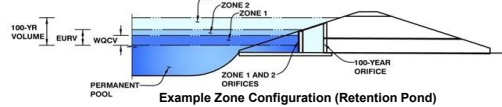
APPENDIX D

EXTENDED DETENTION BASIN/ WATER QUALITY ENHANCEMENT BMP'S

Pond H Outlet Structure Design Spreadsheets
Pond H Forebay Design Spreadsheets

MHFD-Detention, Version 4.07 (June 2025)

Basin ID: Pond H



Example Zone Configuration (Retention Pond)

Selected SCM Type =	EDB	
Watershed Area =	23.81	acres
Watershed Length =	1,840	ft
Watershed Length to Centroid =	808	ft
Watershed Slope =	0.058	ft/ft
Watershed Imperviousness =	42.60%	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
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Water Quality Capture Volume (WQCV) =	0.370	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	0.947	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.06 in.) =	0.929	acre-feet	1.06	inches
5-yr Runoff Volume (P1 = 1.43 in.) =	1.571	acre-feet	1.43	inches
10-yr Runoff Volume (P1 = 1.66 in.) =	2.009	acre-feet	1.66	inches
25-yr Runoff Volume (P1 = 1.69 in.) =	2.153	acre-feet		inches
50-yr Runoff Volume (P1 = 2.26 in.) =	3.297	acre-feet	2.26	inches
100-yr Runoff Volume (P1 = 2.6 in.) =	4.076	acre-feet	2.60	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	5.192	acre-feet		inches
Approximate 2-yr Detention Volume =	0.738	acre-feet		
Approximate 5-yr Detention Volume =	1.218	acre-feet		
Approximate 10-yr Detention Volume =	1.385	acre-feet		
Approximate 25-yr Detention Volume =	1.349	acre-feet		
Approximate 50-yr Detention Volume =	1.667	acre-feet		
Approximate 100-yr Detention Volume =	1.996	acre-feet		

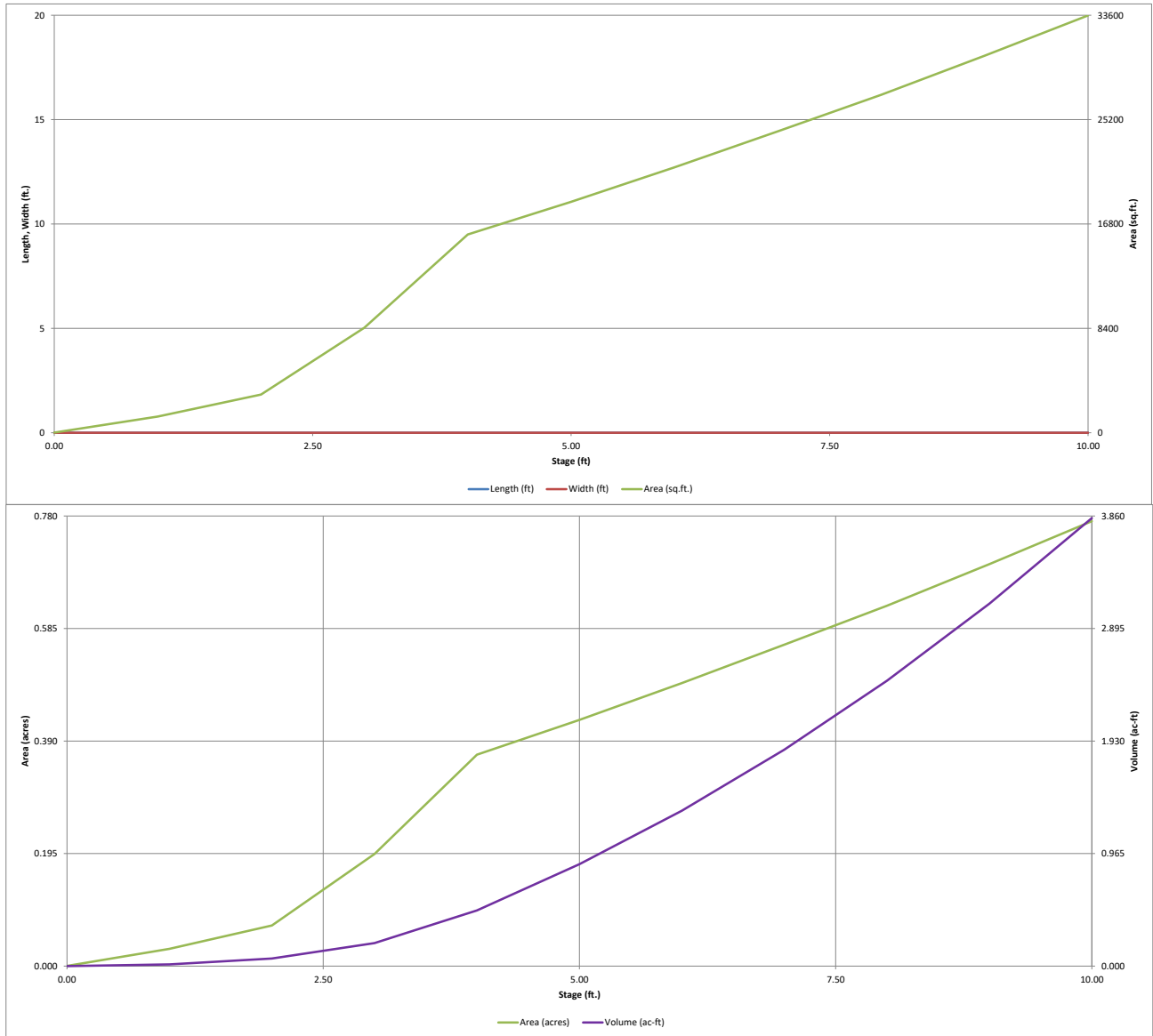
Zone 1 Volume (WQV_{C1}) =	0.370	acre-feet
Zone 2 Volume ($EURV - Zone 1$) =	0.577	acre-feet
Zone 3 ($100yr + 1/2 WQV_{C1} - Zones 1 \& 2$) =	1.233	acre-feet
Total Detention Basin Volume =	2.181	acre-feet
Initial Surge Volume (ISV) =	user	ft ³
Initial Surge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{TDA}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

Initial Surcharge Area (A_{ISV}) =	user	ft ²
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft ²
Volume of Basin Floor (V_{FLOOR}) =	user	ft ³
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft ²
Volume of Main Basin (V_{MAIN}) =	user	ft ³
Calculated Total Basin Volume (V_{TOTAL}) =	user	acre-feet

[illegible]

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.07 (June 2025)

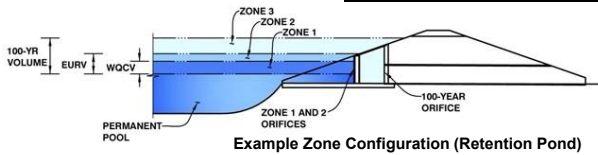


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)

Project: **Canyonside Filing 1, 3rd Amendment**

Basin ID: **Pond H**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.69	0.370	Orifice Plate
Zone 2 (EURV)	5.17	0.577	Rectangular Orifice
Zone 3 (100+1/2WQCV)	7.57	1.233	Weir&Pipe (Restrict)
Total (all zones)		2.181	

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

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

Calculated Parameters for Underdrain
Underdrain Orifice Area = ft²
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 SCM)

Centroid 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 = 1-1/8 inches)

Calculated Parameters for Plate
WQ Orifice Area per Row = ft²
Elliptical Half-Width = feet
Elliptical Slot Centroid = feet
Elliptical Slot Area = ft²

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	1.17	2.33					
Orifice Area (sq. inches)	1.05	1.05	1.05					

	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 Height = inches
Vertical Orifice Width = inches

Calculated Parameters for Vertical Orifice
Zone 2 Rectangular Not Selected
Vertical Orifice Area = ft²
Vertical Orifice Centroid = feet

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

Overflow Weir Front Edge Height, H_o = ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length = feet
Overflow Weir Grate Slope = H:V
Horiz. Length of Weir Sides = feet
Overflow Grate Type =
Debris Clogging % = %

Calculated Parameters for Overflow Weir
Zone 3 Weir Not Selected
Height of Grate Upper Edge, H_u = feet
Overflow Weir Slope Length = feet
Grate Open Area / 100-yr Orifice Area =
Overflow Grate Open Area w/o Debris = ft²
Overflow Grate Open Area w/ Debris = ft²

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)
Outlet Pipe Diameter = inches
Restrictor Plate Height Above Pipe Invert = inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate
Zone 3 Restrictor Not Selected
Outlet Orifice Area = ft²
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
Basin Volume at Top of Freeboard = acre-ft

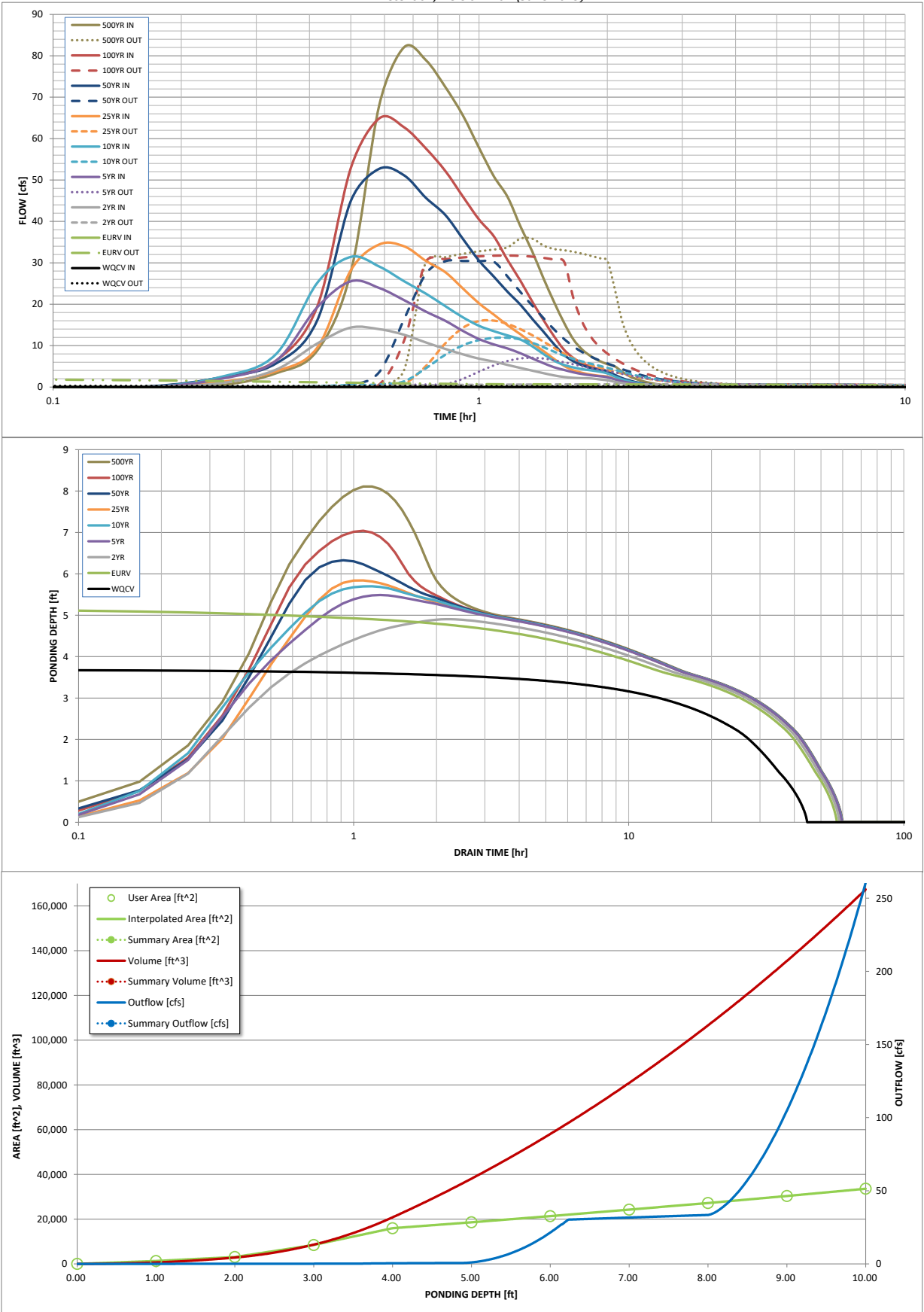
Routed Hydrograph Results

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	1.06	1.43	1.66	1.69	2.26	2.60	3.14
One-Hour Rainfall Depth (in) =	0.370	0.947	0.929	1.571	2.009	2.153	3.297	4.076	5.192
CUHP Runoff Volume (acre-ft) =	N/A	N/A	0.929	1.571	2.009	2.153	3.297	4.076	5.192
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	3.1	10.0	13.8	17.2	29.5	37.8	49.4
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	0.13	0.42	0.58	0.72	1.24	1.59	2.08
Peak Inflow Q (cfs) =	N/A	N/A	14.4	25.5	31.4	34.4	52.7	64.9	82.1
Peak Outflow Q (cfs) =	0.3	2.1	0.7	7.1	11.9	16.0	30.5	31.8	35.8
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.7	0.9	0.9	1.0	0.8	0.7
Structure Controlling Flow =	Vertical Orifice 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	0.10	0.00	0.4	0.7	0.9	1.8	1.9	2.0
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	39	46	48	45	43	43	38	35	32
Time to Drain 99% of Inflow Volume (hours) =	42	52	54	52	51	51	48	47	45
Maximum Ponding Depth (ft) =	3.69	5.17	4.90	5.49	5.70	5.84	6.33	7.04	8.11
Area at Maximum Ponding Depth (acres) =	0.31	0.44	0.42	0.46	0.47	0.48	0.51	0.56	0.63
Maximum Volume Stored (acre-ft) =	0.373	0.948	0.832	1.087	1.184	1.255	1.493	1.873	2.510

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)



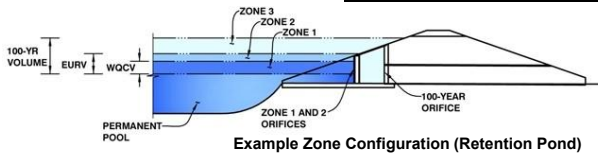
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)

Project: **Canyonside Filing 1, 3rd Amendment**

Basin ID: **Pond H**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.69	0.370	Orifice Plate
Zone 2 (EURV)	5.17	0.577	Rectangular Orifice
Zone 3 (100+1/2WQCV)	7.57	1.233	Weir&Pipe (Restrict)
Total (all zones)		2.181	

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

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

Calculated Parameters for Underdrain
Underdrain Orifice Area = ft²
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 SCM)

Centroid 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 = 1-1/8 inches)

Calculated Parameters for Plate
WQ Orifice Area per Row = ft²
Elliptical Half-Width = feet
Elliptical Slot Centroid = feet
Elliptical Slot Area = ft²

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	1.17	2.33					
Orifice Area (sq. inches)	1.05	1.05	1.05					

	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 Height = inches
Vertical Orifice Width = inches

Calculated Parameters for Vertical Orifice
Zone 2 Rectangular Not Selected
Vertical Orifice Area = ft²
Vertical Orifice Centroid = feet

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

Overflow Weir Front Edge Height, H_o = ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length = feet
Overflow Weir Gate Slope = H:V
Horiz. Length of Weir Sides = feet
Overflow Gate Type =
Debris Clogging % = %

Calculated Parameters for Overflow Weir
Zone 3 Weir Not Selected
Height of Gate Upper Edge, H_u = feet
Overflow Weir Slope Length = feet
Gate Open Area / 100-yr Orifice Area =
Overflow Gate Open Area w/o Debris = ft²
Overflow Gate Open Area w/ Debris = ft²

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)
Outlet Pipe Diameter = inches
Restrictor Plate Height Above Pipe Invert = inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate
Zone 3 Restrictor Not Selected
Outlet Orifice Area = ft²
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
Basin Volume at Top of Freeboard = acre-ft

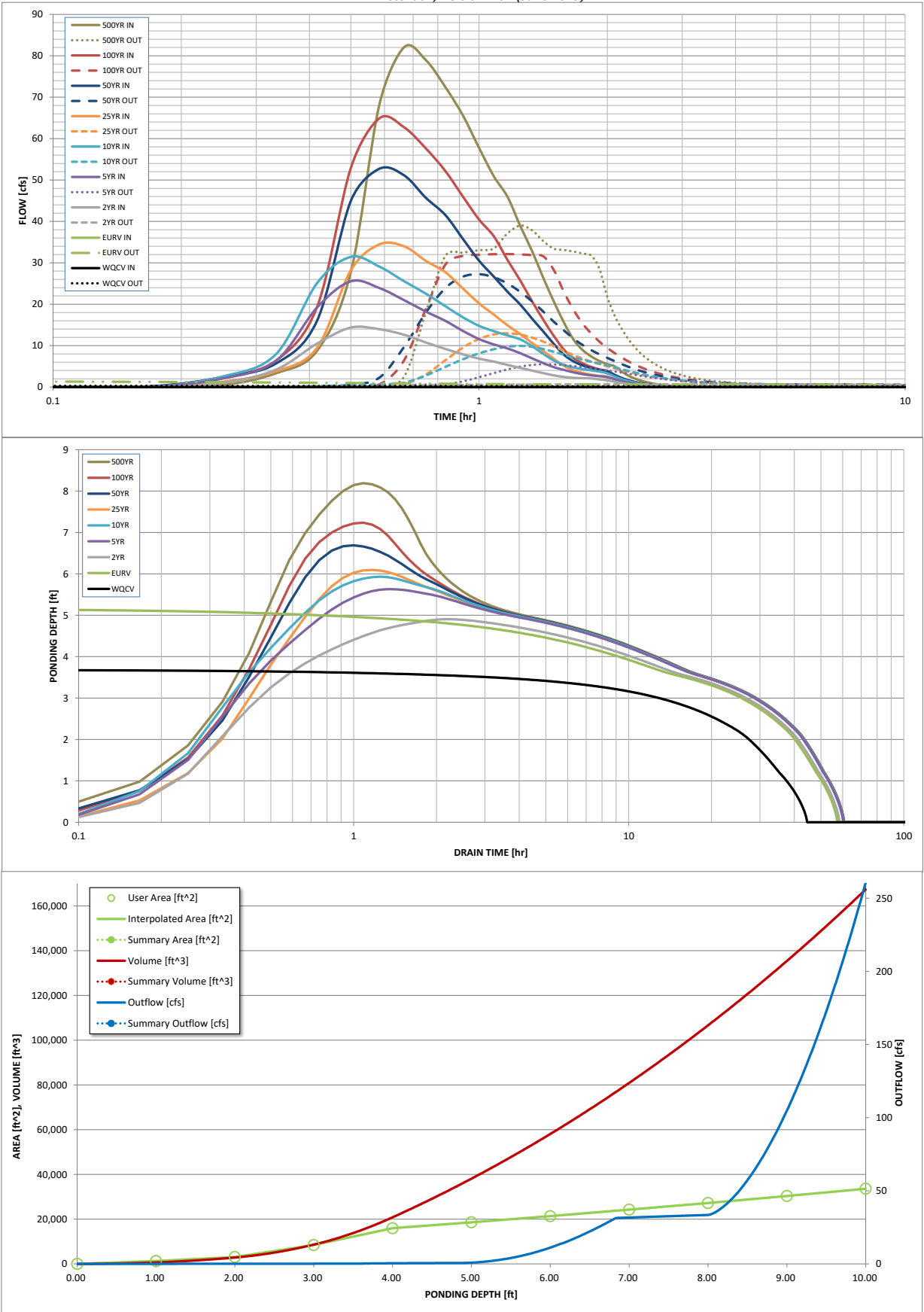
Routed Hydrograph Results

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	1.06	1.43	1.66	1.69	2.26	2.60	3.14
One-Hour Rainfall Depth (in) =	0.370	0.947	0.929	1.571	2.009	2.153	3.297	4.076	5.192
CUHP Runoff Volume (acre-ft) =	N/A	N/A	0.929	1.571	2.009	2.153	3.297	4.076	5.192
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	3.1	10.0	13.8	17.2	29.5	37.8	49.4
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	0.13	0.42	0.58	0.72	1.24	1.59	2.08
Peak Inflow Q (cfs) =	N/A	N/A	14.4	25.5	31.4	34.4	52.7	64.9	82.1
Peak Outflow Q (cfs) =	0.3	1.5	0.7	5.5	9.9	13.0	27.3	32.1	39.0
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.5	0.7	0.8	0.9	0.8	0.8
Structure Controlling Flow =	Vertical Orifice 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Gate 1 (fps) =	N/A	0.05	0.00	0.3	0.6	0.7	1.6	1.9	2.0
Max Velocity through Gate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	39	47	48	46	44	43	39	36	33
Time to Drain 99% of Inflow Volume (hours) =	42	52	54	53	52	51	49	47	46
Maximum Ponding Depth (ft) =	3.69	5.17	4.90	5.63	5.93	6.10	6.69	7.24	8.19
Area at Maximum Ponding Depth (acres) =	0.31	0.44	0.42	0.47	0.49	0.50	0.54	0.57	0.64
Maximum Volume Stored (acre-ft) =	0.373	0.948	0.832	1.156	1.299	1.377	1.682	1.987	2.567

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)



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

Site Layout

SCM Design, Version 4.02 (June 2025)

Designer: **JV**

Company: **Terracina Design**

Date: **July 15, 2026**

Project: **Canyonside Filing 1, 3rd Amendment**

Location: **Castle Pines, CO**

SITE LAYOUT INFO (User Input in Blue Cells)

Water Quality Event (WQE) inches

Outfall ID	Pond H											
Total Tributary Area (ft ²)	1,037,164											
Total Tributary Area (ac)	23.81											
Imperviousness (%)	42.6%											
MS4 Design Standard	WQCV											
SCM Type	EDB											

Notes:

OUTFALL RESULTS

SCM Worksheet Name	EDB_Pond H											
Untreated Area (ft ³)	0											
Default WQCV (ft ³)	16,134											
Optional Override WQCV (ft ³)												
WQCV Reduction (ft ³)	0											
Remaining WQCV (ft ³)	16,134											
WQCV Reduction (%)	0%											
Design WQCV of SCM (ft ³)	0											
Pollutant Removal (ft ³)	0											
Untreated WQCV (ft ³)	16,134											

TOTAL SITE RESULTS (Sums results from all Outfalls)

Total Site Area	1,037,164	ft ²	23.81	acres
Treated Area	1,037,164	ft ²	23.81	acres
Untreated Area	0	ft ²	0.00	acres
Total Site Imperviousness	42.6%	%		
Default (or Override) WQCV	16,134	ft ³	0.370	acre-feet
Remaining WQCV	16,134	ft ³	0.370	acre-feet
WQCV Reduction	0%	%		
Design WQCV	0	ft ³	0.000	acre-feet
Untreated WQCV	16,134	ft ³	0.370	acre-feet

Extended Detention Basin (EDB)

SCM Design, Version 4.02 (June 2025)

Designer: JV
Company: Terracina Design
Date: July 15, 2026
Project: Canyonside Filing 1, 3rd Amendment
Location: Castle Pines, CO
Outfall ID: Pond H

1. Inlet and Forebay

A) Is RPA (GB/GS) used for Runoff Reduction upstream of SCM?

NO

Define inflow points for all areas tributary to the SCM below.

B) Inflow Points contributing to SCM (max 8)

Inflow Design Point ID	FBAY-01	FBAY-02						
Tributary Area to Inflow Point (ft ²)	552,776	484,387						
Imperviousness above Inflow Point (%)	35.9%	50.4%						
Default WQCV for Inflow Point (ft ³)	7,774	8,370						
Optional Override WQCV for Inflow Point (ft ³)								
WQCV Reduction above Inflow Point (ft ³)	0	0						
Remaining WQCV at Inflow Point (ft ³)	7,774	8,370						
Will pretreatment be provided with a Sedimentation MTD (HDS)	NO	NO						
Paired Pretreatment HDS Worksheet Name	--	--						
Sheet or Concentrated Flow	Conc	Conc						

C) Sheet Flow

Select sheet flow inflow feature	--	--						
Is Concrete Edger used?	--	--						
Spacing between slots, recommend ≤ 2 ft on center (ft)	--	--						
Slot Opening Length, recommend 1.5 (in)	--	--						
Select type of blind swale used to distribute flow	--	--						
Select energy dissipation method for level spreader	--	--						
Height of drop, recommend 2 to 3 (in)	--	--						
Is concrete mowing strip provided to facilitate maintenance?	--	--						

D) Concentrated Flow

Select concentrated flow inflow feature	Pipe	Pipe						
Is downspout extension needed to bridge backfill zone?	--	--						
Depth of gutter flow line depression for curb opening, recommend 3 (in)	--	--						
Curb opening inlet width (ft)	--	--						
Height of drop to sediment pad/forebay, recommend ≥ 1 (in)	--	--						
Select energy dissipation method for downspouts and/or curb openings.	--	--						
Select energy dissipation method for swales, channels, and piped outfalls	Riprap	Riprap						

v) Forebay

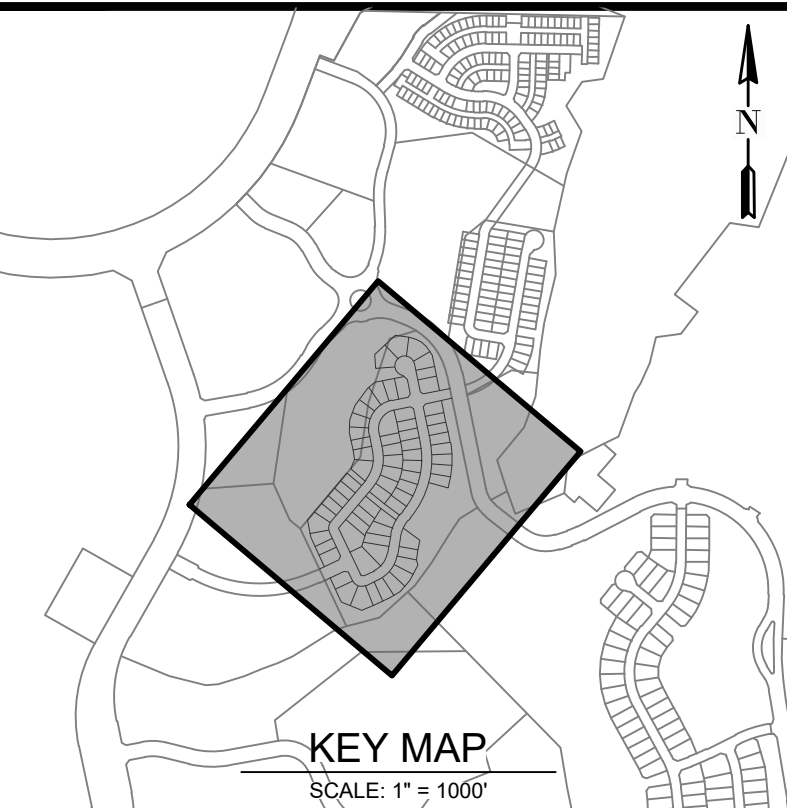
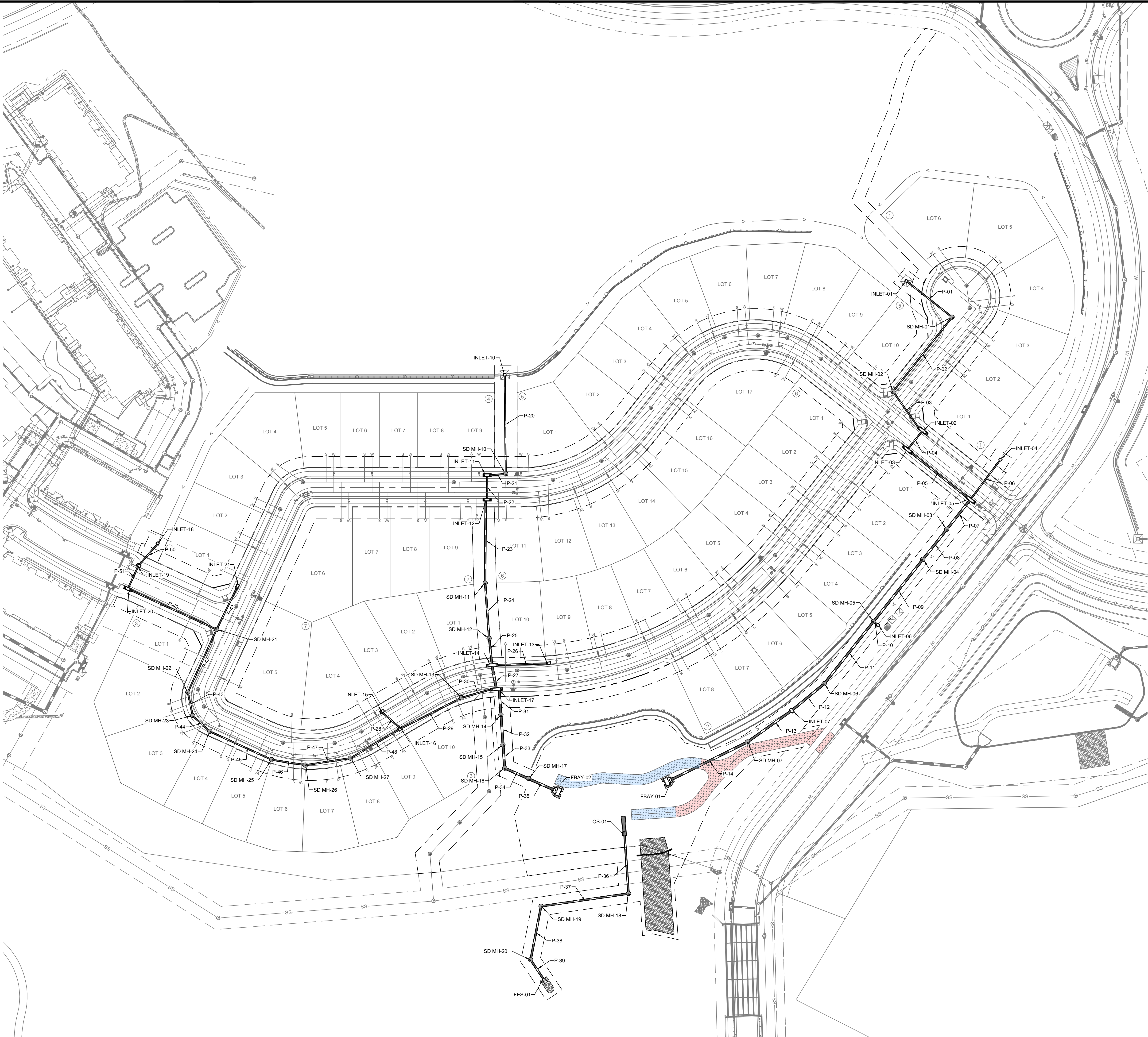
Impervious area tributary to concentrated inflow location (ft ²)	198,447	244,131						
Forebay Type (Concrete Sediment Pad sufficient for Imp Area ≤ 2 acre)	Forebay	Forebay						
Minimum Forebay Volume (ft ³)	78	84						
Design Forebay Volume (ft ³)	96.85	96.85						
Maximum Forebay Depth (in)	15.00	18.00						
Design Forebay Depth (in)	15.00	15.00						
Rectangular Weir Notch Width to Empty Forebay in 5-minutes (in)	1.71	1.84						
Design Notch Width (in)	1.70	1.70						
Forebay Drain Time (minutes)	5.0	5.4						

APPENDIX E

STORMCAD

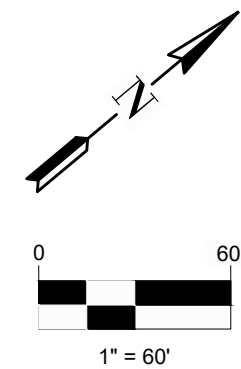
StormCAD Key Map
StormCAD Output Tables

9/31/2021 1:15 PM EDUARDO TORRES-GARCIA X:\NORTH CANYONS\DOCUMENTS\REPORTS\DRAINAGE\07 - CANYONSIDE F1, 3RD AMENDMENT-STORM CAD\STORMCAD KEYMAP.DWG



STORMCAD KEYMAP

CANYONSIDE FILING 1,
3RD AMENDMENT



STORMCAD OUTPUT TABLES

Storm Line H - 5-Year

Catchment Table - Time: 0.00 hours

Label	Outflow Element	Area (acres)	Runoff Coeff.	Time of C (min)	Catchment CA (acres)	Intensity (in/h)	Flow (cfs)
H01	INLET-01	4.400	0.110	15.900	0.484	2.473	1.21
H01.1	INLET-01	1.620	0.150	6.700	0.243	3.491	0.86
H02	INLET-02	2.910	0.550	8.200	1.601	3.263	5.26
H03	INLET-03	1.830	0.590	5.800	1.080	3.647	3.97
H04	INLET-04	0.420	0.310	5.000	0.130	3.799	0.50
H05	INLET-05	0.190	0.620	5.000	0.118	3.799	0.45
H06	INLET-06	0.600	0.390	7.300	0.234	3.396	0.80
H07	INLET-07	0.710	0.380	5.100	0.270	3.779	1.03
H08.1	INLET-10	1.360	0.100	13.000	0.136	2.715	0.37
H08.2	INLET-10	0.130	0.160	7.200	0.021	3.411	0.07
H09	INLET-11	1.410	0.510	7.700	0.719	3.335	2.42
H10	INLET-12	0.700	0.580	5.900	0.406	3.629	1.49
H11	INLET-18	0.250	0.200	5.000	0.050	3.799	0.19
H12	INLET-19	0.050	0.510	5.000	0.026	3.799	0.10
H13	INLET-21	0.700	0.570	7.100	0.399	3.427	1.38
H14	INLET-20	0.170	0.600	5.000	0.102	3.799	0.39
H15	INLET-15	0.960	0.590	5.000	0.566	3.799	2.17
H16	INLET-16	0.880	0.580	5.000	0.510	3.799	1.95
H17	INLET-13	1.040	0.580	8.800	0.603	3.181	1.93
H18	INLET-14	1.350	0.540	7.500	0.729	3.365	2.47
H19	INLET-17	0.450	0.610	6.100	0.275	3.593	0.99

Catch Basin Table - Time: 0.00 hours

Label	Rim (ft)	Invert (ft)	Flow (cfs)	HGL (In) (ft)	HGL (Out) (ft)	Inlet Location	Notes
INLET-01	6,282.27	6,278.39	1.81	6,278.59	6,278.59	In Sag	TYPE C INLET
INLET-02	6,277.17	6,267.55	5.26	6,268.02	6,268.02	In Sag	15' TYPE R INLET
INLET-03	6,277.12	6,266.45	3.97	6,266.94	6,266.94	In Sag	15' TYPE R INLET
INLET-04	6,272.84	6,265.54	0.50	6,265.80	6,265.80	In Sag	TYPE C INLET
INLET-05	6,273.81	6,262.61	0.45	6,263.61	6,263.61	In Sag	15' TYPE R INLET
INLET-06	6,253.38	6,250.74	0.80	6,251.07	6,251.07	In Sag	TYPE C INLET
INLET-07	6,252.01	6,247.64	1.03	6,248.69	6,248.69	In Sag	TYPE D INLET
INLET-10	6,301.03	6,293.64	0.43	6,293.86	6,293.86	In Sag	TYPE C INLET
INLET-11	6,291.89	6,283.01	2.42	6,283.58	6,283.58	In Sag	10' TYPE R INLET
INLET-12	6,291.88	6,281.94	1.49	6,282.58	6,282.58	In Sag	10' TYPE R INLET
INLET-13	6,278.51	6,273.91	1.93	6,273.01	6,273.01	In Sag	5' TYPE R INLET
INLET-14	6,277.87	6,267.53	2.47	6,268.39	6,268.39	In Sag	15' TYPE R INLET
INLET-15	6,280.35	6,271.56	2.17	6,272.12	6,272.12	In Sag	5' TYPE R INLET
INLET-16	6,280.16	6,270.32	1.95	6,271.21	6,271.21	In Sag	5' TYPE R INLET
INLET-17	6,277.87	6,266.87	0.99	6,268.02	6,268.02	In Sag	15' TYPE R INLET
INLET-18	6,291.09	6,287.23	0.19	6,287.39	6,287.39	In Sag	TYPE C INLET
INLET-19	6,289.87	6,286.22	0.10	6,286.42	6,286.42	In Sag	5' TYPE R INLET
INLET-20	6,289.84	6,285.42	0.39	6,285.72	6,285.72	In Sag	10' TYPE R INLET
INLET-21	6,292.35	6,282.08	1.38	6,282.52	6,282.52	In Sag	5' TYPE R INLET
OS-01	6,244.03	6,241.66	0.00	6,242.49	6,242.49	In Sag	OUTLET STRUCTURE

STORMCAD OUTPUT TABLES

Storm Line H - 5-Year

Manhole Table - Time: 0.00 hours

Label	Flow (cfs)	Headloss (ft)	Elevation (Rim) (ft)	HGL (In) (ft)	HGL (Out) (ft)	Notes	Headloss Method	AASHTO Shaping Method
SD MH-01	1.80	0.15	6,283.94	6,275.16	6,275.01	5' DIA MH	AASHTO	Full
SD MH-02	1.79	0.15	6,279.23	6,269.45	6,269.30	5' DIA MH	AASHTO	Full
SD MH-03	8.86	0.00	6,269.39	6,259.11	6,259.11	5' DIA MH	AASHTO	Full
SD MH-04	8.84	0.00	6,266.00	6,254.65	6,254.65	5' DIA MH	AASHTO	Full
SD MH-05	9.36	0.28	6,256.04	6,250.86	6,250.58	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-06	9.29	0.16	6,252.57	6,249.48	6,249.32	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-07	9.85	0.13	6,253.82	6,248.00	6,247.87	5' DIA MH	AASHTO	Full
SD MH-10	0.42	0.85	6,292.14	6,286.23	6,285.38	5' DIA MH	AASHTO	Full
SD MH-11	3.42	0.10	6,284.85	6,275.67	6,275.57	5' DIA MH	AASHTO	Full
SD MH-12	3.41	0.10	6,279.64	6,271.04	6,270.94	5' DIA MH	AASHTO	Full
SD MH-13	5.31	0.21	6,278.31	6,269.61	6,269.40	5' DIA MH	AASHTO	Full
SD MH-14	12.00	0.00	6,275.71	6,262.62	6,262.62	5' DIA MH	AASHTO	Full
SD MH-15	11.98	0.00	6,268.78	6,257.02	6,257.02	5' DIA MH	AASHTO	Full
SD MH-16	11.96	0.00	6,263.59	6,251.77	6,251.77	5' DIA MH	AASHTO	Full
SD MH-17	11.94	0.00	6,256.74	6,247.40	6,247.40	5' DIA MH	AASHTO	Full
SD MH-18	5.50	0.20	6,245.02	6,241.60	6,241.40	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-19	5.50	0.00	6,245.08	6,234.17	6,234.17	5' DIA MH	AASHTO	Full
SD MH-20	5.50	0.63	6,235.84	6,231.82	6,231.19	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-21	1.97	0.08	6,290.96	6,281.10	6,281.03	5' DIA MH	AASHTO	Full
SD MH-22	1.95	0.13	6,288.86	6,278.97	6,278.84	5' DIA MH	AASHTO	Full
SD MH-23	1.94	0.13	6,287.79	6,278.08	6,277.95	5' DIA MH	AASHTO	Full
SD MH-24	1.94	0.11	6,286.74	6,277.19	6,277.07	5' DIA MH	AASHTO	Full
SD MH-25	1.91	0.11	6,283.70	6,275.03	6,274.92	5' DIA MH	AASHTO	Full
SD MH-26	1.90	0.11	6,282.87	6,273.85	6,273.74	5' DIA MH	AASHTO	Full
SD MH-27	1.89	0.11	6,281.75	6,272.36	6,272.24	5' DIA MH	AASHTO	Full

STORMCAD OUTPUT TABLES

Storm Line H - 5-Year

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (ft)	Slope (%)	Dia (in)	Mann	Flow (cfs)	Velo (ft/s)	Depth (ft)	Capacity (cfs)	Froude No.	HGL (In) (ft)	HGL (Out) (ft)
P-01	INLET-01	SD MH-01	6,278.08	6,274.70	77.7	4.35	18.0	0.013	1.81	7.50	0.29	21.90	2.930	6,278.59	6,274.99
P-02	SD MH-01	SD MH-02	6,274.50	6,269.00	126.4	4.35	18.0	0.013	1.80	7.49	0.29	21.91	2.930	6,275.01	6,269.29
P-03	SD MH-02	INLET-02	6,268.80	6,267.30	60.7	2.47	18.0	0.013	1.79	6.11	0.33	16.51	2.227	6,269.30	6,268.02
P-04	INLET-02	INLET-03	6,267.10	6,266.41	27.9	2.47	18.0	0.013	5.69	8.49	0.61	16.52	2.216	6,268.02	6,267.06
P-05	INLET-03	INLET-05	6,265.91	6,263.10	105.4	2.67	24.0	0.013	8.32	9.49	0.65	36.94	2.444	6,266.94	6,263.75
P-06	INLET-04	INLET-05	6,265.54	6,263.61	64.4	3.00	18.0	0.013	0.50	4.48	0.17	18.19	2.310	6,265.80	6,263.78
P-07	INLET-05	SD MH-03	6,262.61	6,260.62	52.6	3.79	30.0	0.013	8.88	10.73	0.56	79.89	3.007	6,263.61	6,261.20
P-08	SD MH-03	SD MH-04	6,258.12	6,256.16	51.5	3.79	30.0	0.013	8.86	10.73	0.56	79.89	3.006	6,259.11	6,256.75
P-09	SD MH-04	SD MH-05	6,253.66	6,249.66	105.4	3.79	30.0	0.013	8.84	10.72	0.56	79.89	3.006	6,254.65	6,250.86
P-10	INLET-06	SD MH-05	6,250.74	6,250.66	7.5	1.00	18.0	0.013	0.80	3.51	0.28	10.50	1.402	6,251.07	6,250.95
P-11	SD MH-05	SD MH-06	6,249.56	6,248.50	105.8	1.00	30.0	0.013	9.36	6.77	0.81	41.01	1.553	6,250.58	6,249.31
P-12	SD MH-06	INLET-07	6,248.30	6,247.74	56.2	1.00	30.0	0.013	9.29	6.76	0.81	41.01	1.554	6,249.32	6,248.56
P-13	INLET-07	SD MH-07	6,247.64	6,246.92	72.1	1.00	30.0	0.013	9.89	6.88	0.84	41.01	1.552	6,248.69	6,248.00
P-14	SD MH-07	FBAY-01	6,246.82	6,245.71	111.0	1.00	30.0	0.013	9.85	6.87	0.83	41.01	1.552	6,247.87	6,246.55
P-20	INLET-10	SD MH-10	6,293.62	6,286.14	132.0	5.67	18.0	0.013	0.43	5.35	0.14	25.00	3.095	6,293.86	6,286.28
P-21	SD MH-10	INLET-11	6,285.14	6,284.00	20.1	5.67	18.0	0.013	0.42	5.33	0.14	25.00	3.093	6,285.38	6,284.14
P-22	INLET-11	INLET-12	6,283.00	6,282.43	28.0	2.04	18.0	0.013	2.36	6.19	0.40	14.99	2.036	6,283.58	6,282.84
P-23	INLET-12	SD MH-11	6,281.93	6,275.12	112.5	6.05	24.0	0.013	3.44	9.84	0.34	55.66	3.590	6,282.58	6,275.46
P-24	SD MH-11	SD MH-12	6,274.92	6,270.49	73.9	6.00	24.0	0.013	3.42	9.79	0.34	55.40	3.573	6,275.57	6,270.83
P-25	SD MH-12	INLET-14	6,270.29	6,268.02	38.0	5.98	24.0	0.013	3.41	9.77	0.34	55.33	3.568	6,270.94	6,268.36
P-26	INLET-13	INLET-14	6,272.49	6,268.53	79.2	5.00	18.0	0.013	1.93	8.03	0.29	23.48	3.140	6,273.01	6,268.82
P-27	INLET-14	INLET-17	6,267.52	6,267.06	30.9	1.49	30.0	0.013	6.93	7.17	0.63	50.06	1.892	6,268.39	6,268.02
P-28	INLET-15	INLET-16	6,271.56	6,270.82	29.5	2.52	18.0	0.013	2.17	6.52	0.37	16.69	2.260	6,272.12	6,271.19
P-29	INLET-16	SD MH-13	6,270.32	6,268.92	93.6	1.50	18.0	0.013	5.36	6.94	0.68	12.85	1.700	6,271.21	6,269.60
P-30	SD MH-13	INLET-17	6,268.51	6,268.07	43.7	1.00	18.0	0.013	5.31	5.97	0.75	10.51	1.365	6,269.40	6,268.83
P-31	INLET-17	SD MH-14	6,266.86	6,265.46	35.0	4.00	30.0	0.013	12.02	11.94	0.65	82.03	3.104	6,268.02	6,266.18
P-32	SD MH-14	SD MH-15	6,261.46	6,259.86	40.0	4.00	30.0	0.013	12.00	11.94	0.65	82.06	3.105	6,262.62	6,260.56

STORMCAD OUTPUT TABLES

Storm Line H - 5-Year Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (ft)	Slope (%)	Dia (in)	Mann	Flow (cfs)	Velo (ft/s)	Depth (ft)	Capacity (cfs)	Froude No.	HGL (In) (ft)	HGL (Out) (ft)
P-33	SD MH-15	SD MH-16	6,255.86	6,254.61	31.3	4.00	30.0	0.013	11.98	11.93	0.65	82.03	3.104	6,257.02	6,255.33
P-34	SD MH-16	SD MH-17	6,250.61	6,249.22	34.7	4.00	30.0	0.013	11.96	11.93	0.64	82.07	3.105	6,251.77	6,249.93
P-35	SD MH-17	FBAY-02	6,246.24	6,245.88	36.1	1.00	30.0	0.013	11.94	7.24	0.92	40.96	1.543	6,247.40	6,246.84
P-36	OS-01	SD MH-18	6,241.66	6,240.77	77.9	1.14	24.0	0.013	5.50	6.23	0.65	24.17	1.599	6,242.49	6,241.42
P-37	SD MH-18	SD MH-19	6,240.57	6,237.34	117.6	2.75	24.0	0.013	5.50	8.53	0.52	37.50	2.479	6,241.40	6,237.86
P-38	SD MH-19	SD MH-20	6,233.34	6,231.35	72.7	2.74	24.0	0.013	5.50	8.52	0.52	37.44	2.475	6,234.17	6,231.87
P-39	SD MH-20	FES-01	6,230.36	6,230.01	30.5	1.14	24.0	0.013	5.50	6.23	0.65	24.20	1.601	6,231.19	6,230.68
P-40	INLET-20	SD MH-21	6,285.42	6,280.70	131.5	3.59	18.0	0.013	0.67	5.22	0.19	19.90	2.563	6,285.72	6,281.10
P-41	INLET-21	SD MH-21	6,282.08	6,280.70	64.1	2.15	18.0	0.013	1.38	5.40	0.30	15.41	2.067	6,282.52	6,281.00
P-42	SD MH-21	SD MH-22	6,280.50	6,278.51	91.9	2.16	18.0	0.013	1.97	6.00	0.36	15.45	2.092	6,281.03	6,278.87
P-43	SD MH-22	SD MH-23	6,278.31	6,277.62	31.9	2.16	18.0	0.013	1.95	5.98	0.36	15.45	2.091	6,278.84	6,277.98
P-44	SD MH-23	SD MH-24	6,277.42	6,276.75	31.0	2.16	18.0	0.013	1.94	5.97	0.36	15.43	2.089	6,277.95	6,277.11
P-45	SD MH-24	SD MH-25	6,276.55	6,274.60	90.4	2.16	18.0	0.013	1.94	5.96	0.36	15.43	2.087	6,277.07	6,274.96
P-46	SD MH-25	SD MH-26	6,274.40	6,273.42	45.5	2.15	18.0	0.013	1.91	5.94	0.36	15.41	2.084	6,274.92	6,273.78
P-47	SD MH-26	SD MH-27	6,273.22	6,271.91	60.6	2.16	18.0	0.013	1.90	5.93	0.36	15.44	2.086	6,273.74	6,272.27
P-48	SD MH-27	INLET-16	6,271.72	6,270.52	79.2	1.52	18.0	0.013	1.89	5.23	0.39	12.95	1.757	6,272.24	6,271.21
P-50	INLET-18	INLET-19	6,287.23	6,286.42	40.3	2.01	18.0	0.013	0.19	2.92	0.12	14.90	1.812	6,287.39	6,286.54
P-51	INLET-19	INLET-20	6,286.22	6,285.62	30.0	2.00	18.0	0.013	0.29	3.29	0.14	14.85	1.851	6,286.42	6,285.76

STORMCAD OUTPUT TABLES

Storm Line H - 100-Year

Catchment Table - Time: 0.00 hours

Label	Outflow Element	Area (acres)	Runoff Coeff.	Time of C (min)	Catchment CA (acres)	Intensity (in/h)	Flow (cfs)
H01	INLET-01	4.400	0.520	15.900	2.288	5.365	12.37
H01.1	INLET-01	1.620	0.540	6.700	0.875	7.575	6.68
H02	INLET-02	2.910	0.740	8.200	2.153	7.080	15.37
H03	INLET-03	1.830	0.760	5.800	1.391	7.912	11.09
H04	INLET-04	0.420	0.620	5.000	0.260	8.242	2.16
H05	INLET-05	0.190	0.780	5.000	0.148	8.242	1.23
H06	INLET-06	0.600	0.660	7.300	0.396	7.368	2.94
H07	INLET-07	0.710	0.660	5.100	0.469	8.199	3.87
H08.1	INLET-10	1.360	0.520	13.000	0.707	5.890	4.20
H08.2	INLET-10	0.130	0.550	7.200	0.072	7.402	0.53
H09	INLET-11	1.410	0.720	7.700	1.015	7.237	7.41
H10	INLET-12	0.700	0.760	5.900	0.532	7.873	4.22
H11	INLET-18	0.250	0.570	5.000	0.143	8.242	1.18
H12	INLET-19	0.050	0.720	5.000	0.036	8.242	0.30
H13	INLET-21	0.700	0.750	7.100	0.525	7.436	3.93
H14	INLET-20	0.170	0.770	5.000	0.131	8.242	1.09
H15	INLET-15	0.960	0.760	5.000	0.730	8.242	6.06
H16	INLET-16	0.880	0.760	5.000	0.669	8.242	5.56
H17	INLET-13	1.040	0.760	8.800	0.790	6.902	5.50
H18	INLET-14	1.350	0.740	7.500	0.999	7.302	7.35
H19	INLET-17	0.450	0.770	6.100	0.347	7.796	2.72

Catch Basin Table - Time: 0.00 hours

Label	Rim (ft)	Invert (ft)	Flow (cfs)	HGL (In) (ft)	HGL (Out) (ft)	Inlet Location	Notes
INLET-01	6,282.27	6,278.39	17.11	6,279.52	6,279.52	In Sag	TYPE C INLET
INLET-02	6,277.17	6,267.55	15.37	6,269.95	6,269.95	In Sag	15' TYPE R INLET
INLET-03	6,277.12	6,266.45	11.09	6,267.84	6,267.84	In Sag	15' TYPE R INLET
INLET-04	6,272.84	6,265.54	2.16	6,266.10	6,266.10	In Sag	TYPE C INLET
INLET-05	6,273.81	6,262.61	1.23	6,264.69	6,264.69	In Sag	15' TYPE R INLET
INLET-06	6,253.38	6,250.74	2.94	6,252.03	6,252.03	In Sag	TYPE C INLET
INLET-07	6,252.01	6,247.64	3.87	6,250.15	6,250.15	In Sag	TYPE D INLET
INLET-10	6,301.03	6,293.64	4.62	6,294.45	6,294.45	In Sag	TYPE C INLET
INLET-11	6,291.89	6,283.01	7.41	6,284.25	6,284.25	In Sag	10' TYPE R INLET
INLET-12	6,291.88	6,281.94	4.22	6,283.26	6,283.26	In Sag	10' TYPE R INLET
INLET-13	6,278.51	6,273.91	5.50	6,273.39	6,273.39	In Sag	5' TYPE R INLET
INLET-14	6,277.87	6,267.53	7.35	6,269.19	6,269.19	In Sag	15' TYPE R INLET
INLET-15	6,280.35	6,271.56	6.06	6,273.19	6,273.19	In Sag	5' TYPE R INLET
INLET-16	6,280.16	6,270.32	5.56	6,273.09	6,273.09	In Sag	5' TYPE R INLET
INLET-17	6,277.87	6,266.87	2.72	6,268.97	6,268.97	In Sag	15' TYPE R INLET
INLET-18	6,291.09	6,287.23	1.18	6,287.64	6,287.64	In Sag	TYPE C INLET
INLET-19	6,289.87	6,286.22	0.30	6,286.68	6,286.68	In Sag	5' TYPE R INLET
INLET-20	6,289.84	6,285.42	1.09	6,286.02	6,286.02	In Sag	10' TYPE R INLET
INLET-21	6,292.35	6,282.08	3.93	6,282.84	6,282.84	In Sag	5' TYPE R INLET
OS-01	6,244.03	6,241.66	0.00	6,244.03	6,244.03	In Sag	OUTLET STRUCTURE

STORMCAD OUTPUT TABLES

Storm Line H - 100-Year

Manhole Table - Time: 0.00 hours

Label	Flow (cfs)	Headloss (ft)	Elevation (Rim) (ft)	HGL (In) (ft)	HGL (Out) (ft)	Notes	Headloss Method	AASHTO Shaping Method
SD MH-01	17.06	0.95	6,283.94	6,276.89	6,275.94	5' DIA MH	AASHTO	Full
SD MH-02	16.98	0.89	6,279.23	6,272.43	6,271.54	5' DIA MH	AASHTO	Full
SD MH-03	37.83	0.00	6,269.39	6,260.20	6,260.20	5' DIA MH	AASHTO	Full
SD MH-04	37.77	0.00	6,266.00	6,255.74	6,255.74	5' DIA MH	AASHTO	Full
SD MH-05	39.75	0.34	6,256.04	6,252.02	6,251.68	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-06	39.53	0.42	6,252.57	6,250.85	6,250.42	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-07	41.72	0.43	6,253.82	6,249.42	6,248.99	5' DIA MH	AASHTO	Full
SD MH-10	4.59	0.68	6,292.14	6,286.64	6,285.96	5' DIA MH	AASHTO	Full
SD MH-11	13.62	0.19	6,284.85	6,276.44	6,276.25	5' DIA MH	AASHTO	Full
SD MH-12	13.58	0.19	6,279.64	6,271.80	6,271.62	5' DIA MH	AASHTO	Full
SD MH-13	15.72	0.45	6,278.31	6,270.96	6,270.52	5' DIA MH	AASHTO	Full
SD MH-14	38.92	0.00	6,275.71	6,263.57	6,263.57	5' DIA MH	AASHTO	Full
SD MH-15	38.86	0.00	6,268.78	6,257.96	6,257.96	5' DIA MH	AASHTO	Full
SD MH-16	38.82	0.00	6,263.59	6,252.71	6,252.71	5' DIA MH	AASHTO	Full
SD MH-17	38.78	0.00	6,256.74	6,248.34	6,248.34	5' DIA MH	AASHTO	Full
SD MH-18	32.10	1.05	6,245.02	6,243.51	6,242.46	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-19	32.10	0.00	6,245.08	6,235.23	6,235.23	5' DIA MH	AASHTO	Full
SD MH-20	32.10	0.87	6,235.84	6,233.45	6,232.58	5' DIA MH FLAT TOP	AASHTO	Full
SD MH-21	6.21	0.12	6,290.96	6,281.58	6,281.46	5' DIA MH	AASHTO	Full
SD MH-22	6.16	0.21	6,288.86	6,279.48	6,279.27	5' DIA MH	AASHTO	Full
SD MH-23	6.14	0.21	6,287.79	6,278.58	6,278.38	5' DIA MH	AASHTO	Full
SD MH-24	6.13	0.18	6,286.74	6,277.68	6,277.51	5' DIA MH	AASHTO	Full
SD MH-25	6.08	0.17	6,283.70	6,275.53	6,275.35	5' DIA MH	AASHTO	Full
SD MH-26	6.05	0.18	6,282.87	6,274.35	6,274.17	5' DIA MH	AASHTO	Full
SD MH-27	6.02	0.08	6,281.75	6,273.43	6,273.35	5' DIA MH	AASHTO	Full

STORMCAD OUTPUT TABLES

Storm Line H - 100-Year

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (ft)	Slope (%)	Dia (in)	Mann	Flow (cfs)	Velo (ft/s)	Depth (ft)	Capacity (cfs)	Froude No.	HGL (In) (ft)	HGL (Out) (ft)
P-01	INLET-01	SD MH-01	6,278.08	6,274.70	77.7	4.35	18.0	0.013	17.11	13.71	1.00	21.90	2.576	6,279.52	6,276.89
P-02	SD MH-01	SD MH-02	6,274.50	6,269.00	126.4	4.35	18.0	0.013	17.06	13.70	1.00	21.91	2.578	6,275.94	6,272.43
P-03	SD MH-02	INLET-02	6,268.80	6,267.30	60.7	2.47	18.0	0.013	16.98	9.61	1.27	16.51	1.539	6,271.54	6,269.95
P-04	INLET-02	INLET-03	6,267.10	6,266.41	27.9	2.47	18.0	0.013	28.45	16.10	(N/A)	16.52	2.317	6,269.95	6,267.90
P-05	INLET-03	INLET-05	6,265.91	6,263.10	105.4	2.67	24.0	0.013	35.86	13.40	1.59	36.94	1.835	6,267.84	6,264.73
P-06	INLET-04	INLET-05	6,265.54	6,263.61	64.4	3.00	18.0	0.013	2.16	6.93	0.35	18.19	2.462	6,266.10	6,264.69
P-07	INLET-05	SD MH-03	6,262.61	6,260.62	52.6	3.79	30.0	0.013	37.89	16.06	1.21	79.89	2.913	6,264.69	6,261.99
P-08	SD MH-03	SD MH-04	6,258.12	6,256.16	51.5	3.79	30.0	0.013	37.83	16.05	1.21	79.89	2.914	6,260.20	6,257.54
P-09	SD MH-04	SD MH-05	6,253.66	6,249.66	105.4	3.79	30.0	0.013	37.77	16.05	1.21	79.89	2.914	6,255.74	6,252.02
P-10	INLET-06	SD MH-05	6,250.74	6,250.66	7.5	1.00	18.0	0.013	2.94	5.10	0.54	10.50	1.421	6,252.03	6,252.02
P-11	SD MH-05	SD MH-06	6,249.56	6,248.50	105.8	1.00	30.0	0.013	39.75	9.52	1.98	41.01	1.169	6,251.68	6,250.85
P-12	SD MH-06	INLET-07	6,248.30	6,247.74	56.2	1.00	30.0	0.013	39.53	9.52	1.97	41.01	1.176	6,250.42	6,250.15
P-13	INLET-07	SD MH-07	6,247.64	6,246.92	72.1	1.00	30.0	0.013	41.87	9.51	2.10	41.01	1.083	6,250.15	6,249.42
P-14	SD MH-07	FBAY-01	6,246.82	6,245.71	111.0	1.00	30.0	0.013	41.72	9.52	2.09	41.01	1.090	6,248.99	6,247.80
P-20	INLET-10	SD MH-10	6,293.62	6,286.14	132.0	5.67	18.0	0.013	4.62	10.80	0.44	25.00	3.399	6,294.45	6,286.58
P-21	SD MH-10	INLET-11	6,285.14	6,284.00	20.1	5.67	18.0	0.013	4.59	10.78	0.44	25.00	3.399	6,285.96	6,284.49
P-22	INLET-11	INLET-12	6,283.00	6,282.43	28.0	2.04	18.0	0.013	10.57	9.19	0.93	14.99	1.823	6,284.25	6,283.42
P-23	INLET-12	SD MH-11	6,281.93	6,275.12	112.5	6.05	24.0	0.013	13.68	14.66	0.68	55.66	3.679	6,283.26	6,275.80
P-24	SD MH-11	SD MH-12	6,274.92	6,270.49	73.9	6.00	24.0	0.013	13.62	14.59	0.68	55.40	3.662	6,276.25	6,271.19
P-25	SD MH-12	INLET-14	6,270.29	6,268.02	38.0	5.98	24.0	0.013	13.58	14.56	0.67	55.33	3.657	6,271.62	6,268.77
P-26	INLET-13	INLET-14	6,272.49	6,268.53	79.2	5.00	18.0	0.013	5.50	10.85	0.49	23.48	3.189	6,273.39	6,269.03
P-27	INLET-14	INLET-17	6,267.52	6,267.06	30.9	1.49	30.0	0.013	23.99	10.09	1.22	50.06	1.823	6,269.19	6,268.97
P-28	INLET-15	INLET-16	6,271.56	6,270.82	29.5	2.52	18.0	0.013	6.06	3.43	0.62	16.69	2.234	6,273.19	6,273.09
P-29	INLET-16	SD MH-13	6,270.32	6,268.92	93.6	1.50	18.0	0.013	15.84	8.96	(N/A)	12.85	1.290	6,273.09	6,270.96
P-30	SD MH-13	INLET-17	6,268.51	6,268.07	43.7	1.00	18.0	0.013	15.72	8.89	(N/A)	10.51	1.280	6,270.52	6,269.49
P-31	INLET-17	SD MH-14	6,266.86	6,265.46	35.0	4.00	30.0	0.013	38.96	16.49	1.21	82.03	2.991	6,268.97	6,266.92
P-32	SD MH-14	SD MH-15	6,261.46	6,259.86	40.0	4.00	30.0	0.013	38.92	16.49	1.21	82.06	2.992	6,263.57	6,261.29

STORMCAD OUTPUT TABLES

Storm Line H - 100-Year

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Length (ft)	Slope (%)	Dia (in)	Mann	Flow (cfs)	Velo (ft/s)	Depth (ft)	Capacity (cfs)	Froude No.	HGL (In) (ft)	HGL (Out) (ft)
P-33	SD MH-15	SD MH-16	6,255.86	6,254.61	31.3	4.00	30.0	0.013	38.86	16.48	1.21	82.03	2.992	6,257.96	6,256.08
P-34	SD MH-16	SD MH-17	6,250.61	6,249.22	34.7	4.00	30.0	0.013	38.82	16.48	1.21	82.07	2.994	6,252.71	6,250.67
P-35	SD MH-17	FBAY-02	6,246.24	6,245.88	36.1	1.00	30.0	0.013	38.78	9.49	1.94	40.96	1.196	6,248.34	6,247.85
P-36	OS-01	SD MH-18	6,241.66	6,240.77	77.9	1.14	24.0	0.013	32.10	10.22	(N/A)	24.17	1.274	6,245.08	6,243.51
P-37	SD MH-18	SD MH-19	6,240.57	6,237.34	117.6	2.75	24.0	0.013	32.10	13.41	1.42	37.50	2.057	6,242.46	6,238.80
P-38	SD MH-19	SD MH-20	6,233.34	6,231.35	72.7	2.74	24.0	0.013	32.10	13.39	1.43	37.44	2.052	6,235.23	6,233.45
P-39	SD MH-20	FES-01	6,230.36	6,230.01	30.5	1.14	24.0	0.013	32.10	10.22	(N/A)	24.20	1.274	6,232.58	6,231.90
P-40	INLET-20	SD MH-21	6,285.42	6,280.70	131.5	3.59	18.0	0.013	2.54	7.73	0.36	19.90	2.694	6,286.02	6,281.58
P-41	INLET-21	SD MH-21	6,282.08	6,280.70	64.1	2.15	18.0	0.013	3.93	7.29	0.52	15.41	2.090	6,282.84	6,281.58
P-42	SD MH-21	SD MH-22	6,280.50	6,278.51	91.9	2.16	18.0	0.013	6.21	8.27	0.66	15.45	2.052	6,281.46	6,279.48
P-43	SD MH-22	SD MH-23	6,278.31	6,277.62	31.9	2.16	18.0	0.013	6.16	8.25	0.66	15.45	2.053	6,279.27	6,278.58
P-44	SD MH-23	SD MH-24	6,277.42	6,276.75	31.0	2.16	18.0	0.013	6.14	8.23	0.66	15.43	2.051	6,278.38	6,277.44
P-45	SD MH-24	SD MH-25	6,276.55	6,274.60	90.4	2.16	18.0	0.013	6.13	8.22	0.66	15.43	2.050	6,277.51	6,275.26
P-46	SD MH-25	SD MH-26	6,274.40	6,273.42	45.5	2.15	18.0	0.013	6.08	8.20	0.65	15.41	2.049	6,275.35	6,274.09
P-47	SD MH-26	SD MH-27	6,273.22	6,271.91	60.6	2.16	18.0	0.013	6.05	8.20	0.65	15.44	2.054	6,274.17	6,273.43
P-48	SD MH-27	INLET-16	6,271.72	6,270.52	79.2	1.52	18.0	0.013	6.02	3.41	0.72	12.95	1.699	6,273.35	6,273.09
P-50	INLET-18	INLET-19	6,287.23	6,286.42	40.3	2.01	18.0	0.013	1.18	5.04	0.29	14.90	1.989	6,287.64	6,286.71
P-51	INLET-19	INLET-20	6,286.22	6,285.62	30.0	2.00	18.0	0.013	1.47	5.36	0.32	14.85	1.999	6,286.68	6,285.94

APPENDIX F

REFERENCES

Core Consultants. August 28, 2020. "Phase II Drainage Report for Canyonside Preliminary Plan No.1, Castle Pines, Colorado."

Core Consultants. June 7, 2021. "Phase III Drainage Report for Canyonside Subdivision Filing No. 1, Amendment No. 1, Castle Pines, Colorado."

Terracina Design. November 5, 2025. "Phase III Drainage Report for The Peaks at Canyons, Castle Pines, Colorado." Case No. SIP-2025-002

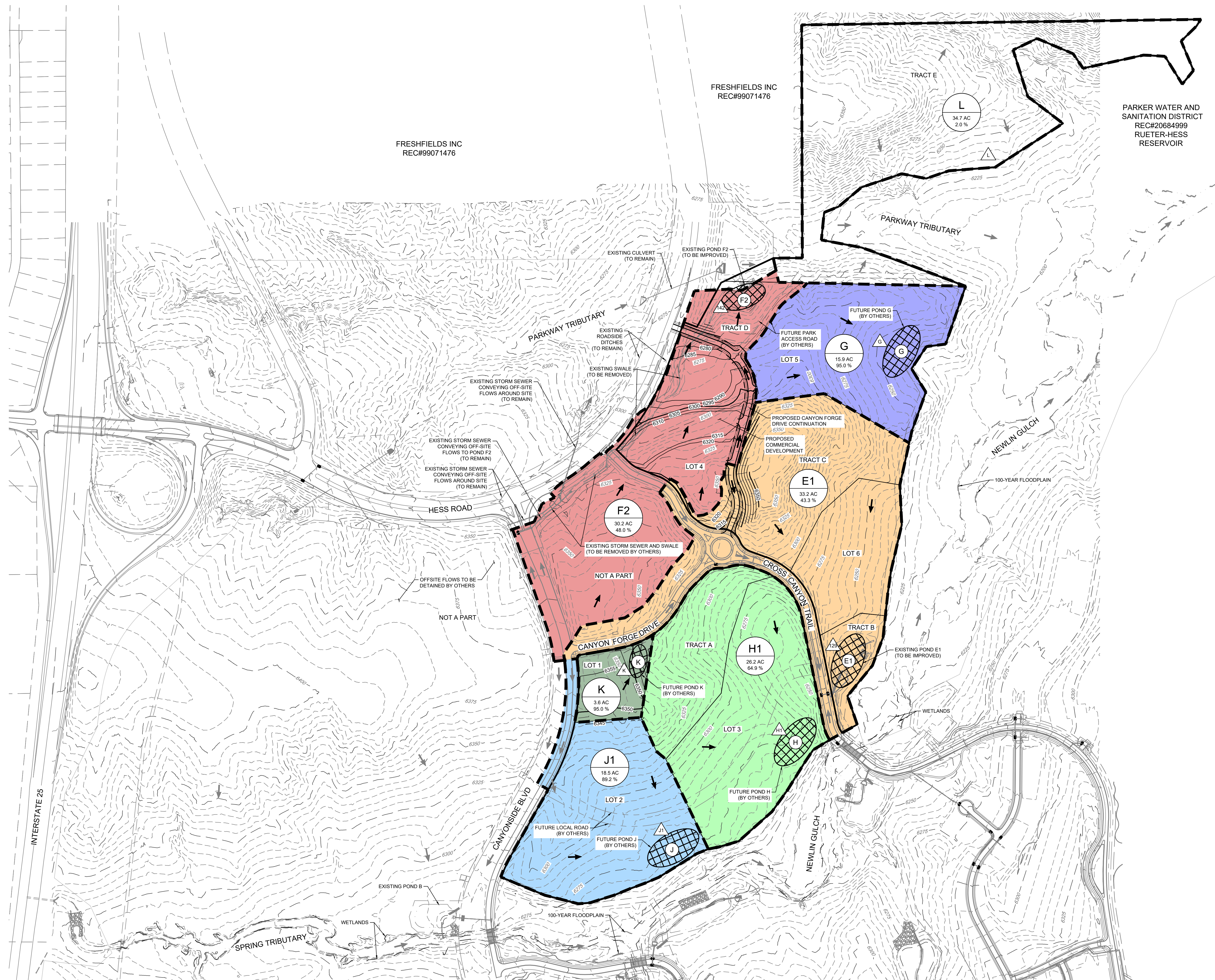


Figure 1 is a plan view map of the study area. It shows a coastline with a red dot indicating the study site. A scale bar at the bottom indicates distances of 0, 250', and 500'. Below the scale bar, it states '1 inch = 250 ft.'.

LEGEND

EXISTING

PROPOSED

BASIN DESIGNATION

AREA IMPERVIOUSNESS

DESIGN POINT

DIRECTIONAL FLOW ARROW

EMERGENCY OVERTFLOW ROUTE

PROPOSED DRAINAGE BASIN

EXISTING DRAINAGE BASIN

PROPOSED MAJOR CONTOUR

PROPOSED MINOR CONTOUR

EXISTING MAJOR CONTOUR

EXISTING MINOR CONTOUR

EASEMENT

RIGHT OF WAY (R.O.W.)

CENTERLINE

PROJECT BOUNDARY

PROPOSED STORM & STUB OUT

EXISTING STORM & STUB OUT

STORM MANHOLES

STORM INLETS

FES, FOREBAY, & TRICKLE CHANNEL

OUTLET STRUCTURE

CRUSHER FINES

MAINTENANCE ACCESS

RIPRAP

100 YEAR FLOODPLAIN

WETLAND

LIMITS OF CONSTRUCTION

RETAINING WALL

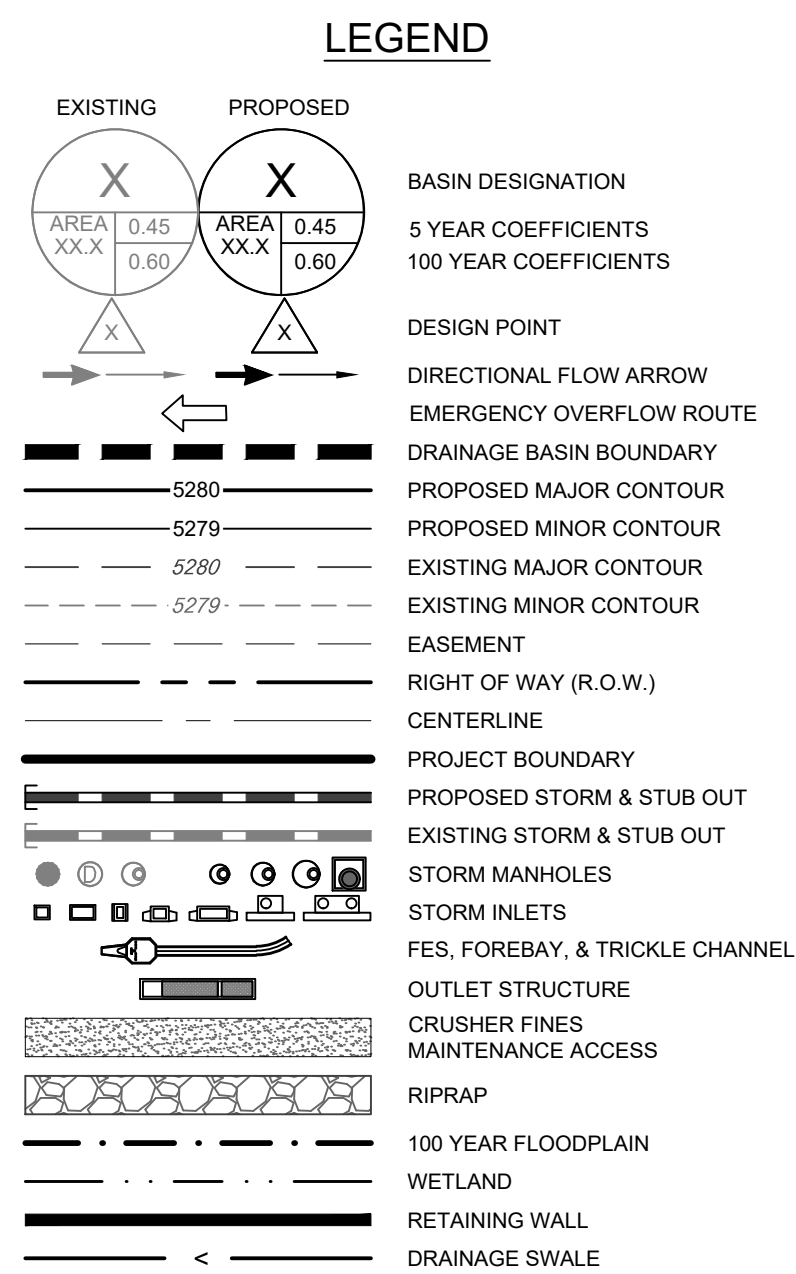
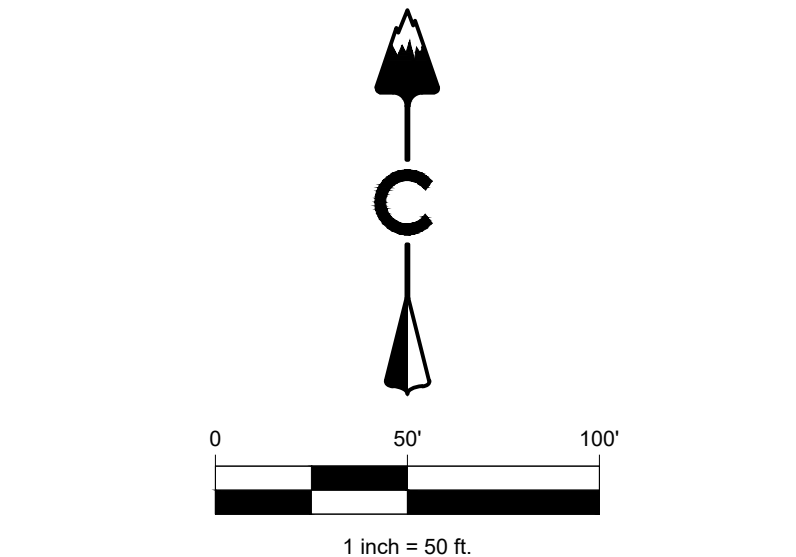
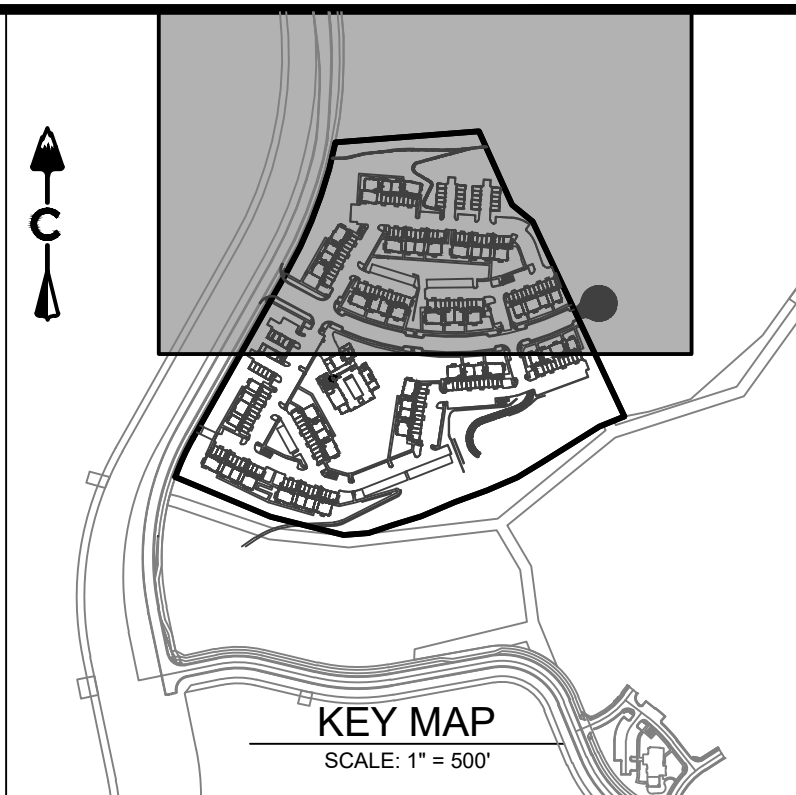
DRAINAGE SWALE

NOTES:

1. THE POND VOLUMES SHOWN ARE THE LARGER OF THE VALUES DETERMINED BY COMPARING THE INTERIM AND FULL BUILD-OUT CONDITION.
2. THE SITE DOES NOT CONTAIN THE 100-YEAR FLOODPLAIN.
3. THERE ARE NO ANTICIPATED IMPACTS TO THE 100-YEAR FLOODPLAIN OR DELINEATED WETLANDS.

POND SUMMARY TABLE			
POND	100-YEAR VOLUME (AC-FT)	100-YEAR MAX RELEASE (CFS)	DETERMINING CONDITON
E1	3.18	68.8	INTERIM
F2	2.94	43.2	FULL BUILD-OUT
G	2.74	28.9	NO CHANGE
H	3.23	48.1	INTERIM
J	3.00	32.9	INTERIM
K	0.62	6.3	FULL BUILD-OUT

6/17/2023 12:40 PM, X:\20-067 BMC CANYONS CIVIL\CDP\ANS\DRAINAGE\PHASE II\DRAINAGE MAPS\PROPOSED.DWG



NOTES:

1. THERE ARE NO ANTICIPATED IMPACTS TO THE EXISTING 100-YEAR FLOODPLAIN OR DELINEATED WETLANDS.

RUNOFF SUMMARY TABLE				
DIRECT RUNOFF				
DESIGN POINT	BASIN	AREA (AC)	5-Year RUNOFF (CFS)	100-Year RUNOFF (CFS)
1	1	0.22	0.81	1.63
2	2	0.14	0.50	1.03
3	3	0.22	0.83	1.66
4	4	0.06	0.23	0.46
5	5	1.30	2.79	6.97
6	6	0.03	0.13	0.26
7	7	0.03	0.12	0.23
24	24	2.00	0.33	5.31
25	25	0.22	0.81	1.63
26	26	0.22	0.82	1.64
27	27	0.14	0.47	0.98
28	28	0.18	0.69	1.39
29	29	0.22	0.82	1.64
32	32	0.86	0.18	2.75
33	33	1.80	3.49	8.98
34	34	0.19	0.73	1.46
35	35	0.22	0.83	1.66
36	36	0.06	0.23	0.46
39	39	2.06	3.07	8.82
40	40	0.26	0.62	1.62

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A	CD'S 1ST SUBMITTAL	02/19/21	KJR
B	CD'S 2ND SUBMITTAL	04/27/21	KJR
C	CD'S 3RD SUBMITTAL	05/10/21	KJR
D	CD'S 4TH SUBMITTAL	05/19/21	KJR
E	CD'S 5TH SUBMITTAL	06/17/21	KJR

CANYONSIDE SUBDIVISION FILING NO. 1

AMENDMENT NO. 1

PHASE III DRAINAGE REPORT

PROPOSED DRAINAGE MAP

DESIGNED BY: LNM

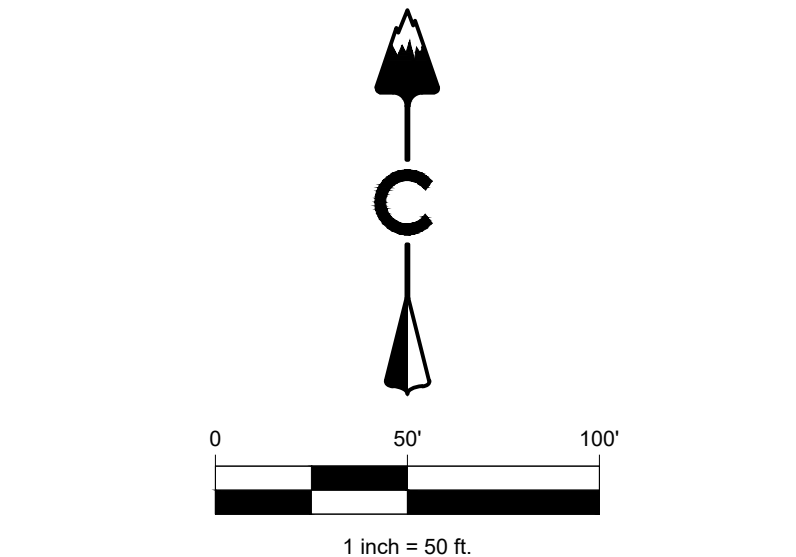
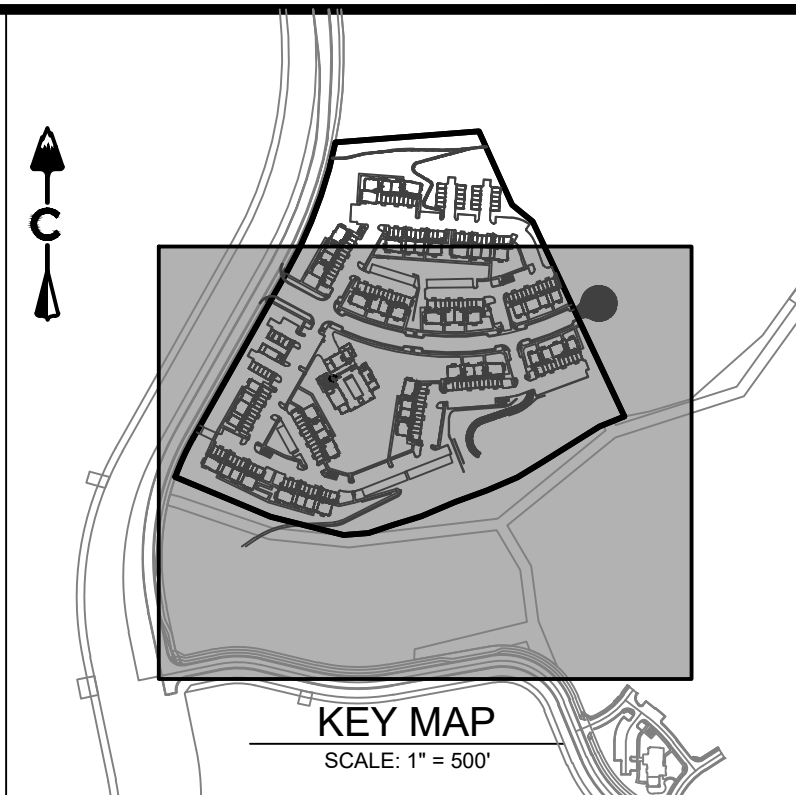
DRAWN BY: LNM

CHECKED BY: KJR

JOB NO. 20-067

SHEET 1 OF 2

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LEGEND	
EXISTING	PROPOSED
XX.X AC XX.X %	XX.X AC XX.X %

NOTES:
1. THERE ARE NO ANTICIPATED IMPACTS TO THE EXISTING 100-YEAR FLOODPLAIN OR DELINEATED WETLANDS.

RUNOFF SUMMARY TABLE				
DIRECT RUNOFF				
DESIGN POINT	BASIN	AREA (AC)	5-Year RUNOFF (CFS)	100-Year RUNOFF (CFS)
8	8	0.03	0.11	0.23
9	9	0.19	0.72	1.45
10	10	0.24	0.19	1.17
11	11	0.36	1.22	2.58
12.1	12.1	0.11	0.42	0.83
12.2	12.2	0.11	0.41	0.82
13.1	13.1	0.11	0.42	0.83
13.2	13.2	0.11	0.41	0.82
14	14	0.04	0.14	0.27
15	15	0.22	0.81	1.63
16	16	0.06	0.23	0.46
17	17	0.37	1.40	2.80
18	18	0.42	0.26	1.79
19	19	0.06	0.23	0.46
20	20	1.82	3.82	9.78
21	21	0.22	0.81	1.63
22	22	0.22	0.81	1.63
23	23	0.94	2.76	6.38
37	37	1.20	3.25	7.53
38	38	0.19	0.72	1.45
41	41	1.37	0.31	5.46
42	42	1.85	0.63	8.20

CANYONSIDE SUBDIVISION FILING NO. 1
AMENDMENT NO. 1
PHASE III DRAINAGE REPORT
PROPOSED DRAINAGE MAP

DESIGNED BY: LNM
DRAWN BY: LNM
CHECKED BY: KJR

JOB NO.
20-067
SHEET
2 OF 2

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU
KNOW WHAT'S BELOW.
Call before you dig.
811

#	REVISION DESCRIPTION	DATE BY
A	CD'S 1ST SUBMITTAL	02/19/21 KR
B	CD'S 2ND SUBMITTAL	04/27/21 KR
C	CD'S 3RD SUBMITTAL	05/10/21 KR
D	CD'S 4TH SUBMITTAL	05/19/21 KR
E	CD'S 5TH SUBMITTAL	06/17/21 KR

CORE CONSULTANTS, INC.
LAND DEVELOPMENT
ENERGY
PUBLIC INFRASTRUCTURE
3473 S. BROADWAY
DENVER, CO 80113
303.703.4444
LIVEYOURCORE.COM

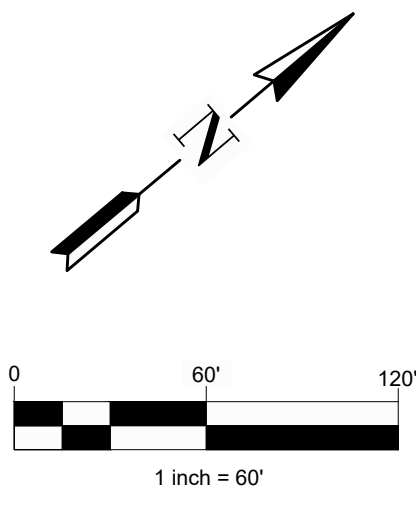
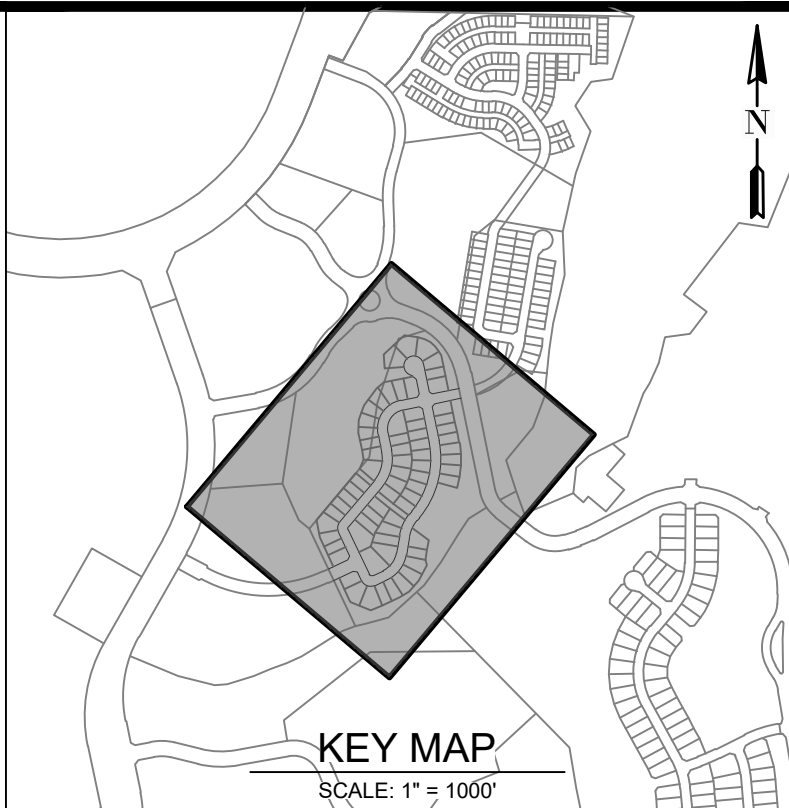
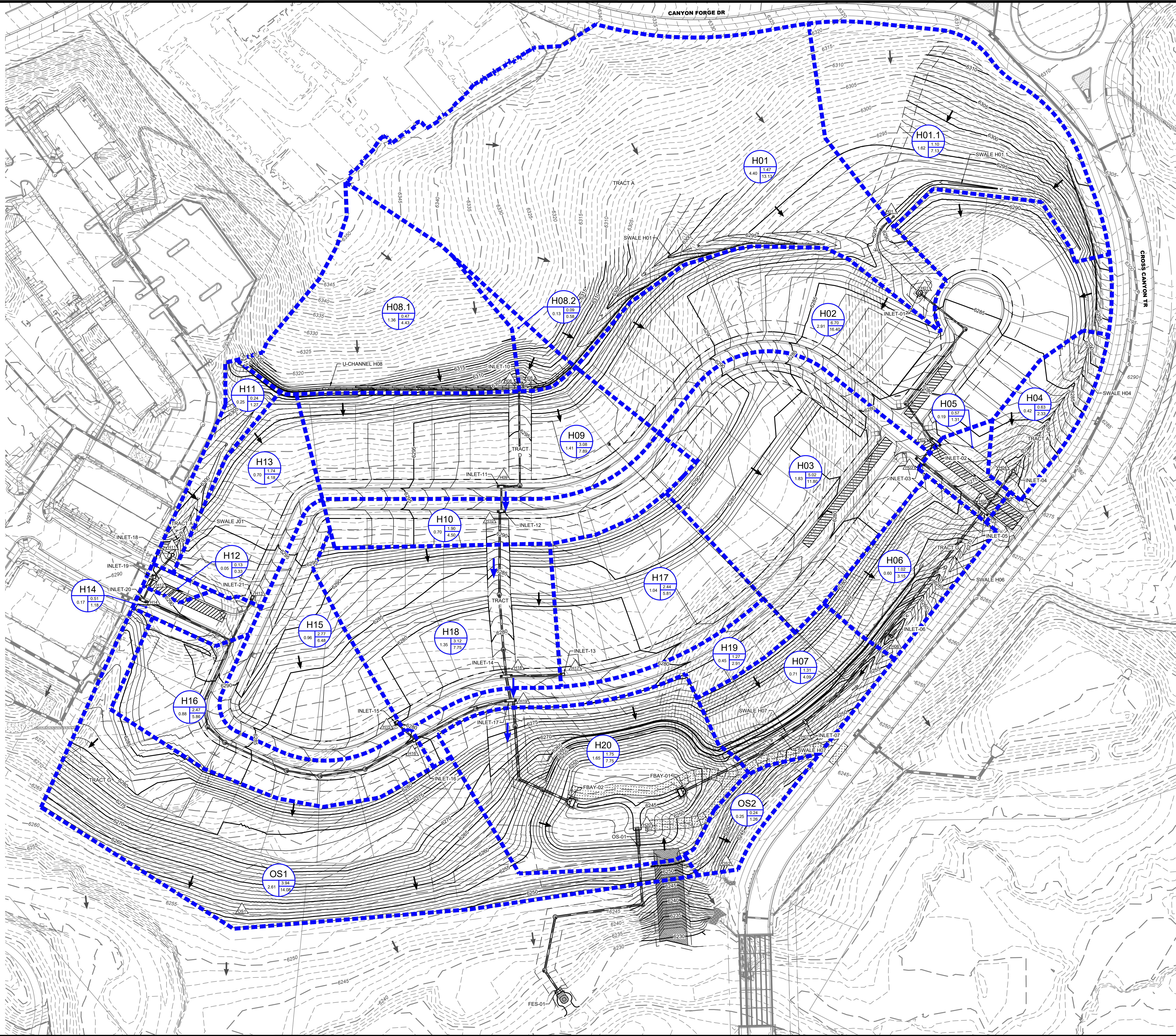


APPENDIX G

DRAINAGE MAPS

PROPOSED DRAINAGE MAP

8/13/2026 10:00 AM X:\NORTH CANYONS\DOCUMENTS\REPORTS\DRAINAGE\07 - CANYONSIDE F1 3RD AMENDMENT\DRAINAGE MAPS PROPOSED DRAINAGE MAP - F1.3.DWG 1



LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR DRAINAGE BASIN
- EXISTING MAJOR DRAINAGE BASIN
- STORM (FES, MH, & INLET)
- EXISTING
- PROPOSED
- EX-1
- PR-1
- BASIN DESIGNATION
- MINOR RUNOFF (CFS)
- MAJOR RUNOFF (CFS)
- DIRECTIONAL FLOW ARROW
- DESIGN POINT
- EMERGENCY OVERFLOW ROUTE

RUNOFF SUMMARY TABLE				
Basin ID	Design Point	Basin Area (Ac)	5-Year Runoff (CFS)	100-Year Runoff (CFS)
H01	H01	4.40	1.47	13.13
H01.1	H01.1	1.62	1.10	7.13
H02	H02	2.91	6.70	16.40
H03	H03	1.83	5.02	11.80
H04	H04	0.42	0.63	2.33
H05	H05	0.19	0.57	1.31
H06	H06	0.60	1.02	3.15
H07	H07	0.71	1.31	4.09
H08.1	H08.1	1.36	0.47	4.43
H08.2	H08.2	0.13	0.09	0.58
H09	H09	1.41	3.08	7.89
H10	H10	0.70	1.90	4.50
H11	H11	0.25	0.24	1.27
H12	H12	0.05	0.13	0.33
H13	H13	0.70	1.74	4.18
H14	H14	0.17	0.51	1.18
H15	H15	0.96	2.77	6.48
H16	H16	0.88	2.47	5.86
H17	H17	1.04	2.44	5.81
H18	H18	1.35	3.12	7.75
H19	H19	0.45	1.27	2.91
H20	H20	1.65	1.75	7.75
OS1	OS1	2.61	3.94	14.08
OS2	OS2	0.25	0.24	1.26

terraccina
design
10200 E. Grand Ave. A-314
Denver, CO 80231
PH: 303.632.8667

DATE	BY	ET
05/15/2026		
07/17/2026		
08/15/2026		

#	REVISION DESCRIPTION
1	1ST SUBMITTAL
2	2ND SUBMITTAL
3	3RD SUBMITTAL

NOT FOR CONSTRUCTION

CANYONSIDE
CITY OF CASTLE PINES, COLORADO
FILING 1 - 3RD AMENDMENT
PROPOSED DRAINAGE MAP

Know what's below.
Call before you dig.
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