



Hardy Road Properties

Final Drainage Report

PCD File No: SF265

All Terrain Engineering Project No: 25018

April 2026

Prepared for:

Hardy Road Properties, LLC

Attn: Jane & Jay Ohmes

10155 Hardy Road

Colorado Springs, CO 80908

Prepared by:

All Terrain Engineering LLC

Contact: Nicholas Jokerst


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(530) 391-7635

ENGINEER'S STATEMENT

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.




Nicholas Q. Jokerst, PE  04/27/2026
Date

State of Colorado No. 59273

For and on behalf of All Terrain Engineering LLC

DEVELOPER'S STATEMENT

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



Jane Ohmes 04-30-2024
Date

Hardy Road Properties, LLC

10155 Hardy Road, Colorado Springs, CO 80908

EL PASO COUNTY ONLY

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Joshua Palmer, P.E. Date
County Engineer/ECM Administrator

Conditions:



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I. General Purpose, Location & Description

a. Purpose

The purpose of this Final Drainage Report (FDR) for the Hardy Road Properties is to describe the site's onsite and offsite drainage patterns, existing and proposed storm infrastructure, and to safely route developed stormwater to adequate outfalls. This FDR will support a final plat for Hardy Road Properties.

b. Location

Hardy Road Properties, referred to as 'the site' herein, is an unplatted parcel in El Paso County, Colorado. The site is bound by Hardy Road to the north, JJ Ranch subdivision to the west, unplatted land to the east and Warner Subdivision to the south. A vicinity map is presented in Appendix A.

c. Description of Property

The site is approximately 19.34 acres. There is no disturbed area associated with this FDR. In general, the site slopes to the east. Onsite elevations range from 7,416' – 7,456' with slopes ranging 1 – 20%. Per a NRCS soil survey, the site is made up of Elbeth sandy loam which is a Type B Soil. The NRCS soil survey is presented in Appendix A.

There are multiple, poorly defined drainage paths that traverse the site. These drainage paths convey onsite & offsite flow to the east and offsite. Based upon field survey, onsite utilities are limited to an overhead power line from Hardy Road to proposed Lot 1. There are no irrigation facilities on site.

d. Floodplain Statement

Based on FEMA Firm map 08041C0310G dated December 7, 2018, the site is Zone X, which are of minimal flood hazard. The site's FEMA floodplain panel is presented in Appendix A.

II. Drainage Basins

a. Major Basin Description

The site is located within the West Kiowa Creek drainage basin, however; there is not an approved DBPS available at the time of this FDR.

b. Existing Basin Description

In the existing condition, the site is a single unplatted lot with two existing structures (sheds). The remainder of the lot is undeveloped. The existing drainage analysis divided the site into 4 basins. In addition to the onsite basins, existing drainage basins from the west and south have been included in the hydrologic analysis of the site. Excerpts from the approved drainage reports are included in Appendix E to detail these basins. See below for existing onsite basin descriptions.

Basin EX1 is 8.71 acres and includes the two existing structures and a portion of Hardy Road. The remainder of Basin EX1 is undeveloped. Basin EX1 stormwater ($Q_5 = 2.1$ cfs $Q_{100} = 11.9$ cfs) sheet flows south and east to DP1 ($Q_5 = 2.5$ cfs $Q_{100} = 14.2$ cfs) where it combines with DPJ8 ($Q_5 = 0.7$ cfs $Q_{100} = 3.3$ cfs) and DPJ9 ($Q_5 = 0.2$

cfs $Q_{100} = 1.1$ cfs). The combined stormwater continues to DP5 ($Q_5 = 23.3$ cfs $Q_{100} = 131.9$ cfs) and flows offsite to the east.

Basin EX2 is 5.01 acres of undeveloped area. Basin EX2 stormwater ($Q_5 = 1.1$ cfs $Q_{100} = 7.4$ cfs) sheet flows east to DP2 ($Q_5 = 17.8$ cfs $Q_{100} = 96.6$ cfs) where it combines with DPJJ5 ($Q_5 = 15.6$ cfs $Q_{100} = 84.6$ cfs) and DPJJ6 ($Q_5 = 2.4$ cfs $Q_{100} = 12.3$ cfs). The combined stormwater continues to DP5 ($Q_5 = 23.3$ cfs $Q_{100} = 131.9$ cfs) and flows offsite to the east.

Basin EX3 is 4.06 acres of undeveloped area. Basin EX3 stormwater ($Q_5 = 0.8$ cfs $Q_{100} = 5.4$ cfs) sheet flows north and east to DP3 ($Q_5 = 4.9$ cfs $Q_{100} = 32.8$ cfs) where it combines with DPJJ7 ($Q_5 = 0.5$ cfs $Q_{100} = 2.3$ cfs) and DPOS1 ($Q_5 = 4.7$ cfs $Q_{100} = 29.5$ cfs). The combined stormwater continues to DP5 ($Q_5 = 23.3$ cfs $Q_{100} = 131.9$ cfs) and flows offsite to the east.

Basin EX4 is 2.76 acres of undeveloped area. Basin H3 stormwater ($Q_5 = 0.6$ cfs $Q_{100} = 4.0$ cfs) sheet flows north to DP4 ($Q_5 = 0.6$ cfs $Q_{100} = 4.0$ cfs). DP4 flows offsite to the east.

c. Proposed Basin Description

In the proposed condition, the site will be subdivided into two 5 acre lots and a 9.34 acre tract. The existing structures will remain on proposed Lot 1. Lot 1 and Lot 2 will remain undeveloped at this time. However, it is assumed that Lot 1 and 2 will eventually be home sites. Assumptions have been made on future home & driveways sizes to account for the additional impervious area. The hydrologic analysis accounts for 16' paved driveways with an assumed length of 200' in addition to 5,000 square feet of roof area for both Lots 1 and 2. Basin 1 and Basin 7 are assumed to include the future home sites. If future development exceeds these assumed values, a lot specific drainage letter and analysis should be performed to ensure downstream facilities are adequately sized and stable.

Basin 1 is 2.30 acres and includes a portion of Hardy Road and one future home sites with a paved driveway. The remainder of Basin 1 is assumed to remain undeveloped. Basin 1 stormwater ($Q_5 = 1.1$ cfs $Q_{100} = 4.3$ cfs) combines with DPJJ8 flow ($Q_5 = 0.7$ cfs $Q_{100} = 3.3$ cfs) at DP1 ($Q_5 = 1.5$ cfs $Q_{100} = 6.3$ cfs). The combined stormwater continues east to DP7. It is assumed a culvert will be required at DP1 when the future driveway is constructed. An assumed hydraulic analysis of the future culvert is presented in Appendix C. Prior to driveway & culvert construction, these assumptions must be verified per proposed roadway grades, culvert type, dimensions and slope.

Basin 2 is 1.95 acres and includes the two existing structures and undeveloped area. Basin 2 stormwater ($Q_5 = 0.6$ cfs $Q_{100} = 3.4$ cfs) combines with DPJJ9 flow ($Q_5 = 0.2$ cfs $Q_{100} = 1.1$ cfs) at DP2 ($Q_5 = 0.7$ cfs $Q_{100} = 4.3$ cfs). The combined stormwater continues east to DP7. It is assumed a culvert will be required at DP2 when the future driveway is constructed. An assumed hydraulic analysis of the future culvert is presented in Appendix C. Prior to driveway & culvert construction, these assumptions must be verified per proposed roadway grades, culvert type, dimensions and slope.

Basin 3 is 2.59 acres of undeveloped area. Basin 3 stormwater ($Q_5 = 0.6$ cfs $Q_{100} = 3.9$ cfs) combines with DPJJ5 flow ($Q_5 = 15.6$ cfs $Q_{100} = 84.6$ cfs) at DP3 ($Q_5 = 14.7$ cfs $Q_{100} = 79.8$ cfs). The combined stormwater

continues east to DP4. It is assumed a culvert will be required at DP3 when the future driveway is constructed. An assumed hydraulic analysis of the future culvert is presented in Appendix C. Prior to driveway & culvert construction, these assumptions must be verified per proposed roadway grades, culvert type, dimensions and slope. Hydraulic analysis of the Basin 3 drainageway is presented in Appendix C.

Basin 4 is 1.81 acres of undeveloped area. Basin 4 stormwater ($Q_5 = 0.4$ cfs $Q_{100} = 2.7$ cfs) combines with DPJJ6 flow ($Q_5 = 2.4$ cfs $Q_{100} = 12.3$ cfs) at DP4 ($Q_5 = 2.5$ cfs $Q_{100} = 13.1$ cfs). The combined stormwater continues to DP4.1 ($Q_5 = 16.3$ cfs $Q_{100} = 88.2$ cfs) where it combines with DP3 flow. DP4.1 continues to DP6.

Basin 5 is 3.98 acres of undeveloped area. Basin 5 stormwater ($Q_5 = 0.8$ cfs $Q_{100} = 5.5$ cfs) combines with DPJJ7 flow ($Q_5 = 0.5$ cfs $Q_{100} = 2.3$ cfs) and DPOS1 flow ($Q_5 = 4.7$ cfs $Q_{100} = 29.5$ cfs) at DP5 ($Q_5 = 4.1$ cfs $Q_{100} = 27.4$ cfs). The combined stormwater continues east to DP6. Hydraulic analysis of the Basin 5 drainageway is presented in Appendix C.

Basin 6 is 0.58 acres of undeveloped area. Basin 6 stormwater ($Q_5 = 0.2$ cfs $Q_{100} = 1.1$ cfs) combines with DP4.1 flow ($Q_5 = 16.3$ cfs $Q_{100} = 88.2$ cfs) at DP6 ($Q_5 = 18.9$ cfs $Q_{100} = 106.7$ cfs). The combined stormwater continues east to DP8. Hydraulic analysis of the Basin 6 drainageway is presented in Appendix C.

Basin 7 is 4.60 acres and includes a portion of Hardy Road and one future home sites with a paved driveway. The remainder of Basin 7 is assumed to remain undeveloped. Basin 7 stormwater ($Q_5 = 1.5$ cfs $Q_{100} = 7.3$ cfs) combines with DP1 flow ($Q_5 = 1.5$ cfs $Q_{100} = 6.3$ cfs) and DP2 flow ($Q_5 = 0.7$ cfs $Q_{100} = 4.3$ cfs) at DP7 ($Q_5 = 3.3$ cfs $Q_{100} = 15.9$ cfs). The combined stormwater continues east to DP8. Hydraulic analysis of the Basin 7 drainageway is presented in Appendix C.

Basin 8 is 2.76 acres of undeveloped area. Basin 8 stormwater ($Q_5 = 0.6$ cfs $Q_{100} = 4.0$ cfs) flows north to DP9 ($Q_5 = 0.6$ cfs $Q_{100} = 4.0$ cfs). DP9 follows historic drainage patterns offsite to the east.

III. Drainage Design Criteria

a. Development Criteria Reference

The drainage analysis follows the criteria from the “Drainage Criteria Manual County of El Paso, Colorado” Volumes 1 and 2,” as amended.

b. Hydrologic Criteria

Runoff was calculated per EPCDCM Chapter 5 – Storm Runoff Method of Analysis.

d. Hydraulic Criteria

Hydraulic criteria for culvert analysis are from EPCDCM Chapter 10 – Open Channel Design. Open channel analysis was performed using Hydraflow Express Extension for Autodesk Civil 3D, latest edition.

IV. Drainage Facility Design

a. General Concept

The site will not be performing any disturbance or ground cover changes at this time. This report supports a final plat that will subdivide the existing site into two 5 acre lots and a 9.34 acre tract. Proposed Lot 1 and 2 are analyzed for their future conditions. However, there are no proposed stormwater facilities being constructed with this report. However, in assumed locations of future culverts, hydraulic calculations are provided for culvert sizing. In general, stormwater will follow historic drainage patterns through onsite drainageways to the east.

b. Water Quality & Detention

The site is not proposing any disturbance, change to ground cover or alteration of existing drainage patterns. Therefore, permanent water quality is not required. A PCM Applicability form is presented in Appendix E. However, the proposed condition of the site provides an analysis if the proposed lots develop in the future.

c. Drainageways

There are multiple drainageways that convey stormwater through Hardy Road Properties to their historic outfall on the eastern property boundary. Drainageways exceeding 15 cfs in the 100-year storm are designated with 'No-Build' easement to maintain the flow path. To determine the easement limits, a hydraulic analysis of select cross sections is performed to determine water surface elevations and top widths. The proposed 'No-Build' easement encompasses the 100-year flow depth in the channel.

A channel analysis summary table is presented in Appendix C. A total of 14 cross sections were analyzed. Based upon EPC DCM Table 10-4, the permissible open channel velocity is 5 ft/s, as the channels are vegetated consistently with tall fescue and slopes are in the range of 0-5%. The 14 cross sections demonstrate velocities that range from 1.39 ft/s to 5.85 ft/s. Channel sections with velocities less than 5 ft/s are stable, and no improvements are necessary to address existing velocities. Cross Sections 6-1, 6-2 & 6-3 have average velocities exceeding 5 ft/s. Field observation will be performed prior to subsequent submittals to determine if signs of erosion are present and mitigation requirements will be detailed if required.

EPC DCM Section 10.5.2 states the permissible 100-year flow depth is 5.0'. All 14 cross sections demonstrate a 100-year flow depth less than 5.0'. EPC DCM Section 10.5.5 requires a minimum of 1.0' freeboard. All 14 cross sections demonstrate a freeboard of at least 1.0' in the 100-year scenario. Shear stress values are computed for reference purposes only, as EPC DCM does not provide guidance regarding acceptable shear stress values. EPC DCM Section 10.7 states that Froude number's greater than 1 represent supercritical flow and Froude's less than 1 represents subcritical flow. Channel Section 6-2 & 6-3 demonstrate 100-year Froude number of 1.1 and 1.0. Field observation will be performed prior to subsequent submittals to determine if signs of erosion are present and mitigation requirements will be detailed if required.

d. Grading & Erosion Control Plan

The project will disturb no area. Therefore, a separate Grading and Erosion Control plan is not required nor provided.

e. Four Step Method

Step 1 – Reducing Runoff Volumes: Roof drains will route across landscape areas whenever possible to promote infiltration and runoff reduction. Runoff reduction areas directly reduce runoff volumes by slowing runoff and promoting infiltration. The Type B soils present on site have a moderate infiltration rate, even when wet, that will help to reduce runoff volumes.

Step 2 – Treat and slowly release the WQCV: Water quality treatment is not required for the site as the total disturbance is 0 acres and no proposed changes to ground cover or drainage patterns is proposed. A PCM Applicability form is presented in Appendix D.

Step 3 – Stabilize stream channels: All new and re-development projects are required to construct or participate in the funding of channel stabilization measures. Drainage basin fees paid, at the time of platting, go towards channel stabilization with the drainage basin. However, there are no fees associated with the West Kiowa Creek drainage basin.

Step 4 – Consider the need for source controls: No industrial or commercial uses are proposed within this development and therefore no source controls are proposed.

f. Drainage Basin & Bridge Fees

There are no basin or bridge fees associated with the West Kiowa Creek drainage basin.

V. Summary

Hardy Road Properties remains consistent with pre-development drainage conditions. It is the professional opinion of the engineer that the future development will not have any adverse impacts on the existing site conditions or downstream facilities.

VI. References

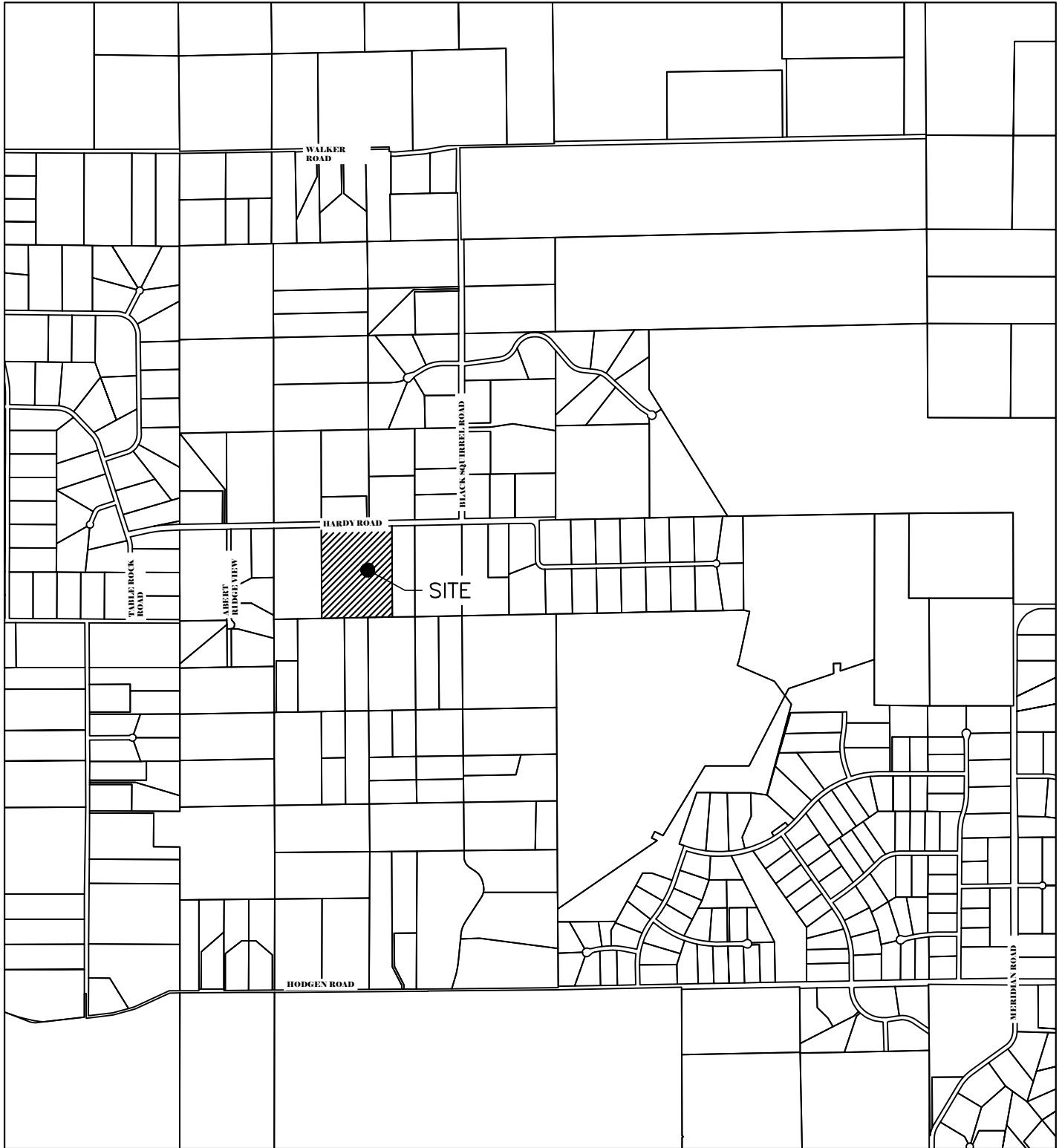
1. El Paso County – Drainage Criteria Manual, 2018 as amended.
2. Federal Emergency Management Agency, Flood Map Service Center - <https://msc.fema.gov/portal/home>
3. Urban Storm Drainage Criteria Manual, Mile High Flood District, January 2018.
4. Web Soil Survey, Natural Resources Conservation Service, February 2026.



APPENDIX A – VICINITY MAP, FEMA MAP & NRCS WEB SOIL SURVEY

HARDY ROAD PROPERTIES

VICINITY MAP



1000 500 0 1000 2000
ORIGINAL SCALE: 1" = 1000'

VICINITY MAP

HARDY ROAD PROPERTIES

JOB NO. 25018

LOCATION: EPC

04/27/2026

SHEET

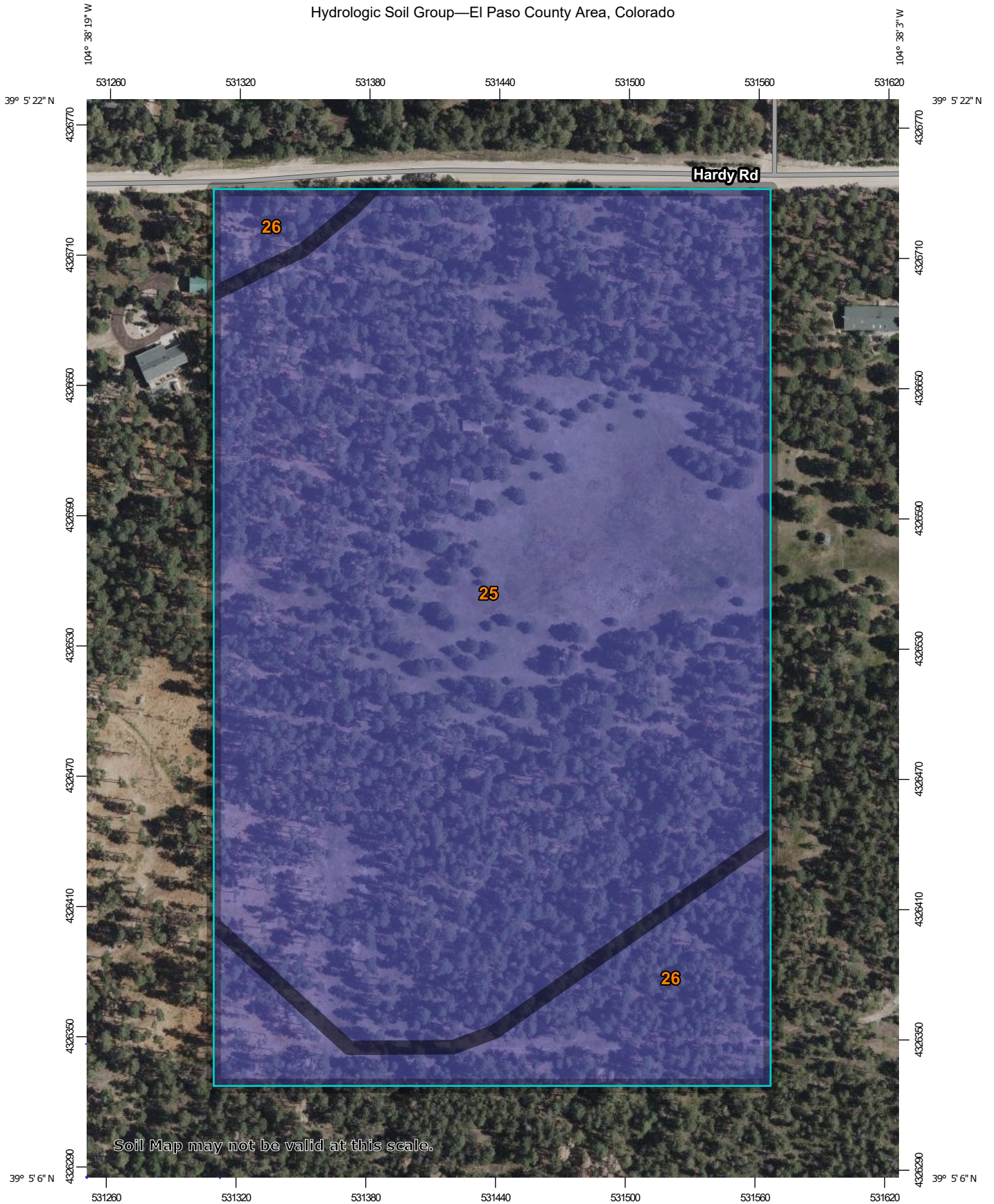
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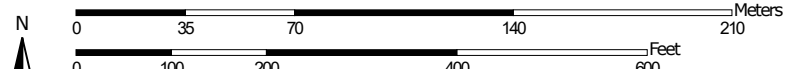
ENGINEERING

1004 WEST VAN BUREN STREET
COLORADO SPRINGS, CO 80907

Hydrologic Soil Group—El Paso County Area, Colorado



Map Scale: 1:2,420 if printed on A portrait (8.5" x 11") sheet.




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



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





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

Soil Rating Lines


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

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
 Survey Area Data: Version 23, 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: Jul 23, 2024—Aug 4, 2024

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
25	Elbeth sandy loam, 3 to 8 percent slopes	B	22.6	85.8%
26	Elbeth sandy loam, 8 to 15 percent slopes	B	3.8	14.2%
Totals for Area of Interest			26.4	100.0%

Description

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

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

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

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

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

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

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

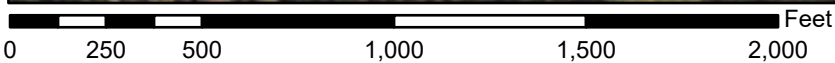
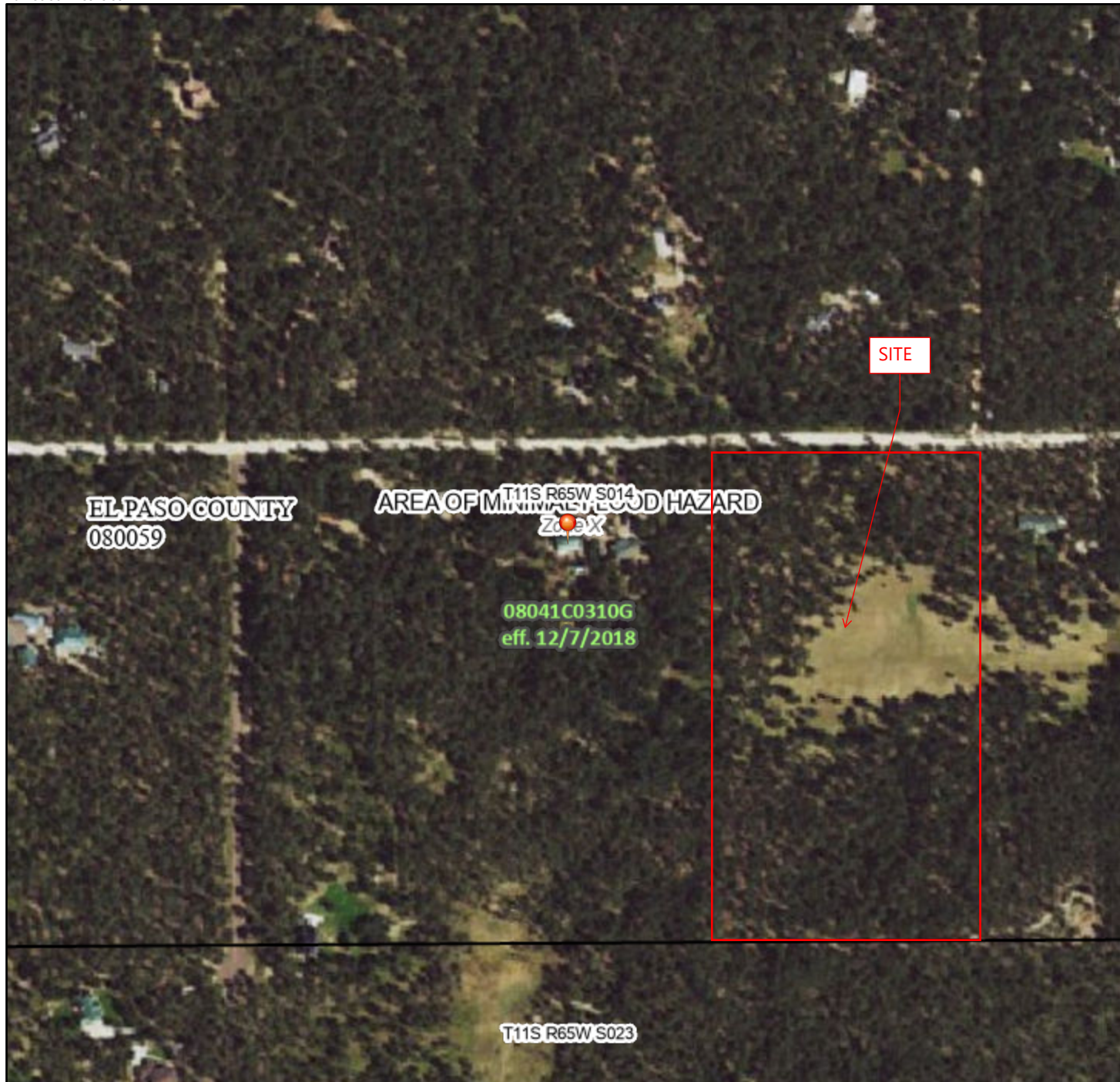
Rating Options

Aggregation Method: Dominant Condition

National Flood Hazard Layer FIRMette



104°38'38"W 39°5'33"N



1:6,000

104°38'1"W 39°5'5"N

Basemap Imagery Source: USGS National Map 2023

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/26/2025 at 5:59 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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



APPENDIX B – HYDROLOGIC CALCULATIONS

Subdivision: Hardy Road Properties
Location: El Paso County
Project Name: Hardy Road Properties
Project Number: 25018
Calculated By: NQJ
Checked By: REB
Date: 2/17/2026

EXISTING CONDITIONS - BASIN SUMMARY TABLE							
Tributary Sub-basin	Area (acres)	Percent Impervious	C ₅	C ₁₀₀	t _c (min)	Q ₅ (cfs)	Q ₁₀₀ (cfs)
EX1	8.71	4%	0.11	0.37	36.9	2.1	11.9
EX2	5.01	2%	0.09	0.36	30.5	1.1	7.4
EX3	4.06	2%	0.09	0.36	36.1	0.8	5.4
EX4	2.76	2%	0.09	0.36	32.0	0.6	4.0

EXISTING CONDITIONS - DESIGN POINT SUMMARY TABLE		
DP#	Q _{5-YR}	Q _{100-YR}
OS1	4.7	29.5
JJ5	15.6	84.6
JJ6	2.4	12.3
JJ7	0.5	2.3
JJ8	0.7	3.3
JJ9	0.2	1.1
1	2.5	14.2
2	17.8	96.6
3	4.9	32.8
4	0.6	4.0
5	23.3	131.9

COMPOSITE % IMPERVIOUS CALCULATIONS - EXISTING CONDITIONS

Subdivision: Hardy Road Properties
 Location: El Paso County

Project Name: Hardy Road Properties
 Project No.: 25018.00
 Calculated By: NQJ
 Checked By: REB
 Date: 2/17/26

Basin ID	Total Area (ac)	Gravel					Paved				Roofs				Undeveloped				Weighted C ₅ & C ₁₀₀		Basins Total Weighted % Imp.	
		C ₅	C ₁₀₀	Area (ac)	% Imp.	% Imp.	C ₅	C ₁₀₀	Area (ac)	% Imp.	C ₅	C ₁₀₀	Area (ac)	% Imp.	C ₅	C ₁₀₀	Area (ac)	% Imp.	C ₅	C ₁₀₀		
EX1	8.71	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.17	100.0%	0.73	0.81	0.05	90.0%	0.09	0.36	8.49	2.0%	0.11	0.37	4.4%	
EX2	5.01	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	5.01	2.0%	0.09	0.36	2.0%	
EX3	4.06	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	4.06	2.0%	0.09	0.36	2.0%	
EX4	2.76	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	2.76	2.0%	0.09	0.36	2.0%	
Total	20.54																					3.0%

STANDARD FORM SF-2 - EXISTING CONDITIONS TIME OF CONCENTRATION

Subdivision: Hardy Road Properties
 Location: El Paso County

Project Name: Hardy Road Properties
 Project No.: 25018.00
 Calculated By: NQJ
 Checked By: REB
 Date: 2/17/26

SUB-BASIN					INITIAL/OVERLAND			TRAVEL TIME					tc CHECK			FINAL
DATA					(Ti)			(Ti)					(URBANIZED BASINS)			
BASIN ID	D.A. (ac)	Hydrologic Soils Group	Weighted C _s	Impervious (%)	L (ft)	S _o (%)	t _i (min)	L _t (ft)	S _t (%)	K	VEL. (ft/s)	t _t (min)	COMP. t _c (min)	TOTAL LENGTH (ft)	Urbanized t _c (min)	t _c (min)
EX1	8.71	B	0.11	4.4%	125	8.0%	10.1	995	2.2%	2.5	0.4	44.7	54.8	1120.0	36.9	36.9
EX2	5.01	B	0.09	2.0%	300	3.3%	21.3	410	2.3%	2.5	0.4	18.0	39.3	710.0	30.5	30.5
EX3	4.06	B	0.09	2.0%	175	5.3%	13.9	915	2.5%	2.5	0.4	38.6	52.5	1090.0	36.1	36.1
EX4	2.76	B	0.09	2.0%	180	7.1%	12.8	735	4.3%	2.5	0.5	23.6	36.4	915.0	32.0	32.0

NOTES:

$$t_c = t_i + t_t$$

Where:

t_c = computed time of concentration (minutes)

t_i = overland (initial) flow time (minutes)

t_t = channelized flow time (minutes).

$$t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t}$$

Where:

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

Eq
$$t_i = \frac{0.395(1.1 - C_s)\sqrt{L_i}}{S_o^{0.33}}$$

Where:

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

Equation 6-4
$$t_c = 1.49S_o^{-0.76}L_i^{0.76} + \frac{L_t}{60(14i + 9)\sqrt{S_o}}$$

∴

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

Equation 6-3

Equation 6-5

Table 6-2. NRCS Conveyance factors, K

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

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

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

Subdivision: Hardy Road Properties
Location: El Paso County
Design Storm: 5-Year

Project Name: Hardy Road Properties
Project No.: 25018.00
Calculated By: NQJ
Checked By: REB
Date: 4/27/26

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_c (min)	
	JJ5	-	-	-	60.0	10.84	1.44	15.6															DPJJ5 FLOW, DRAINS INTO BASIN EX2
	JJ6	-	-	-	33.5	1.04	2.32	2.4															DPJJ6 FLOW, DRAINS INTO BASIN EX2
	JJ7	-	-	-	9.9	0.12	4.15	0.5															DPJJ7 FLOW, DRAINS INTO BASIN EX3
	JJ8	-	-	-	9.1	0.17	4.27	0.7															DPJJ8 FLOW, DRAINS INTO BASIN EX1
	JJ9	-	-	-	13.5	0.05	3.67	0.2															DPJJ9 FLOW, DRAINS INTO BASIN EX1
	OS1				46.2	2.30	1.83	4.7															DPOS1 FLOW PER STREAMSTATS, DRAINS INTO BASIN EX3
	EX1	8.71	0.11	36.9	0.95	2.17	2.1																BASIN E FLOW @ DP6, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	1							36.9	1.17	2.17	2.5												COMBINED DPJJ8, DPJJ9 & BASIN EX1 @ DP1, CONTINUES TO DP5
	EX2	5.01	0.09	30.5	0.45	2.46	1.1																BASIN EX2 FLOW @ DP2
	2							60.0	12.33	1.44	17.8												COMBINED DPJJ5, DPJJ6 & BASIN EX2 FLOW @ DP2, CONTINUES TO DP5
	EX3	4.06	0.09	36.1	0.37	2.21	0.8																BASIN EX3 FLOW @ DP3
	3							46.2	2.67	1.83	4.9												COMBINED DPOS1 & BASIN EX3 @ DP3, CONTINUES TO DP5
	4	EX4	2.76	0.09	32.0	0.25	2.38	0.6															BASIN EX4 FLOW @ DP4, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	5							60.0	16.17	1.44	23.3												DP1-DP3 COMBINED @ DP5, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST

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

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

Subdivision: Hardy Road Properties
Location: El Paso County
Design Storm: 100-Year

Project Name: Hardy Road Properties
Project No.: 25018.00
Calculated By: NQJ
Checked By: REB
Date: 4/27/26

STREET	Design Point	DIRECT RUNOFF				TOTAL RUNOFF				STREET			PIPE			TRAVEL TIME			REMARKS				
		Basin ID	Area (ac)	Runoff Coeff.	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q _{street} (cfs)	C*A (ac)	Slope (%)	Q _{pipe} (cfs)	C*A (ac)	Slope (%)		Pipe Size (inches)	Length (ft)	Velocity (fps)	t _r (min)
	JJ5	-	-	-	60.0	35.00	2.42	84.6															DPJJ5 FLOW, DRAINS INTO BASIN EX2
	JJ6	-	-	-	33.5	3.17	3.89	12.3															DPJJ6 FLOW, DRAINS INTO BASIN EX2
	JJ7	-	-	-	9.9	0.33	6.97	2.3															DPJJ7 FLOW, DRAINS INTO BASIN EX3
	JJ8	-	-	-	9.1	0.47	7.16	3.3															DPJJ8 FLOW, DRAINS INTO BASIN EX1
	JJ9	-	-	-	13.5	0.18	6.17	1.1															DPJJ9 FLOW, DRAINS INTO BASIN EX1
	OS1	-	-	-	46.2	9.22	3.08	29.5															DPOS1 FLOW PER STREAMSTATS, DRAINS INTO BASIN EX3
	EX1	8.71	0.37	36.9	3.26	3.64	11.9																BASIN E FLOW @ DP6, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	1							36.9	3.91	3.64	14.2												COMBINED DPJJ8, DPJJ9 & BASIN EX1 @ DP1, CONTINUES TO DP5
	EX2	5.01	0.36	30.5	1.80	4.12	7.4																BASIN EX2 FLOW @ DP2
	2							60.0	39.97	2.42	96.6												COMBINED DPJJ5, DPJJ6 & BASIN EX2 FLOW @ DP2, CONTINUES TO DP5
	EX3	4.06	0.36	36.1	1.46	3.70	5.4																BASIN EX3 FLOW @ DP3
	3							46.2	10.68	3.08	32.8												COMBINED DPOS1 & BASIN EX3 @ DP3, CONTINUES TO DP5
	4	EX4	2.76	0.36	32.0	0.99	4.00	4.0															BASIN EX4 FLOW @ DP4, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	5							60.0	54.56	2.42	131.9												DP1-DP3 COMBINED @ DP5, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST

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

Subdivision: Hardy Road Properties
Location: El Paso County
Project Name: Hardy Road Properties
Project Number: 25018
Calculated By: NQJ
Checked By: REB
Date: 2/17/2026

PROPOSED CONDITIONS - BASIN SUMMARY TABLE							
Tributary Sub-basin	Area (acres)	Percent Impervious	C ₅	C ₁₀₀	t _c (min)	Q ₅ (cfs)	Q ₁₀₀ (cfs)
1	2.30	13.5%	0.18	0.43	27.8	1.1	4.3
2	1.95	4.3%	0.11	0.37	23.7	0.6	3.4
3	2.59	2.0%	0.09	0.36	29.7	0.6	3.9
4	1.81	2.0%	0.09	0.36	29.6	0.4	2.7
5	3.98	2.0%	0.09	0.36	34.0	0.8	5.5
6	0.58	2.0%	0.09	0.36	19.0	0.2	1.1
7	4.60	7.3%	0.13	0.39	31.0	1.5	7.3
8	2.76	2.0%	0.09	0.36	32.0	0.6	4.0

PROPOSED CONDITIONS - DESIGN POINT SUMMARY TABLE		
DP#	Q _{5-YR}	Q _{100-YR}
OS1	4.7	29.5
JJ5	15.6	84.6
JJ6	2.4	12.3
JJ7	0.5	2.3
JJ8	0.7	3.3
JJ9	0.2	1.1
1	1.5	6.3
2	0.7	4.3
3	14.7	79.8
4	2.5	13.1
4.1	16.3	88.2
5	4.1	27.4
6	18.9	106.7
7	3.3	15.9
8	20.7	115.4
9	0.6	4.0

COMPOSITE % IMPERVIOUS CALCULATIONS - PROPOSED CONDITIONS

Subdivision: Hardy Road Properties
 Location: El Paso County

Project Name: Hardy Road Properties
 Project No.: 25018.00
 Calculated By: NQJ
 Checked By: REB
 Date: 2/17/26

Basin ID	Total Area (ac)	Gravel					Paved					Roofs				Undeveloped				Weighted C ₅ & C ₁₀₀		Basins Total Weighted % Imp.
		C ₅	C ₁₀₀	Area (ac)	% Imp.	% Imp.	C ₅	C ₁₀₀	Area (ac)	% Imp.	C ₅	C ₁₀₀	Area (ac)	% Imp.	C ₅	C ₁₀₀	Area (ac)	% Imp.	C ₅	C ₁₀₀		
1	2.30	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.17	100.0%	0.73	0.81	0.11	90.0%	0.09	0.36	2.02	2.0%	0.18	0.43	13.5%	
2	1.95	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.05	90.0%	0.09	0.36	1.90	2.0%	0.11	0.37	4.3%	
3	2.59	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	2.59	2.0%	0.09	0.36	2.0%	
4	1.81	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	1.81	2.0%	0.09	0.36	2.0%	
5	3.98	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	3.98	2.0%	0.09	0.36	2.0%	
6	0.58	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	0.58	2.0%	0.09	0.36	2.0%	
7	4.60	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.15	100.0%	0.73	0.81	0.11	90.0%	0.09	0.36	4.34	2.0%	0.13	0.39	7.3%	
8	2.76	0.59	0.70	0.00	80.0%	7.0%	0.90	0.96	0.00	100.0%	0.73	0.81	0.00	90.0%	0.09	0.36	2.76	2.0%	0.09	0.36	2.0%	
Total	20.57																				4.7%	

STANDARD FORM SF-2 - PROPOSED CONDITIONS TIME OF CONCENTRATION

Subdivision: Hardy Road Properties
Location: El Paso County

Project Name: Hardy Road Properties
Project No.: 25018.00
Calculated By: NQJ
Checked By: REB
Date: 2/17/26

SUB-BASIN DATA					INITIAL/OVERLAND (T _i)			TRAVEL TIME (T _t)					t _c CHECK (URBANIZED BASINS)			FINAL
BASIN ID	D.A. (ac)	Hydrologic Soils Group	Weighted C _s	Impervious (%)	L (ft)	S _o (%)	t _i (min)	L _t (ft)	S _t (%)	K	VEL. (ft/s)	t _t (min)	COMP. t _c (min)	TOTAL LENGTH (ft)	Urbanized t _c (min)	t _c (min)
1	2.30	B	0.18	13.5%	135	4.4%	11.8	330	1.5%	2.5	0.3	18.0	29.8	465.0	27.8	27.8
2	1.95	B	0.11	4.3%	300	6.5%	16.8	175	2.8%	2.5	0.4	7.0	23.7	475.0	27.1	23.7
3	2.59	B	0.09	2.0%	300	6.0%	17.5	295	1.7%	2.5	0.3	15.1	32.6	595.0	29.7	29.7
4	1.81	B	0.09	2.0%	250	6.0%	16.0	415	3.6%	2.5	0.5	14.6	30.5	665.0	29.6	29.6
5	3.98	B	0.09	2.0%	215	3.3%	18.0	815	3.1%	2.5	0.4	30.9	48.9	1030.0	34.0	34.0
6	0.58	B	0.09	2.0%	65	7.7%	7.5	300	3.0%	2.5	0.4	11.5	19.0	365.0	28.8	19.0
7	4.60	B	0.13	7.3%	140	5.0%	12.2	700	3.5%	2.5	0.5	24.9	37.1	840.0	31.0	31.0
8	2.76	B	0.09	2.0%	180	7.1%	12.8	735	4.3%	2.5	0.5	23.6	36.4	915.0	32.0	32.0

NOTES:

$$t_c = t_i + t_t$$

Where:

t_c = computed time of concentration (minutes)

t_i = overland (initial) flow time (minutes)

t_t = channelized flow time (minutes).

$$t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t}$$

Where:

t_t = channelized flow time (travel time, min)

L_t = waterway length (ft)

S_o = waterway slope (ft/ft)

V_t = travel time velocity (ft/sec) = K√S_o

K = NRCS conveyance factor (see Table 6-2).

$$\text{Eq } t_i = \frac{0.395(1.1 - C_s)\sqrt{L_i}}{S_o^{0.33}}$$

Where:

t_i = overland (initial) flow time (minutes)

C_s = runoff coefficient for 5-year frequency (from Table 6-4)

L_i = length of overland flow (ft)

S_o = average slope along the overland flow path (ft/ft).

$$\text{Equation 6-4 } t_i = \frac{L_i}{60(14i + 9)\sqrt{S_o}}$$

∴

t_c = minimum time of concentration for first design point when less than t_c from Equation 6-1.

L_t = length of channelized flow path (ft)

i = imperviousness (expressed as a decimal)

S_o = slope of the channelized flow path (ft/ft).

Equation 6-3

Equation 6-5

Table 6-2. NRCS Conveyance factors, K

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

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

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

Subdivision: Hardy Road Properties
Location: El Paso County
Design Storm: 5-Year

Project Name: Hardy Road Properties
Project No.: 25018.00
Calculated By: NQJ
Checked By: REB
Date: 2/17/26

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				OVERLAND			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C^*A (Ac)	I (in/hr)	Q (cfs)	t_c (min)	C^*A (ac)	I (in/hr)	Q (cfs)	$Q_{overland}$ (cfs)	C^*A (ac)	Slope (%)	Q_{pipe} (cfs)	C^*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_c (min)	
	JJ5	-	-	-	60.0	10.84	1.44	15.6					15.60	10.84	2.9					350	1.2	4.9	DPJJ5 FLOW, DRAINS INTO BASIN 3
	JJ6	-	-	-	33.5	1.04	2.32	2.4					2.40	1.04	4.8					625	1.5	6.8	DPJJ6 FLOW, DRAINS INTO BASIN 4
	JJ7	-	-	-	9.9	0.12	4.15	0.5					0.50	0.12	3.7					965	1.3	11.9	DPJJ7 FLOW, DRAINS INTO BASIN 5
	JJ8	-	-	-	9.1	0.17	4.27	0.7					0.70	0.17	2.6					462	1.1	6.8	DPJJ8 FLOW, DRAINS INTO BASIN 1
	JJ9	-	-	-	13.5	0.05	3.67	0.2					0.20	0.05	5.4					463	1.6	4.7	DPJJ9 FLOW, DRAINS INTO BASIN 2
	OS1				46.2	2.30	1.83	4.7					4.70	2.30	3.7					968	1.3	12.0	DPOS1 FLOW PER STREAMSTATS, DRAINS INTO BASIN 5
		1	2.30	0.18	27.8	0.42	2.59	1.1															BASIN 1 FLOW @ DP1
	1								27.8	0.59	2.59	1.5	1.52	0.59	3.9					520	1.4	6.3	COMBINED BASIN 1 & DPJJ8 FLOW @ DP1, CONTINUES TO DP7
		2	1.95	0.11	23.7	0.21	2.83	0.6															BASIN 2 FLOW @ DP2
	2								23.7	0.26	2.83	0.7	0.73	0.26	3					350	1.2	4.8	COMBINED BASIN 2 & DPJJ9 FLOW @ DP2, CONTINUES TO DP7
		3	2.59	0.09	29.7	0.23	2.50	0.6															BASIN 3 FLOW @ DP3
	3								64.9	11.07	1.32	14.7	14.66	11.07	5.5					90	1.6	0.9	COMBINED BASIN 3 & DPJJ5 FLOW @ DP3, CONTINUES TO DP4
		4	1.81	0.09	29.6	0.16	2.50	0.4															BASIN 4 FLOW @ DP4
	4								40.3	1.20	2.04	2.5											COMBINED BASIN 4 & DPJJ6 FLOW @ DP4, CONTINUES TO DP4.1
	4.1								64.9	12.28	1.32	16.3	16.25	12.28	3.5					260	1.3	3.3	COMBINED DP3 & DP4 @ DP4.1, CONTINUES TO DP6
		5	3.98	0.09	34.0	0.36	2.29	0.8															BASIN 5 FLOW @ DP5
	5								58.2	2.78	1.49	4.1	4.13	2.78	2					78	1.0	1.3	COMBINED BASIN 5, DPJJ7 & DPOS1 @ DP5, CONTINUES TO DP6
		6	0.58	0.09	19.0	0.05	3.16	0.2															BASIN 6 FLOW @ DP6
	6								68.2	15.11	1.25	18.9											COMBINED BASIN 6, DP4.1, & DP5 @ DP6, CONTINUES TO DP8
		7	4.60	0.13	31.0	0.61	2.43	1.5															BASIN 7 FLOW @ DP7

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

Subdivision: Hardy Road Properties
Location: El Paso County
Design Storm: 5-Year

Project Name: Hardy Road Properties
Project No.: 25018.00
Calculated By: NQJ
Checked By: REB
Date: 2/17/26

STREET	Design Point	DIRECT RUNOFF						TOTAL RUNOFF				OVERLAND			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	$Q_{overland}$ (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	
	7							34.1	1.45	2.29	3.3											COMBINED DP1, DP2, & BASIN 7 FLOW @ DP7, CONTINUES TO DP8
	8							68.2	16.55	1.25	20.7											COMBINED DP6 & DP7 @ DP8, CONTINUES EAST OFFSITE
	9	8	2.76	0.09	32.0	0.25	2.38	0.6														BASIN 8 FLOW @ DP9, CONTINUES EAST OFFSITE

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

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

Subdivision: Hardy Road Properties
Location: El Paso County
Design Storm: 100-Year

Project Name: Hardy Road Properties
Project No.: 25018.00
Calculated By: NQJ
Checked By: REB
Date: 2/17/26

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				OVERLAND			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (ac)	Runoff Coeff.	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q _{overland} (cfs)	C*A (ac)	Slope (%)	Q _{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t _t (min)	
	JJ5	-	-	-	60.0	35.00	2.42	84.6					84.60	35.00	2.9					350	1.2	4.9	DPJJ5 FLOW, DRAINS INTO BASIN 3
	JJ6	-	-	-	33.5	3.17	3.89	12.3					12.30	3.17	4.8					625	1.5	6.8	DPJJ6 FLOW, DRAINS INTO BASIN 4
	JJ7	-	-	-	9.9	0.33	6.97	2.3					2.30	0.33	3.7					965	1.3	11.9	DPJJ7 FLOW, DRAINS INTO BASIN 5
	JJ8	-	-	-	9.1	0.47	7.16	3.3					3.30	0.47	2.6					462	1.1	6.8	DPJJ8 FLOW, DRAINS INTO BASIN 1
	JJ9	-	-	-	13.5	0.18	6.17	1.1					1.10	0.18	5.4					463	1.6	4.7	DPJJ9 FLOW, DRAINS INTO BASIN 2
	OS1				46.2	9.22	3.08	29.5					29.50	9.22	3.7					968	1.3	12.0	DPOS1 FLOW PER STREAMSTATS, DRAINS INTO BASIN 5
	1	2.30	0.43	27.8	0.98	4.35	4.3																BASIN 1 FLOW @ DP1
	1							27.8	1.45	4.35	6.3	6.31	1.45	3.9						520	1.4	6.3	COMBINED BASIN 1 & DPJJ8 FLOW @ DP1, CONTINUES TO DP7
	2	1.95	0.37	23.7	0.72	4.76	3.4																BASIN 2 FLOW @ DP2
	2							23.7	0.90	4.76	4.3	4.30	0.90	3						350	1.2	4.8	COMBINED BASIN 2 & DPJJ9 FLOW @ DP2, CONTINUES TO DP7
	3	2.59	0.36	29.7	0.93	4.19	3.9																BASIN 3 FLOW @ DP3
	3							64.9	35.93	2.22	79.8	79.76	35.93	5.5						90	1.6	0.9	COMBINED BASIN 3 & DPJJ5 FLOW @ DP3, CONTINUES TO DP4
	4	1.81	0.36	29.6	0.65	4.20	2.7																BASIN 4 FLOW @ DP4
	4							40.3	3.82	3.42	13.1												COMBINED BASIN 4, DP3 & DPJJ6 FLOW @ DP4, CONTINUES TO DP6
	4.1							64.9	39.75	2.22	88.2	88.24	39.75	3.5						260	1.3	3.3	COMBINED DP3 & DP4 @ DP4.1, CONTINUES TO DP6
	5	3.98	0.36	34.0	1.43	3.85	5.5																BASIN 5 FLOW @ DP5
	5							58.2	10.98	2.49	27.4	27.40	10.98	2						78	1.0	1.3	COMBINED BASIN 5, DPJJ7 & DPOS1 @ DP5, CONTINUES TO DP6
	6	0.58	0.36	19.0	0.21	5.31	1.1																BASIN 6 FLOW @ DP6
	6							68.2	50.95	2.09	106.7												COMBINED BASIN 6, DP4.1, & DP5 @ DP6, CONTINUES TO DP8

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

Subdivision: Hardy Road Properties
Location: El Paso County
Design Storm: 100-Year

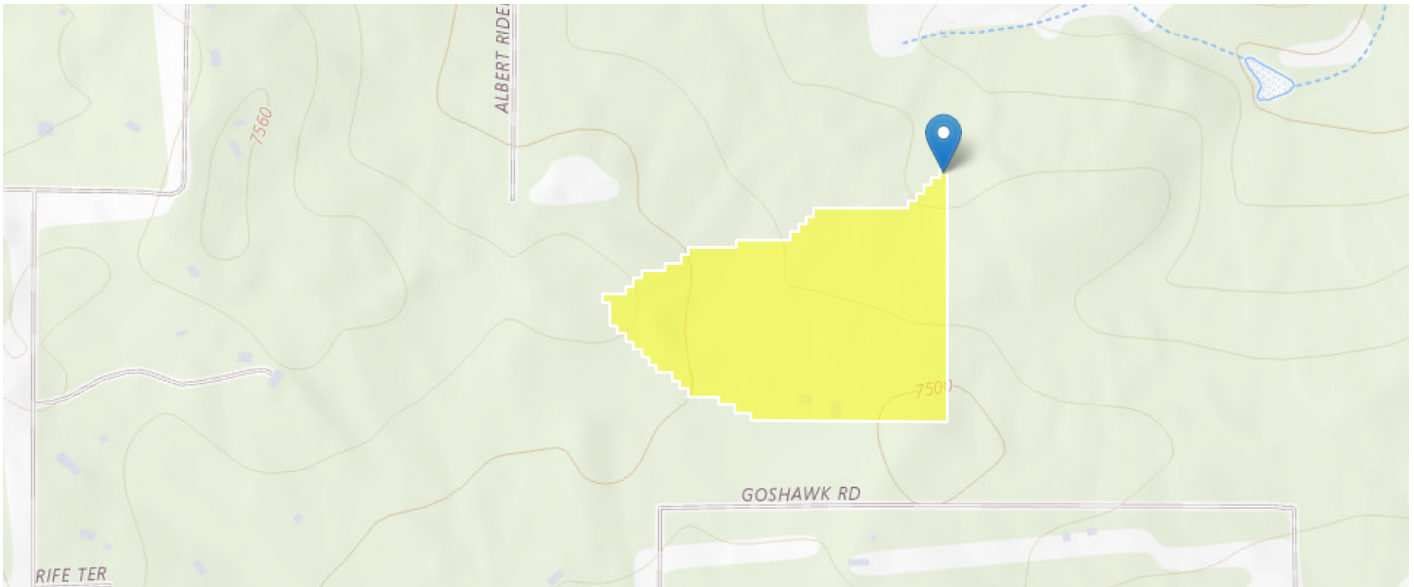
Project Name: Hardy Road Properties
Project No.: 25018.00
Calculated By: NQJ
Checked By: REB
Date: 2/17/26

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				OVERLAND			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (ac)	Runoff Coeff.	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q _{overland} (cfs)	C*A (ac)	Slope (%)	Q _{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t _r (min)	
		7	4.60	0.39	31.0	1.80	4.08	7.3															BASIN 7 FLOW @ DP7
	7								34.1	4.15	3.84	15.9											COMBINED DP1, DP2, & BASIN 7 FLOW @ DP7, CONTINUES TO DP8
	8								68.2	55.10	2.09	115.4											COMBINED DP6 & DP7 @ DP8, CONTINUES EAST OFFSITE
	9	8	2.76	0.36	32.0	0.99	4.00	4.0															BASIN 8 FLOW @ DP9, CONTINUES EAST OFFSITE

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

StreamStats Report - DPOS1

Region ID: CO
 Clicked Point (Latitude, Longitude): 39.08579, -104.63548
 NHD Stream GNIS Name of Click Point: Stream name not found
 Time: 2026-02-19 12:12:37 -0700



StreamStats Update

Starting with version 4.30.0, the StreamStats application uses services that were redeveloped with open-source software components. Users may observe minor variations in computed results when compared to those from previous versions. These differences are expected and do not reflect errors in the underlying data or analytical methods. Users are advised to consider these potential variations when interpreting or comparing results generated across different versions of StreamStats. Please email streamstats@usgs.gov with any questions or concerns. A full list of changes can be found at <https://www.usgs.gov/streamstats/news/streamstats-data-updates-open-source-code-release>.

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	4.72	percent
DRNAREA	Area that drains to a point on a stream	0.04	square miles
EL7500	Percent of area above 7500 ft	15.66	percent
ELEV	Mean Basin Elevation	7487.06	feet
ELEVMAX	Maximum basin elevation	7526.72	feet
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	4.977	inches
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years	1.89	inches
I6H100Y	6-hour precipitation that is expected to occur on average once in 100 years	3.822	inches
I6H2Y	Maximum 6-hour precipitation that occurs on average once in 2 years	1.384	inches

Parameter Code	Parameter Description	Value	Unit
LAT_OUT	Latitude of Basin Outlet	39.085834	decimal degrees
LC11BARE	Percentage of barren from NLCD 2011 class 31	0	percent
LC11CRPHAY	Percentage of cultivated crops and hay, classes 81 and 82, from NLCD 2011	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	0	percent
LC11FOREST	Percentage of forest from NLCD 2011 classes 41-43	100	percent
LC11GRASS	Percent of area covered by grassland/herbaceous using 2011 NLCD	0	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0	percent
LC11SHRUB	Percent of area covered by shrubland using 2011 NLCD	0	percent
LC11SNOIC	Percent snow and ice from NLCD 2011 class 12	0	percent
LC11WATER	Percent of open water, class 11, from NLCD 2011	0	percent
LC11WETLND	Percentage of wetlands, classes 90 and 95, from NLCD 2011	0	percent
LFPLENGTH	Length of longest flow path	0.341	miles
LONG_OUT	Longitude of Basin Outlet	-104.635495	decimal degrees
MINBELEV	Minimum basin elevation	7450.94	feet
OUTLETELEV	Elevation of the stream outlet in feet above NAVD88	7450.94	feet
PRECIP	Mean Annual Precipitation	20.63	inches
RCN	Runoff-curve number as defined by NRCS (http://policy.nrcs.usda.gov/OpenNonWebContent.aspx?content=17758.wba)	55	dimensionless
RUNCO_CO	Soil runoff coefficient as defined by Verdin and Gross (2017)	0.48	dimensionless
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	0	percent
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	100	percent
SSURGOC	Percentage of area of Hydrologic Soil Type C from SSURGO	0	percent
SSURGOD	Percentage of area of Hydrologic Soil Type D from SSURGO	0	percent
STATSCLAY	Percentage of clay soils from STATSGO	16.3	percent
STORNHD	Percent storage (wetlands and waterbodies) determined from 1:24K NHD	0	percent
TOC	Time of concentration in hours	0.77	hours

➤ Peak-Flow Statistics

Peak-Flow Statistics Parameters [Foothills Region Peak Flow 2016 5099]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.04	square miles	0.6	2850
I6H100Y	6 Hour 100 Year Precipitation	3.822	inches	2.38	4.89
OUTLETELEV	Elevation of Gage	7450.94	feet	4290	8270
STATSCLAY	STATSGO Percentage of Clay Soils	16.3	percent	9.87	37.5

Peak-Flow Statistics Disclaimers [Foothills Region Peak Flow 2016 5099]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Foothills Region Peak Flow 2016 5099]

Statistic	Value	Unit
50-percent AEP flood	1.46	ft ³ /s
20-percent AEP flood	4.68	ft ³ /s
10-percent AEP flood	8.23	ft ³ /s
4-percent AEP flood	14.6	ft ³ /s
2-percent AEP flood	21	ft ³ /s
1-percent AEP flood	29.5	ft ³ /s
0.5-percent AEP flood	39.4	ft ³ /s
0.2-percent AEP flood	55.8	ft ³ /s

Peak-Flow Statistics Citations

Kohn, M.S., Stevens, M.R., Harden, T.M., Godaire, J.E., Klinger, R.E., and Mommandi, A., 2016, Paleoflood investigations to improve peak-streamflow regional-regression equations for natural streamflow in eastern Colorado, 2015: U.S. Geological Survey Scientific Investigations Report 2016-5099, 58 p. (<http://dx.doi.org/10.3133/sir20165099>)

➤ Bankfull Statistics

Bankfull Statistics Parameters [Interior Plains D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.04	square miles	0.19305	59927.7393

Bankfull Statistics Parameters [Great Plains P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.04	square miles	0.598455	30899.82624

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.04	square miles	0.07722	59927.7393

Bankfull Statistics Disclaimers [Interior Plains D Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Interior Plains D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	3.79	ft
Bieger_D_channel_depth	0.809	ft
Bieger_D_channel_cross_sectional_area	4.72	ft ²

Bankfull Statistics Disclaimers [Great Plains P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [Great Plains P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	1.09	ft
Bieger_P_channel_depth	0.747	ft
Bieger_P_channel_cross_sectional_area	8.28	ft^2

Bankfull Statistics Disclaimers [USA Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	3.99	ft
Bieger_USA_channel_depth	0.607	ft
Bieger_USA_channel_cross_sectional_area	3	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	3.79	ft
Bieger_D_channel_depth	0.809	ft
Bieger_D_channel_cross_sectional_area	4.72	ft^2
Bieger_P_channel_width	1.09	ft
Bieger_P_channel_depth	0.747	ft
Bieger_P_channel_cross_sectional_area	8.28	ft^2
Bieger_USA_channel_width	3.99	ft
Bieger_USA_channel_depth	0.607	ft
Bieger_USA_channel_cross_sectional_area	3	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G., 2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

➤ Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 12]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.04	square miles	0.1	7000

Maximum Probable Flood Statistics Disclaimers [Crippen Bue Region 12]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 12]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	516	ft ³ /s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (<https://pubs.usgs.gov/wsp/1887/report.pdf>)

➤ NHD Features of Delineated Basin

NHD Streams Intersecting Basin Delineation Boundary

This functionality attempts to find the stream name at the delineation point. The name of the nearest intersecting National Hydrography Dataset (NHD) stream is selected by default to appear in the report above. NHD streams do not correspond to the StreamStats stream grid and may not be accurate. If you would like a different stream to appear in the above section, please make a selection below.

No NHD streams intersect the delineated basin.

Watershed Boundary Dataset (WBD) HUC 8 Intersecting Basin Delineation Boundary

This functionality attempts to find the intersecting HUC 8 of the delineated watershed. HUC boundaries do not correspond to the StreamStats data and may not be accurate.

HUC 8	Name
10190010	Kiowa

NHD Hydrologic Features Citations

U.S. Geological Survey, 2022, USGS TNM - National Hydrography Dataset, accessed July 21, 2022 at URL <https://hydro.nationalmap.gov/arcgis/rest/services/nhd/MapServer/6>. (<https://hydro.nationalmap.gov/arcgis/rest/services/nhd/MapServer/6>) U.S. Geological Survey, 2022, USGS TNM - National Hydrography Dataset, accessed July 21, 2022 at URL <https://hydro.nationalmap.gov/arcgis/rest/services/wbd/MapServer/4>. (<https://hydro.nationalmap.gov/arcgis/rest/services/wbd/MapServer/4>)

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.31.0

SSHydro Services Version: 1.1.0

SSDelineate Services Version: 1.0.1

NSS Services Version: 2.2.1

GageStats Services Version: 1.2.1

Pourpoint Services Version: 1.2.0

Batch Processor Version: 1.6.1



APPENDIX C – HYDRAULIC CALCULATIONS

Culvert Report

DP1 Culvert (Q100 = 6.3 cfs)

Invert Elev Dn (ft)	= 7435.00
Pipe Length (ft)	= 20.00
Slope (%)	= 2.00
Invert Elev Up (ft)	= 7435.40
Rise (in)	= 18.0
Shape	= Circular
Span (in)	= 18.0
No. Barrels	= 1
n-Value	= 0.022
Culvert Type	= Circular Corrugate Metal Pipe
Culvert Entrance	= Projecting
Coeff. K,M,c,Y,k	= 0.034, 1.5, 0.0553, 0.54, 0.9

Embankment

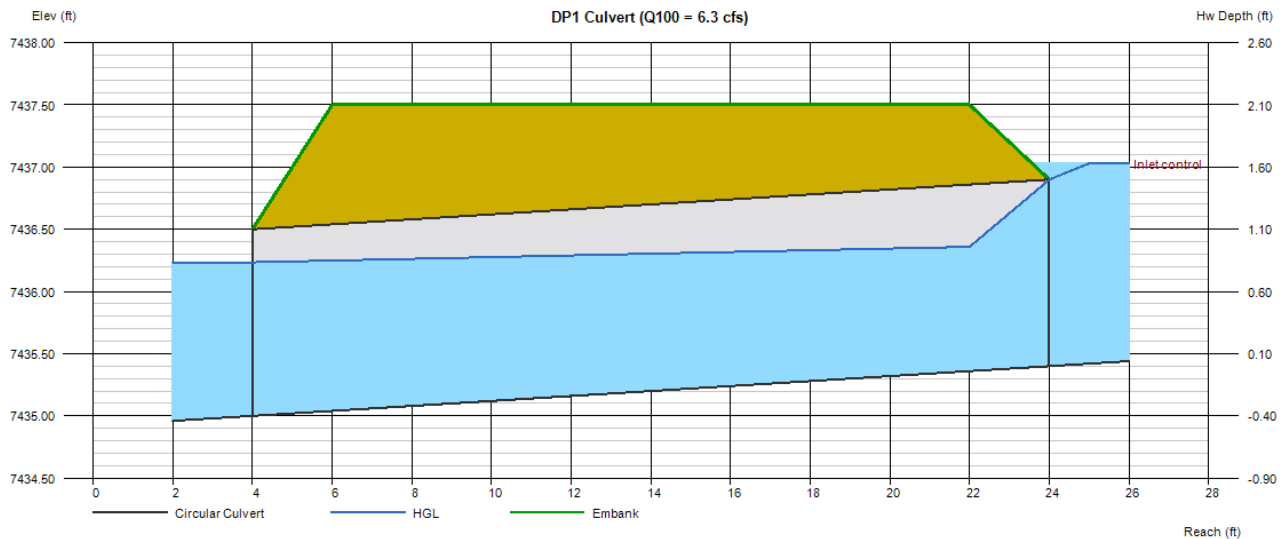
Top Elevation (ft)	= 7437.50
Top Width (ft)	= 16.00
Crest Width (ft)	= 50.00

Calculations

Qmin (cfs)	= 6.30
Qmax (cfs)	= 6.30
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 6.30
Qpipe (cfs)	= 6.30
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 4.05
Veloc Up (ft/s)	= 5.19
HGL Dn (ft)	= 7436.24
HGL Up (ft)	= 7436.37
Hw Elev (ft)	= 7437.03
Hw/D (ft)	= 1.09
Flow Regime	= Inlet Control



Culvert Report

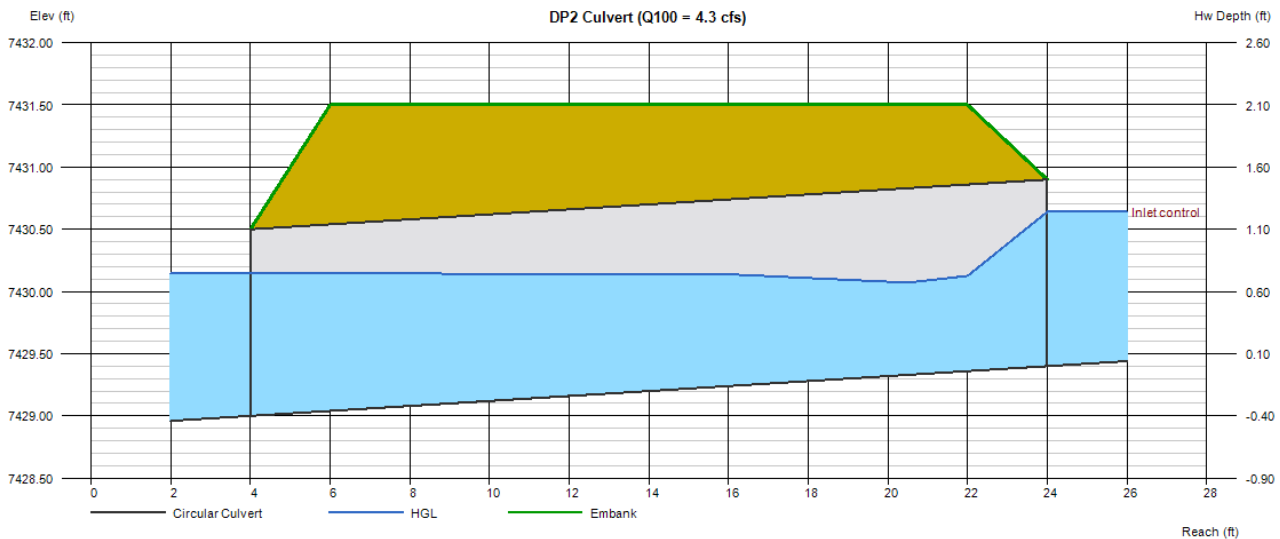
DP2 Culvert (Q100 = 4.3 cfs)

Invert Elev Dn (ft)	= 7429.00
Pipe Length (ft)	= 20.00
Slope (%)	= 2.00
Invert Elev Up (ft)	= 7429.40
Rise (in)	= 18.0
Shape	= Circular
Span (in)	= 18.0
No. Barrels	= 1
n-Value	= 0.022
Culvert Type	= Circular Corrugate Metal Pipe
Culvert Entrance	= Projecting
Coeff. K,M,c,Y,k	= 0.034, 1.5, 0.0553, 0.54, 0.9

Embankment	
Top Elevation (ft)	= 7431.50
Top Width (ft)	= 16.00
Crest Width (ft)	= 50.00

Calculations	
Qmin (cfs)	= 4.30
Qmax (cfs)	= 4.30
Tailwater Elev (ft)	= (dc+D)/2

Highlighted	
Qtotal (cfs)	= 4.30
Qpipe (cfs)	= 4.30
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 2.97
Veloc Up (ft/s)	= 4.50
HGL Dn (ft)	= 7430.15
HGL Up (ft)	= 7430.20
Hw Elev (ft)	= 7430.64
Hw/D (ft)	= 0.83
Flow Regime	= Inlet Control



Culvert Report

DP3 Culvert (Q100 = 79.8 cfs)

Invert Elev Dn (ft)	= 7425.00
Pipe Length (ft)	= 110.00
Slope (%)	= 4.00
Invert Elev Up (ft)	= 7429.40
Rise (in)	= 36.0
Shape	= Circular
Span (in)	= 36.0
No. Barrels	= 1
n-Value	= 0.013
Culvert Type	= Circular Concrete
Culvert Entrance	= Groove end projecting (C)
Coeff. K,M,c,Y,k	= 0.0045, 2, 0.0317, 0.69, 0.2

Embankment

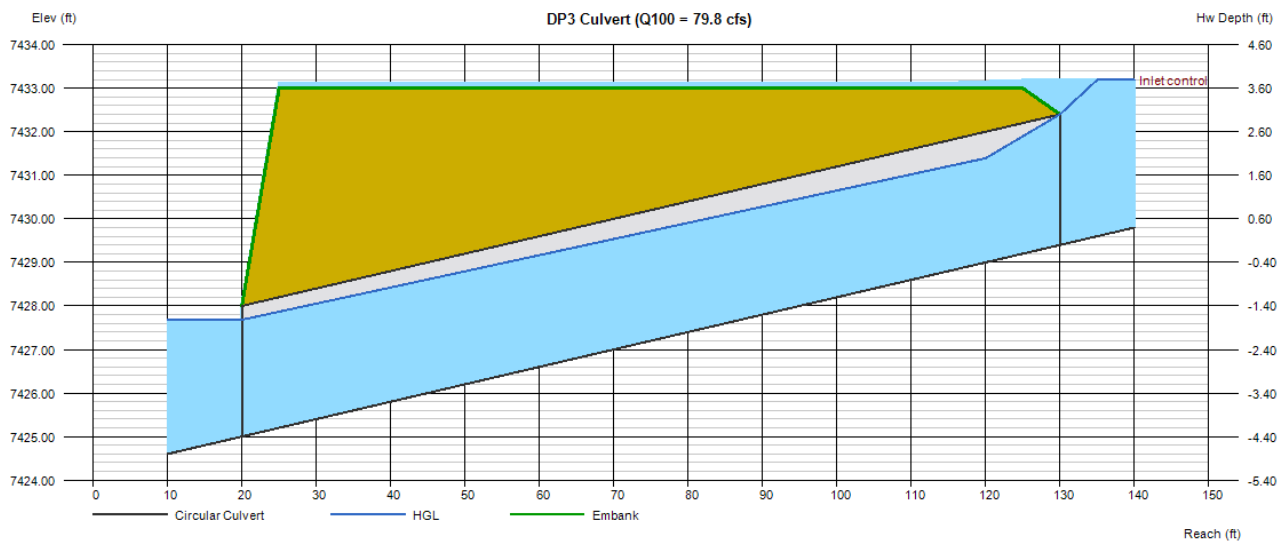
Top Elevation (ft)	= 7433.00
Top Width (ft)	= 100.00
Crest Width (ft)	= 100.00

Calculations

Qmin (cfs)	= 79.80
Qmax (cfs)	= 79.80
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 79.80
Qpipe (cfs)	= 52.99
Qovertop (cfs)	= 26.81
Veloc Dn (ft/s)	= 7.95
Veloc Up (ft/s)	= 8.87
HGL Dn (ft)	= 7427.68
HGL Up (ft)	= 7431.76
Hw Elev (ft)	= 7433.19
Hw/D (ft)	= 1.26
Flow Regime	= Inlet Control



Subdivision: Hardy Road Properties
Location: El Paso County
Project Name: Hardy Road Properties
Project Number: 25018
Calculated By: NQJ
Checked By: REB
Date: 2/20/2026

Proposed Conditions - Drainageway Summary Table

Channel Section	Section Slope, ft/ft	5-year Depth, ft	5-year Velocity, ft/s	5-year Hydraulic Radius, ft	100-year Depth, ft	100-year Velocity, ft/s	100-year Hydraulic Radius, ft	Froude, 5-yr	Froude, 100-yr	Shear Stress, 5-yr	Shear Stress, 100-yr
3-1	0.0384	0.32	2.71	0.16	0.64	3.27	0.20	0.84	0.72	0.4	0.5
3-2	0.0384	0.09	1.74	0.09	0.24	3.32	0.22	1.02	1.19	0.2	0.5
5-1	0.0375	0.18	1.78	0.09	0.36	3.49	0.23	0.74	1.03	0.2	0.5
5-2	0.027	0.19	1.62	0.09	0.39	3.03	0.24	0.65	0.86	0.2	0.4
5-3	0.03	0.22	1.97	0.11	0.45	3.15	0.23	0.74	0.83	0.2	0.4
5-4	0.035	0.27	2.24	0.13	0.54	3.74	0.27	0.76	0.90	0.3	0.6
5-5	0.042	0.15	2.48	0.14	0.43	4.91	0.35	1.13	1.32	0.4	0.9
5-6	0.028	0.27	2.05	0.13	0.54	4.02	0.34	0.70	0.96	0.2	0.6
6-1	0.02	0.41	3.07	0.31	0.96	5.12	0.63	0.84	0.92	0.4	0.8
6-2	0.03	0.34	3.46	0.27	0.83	5.85	0.57	1.05	1.13	0.5	1.1
6-3	0.023	0.34	3.19	0.30	0.88	5.68	0.68	0.96	1.07	0.4	1.0
7-1	0.033	0.13	1.39	0.08	0.24	2.53	0.16	0.68	0.91	0.2	0.3
7-2	0.035	0.15	2.17	0.13	0.35	3.91	0.28	0.99	1.16	0.3	0.6
8-1	0.018	0.38	2.66	0.27	0.86	4.6	0.59	0.76	0.87	0.3	0.7

Channel Report

Drainage 3-1 (Q5 = 14.7 cfs)

User-defined

Invert Elev (ft) = 7436.36
Slope (%) = 3.84
N-Value = 0.030

Highlighted

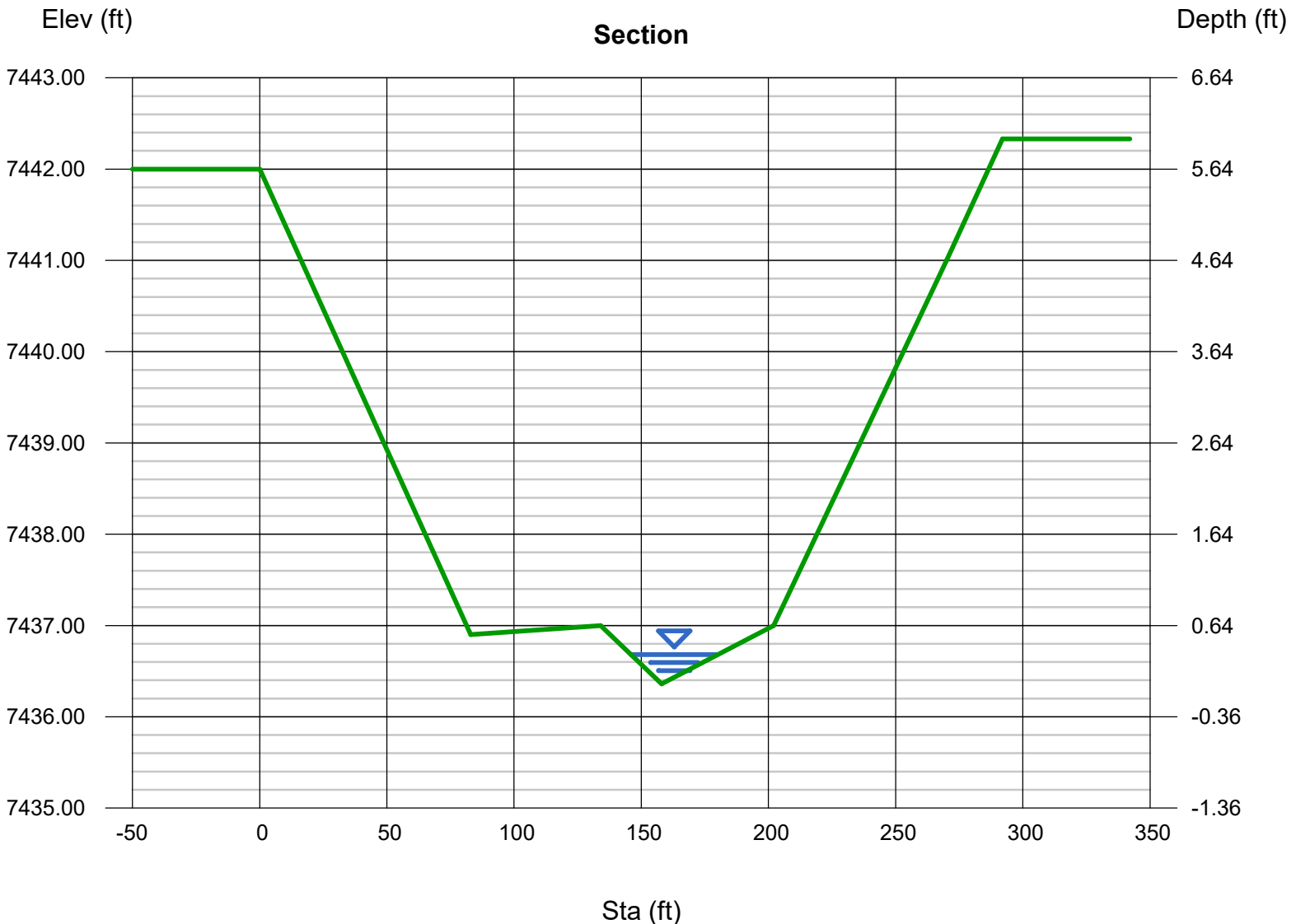
Depth (ft) = 0.32
Q (cfs) = 14.70
Area (sqft) = 5.43
Velocity (ft/s) = 2.71
Wetted Perim (ft) = 33.98
Crit Depth, Yc (ft) = 0.35
Top Width (ft) = 33.97
EGL (ft) = 0.43

Calculations

Compute by: Known Q
Known Q (cfs) = 14.70

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

(0.00, 7442.00)-(83.00, 7436.90, 0.030)-(134.00, 7437.00, 0.030)-(158.00, 7436.36, 0.030)-(202.00, 7437.00, 0.030)-(270.00, 7441.00, 0.030)-(292.00, 7442.33, 0.030)



Channel Report

Drainage 3-1 (Q100= 79.8 cfs)

User-defined

Invert Elev (ft) = 7436.36
Slope (%) = 3.84
N-Value = 0.030

Highlighted

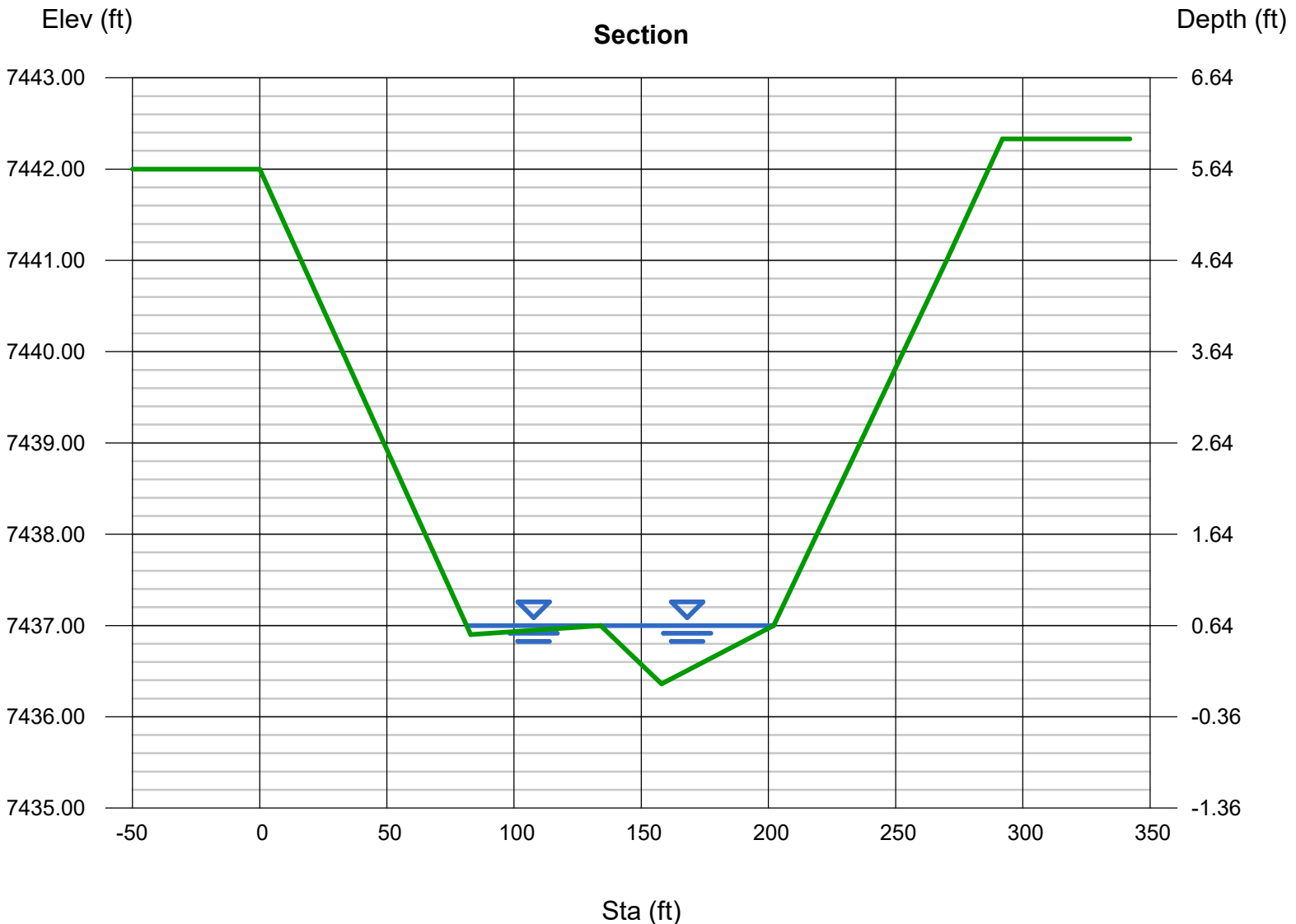
Depth (ft) = 0.64
Q (cfs) = 79.80
Area (sqft) = 24.40
Velocity (ft/s) = 3.27
Wetted Perim (ft) = 120.65
Crit Depth, Yc (ft) = 0.68
Top Width (ft) = 120.63
EGL (ft) = 0.81

Calculations

Compute by: Known Q
Known Q (cfs) = 79.80

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

(0.00, 7442.00)-(83.00, 7436.90, 0.030)-(134.00, 7437.00, 0.030)-(158.00, 7436.36, 0.030)-(202.00, 7437.00, 0.030)-(270.00, 7441.00, 0.030)-(292.00, 7442.33, 0.030)



Channel Report

Drainage 3-2 (Q5 = 14.7 cfs)

User-defined

Invert Elev (ft) = 7430.40
Slope (%) = 3.84
N-Value = 0.030

Highlighted

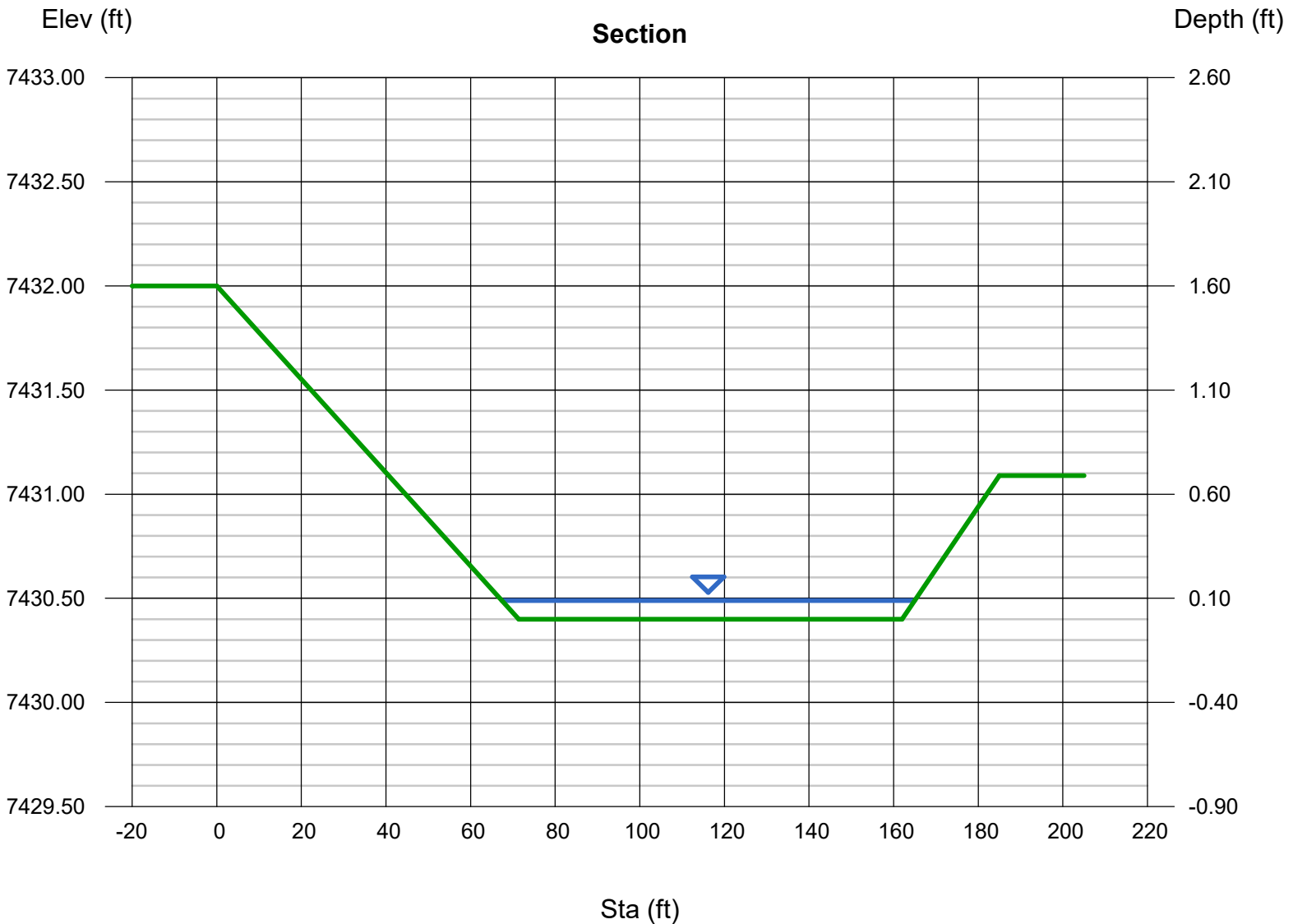
Depth (ft) = 0.09
Q (cfs) = 14.70
Area (sqft) = 8.45
Velocity (ft/s) = 1.74
Wetted Perim (ft) = 97.61
Crit Depth, Yc (ft) = 0.10
Top Width (ft) = 97.60
EGL (ft) = 0.14

Calculations

Compute by: Known Q
Known Q (cfs) = 14.70

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

(0.00, 7432.00)-(71.40, 7430.40, 0.030)-(162.00, 7430.40, 0.030)-(185.00, 7431.09, 0.030)



Channel Report

Drainage 3-2 (Q100 = 79.8 cfs)

User-defined

Invert Elev (ft) = 7430.40
Slope (%) = 3.84
N-Value = 0.030

Highlighted

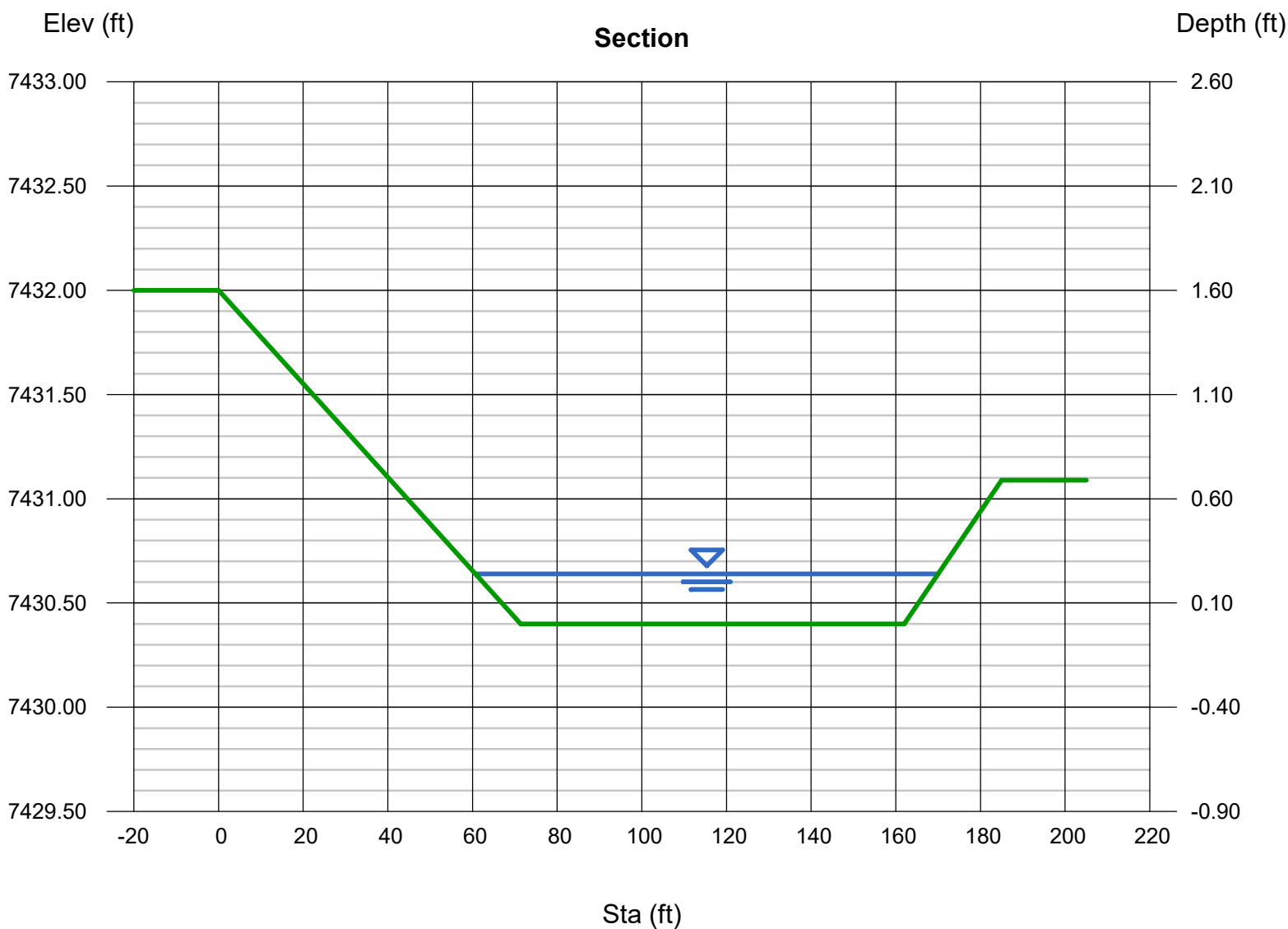
Depth (ft) = 0.24
Q (cfs) = 79.80
Area (sqft) = 24.01
Velocity (ft/s) = 3.32
Wetted Perim (ft) = 109.33
Crit Depth, Yc (ft) = 0.28
Top Width (ft) = 109.33
EGL (ft) = 0.41

Calculations

Compute by: Known Q
Known Q (cfs) = 79.80

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

(0.00, 7432.00)-(71.40, 7430.40, 0.030)-(162.00, 7430.40, 0.030)-(185.00, 7431.09, 0.030)



Channel Report

Drainage 5-1 (Q5 = 4.1 cfs)

User-defined

Invert Elev (ft) = 7443.70
Slope (%) = 3.75
N-Value = 0.030

Highlighted

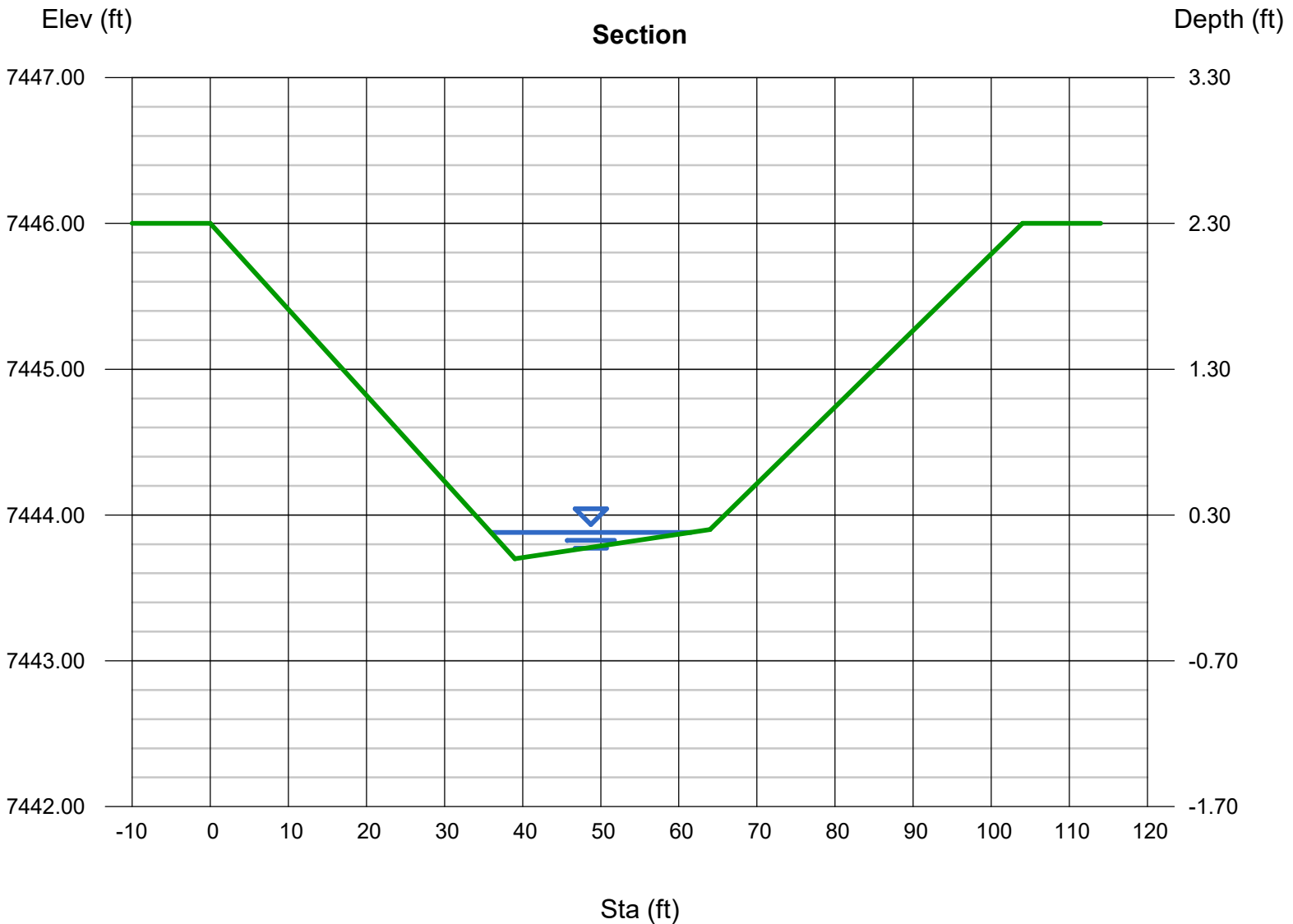
Depth (ft) = 0.18
Q (cfs) = 4.100
Area (sqft) = 2.31
Velocity (ft/s) = 1.78
Wetted Perim (ft) = 25.62
Crit Depth, Yc (ft) = 0.19
Top Width (ft) = 25.61
EGL (ft) = 0.23

Calculations

Compute by: Known Q
Known Q (cfs) = 4.10

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

(0.00, 7446.00)-(39.00, 7443.70, 0.030)-(64.00, 7443.90, 0.030)-(104.00, 7446.00, 0.030)



Channel Report

Drainage 5-1 (Q100 = 27.4 cfs)

User-defined

Invert Elev (ft) = 7443.70
Slope (%) = 3.75
N-Value = 0.030

Highlighted

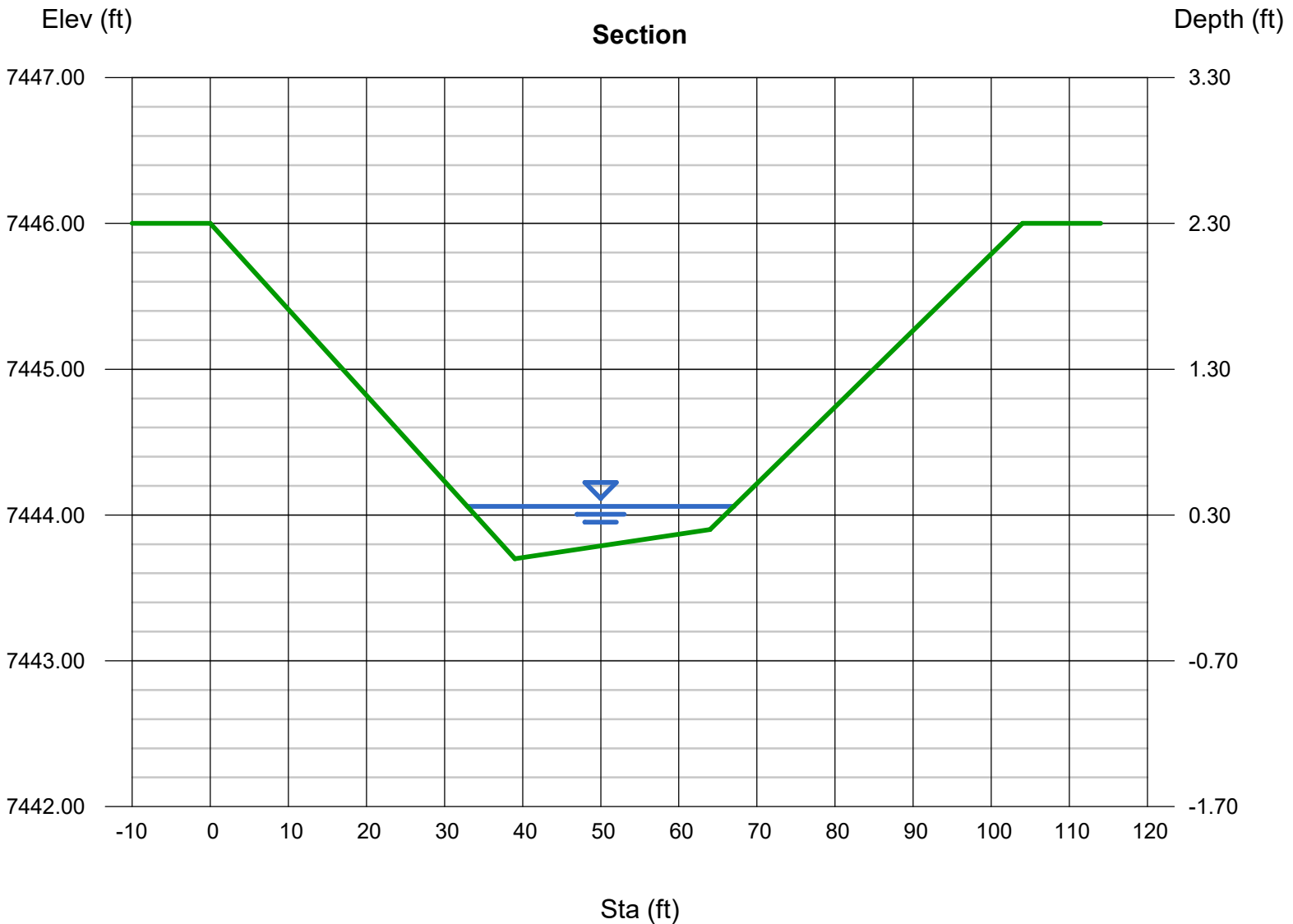
Depth (ft) = 0.36
Q (cfs) = 27.40
Area (sqft) = 7.84
Velocity (ft/s) = 3.49
Wetted Perim (ft) = 34.17
Crit Depth, Yc (ft) = 0.41
Top Width (ft) = 34.15
EGL (ft) = 0.55

Calculations

Compute by: Known Q
Known Q (cfs) = 27.40

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

(0.00, 7446.00)-(39.00, 7443.70, 0.030)-(64.00, 7443.90, 0.030)-(104.00, 7446.00, 0.030)



Channel Report

Drainage 5-2 (Q5 = 4.1 cfs)

User-defined

Invert Elev (ft) = 7438.80
Slope (%) = 2.70
N-Value = 0.030

Highlighted

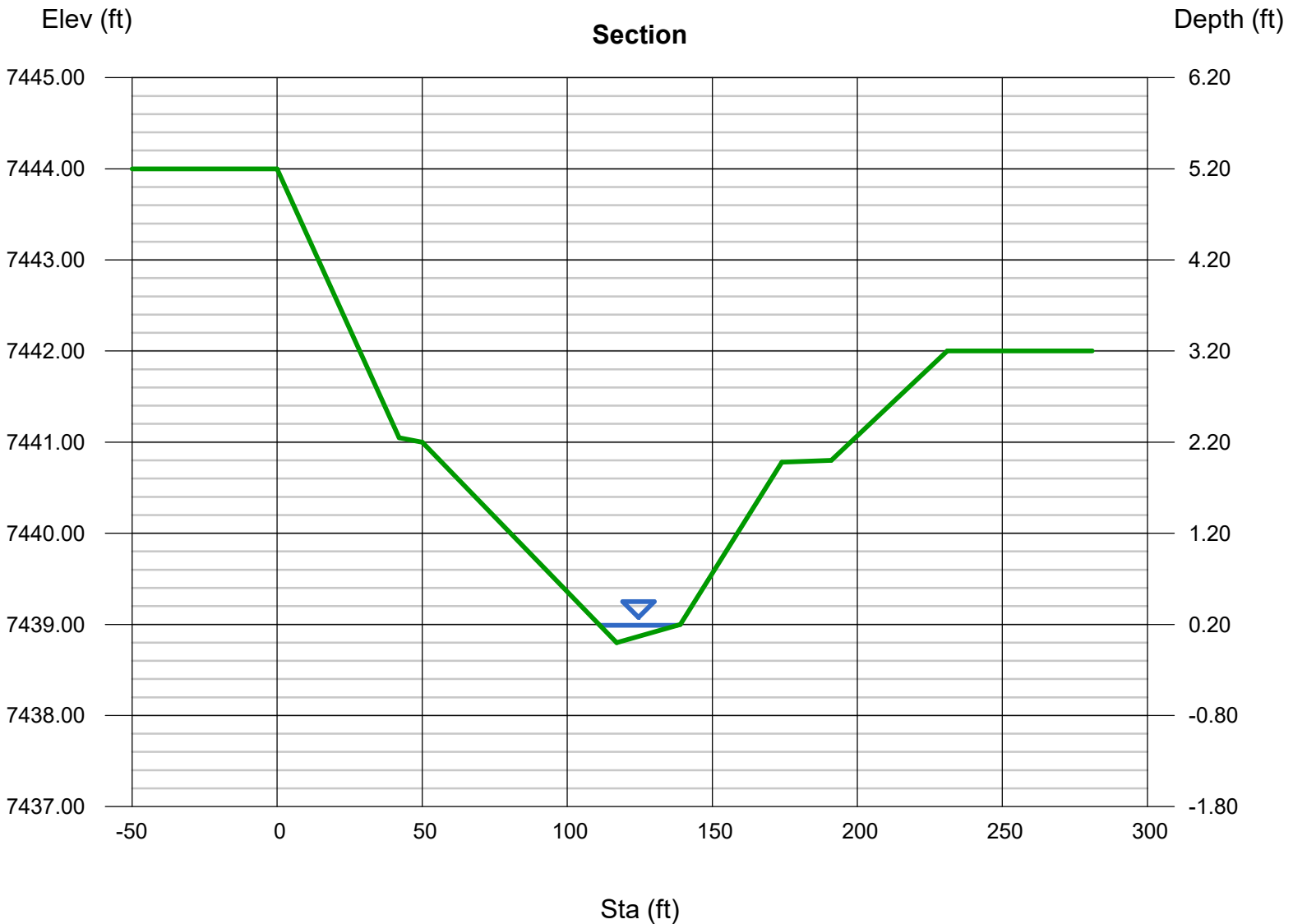
Depth (ft) = 0.19
Q (cfs) = 4.100
Area (sqft) = 2.53
Velocity (ft/s) = 1.62
Wetted Perim (ft) = 26.66
Crit Depth, Yc (ft) = 0.19
Top Width (ft) = 26.66
EGL (ft) = 0.23

Calculations

Compute by: Known Q
Known Q (cfs) = 4.10

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

(0.00, 7444.00)-(42.00, 7441.05, 0.030)-(50.00, 7441.00, 0.030)-(117.00, 7438.80, 0.030)-(139.00, 7439.00, 0.030)-(174.00, 7440.78, 0.030)-(191.00, 7440.80, 0.030)-(231.00, 7442.00, 0.030)



Channel Report

Drainage 5-2 (Q100 = 27.4 cfs)

User-defined

Invert Elev (ft) = 7438.80
Slope (%) = 2.70
N-Value = 0.030

Highlighted

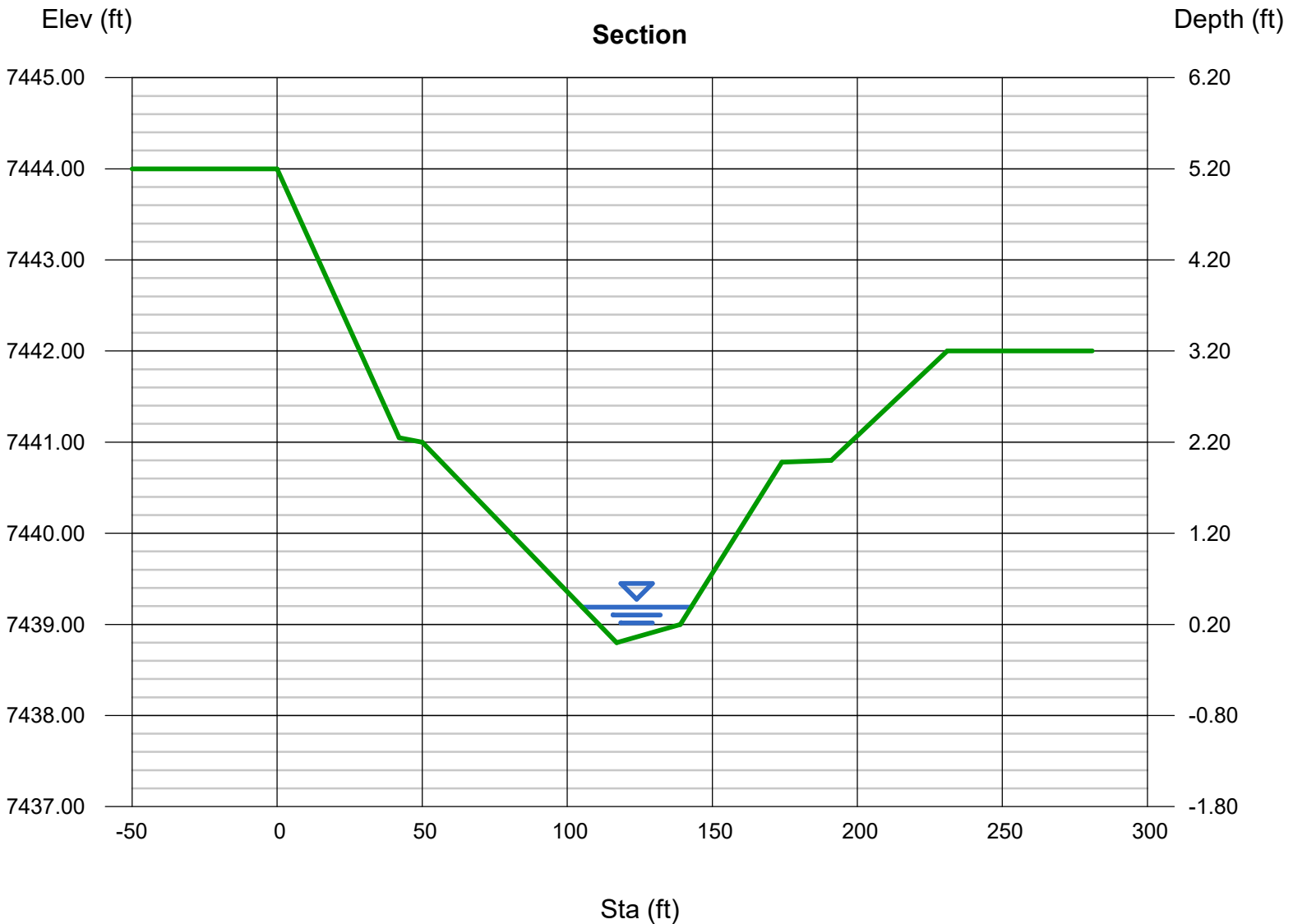
Depth (ft) = 0.39
Q (cfs) = 27.40
Area (sqft) = 9.05
Velocity (ft/s) = 3.03
Wetted Perim (ft) = 37.63
Crit Depth, Yc (ft) = 0.41
Top Width (ft) = 37.62
EGL (ft) = 0.53

Calculations

Compute by: Known Q
Known Q (cfs) = 27.40

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

(0.00, 7444.00)-(42.00, 7441.05, 0.030)-(50.00, 7441.00, 0.030)-(117.00, 7438.80, 0.030)-(139.00, 7439.00, 0.030)-(174.00, 7440.78, 0.030)-(191.00, 7440.80, 0.030)-(231.00, 7442.00, 0.030)



Channel Report

Drainage 5-3 (Q5 = 4.1 cfs)

User-defined

Invert Elev (ft) = 7434.60
Slope (%) = 3.00
N-Value = 0.030

Highlighted

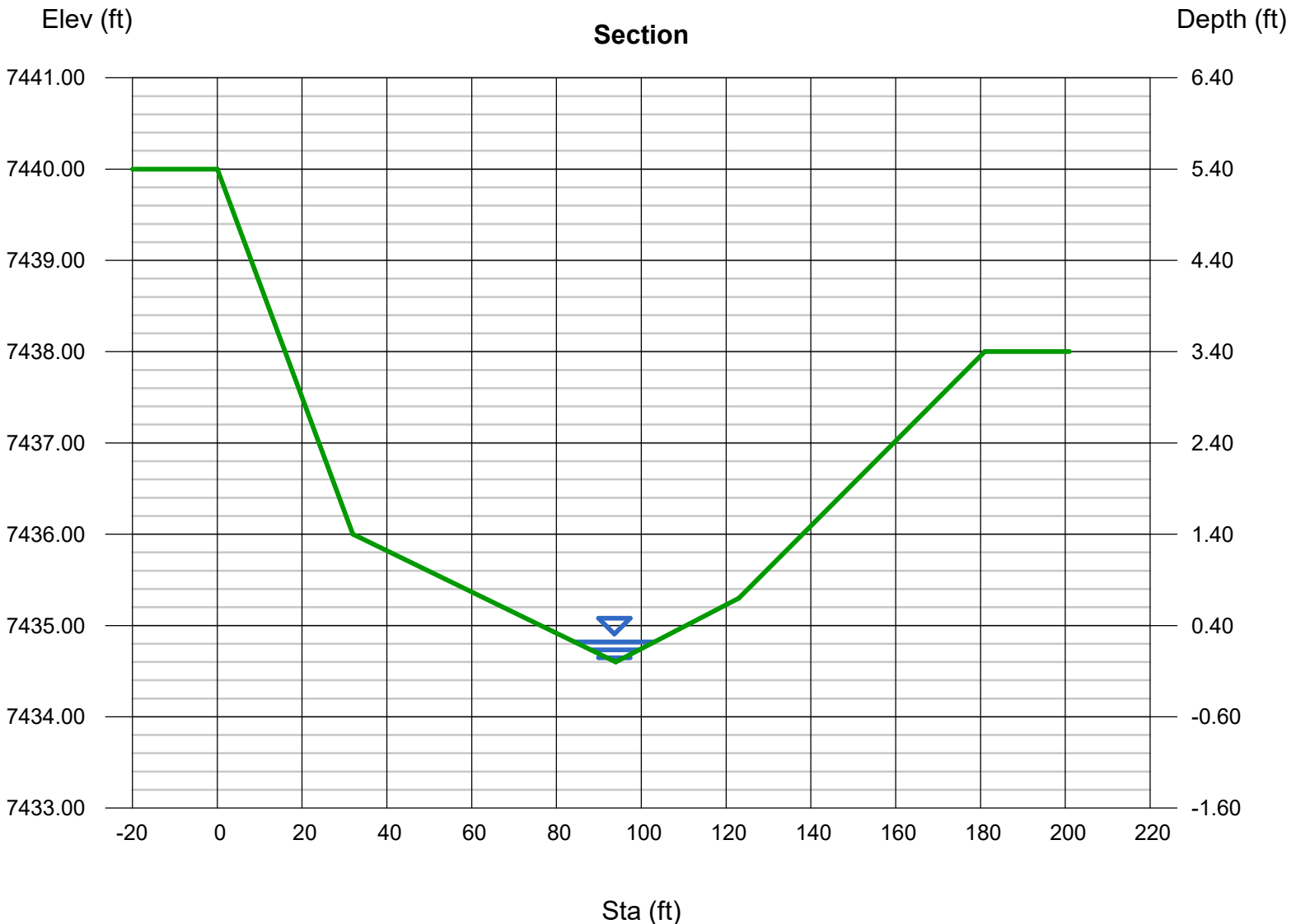
Depth (ft) = 0.22
Q (cfs) = 4.100
Area (sqft) = 2.08
Velocity (ft/s) = 1.97
Wetted Perim (ft) = 18.89
Crit Depth, Yc (ft) = 0.23
Top Width (ft) = 18.88
EGL (ft) = 0.28

Calculations

Compute by: Known Q
Known Q (cfs) = 4.10

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

(0.00, 7440.00)-(32.00, 7436.00, 0.030)-(94.00, 7434.60, 0.030)-(123.00, 7435.30, 0.030)-(181.00, 7438.00, 0.030)



Channel Report

Drainage 5-3 (Q100 = 27.4 cfs)

User-defined

Invert Elev (ft) = 7434.60
Slope (%) = 3.00
N-Value = 0.030

Highlighted

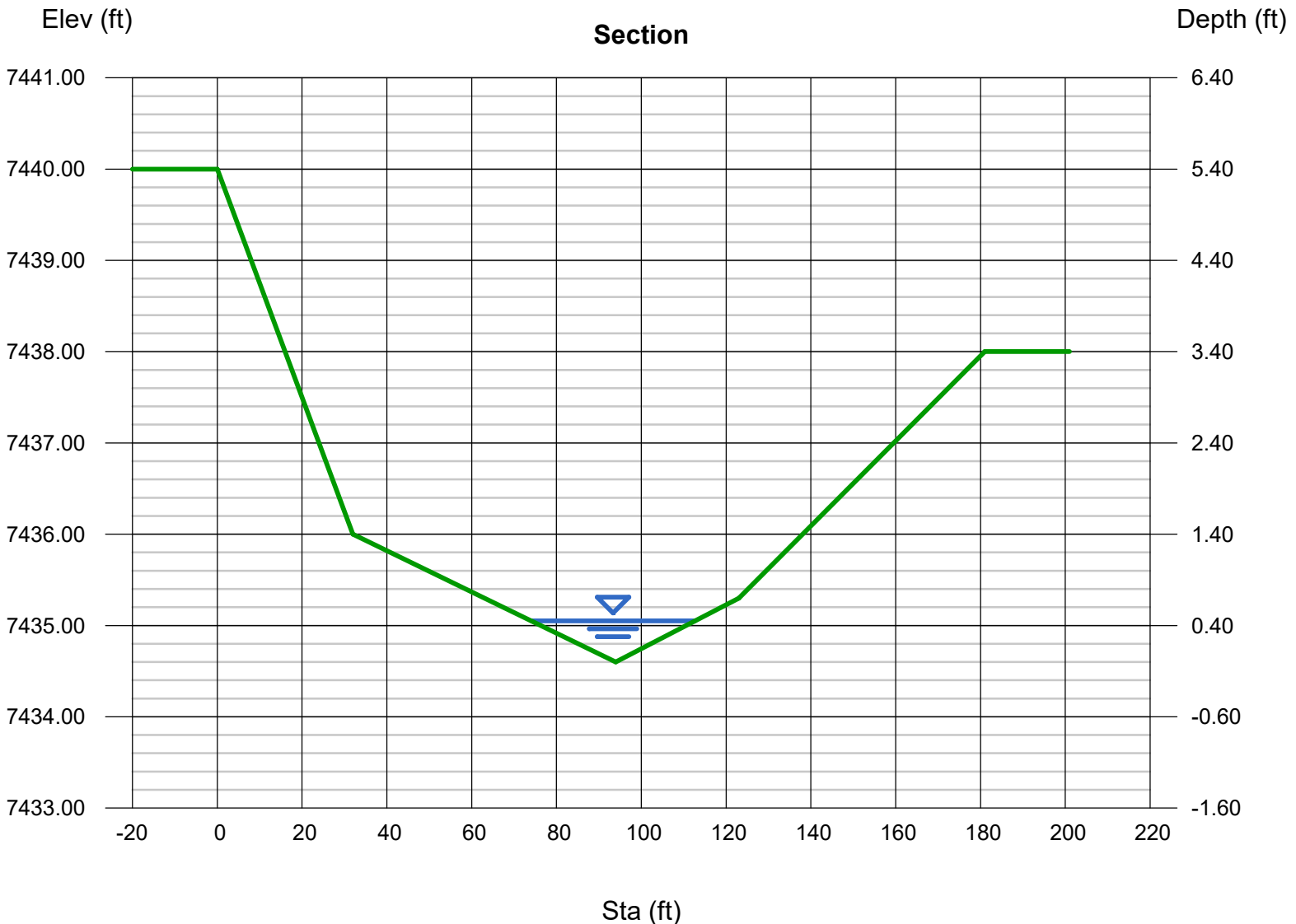
Depth (ft) = 0.45
Q (cfs) = 27.40
Area (sqft) = 8.69
Velocity (ft/s) = 3.15
Wetted Perim (ft) = 38.61
Crit Depth, Yc (ft) = 0.48
Top Width (ft) = 38.60
EGL (ft) = 0.60

Calculations

Compute by: Known Q
Known Q (cfs) = 27.40

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

(0.00, 7440.00)-(32.00, 7436.00, 0.030)-(94.00, 7434.60, 0.030)-(123.00, 7435.30, 0.030)-(181.00, 7438.00, 0.030)



Channel Report

Drainage 5-4 (Q5 = 4.1 cfs)

User-defined

Invert Elev (ft) = 7429.50
Slope (%) = 3.50
N-Value = 0.030

Highlighted

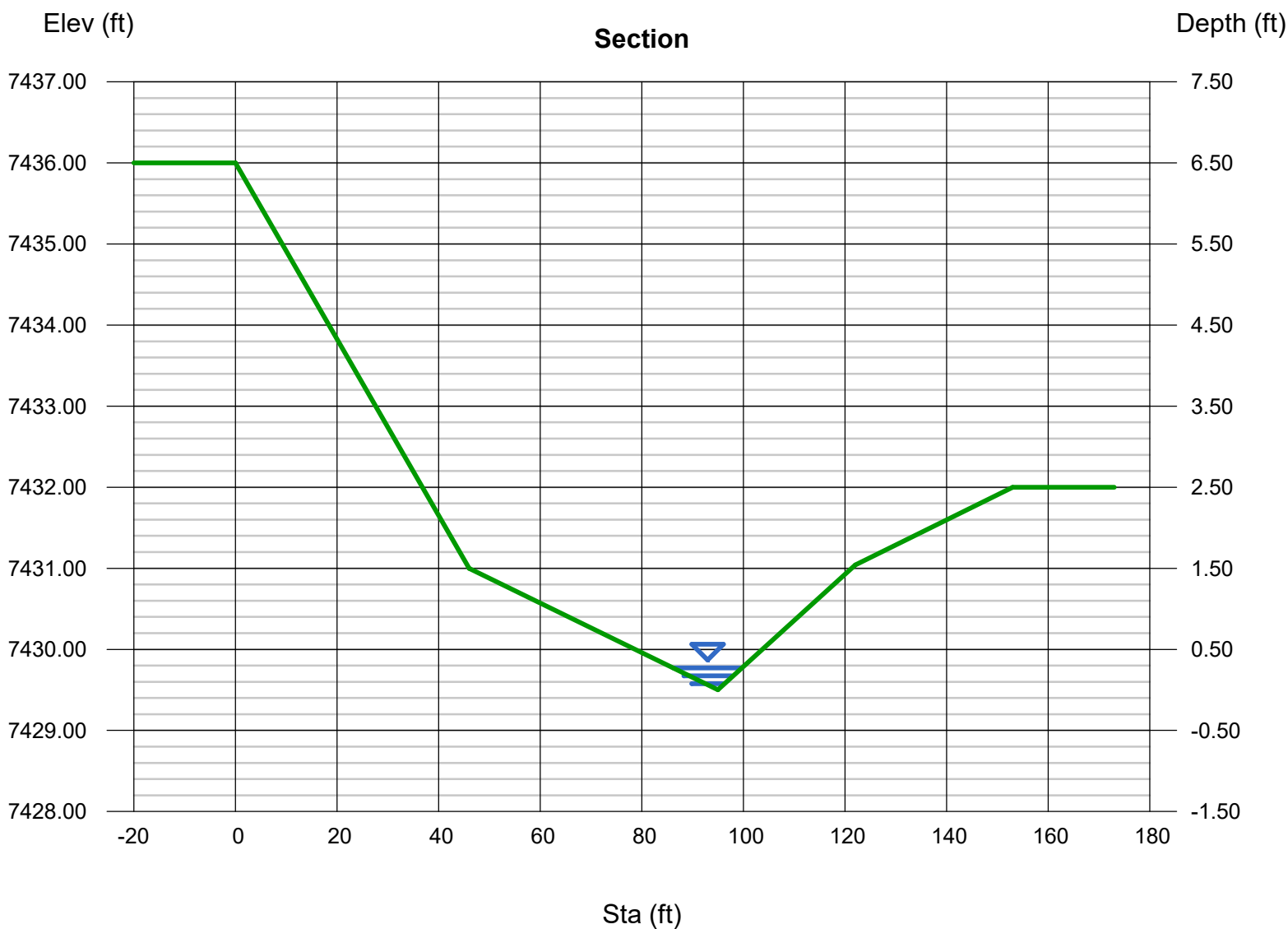
Depth (ft) = 0.27
Q (cfs) = 4.100
Area (sqft) = 1.83
Velocity (ft/s) = 2.24
Wetted Perim (ft) = 13.57
Crit Depth, Yc (ft) = 0.28
Top Width (ft) = 13.55
EGL (ft) = 0.35

Calculations

Compute by: Known Q
Known Q (cfs) = 4.10

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

(0.00, 7436.00)-(46.00, 7431.00, 0.030)-(95.00, 7429.50, 0.030)-(122.00, 7431.04, 0.030)-(153.00, 7432.00, 0.030)



Channel Report

Drainage 5-4 (Q100 =27.4 cfs)

User-defined

Invert Elev (ft) = 7429.50
Slope (%) = 3.50
N-Value = 0.030

Highlighted

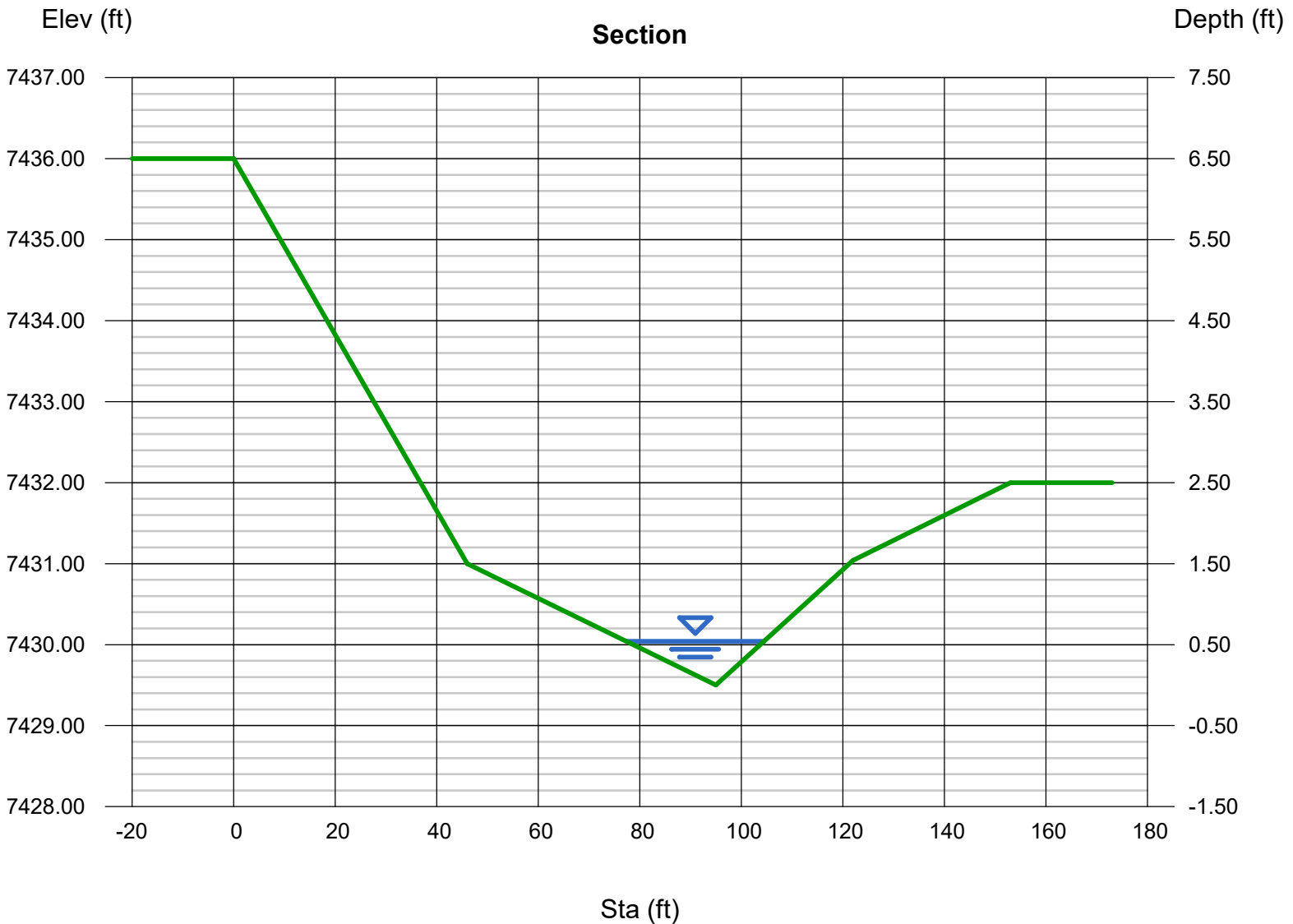
Depth (ft) = 0.54
Q (cfs) = 27.40
Area (sqft) = 7.32
Velocity (ft/s) = 3.74
Wetted Perim (ft) = 27.13
Crit Depth, Yc (ft) = 0.60
Top Width (ft) = 27.11
EGL (ft) = 0.76

Calculations

Compute by: Known Q
Known Q (cfs) = 27.40

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

(0.00, 7436.00)-(46.00, 7431.00, 0.030)-(95.00, 7429.50, 0.030)-(122.00, 7431.04, 0.030)-(153.00, 7432.00, 0.030)



Channel Report

Drainage 5-5 (Q5 =4.1 cfs)

User-defined

Invert Elev (ft) = 7426.00
Slope (%) = 4.20
N-Value = 0.030

Highlighted

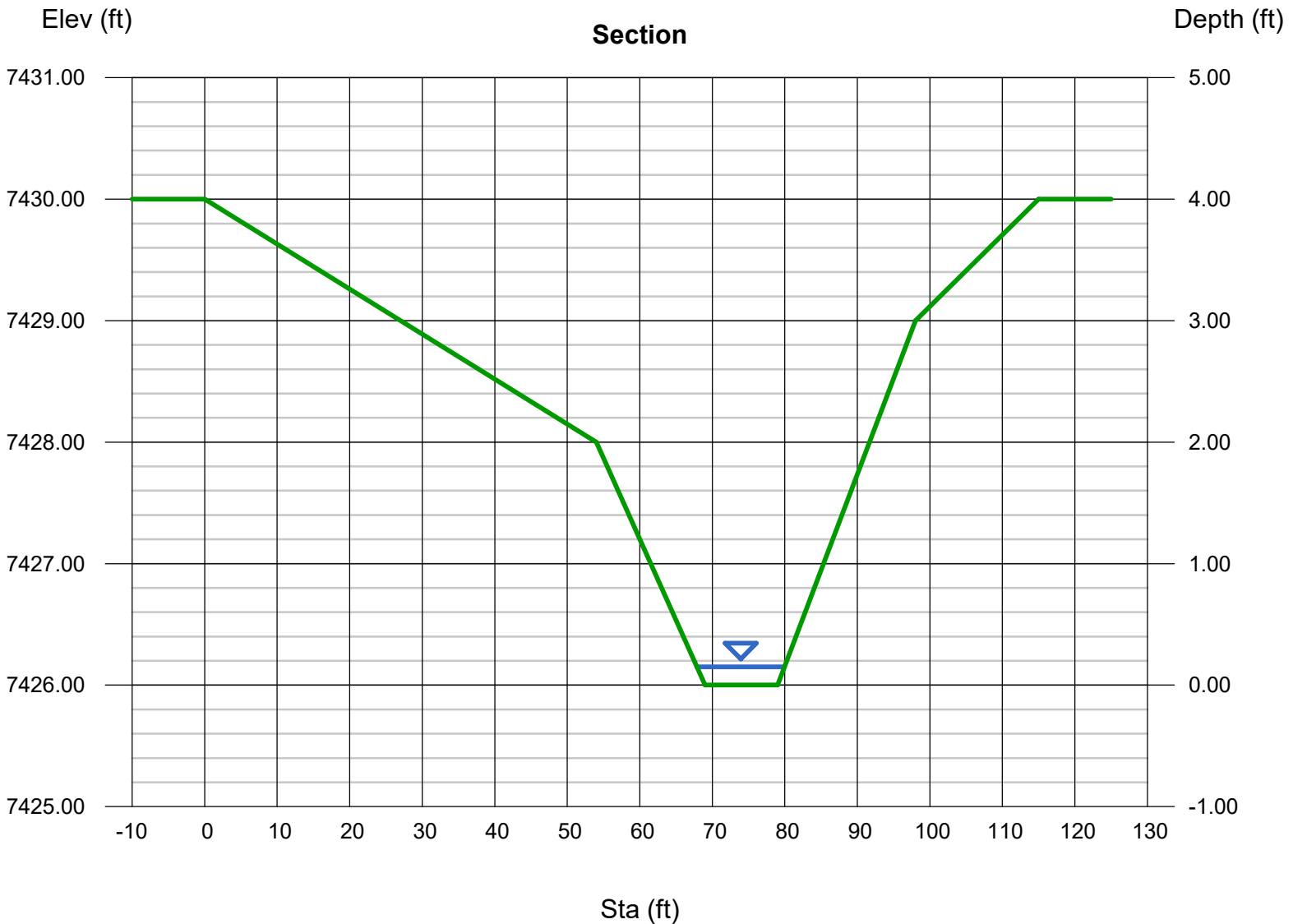
Depth (ft) = 0.15
Q (cfs) = 4.100
Area (sqft) = 1.65
Velocity (ft/s) = 2.48
Wetted Perim (ft) = 12.10
Crit Depth, Yc (ft) = 0.17
Top Width (ft) = 12.07
EGL (ft) = 0.25

Calculations

Compute by: Known Q
Known Q (cfs) = 4.10

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

(0.00, 7430.00)-(54.00, 7428.00, 0.030)-(69.00, 7426.00, 0.030)-(79.00, 7426.00, 0.030)-(98.00, 7429.00, 0.030)-(115.00, 7430.00, 0.030)



Channel Report

Drainage 5-5 (Q100 =27.4 cfs)

User-defined

Invert Elev (ft) = 7426.00
Slope (%) = 4.20
N-Value = 0.030

Highlighted

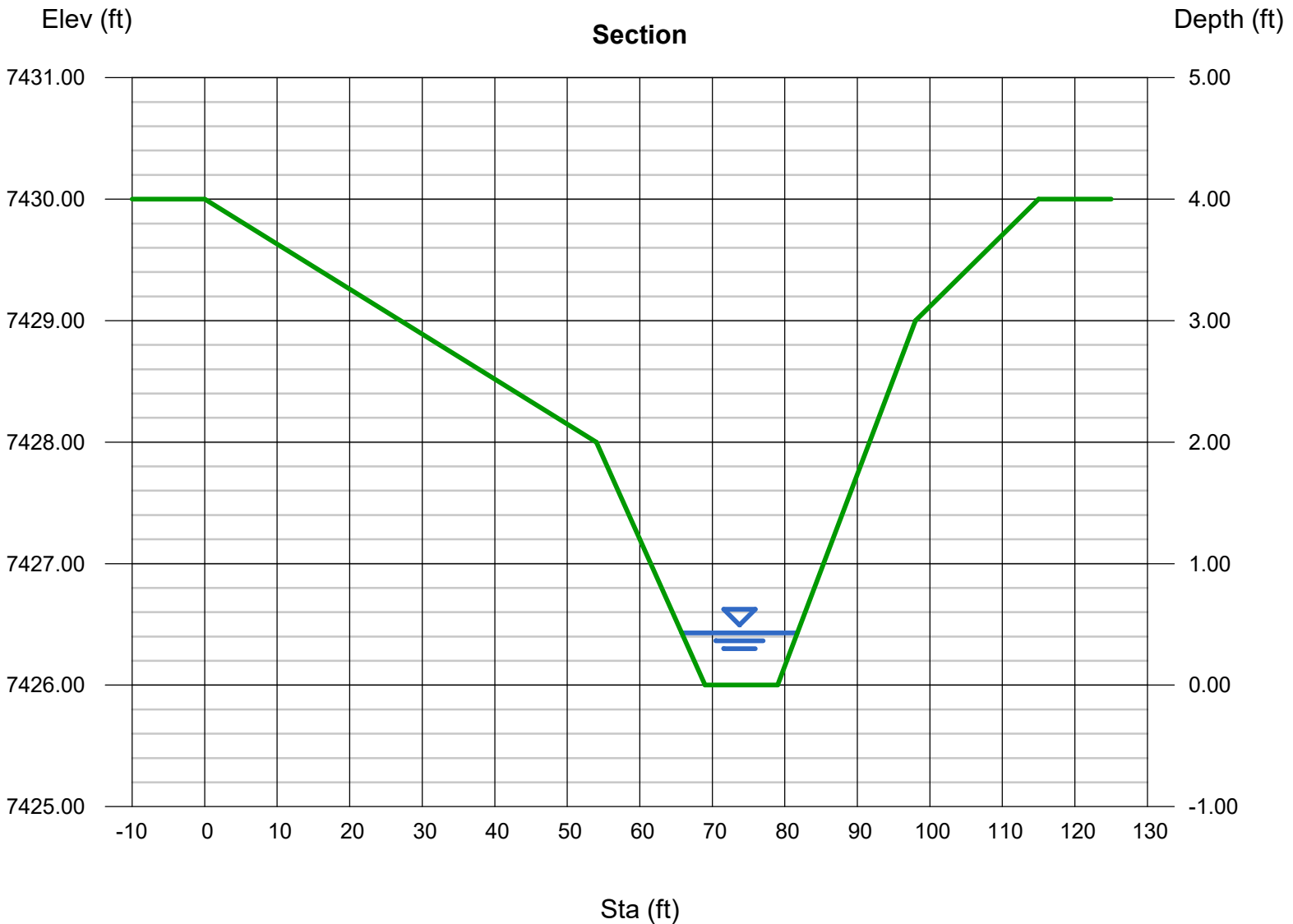
Depth (ft) = 0.43
Q (cfs) = 27.40
Area (sqft) = 5.58
Velocity (ft/s) = 4.91
Wetted Perim (ft) = 16.01
Crit Depth, Yc (ft) = 0.54
Top Width (ft) = 15.95
EGL (ft) = 0.80

Calculations

Compute by: Known Q
Known Q (cfs) = 27.40

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

(0.00, 7430.00)-(54.00, 7428.00, 0.030)-(69.00, 7426.00, 0.030)-(79.00, 7426.00, 0.030)-(98.00, 7429.00, 0.030)-(115.00, 7430.00, 0.030)



Channel Report

Drainage 5-6 (Q5 =4.1 cfs)

User-defined

Invert Elev (ft) = 7422.70
Slope (%) = 2.75
N-Value = 0.030

Highlighted

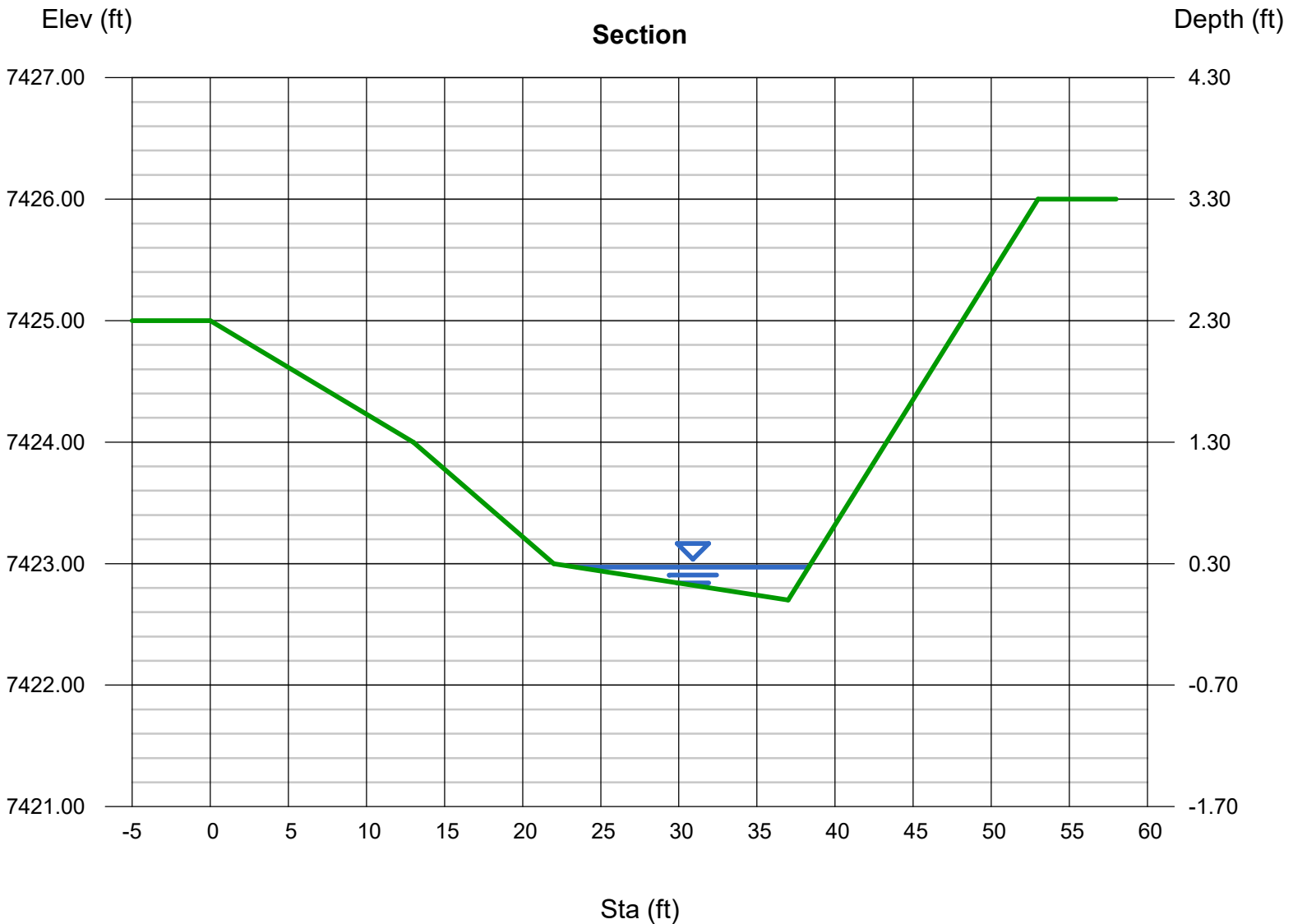
Depth (ft) = 0.27
Q (cfs) = 4.100
Area (sqft) = 2.00
Velocity (ft/s) = 2.05
Wetted Perim (ft) = 14.85
Crit Depth, Yc (ft) = 0.27
Top Width (ft) = 14.82
EGL (ft) = 0.34

Calculations

Compute by: Known Q
Known Q (cfs) = 4.10

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

(0.00, 7425.00)-(13.00, 7424.00, 0.030)-(22.00, 7423.00, 0.030)-(37.00, 7422.70, 0.030)-(53.00, 7426.00, 0.030)



Channel Report

Drainage 5-6 (Q100 =27.4 cfs)

User-defined

Invert Elev (ft) = 7422.70
Slope (%) = 2.75
N-Value = 0.030

Highlighted

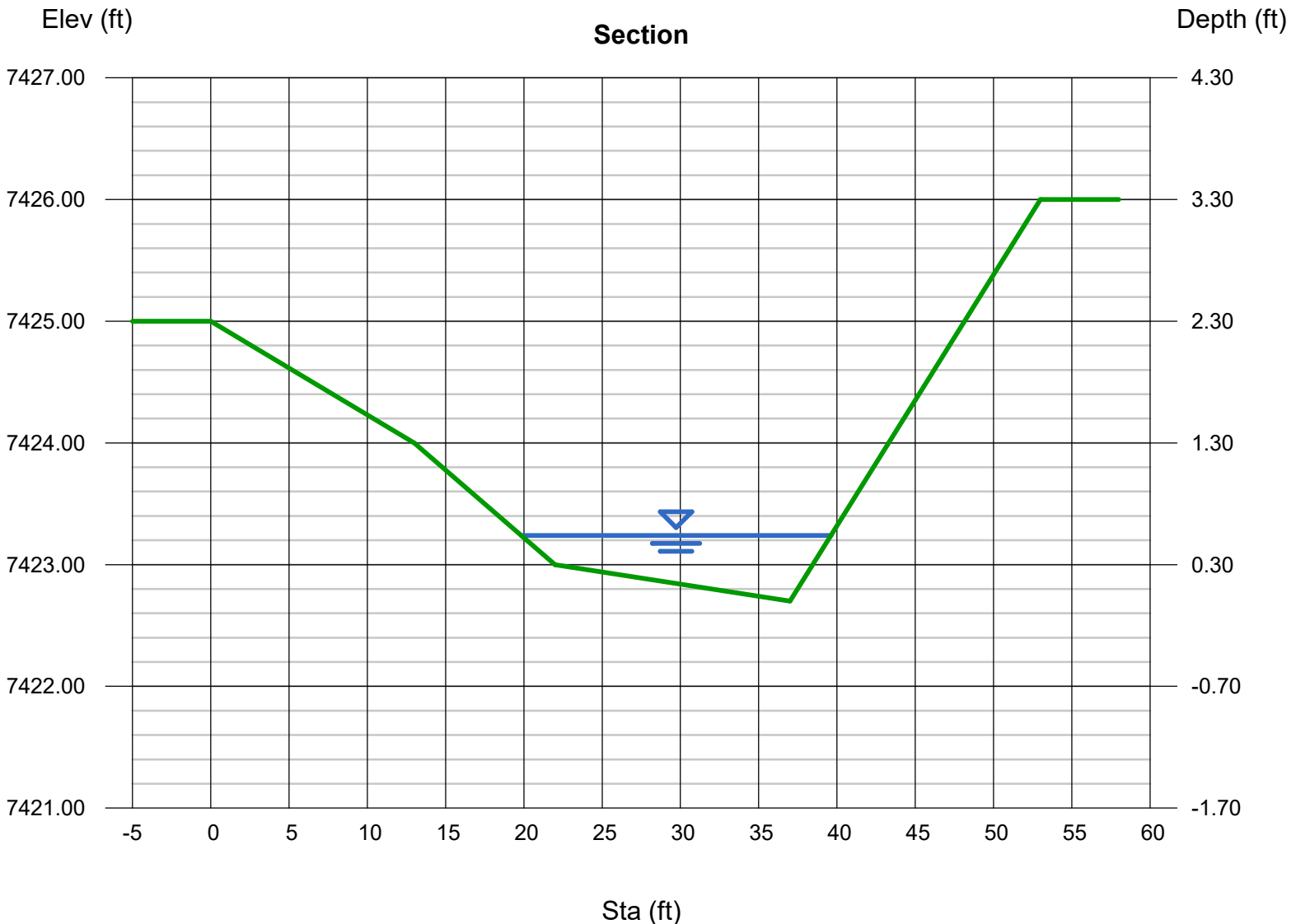
Depth (ft) = 0.54
Q (cfs) = 27.40
Area (sqft) = 6.82
Velocity (ft/s) = 4.02
Wetted Perim (ft) = 19.85
Crit Depth, Yc (ft) = 0.59
Top Width (ft) = 19.78
EGL (ft) = 0.79

Calculations

Compute by: Known Q
Known Q (cfs) = 27.40

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

(0.00, 7425.00)-(13.00, 7424.00, 0.030)-(22.00, 7423.00, 0.030)-(37.00, 7422.70, 0.030)-(53.00, 7426.00, 0.030)



Channel Report

Drainage 6-1 (Q5 = 18.9 cfs)

User-defined

Invert Elev (ft) = 7424.00
Slope (%) = 2.00
N-Value = 0.030

Calculations

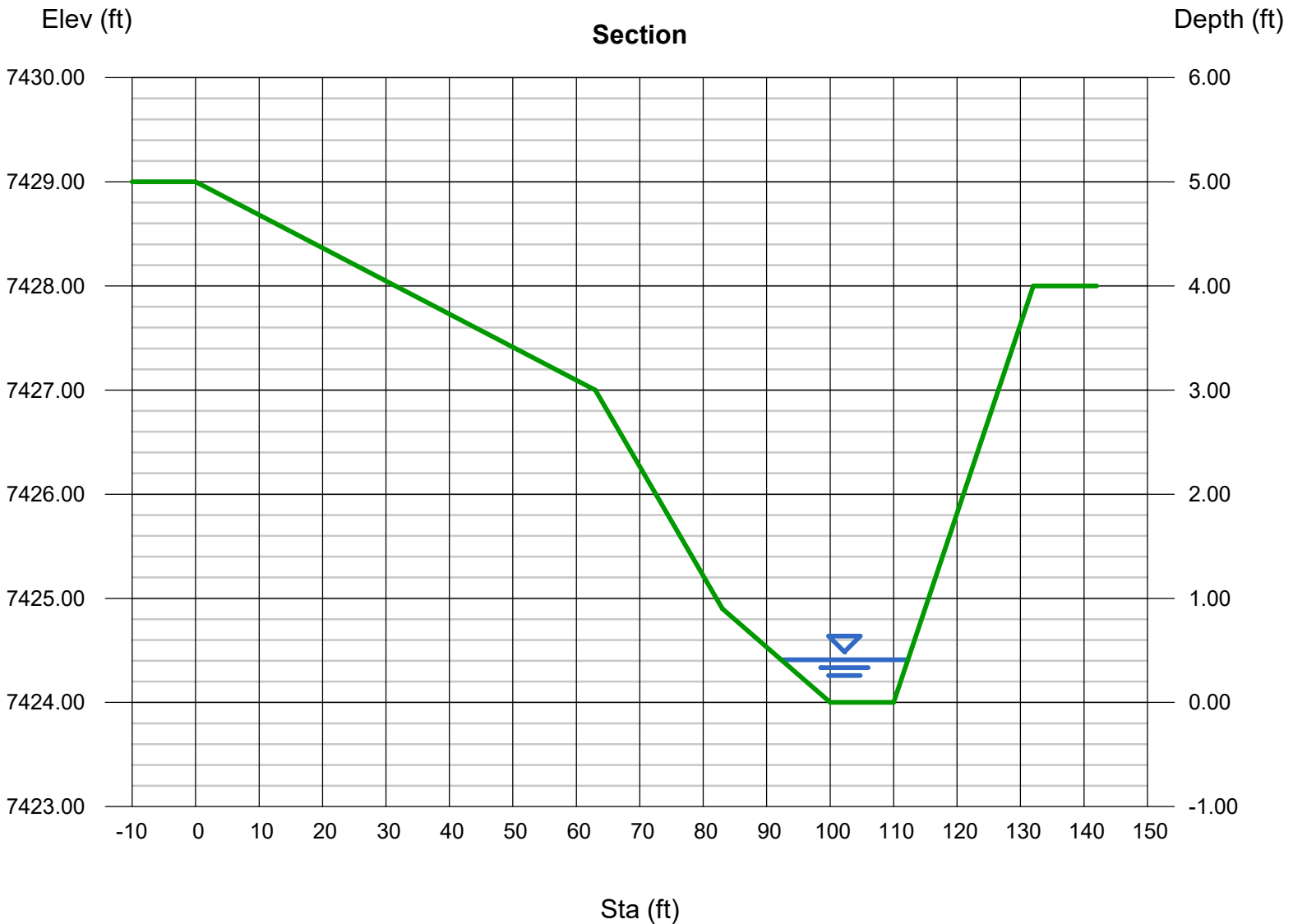
Compute by: Known Q
Known Q (cfs) = 18.90

Highlighted

Depth (ft) = 0.41
Q (cfs) = 18.90
Area (sqft) = 6.15
Velocity (ft/s) = 3.07
Wetted Perim (ft) = 20.05
Crit Depth, Yc (ft) = 0.41
Top Width (ft) = 20.00
EGL (ft) = 0.56

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

(0.00, 7429.00)-(63.00, 7427.00, 0.030)-(83.00, 7424.90, 0.030)-(100.00, 7424.00, 0.030)-(110.00, 7424.00, 0.030)-(132.00, 7428.00, 0.030)



Channel Report

Drainage 6-1 (Q100 = 106.7 cfs)

User-defined

Invert Elev (ft) = 7424.00
Slope (%) = 2.00
N-Value = 0.030

Highlighted

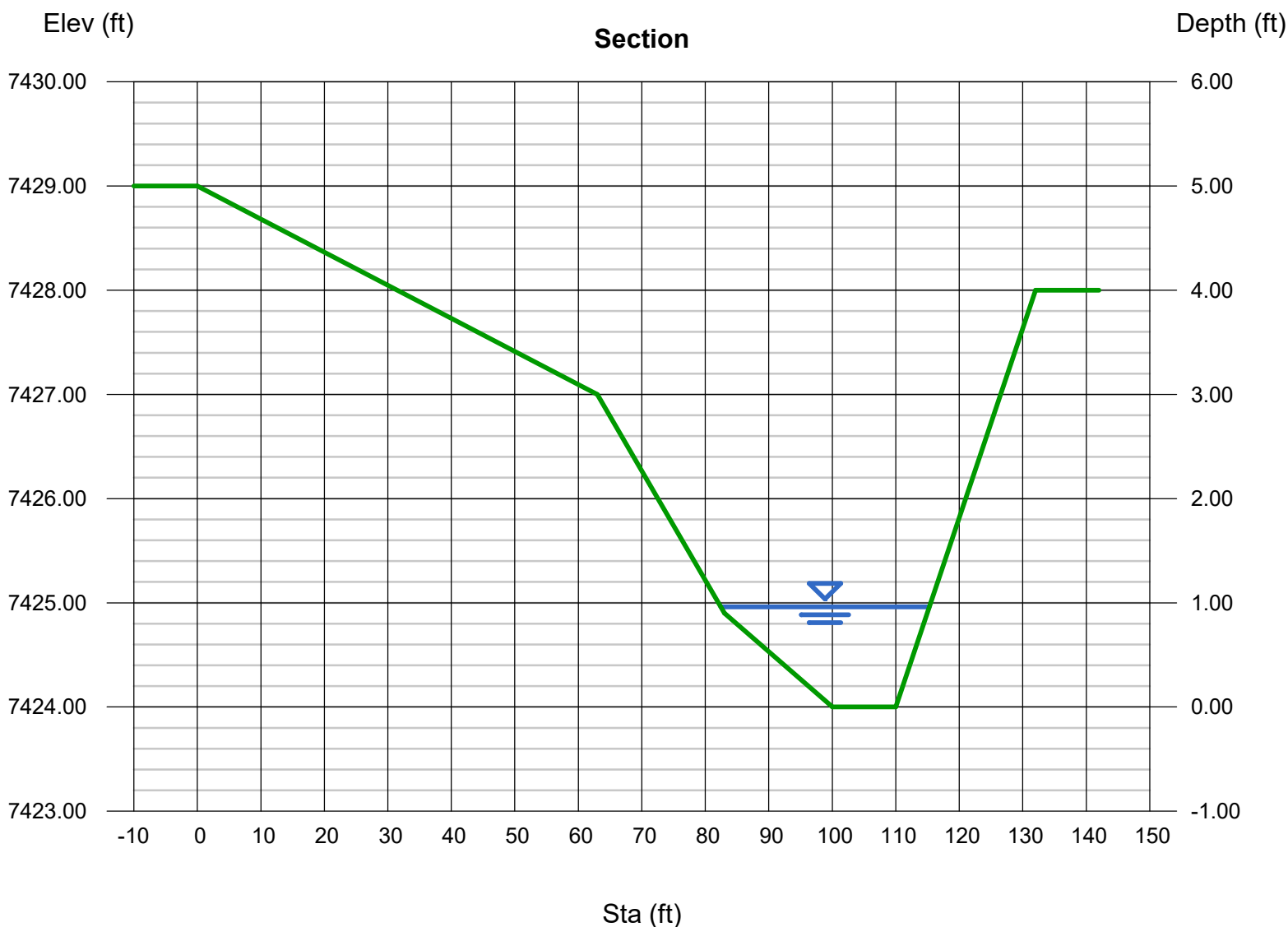
Depth (ft) = 0.96
Q (cfs) = 106.70
Area (sqft) = 20.82
Velocity (ft/s) = 5.12
Wetted Perim (ft) = 32.97
Crit Depth, Yc (ft) = 1.03
Top Width (ft) = 32.85
EGL (ft) = 1.37

Calculations

Compute by: Known Q
Known Q (cfs) = 106.70

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

(0.00, 7429.00)-(63.00, 7427.00, 0.030)-(83.00, 7424.90, 0.030)-(100.00, 7424.00, 0.030)-(110.00, 7424.00, 0.030)-(132.00, 7428.00, 0.030)



Channel Report

Drainage 6-2 (Q5 = 18.9 cfs)

User-defined

Invert Elev (ft) = 7422.00
Slope (%) = 3.00
N-Value = 0.030

Highlighted

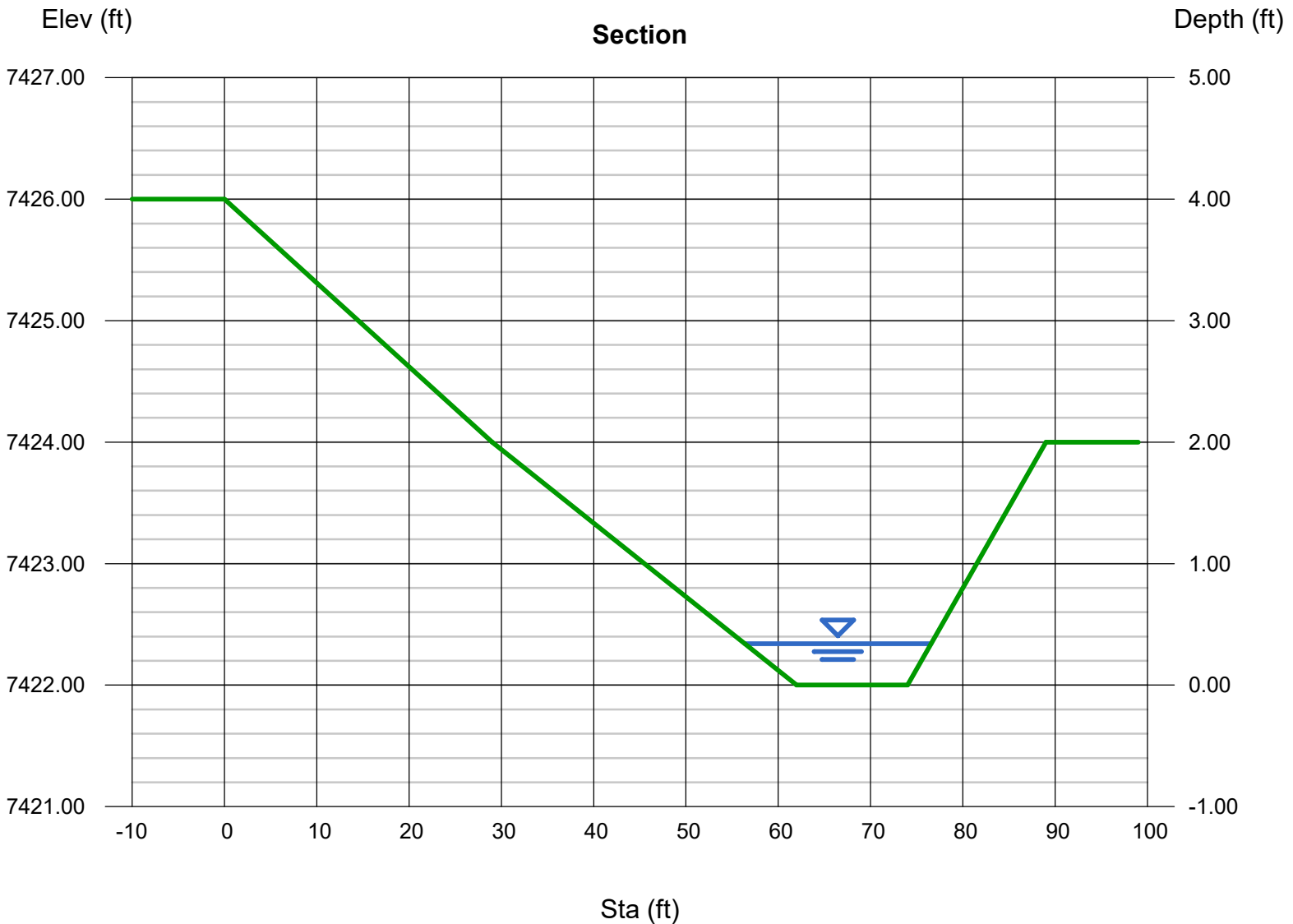
Depth (ft) = 0.34
Q (cfs) = 18.90
Area (sqft) = 5.46
Velocity (ft/s) = 3.46
Wetted Perim (ft) = 20.19
Crit Depth, Yc (ft) = 0.38
Top Width (ft) = 20.16
EGL (ft) = 0.53

Calculations

Compute by: Known Q
Known Q (cfs) = 18.90

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

(0.00, 7426.00)-(29.00, 7424.00, 0.030)-(62.00, 7422.00, 0.030)-(74.00, 7422.00, 0.030)-(89.00, 7424.00, 0.030)



Channel Report

Drainage 6-2 (Q100 = 106.7 cfs)

User-defined

Invert Elev (ft) = 7422.00
Slope (%) = 3.00
N-Value = 0.030

Highlighted

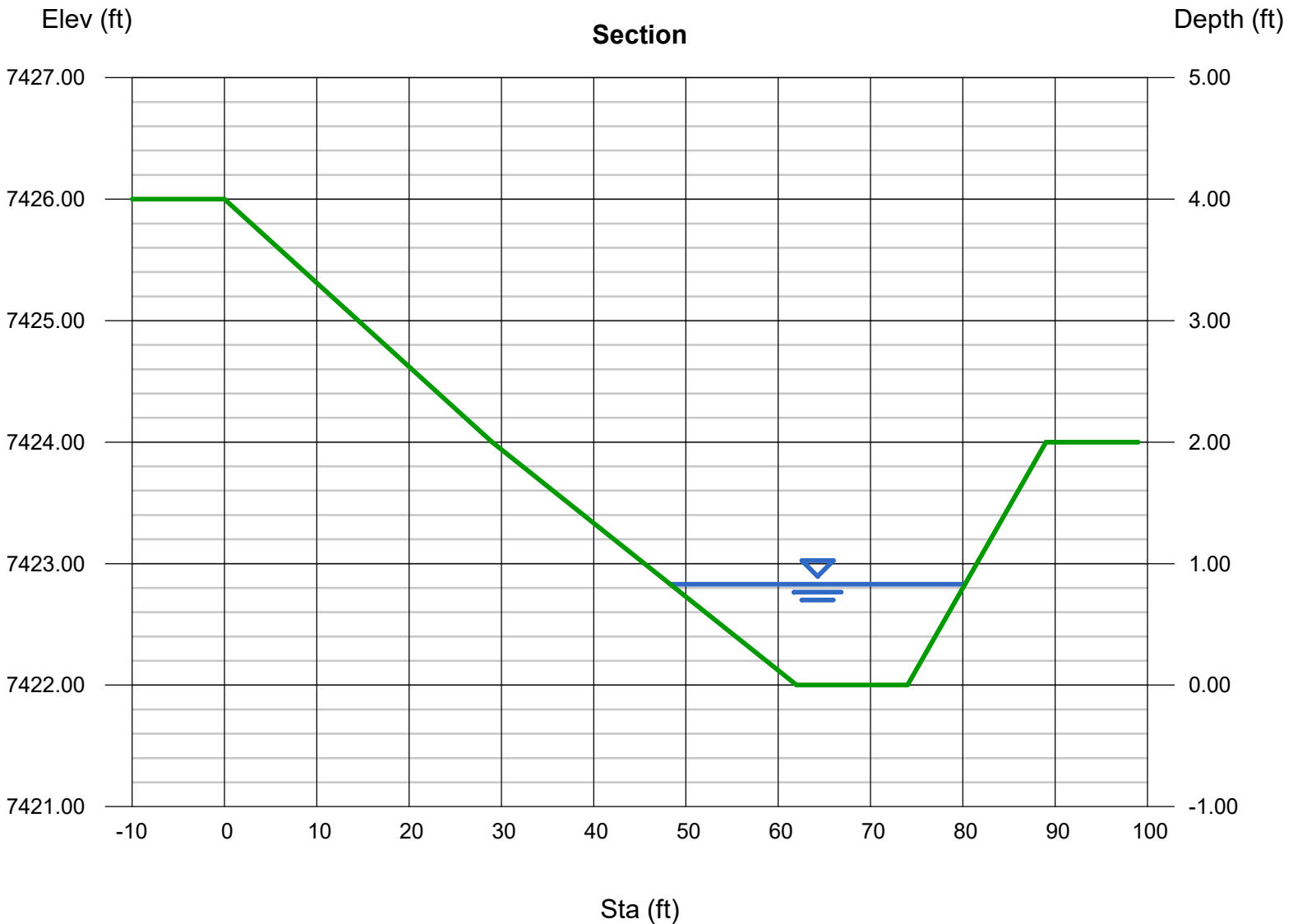
Depth (ft) = 0.83
Q (cfs) = 106.70
Area (sqft) = 18.23
Velocity (ft/s) = 5.85
Wetted Perim (ft) = 32.00
Crit Depth, Yc (ft) = 0.98
Top Width (ft) = 31.92
EGL (ft) = 1.36

Calculations

Compute by: Known Q
Known Q (cfs) = 106.70

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

(0.00, 7426.00)-(29.00, 7424.00, 0.030)-(62.00, 7422.00, 0.030)-(74.00, 7422.00, 0.030)-(89.00, 7424.00, 0.030)



Channel Report

Drainage 6-3 (Q5 = 18.9 cfs)

User-defined

Invert Elev (ft) = 7418.00
Slope (%) = 2.30
N-Value = 0.030

Calculations

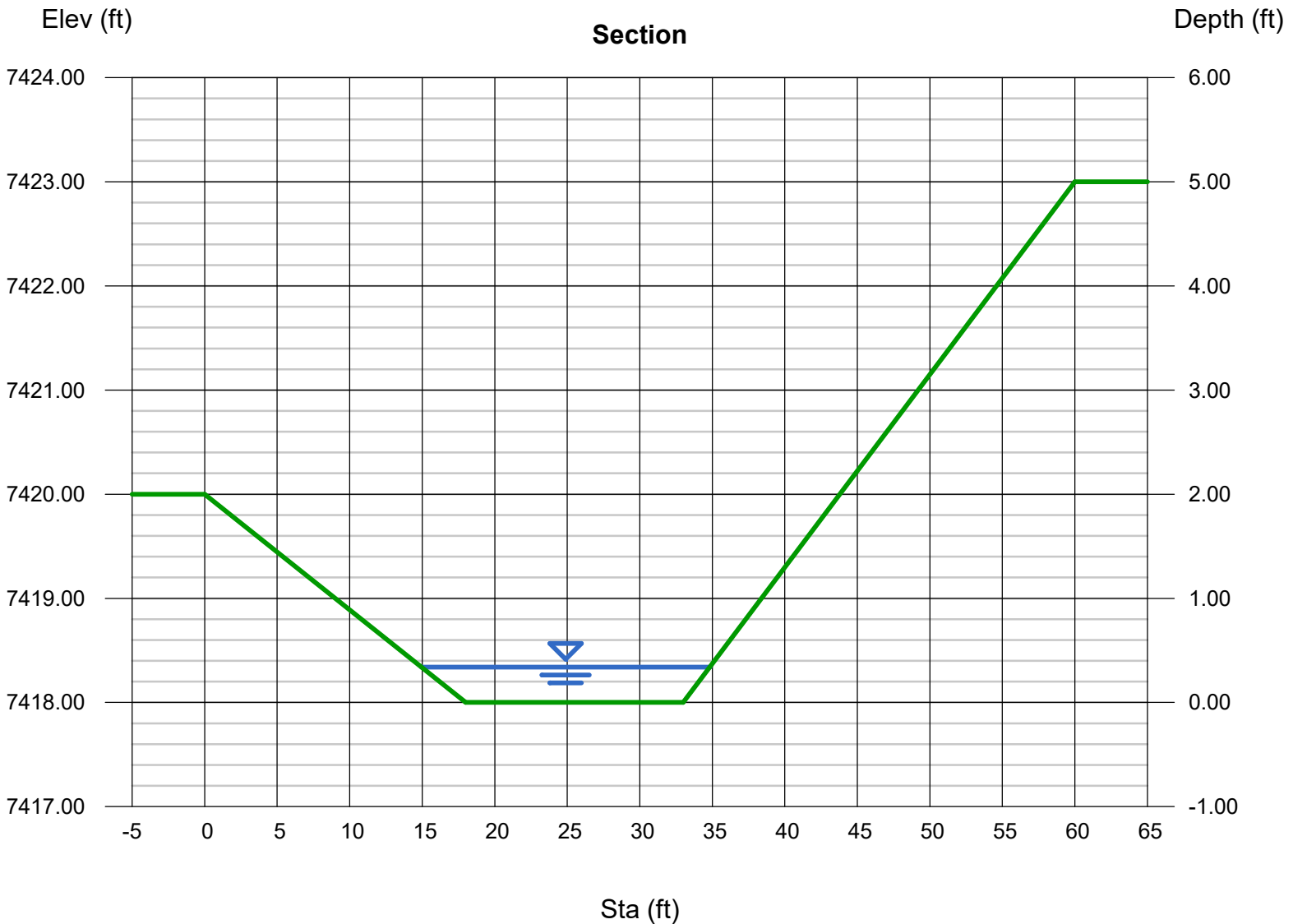
Compute by: Known Q
Known Q (cfs) = 18.90

Highlighted

Depth (ft) = 0.34
Q (cfs) = 18.90
Area (sqft) = 5.93
Velocity (ft/s) = 3.19
Wetted Perim (ft) = 19.94
Crit Depth, Yc (ft) = 0.35
Top Width (ft) = 19.89
EGL (ft) = 0.50

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

(0.00, 7420.00)-(18.00, 7418.00, 0.030)-(33.00, 7418.00, 0.030)-(60.00, 7423.00, 0.030)



Channel Report

Drainage 6-3 (Q100 = 106.7 cfs)

User-defined

Invert Elev (ft) = 7418.00
Slope (%) = 2.30
N-Value = 0.030

Calculations

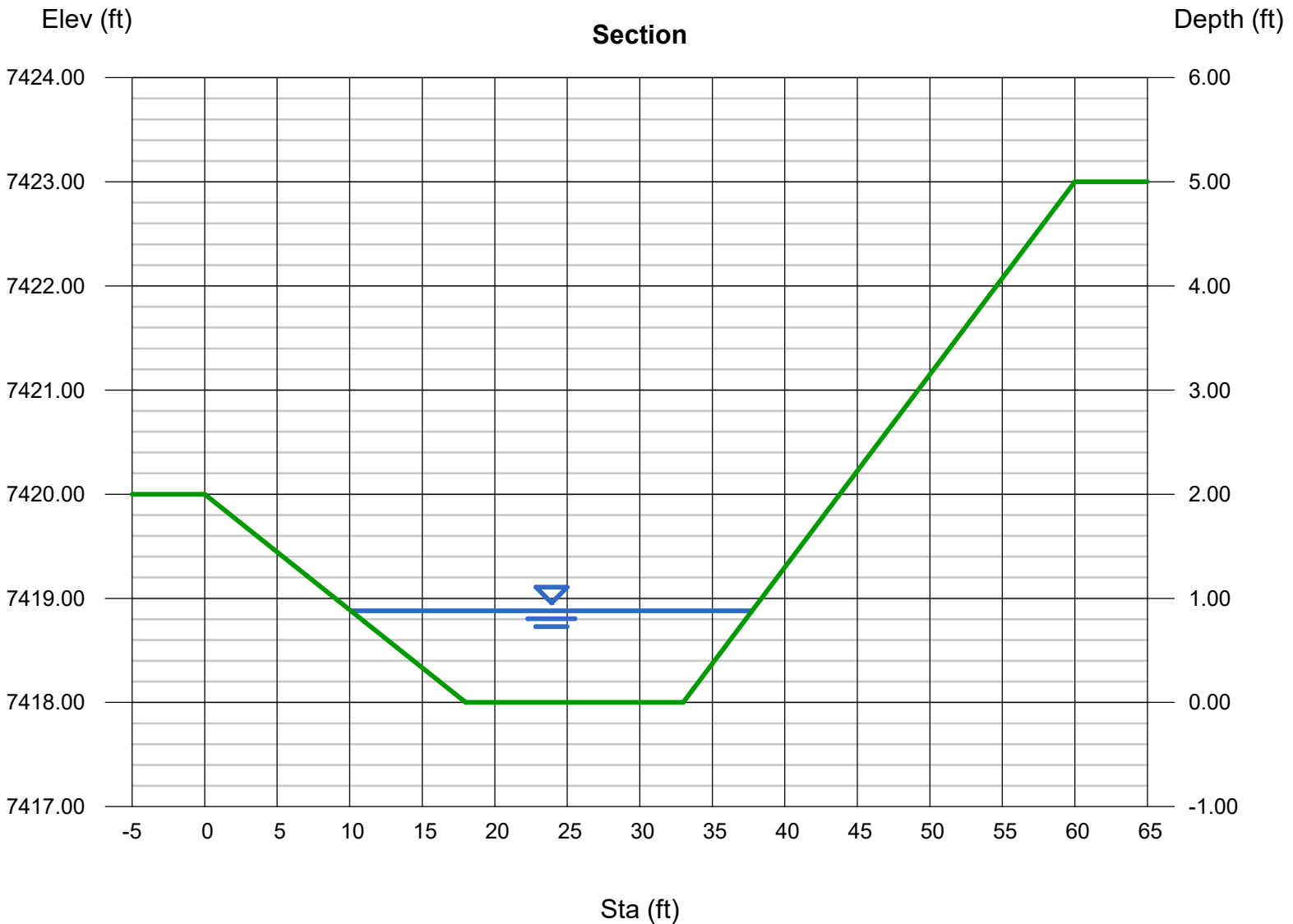
Compute by: Known Q
Known Q (cfs) = 106.70

Highlighted

Depth (ft) = 0.88
Q (cfs) = 106.70
Area (sqft) = 18.77
Velocity (ft/s) = 5.68
Wetted Perim (ft) = 27.80
Crit Depth, Yc (ft) = 0.99
Top Width (ft) = 27.67
EGL (ft) = 1.38

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

(0.00, 7420.00)-(18.00, 7418.00, 0.030)-(33.00, 7418.00, 0.030)-(60.00, 7423.00, 0.030)



Channel Report

Drainage 7-1 (Q5 = 3.3 cfs)

User-defined

Invert Elev (ft) = 7427.30
Slope (%) = 3.30
N-Value = 0.030

Highlighted

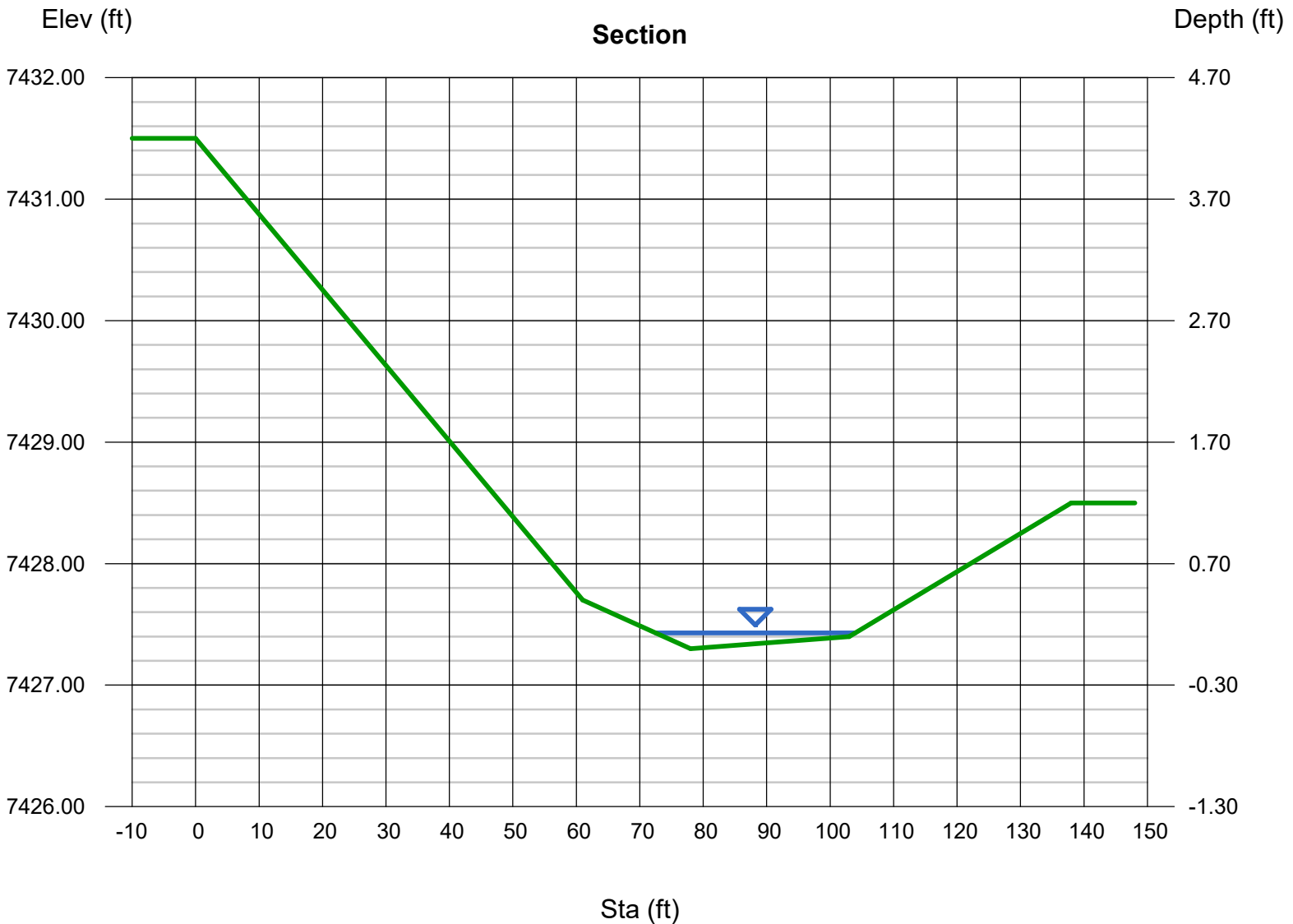
Depth (ft) = 0.13
Q (cfs) = 3.300
Area (sqft) = 2.37
Velocity (ft/s) = 1.39
Wetted Perim (ft) = 31.46
Crit Depth, Yc (ft) = 0.13
Top Width (ft) = 31.46
EGL (ft) = 0.16

Calculations

Compute by: Known Q
Known Q (cfs) = 3.30

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

(0.00, 7431.50)-(61.00, 7427.70, 0.030)-(78.00, 7427.30, 0.030)-(103.00, 7427.40, 0.030)-(138.00, 7428.50, 0.030)



Channel Report

Drainage 7-1 (Q100 = 15.9 cfs)

User-defined

Invert Elev (ft) = 7427.30
Slope (%) = 3.30
N-Value = 0.030

Highlighted

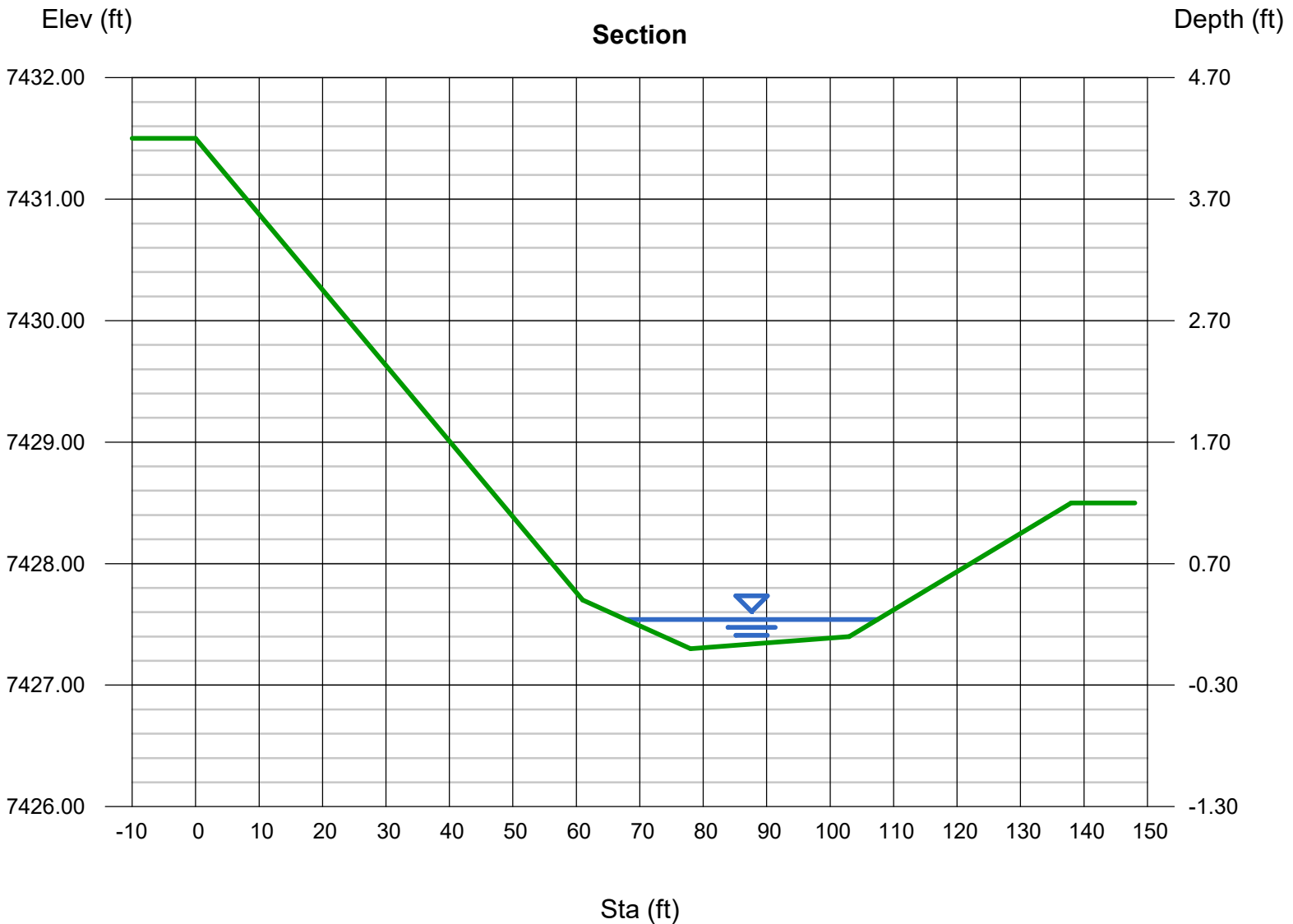
Depth (ft) = 0.24
Q (cfs) = 15.90
Area (sqft) = 6.29
Velocity (ft/s) = 2.53
Wetted Perim (ft) = 39.66
Crit Depth, Yc (ft) = 0.26
Top Width (ft) = 39.66
EGL (ft) = 0.34

Calculations

Compute by: Known Q
Known Q (cfs) = 15.90

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

(0.00, 7431.50)-(61.00, 7427.70, 0.030)-(78.00, 7427.30, 0.030)-(103.00, 7427.40, 0.030)-(138.00, 7428.50, 0.030)



Channel Report

Drainage 7-2 (Q5 = 3.3 cfs)

User-defined

Invert Elev (ft) = 7419.00
Slope (%) = 3.50
N-Value = 0.030

Highlighted

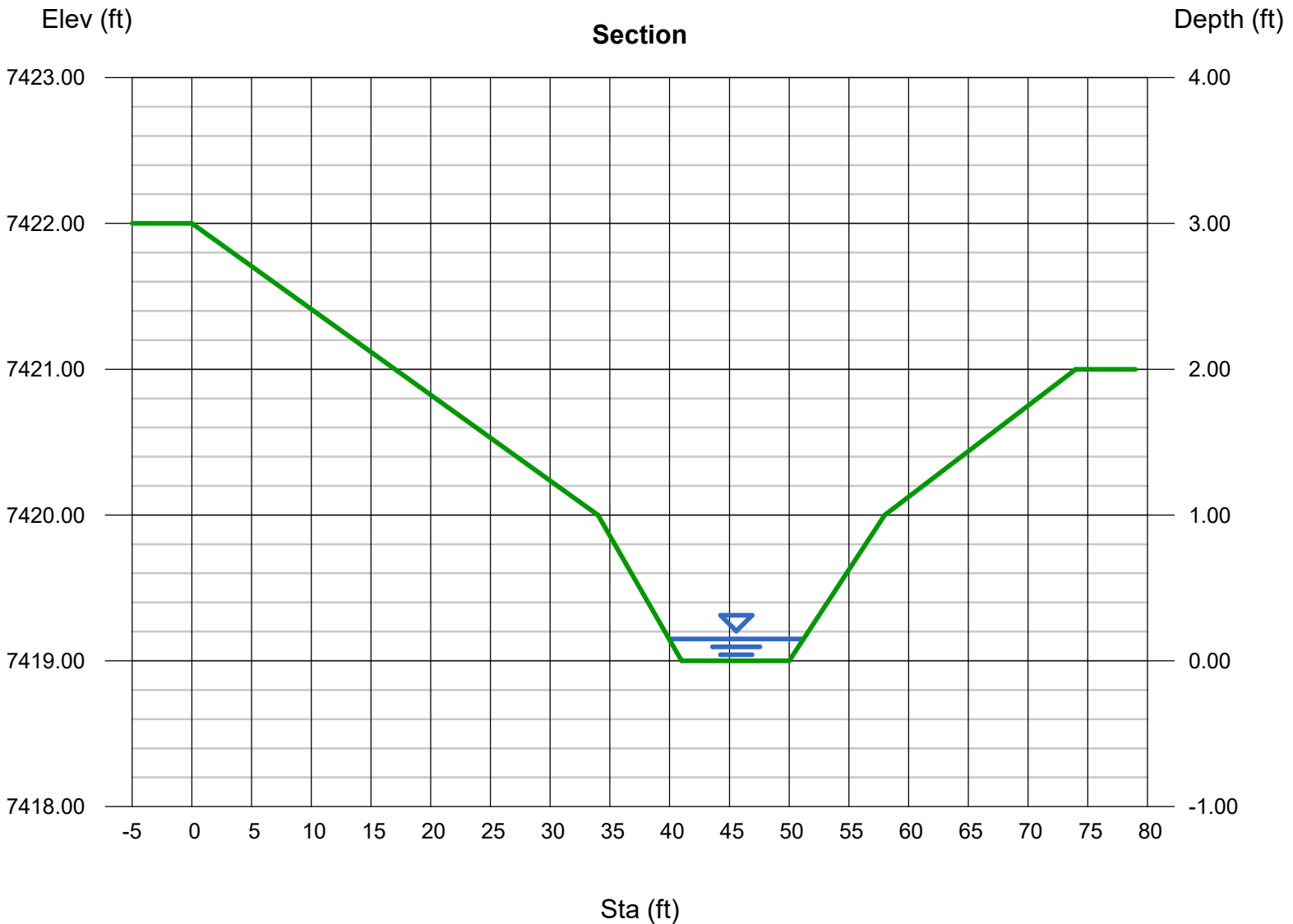
Depth (ft) = 0.15
Q (cfs) = 3.300
Area (sqft) = 1.52
Velocity (ft/s) = 2.17
Wetted Perim (ft) = 11.27
Crit Depth, Yc (ft) = 0.16
Top Width (ft) = 11.25
EGL (ft) = 0.22

Calculations

Compute by: Known Q
Known Q (cfs) = 3.30

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

(0.00, 7422.00)-(34.00, 7420.00, 0.030)-(41.00, 7419.00, 0.030)-(50.00, 7419.00, 0.030)-(58.00, 7420.00, 0.030)-(74.00, 7421.00, 0.030)



Channel Report

Drainage 7-2 (Q100 = 15.9 cfs)

User-defined

Invert Elev (ft) = 7419.00
Slope (%) = 3.50
N-Value = 0.030

Highlighted

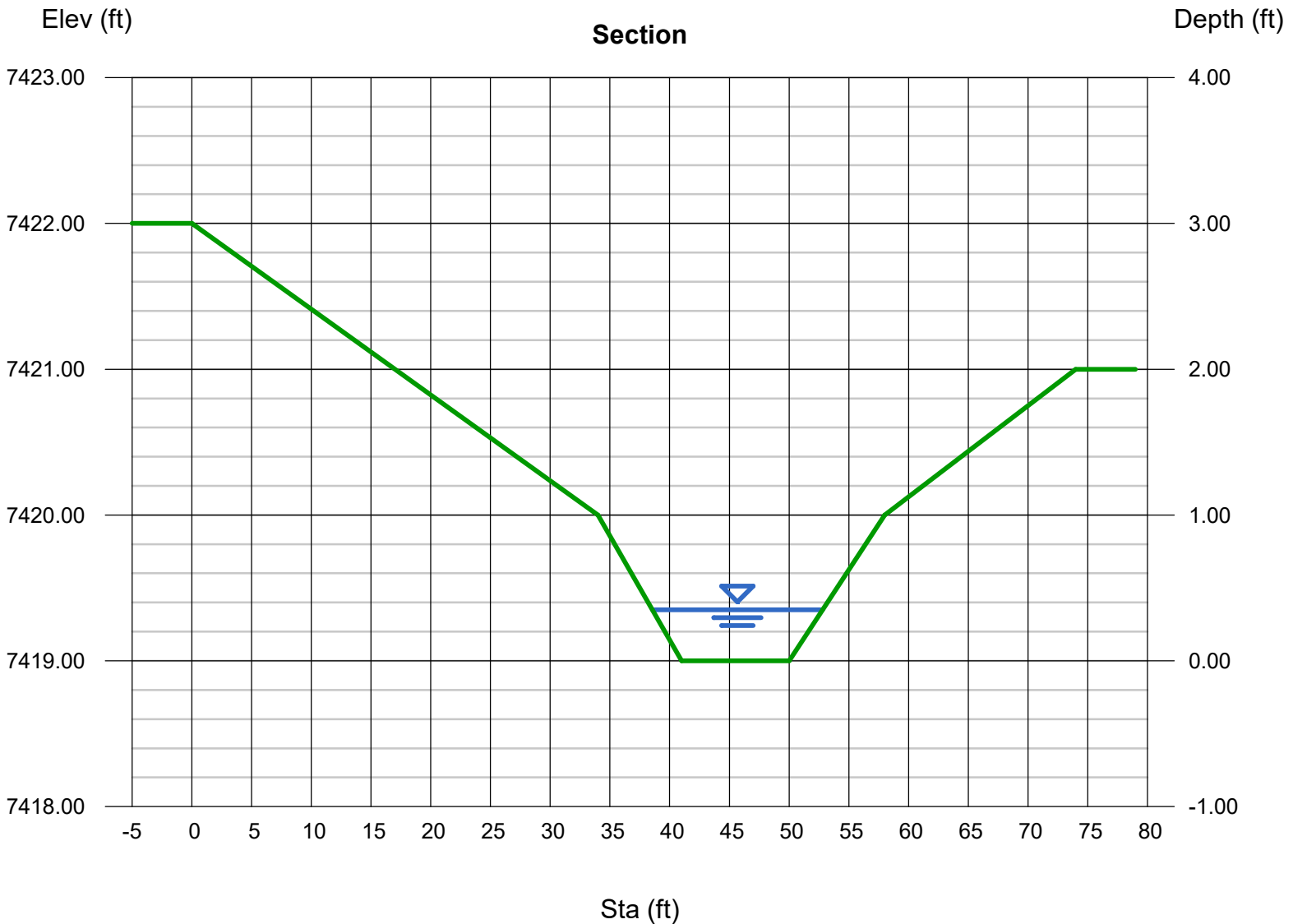
Depth (ft) = 0.35
Q (cfs) = 15.90
Area (sqft) = 4.07
Velocity (ft/s) = 3.91
Wetted Perim (ft) = 14.30
Crit Depth, Yc (ft) = 0.41
Top Width (ft) = 14.25
EGL (ft) = 0.59

Calculations

Compute by: Known Q
Known Q (cfs) = 15.90

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

(0.00, 7422.00)-(34.00, 7420.00, 0.030)-(41.00, 7419.00, 0.030)-(50.00, 7419.00, 0.030)-(58.00, 7420.00, 0.030)-(74.00, 7421.00, 0.030)



Channel Report

Drainage 8-1 (Q5 = 20.7 cfs)

User-defined

Invert Elev (ft) = 7415.20
Slope (%) = 1.80
N-Value = 0.030

Highlighted

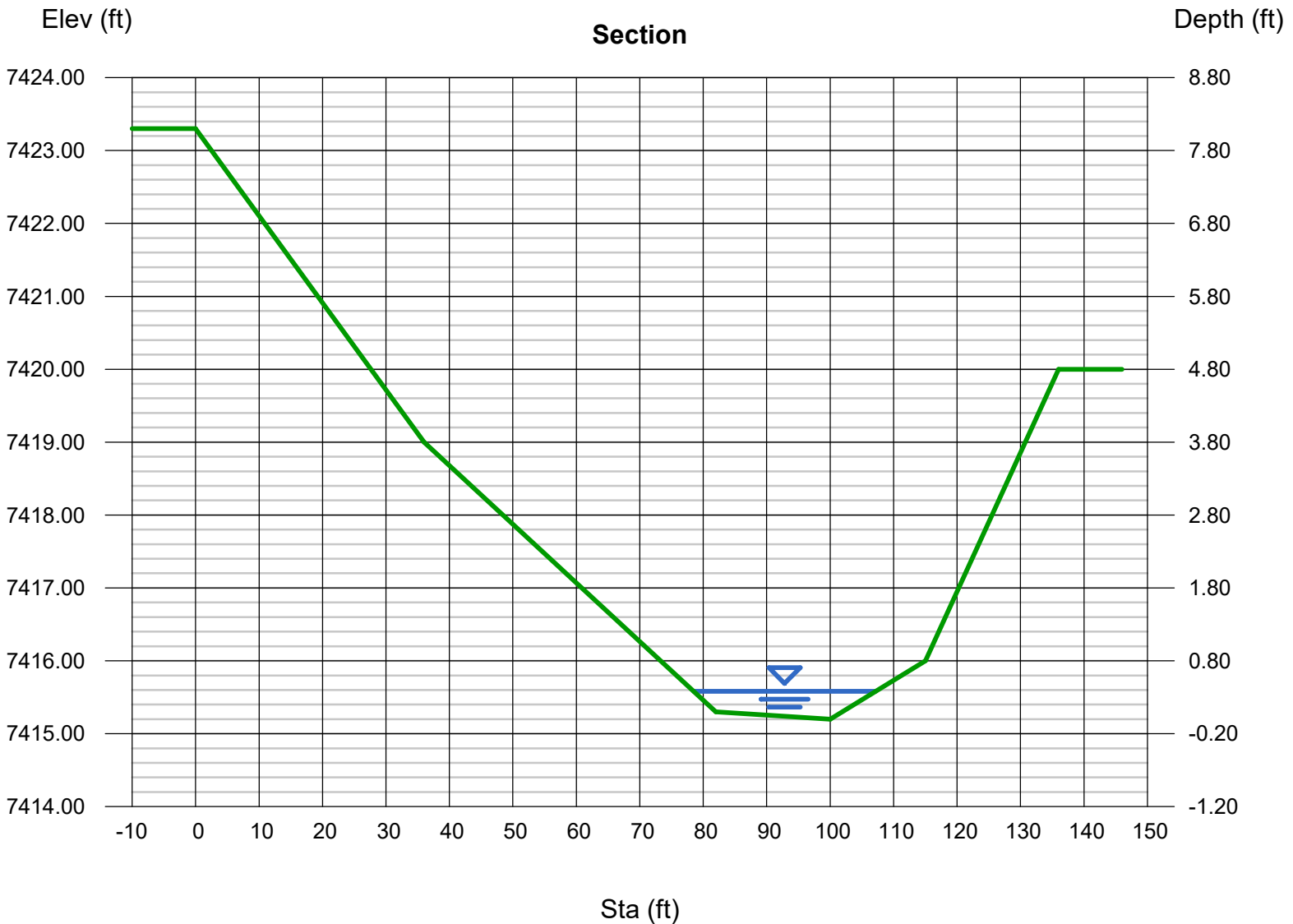
Depth (ft) = 0.38
Q (cfs) = 20.70
Area (sqft) = 7.78
Velocity (ft/s) = 2.66
Wetted Perim (ft) = 28.63
Crit Depth, Yc (ft) = 0.36
Top Width (ft) = 28.61
EGL (ft) = 0.49

Calculations

Compute by: Known Q
Known Q (cfs) = 20.70

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

(0.00, 7423.30)-(36.00, 7419.00, 0.030)-(82.00, 7415.30, 0.030)-(100.00, 7415.20, 0.030)-(115.00, 7416.00, 0.030)-(136.00, 7420.00, 0.030)



Channel Report

Drainage 8-1 (Q100 = 115.4 cfs)

User-defined

Invert Elev (ft) = 7415.20
Slope (%) = 1.80
N-Value = 0.030

Highlighted

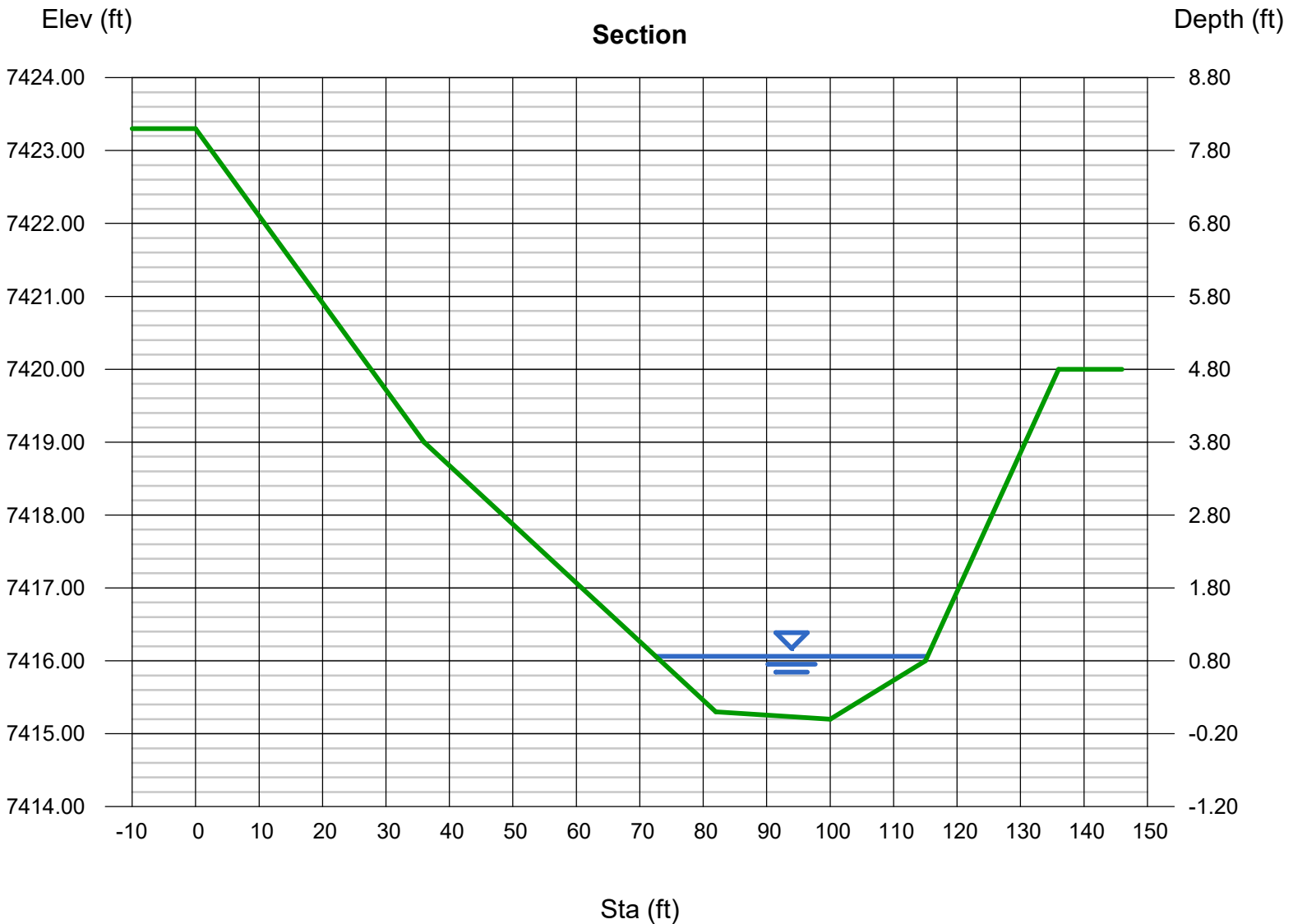
Depth (ft) = 0.86
Q (cfs) = 115.40
Area (sqft) = 25.08
Velocity (ft/s) = 4.60
Wetted Perim (ft) = 42.82
Crit Depth, Yc (ft) = 0.89
Top Width (ft) = 42.77
EGL (ft) = 1.19

Calculations

Compute by: Known Q
Known Q (cfs) = 115.40

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

(0.00, 7423.30)-(36.00, 7419.00, 0.030)-(82.00, 7415.30, 0.030)-(100.00, 7415.20, 0.030)-(115.00, 7416.00, 0.030)-(136.00, 7420.00, 0.030)





APPENDIX D – WATER QUALITY & DETENTION



2880 International Circle, Suite 110
 Colorado Springs, CO 80910
 Phone: 719-520-6300
 Email: Stormwater@elpasoco.com
publicworks.elpasoco.com/stormwater/

EL PASO COUNTY PCM APPLICABILITY FORM

EPC Project Number: _____

This form is to be used by the Engineer of Record to determine if the proposed construction activities are eligible for an exclusion to stormwater quality permanent control measure (PCM) requirements. All “applicable construction activity” within El Paso County (EPC) must comply with the post-construction stormwater management criteria. Reference ECM Appendix I for information about PCMs.

Note that this form only addresses stormwater quality for the site. Even if the site is fully excluded from needing a stormwater quality PCM, the site may still need to address stormwater detention (per DCMv1 Chap 1.5 and ECM Chap 3.2.8.B). However, if the site requires stormwater detention, then it must also address stormwater quality (per DCMv2 Chap 4.1 and ECM Appendix I.7.3). Refer to the Reference Information pages below for more guidance.

Part I. Project Summary			
Project Name:			
Is Stormwater Detention Required?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Is Water Quality Treatment Required? (i.e.: non-excluded disturbance >1ac)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is an ESQCP Required? If “No,” Check Applicable Reason	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Not an Applicable Construction Activity <input type="checkbox"/> Oil & Gas <input type="checkbox"/> R-Factor	
Engineer of Record Email Address:			

Part II. PCM Exclusions				
Note: Questions A through K directly correlate to Part I.E.4.a.i (A) to (K) on page 27 of the 2016 CDPS Statewide Standard MS4 General Permit COR090000 (i.e.: the MS4 Permit), as amended. Document exclusions that apply to the whole project or parts of it.				
Questions	Excluded Acreage	Yes	No	Notes
A. Is this project a “Pavement Management Site?”				This exclusion applies to the maintenance, rehabilitation, and reconstruction of pavement on existing roads, bridges, bike lanes, and parking along roads. Areas used primarily for parking (i.e.: separate lots not along roadway) or access to parking are not included. No increase in impervious area is allowable.
B. Review two options below to see if project is an “Excluded Roadway Development.”				Does <u>not</u> include sidewalks. Does include curb & gutter.
<ul style="list-style-type: none"> Does the project include improvements to an existing roadway that adds < 1 acre of paved or gravel area per mile of roadway? 				If selected, list the proposed additional acreage per mile in Part IV Notes below.
<ul style="list-style-type: none"> Does the project include improvements to an existing roadway that adds ≤ 8.25 ft of paved width at any location? 				If selected, list the proposed additional width in Part IV Notes below.



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EL PASO COUNTY PCM APPLICABILITY FORM

EPC Project Number: _____

Part II. PCM Exclusions (continued)				
Questions	Excluded Acreage	Yes	No	Notes
C. Does the project include “Excluded Existing Roadway Areas?”				For redevelopment of <u>existing</u> roadways. This exclusion only excludes the original roadway area, it does NOT apply to the entire project. This exclusion applies only when the proposed project will expand the existing roadway width by <2x on average. If selected, list the proposed expanded width in Part IV Notes below.
D. Is the project considered an Aboveground or Underground Utilities activity?				Activity can <u>not</u> permanently alter the terrain, ground cover, or drainage patterns from existing conditions.
E. Is the project considered a “Large Lot Single-Family Site”? <i>This exclusion only pertains to the lots and does not include roadways.</i>				Must be a single-family residential lot or agricultural zoned land with ≥ 2.5 acres per dwelling and total lot impervious area < 10%. If “Yes,” notate the percent impervious below in Part IV: Notes.
F. Do Non-Residential or Non-Commercial Infiltration Conditions exist? <i>Post-development surface conditions do not result in concentrated stormwater flow or surface water discharge during an 80th percentile stormwater runoff event, and the 80th percentile event must be infiltrated.</i>				Exclusion does not apply to residential or commercial sites for buildings. A site-specific study is required and must show rainfall and soil conditions, allowable slopes, surface conditions, and ratios of imperviousness area to pervious area.
G. Is the project land disturbance to Undeveloped Land where undeveloped land remains undeveloped following the activity?				Project must be on land with no human made structures such as buildings or pavement. The proposed development must return the disturbed area to its historical condition. See CDPHE’s “Standard MS4 Permit FAQ” for more detail on how this exclusion applies.
H. Is the project a Stream Stabilization Site?				
I. Is the project a Bike or Pedestrian Trail?				Bike lanes for roadways are not included in this exclusion but may qualify if attached to a larger roadway activity that is excluded in A, B or C above. Pedestrian trails (e.g. sidewalks) that are attached to a roadway do not apply.
J. Is the project Oil and Gas Exploration?				Activities and facilities associated with oil and gas exploration are excluded.
K. Is the project in a County Growth Area?				El Paso County does not apply this exclusion.
If any exclusions above apply (via a “Yes” for any row), runoff from those areas is excluded from stormwater quality treatment requirements. All runoff from remaining non-excluded disturbed areas will need to be treated by a stormwater quality PCM, unless remaining area is <1ac. If remaining area is >1ac, select at least one Design Standard on the next page.				



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EL PASO COUNTY PCM APPLICABILITY FORM

EPC Project Number: _____

Part III: PCM Information		
Questions	Yes	No
1. Which of the following Design Standard(s) will the project utilize? <i>(If a PCM is required, you must select at least one. See Control Measure Requirements identified in MS4 Permit Part I.E.4.a.iv on page 29.)</i>		
A. Water Quality Capture Volume (WQCV) Standard		
B. Pollutant Removal Standard - 80% Total Suspended Solids Removal (TSS) <i>(must treat runoff to <30mg/L of TSS)</i>		
C. Runoff Reduction Standard		
D. Applicable Development Site Draining to a Regional WQCV Control Measure <i>(no conveyance via "Waters of the State")</i>		
E. Applicable Development Site Draining to a Regional WQCV Facility <i>(conveyance allowable via "Waters of the State," if the 8 conditions in the MS4 permit are met and documented in the drainage report)</i>		
F. Constrained Redevelopment Sites Standard <i>(must be pre-approved by ECM Administrator)</i>		
G. Previous Permit Term Standard		
2. Will any of the PCMs be located within any other jurisdiction besides EPC?		

Part IV: Notes
Provide info regarding all applicable PCM(s) and PCM Exclusion(s) including location, PCM name(s)/number(s), and additional relevant filings or reports or maintenance agreements, etc. Attach an additional sheet if you need more space. Attaching a detailed summary table would replace the need for any notes here.



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EL PASO COUNTY PCM APPLICABILITY FORM

EPC Project Number: _____

Part V: Signatures

Applicant: This PCM Applicability Form was prepared under my direction and supervision and is correct to the best of my knowledge and belief. It was prepared along with the project design, construction plans, drainage report, specifications, and maintenance and access agreements as required. And it has been reviewed for compliance with the Post Construction Stormwater Management criteria and MS4 Permit requirements.



Signature and Stamp of Engineer or Recorder

(If the project is not an Applicable Construction Activity, this line can be signed by the Applicant or their rep, they do not have to be an engineer)

Date

El Paso County: This PCM Applicability Form has been reviewed and the project design, construction plans, drainage report, specifications, and maintenance and access agreements as required, have been reviewed for compliance with the Post Construction Stormwater Management process and MS4 Permit requirements.

Signature of El Paso County Project Engineer

Date



APPENDIX E – REFERENCE MATERIAL

Drainage Letter
for
Warner 4-Lot Subdivision

Owner/Applicant:
J. Brian Warner
Colorado Springs, CO 80908
(719) 600-7143

Prepared by:
Forsgren Associates
56 Inverness Drive East, Suite 112
Colorado Springs, CO 80923
(720) 214-5884



August, 2021

Design Point 1

Design Point 1 represents the overland flow that exits the site spread over the length of the property line within Drainage Basin A to the North and East. The area representing flows for Design Point 1 is 1,359,414 square feet (31.21 ac). The 2-year maximum flow rate at a rainfall intensity of 3.20 inches per hour for this basin is 2.7 cfs, the 5-year maximum flow rate at a rainfall intensity of 4.10 inches per hour for this basin is 11.1 cfs and the 100-year maximum flow rate at a rainfall intensity of 6.80 inches per hour for this basin is 75.4 cfs (see Appendix B).

Design Point 2

Design Point 2 represents the overland flow that exits the site spread over the length of the property line within Drainage Basin B to the South. The area representing flows for Design Point 2 is 440,989 square feet (10.12 ac). The 2-year maximum flow rate at a rainfall intensity of 3.20 inches per hour for this basin is 1.1 cfs, the 5-year maximum flow rate at a rainfall intensity of 4.10 inches per hour for this basin is 3.9 cfs and the 100-year maximum flow rate at a rainfall intensity of 6.80 inches per hour for this basin is 24.8 cfs (see Appendix B).

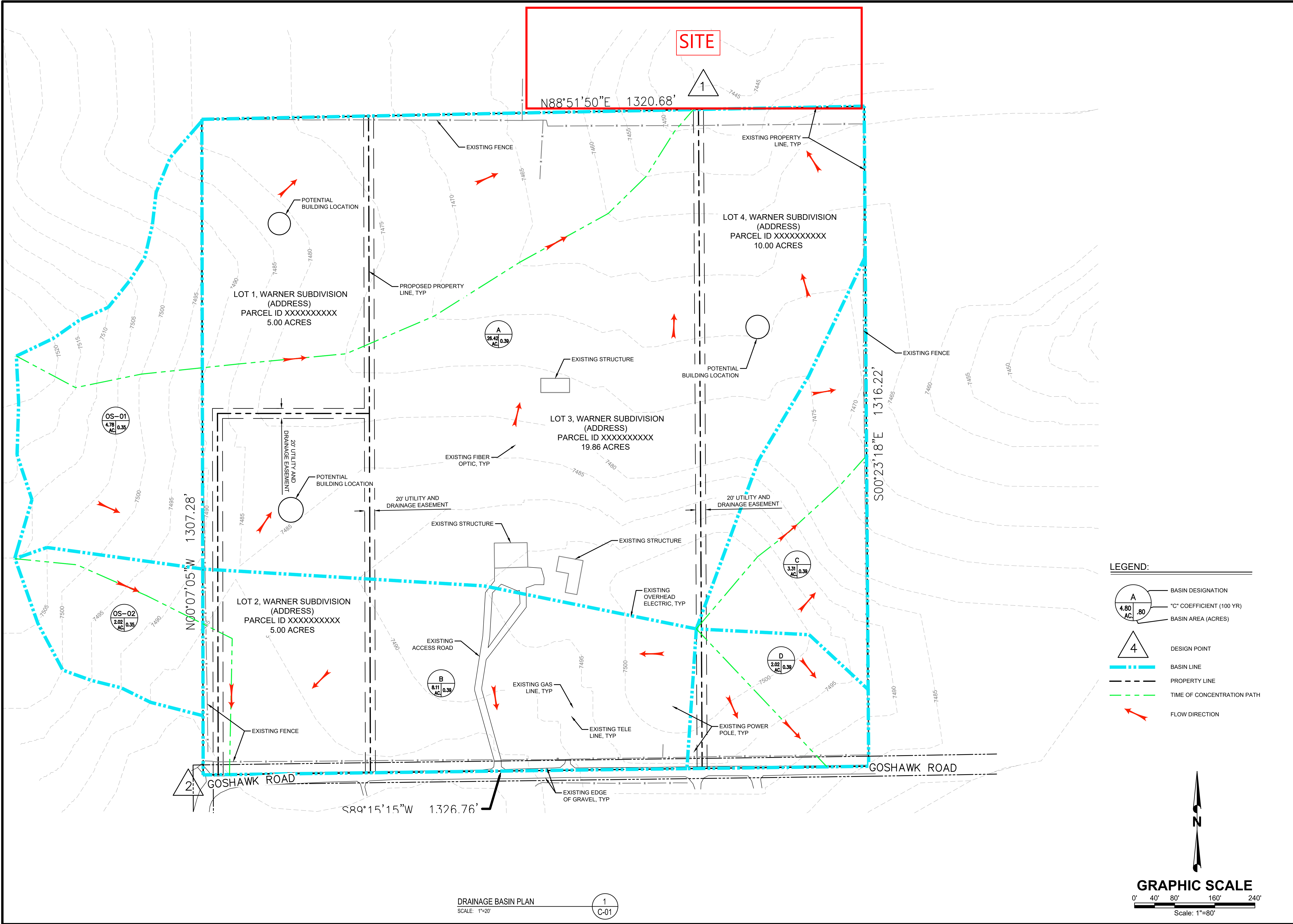
2-Year, 5-Year & 100-Year Storm Runoff (Existing)												
Basin		Area	Tc	2 Intensity	5 Intensity	100 Intensity	2 Comp. C	5 Comp. C	100 Comp. C	2 Q	5 Q	100 Q
		(Acres)	(Min.)	(In./hr.)	(In./hr.)	(In./hr.)				(cfs)	(cfs)	(cfs)
A	Basin A	26.42	10.00	3.20	4.10	6.80	0.03	0.09	0.36	2.4	9.5	64.0
B	Basin B	8.11	10.00	3.20	4.10	6.80	0.04	0.10	0.36	1.0	3.2	20.0
C	Basin C	3.31	10.00	3.20	4.10	6.80	0.02	0.08	0.35	0.2	1.1	7.9
D	Basin D	2.02	10.00	3.20	4.10	6.80	0.02	0.08	0.35	0.1	0.7	4.8
OS-01	Offsite Basin 01	4.78	10.00	3.20	4.10	6.80	0.02	0.08	0.35	0.3	1.6	11.4
OS-02	Offsite Basin 02	2.02	10.00	3.20	4.10	6.80	0.02	0.08	0.35	0.1	0.7	4.8
1	OS-01 + A	31.21	10.10	3.20	4.10	6.80	0.03	0.09	0.36	2.7	11.1	75.4
2	OS-02 + B	10.12	10.00	3.20	4.10	6.80	0.03	0.09	0.36	1.1	3.9	24.8

Proposed Conditions

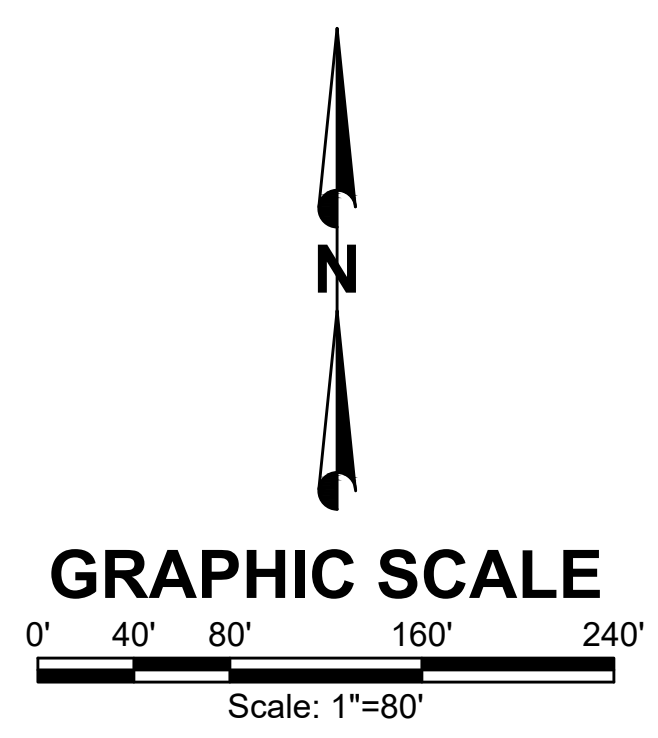
Basin A

Basin A has an overall area of 1,151,039 square feet (26.42 ac) and historically flows overland to the north and east and exits the site spread over the length of the property line. Based on the El Paso County Engineering Criteria Manual, for sites with 5.0 acres or greater areas, the percent imperviousness is approximately 7%. Given this, the 2-year maximum flow rate at a rainfall intensity of 3.20 inches per hour for this basin is 6.8 cfs, the 5-year maximum flow rate at a rainfall intensity of 4.10 inches per hour for this basin is 14.9 cfs and the 100-year maximum flow rate at a rainfall intensity of 6.80 inches per hour for this basin is 70.6 cfs (see Appendix B).

C:\Users\cburba\Desktop\Warner 4-Lot Subdivision\CAD\Exhibit\Proposed Conditions Drainage Map.dwg - 8/24/2021 10:13 AM



- LEGEND:**
- BASIN DESIGNATION
 - "C" COEFFICIENT (100 YR)
 - BASIN AREA (ACRES)
 - DESIGN POINT
 - BASIN LINE
 - PROPERTY LINE
 - TIME OF CONCENTRATION PATH
 - FLOW DIRECTION



DRAINAGE BASIN PLAN
SCALE: 1"=20'

1
C-01

NO.	REVISIONS	BY	DATE

FORSGREN Associates, Inc.
56 Inverness Drive East, Suite 112, Englewood, CO 80112
PH: 720.214.5884 FAX: 720.000.0000

PROJECT NO.	DRAWN	DESIGNED	APPROVED	DATE
04-18-0026	C. BURBA	C. BURBA	C. BURBA	

OWNER
BRIAN WARNER
COLORADO SPRINGS, CO

**4-LOT MINOR SUBDIVISION
PROPOSED CONDITIONS
DRAINAGE MAP**

SHEET NO:
C-01
DATE:
08/19/2021
PAGE NO:
1 OF 1

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Composite "C" Values (Proposed)									
Basin	Desc.	Area	Area	% Imper.	Impervious Area	Pervious Area	2 Comp.	5 Comp.	100 Comp
		(SF)	(Acres)	%	(Acres)	(Acres)	"C"	"C"	"C"
A	Basin A	1,151,039	26.42	7%	1.850	24.57	0.08	0.14	0.39
B	Basin B	353,054	8.11	7%	0.570	7.54	0.08	0.14	0.39
C	Basin C	143,995	3.31	7%	0.230	3.08	0.08	0.14	0.39
D	Basin D	88,163	2.02	7%	0.140	1.88	0.08	0.14	0.39
OS-01	Offsite Basin 01	208,375	4.78	0%	0.000	4.78	0.02	0.08	0.35
OS-02	Offsite Basin 02	87,935	2.02	0%	0.000	2.02	0.02	0.08	0.35
All Onsite Basins		2,032,561	46.66	6%	2.65	44.01	0.07	0.13	0.38
1	OS-01 + A	1,359,414	31.21	6%	1.850	29.36	0.07	0.13	0.39
2	OS-02 + B	440,989	10.12	6%	0.570	9.55	0.07	0.13	0.38
All Offsite Basins		1,800,403	41.33	6%	2.42	38.91	0.07	0.13	0.39

5 Impervious "C"	0.90
5 Pervious "C"	0.08
100 Impervious "C"	0.96
100 Pervious "C"	0.35
2 Impervious "C"	0.89
2 Pervious "C"	0.02

By: Conner Burba
 Project: Warner 4-Lot Subdivision
 Printed:

8/24/2021 10:06

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

Subdivision: JJ Ranch Subdivision
Location: El Paso County
Design Storm: 5-Year

Project Name: JJ Ranch Subdivision
Project No.: 24023.00
Calculated By: NQJ
Checked By: REB
Date: 5/27/25

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_c (min)	
	1	OS1	65.25	0.11	52.9	7.31	1.63	11.9					11.9	7.31	1.8					765	1.3	1.0	BASIN OS1 FLOW, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP1 & CONTINUES TO DP2
	2	B	2.38	0.11	14.7	0.27	3.55	0.9	53.9	7.57	1.60	12.1	12.1	7.57	1.9					305	1.4	3.7	BASIN B & DP1 FLOW @ DP2, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP3
	3	C	6.77	0.13	19.8	0.86	3.10	2.7	57.6	8.43	1.50	12.7	12.7	8.43	3.1					261	1.8	2.5	BASIN C & DP2 FLOW @ DP3, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP5
	4	D1	5.66	0.10	16.9	0.56	3.34	1.9					1.88	0.56	3.9					763	2.0	6.4	BASIN D1 FLOW @ DP4, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP5
		D2	4.64	0.15	22.7	0.69	2.90	2.0															BASIN D2 FLOW @ DP5
	5	A	7.88	0.15	32.7	1.15	2.35	2.7	60.0	10.84	1.44	15.6											BASIN A, BASIN D2, DP1-DP4 COMBINED FLOW @ DP5, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	6	E	8.33	0.13	33.5	1.04	2.32	2.4															BASIN E FLOW @ DP6, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	7	F	0.84	0.14	9.9	0.12	4.15	0.5															BASIN F FLOW @ DP7, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	8	G	1.17	0.15	9.1	0.17	4.27	0.7															BASIN G FLOW @ DP8, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	9	H	0.51	0.09	13.5	0.05	3.67	0.2															BASIN H FLOW @ DP9, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST

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

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

Subdivision: JJ Ranch Subdivision
Location: El Paso County
Design Storm: 100-Year

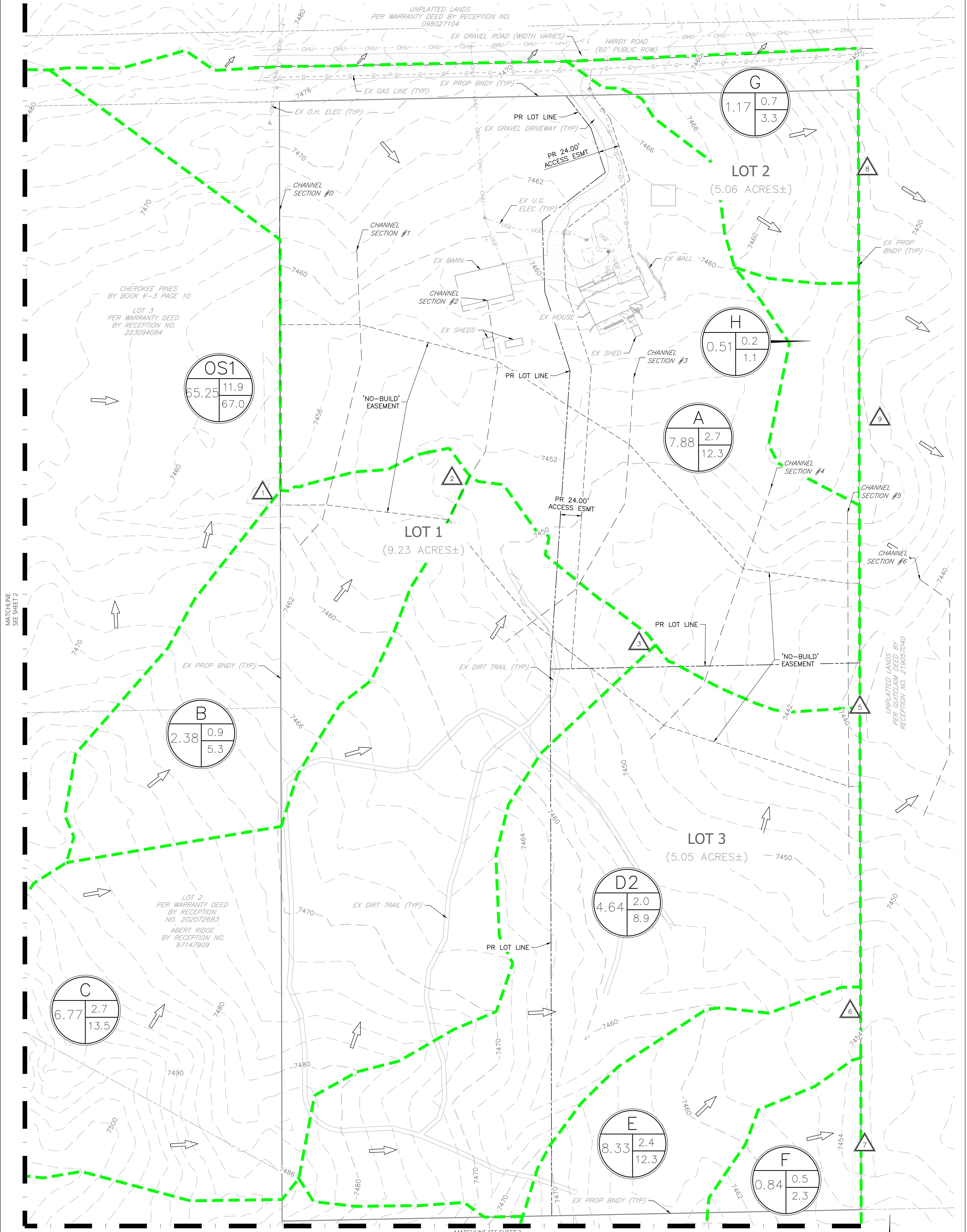
Project Name: JJ Ranch Subdivision
Project No.: 24023.00
Calculated By: NQJ
Checked By: REB
Date: 5/27/25

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE			TRAVEL TIME			REMARKS	
		Basin ID	Area (ac)	Runoff Coeff.	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	t _c (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q _{street} (cfs)	C*A (ac)	Slope (%)	Q _{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)		t _r (min)
	1	OS1	65.25	0.38	52.9	24.48	2.74	67.0					67.0	24.48	1.8					765	1.3	1.0	BASIN OS1 FLOW, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP1 & CONTINUES TO DP2
	2	B	2.38	0.37	14.7	0.89	5.97	5.3	53.9	25.37	2.69	68.2	68.2	25.37	1.9					305	1.4	3.7	BASIN B & DP1 FLOW @ DP2, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP3
	3	C	6.77	0.38	19.8	2.59	5.21	13.5	57.6	27.96	2.52	70.5	70.5	27.96	3.1					261	1.8	2.5	BASIN C & DP2 FLOW @ DP3, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP5
	4	D1	5.66	0.37	16.9	2.07	5.60	11.6					11.60	2.07	3.9					763	2.0	6.4	BASIN D1 FLOW @ DP4, FOLLOWS HISTORIC DRAINAGE PATTERNS TO DP5
		D2	4.64	0.40	22.7	1.84	4.87	8.9															BASIN D2 FLOW @ DP5
	5	A	7.88	0.40	32.7	3.13	3.94	12.3	60.0	35.00	2.42	84.6											BASIN A, BASIN D2, DP3 & DP4 COMBINED FLOW @ DP5, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	6	E	8.33	0.38	33.5	3.17	3.89	12.3															BASIN E FLOW @ DP6, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	7	F	0.84	0.39	9.9	0.33	6.97	2.3															BASIN F FLOW @ DP7, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	8	G	1.17	0.40	9.1	0.47	7.16	3.3															BASIN G FLOW @ DP8, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST
	9	H	0.51	0.36	13.5	0.18	6.17	1.1															BASIN H FLOW @ DP9, FOLLOWS HISTORIC DRAINAGE PATTERNS OFFSITE TO THE EAST

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

JJ RANCH SUBDIVISION

PROPOSED DRAINAGE MAP



Tributary Sub-basin	Area (acres)	Percent Impervious	C _s	C ₁₀₀	t _c (min)	Q _s (cfs)	Q ₁₀₀ (cfs)
A	7.88	9.2%	0.15	0.40	32.7	2.7	12.3
B	2.38	4.2%	0.11	0.37	14.7	0.9	5.3
C	6.77	6.3%	0.13	0.38	19.8	2.7	13.5
D1	5.66	3.0%	0.10	0.37	16.9	1.9	11.6
D2	4.64	8.4%	0.15	0.40	22.7	2.0	8.9
E	8.33	5.5%	0.13	0.38	33.5	2.4	12.3
F	0.84	7.0%	0.14	0.39	9.9	0.5	2.3
G	1.17	10.7%	0.15	0.40	9.1	0.7	3.3
H	0.51	2.0%	0.09	0.36	13.5	0.2	1.1
OS1	65.25	5.2%	0.11	0.38	52.9	11.9	67.0

DP#	Q _s -YR	Q ₁₀₀ -YR
1	11.9	67.0
2	12.1	68.2
3	12.7	70.5
4	1.9	11.6
5	15.6	84.6
6	2.4	12.3
7	0.5	2.3
8	0.7	3.3
9	0.2	1.1

LEGEND

SECTION LINE: ————

BOUNDARY LINE: ————

PROPERTY LINE: ————

EASEMENT LINE: - - - - -

RIGHT OF WAY CENTERLINE: ————

INTERMEDIATE CONTOUR: - - - - -

FLOW DIRECTION: →

BASIN ID:

SUB-BASIN DRAINAGE AREA: - - - - -

EXISTING: ————

PROPOSED: ————

DESIGN POINT DESIGNATION:

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

PROPOSED DRAINAGE MAP

JJ RANCH SUBDIVISION

JOB NO. 24023

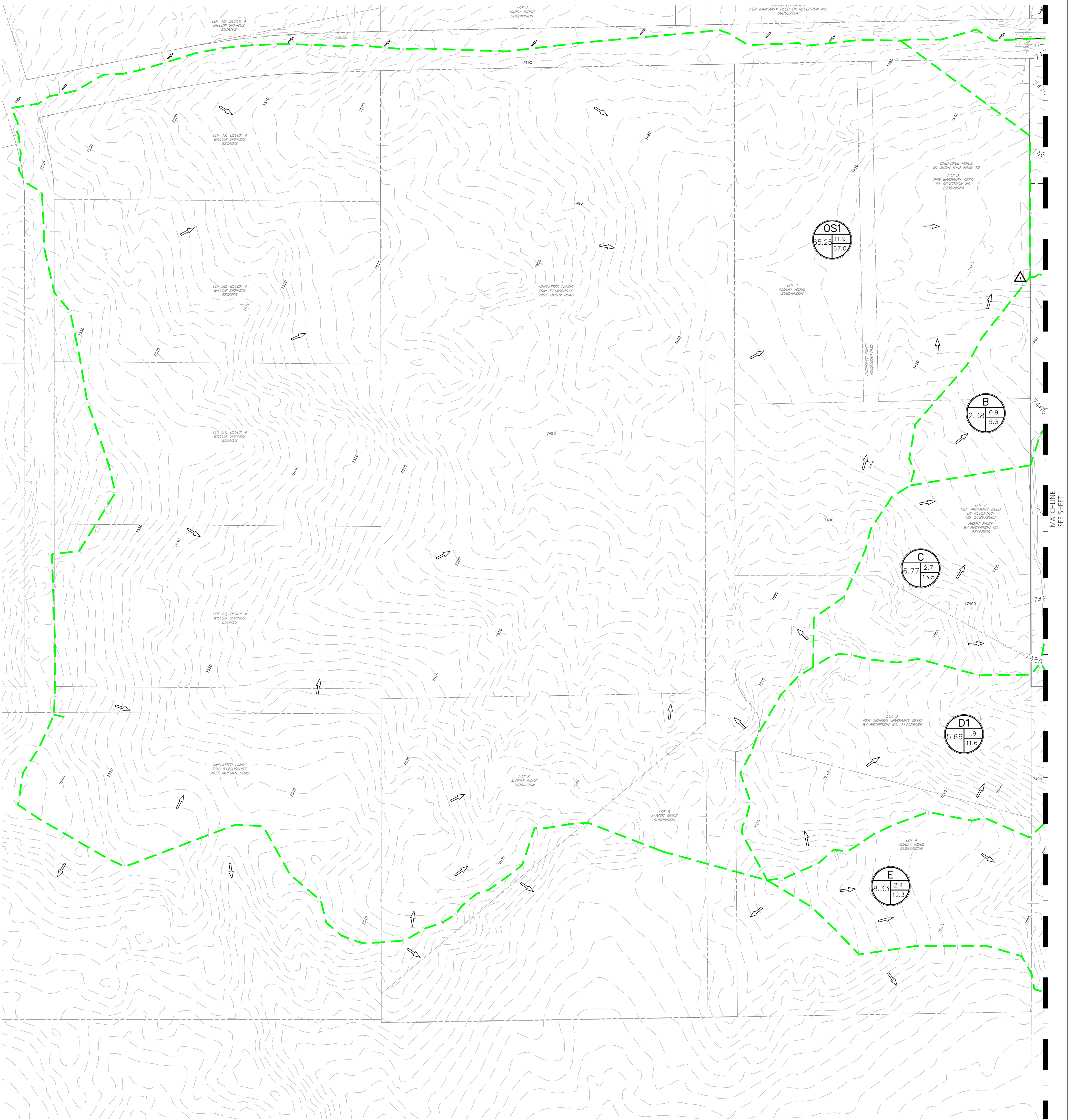
LOCATION: EPC

05/27/2025

SHEET 1

ALL TERRAIN ENGINEERING

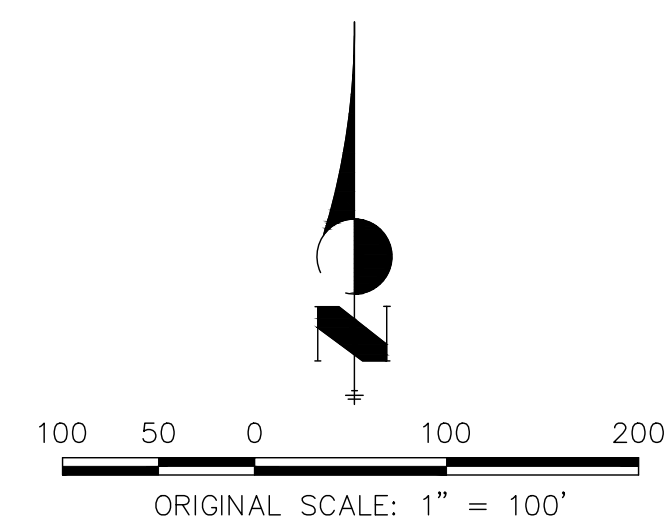
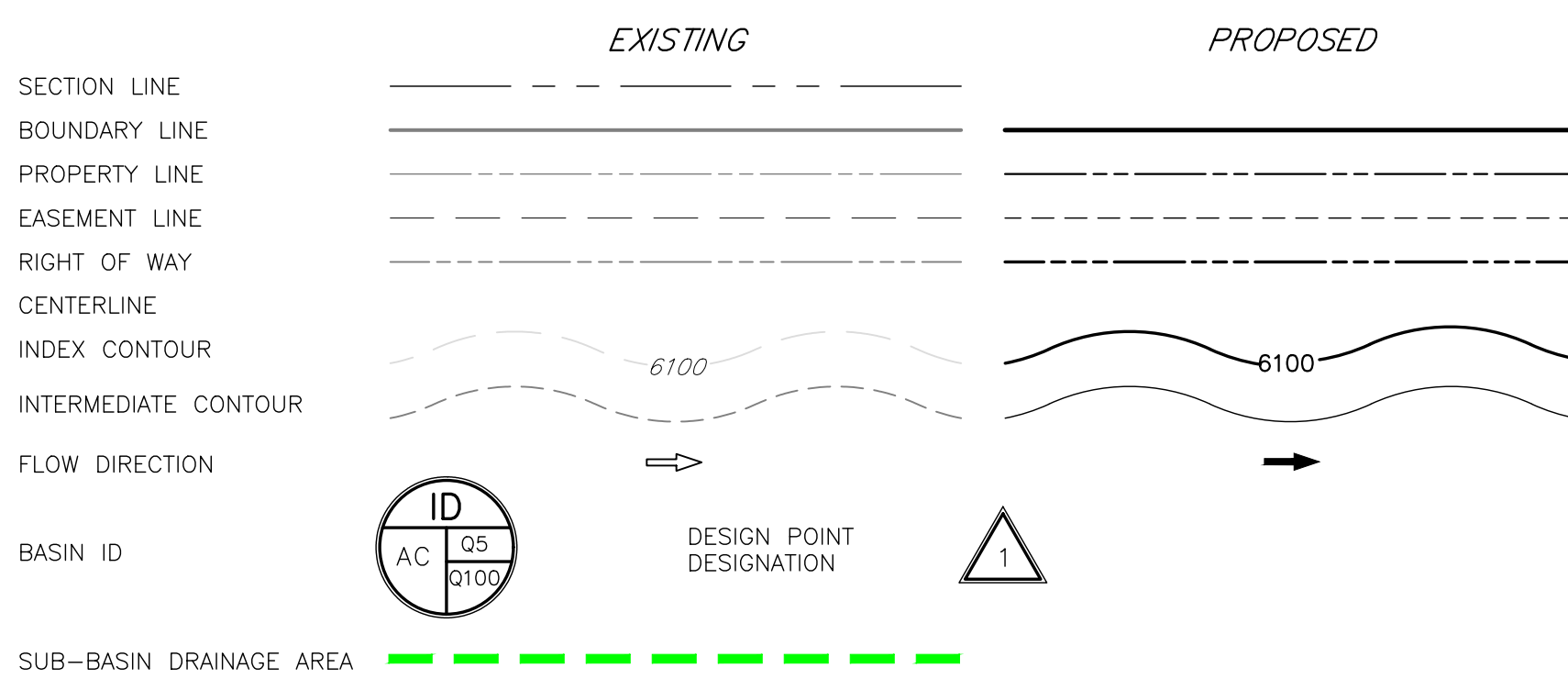
JJ RANCH SUBDIVISION PROPOSED DRAINAGE MAP



Tributary Sub-basin	Area (acres)	Percent Impervious	C _s	C ₁₀₀	t _c (min)	Q _c (cfs)	Q ₁₀₀ (cfs)
A	7.88	9.2%	0.15	0.40	32.7	2.7	12.3
B	2.38	4.2%	0.11	0.37	14.7	0.9	5.3
C	6.77	6.3%	0.13	0.38	19.8	2.7	13.5
D1	5.66	3.0%	0.10	0.37	16.9	1.9	11.6
D2	4.64	8.4%	0.15	0.40	22.7	2.0	8.9
E	8.33	5.5%	0.13	0.38	33.5	2.4	12.3
F	0.84	7.0%	0.14	0.39	9.9	0.5	2.3
G	1.17	10.7%	0.15	0.40	9.1	0.7	3.3
H	0.51	2.0%	0.09	0.36	13.5	0.2	1.1
OS1	65.25	5.2%	0.11	0.38	52.9	11.9	67.0

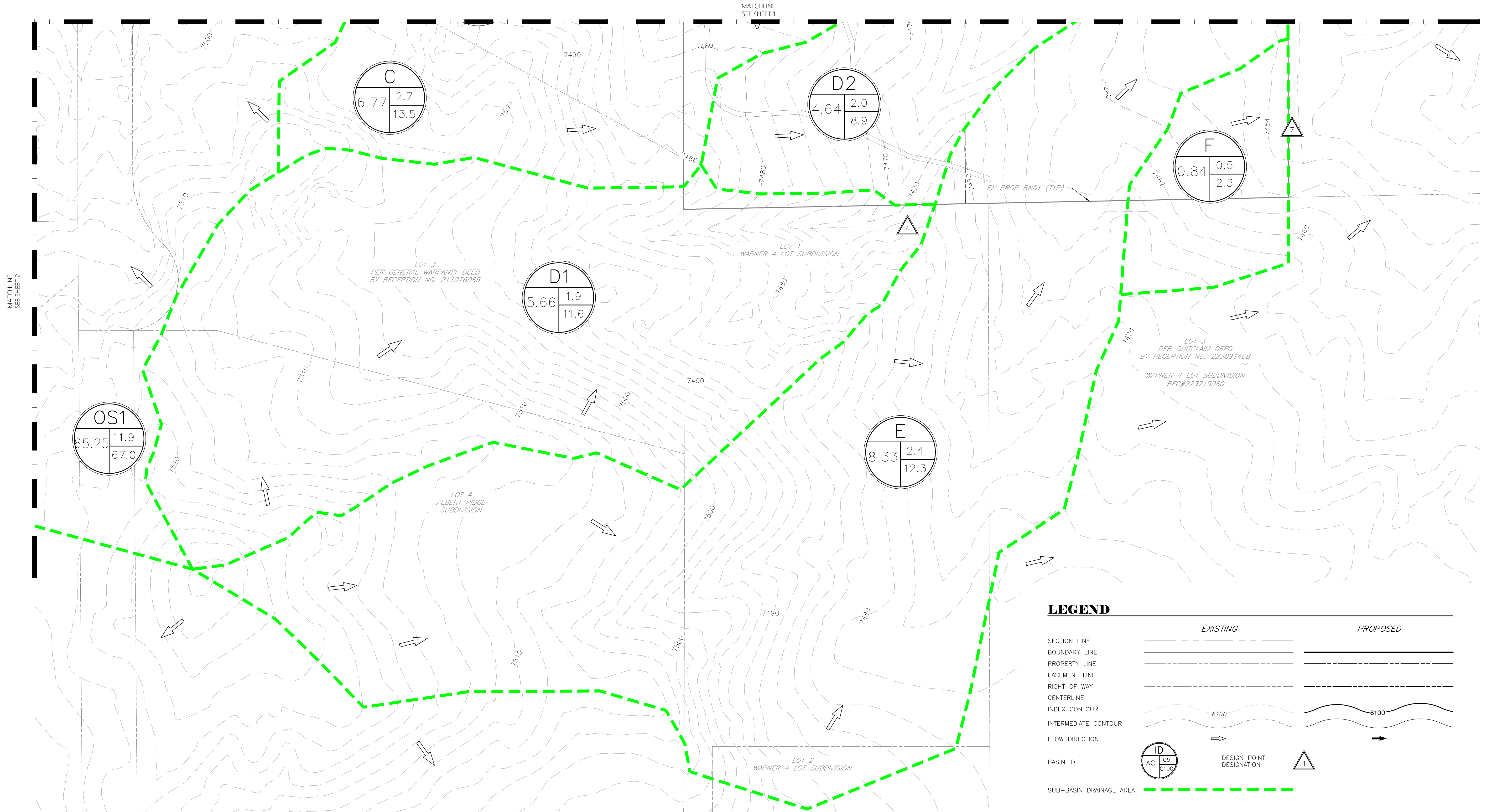
DP#	Q _{5-YR}	Q _{100-YR}
1	11.9	67.0
2	12.1	68.2
3	12.7	70.5
4	1.9	11.6
5	15.6	84.6
6	2.4	12.3
7	0.5	2.3
8	0.7	3.3
9	0.2	1.1

LEGEND



PROPOSED DRAINAGE MAP	
JJ RANCH SUBDIVISION	
JOB NO. 24023	SHEET
LOCATION: EPC	2
05/27/2025	

JJ RANCH SUBDIVISION PROPOSED DRAINAGE MAP

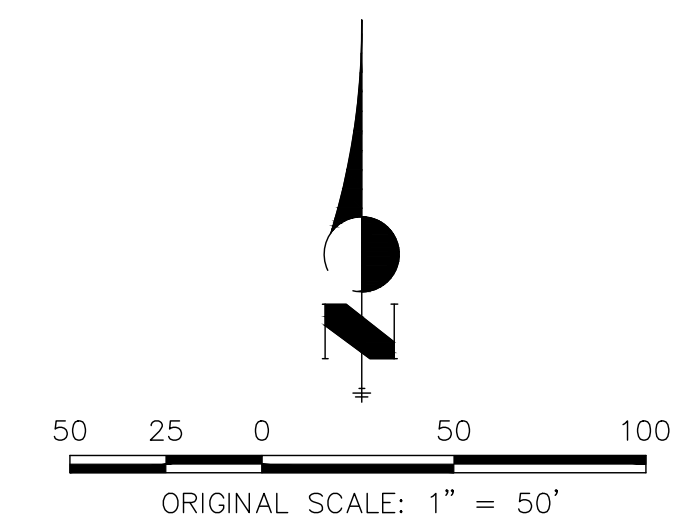


LEGEND

	EXISTING	PROPOSED
SECTION LINE	---	---
BOUNDARY LINE	---	---
PROPERTY LINE	---	---
EASEMENT LINE	---	---
RIGHT OF WAY	---	---
CENTERLINE	---	---
INDEX CONTOUR	~ 6100 ~	~ 6100 ~
INTERMEDIATE CONTOUR	~ 6100 ~	~ 6100 ~
FLOW DIRECTION	→	→
BASIN ID		
DESIGN POINT DESIGNATION		
SUB-BASIN DRAINAGE AREA	---	---

Tributary Sub-basin	Area (acres)	Percent Impervious	C _s	C ₁₀₀	t _c (min)	Q _s (cfs)	Q ₁₀₀ (cfs)
A	7.88	9.2%	0.15	0.40	32.7	2.7	12.3
B	2.38	4.2%	0.11	0.37	14.7	0.9	5.3
C	6.77	6.3%	0.13	0.38	19.8	2.7	13.5
D1	5.66	3.0%	0.10	0.37	16.9	1.9	11.6
D2	4.64	8.4%	0.15	0.40	22.7	2.0	8.9
E	8.33	5.5%	0.13	0.38	33.5	2.4	12.3
F	0.84	7.0%	0.14	0.39	9.9	0.5	2.3
G	1.17	10.7%	0.15	0.40	9.1	0.7	3.3
H	0.51	2.0%	0.09	0.36	13.5	0.2	1.1
OS1	65.25	5.2%	0.11	0.38	52.9	11.9	67.0

DPH	Q _s -YR	Q ₁₀₀ -YR
1	11.9	67.0
2	12.1	68.2
3	12.7	70.5
4	1.9	11.6
5	15.6	84.6
6	2.4	12.3
7	0.5	2.3
8	0.7	3.3
9	0.2	1.1



PROPOSED DRAINAGE MAP

JJ RANCH SUBDIVISION

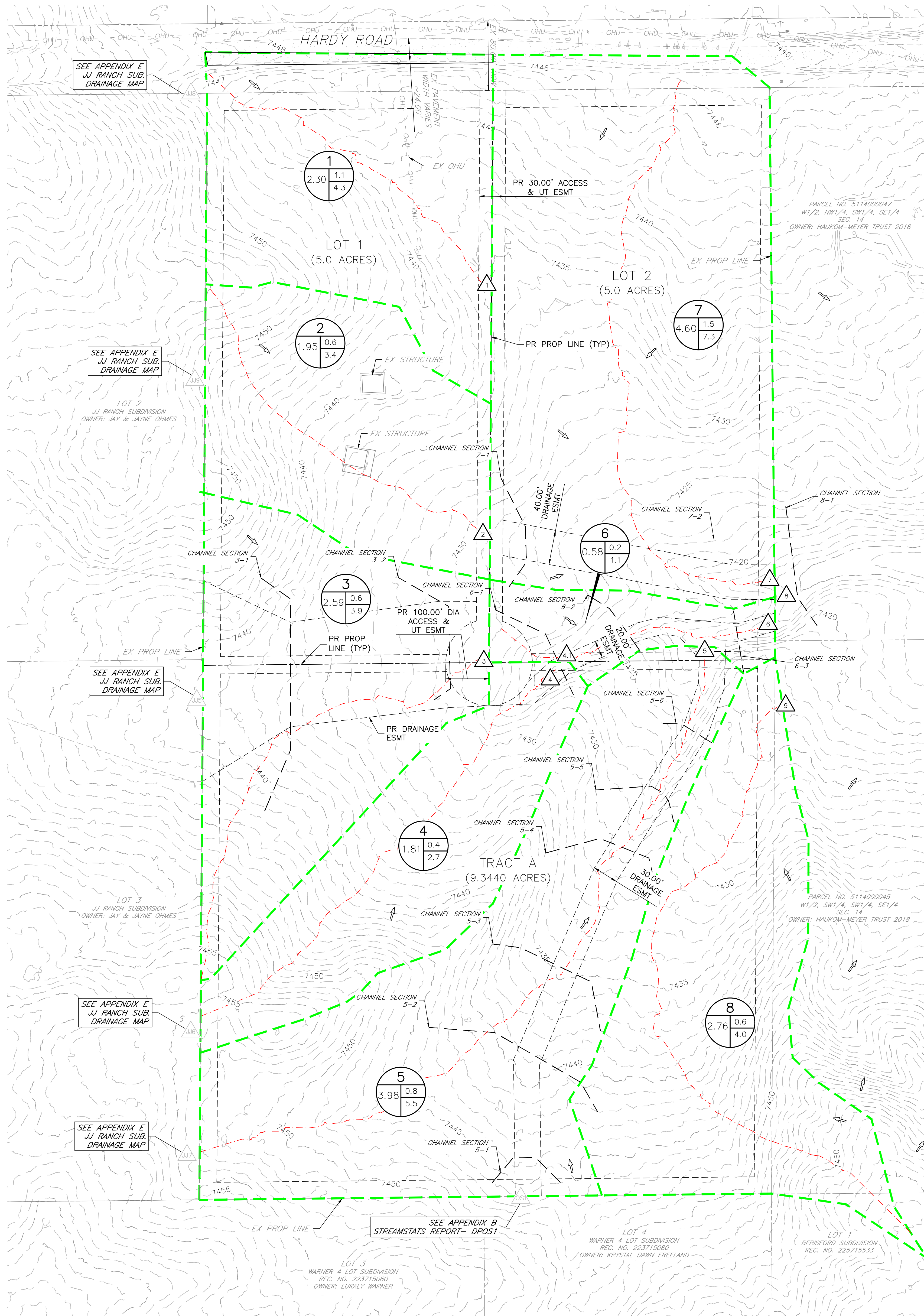
JOB NO. 24023
LOCATION: EPC
05/27/2025

SHEET 3

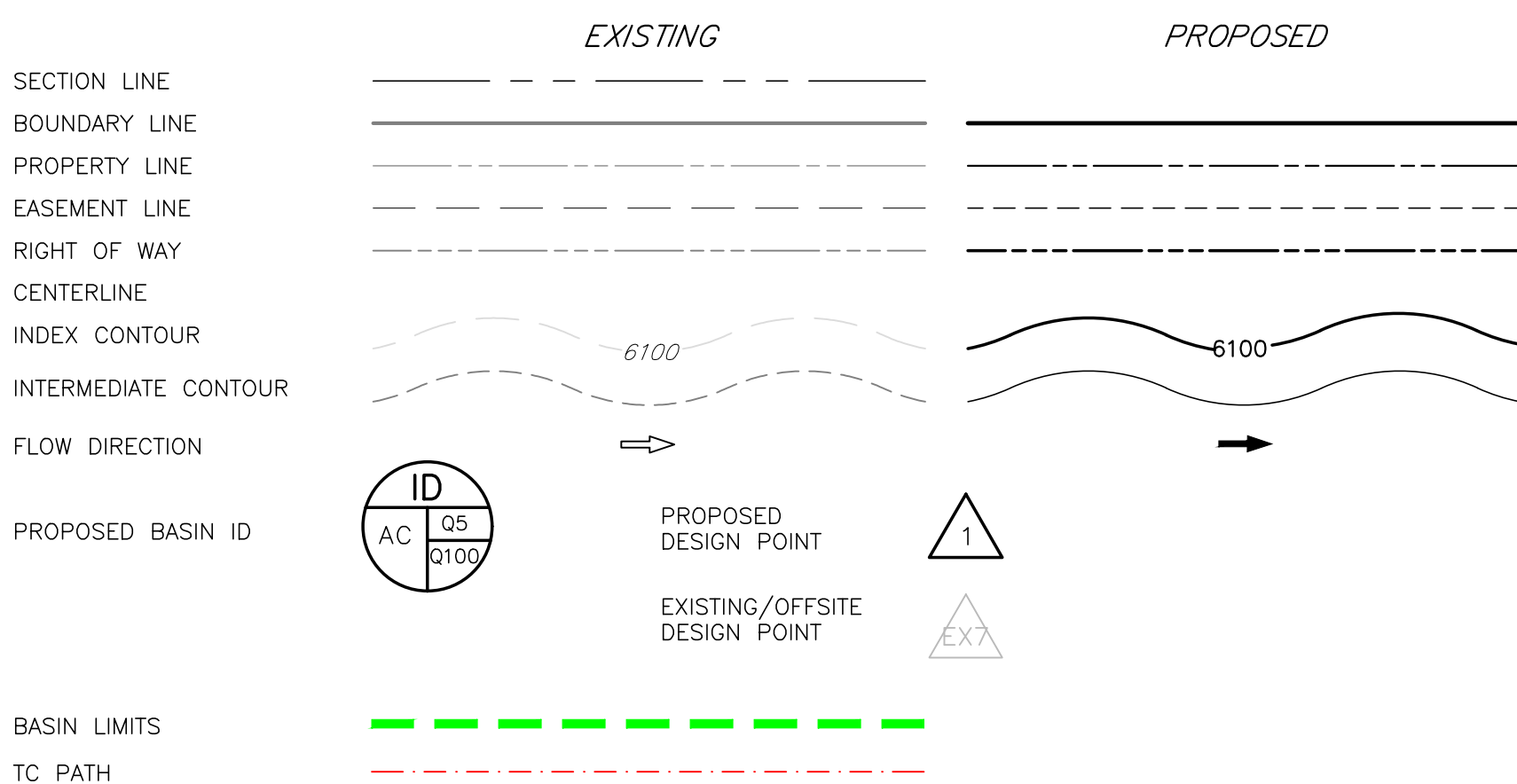


APPENDIX F – DRAINAGE MAPS

HARDY ROAD PROPERTIES PROPOSED DRAINAGE MAP



LEGEND



PROPOSED CONDITIONS - BASIN SUMMARY TABLE

Tributary Sub-basin	Area (acres)	Percent Impervious	C _s	C ₁₀₀	t _c (min)	Q ₅ (cfs)	Q ₁₀₀ (cfs)
1	2.30	13.5%	0.18	0.43	27.8	1.1	4.3
2	1.95	4.3%	0.11	0.37	23.7	0.6	3.4
3	2.59	2.0%	0.09	0.36	29.7	0.6	3.9
4	1.81	2.0%	0.09	0.36	29.6	0.4	2.7
5	3.98	2.0%	0.09	0.36	34.0	0.8	5.5
6	0.58	2.0%	0.09	0.36	19.0	0.2	1.1
7	4.60	7.3%	0.13	0.39	31.0	1.5	7.3
8	2.76	2.0%	0.09	0.36	32.0	0.6	4.0

PROPOSED CONDITIONS - DESIGN POINT SUMMARY TABLE

DP#	Q _{5-YR}	Q _{100-YR}
OS1	4.7	29.5
JJ5	15.6	84.6
JJ6	2.4	12.3
JJ7	0.5	2.3
JJ8	0.7	3.3
JJ9	0.2	1.1
1	1.5	6.3
2	0.7	4.3
3	14.7	79.8
4	2.5	13.1
4.1	16.3	88.2
5	4.1	27.4
6	18.9	106.7
7	3.3	15.9
8	20.7	115.4
9	0.6	4.0

PROPOSED DRAINAGE MAP

HARDY ROAD PROP.	
JOB NO. 25018	SHEET
LOCATION: EPC	2
02/17/2026	

60 30 0 60 120
ORIGINAL SCALE: 1" = 60'