

APPENDIX E
STORMWATER TECHNICAL MEMORANDUM
Part 3 of 3

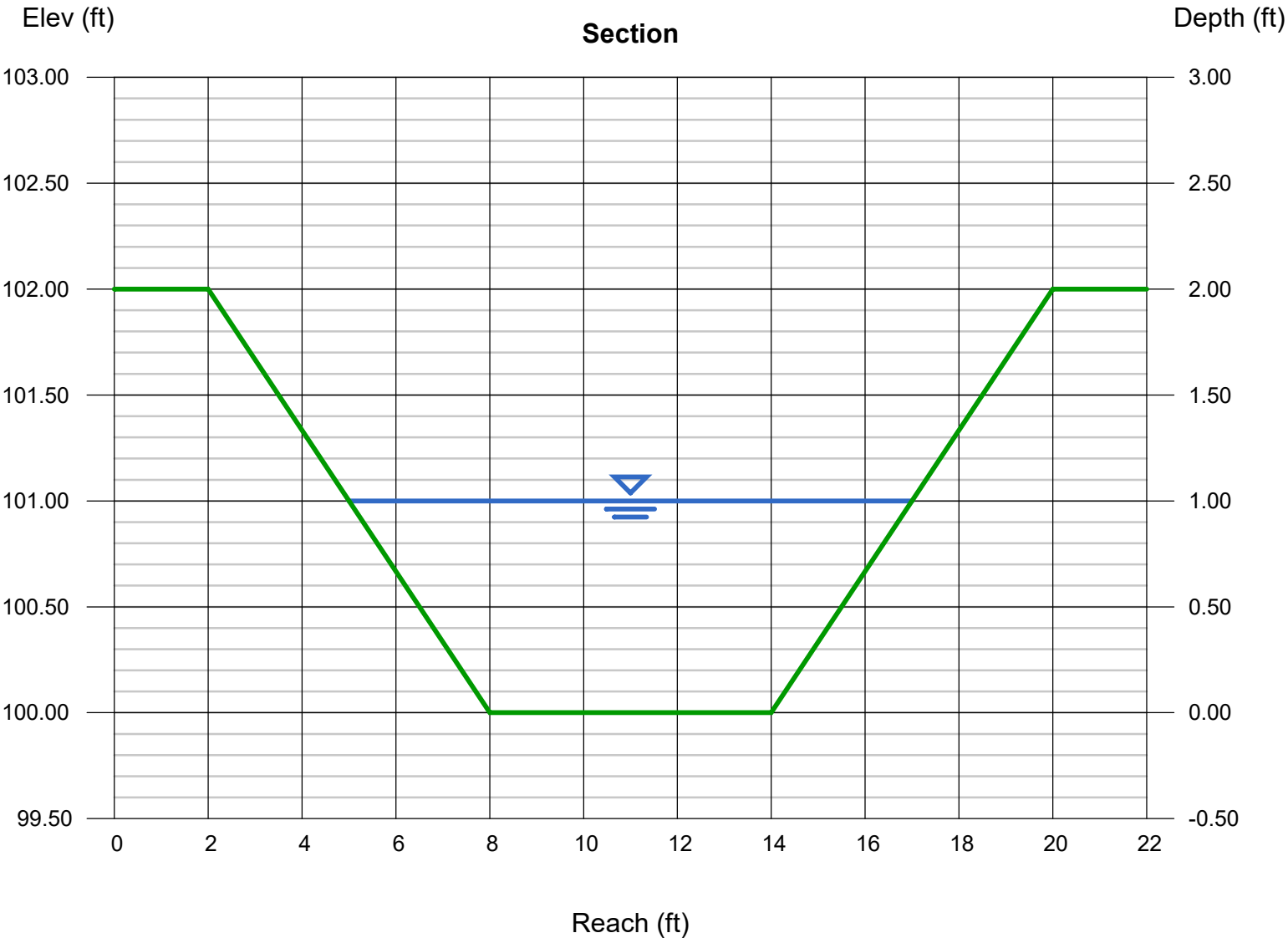
Attachment 3

On-site Channel Capacity
EX. and PR. Culvert Capacity
Brow Ditch Capacity

Channel Report

El Caballo Park - EX Vegetated Channel Upstream - n=0.045 - 1ft Freeboard

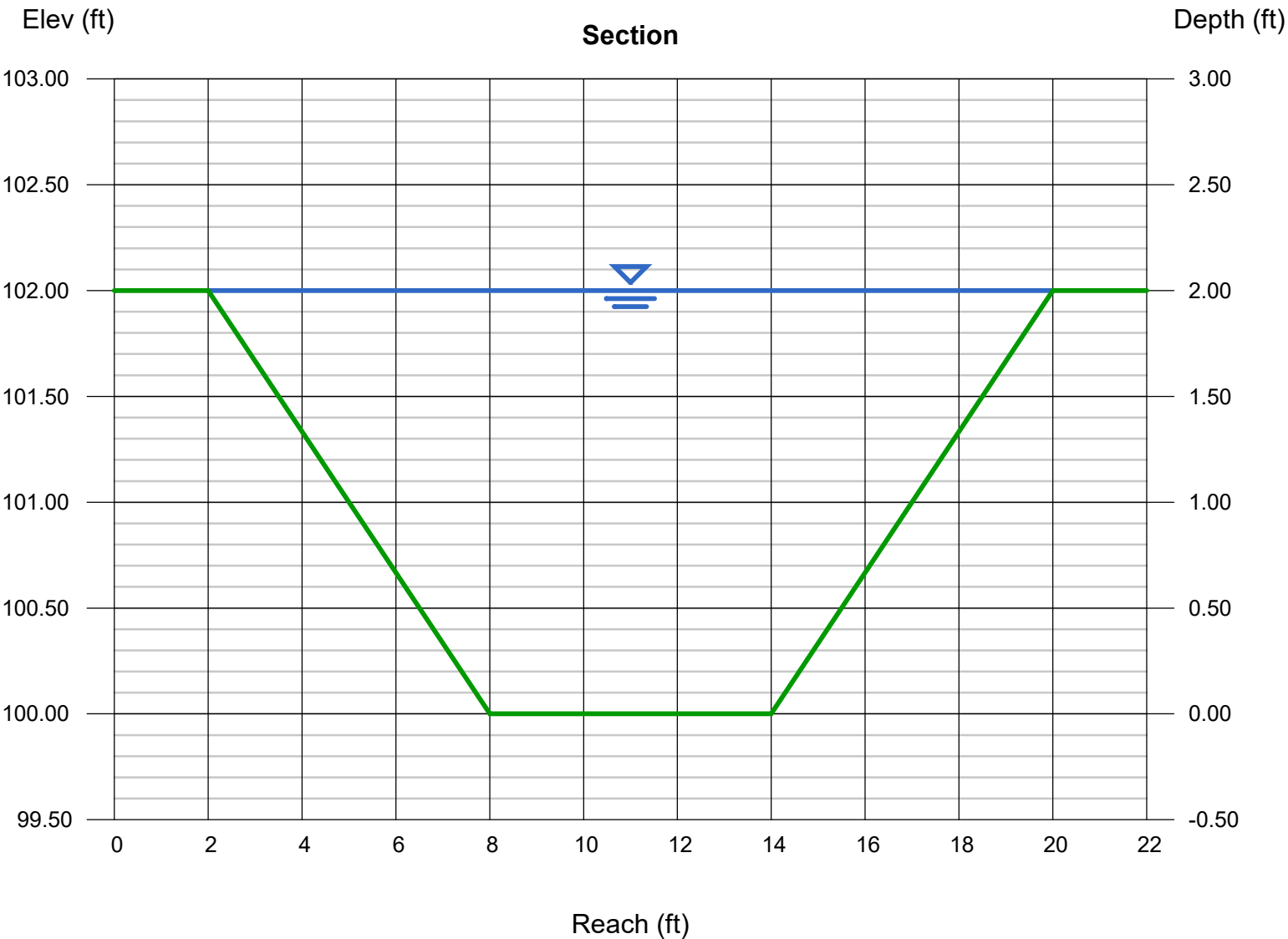
Trapezoidal		Highlighted	
Bottom Width (ft)	= 6.00	Depth (ft)	= 1.00
Side Slopes (z:1)	= 3.00, 3.00	Q (cfs)	= 24.10
Total Depth (ft)	= 2.00	Area (sqft)	= 9.00
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 2.68
Slope (%)	= 1.00	Wetted Perim (ft)	= 12.32
N-Value	= 0.045	Crit Depth, Yc (ft)	= 0.71
		Top Width (ft)	= 12.00
		EGL (ft)	= 1.11
Calculations			
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

El Caballo Park - EX Vegetated Channel Upstream - n=0.045 - 100% Full

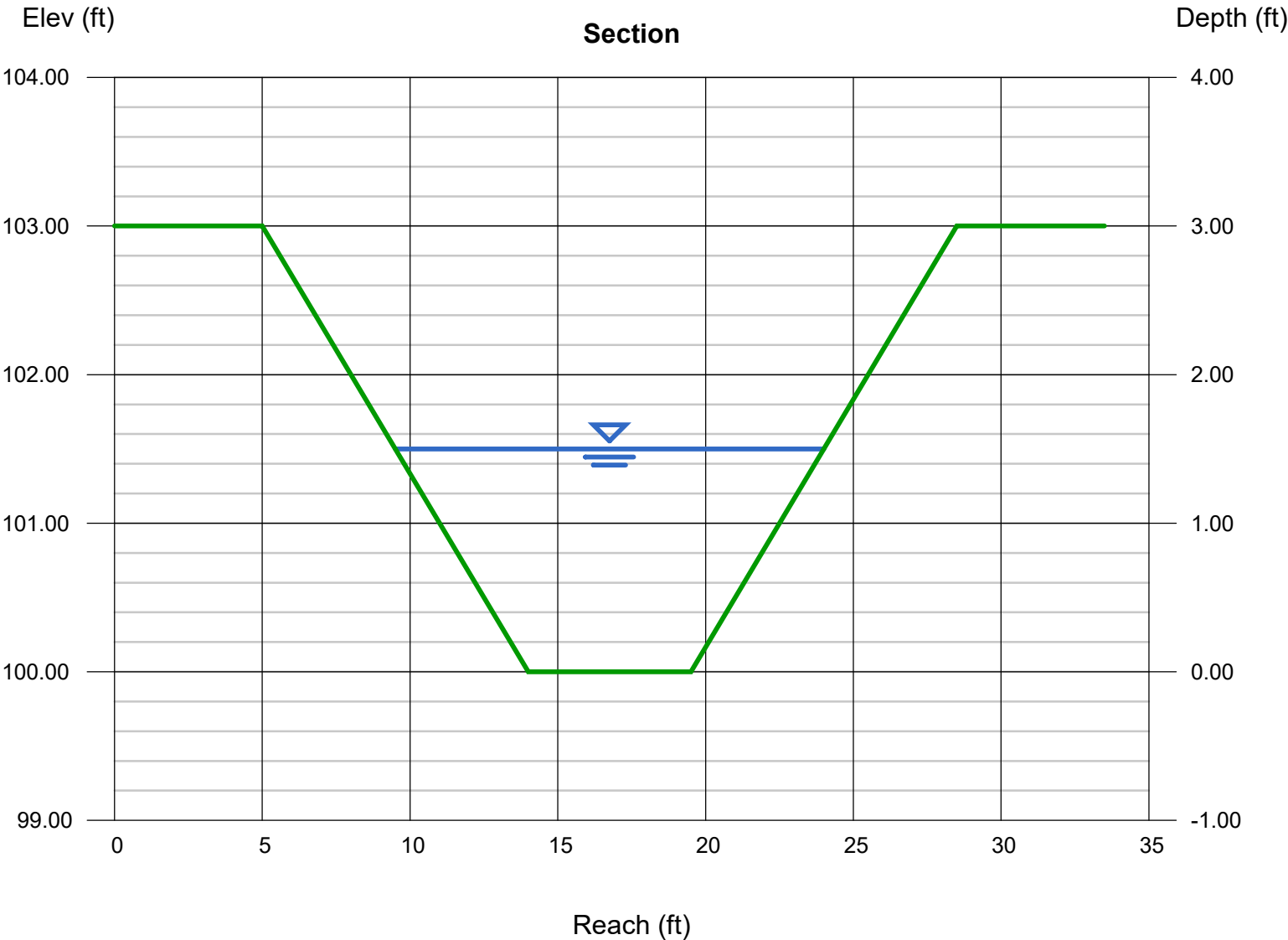
Trapezoidal		Highlighted	
Bottom Width (ft)	= 6.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 3.00, 3.00	Q (cfs)	= 93.78
Total Depth (ft)	= 2.00	Area (sqft)	= 24.00
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 3.91
Slope (%)	= 1.00	Wetted Perim (ft)	= 18.65
N-Value	= 0.045	Crit Depth, Yc (ft)	= 1.52
		Top Width (ft)	= 18.00
		EGL (ft)	= 2.24
Calculations			
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

El Caballo Park - EX Concrete Channel - n=0.014 - 1ft Freeboard

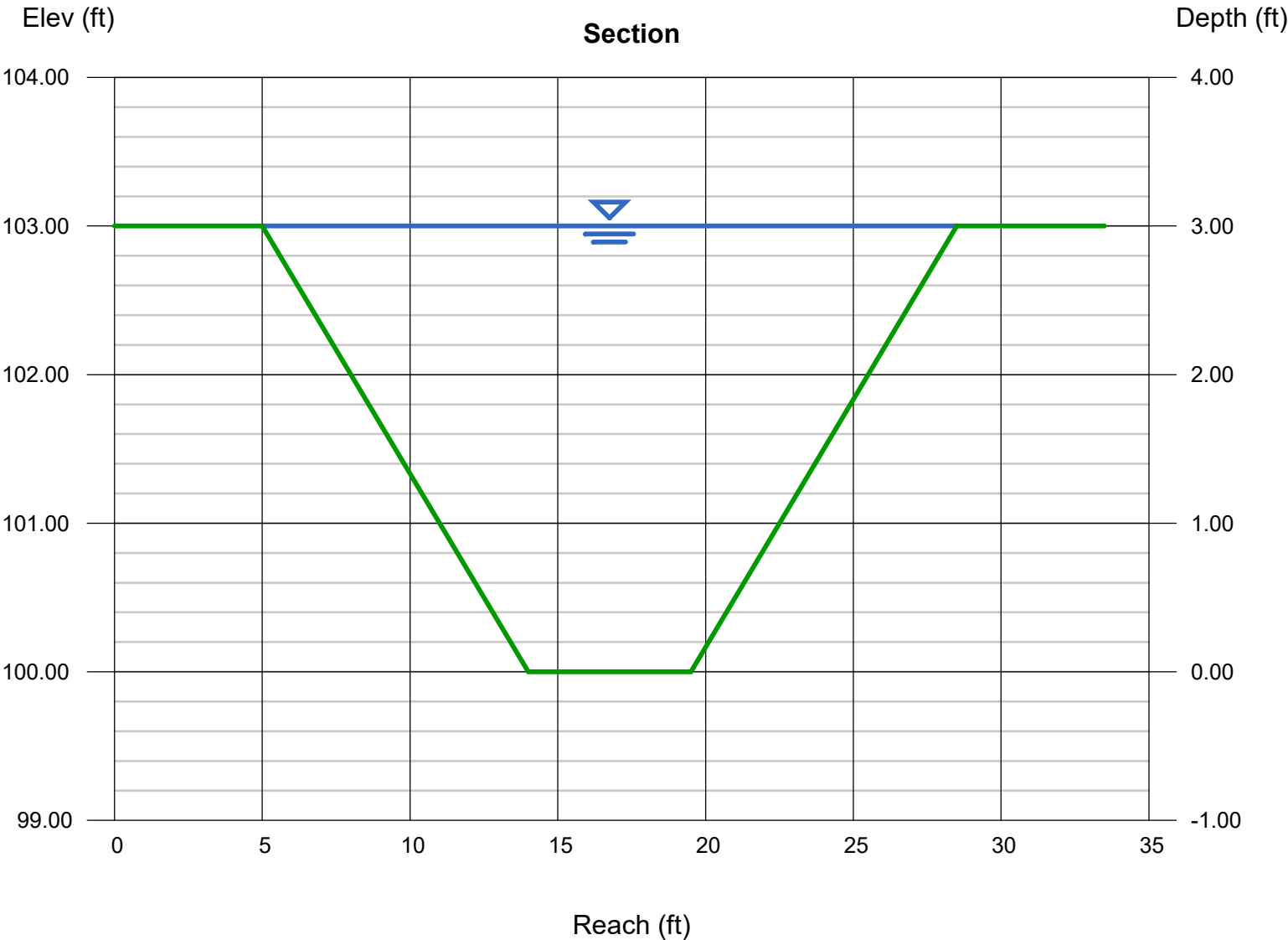
Trapezoidal		Highlighted	
Bottom Width (ft)	= 5.50	Depth (ft)	= 1.50
Side Slopes (z:1)	= 3.00, 3.00	Q (cfs)	= 159.31
Total Depth (ft)	= 3.00	Area (sqft)	= 15.00
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 10.62
Slope (%)	= 1.00	Wetted Perim (ft)	= 14.99
N-Value	= 0.014	Crit Depth, Yc (ft)	= 2.07
Calculations		Top Width (ft)	= 14.50
Compute by:	Q vs Depth	EGL (ft)	= 3.25
No. Increments	= 10		



Channel Report

El Caballo Park - EX Concrete Channel - n=0.014 - 100% Full

Trapezoidal		Highlighted	
Bottom Width (ft)	= 5.50	Depth (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00	Q (cfs)	= 677.63
Total Depth (ft)	= 3.00	Area (sqft)	= 43.50
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 15.58
Slope (%)	= 1.00	Wetted Perim (ft)	= 24.47
N-Value	= 0.014	Crit Depth, Yc (ft)	= 3.00
Calculations		Top Width (ft)	= 23.50
Compute by:	Q vs Depth	EGL (ft)	= 6.77
No. Increments	= 10		



Channel Report

El Caballo Park - EX Vegetated Channel Downstream - n=0.045 - 1ft Freeboard

Trapezoidal

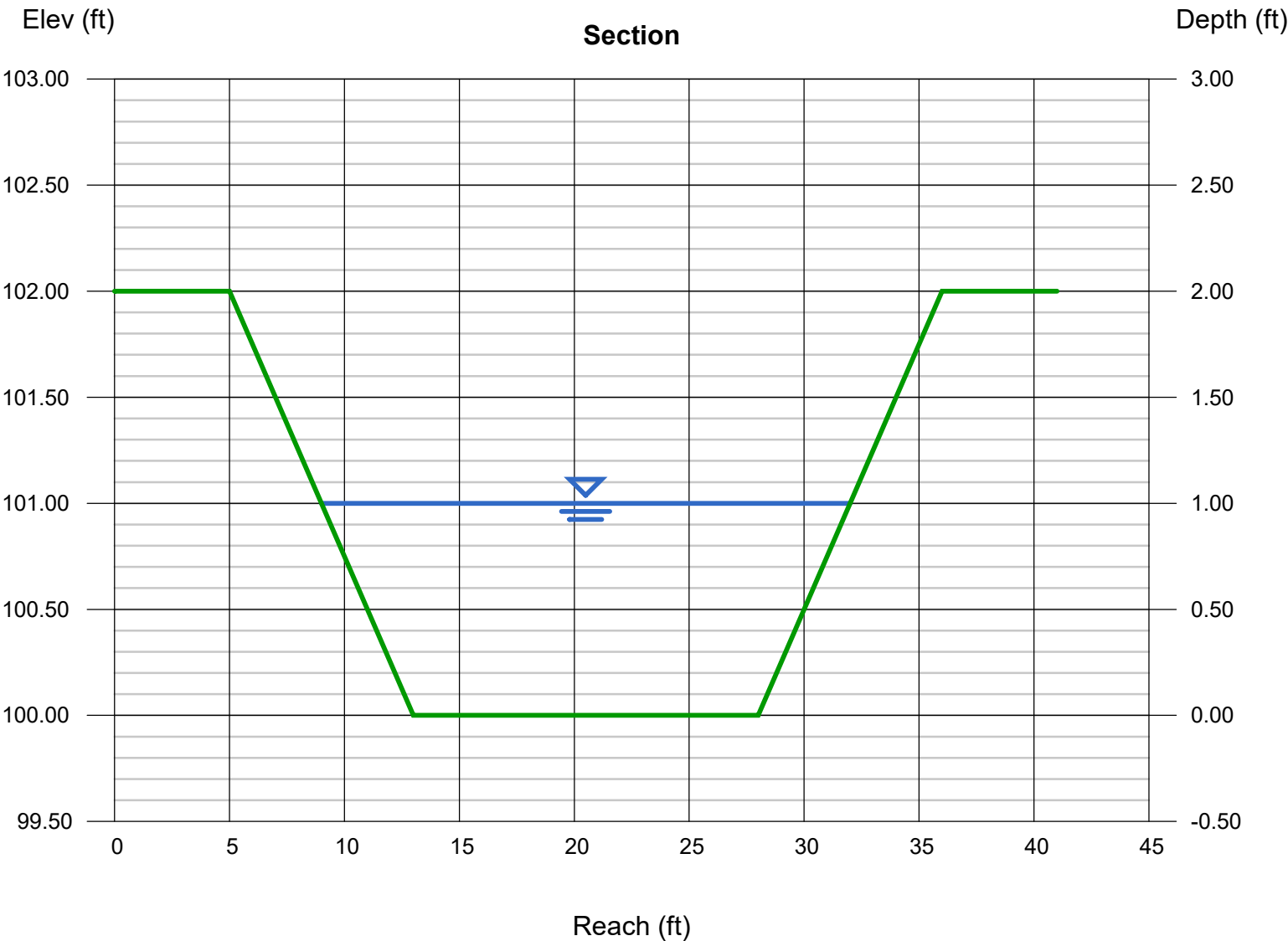
Bottom Width (ft)	= 15.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 1.00
N-Value	= 0.045

Highlighted

Depth (ft)	= 1.00
Q (cfs)	= 54.84
Area (sqft)	= 19.00
Velocity (ft/s)	= 2.89
Wetted Perim (ft)	= 23.25
Crit Depth, Yc (ft)	= 0.70
Top Width (ft)	= 23.00
EGL (ft)	= 1.13

Calculations

Compute by:	Q vs Depth
No. Increments	= 10



Channel Report

El Caballo Park - EX Vegetated Channel Downstream - n=0.045 - 100% Full

Trapezoidal

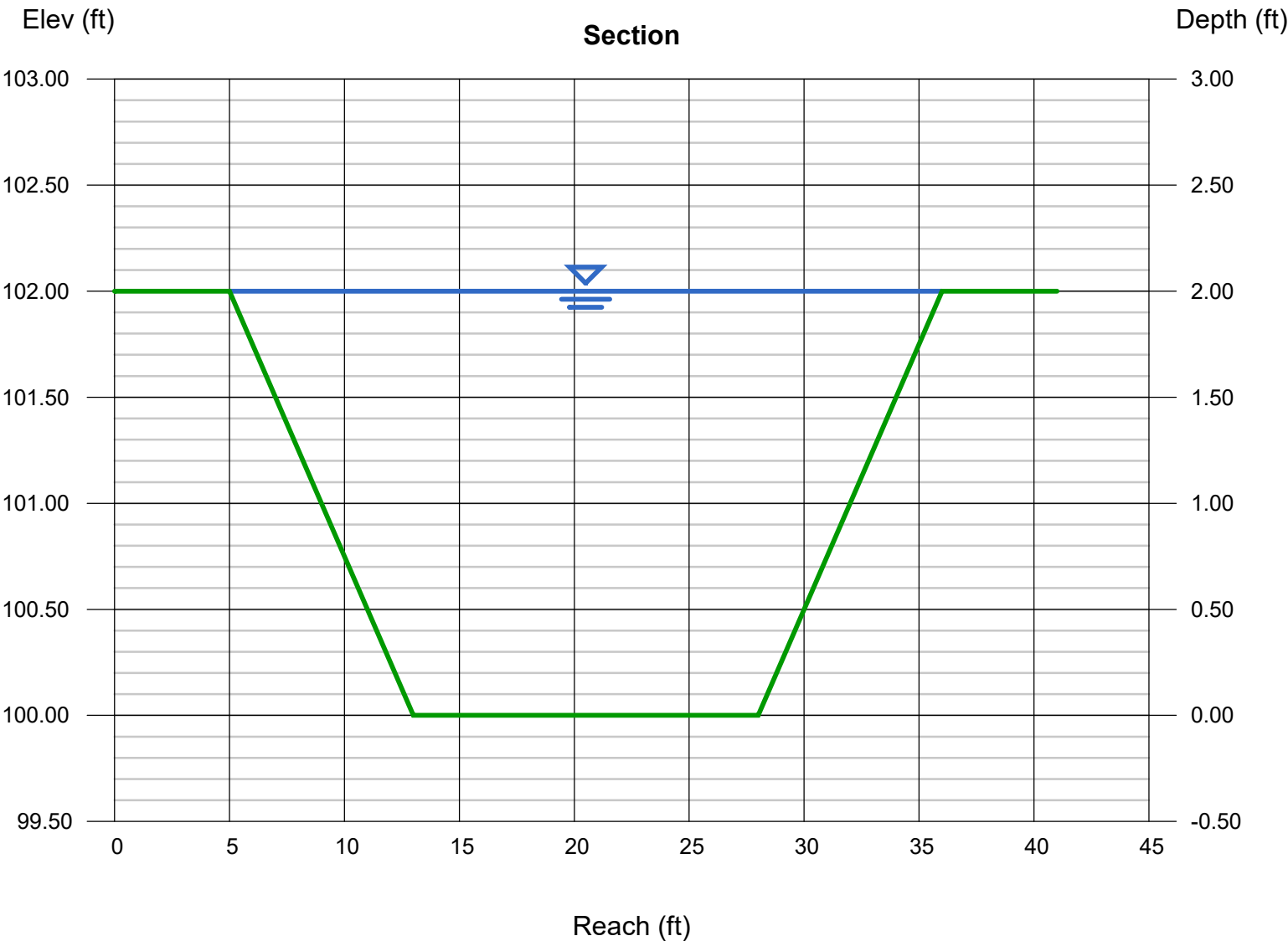
Bottom Width (ft)	= 15.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 1.00
N-Value	= 0.045

Highlighted

Depth (ft)	= 2.00
Q (cfs)	= 195.58
Area (sqft)	= 46.00
Velocity (ft/s)	= 4.25
Wetted Perim (ft)	= 31.49
Crit Depth, Yc (ft)	= 1.52
Top Width (ft)	= 31.00
EGL (ft)	= 2.28

Calculations

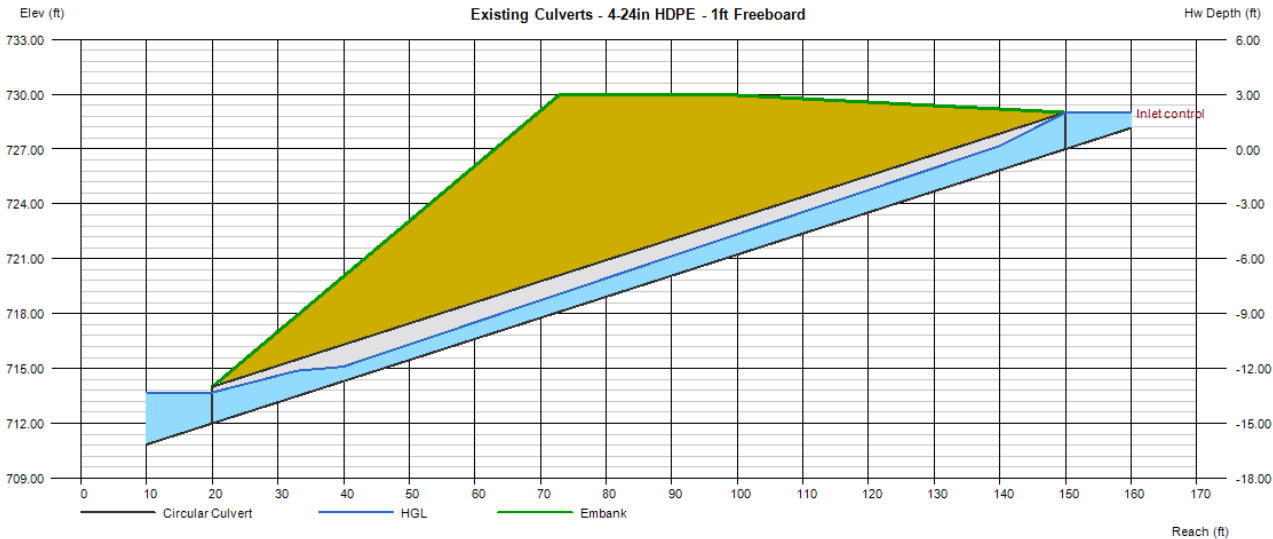
Compute by:	Q vs Depth
No. Increments	= 10



Culvert Report

Existing Culverts - 4-24in HDPE - 1ft Freeboard

Invert Elev Dn (ft)	= 712.00	Calculations	
Pipe Length (ft)	= 130.00	Qmin (cfs)	= 59.00
Slope (%)	= 11.54	Qmax (cfs)	= 59.00
Invert Elev Up (ft)	= 727.00	Tailwater Elev (ft)	= (dc+D)/2
Rise (in)	= 24.0		
Shape	= Circular	Highlighted	
Span (in)	= 24.0	Qtotal (cfs)	= 59.00
No. Barrels	= 4	Qpipe (cfs)	= 59.00
n-Value	= 0.012	Qovertop (cfs)	= 0.00
Culvert Type	= Circular Concrete	Veloc Dn (ft/s)	= 5.21
Culvert Entrance	= Groove end projecting (C)	Veloc Up (ft/s)	= 6.37
Coeff. K,M,c,Y,k	= 0.0045, 2, 0.0317, 0.69, 0.2	HGL Dn (ft)	= 713.69
		HGL Up (ft)	= 728.38
		Hw Elev (ft)	= 729.00
		Hw/D (ft)	= 1.00
		Flow Regime	= Inlet Control
Embankment			
Top Elevation (ft)	= 730.00		
Top Width (ft)	= 24.00		
Crest Width (ft)	= 30.00		



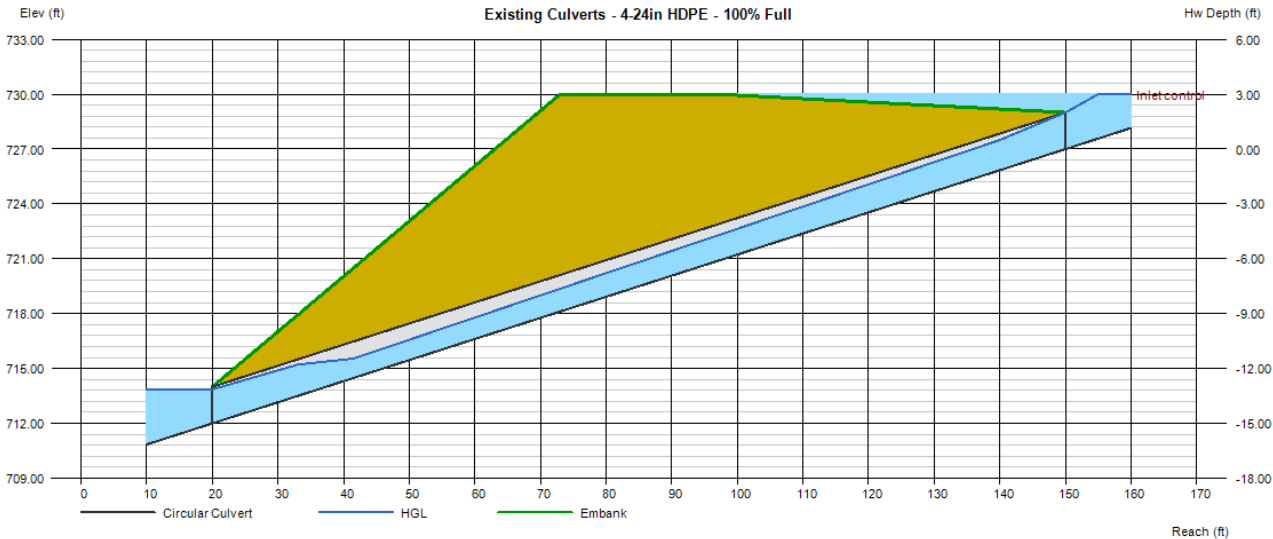
Culvert Report

Existing Culverts - 4-24in HDPE - 100% Full

Invert Elev Dn (ft)	=	712.00
Pipe Length (ft)	=	130.00
Slope (%)	=	11.54
Invert Elev Up (ft)	=	727.00
Rise (in)	=	24.0
Shape	=	Circular
Span (in)	=	24.0
No. Barrels	=	4
n-Value	=	0.012
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)	= 730.00
Top Width (ft)	= 24.00
Crest Width (ft)	= 30.00

Calculations	
Qmin (cfs)	= 93.00
Qmax (cfs)	= 93.00
Tailwater Elev (ft)	= (dc+D)/2
Highlighted	
Qtotal (cfs)	= 93.00
Qpipe (cfs)	= 93.00
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 7.65
Veloc Up (ft/s)	= 8.12
HGL Dn (ft)	= 713.86
HGL Up (ft)	= 728.71
Hw Elev (ft)	= 730.00
Hw/D (ft)	= 1.50
Flow Regime	= Inlet Control



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Aug 1 2024

El Caballo Park - PR Crossing - n=0.035 - 1ft Freeboard

Trapezoidal

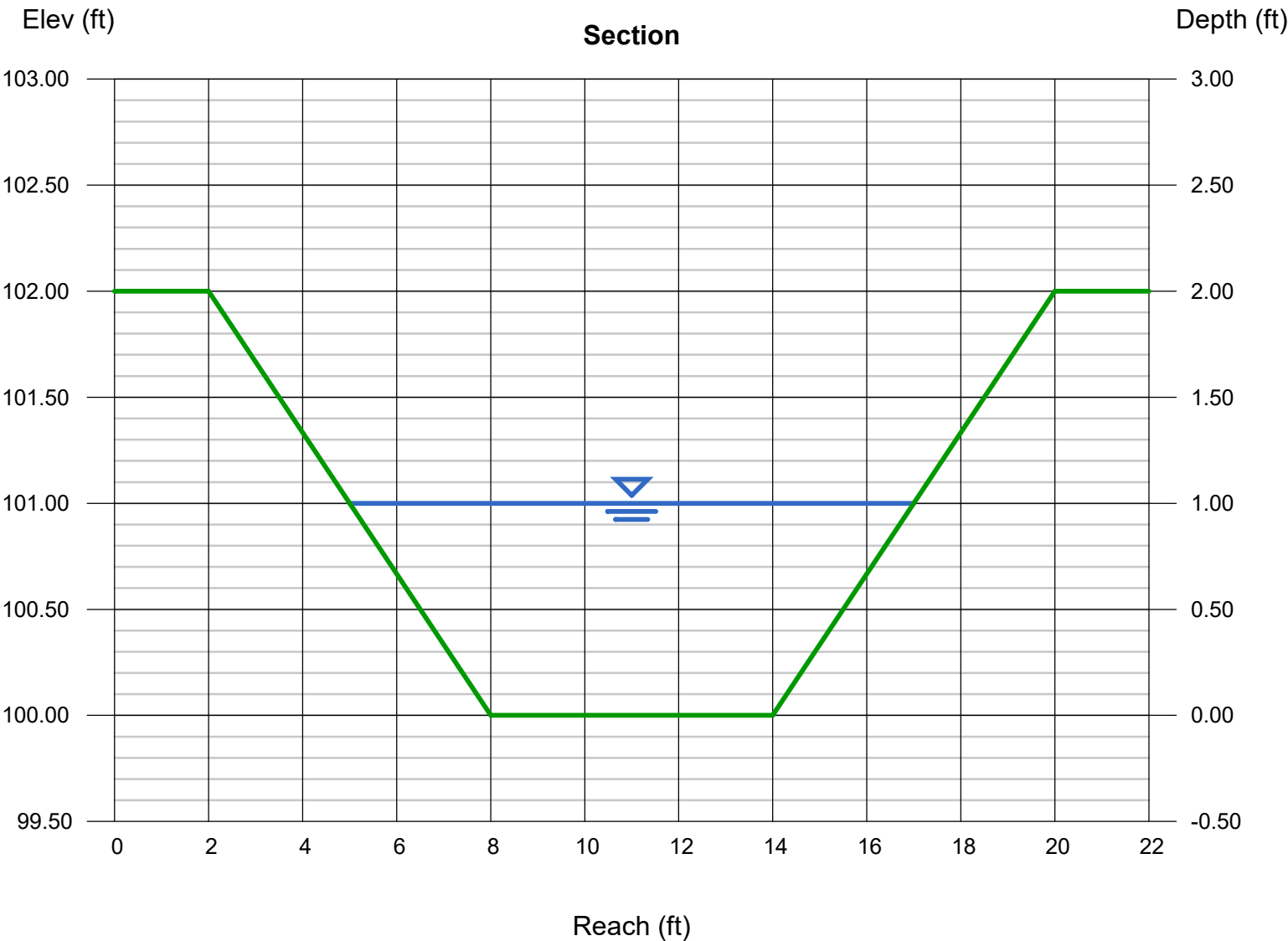
Bottom Width (ft)	= 6.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 1.00
N-Value	= 0.035

Highlighted

Depth (ft)	= 1.00
Q (cfs)	= 30.98
Area (sqft)	= 9.00
Velocity (ft/s)	= 3.44
Wetted Perim (ft)	= 12.32
Crit Depth, Yc (ft)	= 0.82
Top Width (ft)	= 12.00
EGL (ft)	= 1.18

Calculations

Compute by:	Q vs Depth
No. Increments	= 10



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Thursday, Aug 1 2024

El Caballo Park - PR Crossing - n=0.035 - 100% Full

Trapezoidal

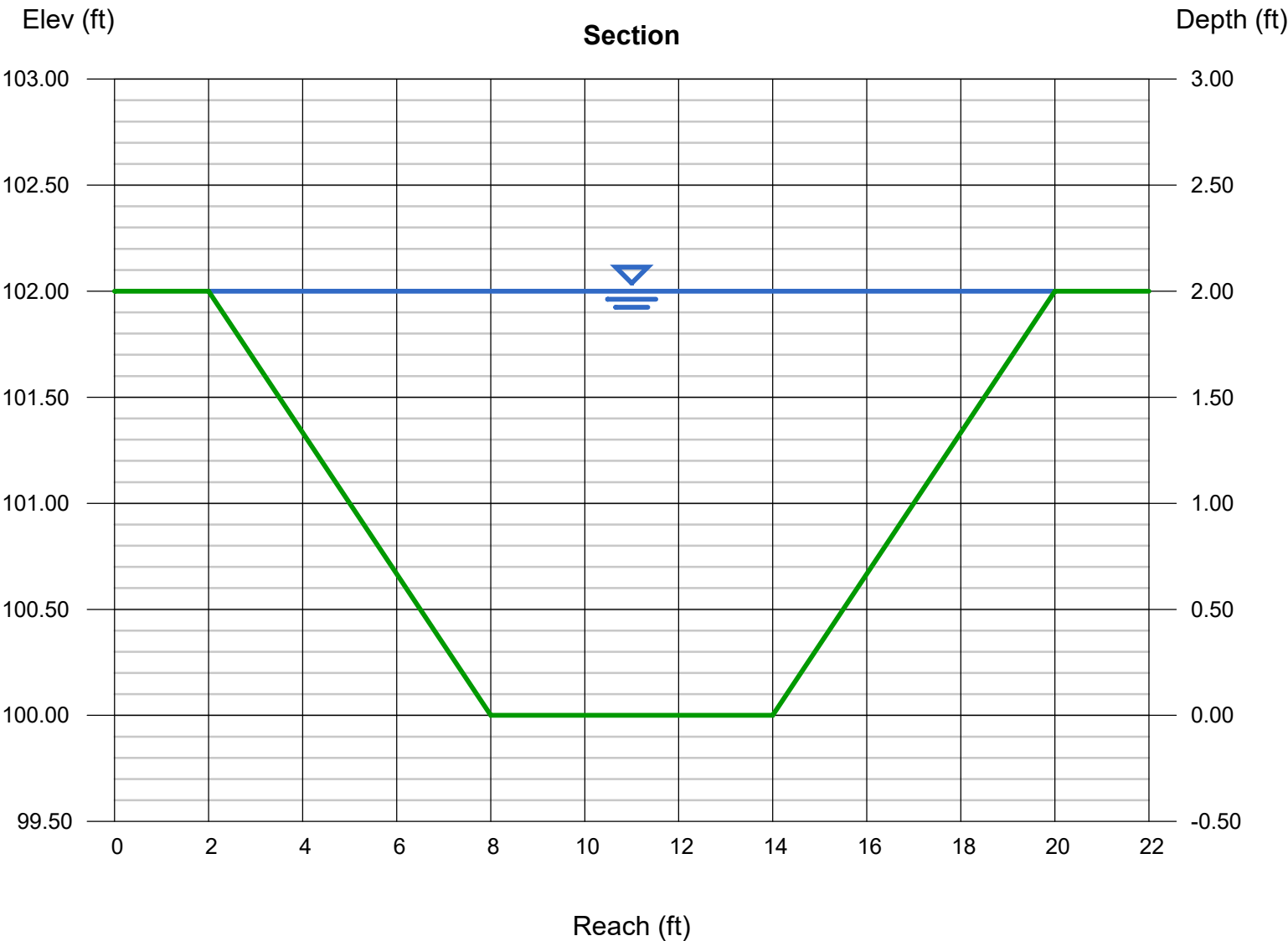
Bottom Width (ft)	= 6.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 1.00
N-Value	= 0.035

Highlighted

Depth (ft)	= 2.00
Q (cfs)	= 120.57
Area (sqft)	= 24.00
Velocity (ft/s)	= 5.02
Wetted Perim (ft)	= 18.65
Crit Depth, Yc (ft)	= 1.74
Top Width (ft)	= 18.00
EGL (ft)	= 2.39

Calculations

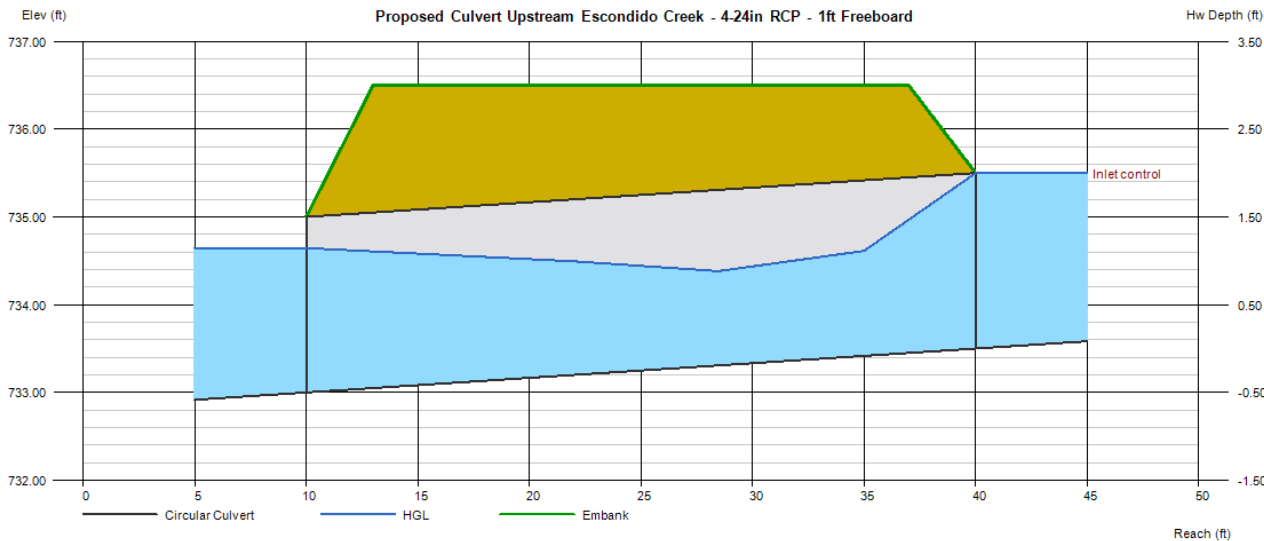
Compute by:	Q vs Depth
No. Increments	= 10



Culvert Report

Proposed Culvert Upstream Escondido Creek - 4-24in RCP - 1ft Freeboard

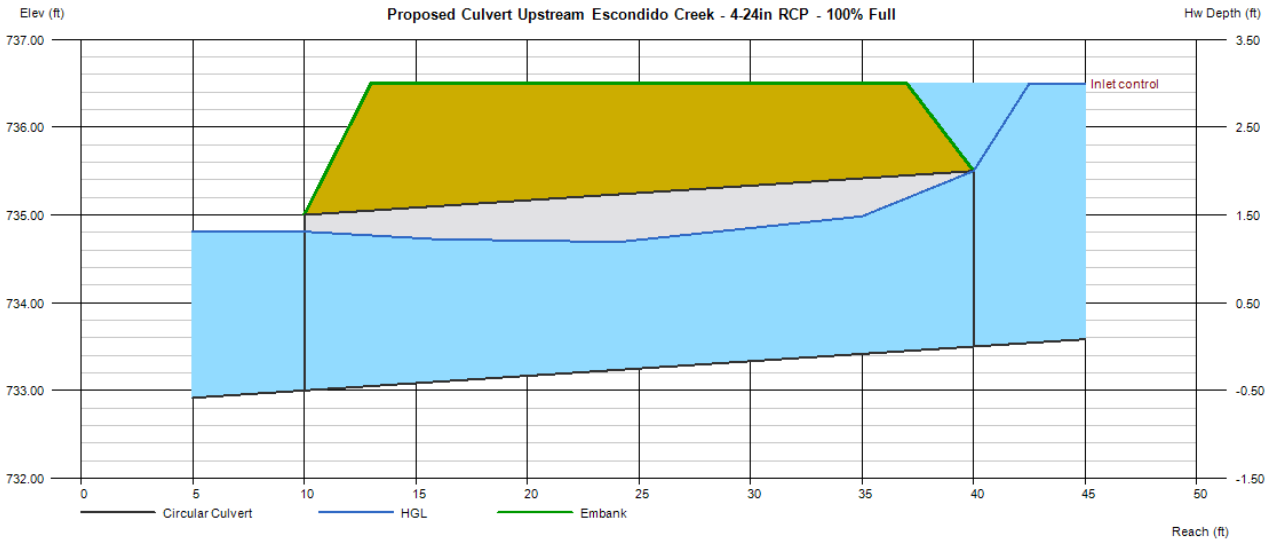
Invert Elev Dn (ft)	= 733.00	Calculations	
Pipe Length (ft)	= 30.00	Qmin (cfs)	= 51.50
Slope (%)	= 1.67	Qmax (cfs)	= 51.50
Invert Elev Up (ft)	= 733.50	Tailwater Elev (ft)	= (dc+D)/2
Rise (in)	= 24.0		
Shape	= Circular	Highlighted	
Span (in)	= 24.0	Qtotal (cfs)	= 51.50
No. Barrels	= 4	Qpipe (cfs)	= 51.50
n-Value	= 0.013	Qovertop (cfs)	= 0.00
Culvert Type	= Circular Concrete	Veloc Dn (ft/s)	= 4.66
Culvert Entrance	= Square edge w/headwall (C)	Veloc Up (ft/s)	= 6.01
Coeff. K,M,c,Y,k	= 0.0098, 2, 0.0398, 0.67, 0.5	HGL Dn (ft)	= 734.64
		HGL Up (ft)	= 734.79
Embankment		Hw Elev (ft)	= 735.50
Top Elevation (ft)	= 736.50	Hw/D (ft)	= 1.00
Top Width (ft)	= 24.00	Flow Regime	= Inlet Control
Crest Width (ft)	= 20.00		



Culvert Report

Proposed Culvert Upstream Escondido Creek - 4-24in RCP - 100% Full

Invert Elev Dn (ft)	= 733.00	Calculations	
Pipe Length (ft)	= 30.00	Qmin (cfs)	= 81.50
Slope (%)	= 1.67	Qmax (cfs)	= 81.50
Invert Elev Up (ft)	= 733.50	Tailwater Elev (ft)	= (dc+D)/2
Rise (in)	= 24.0		
Shape	= Circular	Highlighted	
Span (in)	= 24.0	Qtotal (cfs)	= 81.50
No. Barrels	= 4	Qpipe (cfs)	= 81.50
n-Value	= 0.013	Qovertop (cfs)	= 0.00
Culvert Type	= Circular Concrete	Veloc Dn (ft/s)	= 6.82
Culvert Entrance	= Square edge w/headwall (C)	Veloc Up (ft/s)	= 7.48
Coeff. K,M,c,Y,k	= 0.0098, 2, 0.0398, 0.67, 0.5	HGL Dn (ft)	= 734.81
		HGL Up (ft)	= 735.12
Embankment		Hw Elev (ft)	= 736.50
Top Elevation (ft)	= 736.50	Hw/D (ft)	= 1.50
Top Width (ft)	= 24.00	Flow Regime	= Inlet Control
Crest Width (ft)	= 20.00		



Channel Report

NODE 111 to 106 - 4 FT WIDE 1 FT DEEP V-DITCH

Triangular

Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 1.00

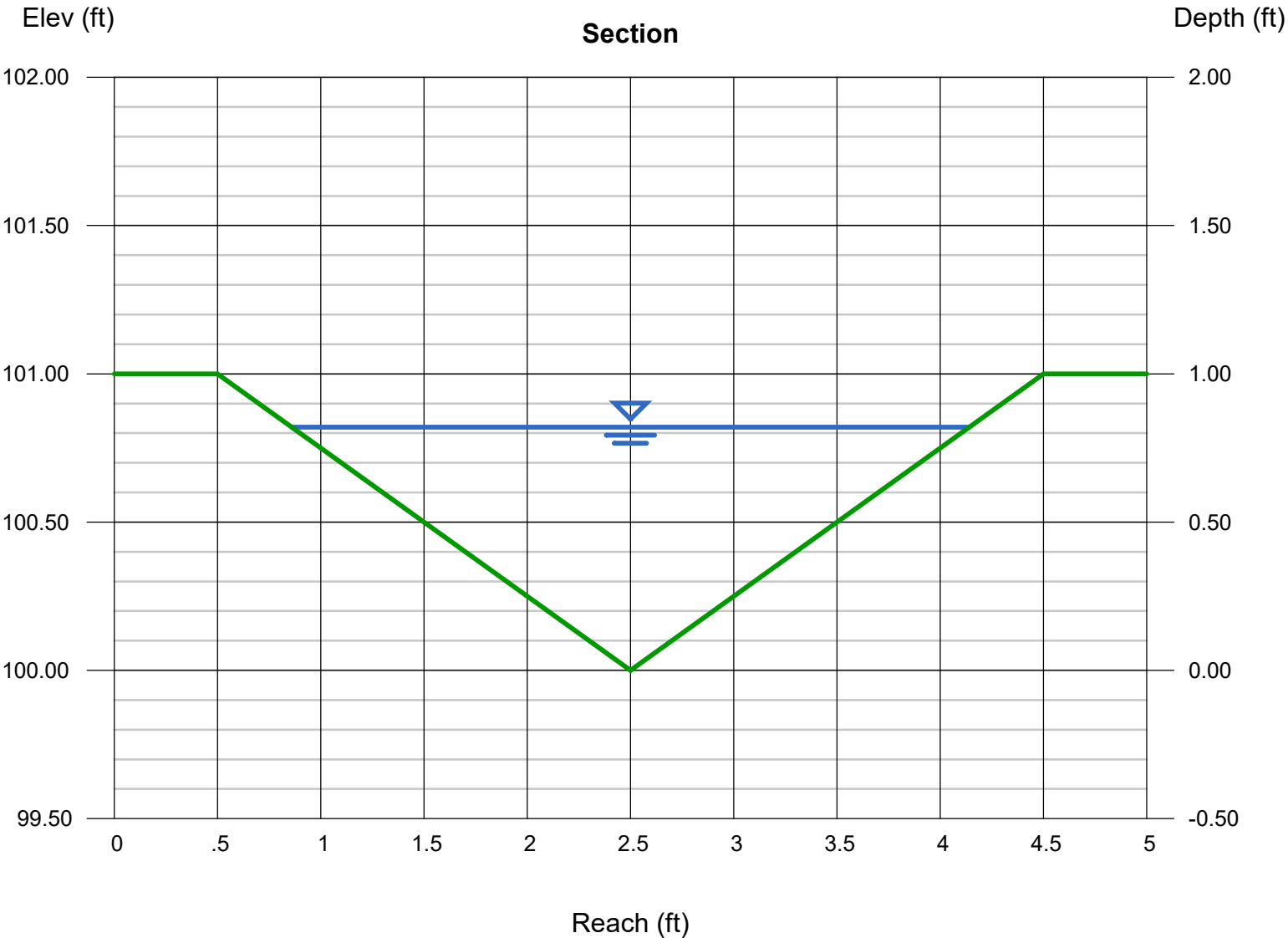
Invert Elev (ft) = 100.00
Slope (%) = 1.00
N-Value = 0.013

Calculations

Compute by: Known Q
Known Q (cfs) = 7.65

Highlighted

Depth (ft) = 0.82
Q (cfs) = 7.650
Area (sqft) = 1.34
Velocity (ft/s) = 5.69
Wetted Perim (ft) = 3.67
Crit Depth, Yc (ft) = 0.99
Top Width (ft) = 3.28
EGL (ft) = 1.32



Channel Report

NODE 113 to 108 - 4 FT WIDE 1 FT DEEP V-DITCH

Triangular

Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 1.00

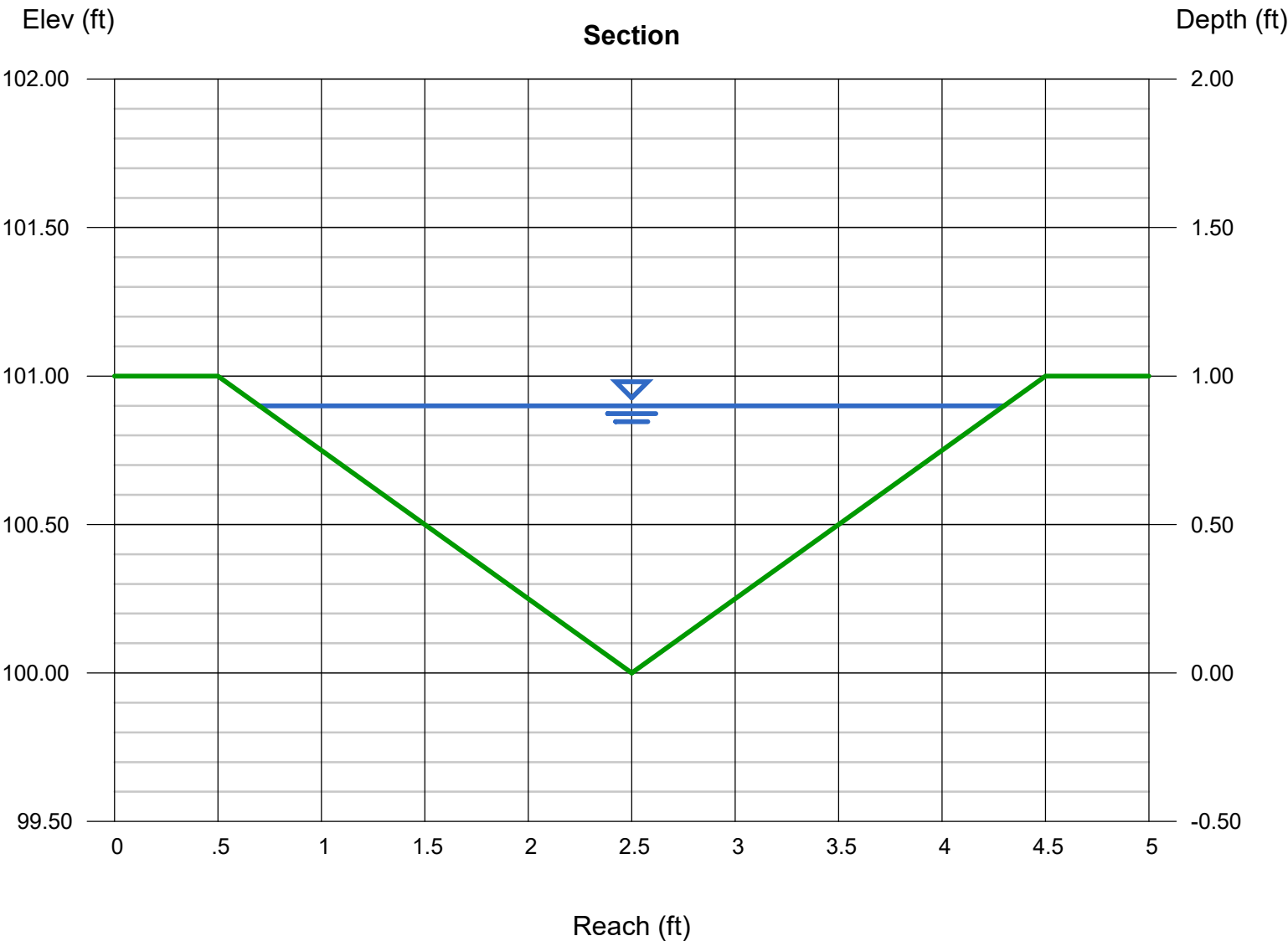
Invert Elev (ft) = 100.00
Slope (%) = 1.00
N-Value = 0.013

Calculations

Compute by: Known Q
Known Q (cfs) = 9.86

Highlighted

Depth (ft) = 0.90
Q (cfs) = 9.860
Area (sqft) = 1.62
Velocity (ft/s) = 6.09
Wetted Perim (ft) = 4.02
Crit Depth, Yc (ft) = 1.00
Top Width (ft) = 3.60
EGL (ft) = 1.48



Attachment 4

DMA Exhibit
WQ Calculations
HMP Calculations



LEGEND

DRAINAGE MANAGEMENT AREA BOUNDARY	
PROPERTY LINE	
POINT OF COMPLIANCE	
CHANNEL FLOW PATH	
CONCRETE SWALE	
PROPOSED SEMI PERVIOUS WALKWAYS	
PROPOSED IMPERVIOUS AREA	
SELF-MITIGATING AREA	
PROPOSED D.G.	

EL CABALLO PARK:

TOTAL: 731,000 SF/16.78 AC (100.0%)
PERVIOUS: 672,000 SF/15.43 AC (92%)
IMPERVIOUS: 59,000 SF/1.35 AC (8%)

- ASSUMPTIONS:
1. Water Quality and BMP sizing per City of Escondido Worksheet B-2 and B-5.
 2. HMP required if the channel will be changed from concrete to vegetated.
 3. Infiltration Basins (INF-1), Biofiltration Basins (BF-1), and Dispersion Area w/ Amended Soils (SD-D & SD-F) used to analyze Water Quality and Hydromodification options.

TABULAR SUMMARY OF DMA'S													
DMA ID	TOTAL AREA	IMP AREA	PERV AREA	TOTAL AREA	IMP AREA	PERV AREA	% IMP	C	DCV	DMP ID	DMP TYPE	SOIL TYPE	POC ID
-	(SF)	(SF)	(SF)	(AC)	(AC)	(AC)	-	-	(CF)	-	-	-	-
1	185,000	45,000	140,000	4.25	1.03	3.21	24.3%	0.29	3,264	BMP-1	See BMP Summary Tables	A	POC-1
2	67,000	1,500	65,500	1.54	0.03	1.50	2.2%				Self-Mitigating Area (Impervious Area < 5%)		
3	122,000	3,500	118,500	2.80	0.08	2.72	2.9%				Self-Mitigating Area (Impervious Area < 5%)		
4	154,000	4,000	150,000	3.54	0.09	3.44	2.6%				Self-Mitigating Area (Impervious Area < 5%)		
5	43,000	0	43,000	0.99	0.00	0.99	0.0%				Self-Mitigating Area (Impervious Area < 5%)		
6	160,000	5,000	155,000	3.67	0.11	3.56	3.1%				Self-Mitigating Area (Impervious Area < 5%)		
TOTAL	731,000	59,000	672,000	16.78	1.35	15.43	8.1%	0.16	3,264				

BIOFILTRATION BASIN SUMMARY TABLE													
BMP ID	WQ BOTTOM BMP AREA	HMP BOTTOM BMP AREA (W/ LINER)	HMP BOTTOM BMP AREA (NO LINER)*	FRFB BOARD	STORAGE DEPTH	PONDING DEPTH	MILL CH DEPTH	MFHA DEPTH	FILTER COURSE DEPTH	GRAVEL DEPTH*	UNDER DRAIN OFFSET*	TOTAL SECTION DEPTH	
-	(SF)	(SF)	(SF)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	
BMP-1	1,635	16,250	6,500	1.00	1.00	1.00	0.25	1.50	0.50	1.00	0.25	6.00	
*BASINS W/ NO LINER WILL NEED AN UNDERDRAIN OFFSET OF 1.5 FT TO MEET HMP. A THICKER GRAVEL LAYER IS REQUIRED TO ACCOUNT FOR THIS.													

INFILTRATION BASIN SUMMARY TABLE									
BMP ID	WQ BOTTOM BMP AREA	HMP BOTTOM BMP AREA	FREEBOARD	STORAGE DEPTH	WQ PONDING DEPTH	HMP PONDING DEPTH	WQ TOTAL DEPTH	HMP TOTAL DEPTH*	
-	(SF)	(SF)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	
BMP-1	3,264	5,050	1.00	1.00	1.00	3.00	3.00	4.00	
*HMP AND WATER QUALITY DEPTH CAN OVERLAP. STORAGE DEPTH AND HMP CAN OVERLAP. SEE CONJUNCTIVE USE REQUIREMENTS OUTLINED BY THE COUNTY OF SAN DIEGO.									

DISPERSION AREA & AMENDED SOIL SUMMARY TABLE								
BMP ID	TOTAL AREA	IMPERVIOUS DISPERSION AREA	AMENDED SOIL AREA	C	DISPERSION RATIO*	AMENDED SOIL DEPTH	VOLUME RETENTION REQUIRED	VOLUME RETENTION PROVIDED
-	(SF)	(SF)	(SF)	-	-	(IN)	(CF)	(CF)
BMP-1	185,000	45,000	45,000	0.25	1.00	12	3,264	3,264
*MAXIMUM IMPERVIOUS TO PERVIOUS RATIO OF 1:1 & MINIMUM 11" OF AMENDED SOILS TO MEET STORM WATER POLLUTANT TREATMENT AND FLOW CONTROL REQUIREMENTS PER FACT SHEET SD-B.								



EL CABALLO PARK
DMA & HMP EXHIBIT

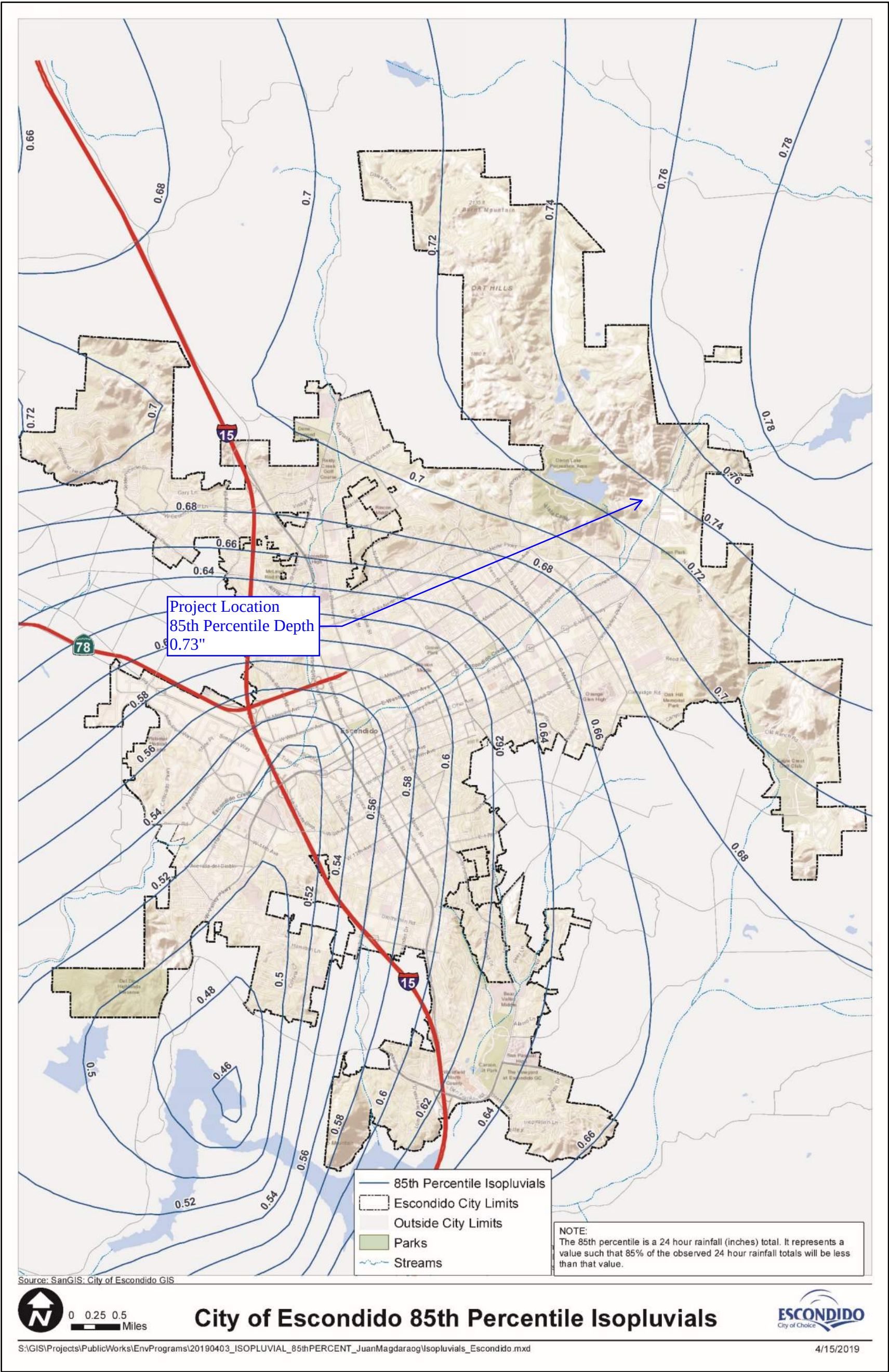


Figure B.1-1: City of Escondido 85th Percentile 24-hour Isopluvial Map

Table B.1-1: Runoff factors for surfaces draining to BMPs – Pollutant Control BMPs

Surface	Runoff Factor
Roofs ¹	0.90
Concrete or Asphalt ¹	0.90
Unit Pavers (grouted) ¹	0.90
Decomposed Granite	0.30
Cobbles or Crushed Aggregate	0.30
Amended, Mulched Soils or Landscape	0.10
Compacted Soil (e.g., unpaved parking)	0.30
Natural (A Soil)	0.10
Natural (B Soil)	0.14
Natural (C Soil)	0.23
Natural (D Soil)	0.30

¹Surface is considered impervious and could benefit from use of Site Design BMPs and adjustment of the runoff factor per Section B.2.1.

DMA-1

Surface Type	Runoff Factor	Surface Area (sf)	Surface Area (ac)	Factored Area (ac)
Roofs/Pavements	0.9	45,000	1.03	0.93
Unit Pavers (Grouted)	0.9		0	0
Decomposed Granite	0.3		0	0
Cobbles or Crushed Aggregate	0.3		0	0
Amended, Mulched Soils or Landscape	0.1	140,000	3.21	0.321
Compacted Soils	0.3		0	0

Total Factored Area	1.25
Total Area	4.25
% Imp	24.32
Factored 'C' Value	0.29
DMA Type	Drains to BMP

DCV

Design Capture Volume		Worksheet B2.1		
1	85th Percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Areas tributary to BMP(s)	A=	4.25	acres
3	Area weighted runoff factor (estimated using Appendix B.1.1 and B.2.1)	C=	0.29	unitless
4	Street Trees Reduction Volume	TCV=	0	cubic-feet
5	Rain Barrels Reduction Volume	RCV=	0	cubic-feet
6	Calculate DCV = (C x d x A) - TCV - RCV	DCV=	3,264	cubic-feet

		Project Name	El Caballo Park	
		BMP ID	BMP-1	
Sizing Method for Pollutant Removal Criteria			Worksheet B.5-1	
1	Area draining to the BMP	185,000	sq. ft.	
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.29		
3	85 th percentile 24-hour rainfall depth	0.73	inches	
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	3315	cu. ft.	
BMP Parameters				
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches	
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches	
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches	
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches	
9	Freely drained pore storage of the media	0.2	in/in	
10	Porosity of aggregate storage	0.4	in/in	
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.	
Baseline Calculations				
12	Allowable routing time for sizing	6	hours	
13	Depth filtered during storm [Line 11 x Line 12]	30	inches	
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	22.8	inches	
15	Total Depth Treated [Line 13 + Line 14]	52.8	inches	
Option 1 – Biofilter 1.5 times the DCV				
16	Required biofiltered volume [1.5 x Line 4]	4973	cu. ft.	
17	Required Footprint [Line 16/ Line 15] x 12	1130	sq. ft.	
Option 2 - Store 0.75 of remaining DCV in pores and ponding				
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	2487	cu. ft.	
19	Required Footprint [Line 18/ Line 14] x 12	1309	sq. ft.	
Footprint of the BMP				
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03		
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	1635	sq. ft.	
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	1635	sq. ft.	
23	Provided BMP Footprint	1635	sq. ft.	
24	Is Line 23 ≥ Line 22?	Yes, Performance Standard is Met		

BMP Sizing Spreadsheet V3.1

Project Name:	El Caballo Park
Project Applicant:	Michael Baker International
Jurisdiction:	City of Escondido
Parcel (APN):	225-141-40-00
Hydrologic Unit:	Carlsbad 904.62
Rain Gauge:	Lake Wohlford
Total Project Area (sf):	731,000
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1			
Project Name:	El Cabello Park	Hydrologic Unit:	Carlsbad 904.62
Project Applicant:	Michael Baker International	Rain Gauge:	Lake Wohlford
Jurisdiction:	City of Escondido	Total Project Area:	731,000
Parcel (APN):	225-141-40-00	Low Flow Threshold:	0.1Q2
BMP Name:	BMP-1	BMP Type:	Infiltration Facilities
BMP Native Soil Type:	A	BMP Infiltration Rate (in/hr):	0.5

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1) ¹	Surface Area	Surface Area (SF)
DMA 1 IMPERVIOUS	45,000	A	Moderate	Concrete	1.00	0.085	3825
DMA 1 PERVIOUS	140,000	A	Moderate	Landscape	0.1	0.085	1190
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	185,000						
						Minimum BMP Size	5015
						Proposed BMP Size*	5050
						Surface Ponding Depth	36.00 in

* Assumes standard configuration

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manual.

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head. Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, May 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.1			
Project Name:	El Caballo Park	Hydrologic Unit:	Carlsbad 904.62
Project Applicant:	Michael Baker International	Rain Gauge:	Lake Wohlford
Jurisdiction:	City of Escondido	Total Project Area:	731,000
Parcel (APN):	225-141-40-00	Low Flow Threshold:	0.1Q2
BMP Name	BMP-1	BMP Type:	Infiltration Facilities

[illegible]

No Orifice Required for Infiltration Facilities

N/A	N/A	N/A	N/A
Max Orifice Head (feet)	Max Tot. Allowable Orifice Flow (cfs)	Max Tot. Allowable Orifice Area (in ²)	Max Orifice Diameter (in)

N/A	N/A	0.00	
Average outflow during surface drawdown	Max Orifice Outflow	Actual Orifice Area	Selected Orifice Diameter
(cfs)	(cfs)	(in ²)	(in)

Drawdown (Hrs)	72.0
----------------	------

BMP Sizing Spreadsheet V3.1			
Project Name:	El Caballo Park	Hydrologic Unit:	Carlsbad 904.62
Project Applicant:	Michael Baker International	Rain Gauge:	Lake Wohlford
Jurisdiction:	City of Escondido	Total Project Area:	731,000
Parcel (APN):	225-141-40-00	Low Flow Threshold:	0.1Q2
BMP Name:	BMP-1	BMP Type:	Biofiltration
BMP Native Soil Type:	N/A - Impervious Liner	BMP Infiltration Rate (in/hr):	N/A

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1) ¹	Surface Area	Surface Area (SF)
DMA 1 IMPERVIOUS	45,000	A	Moderate	Concrete	1.00	0.275	12375
DMA 1 PERVIOUS	140,000	A	Moderate	Landscape	0.1	0.275	3850
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	185,000					Minimum BMP Size	16225

Surface Ponding Depth	12.00	in
Bioretention Soil Media Depth	18.00	in
Filter Coarse	6.00	in
Gravel Storage Layer Depth	12	in
Underdrain Offset	3.0	in

* Assumes standard configuration

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manual.

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.

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This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, May 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.1			
Project Name:	El Caballo Park	Hydrologic Unit:	Carlsbad 904.62
Project Applicant:	Michael Baker International	Rain Gauge:	Lake Wohlford
Jurisdiction:	City of Escondido	Total Project Area:	731,000
Parcel (APN):	225-141-40-00	Low Flow Threshold:	0.1Q2
BMP Name	BMP-1	BMP Type:	Biofiltration

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q ₂ (cfs)	Orifice Area (in ²)
		Soil Type	Slope				
DMA 1 IMPERVIOUS	Lake Wohlford	A	Moderate	0.275	1.033	0.028	0.40
DMA 1 PERVIOUS	Lake Wohlford	A	Moderate	0.275	3.214	0.088	1.26

3.75	0.117	1.66	1.46
Max Orifice Head (feet)	Max Tot. Allowable Orifice Flow (cfs)	Max Tot. Allowable Orifice Area (in ²)	Max Orifice Diameter (in)

0.112	0.121	1.72	1.48
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in ²)	Selected Orifice Diameter (in)

Drawdown (Hrs)	40.2
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BMP Sizing Spreadsheet V3.1			
Project Name:	El Cabello Park	Hydrologic Unit:	Carlsbad 904.62
Project Applicant:	Michael Baker International	Rain Gauge:	Lake Wohlford
Jurisdiction:	City of Escondido	Total Project Area:	731,000
Parcel (APN):	225-141-40-00	Low Flow Threshold:	0.1Q2
BMP Name:	BMP-1	BMP Type:	Biofiltration w/ Partial Retention
BMP Native Soil Type:	A	BMP Infiltration Rate (in/hr):	0.3

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1) ¹	Surface Area	Surface Area (SF)
DMA 1 IMPERVIOUS	45,000	A	Moderate	Concrete	1.00	0.11	4950
DMA 1 PERVIOUS	140,000	A	Moderate	Landscape	0.1	0.11	1540
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	185,000						
						Minimum BMP Size	6490
						Proposed BMP Size*	6500

* Assumes standard configuration

Surface Ponding Depth	12.00	in
Bioretention Soil Media Depth	18.00	in
Filter Course	6.00	in
Gravel Storage Layer Depth	18	in
Underdrain Offset	18.0	in

*Use Upturned Elbow

Notes:
 1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manual.

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

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BMP Sizing Spreadsheet V3.1			
Project Name:	El Caballo Park	Hydrologic Unit:	Carlsbad 904.62
Project Applicant:	Michael Baker International	Rain Gauge:	Lake Wohlford
Jurisdiction:	City of Escondido	Total Project Area:	731,000
Parcel (APN):	225-141-40-00	Low Flow Threshold:	0.1Q2
BMP Name	BMP-1	BMP Type:	Biofiltration w/ Partial Retention

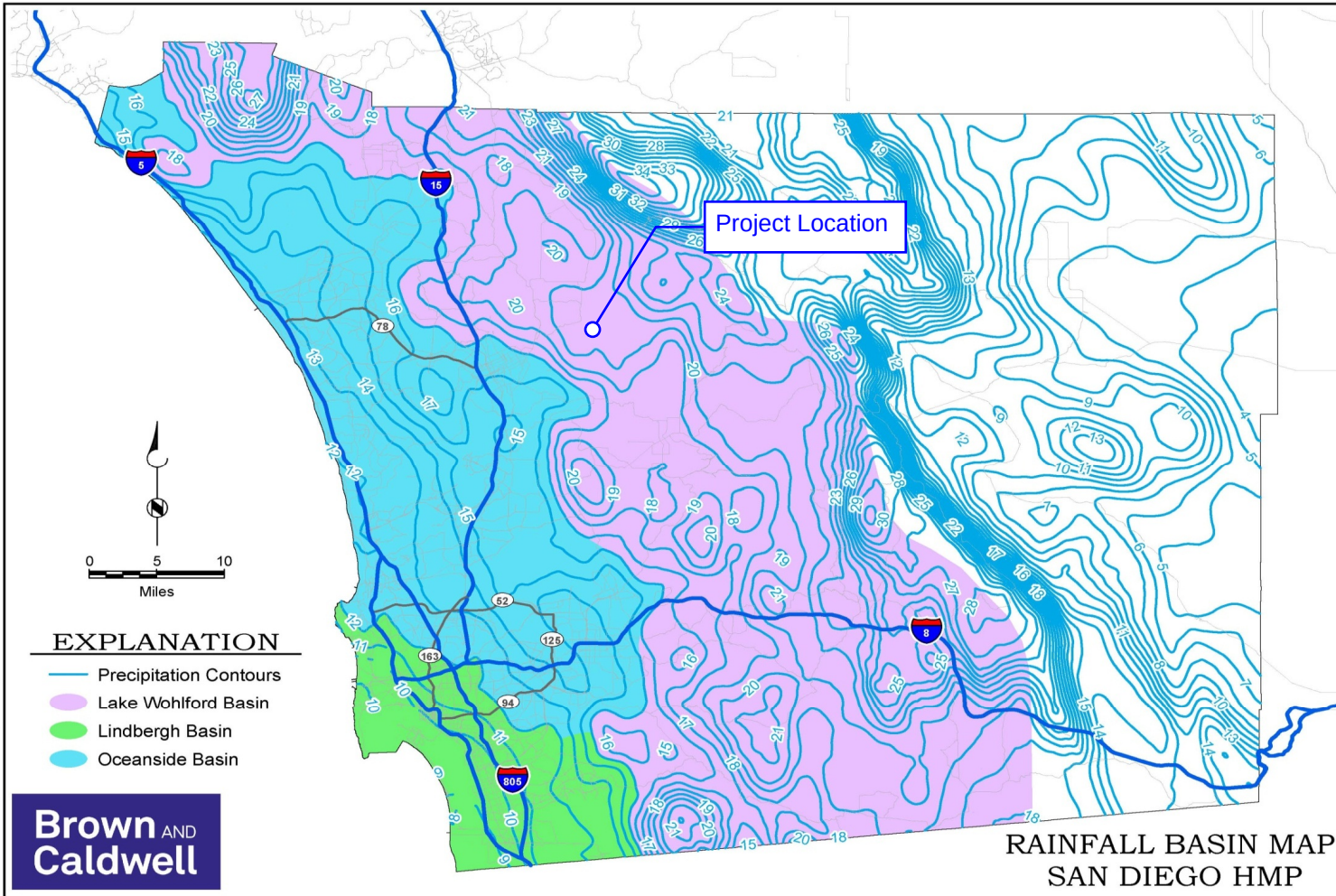
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3.00	0.117	1.86	1.54
Max Orifice Head	Max Tot. Allowable	Max Tot. Allowable	Max Orifice
(feet)	Orifice Flow	Orifice Area	Diameter
	(cfs)	(in²)	(in)

0.109	0.120	1.91	1.56
Average outflow during surface drawdown	Max Orifice Outflow	Actual Orifice Area	Selected Orifice Diameter
(cfs)	(cfs)	(in ²)	(in)

Drawdown (Hrs)	16.5
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File Name: P:\Projects\San Diego County\139942 - HMP Implementation Assistance\GIS\HMF GIS\Basins.mxd



Attachment 5

Escondido Creek Hydraulic Analyses

Escondido Creek - Potential Modification

The existing Escondido Creek, running along the east side of the park, is lined with concrete and has a concrete bottom. The master plan proposes to modify the creek, beginning at the north end of the concrete channel by removing the concrete sides and a portion of the concrete bottom replacing the concrete with vegetation as shown in the drawing to the right.

With the addition of trees and grasses, the creek will create a stronger visual connection between the Mayflower Dog Park and El Caballo Park and promote natural solutions to stormwater drainage.

An 8' wide concrete path is proposed to facilitate ongoing maintenance access.

Careful hydrologic flow analysis must be conducted prior to developing any details for this work. Drawings in this report depicting such modifications are conceptual only and not based on detailed studies.

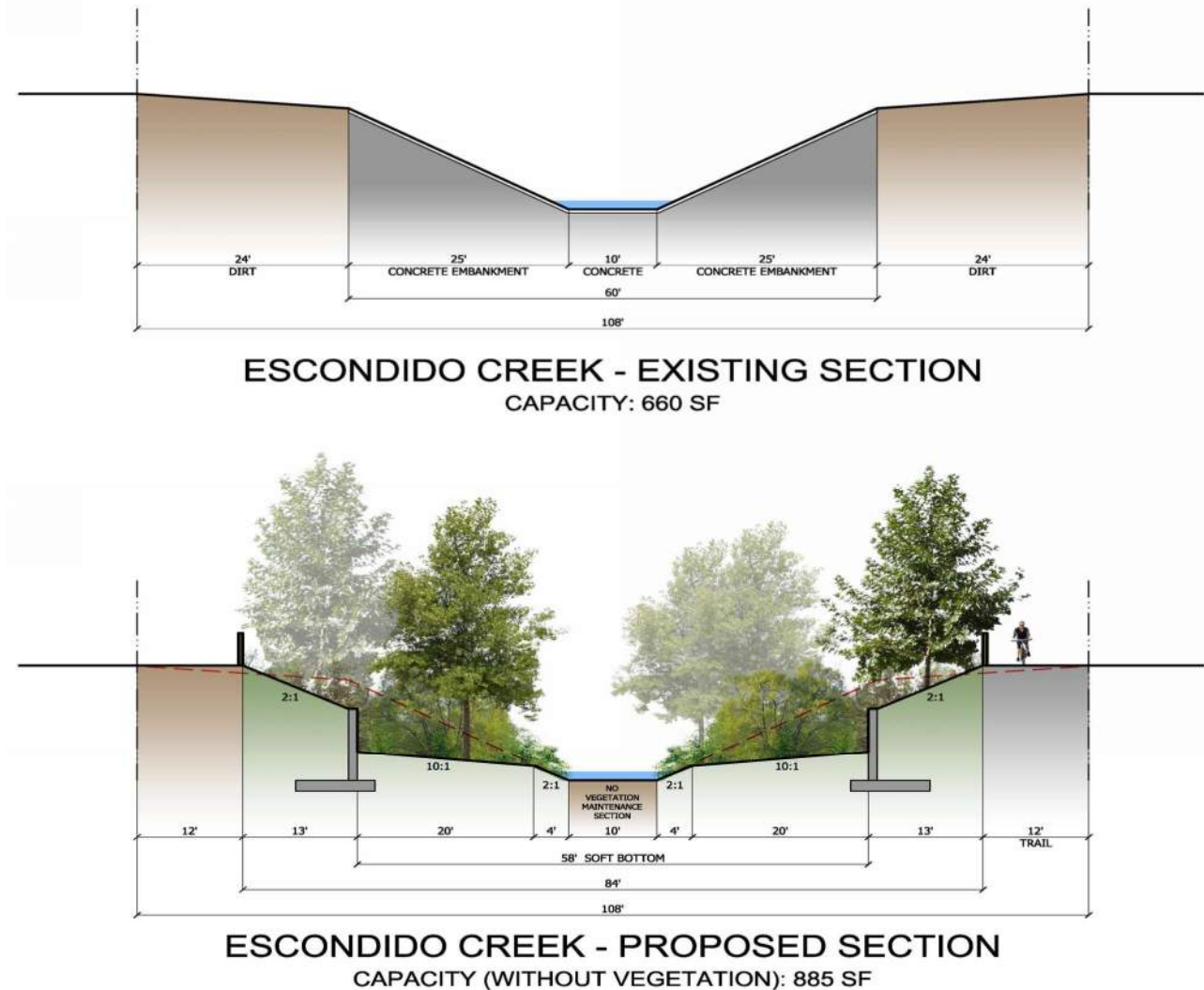


Figure 67: Escondido Creek Potential Modification

Project Name: El Caballo Park
MBI Project Number: 201617
Escondido Creek - Cross Sections & Capacity

EX Concrete Channel	
X	Y
0	730
24	728
49	716
59	716
84	728
108	730

PR Vegetated Channel	
X	Y
0	730
12	730
24	724
25	724
25	720
45	718
49	716
59	716
63	718
83	720
83	724
84	724
96	730
108	730

Flow Capacity	Capacity in the Channel (cfs)					
	EX Concrete Channel (n=0.014)	PR Vegetated Channel (n=0.035)	PR Vegetated Channel (n=0.040)	PR Vegetated Channel (n=0.050)	PR Vegetated Channel (n=0.060)	PR Vegetated Channel (n=0.150) ⁽¹⁾
25%	2,441	2,068	1,809	1,447	1,206	482
50%	4,881	4,135	3,618	2,894	2,412	964
75%	7,322	6,203	5,427	4,341	3,617	1,446
1' FB ⁽²⁾	8,004	7,073	6,188	4,950	4,125	1,649
100%	9,762	8,270	7,236	5,788	4,823	1,928

1. n=0.150, maximum Manning roughness coefficient expected during the lifetime of the channel per section 5.3.7 of the County of San Diego Hydraulic Manual (September 2014)
2. One (1) foot minimum freeboard for open channel facilities conveying a design flow of 10 cfs or more per Section 5.3.7 of the County of San Diego Hydraulic Manual (September 2014)

Channel ID	Q2	Q2 Capacity	Q10	Q10 Capacity	Q25	Q25 Capacity	Q50	Q50 Capacity	Q100	Q100 Capacity
EX Concrete Channel (n=0.014)	2,697 (2)	28%	3,997 (2)	41%	4,843 (2)	50%	5,650 (2)	58%	6,300 (1)	65%
PR Vegetated Channel (n=0.035)		33%		48%		59%		68%		76%
PR Vegetated Channel (n=0.040)		37%		55%		67%		78%		87%
PR Vegetated Channel (n=0.050)		47%		69%		84%		98%		109%
PR Vegetated Channel (n=0.060)		56%		83%		100%		117%		131%
PR Vegetated Channel (n=0.150) ⁽³⁾		140%		207%		207%		293%		327%

1. 100-yr, 6-hr Q=6,300 cfs per separate study performed in 2018. The other storm events are pro-rated based on rainfall depth. ⁽²⁾
2. 6-hr Rainfall Depths per NOAA Atlas 14: Q2 = 1.37", Q10 = 2.03", Q25 = 2.46", Q50 = 2.82 Q100 = 3.20"
3. An un-maintained vegetated channel does not have capacity to handle any of the storm events studied.

Table A-5

Table A-5 Average Manning Roughness Coefficients for Natural Channels

Minor Streams (Surface Width at Flood Stage < 100 ft)	
Fairly Regular Section	
(A) Some Grass and Weeds, Little or No Brush	0.030
(B) Dense Growth of Weeds, Depth of Flow Materially Greater Than Weed Height	0.040
(C) Some Weeds, Light Brush on Banks	0.040
(D) Some Weeds, Heavy Brush on Banks	0.060
(E) For Trees within Channel with Branches Submerged at High Stage, Increase All Above Values By	0.015
Irregular Section, with Pools, Slight Channel Meander	
Channels (A) to (E) Above, Increase All Values By	0.015
Mountain Streams; No Vegetation in Channel, Banks Usually Steep, Trees and Brush along Banks Submerged at High Stage	
(A) Bottom, Gravel, Cobbles and Few Boulders	0.050
(B) Bottom, Cobbles with Large Boulders	0.060
Flood Plains (Adjacent To Natural Streams)	
Pasture, No Brush	
(A) Short Grass	0.030
(B) High Grass	0.040
Cultivated Areas	
(A) No Crop	0.040
(B) Mature Row Crops	0.040
(C) Mature Field Crops	0.050
Heavy Weeds, Scattered Brush	0.050
Light Brush and Trees	0.060
Medium To Dense Brush	0.090
Dense Willows	0.170
Cleared Land with Tree Stumps, 100-150 Per Acre	0.060
Heavy Stand of Timber, Little Undergrowth	
(A) Flood Depth below Branches	0.110
(B) Flood Depth Reaches Branches	0.140

Table A-4

Table A-4 Average Manning Roughness Coefficients for Larger Open Channels

Unlined Channels	
Clay Loam	0.023
Sand	0.020
Lined Channels	
Grass Lined (Well-Maintained)	0.035
Grass Lined (Not Maintained)	0.045
Wetland-Bottom Channels (New Channel)	0.023
Wetland-Bottom Channels (Mature Channel)	See Table A-5
Riprap-Lined Channels	See Section 5.7.2
Concrete (Poured)	0.014
Air Blown Mortar (Gunite or Shotcrete) ³	0.016
Asphaltic Concrete or Bituminous Plant Mix	0.018

For channels with revetments or multiple lining types, use composite Manning roughness coefficient based on component lining materials.

³ Based on materials and workmanship required by standard specifications.
³ For air-blown concrete, use n=0.012 (if troweled) and n=0.025 if purposely roughened.

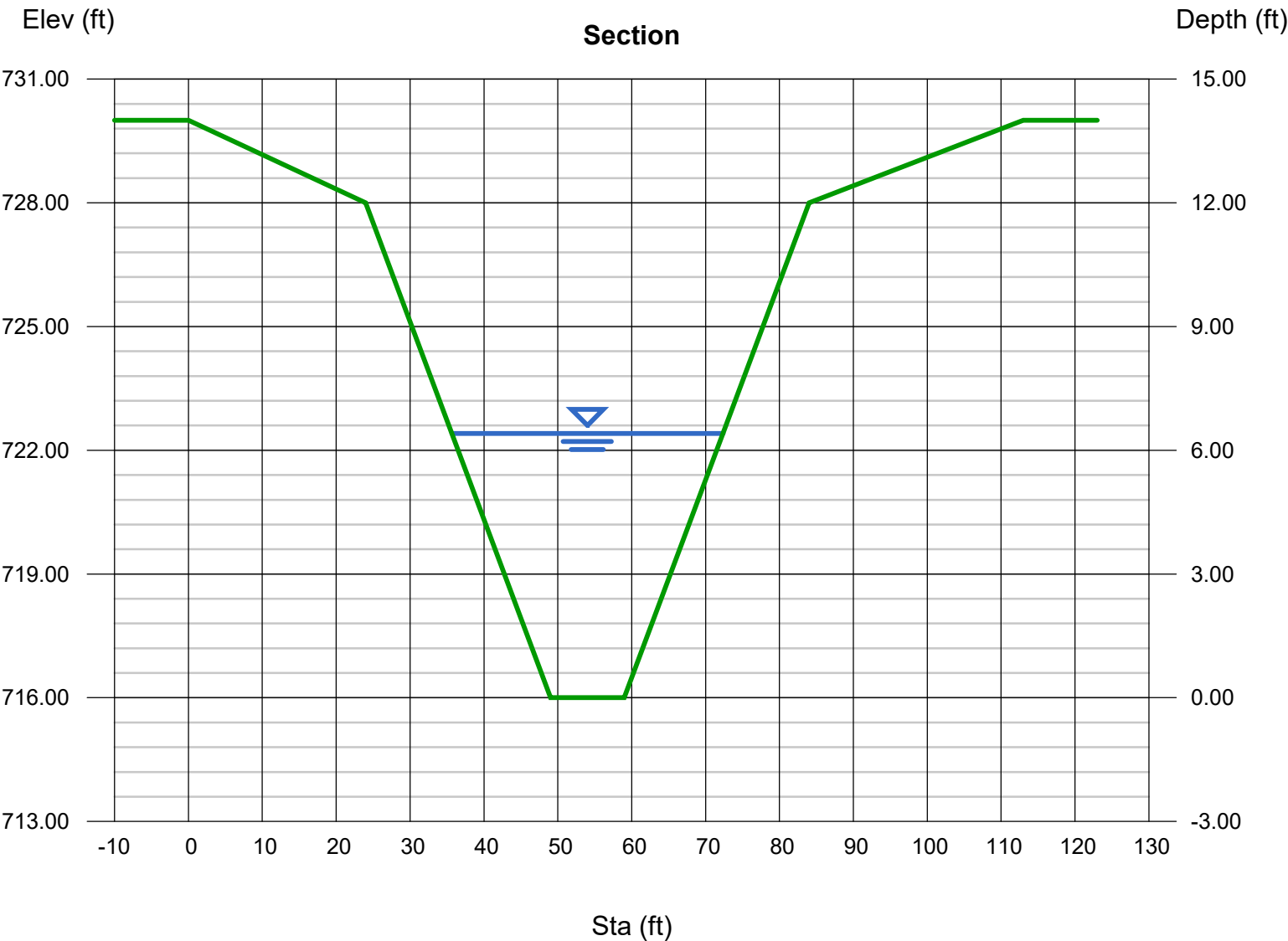
Channel Report

Escondido Creek EX Concrete Channel - n=0.014 - 25% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 6.41
Slope (%)	= 0.40	Q (cfs)	= 2,441
N-Value	= 0.014	Area (sqft)	= 149.70
		Velocity (ft/s)	= 16.31
		Wetted Perim (ft)	= 39.63
		Crit Depth, Yc (ft)	= 7.64
		Top Width (ft)	= 36.71
		EGL (ft)	= 10.54

Calculations
Compute by: Known Q
Known Q (cfs) = 2441.00

(Sta, El, n)-(Sta, El, n)...
(0.00, 730.00)-(24.00, 728.00, 0.014)-(49.00, 716.00, 0.014)-(59.00, 716.00, 0.014)-(84.00, 728.00, 0.014)-(113.00, 730.00, 0.014)



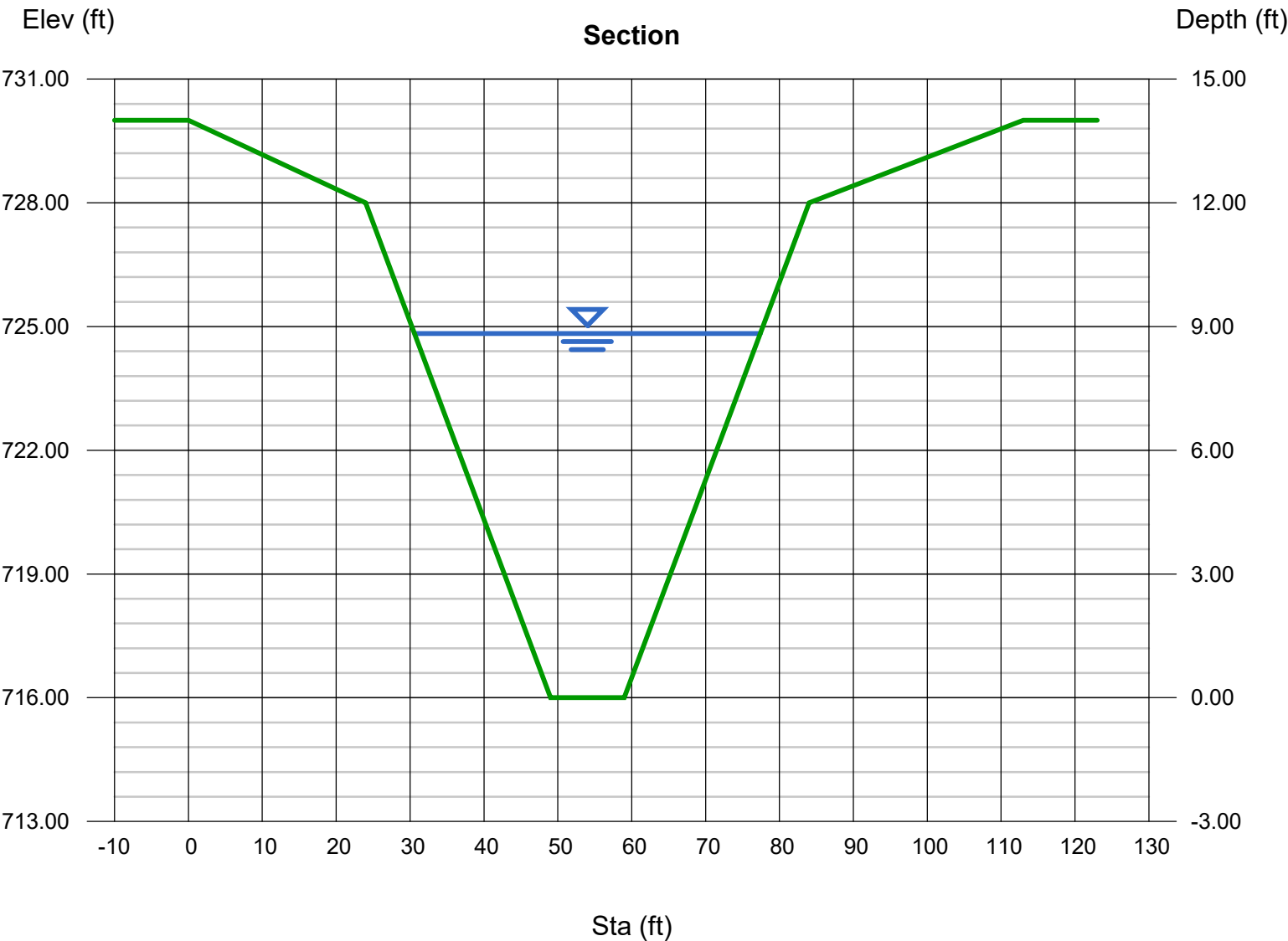
Channel Report

Escondido Creek EX Concrete Channel - n=0.014 - 50% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 8.83
Slope (%)	= 0.40	Q (cfs)	= 4,881
N-Value	= 0.014	Area (sqft)	= 250.74
		Velocity (ft/s)	= 19.47
		Wetted Perim (ft)	= 50.81
		Crit Depth, Yc (ft)	= 10.65
		Top Width (ft)	= 46.79
		EGL (ft)	= 14.72

Calculations
Compute by: Known Q
Known Q (cfs) = 4881.00

(Sta, El, n)-(Sta, El, n)...
(0.00, 730.00)-(24.00, 728.00, 0.014)-(49.00, 716.00, 0.014)-(59.00, 716.00, 0.014)-(84.00, 728.00, 0.014)-(113.00, 730.00, 0.014)



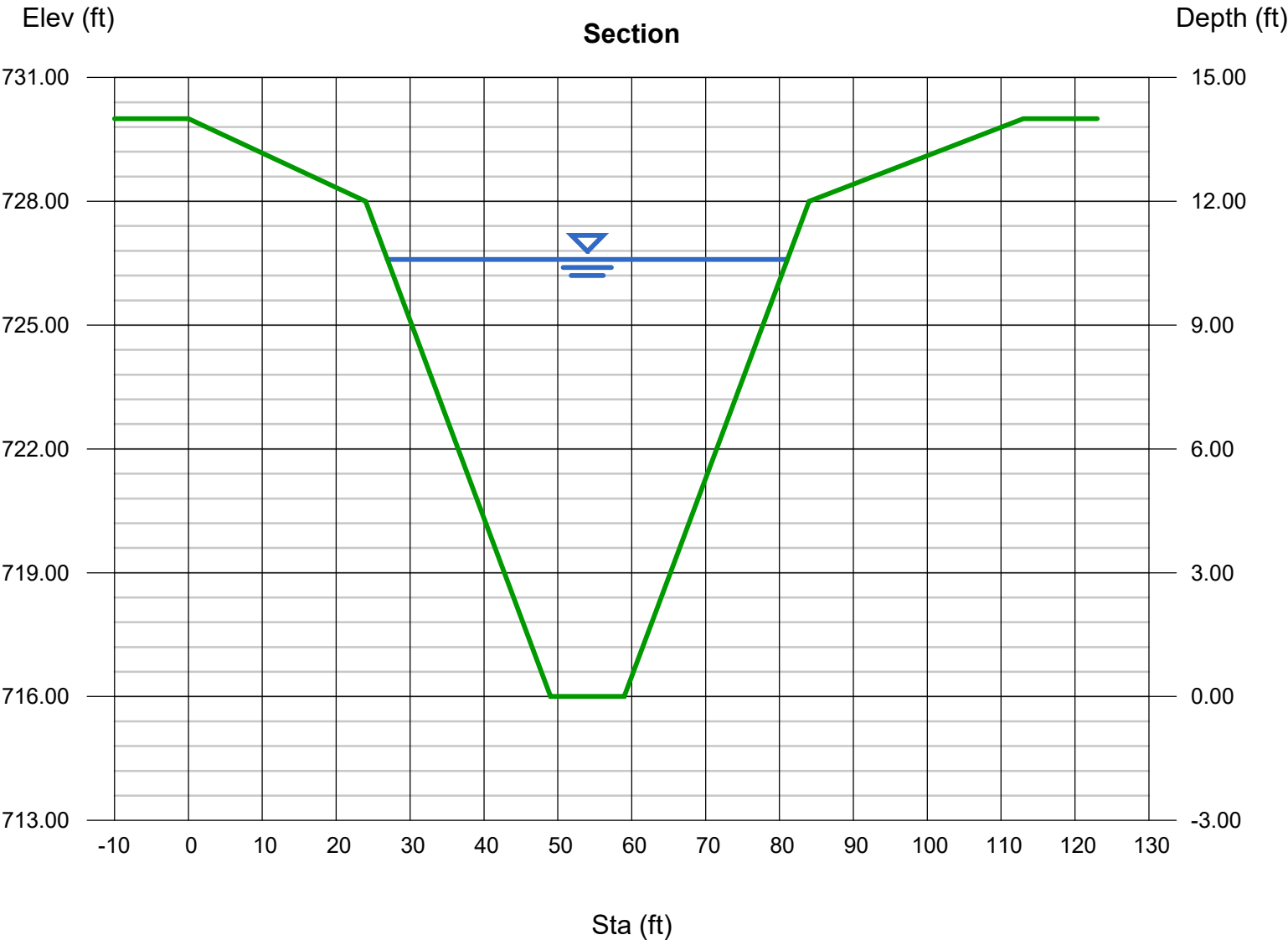
Channel Report

Escondido Creek EX Concrete Channel - n=0.014 - 75% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 10.59
Slope (%)	= 0.40	Q (cfs)	= 7,332
N-Value	= 0.014	Area (sqft)	= 339.55
		Velocity (ft/s)	= 21.59
		Wetted Perim (ft)	= 58.95
		Crit Depth, Yc (ft)	= 13.70
		Top Width (ft)	= 54.13
		EGL (ft)	= 17.84

Calculations
Compute by: Known Q
Known Q (cfs) = 7332.00

(Sta, El, n)-(Sta, El, n)...
(0.00, 730.00)-(24.00, 728.00, 0.014)-(49.00, 716.00, 0.014)-(59.00, 716.00, 0.014)-(84.00, 728.00, 0.014)-(113.00, 730.00, 0.014)



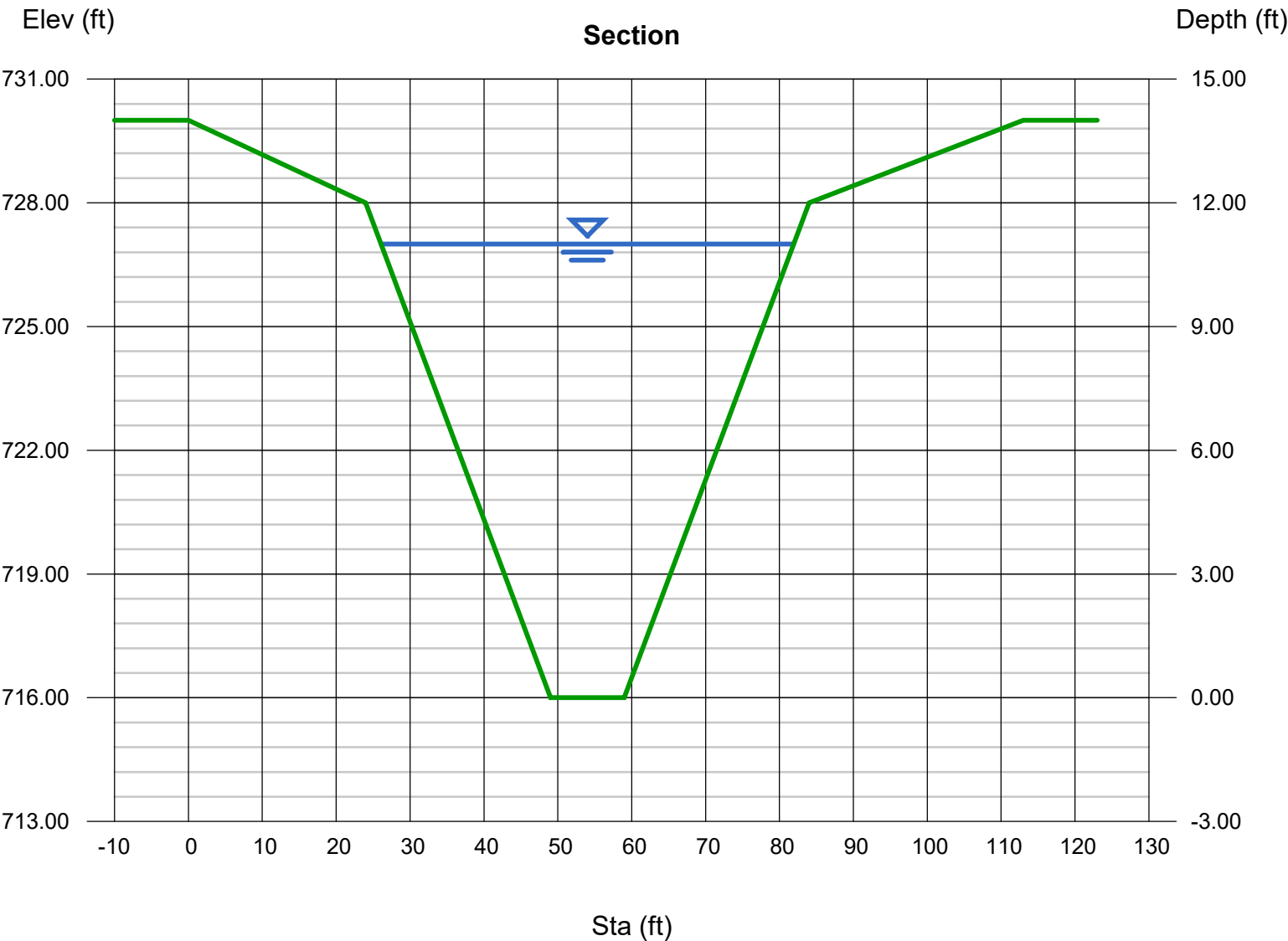
Channel Report

Escondido Creek EX Concrete Channel - n=0.014 - 1ft Freeboard

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 11.00
Slope (%)	= 0.40	Q (cfs)	= 8,004
N-Value	= Composite	Area (sqft)	= 362.08
		Velocity (ft/s)	= 22.11
		Wetted Perim (ft)	= 60.84
		Crit Depth, Yc (ft)	= 14.00
		Top Width (ft)	= 55.83
		EGL (ft)	= 18.60

Calculations
Compute by: Q vs Depth
No. Increments = 14

(Sta, El, n)-(Sta, El, n)...
(0.00, 730.00)-(24.00, 728.00, 0.014)-(49.00, 716.00, 0.014)-(59.00, 716.00, 0.014)-(84.00, 728.00, 0.014)-(113.00, 730.00, 0.014)



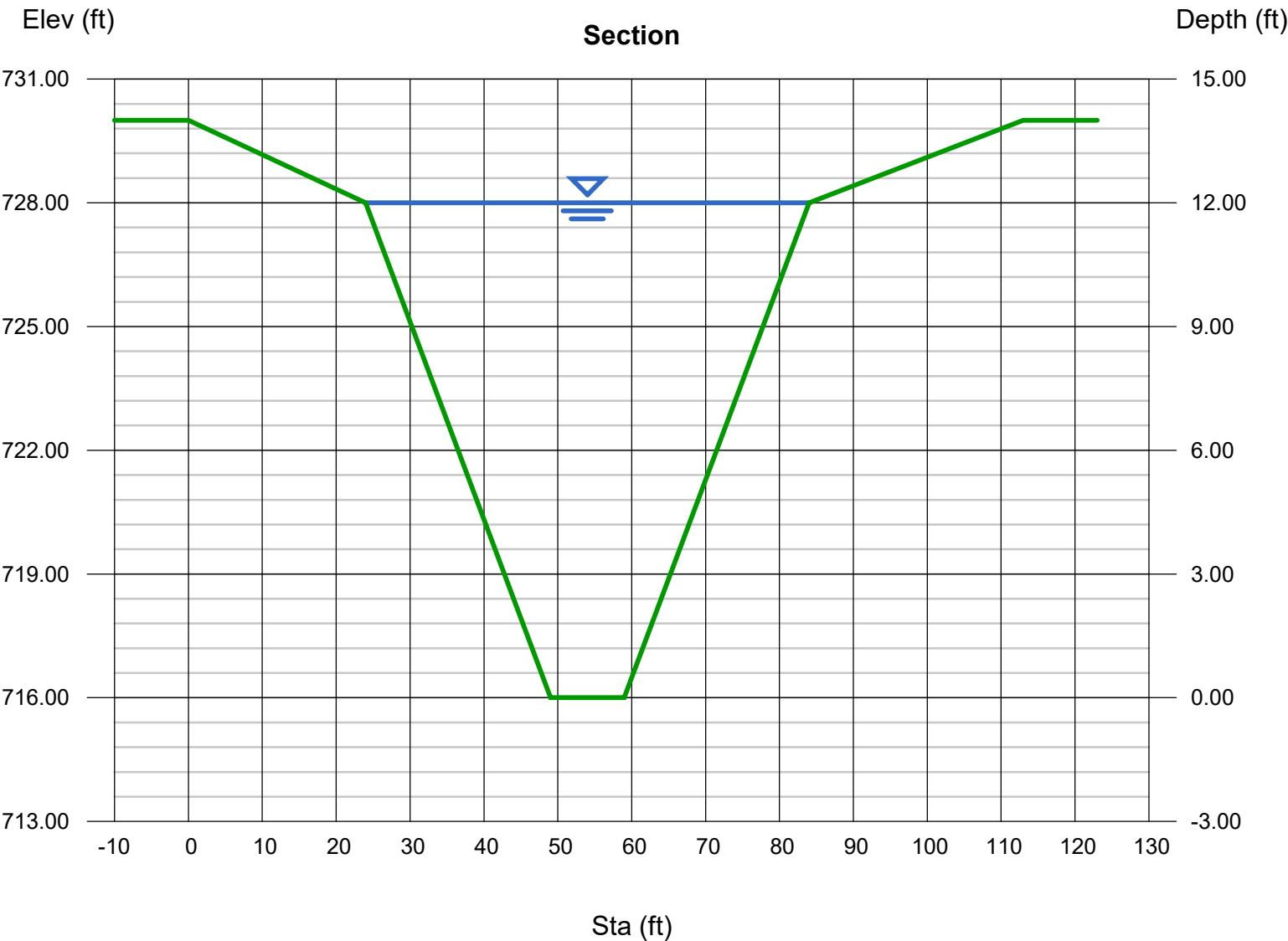
Channel Report

Escondido Creek EX Concrete Channel - n=0.014 - 100% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 12.00
Slope (%)	= 0.40	Q (cfs)	= 9,762
N-Value	= Composite	Area (sqft)	= 420.00
		Velocity (ft/s)	= 23.24
		Wetted Perim (ft)	= 65.46
		Crit Depth, Yc (ft)	= 14.00
		Top Width (ft)	= 60.00
		EGL (ft)	= 20.40

Calculations
Compute by: Q vs Depth
No. Increments = 14

(Sta, El, n)-(Sta, El, n)...
(0.00, 730.00)-(24.00, 728.00, 0.014)-(49.00, 716.00, 0.014)-(59.00, 716.00, 0.014)-(84.00, 728.00, 0.014)-(113.00, 730.00, 0.014)



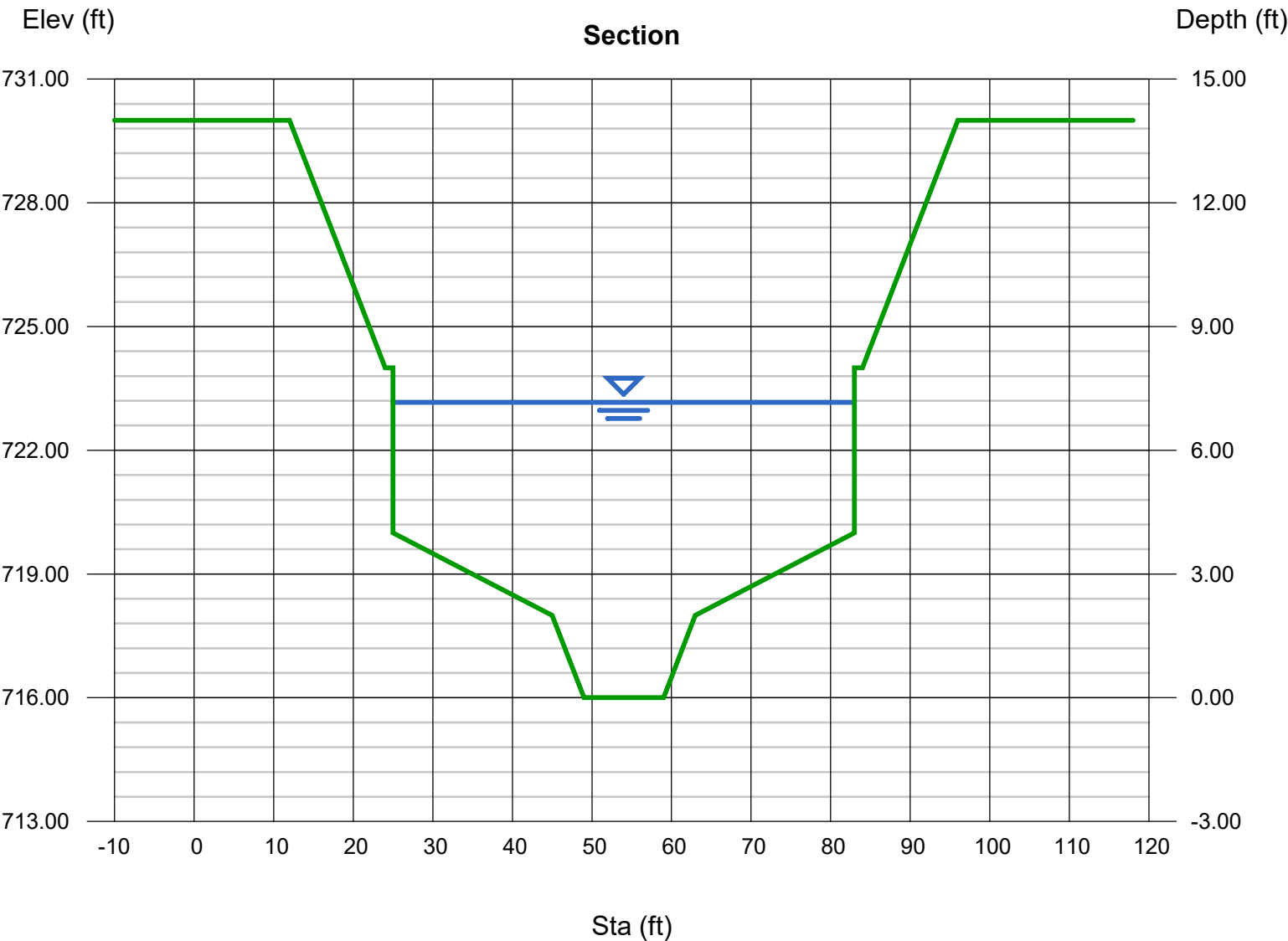
Channel Report

Escondido Creek PR Vegetated Channel - n=0.035 - 25% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 7.16
Slope (%)	= 0.40	Q (cfs)	= 2,068
N-Value	= 0.035	Area (sqft)	= 287.29
		Velocity (ft/s)	= 7.20
		Wetted Perim (ft)	= 65.46
		Crit Depth, Yc (ft)	= 5.62
		Top Width (ft)	= 58.00
		EGL (ft)	= 7.97

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

(0.00, 730.00)-(12.00, 730.00, 0.035)-(24.00, 724.00, 0.035)-(25.00, 724.00, 0.035)-(25.00, 720.00, 0.035)-(45.00, 718.00, 0.035)-(49.00, 716.00, 0.035)
-(59.00, 716.00, 0.035)-(63.00, 718.00, 0.035)-(83.00, 720.00, 0.035)-(83.00, 724.00, 0.035)-(84.00, 724.00, 0.035)-(96.00, 730.00, 0.035)-(108.00, 730.00, 0.035)



Channel Report

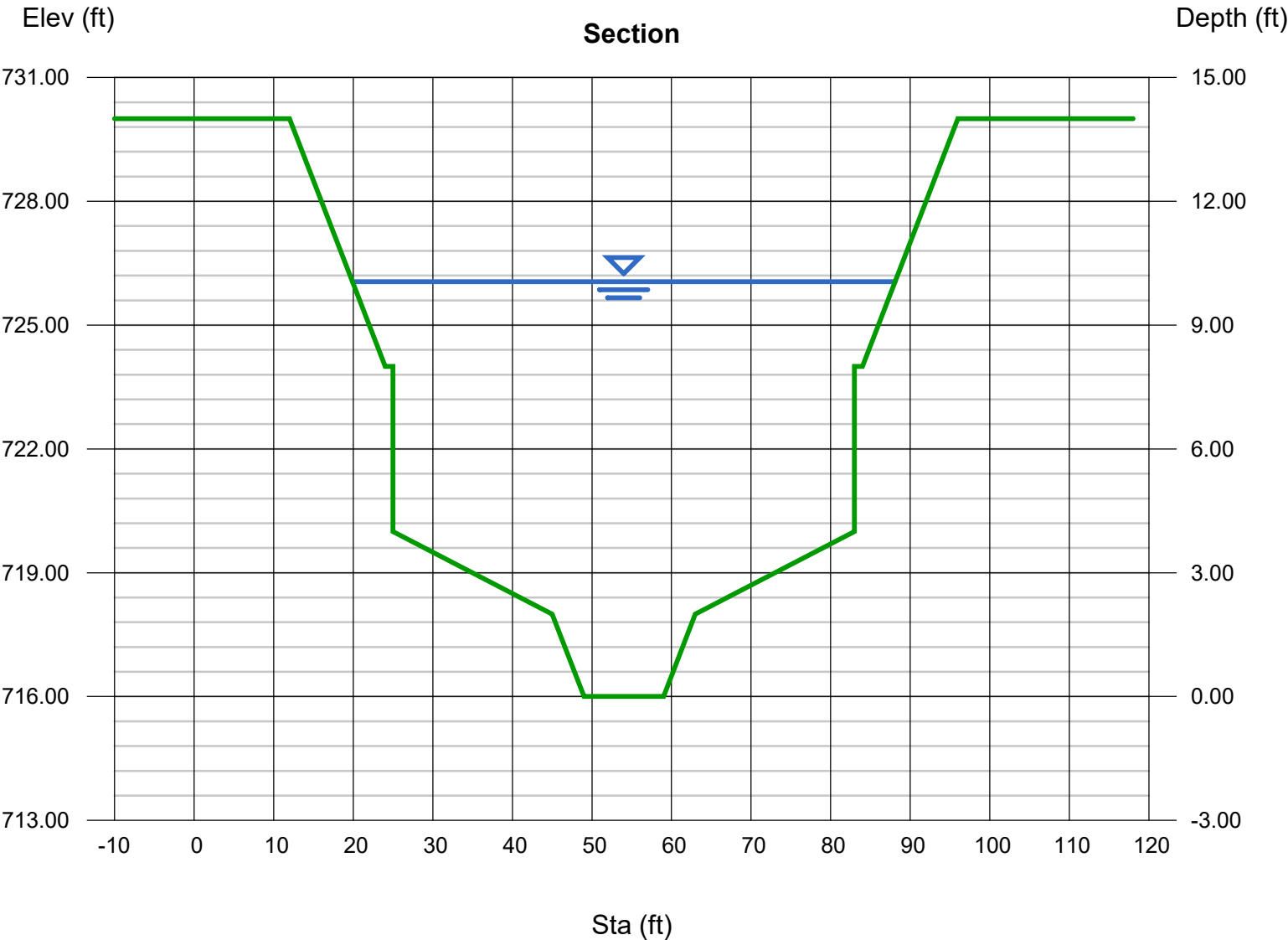
Escondido Creek PR Vegetated Channel - n=0.035 - 50% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 10.05
Slope (%)	= 0.40	Q (cfs)	= 4,135
N-Value	= 0.035	Area (sqft)	= 467.41
Calculations		Velocity (ft/s)	= 8.85
		Wetted Perim (ft)	= 78.31
		Crit Depth, Yc (ft)	= 7.62
		Top Width (ft)	= 68.20
		EGL (ft)	= 11.27

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

(0.00, 730.00)-(12.00, 730.00, 0.035)-(24.00, 724.00, 0.035)-(25.00, 724.00, 0.035)-(25.00, 720.00, 0.035)-(45.00, 718.00, 0.035)-(49.00, 716.00, 0.035)-

-(59.00, 716.00, 0.035)-(63.00, 718.00, 0.035)-(83.00, 720.00, 0.035)-(83.00, 724.00, 0.035)-(84.00, 724.00, 0.035)-(96.00, 730.00, 0.035)-(108.00, 730.00, 0.035)

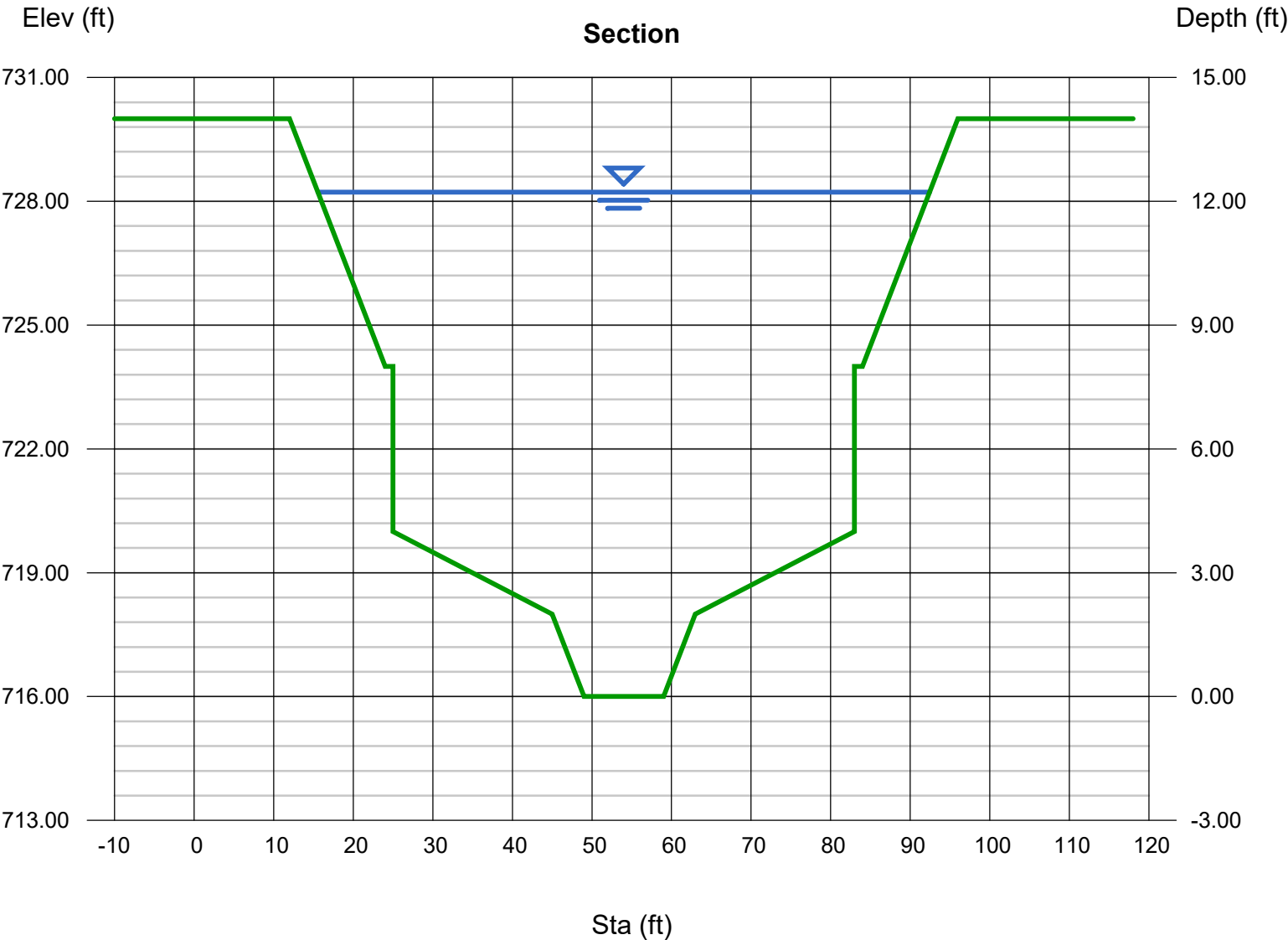


Channel Report

Escondido Creek PR Vegetated Channel - n=0.035 - 75% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 12.22
Slope (%)	= 0.40	Q (cfs)	= 6,203
N-Value	= 0.035	Area (sqft)	= 624.83
		Velocity (ft/s)	= 9.93
		Wetted Perim (ft)	= 88.02
		Crit Depth, Yc (ft)	= 9.48
		Top Width (ft)	= 76.88
		EGL (ft)	= 13.75

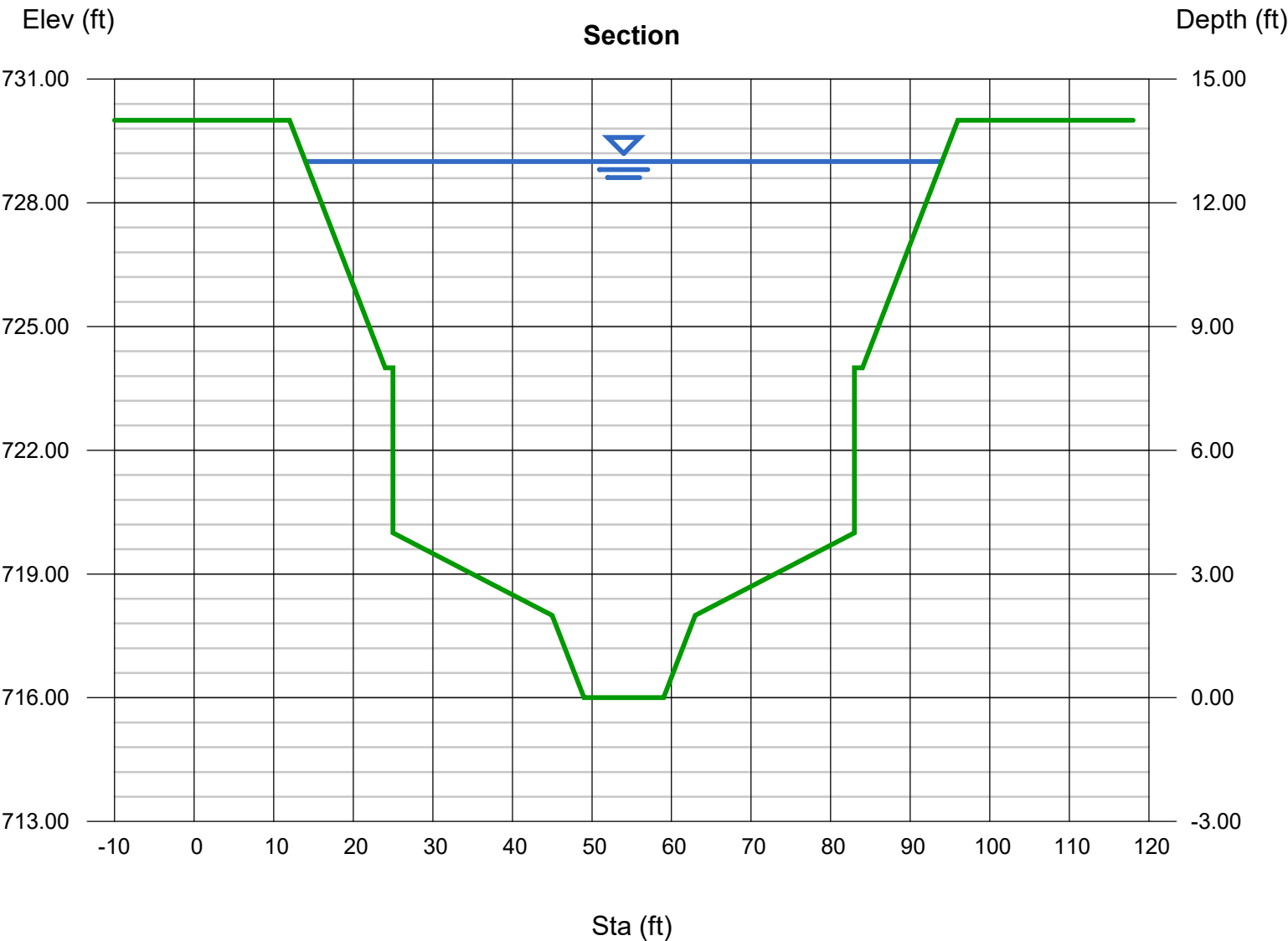
(Sta, El, n)-(Sta, El, n)...
(0.00, 730.00)-(12.00, 730.00, 0.035)-(24.00, 724.00, 0.035)-(25.00, 724.00, 0.035)-(25.00, 720.00, 0.035)-(45.00, 718.00, 0.035)-(49.00, 716.00, 0.035)-
-(59.00, 716.00, 0.035)-(63.00, 718.00, 0.035)-(83.00, 720.00, 0.035)-(83.00, 724.00, 0.035)-(84.00, 724.00, 0.035)-(96.00, 730.00, 0.035)-(108.00, 730.00, 0.035)



Channel Report

Escondido Creek PR Vegetated Channel - n=0.035 - 1ft Freeboard

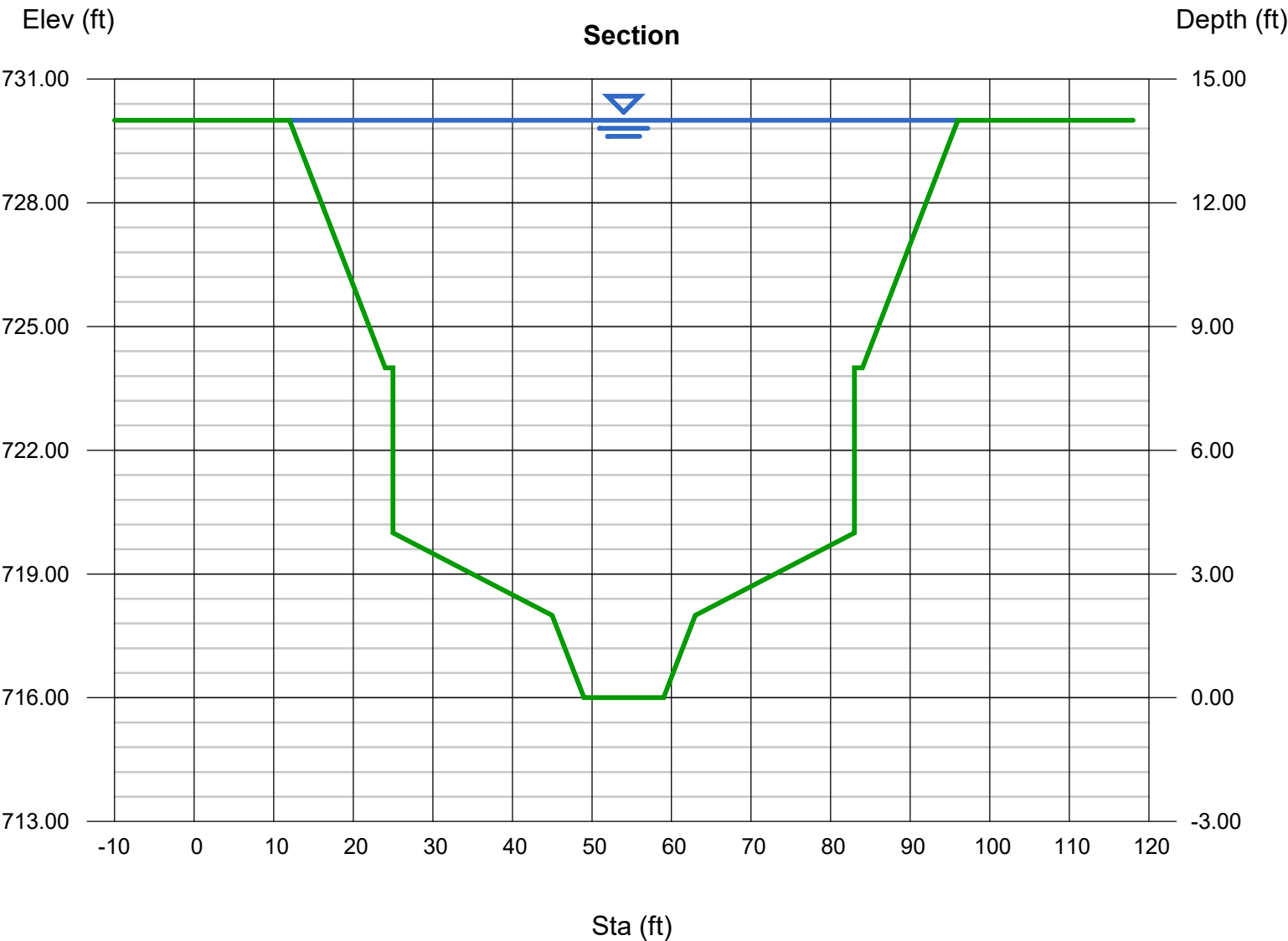
User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 13.00
Slope (%)	= 0.40	Q (cfs)	= 7,073
N-Value	= Composite	Area (sqft)	= 686.00
Calculations		Velocity (ft/s)	= 10.31
Compute by:	Q vs Depth	Wetted Perim (ft)	= 91.50
No. Increments	= 14	Crit Depth, Yc (ft)	= 10.16
		Top Width (ft)	= 80.00
		EGL (ft)	= 14.65
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.035)-(24.00, 724.00, 0.035)-(25.00, 724.00, 0.035)-(25.00, 720.00, 0.035)-(45.00, 718.00, 0.035)-(49.00, 716.00, 0.035)-			
-(59.00, 716.00, 0.035)-(63.00, 718.00, 0.035)-(83.00, 720.00, 0.035)-(83.00, 724.00, 0.035)-(84.00, 724.00, 0.035)-(96.00, 730.00, 0.035)-(108.00, 730.00, 0.035)			



Channel Report

Escondido Creek PR Vegetated Channel - n=0.035 - 100% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 14.00
Slope (%)	= 0.40	Q (cfs)	= 8,270
N-Value	= Composite	Area (sqft)	= 768.00
Calculations		Velocity (ft/s)	= 10.77
Compute by:	Q vs Depth	Wetted Perim (ft)	= 95.98
No. Increments	= 14	Crit Depth, Yc (ft)	= 11.02
		Top Width (ft)	= 84.00
		EGL (ft)	= 15.80
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.035)-(24.00, 724.00, 0.035)-(25.00, 724.00, 0.035)-(25.00, 720.00, 0.035)-(45.00, 718.00, 0.035)-(49.00, 716.00, 0.035)			
-(59.00, 716.00, 0.035)-(63.00, 718.00, 0.035)-(83.00, 720.00, 0.035)-(83.00, 724.00, 0.035)-(84.00, 724.00, 0.035)-(96.00, 730.00, 0.035)-(108.00, 730.00, 0.035)			



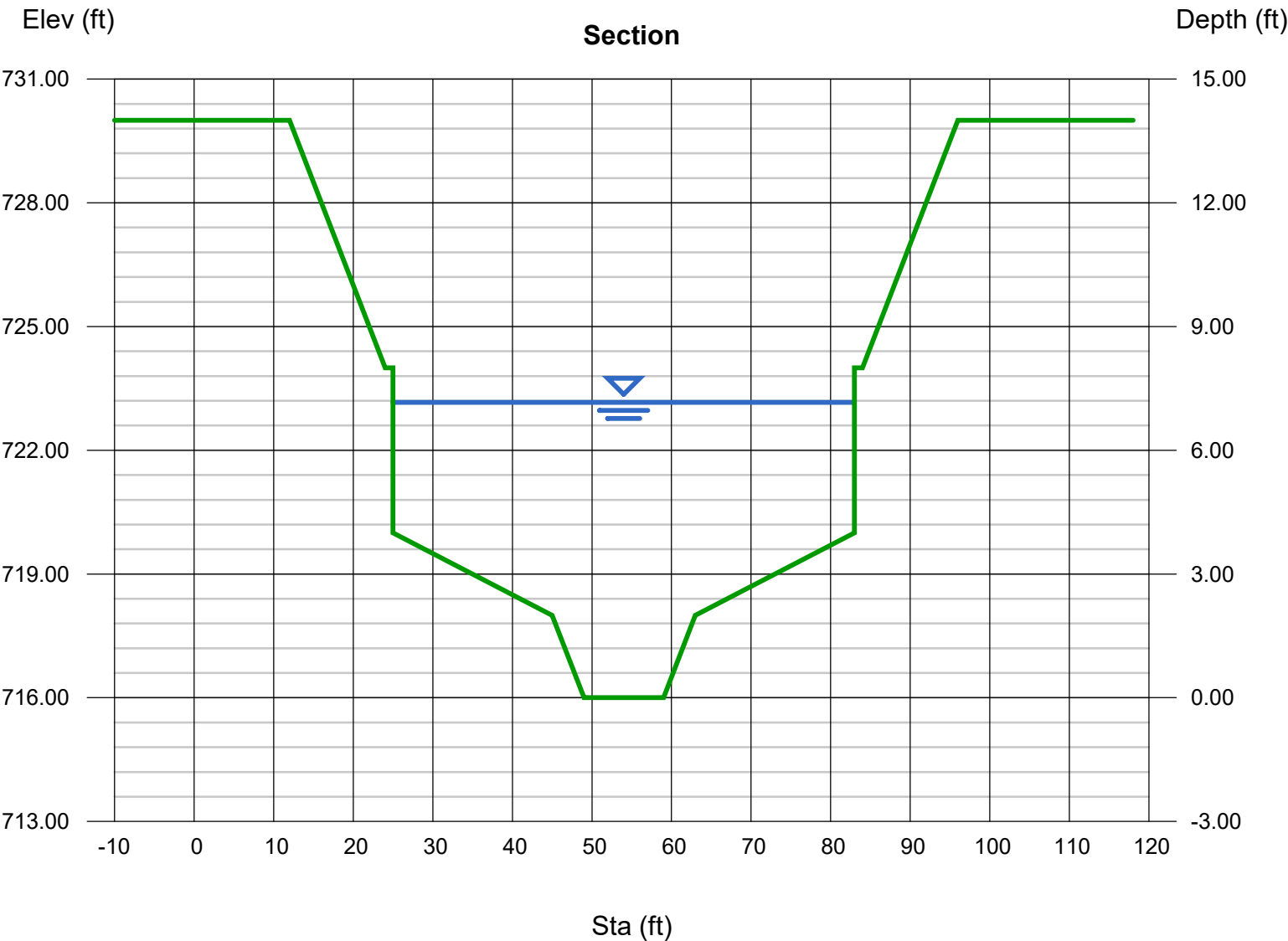
Channel Report

Escondido Creek PR Vegetated Channel - n=0.040 - 25% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 7.16
Slope (%)	= 0.40	Q (cfs)	= 1,809
N-Value	= 0.040	Area (sqft)	= 287.29
		Velocity (ft/s)	= 6.30
		Wetted Perim (ft)	= 65.46
		Crit Depth, Yc (ft)	= 5.33
		Top Width (ft)	= 58.00
		EGL (ft)	= 7.78

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

(0.00, 730.00)-(12.00, 730.00, 0.040)-(24.00, 724.00, 0.040)-(25.00, 724.00, 0.040)-(25.00, 720.00, 0.040)-(45.00, 718.00, 0.040)-(49.00, 716.00, 0.040)
-(59.00, 716.00, 0.040)-(63.00, 718.00, 0.040)-(83.00, 720.00, 0.040)-(83.00, 724.00, 0.040)-(84.00, 724.00, 0.040)-(96.00, 730.00, 0.040)-(108.00, 730.00, 0.040)



Channel Report

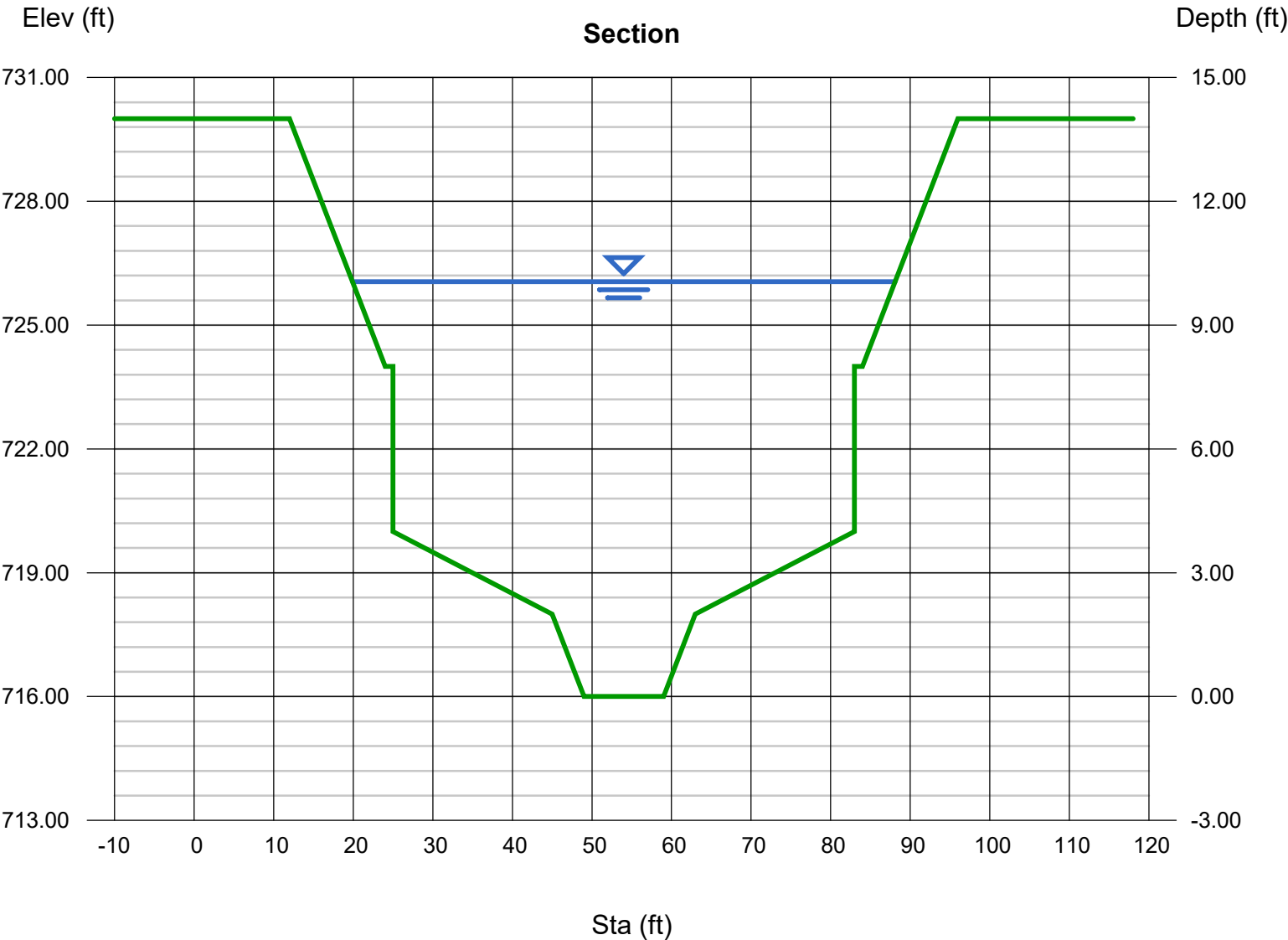
Escondido Creek PR Vegetated Channel - n=0.040 - 50% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 10.05
Slope (%)	= 0.40	Q (cfs)	= 3,618
N-Value	= 0.040	Area (sqft)	= 467.41
Calculations		Velocity (ft/s)	= 7.74
		Wetted Perim (ft)	= 78.31
		Crit Depth, Yc (ft)	= 7.16
		Top Width (ft)	= 68.20
		EGL (ft)	= 10.98

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

(0.00, 730.00)-(12.00, 730.00, 0.040)-(24.00, 724.00, 0.040)-(25.00, 724.00, 0.040)-(25.00, 720.00, 0.040)-(45.00, 718.00, 0.040)-(49.00, 716.00, 0.040)

-(59.00, 716.00, 0.040)-(63.00, 718.00, 0.040)-(83.00, 720.00, 0.040)-(83.00, 724.00, 0.040)-(84.00, 724.00, 0.040)-(96.00, 730.00, 0.040)-(108.00, 730.00, 0.040)



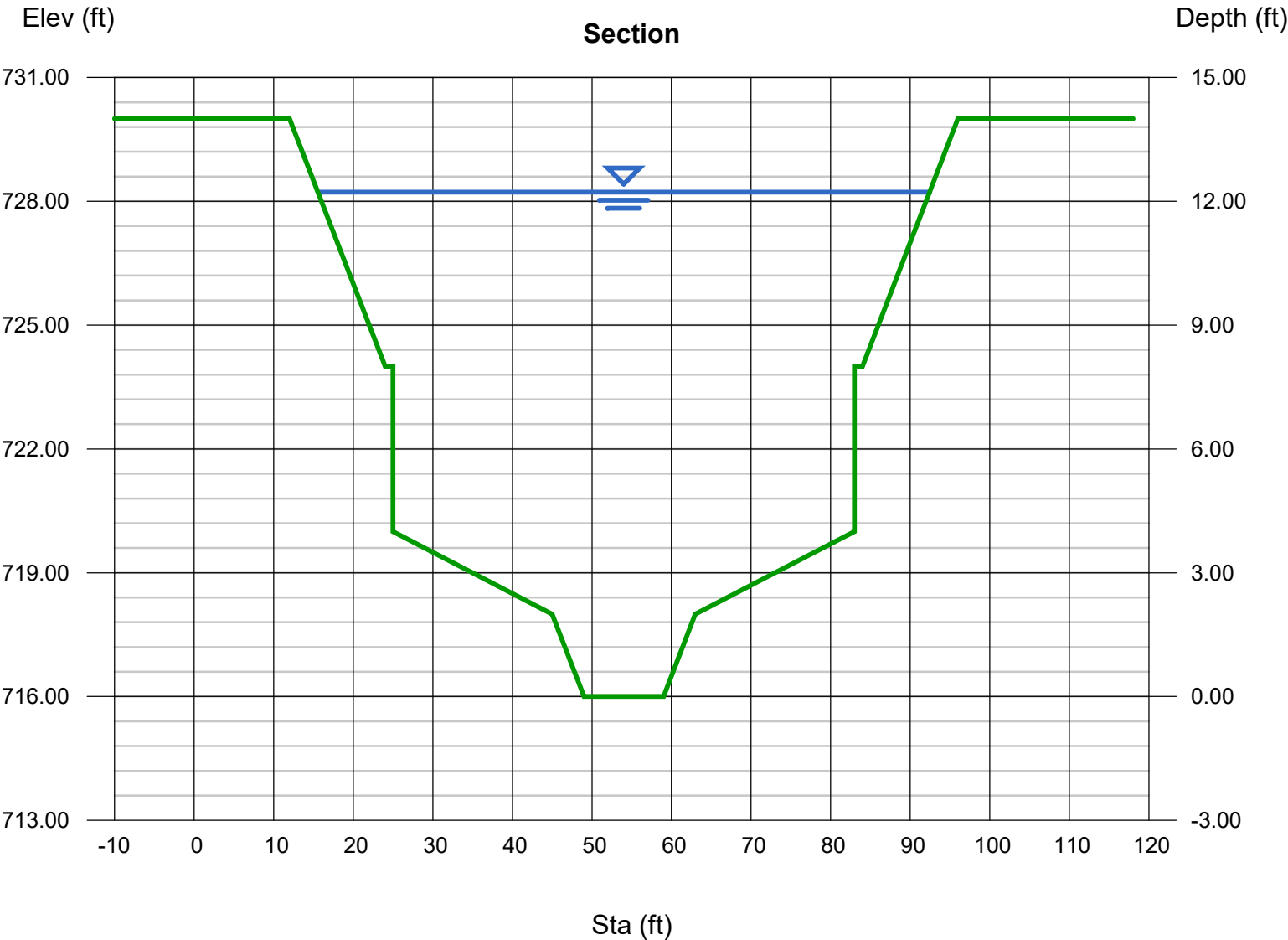
Channel Report

Escondido Creek PR Vegetated Channel - n=0.040 - 75% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 12.22
Slope (%)	= 0.40	Q (cfs)	= 5,427
N-Value	= 0.040	Area (sqft)	= 624.83
		Velocity (ft/s)	= 8.69
		Wetted Perim (ft)	= 88.02
		Crit Depth, Yc (ft)	= 8.83
		Top Width (ft)	= 76.88
		EGL (ft)	= 13.39

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

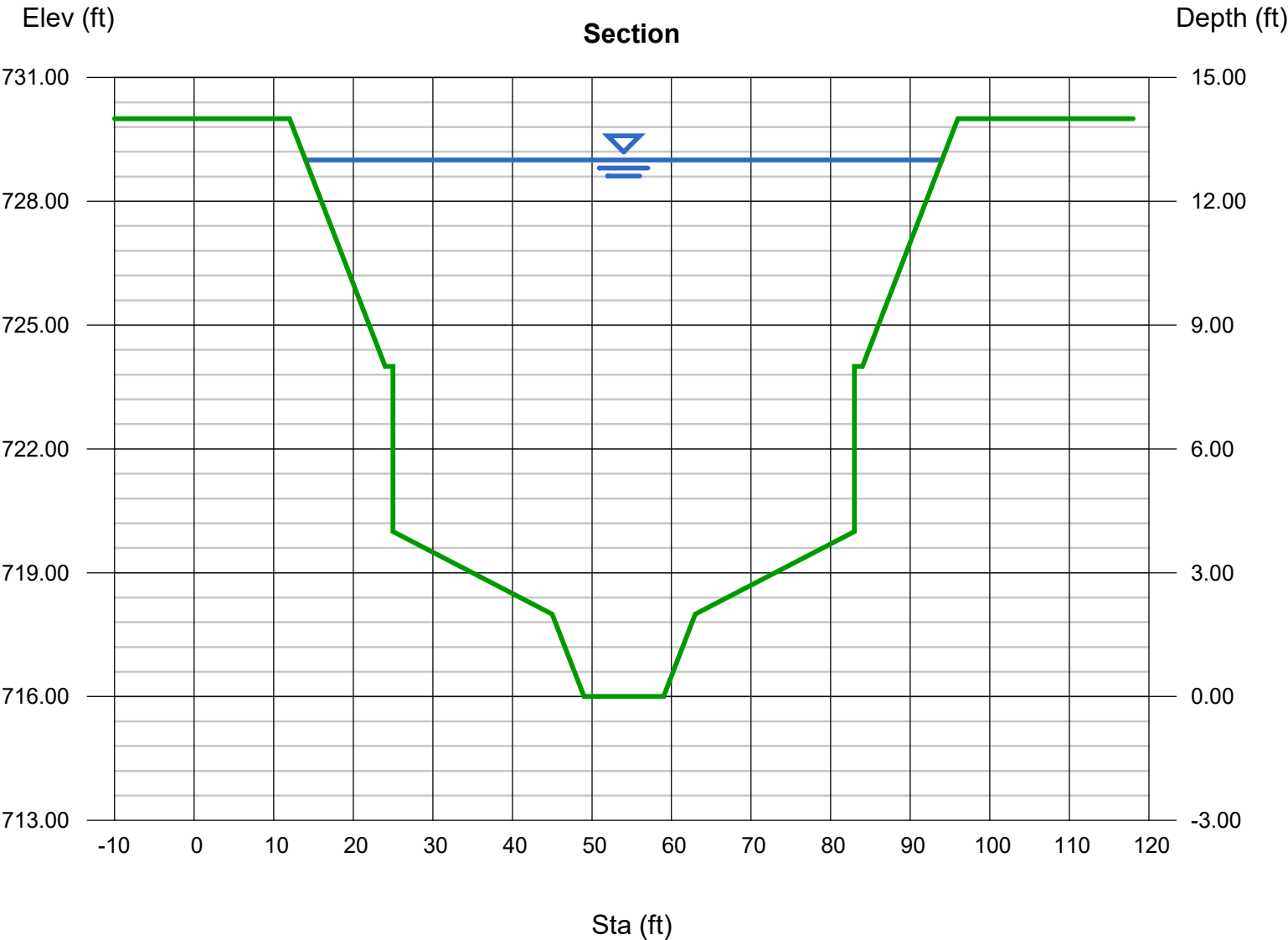
(0.00, 730.00)-(12.00, 730.00, 0.040)-(24.00, 724.00, 0.040)-(25.00, 724.00, 0.040)-(25.00, 720.00, 0.040)-(45.00, 718.00, 0.040)-(49.00, 716.00, 0.040)
-(59.00, 716.00, 0.040)-(63.00, 718.00, 0.040)-(83.00, 720.00, 0.040)-(83.00, 724.00, 0.040)-(84.00, 724.00, 0.040)-(96.00, 730.00, 0.040)-(108.00, 730.00, 0.040)



Channel Report

Escondido Creek PR Vegetated Channel - n=0.040 - 1ft Freeboard

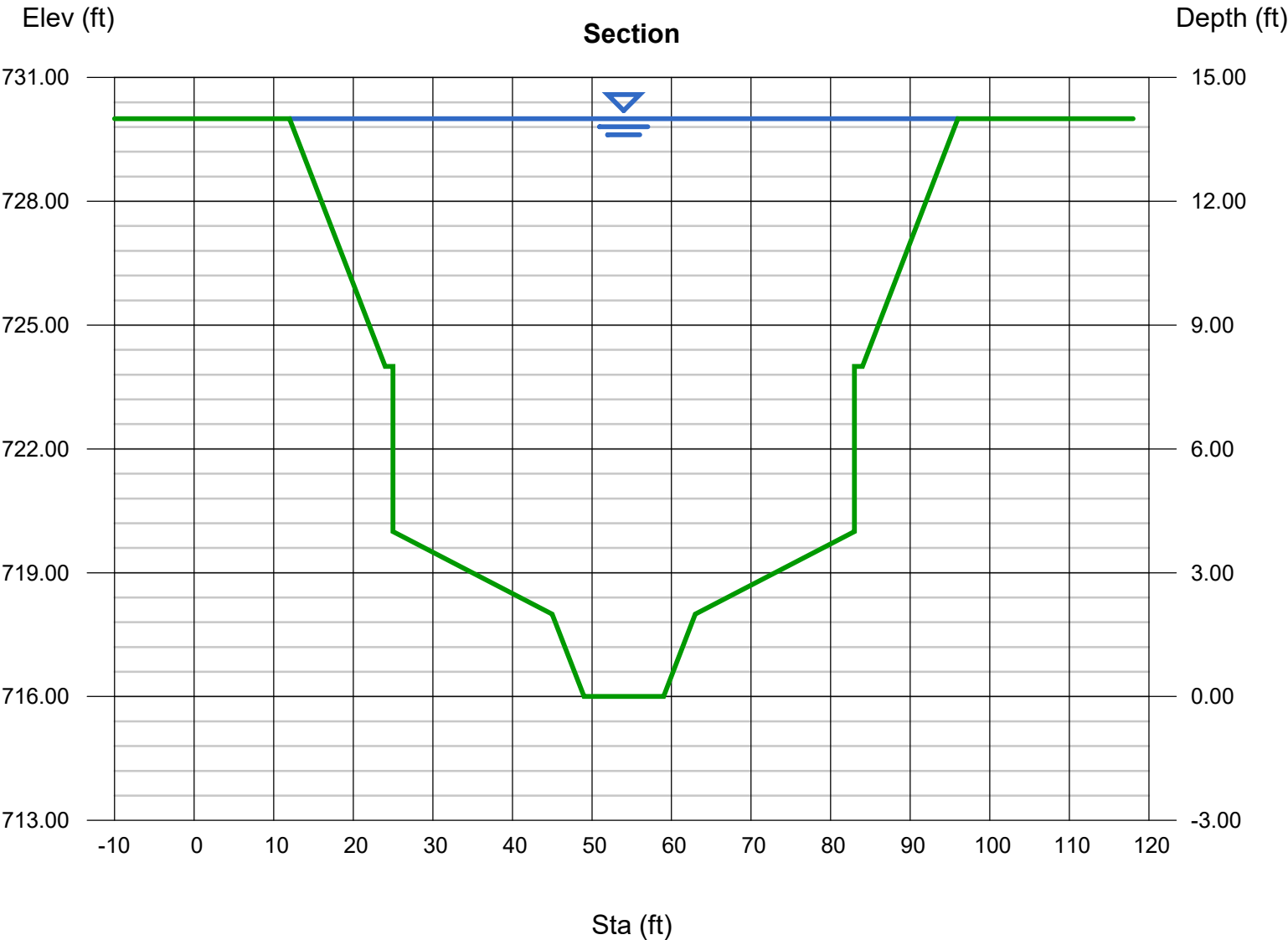
User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 13.00
Slope (%)	= 0.40	Q (cfs)	= 6,188
N-Value	= Composite	Area (sqft)	= 686.00
Calculations		Velocity (ft/s)	= 9.02
Compute by:	Q vs Depth	Wetted Perim (ft)	= 91.50
No. Increments	= 14	Crit Depth, Yc (ft)	= 9.47
		Top Width (ft)	= 80.00
		EGL (ft)	= 14.27
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.040)-(24.00, 724.00, 0.040)-(25.00, 724.00, 0.040)-(25.00, 720.00, 0.040)-(45.00, 718.00, 0.040)-(49.00, 716.00, 0.040)			
-(59.00, 716.00, 0.040)-(63.00, 718.00, 0.040)-(83.00, 720.00, 0.040)-(83.00, 724.00, 0.040)-(84.00, 724.00, 0.040)-(96.00, 730.00, 0.040)-(108.00, 730.00, 0.040)			



Channel Report

Escondido Creek PR Vegetated Channel - n=0.040 - 100% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 14.00
Slope (%)	= 0.40	Q (cfs)	= 7,236
N-Value	= Composite	Area (sqft)	= 768.00
Calculations		Velocity (ft/s)	= 9.42
Compute by:	Q vs Depth	Wetted Perim (ft)	= 95.98
No. Increments	= 14	Crit Depth, Yc (ft)	= 10.28
		Top Width (ft)	= 84.00
		EGL (ft)	= 15.38
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.040)-(24.00, 724.00, 0.040)-(25.00, 724.00, 0.040)-(25.00, 720.00, 0.040)-(45.00, 718.00, 0.040)-(49.00, 716.00, 0.040)			
-(59.00, 716.00, 0.040)-(63.00, 718.00, 0.040)-(83.00, 720.00, 0.040)-(83.00, 724.00, 0.040)-(84.00, 724.00, 0.040)-(96.00, 730.00, 0.040)-(108.00, 730.00, 0.040)			



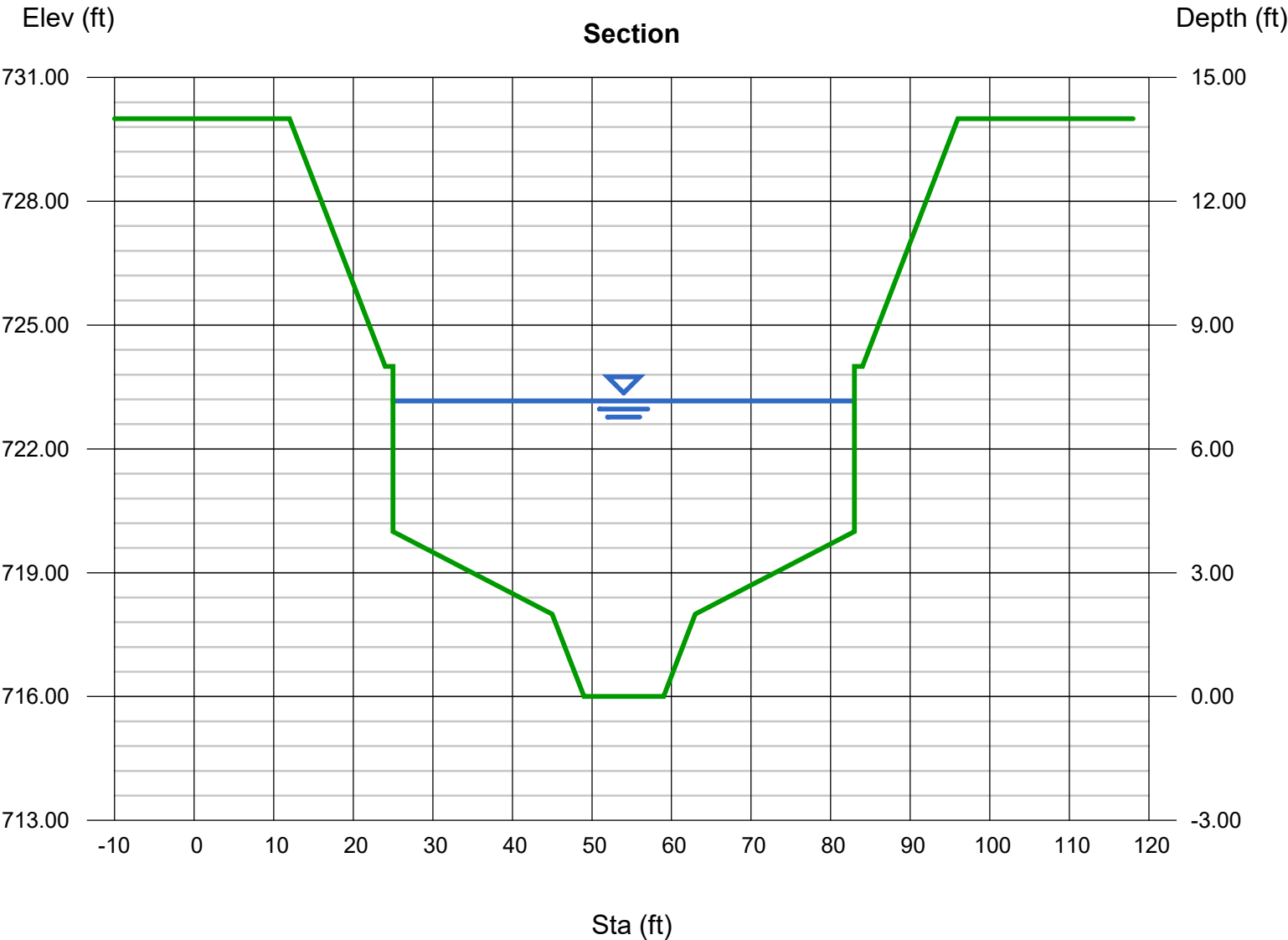
Channel Report

Escondido Creek PR Vegetated Channel - n=0.050 - 25% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 7.16
Slope (%)	= 0.40	Q (cfs)	= 1,447
N-Value	= 0.050	Area (sqft)	= 287.29
		Velocity (ft/s)	= 5.04
		Wetted Perim (ft)	= 65.46
		Crit Depth, Yc (ft)	= 4.90
		Top Width (ft)	= 58.00
		EGL (ft)	= 7.55

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

(0.00, 730.00)-(12.00, 730.00, 0.050)-(24.00, 724.00, 0.050)-(25.00, 724.00, 0.050)-(25.00, 720.00, 0.050)-(45.00, 718.00, 0.050)-(49.00, 716.00, 0.050)
-(59.00, 716.00, 0.050)-(63.00, 718.00, 0.050)-(83.00, 720.00, 0.050)-(83.00, 724.00, 0.050)-(84.00, 724.00, 0.050)-(96.00, 730.00, 0.050)-(108.00, 730.00, 0.050)



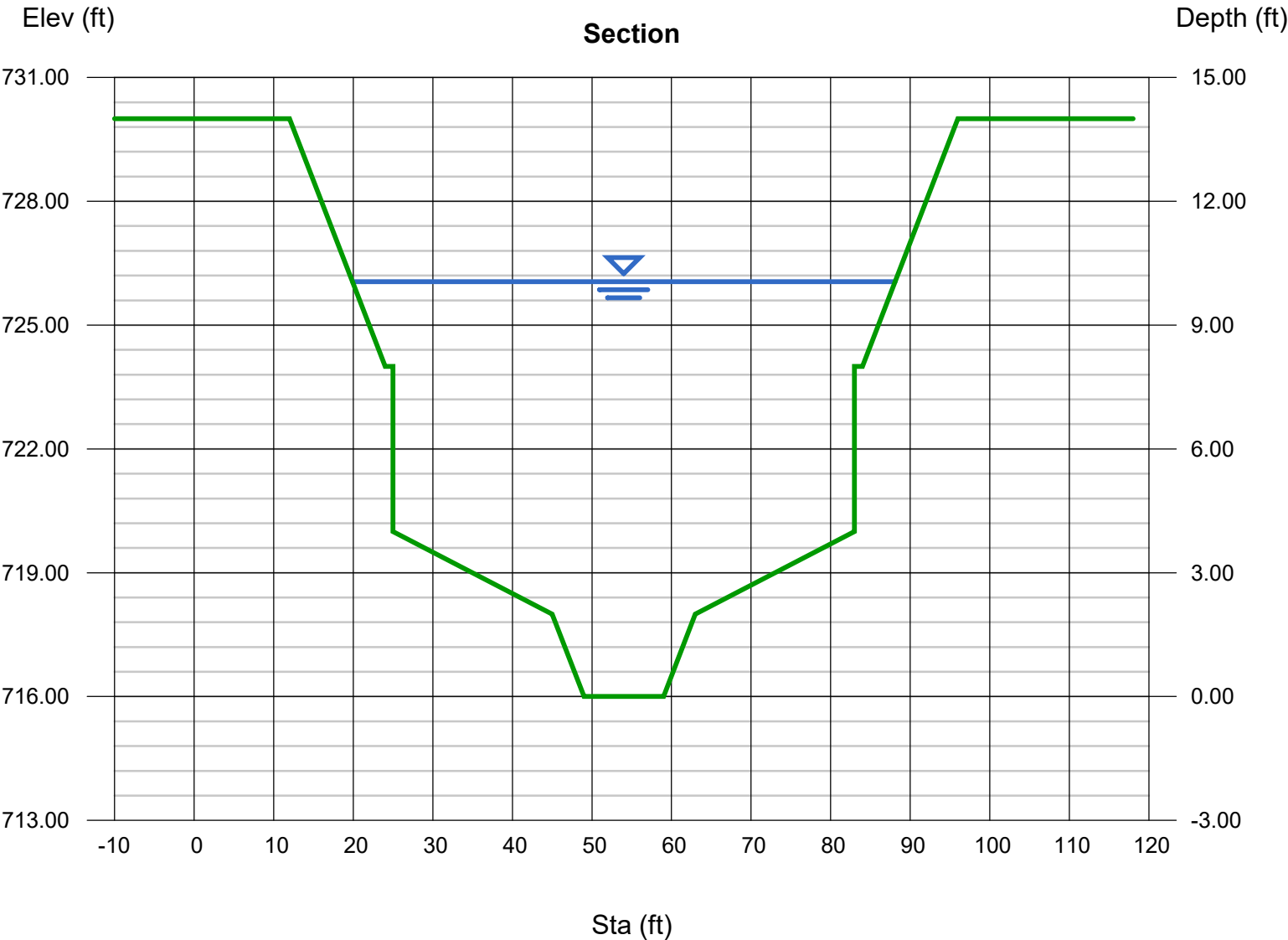
Channel Report

Escondido Creek PR Vegetated Channel - n=0.050 - 50% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 10.05
Slope (%)	= 0.40	Q (cfs)	= 2,894
N-Value	= 0.050	Area (sqft)	= 467.41
		Velocity (ft/s)	= 6.19
		Wetted Perim (ft)	= 78.31
		Crit Depth, Yc (ft)	= 6.47
		Top Width (ft)	= 68.20
		EGL (ft)	= 10.65

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

(0.00, 730.00)-(12.00, 730.00, 0.050)-(24.00, 724.00, 0.050)-(25.00, 724.00, 0.050)-(25.00, 720.00, 0.050)-(45.00, 718.00, 0.050)-(49.00, 716.00, 0.050)-
-(59.00, 716.00, 0.050)-(63.00, 718.00, 0.050)-(83.00, 720.00, 0.050)-(83.00, 724.00, 0.050)-(84.00, 724.00, 0.050)-(96.00, 730.00, 0.050)-(108.00, 730.00, 0.050)



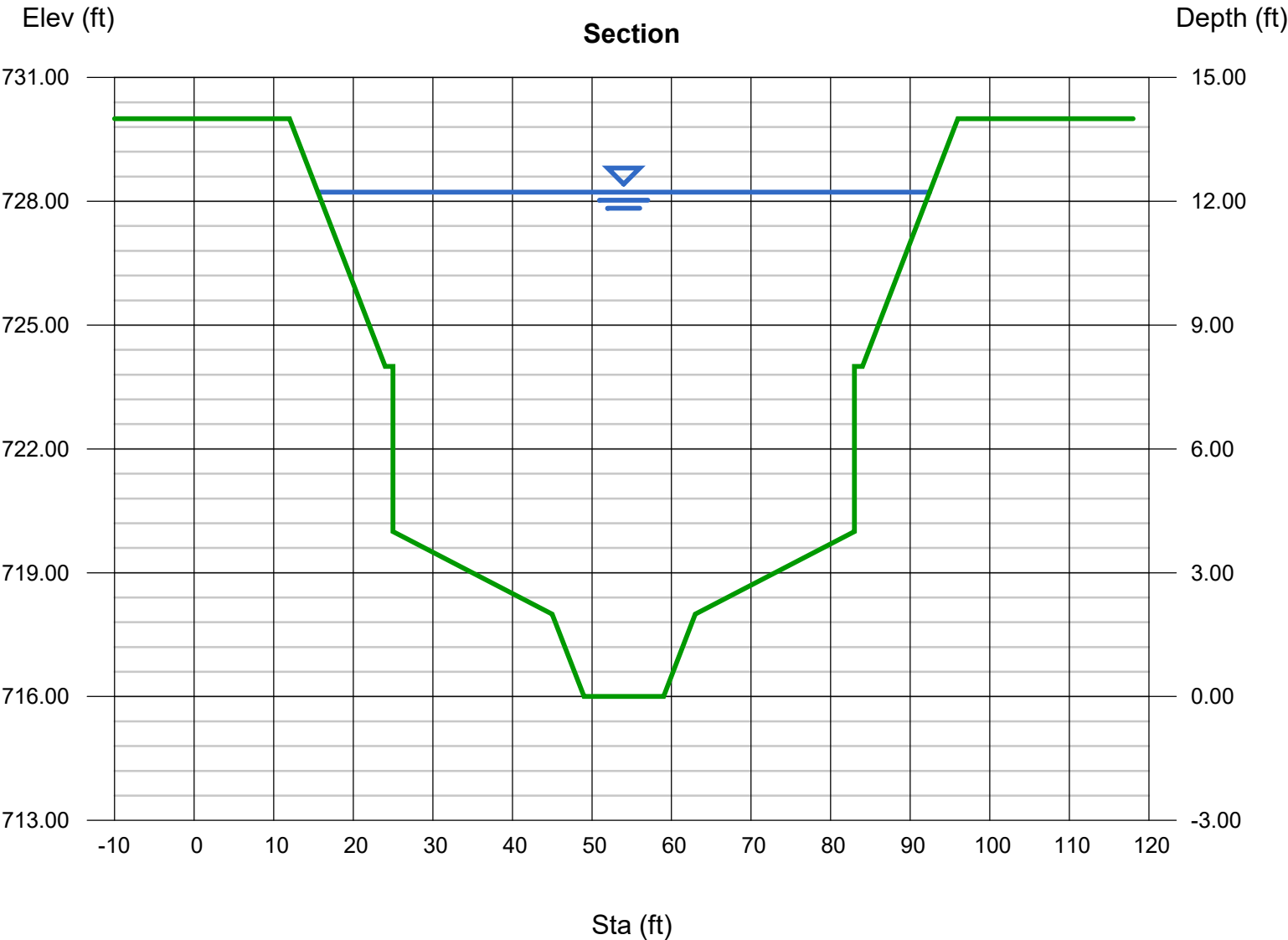
Channel Report

Escondido Creek PR Vegetated Channel - n=0.050 - 75% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 12.22
Slope (%)	= 0.40	Q (cfs)	= 4,341
N-Value	= 0.050	Area (sqft)	= 624.83
		Velocity (ft/s)	= 6.95
		Wetted Perim (ft)	= 88.02
		Crit Depth, Yc (ft)	= 7.80
		Top Width (ft)	= 76.88
		EGL (ft)	= 12.97

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

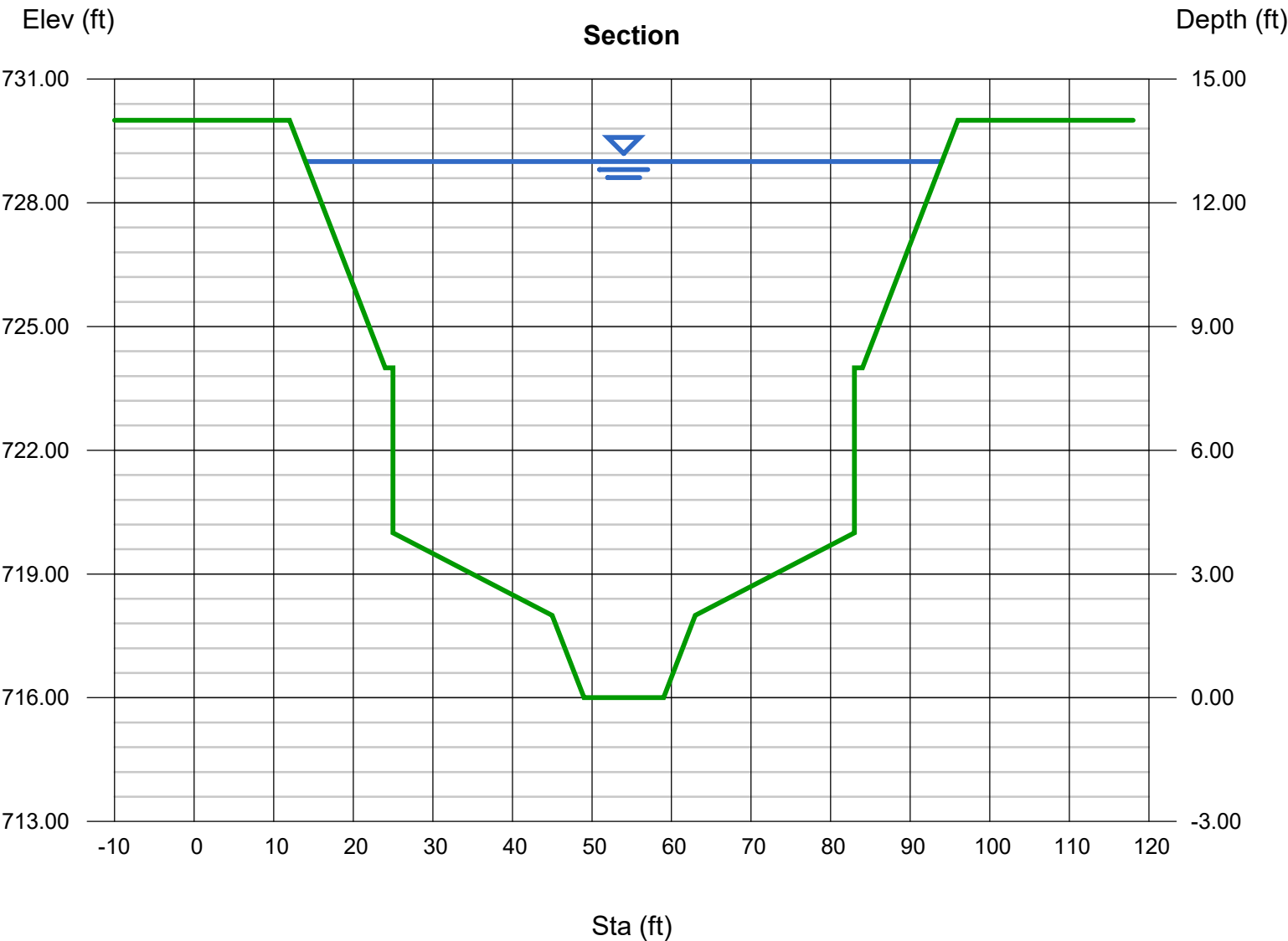
(0.00, 730.00)-(12.00, 730.00, 0.050)-(24.00, 724.00, 0.050)-(25.00, 724.00, 0.050)-(25.00, 720.00, 0.050)-(45.00, 718.00, 0.050)-(49.00, 716.00, 0.050)
-(59.00, 716.00, 0.050)-(63.00, 718.00, 0.050)-(83.00, 720.00, 0.050)-(83.00, 724.00, 0.050)-(84.00, 724.00, 0.050)-(96.00, 730.00, 0.050)-(108.00, 730.00, 0.050)



Channel Report

Escondido Creek PR Vegetated Channel - n=0.050 - 1ft Freeboard

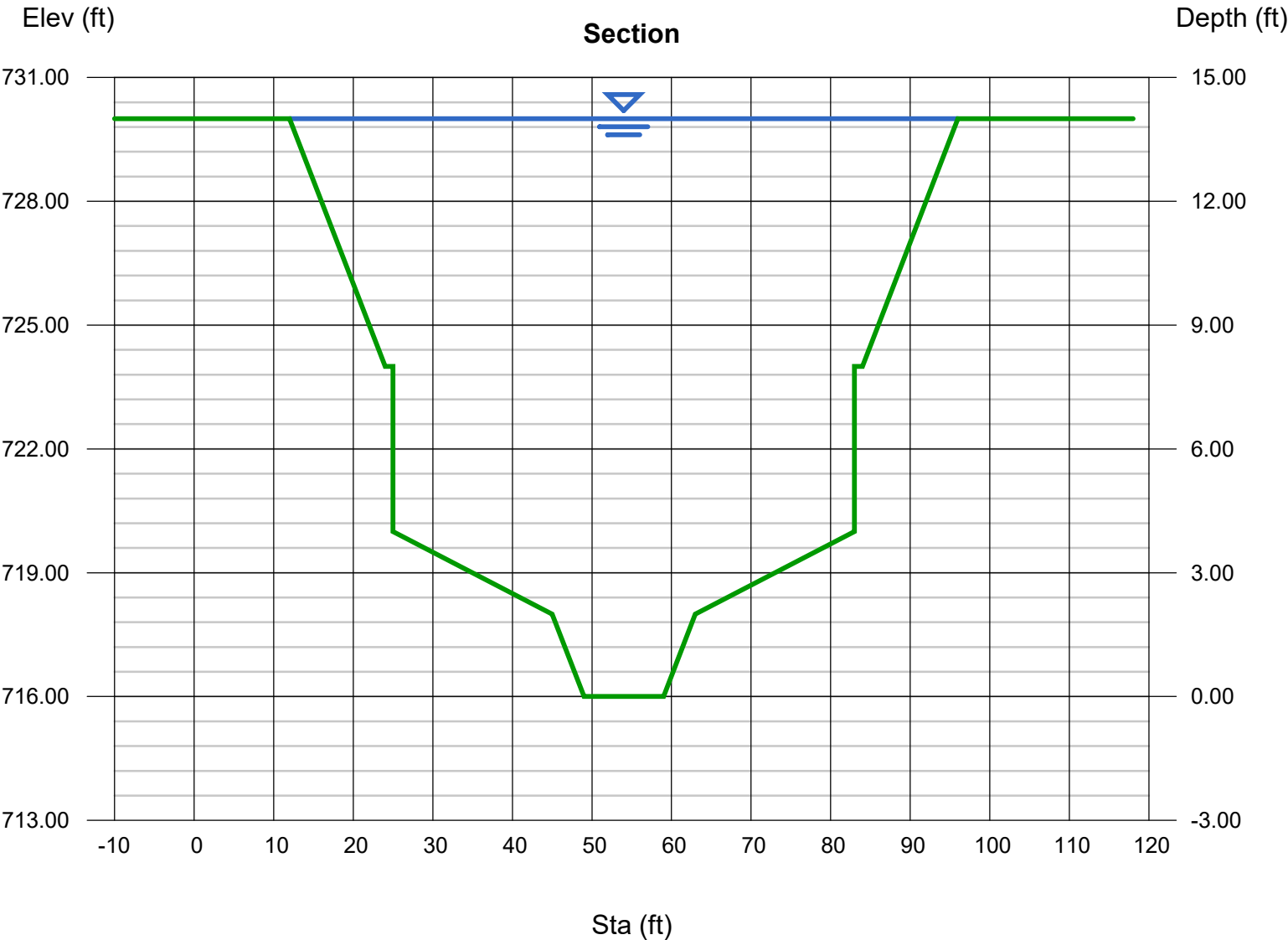
User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 13.00
Slope (%)	= 0.40	Q (cfs)	= 4,950
N-Value	= Composite	Area (sqft)	= 686.00
Calculations		Velocity (ft/s)	= 7.22
Compute by:	Q vs Depth	Wetted Perim (ft)	= 91.50
No. Increments	= 14	Crit Depth, Yc (ft)	= 8.41
		Top Width (ft)	= 80.00
		EGL (ft)	= 13.81
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.050)-(24.00, 724.00, 0.050)-(25.00, 724.00, 0.050)-(25.00, 720.00, 0.050)-(45.00, 718.00, 0.050)-(49.00, 716.00, 0.050)			
-(59.00, 716.00, 0.050)-(63.00, 718.00, 0.050)-(83.00, 720.00, 0.050)-(83.00, 724.00, 0.050)-(84.00, 724.00, 0.050)-(96.00, 730.00, 0.050)-(108.00, 730.00, 0.050)			



Channel Report

Escondido Creek PR Vegetated Channel - n=0.050 - 100% Full

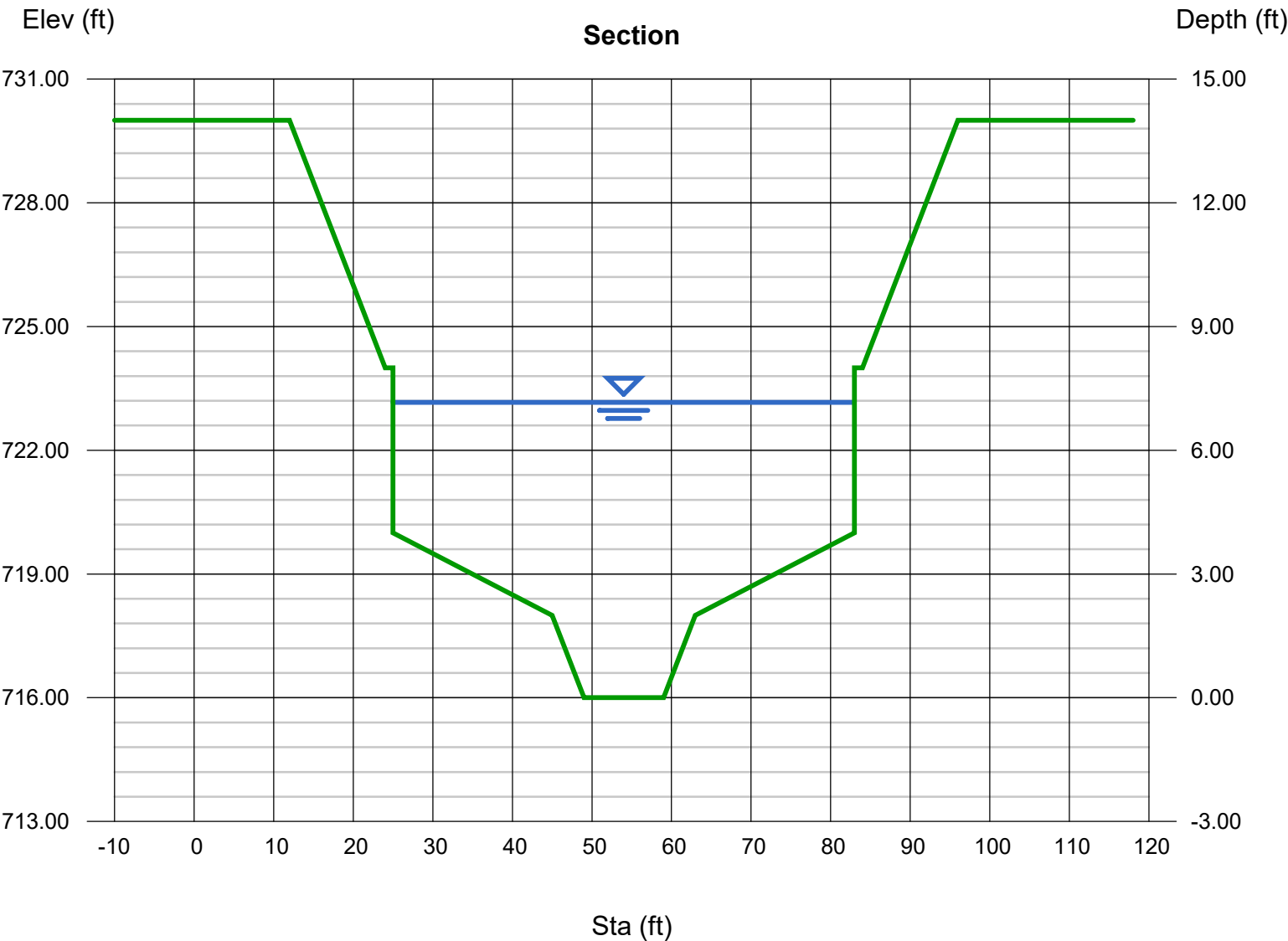
User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 14.00
Slope (%)	= 0.40	Q (cfs)	= 5,788
N-Value	= Composite	Area (sqft)	= 768.00
Calculations		Velocity (ft/s)	= 7.54
		Wetted Perim (ft)	= 95.98
		Crit Depth, Yc (ft)	= 9.14
		Top Width (ft)	= 84.00
		EGL (ft)	= 14.88
Compute by:	Q vs Depth		
No. Increments	= 14		
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.050)-(24.00, 724.00, 0.050)-(25.00, 724.00, 0.050)-(25.00, 720.00, 0.050)-(45.00, 718.00, 0.050)-(49.00, 716.00, 0.050)			
-(59.00, 716.00, 0.050)-(63.00, 718.00, 0.050)-(83.00, 720.00, 0.050)-(83.00, 724.00, 0.050)-(84.00, 724.00, 0.050)-(96.00, 730.00, 0.050)-(108.00, 730.00, 0.050)			



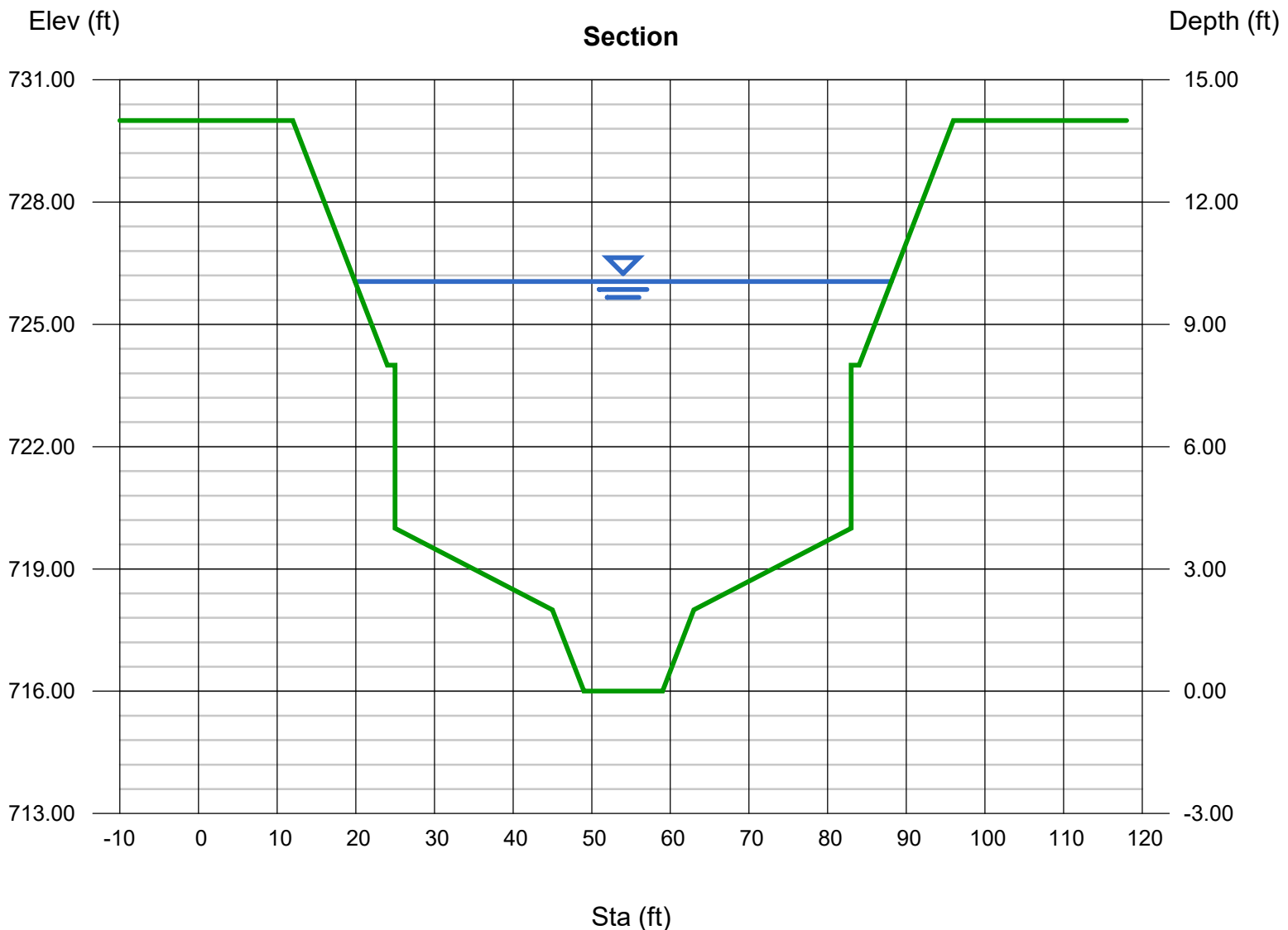
Channel Report

Escondido Creek PR Vegetated Channel - n=0.060 - 25% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 7.16
Slope (%)	= 0.40	Q (cfs)	= 1,206
N-Value	= 0.060	Area (sqft)	= 287.29
Calculations		Velocity (ft/s)	= 4.20
Compute by:	Known Q	Wetted Perim (ft)	= 65.46
Known Q (cfs)	= 1206.00	Crit Depth, Yc (ft)	= 4.59
		Top Width (ft)	= 58.00
		EGL (ft)	= 7.43
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.060)-(24.00, 724.00, 0.060)-(25.00, 724.00, 0.060)-(25.00, 720.00, 0.060)-(45.00, 718.00, 0.060)-(49.00, 716.00, 0.060)			
-(59.00, 716.00, 0.060)-(63.00, 718.00, 0.060)-(83.00, 720.00, 0.060)-(83.00, 724.00, 0.060)-(84.00, 724.00, 0.060)-(96.00, 730.00, 0.060)-(108.00, 730.00, 0.060)			



Monday, Aug 5 2024



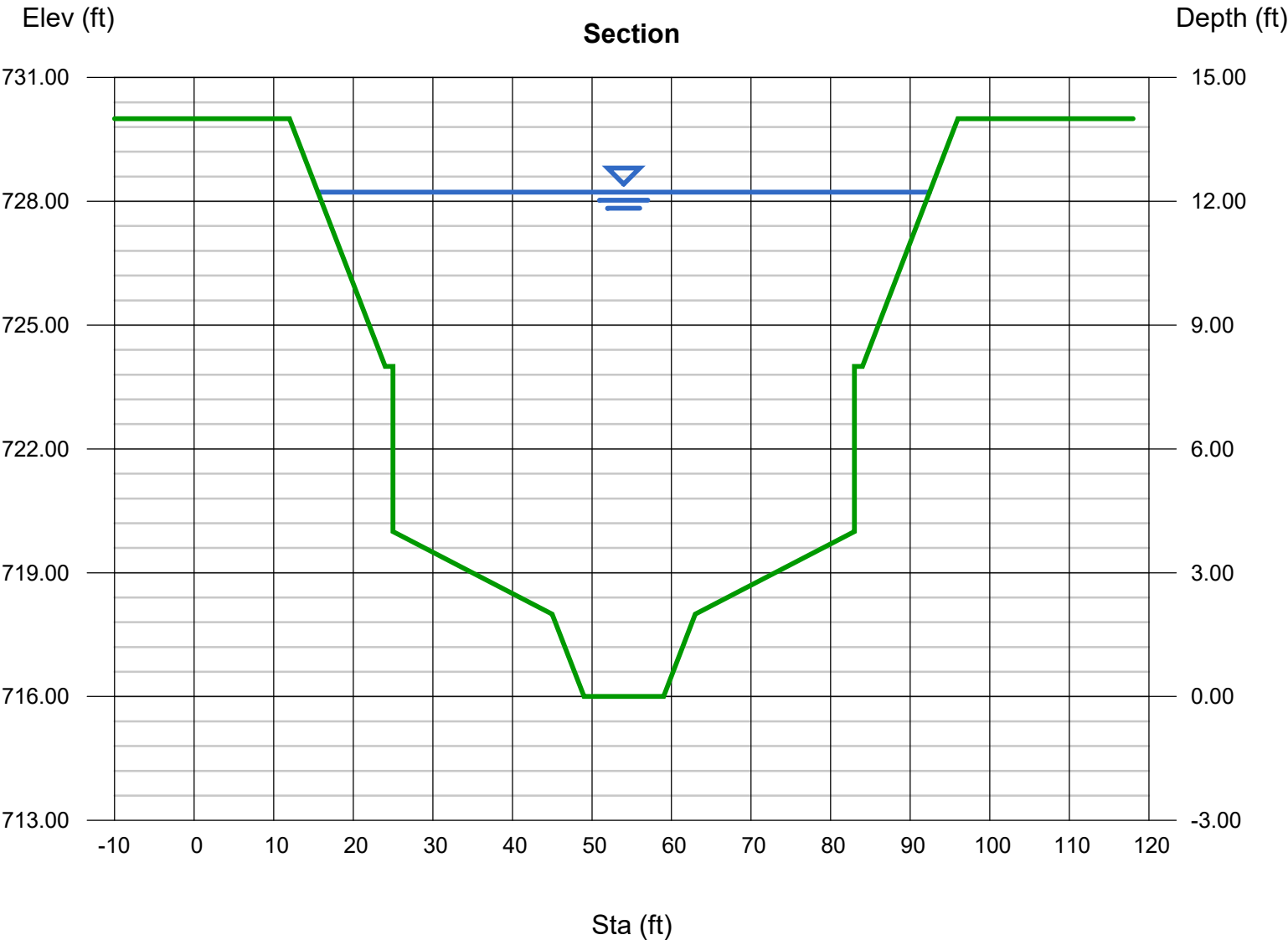
Channel Report

Escondido Creek PR Vegetated Channel - n=0.060 - 75% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 12.22
Slope (%)	= 0.40	Q (cfs)	= 3,617
N-Value	= 0.060	Area (sqft)	= 624.83
		Velocity (ft/s)	= 5.79
		Wetted Perim (ft)	= 88.02
		Crit Depth, Yc (ft)	= 7.16
		Top Width (ft)	= 76.88
		EGL (ft)	= 12.74

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

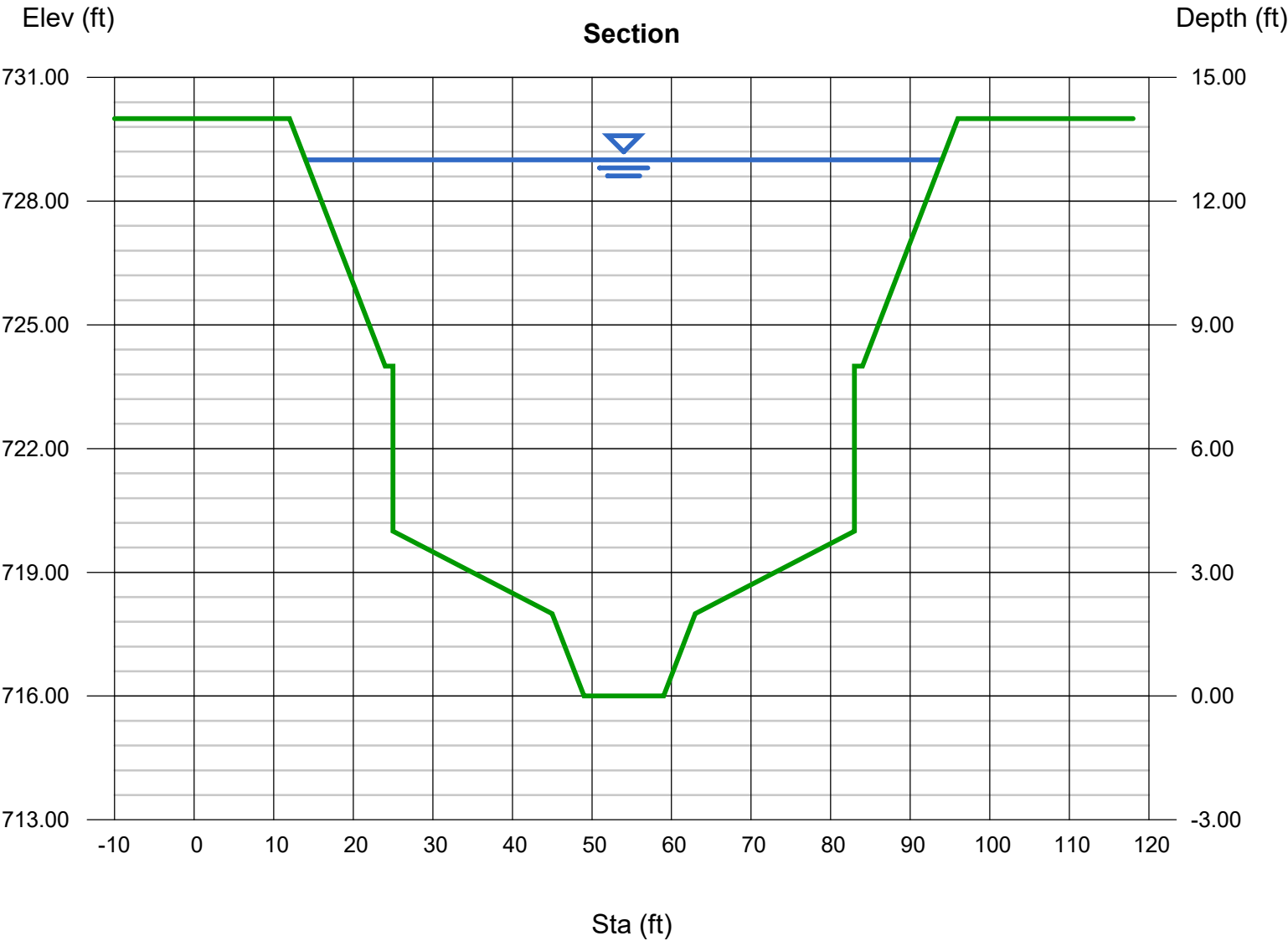
(0.00, 730.00)-(12.00, 730.00, 0.060)-(24.00, 724.00, 0.060)-(25.00, 724.00, 0.060)-(25.00, 720.00, 0.060)-(45.00, 718.00, 0.060)-(49.00, 716.00, 0.060)
-(59.00, 716.00, 0.060)-(63.00, 718.00, 0.060)-(83.00, 720.00, 0.060)-(83.00, 724.00, 0.060)-(84.00, 724.00, 0.060)-(96.00, 730.00, 0.060)-(108.00, 730.00, 0.060)



Channel Report

Escondido Creek PR Vegetated Channel - n=0.060 - 1ft Freeboard

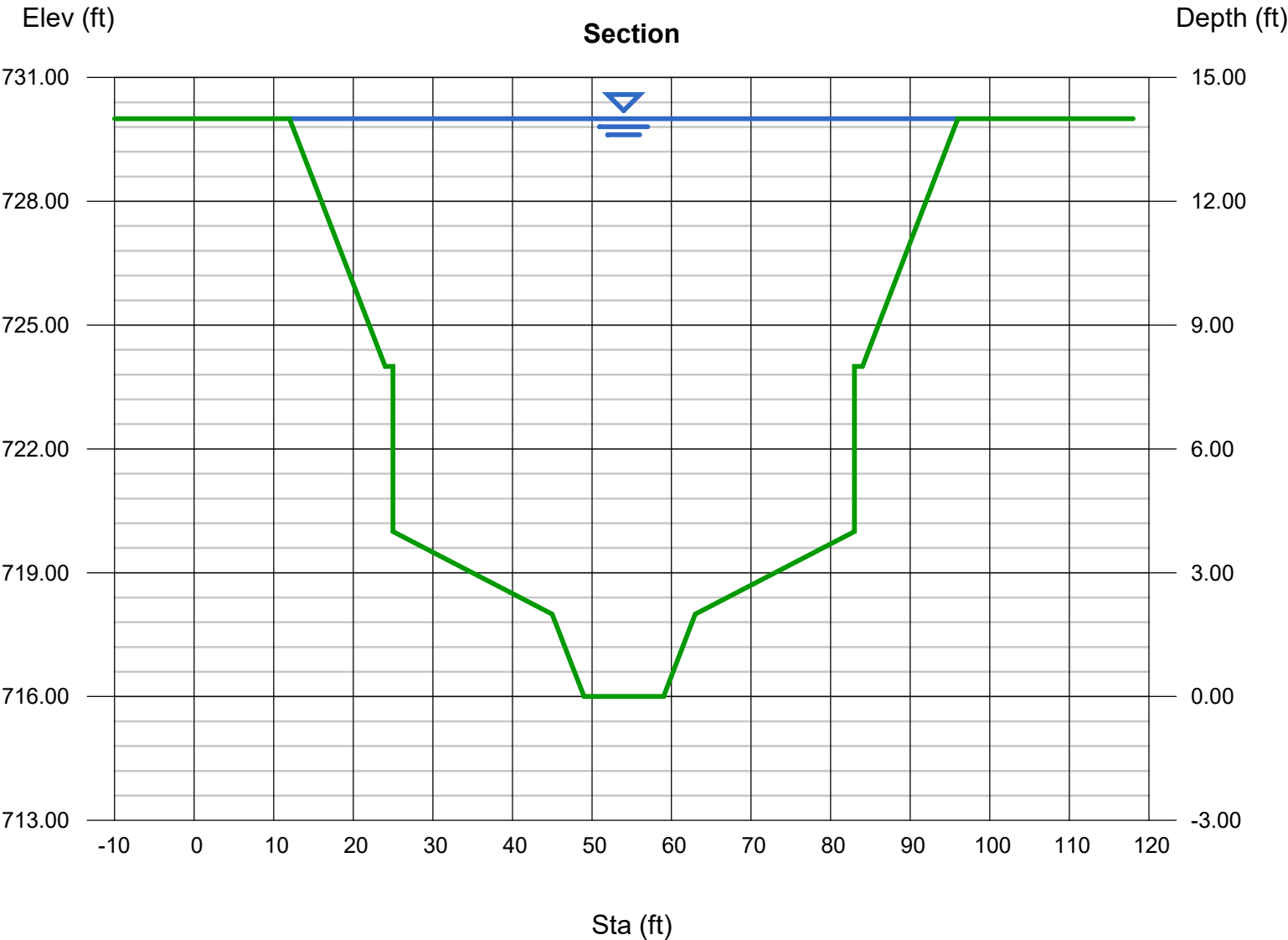
User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 13.00
Slope (%)	= 0.40	Q (cfs)	= 4,125
N-Value	= Composite	Area (sqft)	= 686.00
Calculations		Velocity (ft/s)	= 6.01
Compute by:	Q vs Depth	Wetted Perim (ft)	= 91.50
No. Increments	= 14	Crit Depth, Yc (ft)	= 7.61
		Top Width (ft)	= 80.00
		EGL (ft)	= 13.56
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.060)-(24.00, 724.00, 0.060)-(25.00, 724.00, 0.060)-(25.00, 720.00, 0.060)-(45.00, 718.00, 0.060)-(49.00, 716.00, 0.060)			
-(59.00, 716.00, 0.060)-(63.00, 718.00, 0.060)-(83.00, 720.00, 0.060)-(83.00, 724.00, 0.060)-(84.00, 724.00, 0.060)-(96.00, 730.00, 0.060)-(108.00, 730.00, 0.060)			



Channel Report

Escondido Creek PR Vegetated Channel - n=0.060 - 100% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 14.00
Slope (%)	= 0.40	Q (cfs)	= 4,823
N-Value	= Composite	Area (sqft)	= 768.00
Calculations		Velocity (ft/s)	= 6.28
Compute by:	Q vs Depth	Wetted Perim (ft)	= 95.98
No. Increments	= 14	Crit Depth, Yc (ft)	= 8.30
		Top Width (ft)	= 84.00
		EGL (ft)	= 14.61
(Sta, El, n)-(Sta, El, n)...			
(0.00, 730.00)-(12.00, 730.00, 0.060)-(24.00, 724.00, 0.060)-(25.00, 724.00, 0.060)-(25.00, 720.00, 0.060)-(45.00, 718.00, 0.060)-(49.00, 716.00, 0.060)			
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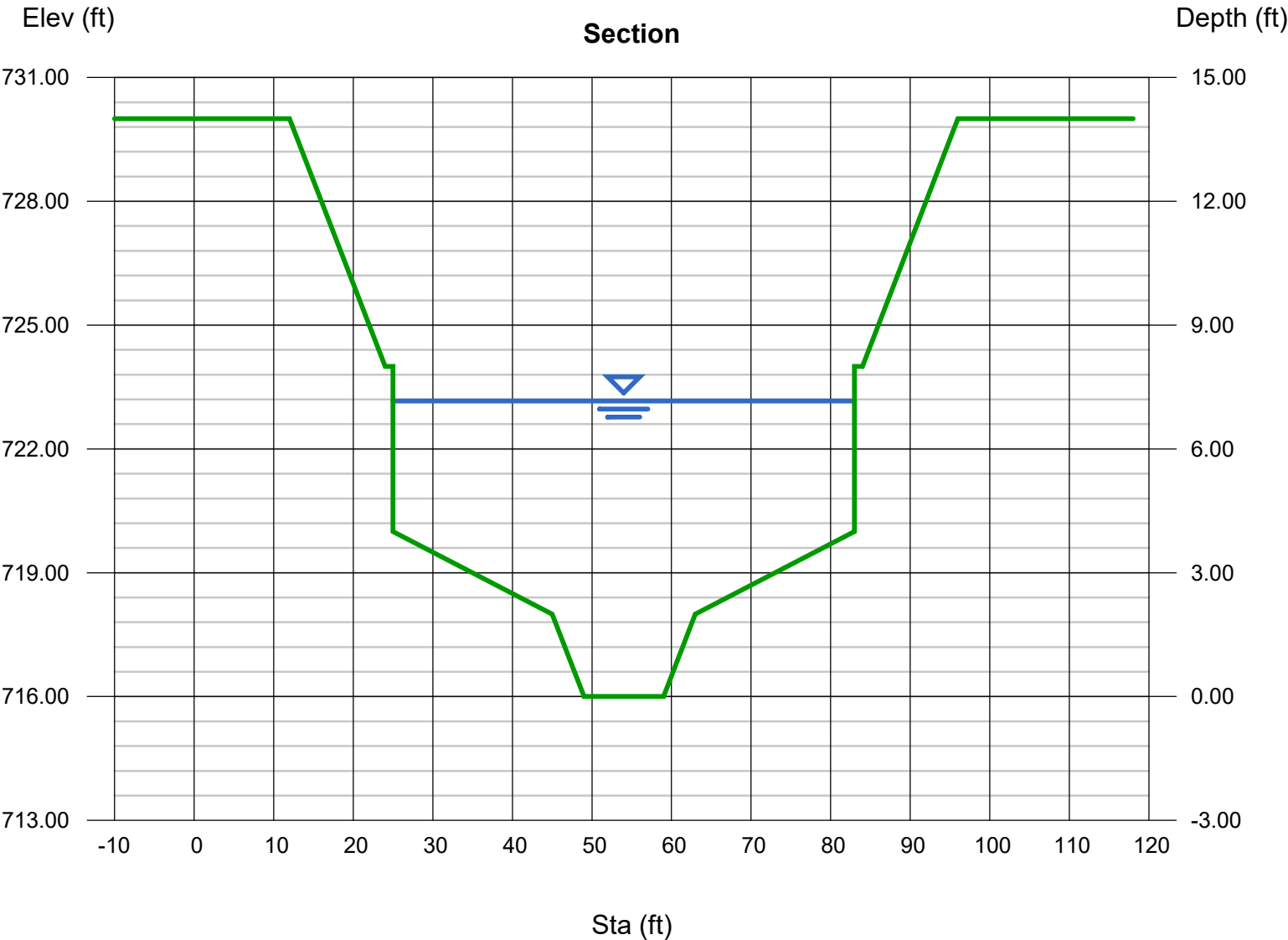
Channel Report

Escondido Creek PR Vegetated Channel - n=0.150 - 25% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 7.16
Slope (%)	= 0.40	Q (cfs)	= 482.00
N-Value	= 0.150	Area (sqft)	= 287.29
		Velocity (ft/s)	= 1.68
		Wetted Perim (ft)	= 65.46
		Crit Depth, Yc (ft)	= 3.30
		Top Width (ft)	= 58.00
		EGL (ft)	= 7.20

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

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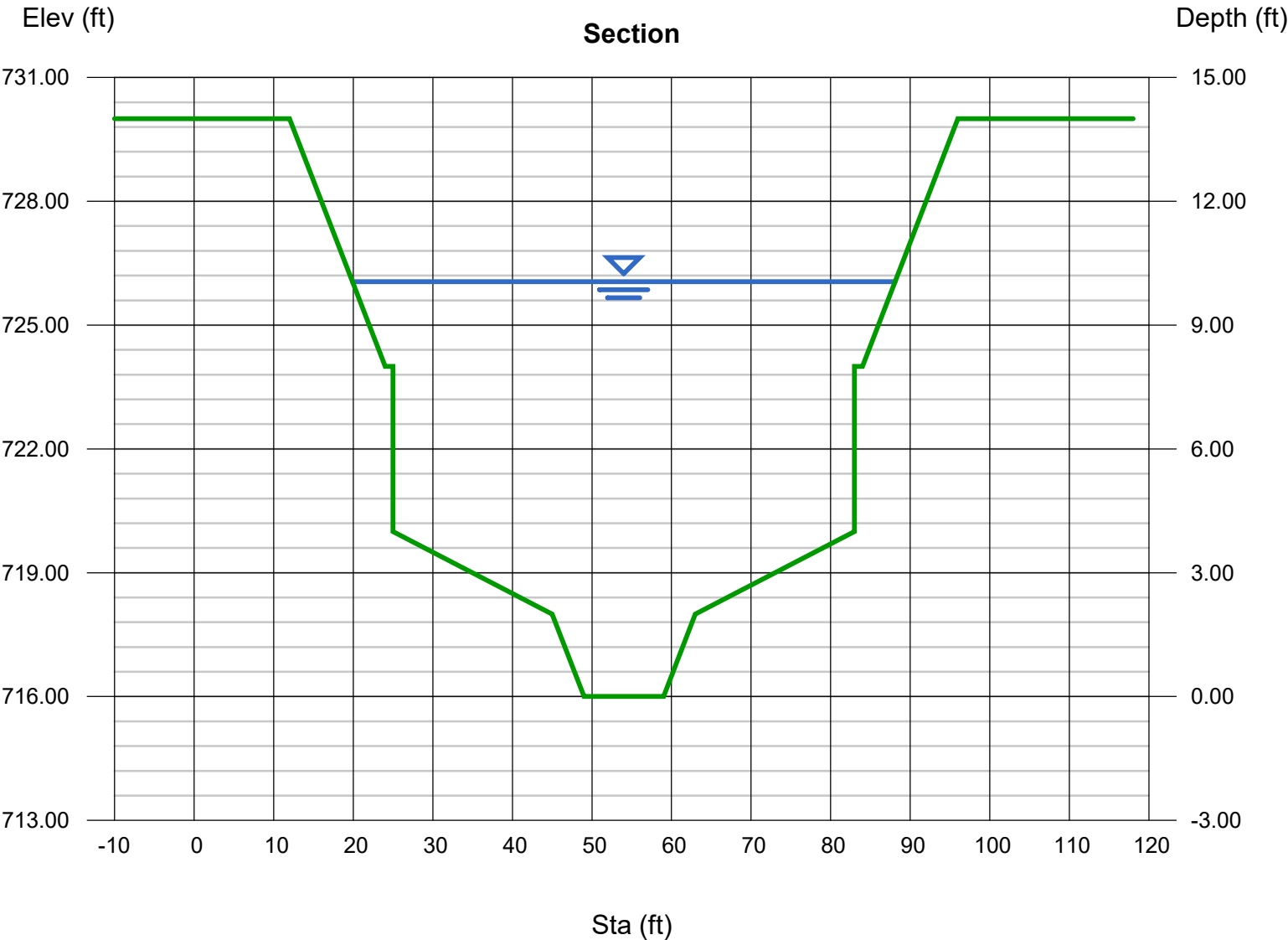
Channel Report

Escondido Creek PR Vegetated Channel - n=0.150 - 50% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 10.05
Slope (%)	= 0.40	Q (cfs)	= 964.00
N-Value	= 0.150	Area (sqft)	= 467.41
Calculations		Velocity (ft/s)	= 2.06
		Wetted Perim (ft)	= 78.31
		Crit Depth, Yc (ft)	= 4.26
		Top Width (ft)	= 68.20
		EGL (ft)	= 10.12

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

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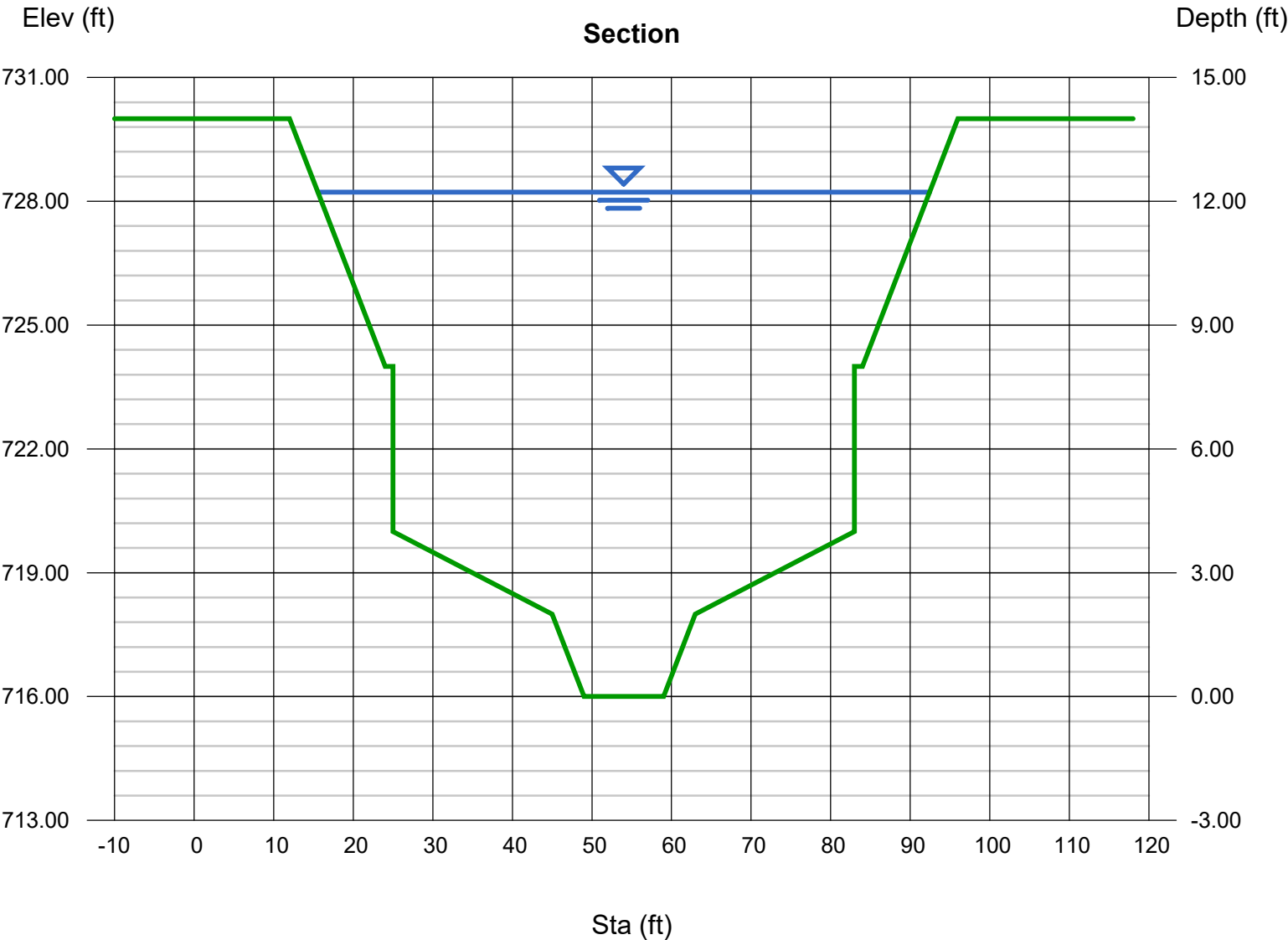
Channel Report

Escondido Creek PR Vegetated Channel - n=0.150 - 75% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 12.22
Slope (%)	= 0.40	Q (cfs)	= 1,446
N-Value	= 0.150	Area (sqft)	= 624.83
		Velocity (ft/s)	= 2.31
		Wetted Perim (ft)	= 88.02
		Crit Depth, Yc (ft)	= 4.90
		Top Width (ft)	= 76.88
		EGL (ft)	= 12.30

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

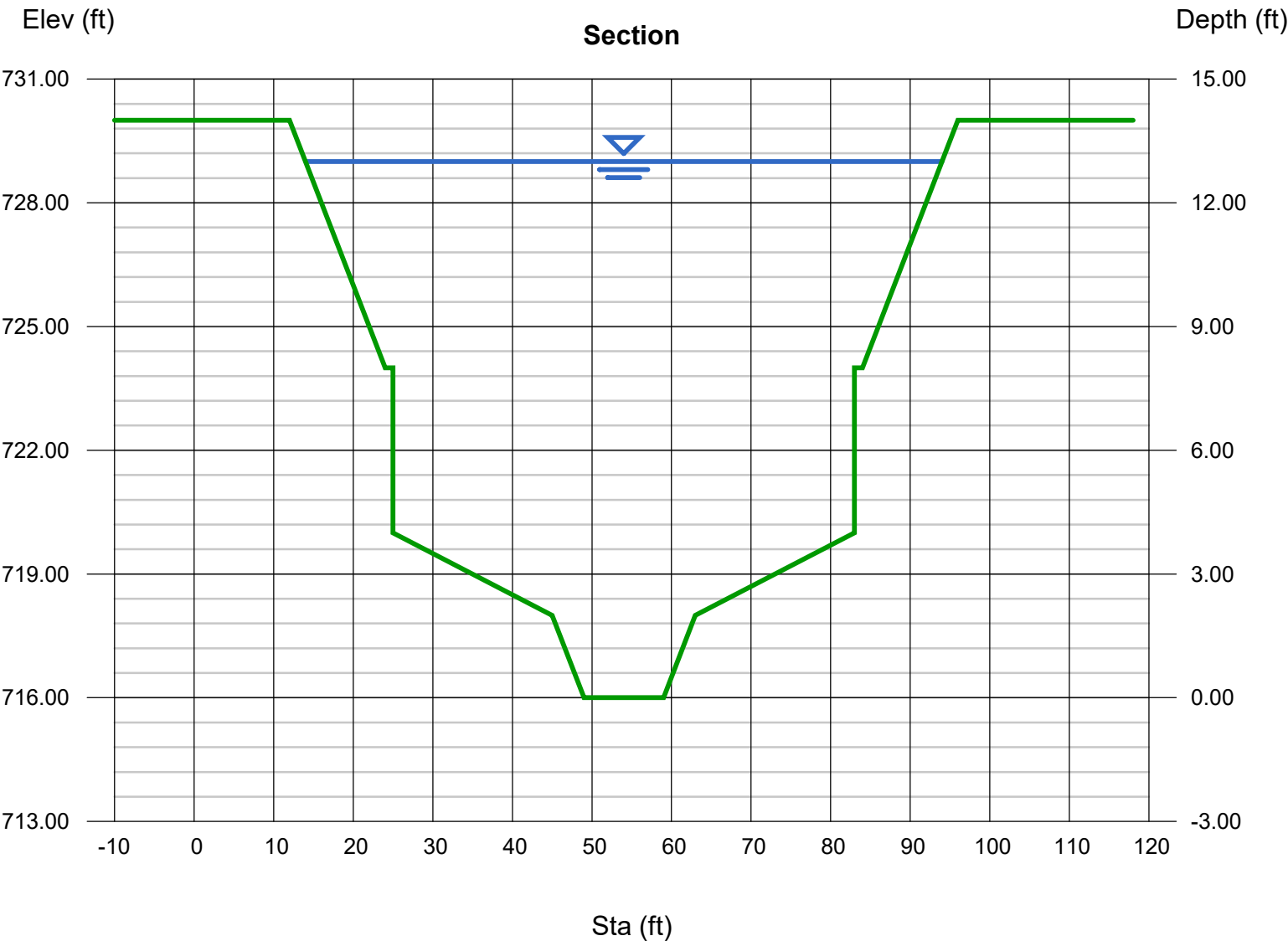
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Channel Report

El Caballo Park - PR Vegetated Channel - n=0.150 - 1ft Freeboard

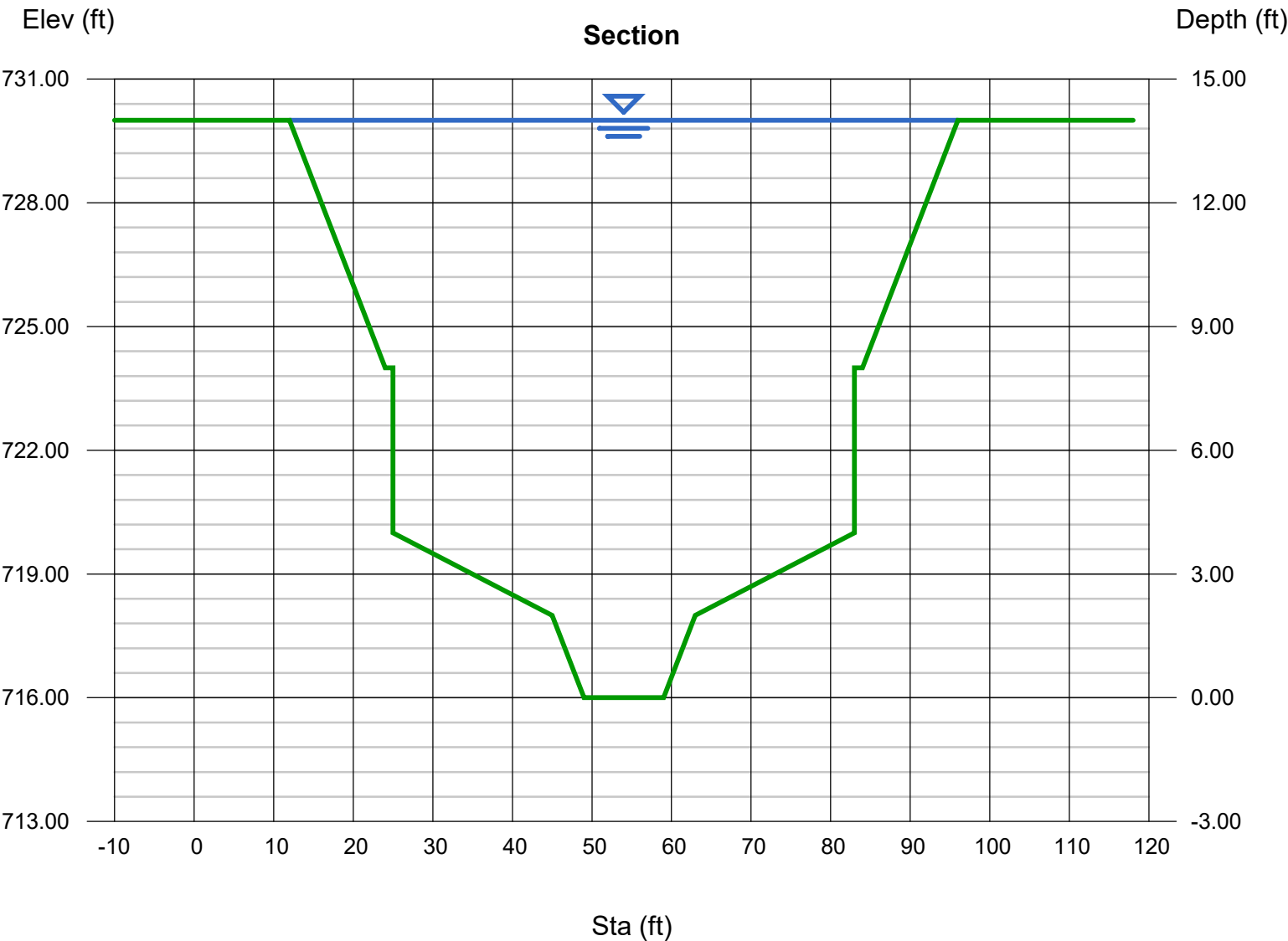
User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 13.00
Slope (%)	= 0.40	Q (cfs)	= 1,649
N-Value	= Composite	Area (sqft)	= 686.00
Calculations Compute by: Q vs Depth No. Increments = 14		Velocity (ft/s)	= 2.40
		Wetted Perim (ft)	= 91.50
		Crit Depth, Yc (ft)	= 5.14
		Top Width (ft)	= 80.00
		EGL (ft)	= 13.09
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Channel Report

El Caballo Park - PR Vegetated Channel - n=0.150 - 100% Full

User-defined		Highlighted	
Invert Elev (ft)	= 716.00	Depth (ft)	= 14.00
Slope (%)	= 0.40	Q (cfs)	= 1,928
N-Value	= Composite	Area (sqft)	= 768.00
Calculations		Velocity (ft/s)	= 2.51
Compute by:	Q vs Depth	Wetted Perim (ft)	= 95.98
No. Increments	= 14	Crit Depth, Yc (ft)	= 5.46
		Top Width (ft)	= 84.00
		EGL (ft)	= 14.10
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Attachment 6

2014 Master Plan Excerpts



DRAFT **EL CABALLO PARK MASTER PLAN REPORT**

DATE: 02-11-14

PREPARED FOR:
CITY OF ESCONDIDO
201 NORTH BROADWAY
ESCONDIDO, CA 92025

PREPARED BY:
WYNN-SMITH LANDSCAPE ARCHITECTURE, INC.
12315 OAK KNOLL RD., SUITE 230 POWAY, CA 92064



An aerial photograph of a park area with a master plan overlay. The plan shows a winding river on the left, a large paved area with a circular feature, several rectangular fields, and numerous trees. A road runs along the right side of the park. The text "Master Plan Description" is overlaid in the center.

Master Plan Description

MASTER PLAN DESCRIPTION

Final Master Plan

The Master Plan, shown on the following page, reflects the overall plan and the subsequent pages provide enlargements showing greater detail.

It is proposed that the park will be built in phases as suggested later in this report.

Master Plan Features Legend

- ① Improved Existing Arena
- ② Lower Equestrian Area Development
- ③ Connection to Caballo Trail and Daley Ranch
- ④ Therapeutic Riding Arena
- ⑤ Common Gathering and Picnic Areas
- ⑥ Tributary Creek
- ⑦ Horse Trailer Parking
- ⑧ Overflow Parking
- ⑨ Improved Escondido Creek
- ⑩ Connection to Escondido Creek Trail
- ⑪ Mayflower Dog Park
- ⑫ Hidden Valley Obedience Club
- ⑬ Therapeutic Riding Trail
- ⑭ Monument Sign 1
- ⑮ Monument Sign 2
- ⑯ Monument Sign 3
- ⑰ Monument Sign 4



Master Plan Features

- ① Improved Existing Area
- ② Lower Equestrian Area
- ③ Connection to Caballo
- ④ Therapeutic Riding Area
- ⑤ Common Gathering and
- ⑥ Tributary Creek
- ⑦ Horse Trailer Parking
- ⑧ Overflow Parking
- ⑨ Improved Escondido C
- ⑩ Connection to Escondido
- ⑪ Mayflower Dog Park
- ⑫ Hidden Valley Obedien
- ⑬ Therapeutic Riding Tra
- ⑭ Monument Sign 1
- ⑮ Monument Sign 2
- ⑯ Monument Sign 3
- ⑰ Monument Sign 4

Figure 43: Final Master Plan

MASTER PLAN DESCRIPTION

Existing Arena Area Improvement

Existing Arena Area Improvement Description

This area has an existing arena designed and built by the Charros who currently use the facility. There is a small set of bleachers at the east end of the round arena and make-shift amphitheater seating on the south end of the arena taking advantage of an existing slope.

The condition of the arena requires improvements to make the arena safer for animals and riders. It is proposed that the arena will be improved with better railings, solid siding and improved corrals for temporary holding of livestock.

The railings will be divided by stone pillars using matching natural stone used throughout the park.

For separation between pedestrians and horses, horses enter the arena area from the north using a dedicated trail fenced off from the “event” picnic area to the east of the entry trail. The horses are led or ridden over a bridge designed to reduce balking by the horse.

Improved Existing Arena Features Legend

- ① Improved Fencing
- ② New Bleachers
- ③ New Seating on Slope
- ④ Ticket Booth and Restrooms
- ⑤ Accessible Path from Disabled Parking Below
- ⑥ 3-Rail Fencing to Control Visitor Access
- ⑦ Gates
- ⑧ Citrus Grove (To Reflect Historic Use)
- ⑨ Shade Trees
- ⑩ Announcer’s Stage

Improved Existing Arena Features Legend

- ⑪ Band Stand
- ⑫ 16’ Wide Bridge with Decomposed Granite Paving
- ⑬ Pedestrian Bridge
- ⑭ New 12’ x 12’ Corrals
- ⑮ Muck Storage
- ⑯ Trash Enclosure
- ⑰ Wash Racks (2)
- ⑱ Bull Corrals
- ⑲ Round Pen
- ⑳ Vehicular Turn-Around
- ㉑ Emergency Vehicular Hammerhead
- ㉒ Equestrian Entry Path
- ㉓ Shade Structure
- ㉔ BBQ, Picnic and Dance area
- ㉕ Changing Room
- ㉖ Expanded Vehicular Access
- ㉗ 4-Rail Fencing
- ㉘ Existing Eucalptus to be removed per phasing plan and replace with native trees



KEY MAP

Figure 44: Existing Arena Area Improvements

MASTER PLAN DESCRIPTION

Lower Equestrian Area

Lower Equestrian Area Description

This area is the heart of the park in that it provides amenities for all. Equestrians, dog lovers and anyone else will be able to interact in this space safely.

The Equestrian components include a 100'x200' riding arena, two 55' portable round pens, a 45' round pen, corrals for a variety of purposes, multiple seating areas for events in the large arena and appropriate safety fencing and a staging area to Daley Ranch.

This area is set 14' below and centered on the upper shade structure and picnic space creating optimum viewing opportunities.

The round lawn area, surrounded by paving with a "lasso" pattern, is integrated into the park providing passive and light active play opportunities. The perimeter of this space has three shaded picnic spaces, four horse corrals for visitors arriving by horse and a landscaped area to the west that will provide opportunities to learn about the environment and history of the area. An additional lawn area is provided north of the circular lawn area creating close viewing of activities in the large arena. The edges are natural without definition to create a rustic park appearance.

Children exploring this area may find opportunities to make etchings of "fossils" of paw prints, leaves and other natural elements. Descriptions of these findings will be located near the Community Hall. QR codes may also be available to aid in looking up additional information. Grinding stones may also be found.

Outdoor classrooms may occur in the lawn areas, shaded picnic areas and the space between the Community Hall and the large arena.

Opportunities for public art surround the circular lawn area. The Mayflower Tree is included in the potential provision of public art and is proposed to be relocated in this area.

Lower Equestrian Area Features Legend

- ① Community Hall Building with 40' x 40' Multi-Use Space, Restrooms, Office Space, Kitchen/Concessions Space, Wrap around Porch and 2nd floor caretakers apartment
- ② 100' x 200' Arena
- ③ 55' Round Pen
- ④ 20' x 24' Corrals
- ⑤ Bleachers
- ⑥ Amphitheater Seating
- ⑦ Wash Racks
- ⑧ 12' x 12" Corrals
- ⑨ Staging Area at Caballo Trailhead
- ⑩ Mounded Lawn Area
- ⑪ Lawn Area Surrounded by Paved Walkway with Lasso Pattern to Reflect Equestrian Activities
- ⑫ Shade Structures
- ⑬ Nature Exploration Area
- ⑭ Public Art Opportunity
- ⑮ Standard Vehicular Parking
- ⑯ Disabled Parking Stalls
- ⑰ 24' Wide Two-Way Improved Access Road
- ⑱ Tributary Creek Improved with Native Planting
- ⑲ Therapeutic Arena
- ⑳ 2-Rail Fence
- ㉑ 3-Rail Fence
- ㉒ 4-Rail Fence



KEY MAP

Figure 45: Lower Equestrian Area

MASTER PLAN DESCRIPTION

Horse Trailer Parking

Horse Trailer Parking Description

Providing a portion of the necessary parking for large equestrian events, 15 trailer spaces are proposed with decomposed granite paving and hitching posts at each space. These spaces have potential to hold 15 - 72 horses depending on the number of horses carried in each trailer.

A maintenance facility structure for the park is provided at the north end of the parking area along with a trash enclosure and muck storage facility.

Horse riders, arriving by trailer, have easy and safe access to the new entry area to Caballo Trail in Daley Ranch.

The staging area is equipped with hitching posts, picnic tables, 12x12 corrals, wash racks and shade creating opportunities for people to meet before and after a ride. This also provides opportunities for non-equestrians to get close to horses and talk with equestrians.

Parking for standard vehicles, located on the west side of "Save A Life driveway" are proposed to be decomposed granite.

A gate is proposed at the entrance to the Escondido Humane Society to control traffic if, in the future, a new access road is constructed at the intersection of Lake Wohlford Road and East Valley Road.

Horse Trailer Parking Features Legend

- ① Community Hall Building / Restrooms / Caretaker Residence / Offices - raised 18"
- ② Porch - Raised 18"
- ③ Disabled Parking Stalls
- ④ Trailer Parking - 18' x 60' minimum with Decomposed Granite Surface
- ⑤ Emergency Drive Through and Turn-Around Loop
- ⑥ Maintenance Building
- ⑦ Muck Storage - Covered
- ⑧ Trash Enclosure
- ⑨ Maintenance Crew Parking
- ⑩ Pedestrian Access to Existing Pedestrian Bridge
- ⑪ Escondido Creek Channel
- ⑫ 4 - Rail Fence
- ⑬ Escondido Creek Trail Extension
- ⑭ City Entry Monument #1
- ⑮ Gate for Future Expansion of Road
- ⑯ Staging area for Daley Ranch
- ⑰ Bicycle Rack
- ⑱ Entry Monument #4



KEY MAP

Figure 46: Horse Trailer Parking

MASTER PLAN DESCRIPTION

Lower Multi-Use Parking

Lower Multi-Use Parking Description

Providing important overload parking for large events occurring in the park, this parking area will also provide parking for the Hidden Valley Obedience Club that has needs for standard parking stalls and motor home stalls.

The paving is to be decomposed granite and will drain to the landscape area between Beven Road and the parking lot.

Parking along the south edge of the lot is on GrassPave2 material to visually widen the landscape appearance.

The Park Entry Monument #2 identifies the park and other amenities found in the area. Pedestrians walk through the Ranch style gateway and walk along a meandering DG path with benches along the way. The landscape will be used to provide visual interest and water quality treatment meeting hydromodification requirements.

Just inside the entry gateway are bicycle racks, picnic tables and a drinking fountain to provide important rest and hydration for cyclists attracted to the area.

Equestrian access to the main park is provided by a bridge immediately north of the existing vehicular bridge crossing Escondido Creek.

Lower Multi-Use Parking Features Legend

- ① Hidden Valley Obedience Club
- ② Park Entry Monument Sign #2
- ③ Existing Concrete Walkway
- ④ New Decomposed Granite Pathway with benches
- ⑤ Decomposed Granite Parking Lot
- ⑥ 28' x 75' Trailer and Motorhome Parking
- ⑦ Log Tire Stops from Eucalyptus Trees On-Site
- ⑧ 3 - Rail Fence
- ⑨ 4 - Rail Fence
- ⑩ GrassPave2 Parking Spaces to Expand the "Park" Experience
- ⑪ Shade Trees
- ⑫ Escondido Creek Trail Extension
- ⑬ Decomposed Granite Pathway
- ⑭ Bicycle Rack
- ⑮ Drinking Fountain
- ⑯ Picnic Table
- ⑰ New Concrete Pathway
- ⑱ 16" Wide Bridge with Decomposed Granite Paving



KEY MAP

Figure 47: Lower Multi-Use Parking

MASTER PLAN DESCRIPTION

Dog Park - El Caballo Park Connection

Dog Park - El Caballo Park Connection Description

Connecting Mayflower Dog Park with El Caballo Park is critical in supporting the park design concept of bringing people together and maximizing opportunities to share experiences. The concrete channel of Escondido Creek strongly divides the two park spaces making it difficult to move from one space to the other.

A rustic bridge is proposed to link the two spaces with an entry point strategically located at the southwest end of Mayflower Dog Park with a direct view and path to the heart of El Caballo Park. Existing parking is immediately adjacent to this park entry.

On the Dog Park side, a restroom is proposed with bicycle racks and drinking fountain. Following the City's design guidelines for Escondido Creek Trail, accent paving is proposed at this "node" where it connects with the proposed extension of Escondido Creek Trail.

Dog Park - El Caballo Park Connection Features Legend

- ① Dog Park Connection Node
- ② Public Art
- ③ Restrooms
- ④ Escondido Creek Channel
- ⑤ New Pedestrian Bridge
- ⑥ Existing Culvert
- ⑦ Trailer Parking
- ⑧ Bicycle Rack
- ⑨ Drinking Fountain



KEY MAP

Figure 48: Dog Park - El Caballo Park Connection

MASTER PLAN
DESCRIPTION

3-D Views Into Park

3-D Views Into Park



Figure 49: View Across Bridge Into Heart Of Park



Figure 50: View Of Community Hall And 100' x 200' Arena

MASTER PLAN
DESCRIPTION

3-D Views Into Park



Figure 51: View From Above Daley Ranch Looking South



Figure 52: View Of Lower Equestrian Area

Escondido Creek - Potential Modification

The existing Escondido Creek, running along the east side of the park, is lined with concrete and has a concrete bottom. The master plan proposes to modify the creek, beginning at the north end of the concrete channel by removing the concrete sides and a portion of the concrete bottom replacing the concrete with vegetation as shown in the drawing to the right.

With the addition of trees and grasses, the creek will create a stronger visual connection between the Mayflower Dog Park and El Caballo Park and promote natural solutions to stormwater drainage.

An 8' wide concrete path is proposed to facilitate ongoing maintenance access.

Careful hydrologic flow analysis must be conducted prior to developing any details for this work. Drawings in this report depicting such modifications are conceptual only and not based on detailed studies.

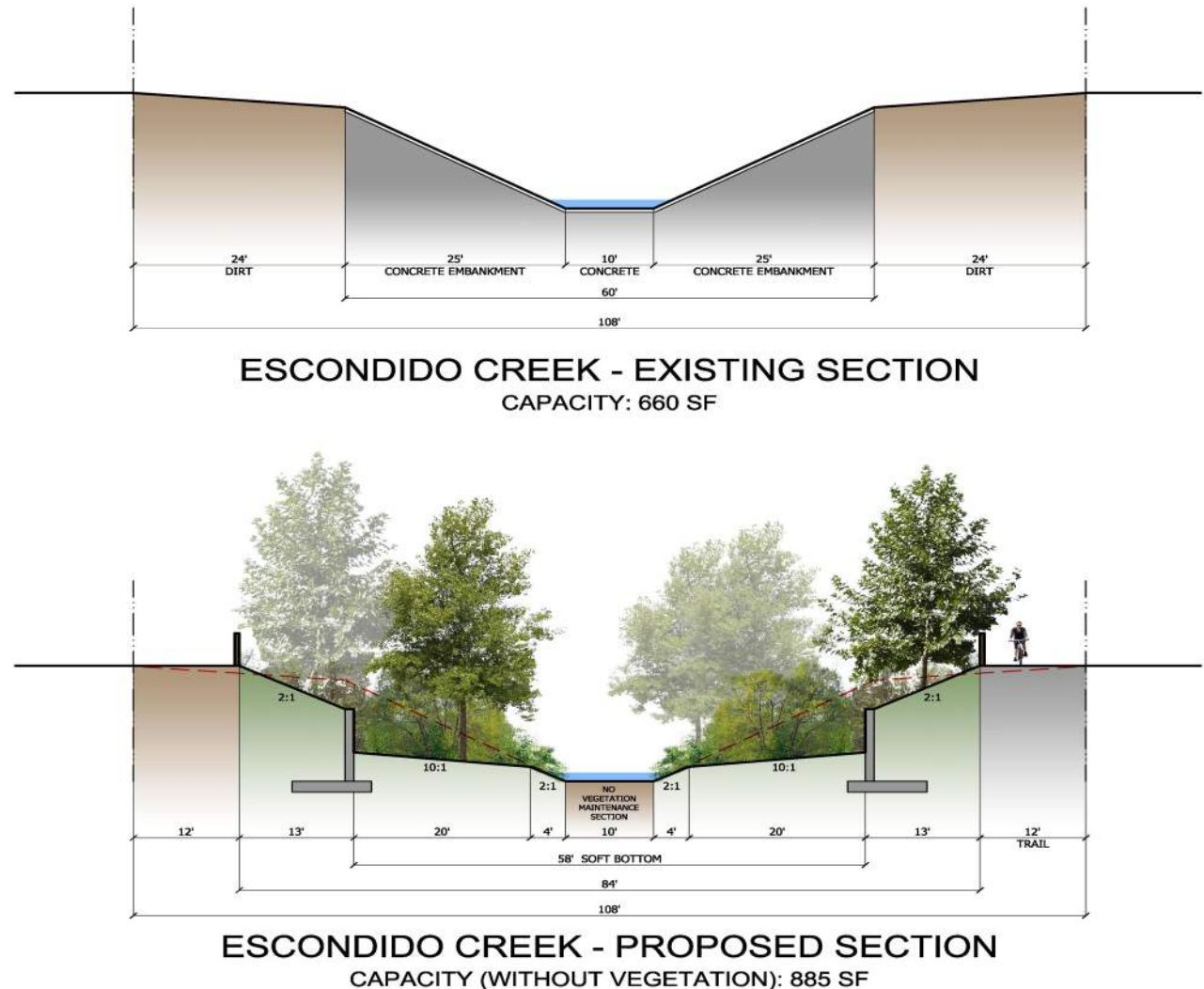


Figure 67: Escondido Creek Potential Modification