Appendix C – Hydraulic Calculations

- Normal Depth Calculations – Streets
- Normal Depth Calculations – Onsite
- Normal Depth Calculations – Easements
- Flow Split Calculations
- Finished Floor Elevation Table Check

Worksheet for RAC1 (100 Yrs)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.47 %
Discharge	63.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.71
0+06.00	0.59
0+16.50	0.38
0+16.86	0.38
0+17.83	0.06
0+17.83	0.00
0+19.00	0.13
0+19.00	0.17
0+36.00	0.51
0+53.00	0.17
0+53.00	0.13
0+54.17	0.00
0+54.17	0.06
0+55.14	0.38
0+55.50	0.38
0+66.00	0.59

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.71)	(0+16.50, 0.38)	0.025
(0+16.50, 0.38)	(0+19.00, 0.13)	0.013
(0+19.00, 0.13)	(0+53.00, 0.13)	0.016
(0+53.00, 0.13)	(0+55.50, 0.38)	0.013
(0+55.50, 0.38)	(0+66.00, 0.59)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.77 ft
Roughness Coefficient	0.020

Worksheet for RAC1 (100 Yrs)

Results	
Elevation	0.77 ft
Elevation Range	0.00 to 0.71 ft
Flow Area	24.2 ft²
Wetted Perimeter	66.57 ft
Hydraulic Radius	0.36 ft
Top Width	66.00 ft
Normal Depth	0.77 ft
Critical Depth	0.71 ft
Critical Slope	0.87 %
Velocity	2.60 ft/s
Velocity Head	0.10 ft
Specific Energy	0.87 ft
Froude Number	0.756
Flow Type	Subcritical

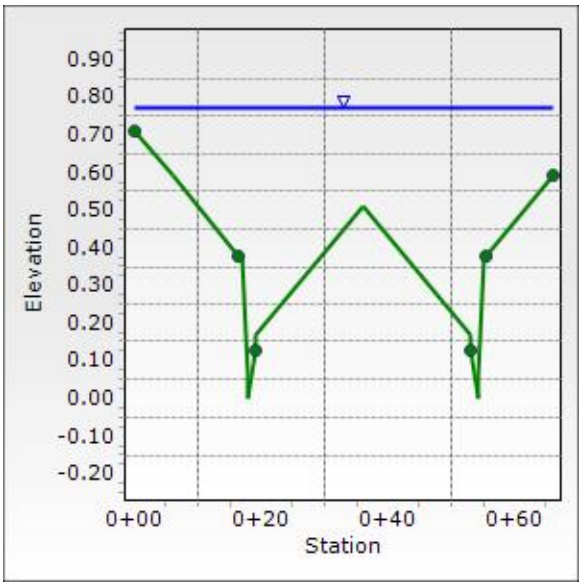
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.77 ft
Critical Depth	0.71 ft
Channel Slope	0.47 %
Critical Slope	0.87 %

Cross Section for RAC1 (100 Yrs)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.47 %
Normal Depth	0.77 ft
Discharge	63.00 cfs



Worksheet for RAC1 (10 Yrs)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.47 %
Discharge	18.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.71
0+06.00	0.59
0+16.50	0.38
0+16.86	0.38
0+17.83	0.06
0+17.83	0.00
0+19.00	0.13
0+19.00	0.17
0+36.00	0.51
0+53.00	0.17
0+53.00	0.13
0+54.17	0.00
0+54.17	0.06
0+55.14	0.38
0+55.50	0.38
0+66.00	0.59

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.71)	(0+16.50, 0.38)	0.025
(0+16.50, 0.38)	(0+19.00, 0.13)	0.013
(0+19.00, 0.13)	(0+53.00, 0.13)	0.016
(0+53.00, 0.13)	(0+55.50, 0.38)	0.013
(0+55.50, 0.38)	(0+66.00, 0.59)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.55 ft
Roughness Coefficient	0.019

Worksheet for RAC1 (10 Yrs)

Results	
Elevation	0.55 ft
Elevation Range	0.00 to 0.71 ft
Flow Area	10.3 ft²
Wetted Perimeter	56.02 ft
Hydraulic Radius	0.18 ft
Top Width	55.69 ft
Normal Depth	0.55 ft
Critical Depth	0.50 ft
Critical Slope	0.97 %
Velocity	1.75 ft/s
Velocity Head	0.05 ft
Specific Energy	0.59 ft
Froude Number	0.715
Flow Type	Subcritical

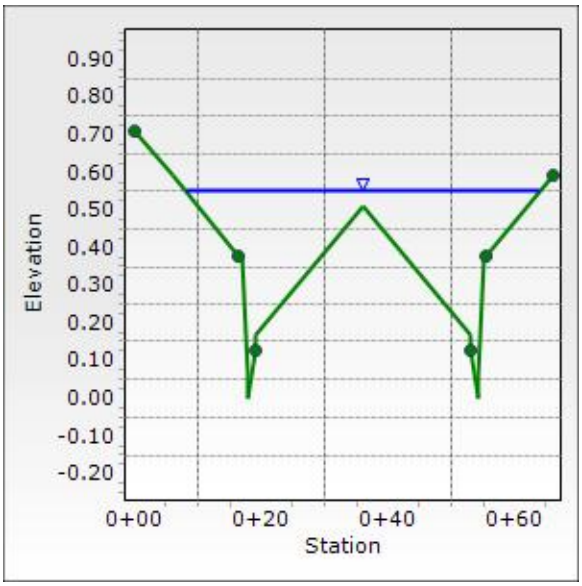
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.55 ft
Critical Depth	0.50 ft
Channel Slope	0.47 %
Critical Slope	0.97 %

Cross Section for RAC1 (10 Yrs)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.47 %
Normal Depth	0.55 ft
Discharge	18.00 cfs



Worksheet for RAC2 (100 Yrs)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.53 %
Discharge	68.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.71
0+06.00	0.59
0+16.50	0.38
0+16.86	0.38
0+17.83	0.06
0+17.83	0.00
0+19.00	0.13
0+19.00	0.17
0+36.00	0.51
0+53.00	0.17
0+53.00	0.13
0+54.17	0.00
0+54.17	0.06
0+55.14	0.38
0+55.50	0.38
0+66.00	0.59

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.71)	(0+16.50, 0.38)	0.025
(0+16.50, 0.38)	(0+19.00, 0.13)	0.013
(0+19.00, 0.13)	(0+53.00, 0.13)	0.016
(0+53.00, 0.13)	(0+55.50, 0.38)	0.013
(0+55.50, 0.38)	(0+66.00, 0.59)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.77 ft
Roughness Coefficient	0.020

Worksheet for RAC2 (100 Yrs)

Results	
Elevation	0.77 ft
Elevation Range	0.00 to 0.71 ft
Flow Area	24.5 ft²
Wetted Perimeter	66.57 ft
Hydraulic Radius	0.37 ft
Top Width	66.00 ft
Normal Depth	0.77 ft
Critical Depth	0.72 ft
Critical Slope	0.86 %
Velocity	2.78 ft/s
Velocity Head	0.12 ft
Specific Energy	0.89 ft
Froude Number	0.804
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.77 ft
Critical Depth	0.72 ft
Channel Slope	0.53 %
Critical Slope	0.86 %

Worksheet for RAC2 (100 Yrs)

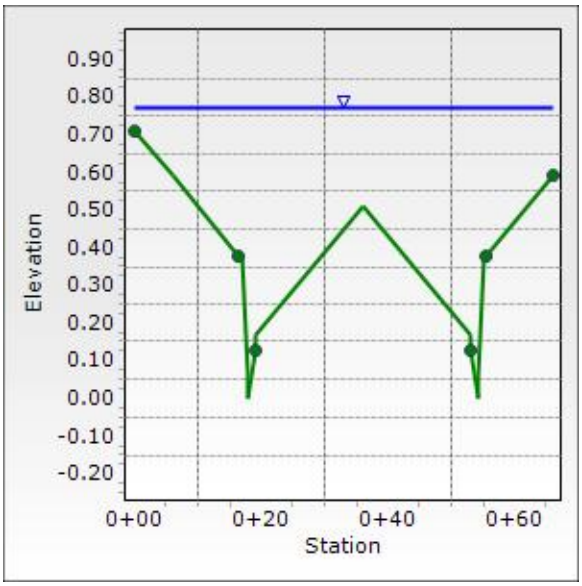
Messages:

Water Surface Elevation exceeds lowest end station by 0.182424336153836ft.

Cross Section for RAC2 (100 Yrs)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.53 %
Normal Depth	0.77 ft
Discharge	68.00 cfs



Worksheet for RAC2 (10 Yrs)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.53 %
Discharge	16.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.71
0+06.00	0.59
0+16.50	0.38
0+16.86	0.38
0+17.83	0.06
0+17.83	0.00
0+19.00	0.13
0+19.00	0.17
0+36.00	0.51
0+53.00	0.17
0+53.00	0.13
0+54.17	0.00
0+54.17	0.06
0+55.14	0.38
0+55.50	0.38
0+66.00	0.59

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.71)	(0+16.50, 0.38)	0.025
(0+16.50, 0.38)	(0+19.00, 0.13)	0.013
(0+19.00, 0.13)	(0+53.00, 0.13)	0.016
(0+53.00, 0.13)	(0+55.50, 0.38)	0.013
(0+55.50, 0.38)	(0+66.00, 0.59)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.52 ft
Roughness Coefficient	0.019

Worksheet for RAC2 (10 Yrs)

Results	
Elevation	0.52 ft
Elevation Range	0.00 to 0.71 ft
Flow Area	9.0 ft²
Wetted Perimeter	53.65 ft
Hydraulic Radius	0.17 ft
Top Width	53.32 ft
Normal Depth	0.52 ft
Critical Depth	0.49 ft
Critical Slope	0.95 %
Velocity	1.77 ft/s
Velocity Head	0.05 ft
Specific Energy	0.57 ft
Froude Number	0.761
Flow Type	Subcritical

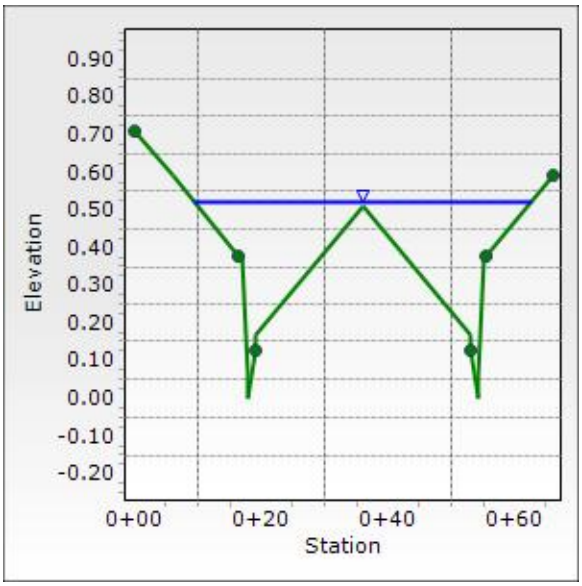
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.52 ft
Critical Depth	0.49 ft
Channel Slope	0.53 %
Critical Slope	0.95 %

Cross Section for RAC2 (10 Yrs)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.53 %
Normal Depth	0.52 ft
Discharge	16.00 cfs



Worksheet for MEI1 (100 Yrs)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.40 %
Discharge	92.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+10.50	0.39
0+10.86	0.39
0+11.83	0.07
0+11.83	0.01
0+13.00	0.14
0+13.00	0.18
0+30.00	0.51
0+47.50	0.17
0+47.50	0.13
0+49.00	0.00
0+49.00	0.48
0+49.50	0.50
0+60.00	0.72

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+10.50, 0.39)	0.025
(0+10.50, 0.39)	(0+13.00, 0.14)	0.013
(0+13.00, 0.14)	(0+47.50, 0.13)	0.016
(0+47.50, 0.13)	(0+49.50, 0.50)	0.013
(0+49.50, 0.50)	(0+60.00, 0.72)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.91 ft
Roughness Coefficient	0.019
Elevation	0.91 ft

Worksheet for MEI1 (100 Yrs)

Results	
Elevation Range	0.00 to 0.72 ft
Flow Area	30.4 ft²
Wetted Perimeter	61.20 ft
Hydraulic Radius	0.50 ft
Top Width	60.00 ft
Normal Depth	0.91 ft
Critical Depth	0.82 ft
Critical Slope	0.75 %
Velocity	3.03 ft/s
Velocity Head	0.14 ft
Specific Energy	1.05 ft
Froude Number	0.751
Flow Type	Subcritical

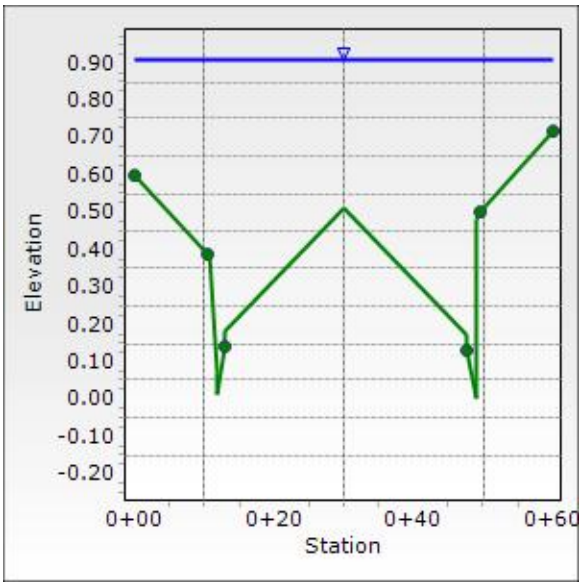
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.91 ft
Critical Depth	0.82 ft
Channel Slope	0.40 %
Critical Slope	0.75 %

Cross Section for MEI1 (100 Yrs)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.40 %
Normal Depth	0.91 ft
Discharge	92.00 cfs



Worksheet for MEI1 (10 Yrs)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.40 %
Discharge	28.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+10.50	0.39
0+10.86	0.39
0+11.83	0.07
0+11.83	0.01
0+13.00	0.14
0+13.00	0.18
0+30.00	0.51
0+47.50	0.17
0+47.50	0.13
0+49.00	0.00
0+49.00	0.48
0+49.50	0.50
0+60.00	0.72

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+10.50, 0.39)	0.025
(0+10.50, 0.39)	(0+13.00, 0.14)	0.013
(0+13.00, 0.14)	(0+47.50, 0.13)	0.016
(0+47.50, 0.13)	(0+49.50, 0.50)	0.013
(0+49.50, 0.50)	(0+60.00, 0.72)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.64 ft
Roughness Coefficient	0.019
Elevation	0.64 ft

Worksheet for MEI1 (10 Yrs)

Results	
Elevation Range	0.00 to 0.72 ft
Flow Area	14.2 ft²
Wetted Perimeter	56.80 ft
Hydraulic Radius	0.25 ft
Top Width	56.07 ft
Normal Depth	0.64 ft
Critical Depth	0.57 ft
Critical Slope	0.90 %
Velocity	1.97 ft/s
Velocity Head	0.06 ft
Specific Energy	0.70 ft
Froude Number	0.690
Flow Type	Subcritical

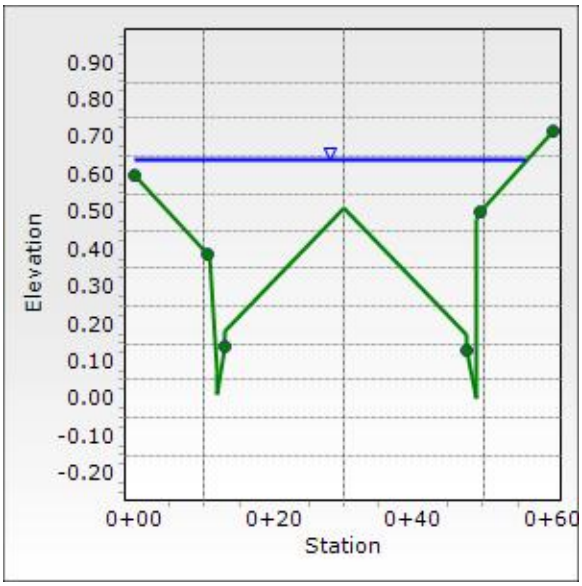
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.64 ft
Critical Depth	0.57 ft
Channel Slope	0.40 %
Critical Slope	0.90 %

Cross Section for MEI1 (10 Yrs)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.40 %
Normal Depth	0.64 ft
Discharge	28.00 cfs



Worksheet for MEI2 (100 Yrs)(min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.42 %
Discharge	95.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+10.50	0.39
0+10.86	0.39
0+11.83	0.07
0+11.83	0.01
0+13.00	0.14
0+13.00	0.18
0+30.00	0.51
0+47.50	0.17
0+47.50	0.13
0+49.00	0.00
0+49.00	0.48
0+49.50	0.50
0+60.00	0.72

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+10.50, 0.39)	0.025
(0+10.50, 0.39)	(0+13.00, 0.14)	0.013
(0+13.00, 0.14)	(0+47.50, 0.13)	0.016
(0+47.50, 0.13)	(0+49.50, 0.50)	0.013
(0+49.50, 0.50)	(0+60.00, 0.72)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.91 ft
Roughness Coefficient	0.019
Elevation	0.91 ft

Worksheet for MEI2 (100 Yrs)(min%)

Results	
Elevation Range	0.00 to 0.72 ft
Flow Area	30.5 ft²
Wetted Perimeter	61.20 ft
Hydraulic Radius	0.50 ft
Top Width	60.00 ft
Normal Depth	0.91 ft
Critical Depth	0.83 ft
Critical Slope	0.75 %
Velocity	3.11 ft/s
Velocity Head	0.15 ft
Specific Energy	1.06 ft
Froude Number	0.770
Flow Type	Subcritical

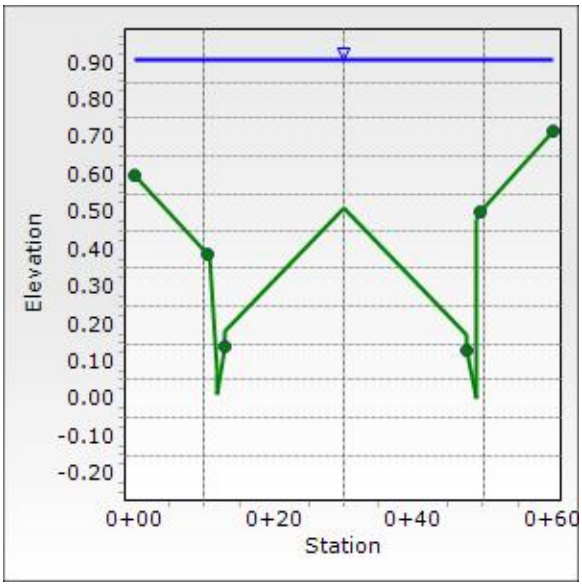
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.91 ft
Critical Depth	0.83 ft
Channel Slope	0.42 %
Critical Slope	0.75 %

Cross Section for MEI2 (100 Yrs)(min%)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.42 %
Normal Depth	0.91 ft
Discharge	95.00 cfs



Worksheet for MEI2 (100 Yrs)(max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.69 %
Discharge	95.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+10.50	0.39
0+10.86	0.39
0+11.83	0.07
0+11.83	0.01
0+13.00	0.14
0+13.00	0.18
0+30.00	0.51
0+47.50	0.17
0+47.50	0.13
0+49.00	0.00
0+49.00	0.48
0+49.50	0.50
0+60.00	0.72

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+10.50, 0.39)	0.025
(0+10.50, 0.39)	(0+13.00, 0.14)	0.013
(0+13.00, 0.14)	(0+47.50, 0.13)	0.016
(0+47.50, 0.13)	(0+49.50, 0.50)	0.013
(0+49.50, 0.50)	(0+60.00, 0.72)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.84 ft
Roughness Coefficient	0.019
Elevation	0.84 ft

Worksheet for MEI2 (100 Yrs)(max%)

Results	
Elevation Range	0.00 to 0.72 ft
Flow Area	26.3 ft²
Wetted Perimeter	61.06 ft
Hydraulic Radius	0.43 ft
Top Width	60.00 ft
Normal Depth	0.84 ft
Critical Depth	0.83 ft
Critical Slope	0.75 %
Velocity	3.62 ft/s
Velocity Head	0.20 ft
Specific Energy	1.04 ft
Froude Number	0.965
Flow Type	Subcritical

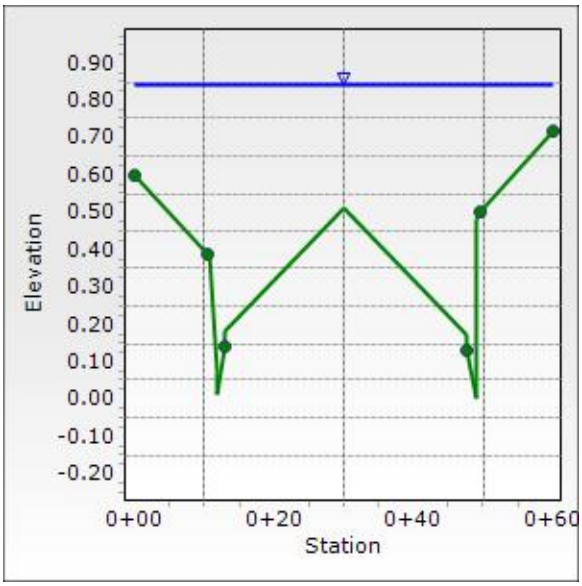
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.84 ft
Critical Depth	0.83 ft
Channel Slope	0.69 %
Critical Slope	0.75 %

Cross Section for MEI2 (100 Yrs)(max%)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.69 %
Normal Depth	0.84 ft
Discharge	95.00 cfs



Worksheet for MEI2 (10 Yrs)(min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.42 %
Discharge	28.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+10.50	0.39
0+10.86	0.39
0+11.83	0.07
0+11.83	0.01
0+13.00	0.14
0+13.00	0.18
0+30.00	0.51
0+47.50	0.17
0+47.50	0.13
0+49.00	0.00
0+49.00	0.48
0+49.50	0.50
0+60.00	0.72

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+10.50, 0.39)	0.025
(0+10.50, 0.39)	(0+13.00, 0.14)	0.013
(0+13.00, 0.14)	(0+47.50, 0.13)	0.016
(0+47.50, 0.13)	(0+49.50, 0.50)	0.013
(0+49.50, 0.50)	(0+60.00, 0.72)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.63 ft
Roughness Coefficient	0.019
Elevation	0.63 ft

Worksheet for MEI2 (10 Yrs)(min%)

Results	
Elevation Range	0.00 to 0.72 ft
Flow Area	14.0 ft²
Wetted Perimeter	56.59 ft
Hydraulic Radius	0.25 ft
Top Width	55.86 ft
Normal Depth	0.63 ft
Critical Depth	0.58 ft
Critical Slope	0.90 %
Velocity	2.00 ft/s
Velocity Head	0.06 ft
Specific Energy	0.70 ft
Froude Number	0.707
Flow Type	Subcritical

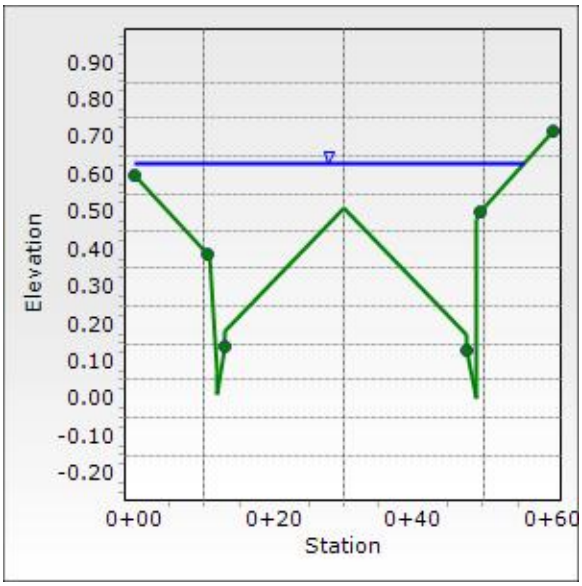
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.63 ft
Critical Depth	0.58 ft
Channel Slope	0.42 %
Critical Slope	0.90 %

Cross Section for MEI2 (10 Yrs)(min%)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.42 %
Normal Depth	0.63 ft
Discharge	28.00 cfs



Worksheet for MEI2 (10 Yrs)(max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.69 %
Discharge	28.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+10.50	0.39
0+10.86	0.39
0+11.83	0.07
0+11.83	0.01
0+13.00	0.14
0+13.00	0.18
0+30.00	0.51
0+47.50	0.17
0+47.50	0.13
0+49.00	0.00
0+49.00	0.48
0+49.50	0.50
0+60.00	0.72

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+10.50, 0.39)	0.025
(0+10.50, 0.39)	(0+13.00, 0.14)	0.013
(0+13.00, 0.14)	(0+47.50, 0.13)	0.016
(0+47.50, 0.13)	(0+49.50, 0.50)	0.013
(0+49.50, 0.50)	(0+60.00, 0.72)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.59 ft
Roughness Coefficient	0.019
Elevation	0.59 ft

Worksheet for MEI2 (10 Yrs)(max%)

Results	
Elevation Range	0.00 to 0.72 ft
Flow Area	11.7 ft²
Wetted Perimeter	54.25 ft
Hydraulic Radius	0.22 ft
Top Width	53.56 ft
Normal Depth	0.59 ft
Critical Depth	0.57 ft
Critical Slope	0.87 %
Velocity	2.39 ft/s
Velocity Head	0.09 ft
Specific Energy	0.68 ft
Froude Number	0.898
Flow Type	Subcritical

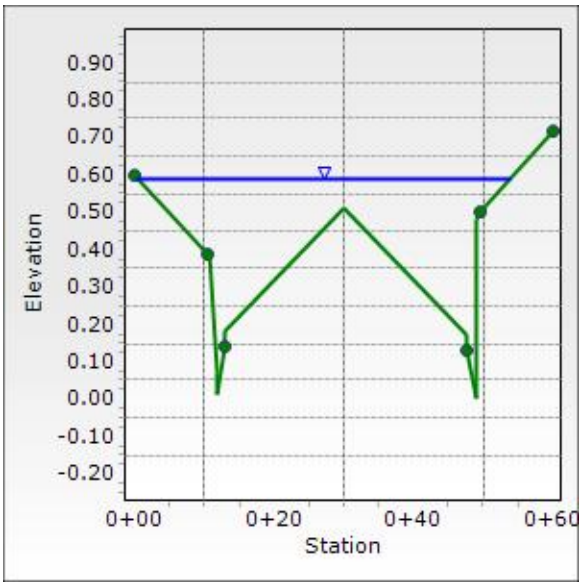
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.59 ft
Critical Depth	0.57 ft
Channel Slope	0.69 %
Critical Slope	0.87 %

Cross Section for MEI2 (10 Yrs)(max%)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.69 %
Normal Depth	0.59 ft
Discharge	28.00 cfs



Worksheet for DON1 (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.38 %
Discharge	3.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+05.00	0.44
0+08.00	0.38
0+08.36	0.38
0+09.33	0.06
0+09.33	0.00
0+10.50	0.13
0+10.50	0.17
0+23.50	0.43
0+36.50	0.17
0+36.50	0.13
0+37.67	0.00
0+37.67	0.06
0+38.64	0.38
0+39.00	0.38
0+42.00	0.44
0+47.00	0.54

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+05.00, 0.44)	0.013
(0+05.00, 0.44)	(0+08.00, 0.38)	0.025
(0+08.00, 0.38)	(0+10.50, 0.13)	0.013
(0+10.50, 0.13)	(0+36.50, 0.13)	0.016
(0+36.50, 0.13)	(0+39.00, 0.38)	0.013
(0+39.00, 0.38)	(0+42.00, 0.44)	0.025
(0+42.00, 0.44)	(0+47.00, 0.54)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Worksheet for DON1 (min%)

Results	
Normal Depth	0.29 ft
Roughness Coefficient	0.015
Elevation	0.29 ft
Elevation Range	0.00 to 0.54 ft
Flow Area	1.3 ft²
Wetted Perimeter	15.62 ft
Hydraulic Radius	0.09 ft
Top Width	15.33 ft
Normal Depth	0.29 ft
Critical Depth	0.31 ft
Critical Slope	0.76 %
Velocity	2.23 ft/s
Velocity Head	0.08 ft
Specific Energy	0.36 ft
Froude Number	1.324
Flow Type	Supercritical

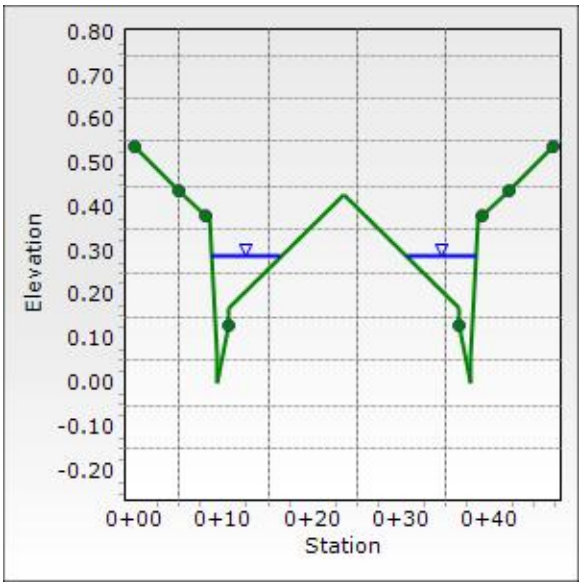
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.29 ft
Critical Depth	0.31 ft
Channel Slope	1.38 %
Critical Slope	0.76 %

Cross Section for DON1 (min%)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.38 %
Normal Depth	0.29 ft
Discharge	3.00 cfs



Worksheet for DON1 (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.69 %
Discharge	3.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+05.00	0.44
0+08.00	0.38
0+08.36	0.38
0+09.33	0.06
0+09.33	0.00
0+10.50	0.13
0+10.50	0.17
0+23.50	0.43
0+36.50	0.17
0+36.50	0.13
0+37.67	0.00
0+37.67	0.06
0+38.64	0.38
0+39.00	0.38
0+42.00	0.44
0+47.00	0.54

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+05.00, 0.44)	0.013
(0+05.00, 0.44)	(0+08.00, 0.38)	0.025
(0+08.00, 0.38)	(0+10.50, 0.13)	0.013
(0+10.50, 0.13)	(0+36.50, 0.13)	0.016
(0+36.50, 0.13)	(0+39.00, 0.38)	0.013
(0+39.00, 0.38)	(0+42.00, 0.44)	0.025
(0+42.00, 0.44)	(0+47.00, 0.54)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Worksheet for DON1 (max%)

Results	
Normal Depth	0.28 ft
Roughness Coefficient	0.015
Elevation	0.28 ft
Elevation Range	0.00 to 0.54 ft
Flow Area	1.2 ft²
Wetted Perimeter	14.86 ft
Hydraulic Radius	0.08 ft
Top Width	14.58 ft
Normal Depth	0.28 ft
Critical Depth	0.31 ft
Critical Slope	0.76 %
Velocity	2.42 ft/s
Velocity Head	0.09 ft
Specific Energy	0.37 ft
Froude Number	1.460
Flow Type	Supercritical

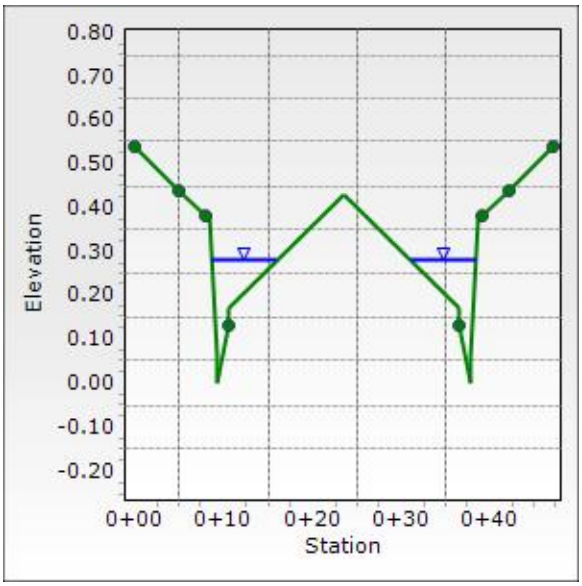
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.28 ft
Critical Depth	0.31 ft
Channel Slope	1.69 %
Critical Slope	0.76 %

Cross Section for DON1 (max%)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.69 %
Normal Depth	0.28 ft
Discharge	3.00 cfs



Worksheet for EA1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.62	%
Discharge	9.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	6.00
0+00.00	0.06
0+05.00	0.00
0+10.00	0.06
0+10.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+10.00, 6.00)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.29	ft
Roughness Coefficient	0.013	
Elevation	0.29	ft
Elevation Range	0.00 to 6.00	ft
Flow Area	2.6	ft²
Wetted Perimeter	10.45	ft
Hydraulic Radius	0.24	ft
Top Width	10.00	ft
Normal Depth	0.29	ft
Critical Depth	0.32	ft
Critical Slope	0.40	%
Velocity	3.52	ft/s
Velocity Head	0.19	ft
Specific Energy	0.48	ft
Froude Number	1.228	
Flow Type	Supercritical	

Worksheet for EA1

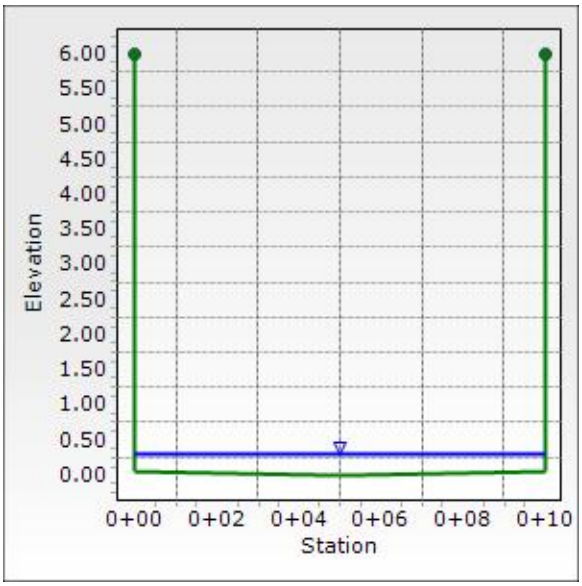
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.29 ft
Critical Depth	0.32 ft
Channel Slope	0.62 %
Critical Slope	0.40 %

Cross Section for EA1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.62 %
Normal Depth	0.29 ft
Discharge	9.00 cfs



Worksheet for EA2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.62	%
Discharge	9.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	6.00
0+00.00	0.06
0+04.67	0.00
0+09.33	0.06
0+09.33	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+09.33, 6.00)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.30	ft
Roughness Coefficient	0.013	
Elevation	0.30	ft
Elevation Range	0.00 to 6.00	ft
Flow Area	2.5	ft²
Wetted Perimeter	9.80	ft
Hydraulic Radius	0.25	ft
Top Width	9.33	ft
Normal Depth	0.30	ft
Critical Depth	0.34	ft
Critical Slope	0.39	%
Velocity	3.61	ft/s
Velocity Head	0.20	ft
Specific Energy	0.50	ft
Froude Number	1.232	
Flow Type	Supercritical	

Worksheet for EA2

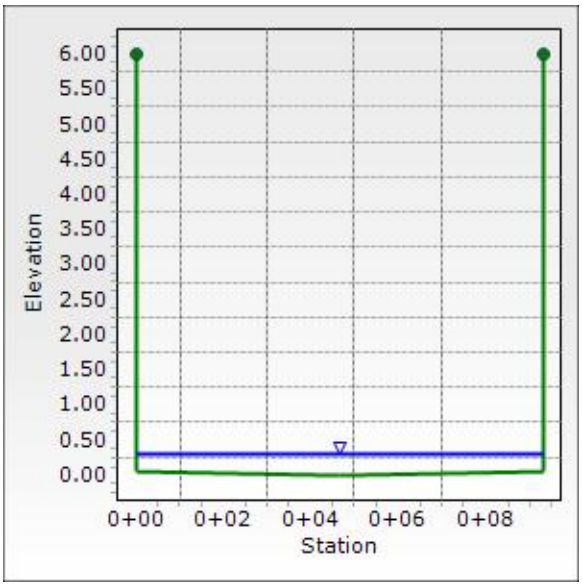
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.30 ft
Critical Depth	0.34 ft
Channel Slope	0.62 %
Critical Slope	0.39 %

Cross Section for EA2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.62 %
Normal Depth	0.30 ft
Discharge	9.00 cfs



Worksheet for EA3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.66	%
Discharge	7.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.16
0+10.00	0.06
0+10.00	0.06
0+15.00	0.00
0+20.00	0.06
0+20.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.16)	(0+10.00, 0.06)	0.025
(0+10.00, 0.06)	(0+20.00, 6.00)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.25	ft
Roughness Coefficient	0.020	
Elevation	0.25	ft
Elevation Range	0.00 to 6.00	ft
Flow Area	3.6	ft²
Wetted Perimeter	20.28	ft
Hydraulic Radius	0.18	ft
Top Width	20.00	ft
Normal Depth	0.25	ft
Critical Depth	0.23	ft
Critical Slope	1.09	%
Velocity	1.93	ft/s
Velocity Head	0.06	ft
Specific Energy	0.31	ft

Worksheet for EA3

Results	
Froude Number	0.797
Flow Type	Subcritical

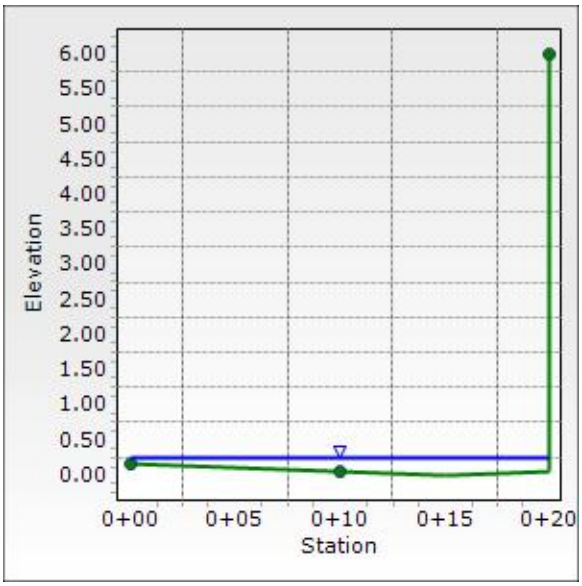
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.25 ft
Critical Depth	0.23 ft
Channel Slope	0.66 %
Critical Slope	1.09 %

Cross Section for EA3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.66 %
Normal Depth	0.25 ft
Discharge	7.00 cfs



Worksheet for SW-1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	0.62	%
Bottom Width	2.00	ft
Discharge	3.00	cfs

Results		
Normal Depth	0.39	ft
Flow Area	0.8	ft²
Wetted Perimeter	2.78	ft
Hydraulic Radius	0.28	ft
Top Width	2.00	ft
Critical Depth	0.41	ft
Critical Slope	0.52	%
Velocity	3.86	ft/s
Velocity Head	0.23	ft
Specific Energy	0.62	ft
Froude Number	1.090	
Flow Type	Supercritical	

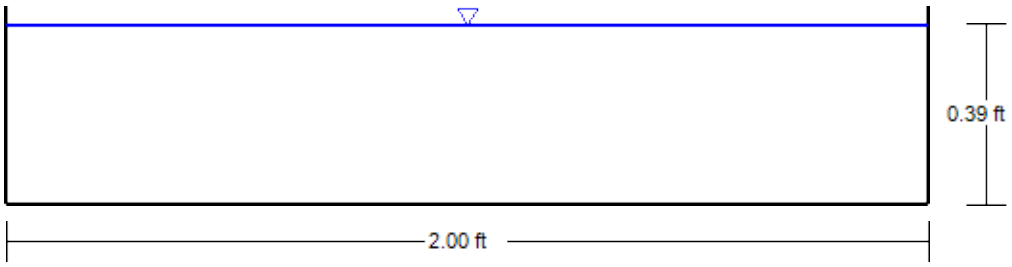
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

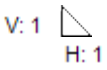
GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.41	ft
Channel Slope	0.62	%
Critical Slope	0.52	%

Cross Section for SW-1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	0.62	%
Normal Depth	0.39	ft
Bottom Width	2.00	ft
Discharge	3.00	cfs





Worksheet for CH1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	1.00	%
Discharge	9.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.00	0.06
0+05.50	0.00
0+11.00	0.06
0+11.00	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.50)	(0+11.00, 0.50)	0.013

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results		
Normal Depth	0.24	ft
Roughness Coefficient	0.013	
Elevation	0.24	ft
Elevation Range	0.00 to 0.50	ft
Flow Area	2.3	ft²
Wetted Perimeter	11.36	ft
Hydraulic Radius	0.20	ft
Top Width	11.00	ft
Normal Depth	0.24	ft
Critical Depth	0.31	ft
Critical Slope	0.40	%
Velocity	3.93	ft/s
Velocity Head	0.24	ft
Specific Energy	0.48	ft
Froude Number	1.519	
Flow Type	Supercritical	

Worksheet for CH1

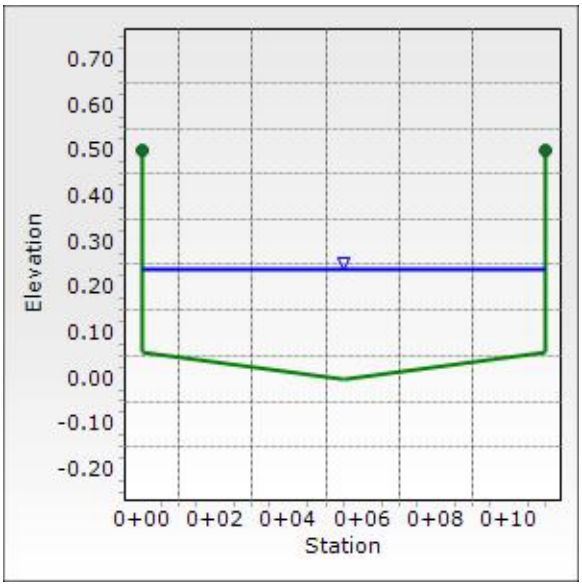
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.24 ft
Critical Depth	0.31 ft
Channel Slope	1.00 %
Critical Slope	0.40 %

Cross Section for CH1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.24 ft
Discharge	9.00 cfs



Worksheet for Torrey Pines_100cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.72 %
Discharge	100.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+40.00	0.83
0+73.00	0.17
0+73.00	0.13
0+74.50	0.00
0+74.50	0.48
0+75.00	0.50
0+80.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+80.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.82 ft
Roughness Coefficient	0.016
Elevation	0.82 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	26.6 ft²
Wetted Perimeter	80.74 ft
Hydraulic Radius	0.33 ft
Top Width	79.23 ft

Worksheet for Torrey Pines_100cfs

Results	
Normal Depth	0.82 ft
Critical Depth	0.85 ft
Critical Slope	0.54 %
Velocity	3.76 ft/s
Velocity Head	0.22 ft
Specific Energy	1.04 ft
Froude Number	1.144
Flow Type	Supercritical

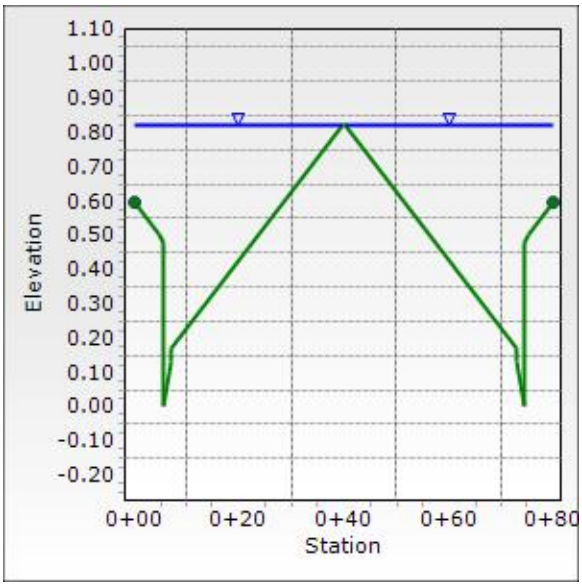
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.82 ft
Critical Depth	0.85 ft
Channel Slope	0.72 %
Critical Slope	0.54 %

Cross Section for Torrey Pines_100cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.72 %
Normal Depth	0.82 ft
Discharge	100.00 cfs



Worksheet for Meisenheimer Ave _100cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.40 %
Discharge	100.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.45
0+10.00	0.25
0+13.00	0.19
0+16.00	0.25
0+30.00	0.53
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.45)	(0+10.00, 0.25)	0.015
(0+10.00, 0.25)	(0+16.00, 0.25)	0.025
(0+16.00, 0.25)	(0+60.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.85 ft
Roughness Coefficient	0.017
Elevation	0.85 ft
Elevation Range	0.00 to 0.60 ft
Flow Area	29.4 ft²
Wetted Perimeter	61.18 ft
Hydraulic Radius	0.48 ft
Top Width	60.00 ft

Worksheet for Meisenheimer Ave _100cfs

Results		
Normal Depth	0.85	ft
Critical Depth	0.80	ft
Critical Slope	0.56	%
Velocity	3.40	ft/s
Velocity Head	0.18	ft
Specific Energy	1.03	ft
Froude Number	0.858	
Flow Type	Subcritical	

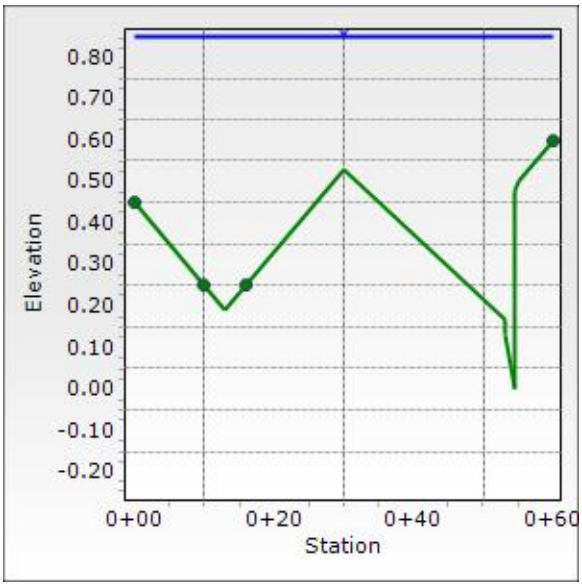
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	0.00	ft/s
Upstream Velocity	0.00	ft/s
Normal Depth	0.85	ft
Critical Depth	0.80	ft
Channel Slope	0.40	%
Critical Slope	0.56	%

Cross Section for Meisenheimer Ave _100cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.40 %
Normal Depth	0.85 ft
Discharge	100.00 cfs



Worksheet for Torrey Pines_500cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.72 %
Discharge	500.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+40.00	0.83
0+73.00	0.17
0+73.00	0.13
0+74.50	0.00
0+74.50	0.48
0+75.00	0.50
0+80.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+80.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.37 ft
Roughness Coefficient	0.016
Elevation	1.37 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	70.5 ft²
Wetted Perimeter	82.61 ft
Hydraulic Radius	0.85 ft
Top Width	80.00 ft

Worksheet for Torrey Pines_500cfs

Results		
Normal Depth	1.37	ft
Critical Depth	1.56	ft
Critical Slope	0.38	%
Velocity	7.09	ft/s
Velocity Head	0.78	ft
Specific Energy	2.15	ft
Froude Number	1.332	
Flow Type	Supercritical	

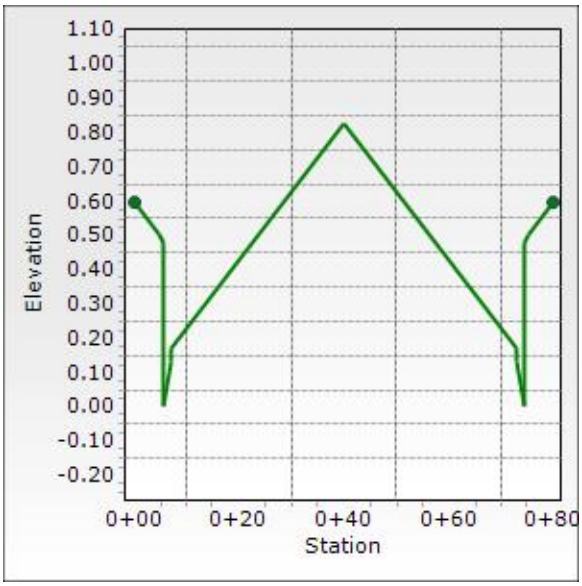
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.37	ft
Critical Depth	1.56	ft
Channel Slope	0.72	%
Critical Slope	0.38	%

Cross Section for Torrey Pines_500cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.72 %
Normal Depth	1.37 ft
Discharge	500.00 cfs



Worksheet for Meisenheimer Ave_500cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.40 %
Discharge	500.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.45
0+10.00	0.25
0+13.00	0.19
0+16.00	0.25
0+30.00	0.53
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.45)	(0+10.00, 0.25)	0.015
(0+10.00, 0.25)	(0+16.00, 0.25)	0.025
(0+16.00, 0.25)	(0+60.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.66 ft
Roughness Coefficient	0.017
Elevation	1.66 ft
Elevation Range	0.00 to 0.60 ft
Flow Area	77.9 ft²
Wetted Perimeter	62.80 ft
Hydraulic Radius	1.24 ft
Top Width	60.00 ft

Worksheet for Meisenheimer Ave_500cfs

Results	
Normal Depth	1.66 ft
Critical Depth	1.65 ft
Critical Slope	0.41 %
Velocity	6.42 ft/s
Velocity Head	0.64 ft
Specific Energy	2.30 ft
Froude Number	0.993
Flow Type	Subcritical

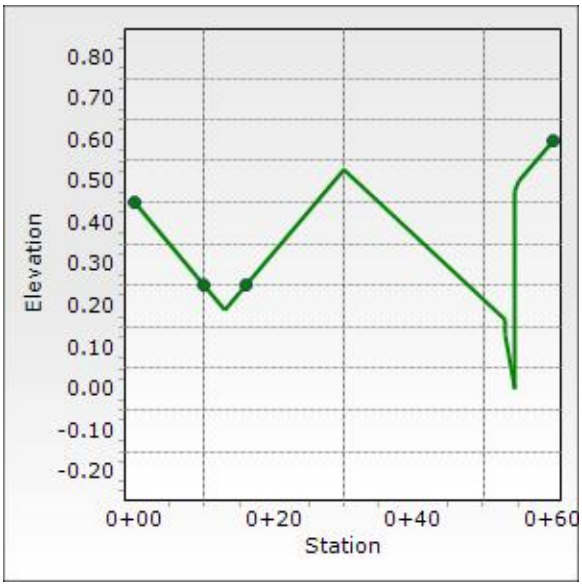
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	1.66 ft
Critical Depth	1.65 ft
Channel Slope	0.40 %
Critical Slope	0.41 %

Cross Section for Meisenheimer Ave_500cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.40 %
Normal Depth	1.66 ft
Discharge	500.00 cfs



Worksheet for Torrey Pines_1000cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.72 %
Discharge	1,000.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+40.00	0.83
0+73.00	0.17
0+73.00	0.13
0+74.50	0.00
0+74.50	0.48
0+75.00	0.50
0+80.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+80.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.83 ft
Roughness Coefficient	0.016
Elevation	1.83 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	107.4 ft²
Wetted Perimeter	83.53 ft
Hydraulic Radius	1.29 ft
Top Width	80.00 ft

Worksheet for Torrey Pines_1000cfs

Results		
Normal Depth	1.83	ft
Critical Depth	2.18	ft
Critical Slope	0.34	%
Velocity	9.31	ft/s
Velocity Head	1.35	ft
Specific Energy	3.18	ft
Froude Number	1.417	
Flow Type	Supercritical	

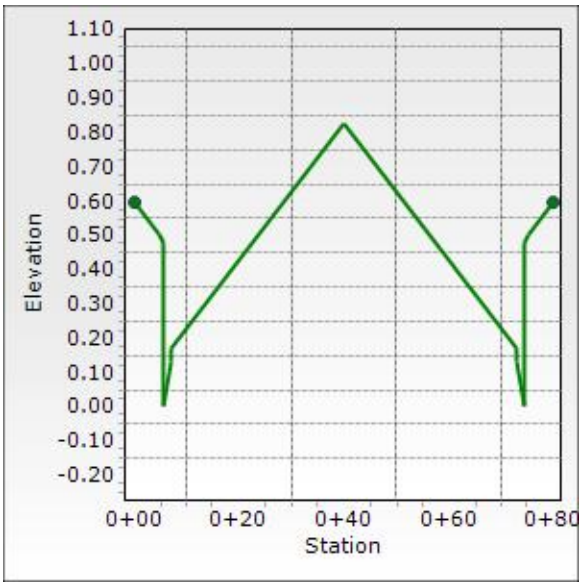
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.83	ft
Critical Depth	2.18	ft
Channel Slope	0.72	%
Critical Slope	0.34	%

Cross Section for Torrey Pines_1000cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.72 %
Normal Depth	1.83 ft
Discharge	1,000.00 cfs



Worksheet for Meisenheimer Ave_1000cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.40 %
Discharge	1,000.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.45
0+10.00	0.25
0+13.00	0.19
0+16.00	0.25
0+30.00	0.53
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.45)	(0+10.00, 0.25)	0.015
(0+10.00, 0.25)	(0+16.00, 0.25)	0.025
(0+16.00, 0.25)	(0+60.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	2.34 ft
Roughness Coefficient	0.017
Elevation	2.34 ft
Elevation Range	0.00 to 0.60 ft
Flow Area	119.0 ft²
Wetted Perimeter	64.17 ft
Hydraulic Radius	1.85 ft
Top Width	60.00 ft

Worksheet for Meisenheimer Ave_1000cfs

Results		
Normal Depth	2.34	ft
Critical Depth	2.41	ft
Critical Slope	0.36	%
Velocity	8.40	ft/s
Velocity Head	1.10	ft
Specific Energy	3.44	ft
Froude Number	1.052	
Flow Type	Supercritical	

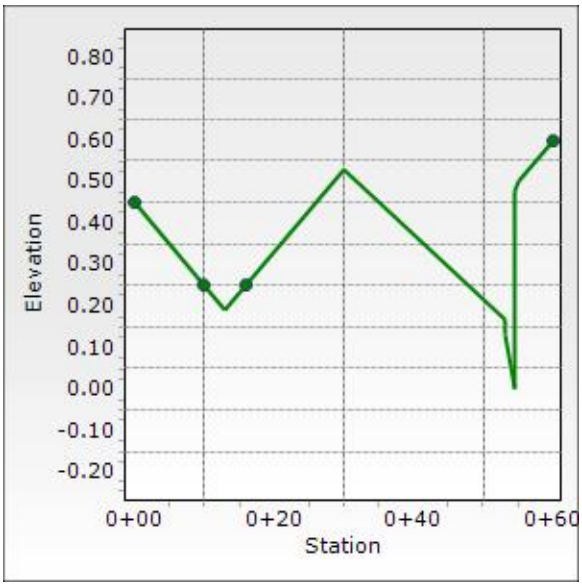
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.34	ft
Critical Depth	2.41	ft
Channel Slope	0.40	%
Critical Slope	0.36	%

Cross Section for Meisenheimer Ave_1000cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.40 %
Normal Depth	2.34 ft
Discharge	1,000.00 cfs



Worksheet for Torrey Pines_5000cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.72 %
Discharge	5,000.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+40.00	0.83
0+73.00	0.17
0+73.00	0.13
0+74.50	0.00
0+74.50	0.48
0+75.00	0.50
0+80.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+80.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	4.09 ft
Roughness Coefficient	0.016
Elevation	4.09 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	288.0 ft²
Wetted Perimeter	88.05 ft
Hydraulic Radius	3.27 ft
Top Width	80.00 ft

Worksheet for Torrey Pines_5000cfs

Results		
Normal Depth	4.09	ft
Critical Depth	5.44	ft
Critical Slope	0.26	%
Velocity	17.36	ft/s
Velocity Head	4.69	ft
Specific Energy	8.77	ft
Froude Number	1.613	
Flow Type	Supercritical	

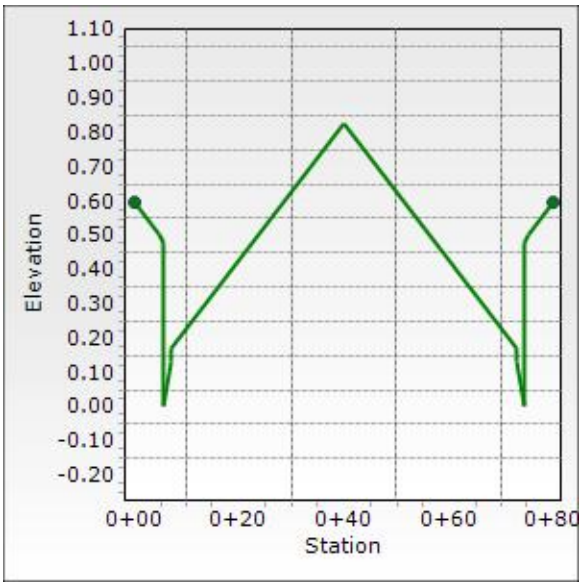
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	4.09	ft
Critical Depth	5.44	ft
Channel Slope	0.72	%
Critical Slope	0.26	%

Cross Section for Torrey Pines_5000cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.72 %
Normal Depth	4.09 ft
Discharge	5,000.00 cfs



Worksheet for Meisenheimer Ave_5000cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.40 %
Discharge	5,000.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.45
0+10.00	0.25
0+13.00	0.19
0+16.00	0.25
0+30.00	0.53
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.45)	(0+10.00, 0.25)	0.015
(0+10.00, 0.25)	(0+16.00, 0.25)	0.025
(0+16.00, 0.25)	(0+60.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	5.76 ft
Roughness Coefficient	0.017
Elevation	5.76 ft
Elevation Range	0.00 to 0.60 ft
Flow Area	323.9 ft²
Wetted Perimeter	71.00 ft
Hydraulic Radius	4.56 ft
Top Width	60.00 ft

Worksheet for Meisenheimer Ave_5000cfs

Results		
Normal Depth	5.76	ft
Critical Depth	6.36	ft
Critical Slope	0.29	%
Velocity	15.44	ft/s
Velocity Head	3.70	ft
Specific Energy	9.46	ft
Froude Number	1.171	
Flow Type	Supercritical	

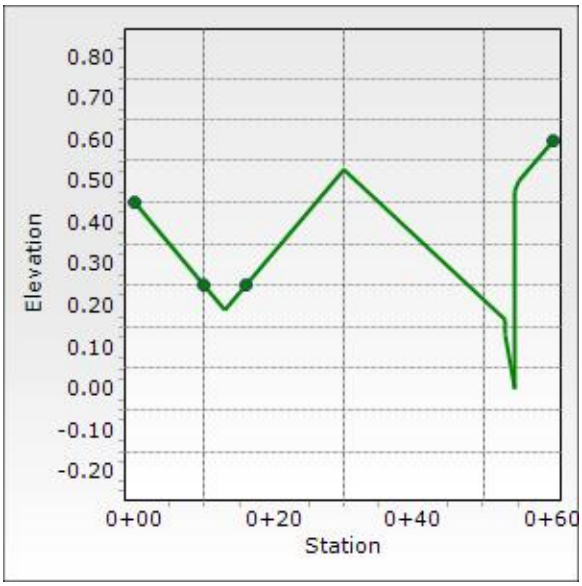
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	5.76	ft
Critical Depth	6.36	ft
Channel Slope	0.40	%
Critical Slope	0.29	%

Cross Section for Meisenheimer Ave_5000cfs

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.40 %
Normal Depth	5.76 ft
Discharge	5,000.00 cfs



NORTHWEST NEIGHBORHOOD STUDY PHASE 2
FLOW SPLIT CALCULATIONS

Diversion Name	Street Names	Total Flow at Intersection QT (cfs)	1/2 Total Flow at Intersection QT/2 (cfs)	Slope of Street 1 S1 (ft./ft.)	Slope of Street 2 S2 (ft./ft.)	Right-of-Way Width Street 1 W1 (ft.)	Right-of-Way Width Street 2 W2 (ft.)	Depth of Flow in Street 1 Q = QT/2 D1 (ft.)	Depth of Flow in Street 2 Q = QT/2 D2 (ft.)	Average Depth (Assumed) D (ft.)	Calculated Flow Area at Depth = D Street 1 A1 (ft.^2)	Calculated Flow Area at Depth = D Street 2 A2 (ft.^2)	Wetted Perimeter at Depth = D Street 1 WP1 (ft.)	Wetted Perimeter at Depth = D Street 2 WP2 (ft.)	Hydraulic Radius x Area Street 1 A1(A1/WP1)^2/3	Hydraulic Radius x Area Street 2 A2(A2/WP2)^2/3	Calculated Flow in Street 1 Q1 (cfs)	Calculated Flow in Street 2 Q2 (cfs)
DCCNW173-A	TORREY PINES AND HORSE	100	50	0.0067	0.004	80	80	0.67	0.73	0.70	17.65	17.65	68.31	68.31	7.16	7.16	56	44
	TORREY PINES AND HORSE	500	250	0.0067	0.004	80	80	1.05	1.20	1.13	50.81	50.81	82.17	82.17	36.87	36.87	282	218
	TORREY PINES AND HORSE	1000	500	0.0067	0.004	80	80	1.34	1.53	1.44	75.60	75.60	82.79	82.79	71.16	71.16	564	436
	TORREY PINES AND HORSE	5000	2500	0.0067	0.004	80	80	2.74	3.31	3.03	202.81	202.81	85.97	85.97	359.38	359.38	2821	2179
DDNW173-A	TORREY PINES AND MEISENHEIMER	100	50	0.0072	0.004	80	60	0.82	0.85	0.84	26.60	29.40	80.74	61.18	12.69	18.04	49	51
	TORREY PINES AND MEISENHEIMER	500	250	0.0072	0.004	80	60	1.37	1.66	1.52	70.50	77.90	82.61	62.80	63.43	89.93	243	257
	TORREY PINES AND MEISENHEIMER	1000	500	0.0072	0.004	80	60	1.83	2.34	2.09	107.40	119.00	83.53	64.17	126.99	179.62	487	513
	TORREY PINES AND MEISENHEIMER	5000	2500	0.0072	0.004	80	60	4.09	5.76	4.93	288.00	323.90	88.05	71.00	634.60	890.93	2443	2557
DCNW173	TORREY PINES AND RACEL	100	50	0.0076	0.004	80	60	0.67	0.72	0.70	17.32	17.10	67.80	61.29	6.97	7.30	57	43
	TORREY PINES AND RACEL	500	250	0.0076	0.004	80	60	1.05	1.20	1.13	50.81	42.90	82.17	62.15	36.87	33.51	301	199
	TORREY PINES AND RACEL	1000	500	0.0076	0.004	80	60	1.34	1.65	1.50	80.40	65.11	82.91	62.89	78.78	66.62	620	380
	TORREY PINES AND RACEL	5000	2500	0.0076	0.004	80	60	2.74	3.82	3.28	223.21	172.21	86.48	66.46	419.97	324.86	3203	1797

BUILDING #	FF	High	Low	Criteria	Depth	Freeboard	Section #	Remarks
Finished Floor Elevations								
1	2375.80	2372.07	2371.83	1.56	0.78	2.67	RAC2	
1	2375.80	2373.41	2372.24	1.75	0.25	1.61	EA3	FL used instead of TC
2	2375.30	2371.83	2370.97	1.56	0.78	2.72	RAC2	
3	2375.30	2370.97	2370.46	1.56	0.78	3.41	RAC2	
4	2374.10	2370.46	2369.93	1.56	0.78	2.73	RAC2	
5	2373.50	2369.93	2369.32	1.56	0.78	2.70	RAC2	
6	2372.90	2369.32	2368.87	1.56	0.78	2.63	RAC2	
6	2372.90	2370.14	2369.09	1.80	0.30	1.87	EA2	FL used instead of TC
7	2379.20	2376.02	2375.41	1.86	0.93	2.00	MEI1	
7	2379.20	2376.08	2375.43	0.58	0.29	3.24	DON1	
7	2379.20	2376.00	2375.71	1.75	0.25	1.97	EA3	FL used instead of TC
8	2378.50	2375.40	2374.17	0.92	0.46	3.18	DON2	
8	2378.50	2375.71	2374.91	1.75	0.25	1.82	EA3	FL used instead of TC
9	2378.45	2374.17	2373.86	0.92	0.46	3.89	DON2	
9	2378.45	2374.91	2373.48	1.75	0.25	2.89	EA3	FL used instead of TC
10	2378.00	2373.86	2373.57	0.92	0.46	3.74	DON2	
10	2378.00	2373.48	2373.41	1.75	0.25	3.19	EA3	FL used instead of TC
11	2376.60	2373.57	2372.98	0.92	0.46	2.78	DON2	
12	2376.40	2372.98	2372.33	0.92	0.46	3.21	DON2	FL used instead of TC
13	2376.70	2372.33	2372.00	1.74	0.24	3.18	CH1	Checked for WSEL+18"
13	2376.70	2371.59	2370.14	1.79	0.29	4.43	EA1	FL used instead of TC
14	2377.00	2372.54	2372.06	1.74	0.24	3.34	CH1	Checked for WSEL+18"
14	2377.00	2371.59	2370.14	1.79	0.29	4.73	EA1	FL used instead of TC
15	2377.10	2374.17	2372.54	0.92	0.46	3.20	DON2	
16	2377.90	2374.42	2373.99	0.58	0.29	3.50	DON1	
16	2377.90	2373.83	2373.18	1.86	0.93	2.91	MEI2	
17	2376.50	2372.99	2372.51	0.92	0.46	3.21	DON2	
17	2376.50	2374.39	2372.51	0.92	0.46	2.51	DON2	
18	2377.10	2373.86	2372.99	0.92	0.46	3.13	DON2	
18	2377.10	2375.52	2374.20	0.92	0.46	1.70	DON2	East of the lot
19	2379.80	2375.07	2374.08	1.86	0.93	3.75	MEI2	West of the lot
19	2379.80	2374.42	2374.10	0.58	0.29	5.34	DON1	
19	2379.80	2375.55	2375.17	0.58	0.29	4.24	DON1	